

# ML-1000



## Laser Show System

### **Owner's Manual and User Guide**

Magnum Lighting strongly recommends keeping this manual with your new laser projector at all times as a field reference.



# **WARNING!**

**LASER RADIATION  
AVOID EYE OR SKIN EXPOSURE TO  
DIRECT OR SCATTERED RADIATION  
CLASS 4 LASER PRODUCT**

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

**AN FDA VARIANCE IS REQUIRED PRIOR TO OPERATION  
OF ANY CLASS 4 LASER PROJECTOR.**

**THIS LASER PRODUCT IS NOT TO BE USED OUTDOORS**

**Some US states require additional licensing and/or registration. Many  
locations require operation only under the supervision of a trained Laser  
Safety Officer (LSO).**

**MAGNUM**  
LIGHTING

**[www.magnumlighting.com](http://www.magnumlighting.com)**

12/F, San Toi Building, 137-139 Connaught Road Central, Hong Kong

Email: [lynn@magnumlighting.com](mailto:lynn@magnumlighting.com)

Phone: +8613798969520

If you have any questions about any of the content of this manual  
or the safe operation of your new laser projector, please do not hesitate  
to contact Magnum Lighting directly.

# **Content**

**1. Introduction**

**2. ML-1000 Parts Diagram**

**3. Technical Specifications**

**4. Product Labeling and Placement**

**5. Safety Guidelines and Proper Usage**

**6. Setup Guide**

**7. Troubleshooting**

**8. Limitation of Liability**

**9. Manufacturer's Warranty**

# Introduction

Visuals play a huge role in the sensory experience of music. The synergy of lasers, lights, screens and strobes are why we go to clubs and festivals. The ML-1000 features over 100 built-in visualizers and a library of music laser shows. Bring the party home every night with ML-1000.

The ML-1000 combines a laser projector, music visualizer and laser show software to produce amazing laser shows anywhere. Just connect a Mac, PC, or Android device and that's it. LaserOS is open source, giving everyone a chance to create.

The ML-1000 is a 1W RGB laser projector with AT20 galvos. It's pure-diode lasers can create up to 16.8 million unique color combinations.



**“Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.”**

## 2. ML-1000 Parts Diagram

1. Laser Aperture - Laser light is emitted from this opening.
2. Beam Block - Prevents laser emission and also restricts the laser scan from going into an audience.
3. USB Port - Provides connection and control of the ML-1000 via a PC/Mac/Android device. The laser will turn off if it is disconnected.
4. Key Control - Prevents accidental operation. Resetting of the key control will be required if there is a power loss or remote interlock cycling.
5. Power Switch - Toggles the power ON or OFF.
6. Remote Interlock Connector- Provides a safety shut-off for terminating the laser emission via a jumper connection. A jumper is included with the product.
7. Fuse - Provides overcurrent protection.
8. Mains Input - Power connection for the laser via a wall outlet.



### **3. Technical Specifications:**

- LASER PRODUCT CLASS: Class 4 Laser
- RED: 637nm 150mw
- GREEN: 520nm 100mw
- BLUE: 450nm <700mw
- EMISSION TYPE: CW
- BEAM DIAMETER: 4mm
- BEAM DIVERGENCE: 1.0mRad
- SCAN ANGLE (MECHANICAL): +/- 20 degrees
- SCAN ANGLE (OPTICAL): 80 degrees
- SCANNER TUNING: 20kpps (ILDA Test Pattern)
- REQUIRED EYEWEAR O.D.: 3.0+ (450nm - 637nm)
- NOHD: 447 meters
- SIZE: 10(L) x 10(W) x 10.5(H) cm
- NET WEIGHT: 2kg
- VOLTAGE: 100-240V

#### **DAC / Software:**

- MAC: OSX 10.6+
- PC: Windows 7+, 1GHz, 2GB of RAM
- ANDROID: Android 4.4+
- INPUT MODES: Line-in (25ms latency) or Microphone (40ms latency)
- LaserOS: Features an ILDA player with a selection of over 100 visualizers and various apps included.





## 5. Safety Guidelines and Proper Usage

1. No scheduled maintenance necessary to keep the product in compliance. Simply keep the laser free from dust or other contaminants that could cloud or dirty the laser aperture. Cleaning the aperture window is the **ONLY** maintenance allowed and must be performed with the unit powered down and locked off. **Servicing by the user is not allowed. Any attempt to open or modify the unit is prohibited. Instant permanent blindness may result in case of an accidental eye exposure to the beam.**
2. 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. Lasers are capable of starting fires at great distances. Do not use around flammable materials.\*
3. Do not take apart, modify or dismantle the laser or operate it under abnormal current load (doing so will void the warranty). Strictly no service is allowed. Servicing should only be handled by authorized factory trained technicians.
4. Always treat your laser with great care as some components are very fragile and must not be subjected to shock.
5. Avoid turning the laser on and off frequently as it will reduce the diode life. This device does not have a set duty cycle but we do not recommend using it for more than four hours continuously.
6. From time to time, 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 maintenance allowed and can ONLY be performed with the unit powered down and locked off.**
7. Always keep all factory supplied labels on the unit and visible. These are required for legal compliance.
8. During use, be sure to leave an open space around all sides of the laser to facilitate airflow through the heatsink beneath the device.
9. Operate your laser only within the specified temperature range of 10°C (50°F) to 40°C (104°F). Failure to do so may result in weak output, overly strong output which will diminish the life of the unit and/or large output power swings. The ML-1000 is thermostatically monitored so we can determine if a failure was

temperature related. Such failures are NOT covered under our manufacturer's warranty. Extreme cold and hot temperatures WILL cause a diode failure. Keep this unit climate controlled at ALL times.

10. Always ensure that the main power supply is properly grounded before use. Do not use a 2 prong IEC cord with this projector. You should always hook up a laser system in such a way that you have both a primary and backup means of instantly terminating laser emissions.

11. DO NOT USE the laser device if you suspect that it contains a defect of any kind either from manufacturing, damage, general wear or has a broken manufacturer's seal. Contact Magnum Lighting to return the unit to the factory for service and/or maintenance immediately.

12. Should you have difficulty operating the laser properly and troubleshooting does not work, go to <http://www.magnumlighting.com> for support and RMA assistance if necessary. Do not attempt to service, modify or fix the laser yourself. You will be provided with instructions on how to send the laser projector back for repair.

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

14. This product is not a toy and should be kept inaccessible to unauthorized persons before, during, and after use. Keep away from minors.

15. Authorized persons should only be employees of an FDA variance holder. See the Magnum website: <http://variance.magnumlighting.com/> for obtaining a variance and to view online laser safety and operator training.

16. This product is not to be used outdoors. Do not allow laser light to escape indoor settings as this level of laser light can interfere with Aircraft operation at many miles. DO NOT allow lasers to hit aircraft or enter airspace. Shining a laser at an aircraft in the US is considered a federal crime punishable by fines or jail time.\*\*

17. 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, some US states require additional licensing and/or registration. Many locations require operation only under the supervision of a trained Laser Safety Officer (LSO). An FDA variance is required to operate this product in the United States.

18. 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. The laser must never be aimed at or allowed to be directed or reflected toward other people or reflective objects.

19. 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 or skin damage. Class 4 lasers must be handled and operated with care and extreme caution.

\*\*This product shall 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 laser system properly. The safety procedures outlined in this manual must be observed at all times to provide you with safe and fun laser displays. Please contact us if you have any questions about how to safely and effectively use our products!

**For more safety information & guidance please refer to ANSI Z136.1 (2007) Safe Use of Laser available at the Laser Institute of America website:  
[www.laserinstitute.org](http://www.laserinstitute.org)**

## 6. Setup Guide

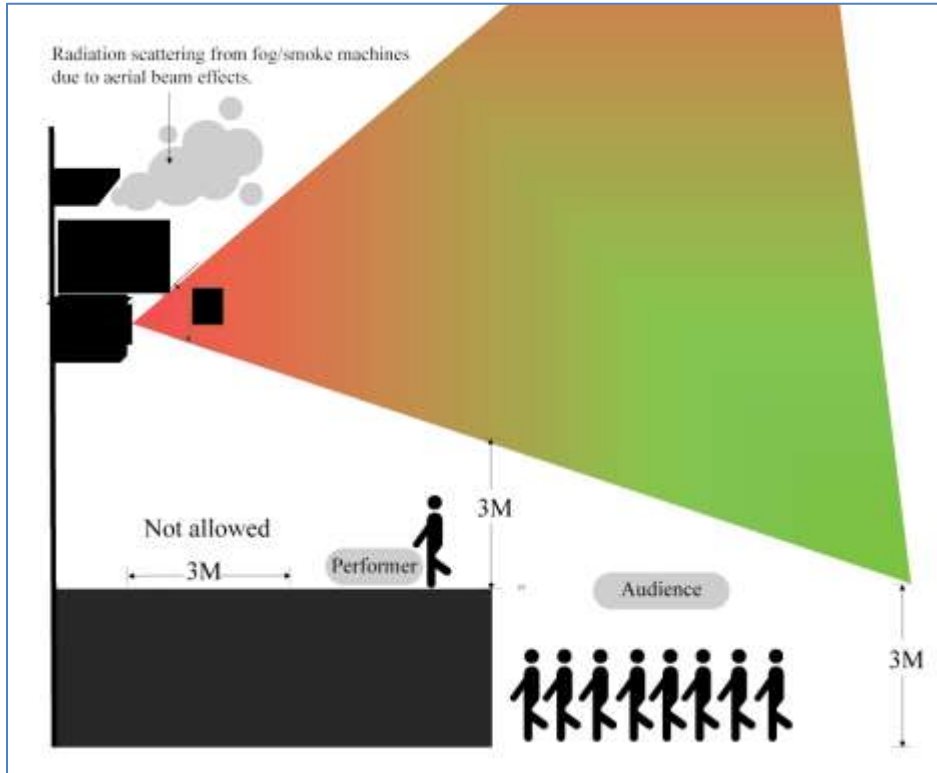
### What you need:

- ML-1000 home laser system
- USB Micro cable
- An approved US FDA variance prior to use of the laser.
- View the online laser safety and operators training prior to powering on the laser. See “General Safety and Maintenance Guidelines” #15 for details.
- Mac OS X 10.6, Windows PC or Android device and the LaserOS app.  
You can download a copy of the app from “www.laseros.com”.

### Installation and Operation:

1. Adjust the beam block with the unit powered off, make sure the key is not connected, secure projector aiming, then make adjustments to the beam block.

Note: You may need to repeatedly power the laser back on to check for the proper beam block setting until it prevents any scanning into audience areas. All beams must be maintained at least 3 Meters (10 feet) above the floor level where people may be present. **Eye exposure to laser light can cause instant injury and permanent blindness.**



2. Place appropriate compliant ANSI area warning sign(s) in and around the lasershow venue especially areas accessible to the audience.



3. Connect the USB cable, power cable, interlock, key. Use the on/off switch to power the ML-1000 laser projector. Turn the Key Control to the run position to enable laser operations.



4. Connect the ML-1000 to your Mac, PC or Android device via USB cable.



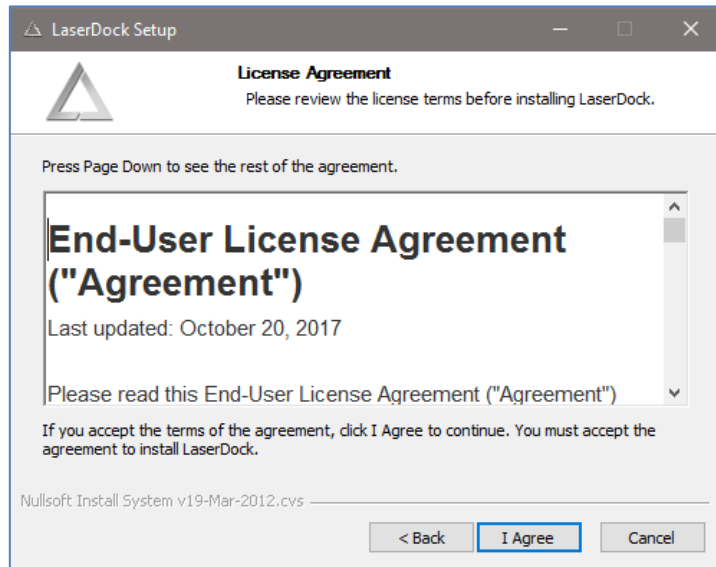
5. Download and install the app from “[www.laseros.com](http://www.laseros.com)”. The app is available for Windows, MAC or Android.



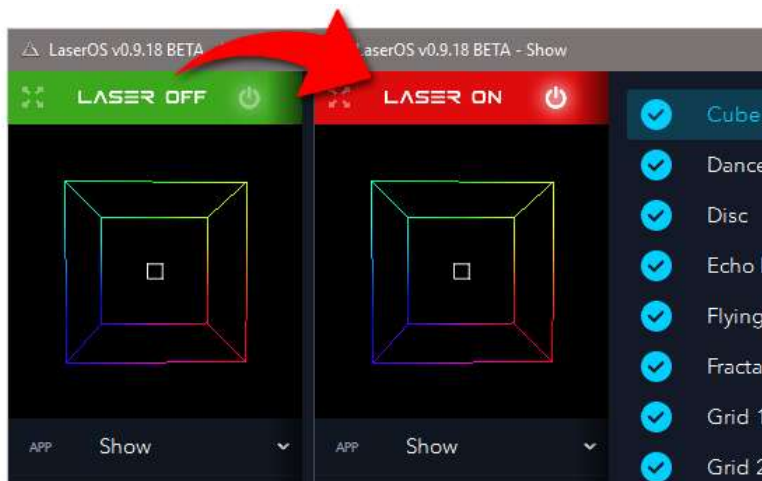
If you get an error with OSX security preferences, locate the app in Finder, right-click on the app file and choose "Open" to allow the app to run.

6. Run LaserOS installer and follow instructions carefully. You will need to accept the License Agreement to use the app.

After the installation is complete, look for the LaserOS icon and launch the program.

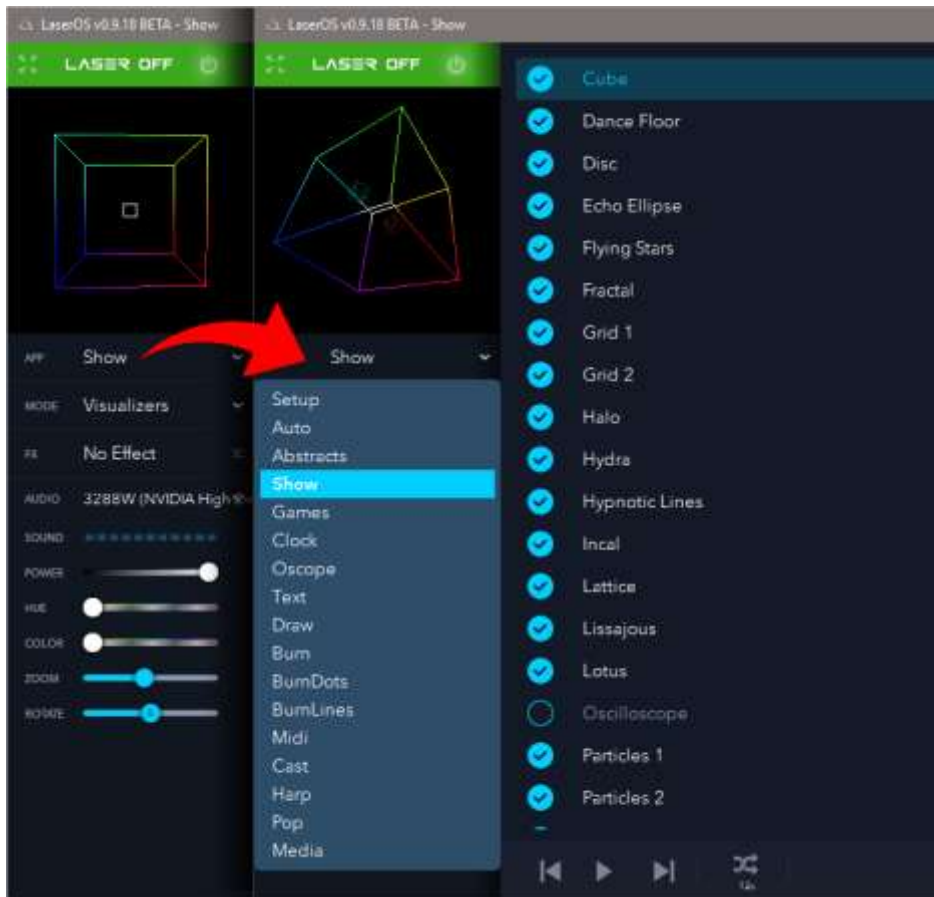


7. The LaserOS app will detect if the ML-1000 is connected. It can then be turned on or off from the power menu in the top left corner of the app. Pressing the ESC key will also turn off the laser.



Note: While securing projector aiming, turn off the unit and remove the key. Check for the proper beam block setting. Repeat until beam block prevents any scanning into audience areas.

8. From the main menu, you can easily select from the different apps, modes and laser show effects available. Audio, power level, color/hue and other settings can also be adjusted from here.





## 7. Troubleshooting

Here are a few simple solutions to common difficulties to try out first to get you up and running quickly. If you are having any difficulty with your laser projector, please feel free to contact us online, any time, at [lynn@magnumlighting.com](mailto:lynn@magnumlighting.com).

PROBLEM	SUGGESTED SOLUTION
The product doesn't switch on.	<p>Power cable may not be properly connected. Re-connect the power cable.</p> <p>Power supply is damaged or abnormal. Call qualified personnel/technician for repair.</p> <p>If damage is suspected, call qualified personnel/technician for repair. DO NOT attempt to service it yourself.</p>
The product can turn on but no light coming out.	<p>USB cable may not be connected properly or the LaserOS APP is not running. Check steps outlined in the quick-start guide if anything was missed.</p> <p>If damage suspected, call qualified personnel/technician for repair. DO NOT attempt to service it yourself.</p>
The beam appears dim.	<p>The product is too hot. Take appropriate ventilation measures to keep it cool.</p>

## 8. Limitation of Liability

In no event shall Magnum Lighting or any of its subsidiaries or affiliates be liable for any indirect, special, incidental or consequential injury to persons or damage to property caused by the use of any of our products. By purchasing from Magnum Lighting, you hereby indicate that it is your sole responsibility as the buyer and not Magnum Lighting to determine and obey all applicable local, state and federal laws governing the purchase, possession and/or use of the products sold by Magnum Lighting.

Magnum Lighting will not be responsible to you or any third party for any direct, indirect, special, incidental or consequential damages, arising out of use, misuse or inability to use any of our products. By purchasing the ML-1000 home laser system, the buyer represents that the products purchased will be used only in a lawful manner. Consult an attorney or law enforcement professional, regarding local, state and federal laws before using the product in a public setting.

**NOTICE:** All products sold by Magnum Lighting may not be used to violate the privacy rights of others. In no way shall Magnum Lighting or its or any of its subsidiaries or affiliates be held responsible for inappropriate use of its products.

**IT IS THE SOLE RESPONSIBILITY OF THE BUYER TO CONSULT LEGAL COUNSEL FOR THE INTERPRETATION OF ANY LAWS APPLICABLE TO THE AREA OF INTENDED USE OF THIS PRODUCT.**

**WARNING:** The ML-1000 should not be shone directly into anyone's eyes. It could cause eye damage or blindness.

## 9. Manufacturer's Warranty

The ML-1000 comes with a standard 12 Month Manufacturer's Warranty. Our warranty guarantees your laser projector to be free from defects in manufacture and workmanship.

**All defective products will be replaced or repaired subject to the full discretion of Magnum Lighting.**

Ownership of the warranty is not transferable and will expire exactly 12 months from the date of receiving the purchase.

This warranty does not include defects or damages attributable to misuse, normal surface weathering, or damages caused by accidents or fire or other casualty or force majeure or any other causes or occurrences beyond the manufacturer's control.

### Questions? Feedback?

If you have any questions about any of the content of this manual or the safe operation of your new laser projector or would like to give us some feedback on our products or documentation, please do not hesitate to contact us at Magnum Lighting.



[www.magnumlighting.com](http://www.magnumlighting.com)

12/F, San Toi Building, 137-139 Connaught Road Central, Hong Kong

Email: [lynn@magnumlighting.com](mailto:lynn@magnumlighting.com)

Phone: +8613798969520