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## Ortur Laser Master 2 LU1-3

# Ortur Laser Master 2 Laser Engraving Machine

**MODEL: LU1-3**

**User Manual**

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## 1. INTRODUCTION

Welcome to the user manual for the Ortur Laser Master 2 Laser Engraving Machine. This device is a versatile CNC laser cutter and engraver designed for various materials including wood, glass, and plastic. With a maximum speed of 3000mm/min, it offers precision and efficiency for your creative and professional projects. This manual provides essential information for safe operation, assembly, maintenance, and troubleshooting to ensure optimal performance and longevity of your machine.

The Ortur Laser Master 2 features a 32-bit motherboard for smoother and faster carving, and supports popular DIY engraving software like LaserGRBL and LightBurn.



Image: The Ortur Laser Master 2 laser engraving machine, showcasing its main components and included accessories such as safety glasses, wrenches, and material samples.

## 2. SAFETY INFORMATION

Operating a laser engraving machine involves potential hazards. It is crucial to read and understand all safety instructions before operating the device to prevent injury and damage. Always prioritize safety.

- **Eye Protection:** Always wear the provided laser safety glasses when the machine is in operation. Direct exposure to the laser beam can cause severe and permanent eye damage.
- **Skin Protection:** Avoid direct contact with the laser beam. The laser can cause burns.
- **Ventilation:** Operate the machine in a well-ventilated area. Laser engraving can produce smoke, fumes, and odors, which may be harmful if inhaled.
- **Fire Hazard:** The laser can ignite flammable materials. Never leave the machine unattended during operation. Keep a fire extinguisher nearby.
- **Material Compatibility:** Only engrave or cut materials specified as safe. Certain plastics and other materials can produce toxic fumes when laser processed. Avoid reflective materials.

- **Children and Pets:** Keep children and pets away from the operating area.
- **Emergency Stop:** Familiarize yourself with the location of the emergency stop button and how to quickly power off the machine in an emergency.

### 3. PACKAGE CONTENTS

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Before beginning assembly, please verify that all components listed below are present in your package:

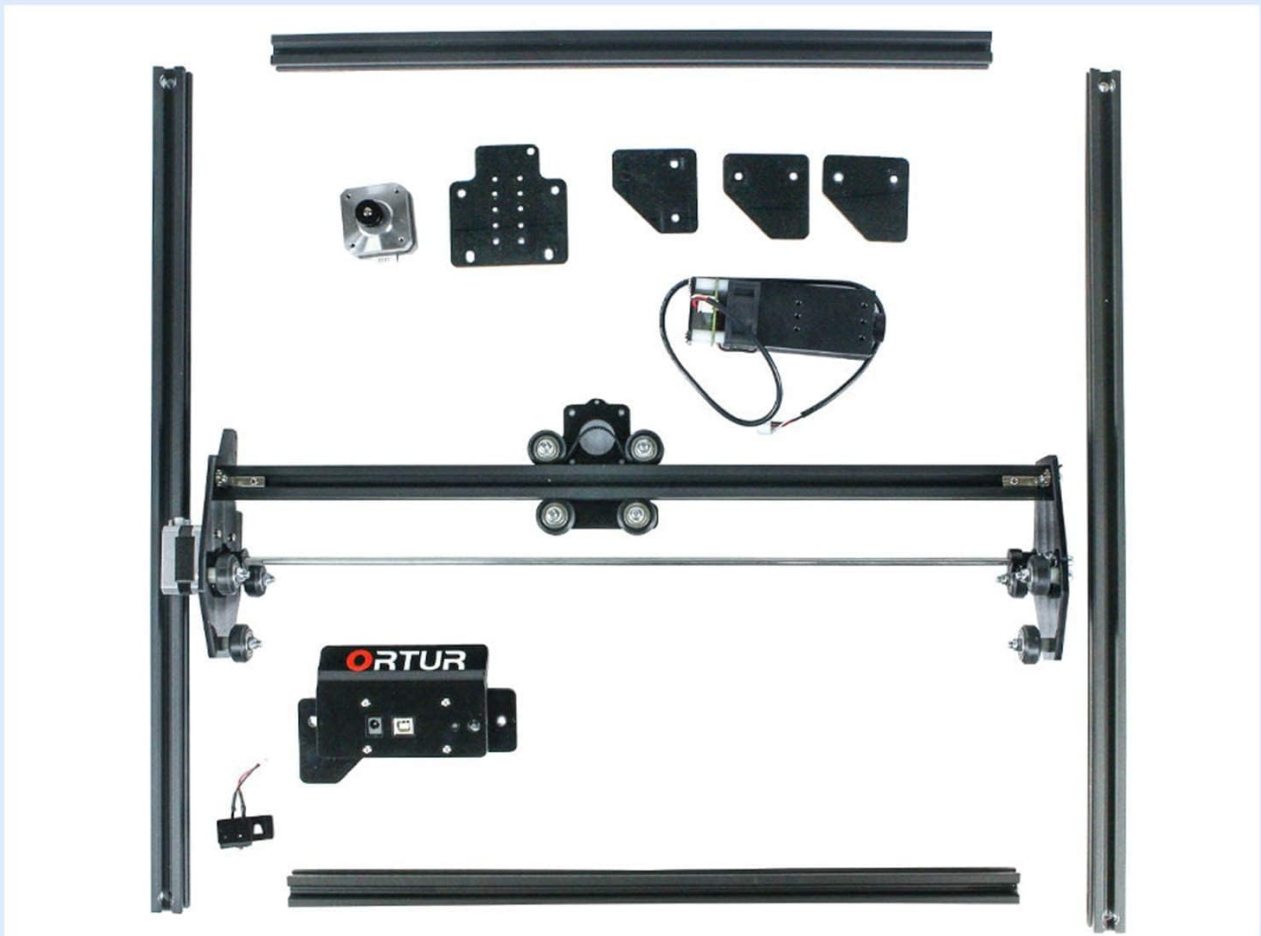
- Ortur Laser Master 2 Frame Components (Aluminum profiles, gantry, etc.)
- Laser Module (LU1-3, 15W)
- Control Box / Motherboard
- Power Adapter and Cable
- USB Cable
- Laser Safety Glasses
- Assembly Tools (Wrenches, Hex keys)
- Cable Ties
- Test Materials (e.g., wood samples, cardboard)
- User Manual (this document)

### 4. SETUP AND ASSEMBLY

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The Ortur Laser Master 2 is designed for easy assembly, typically taking 10-20 minutes to get it ready for operation. Follow these steps carefully:

# Modular Construction



Easy to assemble, it would spend 10-20 minutes to get this Ortur laser engraver ready for working.

Image: Disassembled components of the Ortur Laser Master 2, illustrating its modular design for straightforward assembly.

1. **Unpack Components:** Carefully remove all parts from the packaging and lay them out on a clean, flat surface. Refer to the package contents list to ensure everything is present.
2. **Assemble Frame:** Connect the aluminum profiles to form the rectangular frame. Ensure all screws are tightened securely.
3. **Install Gantry:** Attach the gantry (the moving crossbar) to the side rails. Ensure it slides smoothly along the rails.
4. **Mount Laser Module:** Securely attach the laser module to the gantry. Ensure it is firmly in place and properly aligned.
5. **Connect Wiring:** Connect all necessary cables from the motors, limit switches, and laser module to the control box/motherboard. Refer to the wiring diagram in the quick start guide for precise connections.
6. **Power Connection:** Connect the power adapter to the control box and then to a suitable power outlet. Do not power on the machine yet.
7. **USB Connection:** Connect the machine to your computer using the provided USB cable.

## 5. OPERATING INSTRUCTIONS

### 5.1 Software Installation and Usage

The Ortur Laser Master 2 supports widely used engraving software. It is recommended to use either LaserGRBL (free) or LightBurn (paid).

## Supports The Most Popular *DIY Engraving Software*

**LaserGRBL**  
( free software) supports Windows XP, 7, 8, 10. LaserGRBL is the most popular carving software in the world, could import different format images, you could editing in PhotoShop, inkscape, CAD, etc. and then connect to the laser engraver via LaserGRBL for engraving and cutting.

**LightBurn**  
( paid software) supports Windows, Mac OS, and Linux. It's the most popular paid carving software in the world, very easy to use.

**Image formats** NC, DXF, BMP, JPG, PNG

**Operating System** Win XP, Win 7, Win 8, Win 10



Image: Displays the user interfaces of LaserGRBL and LightBurn, two popular software options compatible with the Ortur Laser Master 2.

- **LaserGRBL:** A free, open-source software compatible with Windows XP, 7, 8, and 10. It allows importing various image formats (NC, DXF, BMP, JPG, PNG) and can be used for basic carving and cutting.
- **LightBurn:** A powerful, paid software compatible with Windows, macOS, and Linux. It offers advanced features for design, layout, and control of your laser engraver.

Download and install your preferred software from the official Ortur website or the respective software developer's website. Follow the software's specific instructions for driver installation and machine connection.

### 5.2 Material Compatibility and Settings

The Ortur Laser Master 2 (LU1-3 module) is capable of engraving and cutting a wide range of materials. Optimal results depend on adjusting the laser speed and power based on the material type and desired effect. Always perform test engravings on scrap material before starting a final project.

Laser Module Materials	Electric Power:7W Luminous Power:1.2-1.6W	Electric Power:15W Luminous Power:4.0- 4.5W	Electric Power:20W Luminous Power:5.0-5.5W	Remark
1.6mm Plywood Plate	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000 Cutting 200mm/min,S1000 Run 1 round	Engraving 3000mm/min,S800 Cutting 200mm/min,S1000 Run 1 round	Darker Colors, Better Results.
2.8mm Plywood Plate	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000 Cutting 100mm/min,S1000 Run 2 rounds	Engraving 3000mm/min,S800 Cutting 100mm/min,S1000 Run 2 rounds	Darker Colors, Better Results.
Colored A4 Paper (Not White)	Engraving 3000mm/min,S600 Cutting 400mm/min,S1000	Engraving 3000mm/min,S200 Cutting 1200mm/min,S1000	Engraving 3000mm/min,S150 Cutting 1400mm/min,S1000	The white paper is nonopaque, the result is not very good.
250g Kraft Paper	Engraving 3000mm/min,S1000 Cutting 200mm/min,S1000	Engraving 3000mm/min,S300 Cutting 800mm/min,S1000	Engraving 3000mm/min,S200 Cutting 1000mm/min,S1000	Darker Colors, Better Results.
3mm Paperboard (Cardboard Box)	Engraving 3000mm/min,S1000 Cutting 200mm/min,S1000 Run 2 rounds	Engraving 3000mm/min,S300 Cutting 1000mm/min,S1000 Run 4 rounds	Engraving 3000mm/min,S200 Cutting 1000mm/min,S1000 Run 3 rounds	Darker Colors, Better Results.
0.7MM Leather	Engraving 3000mm/min,S1000 Cutting 100mm/min,S1000	Engraving 3000mm/min,S400 Cutting 300mm/min,S1000	Engraving 3000mm/min,S400 Cutting 500mm/min,S1000	Darker Colors, Better Results.
5MM KT Board	Cutting 600mm/min,S1000	Cutting 2000mm/min,S1000	Cutting 2000mm/min,S1000	Darker Colors, Better Results.
Non-woven fabrics (0.5mm, Dark Color)	Cutting 500mm/min,S1000	Cutting 1400mm/min,S1000	Cutting 1600mm/min,S1000	Cannot cut the white one, it's transparent in fact.
Some Plastic Sheet (Dark Color)	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S800	Some plastic sheets may be melt.
Solid Wood	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S800	Darker Colors, Better Results.
Acrylic	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S800	Need coat the dark color paper onto the transparent Acrylic plate.
Tin Wire	Melting	Melting	Melting	Cannot engrave.
Cobblestone	×	Engraving 100mm/min,S1000	Engraving 100mm/min,S1000	Need coated with acrylic dye heat transfer film.
Ceramic	×	Engraving 100mm/min,S1000	Engraving 100mm/min,S1000	Need coated with acrylic dye heat transfer film.
Powder Coated Metal Paint Sprayed Metal	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S1000	Engraved in the layer of powder coating.
Plated Metal	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S1000	It's the surface color turned to be other color.
Anodised Aluminium	Engraving 2000mm/min,S1000	Engraving 3000mm/min,S1000	Engraving 3000mm/min,S1000	The Glossy finishing surface should be

Stainless Steel	×	Engraving 100mm/min,S1000	Engraving 100mm/min,S1000	Surface should be painted black by Marker Pen.
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The results would be different in even same material with different finishing or different colors, **So you need to adjust the speed and power rate based on different objects.** Also, please adjust the focal length to be the best, make the focal spot to be the smallest.

**It couldn't engrave or cut directly:** Glossy metal plate, Transparent materials, Reflecting materials, Some materials in white color or pervious to light, etc. Then, you need to use the marker pen to black it to engrave.

Image: A detailed table providing recommended speed and power settings for engraving and cutting different materials like plywood, paper, wood, glass, and various plastics.

Common materials include wood, plywood, cardboard, paper, leather, acrylic, glass, stone, ceramic tile, and some coated metals. Note that the LU1-3 module is not suitable for cutting non-flammable materials or engraving highly reflective surfaces without proper preparation (e.g., painting the surface black).

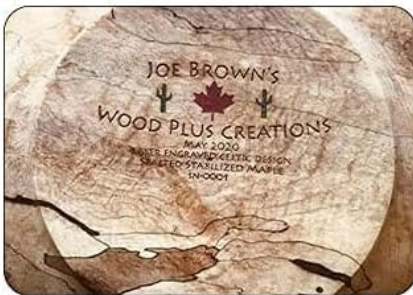
### 5.3 Engraving and Cutting Process

1. **Prepare Material:** Place your material securely on the engraving bed. Ensure it is flat and stable.
2. **Focus the Laser:** The LU1-3 module has a fixed focus. Use the provided focal gauge (typically 29mm from the laser module to the material surface) to set the correct distance. Adjust the material height or use a Z-axis lifter if available.
3. **Load Design:** Open your chosen software (LaserGRBL or LightBurn) and load your design file.
4. **Set Parameters:** Adjust the laser power, speed, and number of passes according to your material and desired outcome. Refer to the material compatibility table.
5. **Position Origin:** Use the software to set the starting point (origin) for your engraving or cutting job. Perform a frame test to ensure the design fits within your material.
6. **Start Operation:** Ensure all safety precautions are in place (wearing safety glasses, proper ventilation). Initiate the engraving/cutting process from the software.
7. **Monitor Progress:** Do not leave the machine unattended during operation. Observe for any issues like smoke, fire, or unexpected behavior.
8. **Completion:** Once the job is complete, wait for the laser to turn off and the machine to stop moving before removing the material.

These works are well made by **LU1-3, LU1-4, and LU2-4** laser modules.

**LU1-2** laser module is good at engraving detailed photo on paper & wood.

But it couldn't cut materials or engrave on non-flammable materials.



Wood



Glass



Food



Stone



Plated Metal



Stainless Steel



Ceramic Tile



Phone Case



Paper



Acrylic



Plywood



Thin Leather

Image: A collage of various items engraved and cut by the Ortur Laser Master 2, demonstrating its versatility on materials like wood, glass, stone, and acrylic.

## 6. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your Ortur Laser Master 2.

- **Clean Lens:** Periodically clean the laser lens with a soft, lint-free cloth and lens cleaning solution (if recommended by manufacturer) to ensure clear beam transmission.
- **Clean Rails and Wheels:** Keep the guide rails and wheels free from dust and debris. Use a dry cloth or

compressed air. Lubricate if necessary, following manufacturer guidelines.

- **Check Wiring:** Inspect all cables and connections regularly for any signs of wear, fraying, or loose connections.
- **Clear Debris:** After each use, remove any material scraps, dust, or residue from the engraving area.
- **Firmware Updates:** Check the official Ortur website for any available firmware updates for your machine.

## 7. TROUBLESHOOTING

This section addresses common issues you might encounter and provides potential solutions.

Problem	Possible Cause	Solution
Laser not firing or weak output	Loose connection, dirty lens, incorrect power setting, laser module failure.	Check all cable connections. Clean the laser lens. Verify power settings in software. Contact support if module is faulty.
Machine not connecting to computer	USB cable issue, driver not installed, incorrect COM port selected.	Try a different USB port/cable. Install/reinstall drivers. Select correct COM port in software.
Engraving is blurry or inconsistent	Incorrect focus, loose belts, material not flat, machine vibration.	Re-focus the laser. Check and tighten belts. Ensure material is flat and secured. Place machine on a stable surface.
Machine moves erratically or stops mid-job	Loose wiring, software error, power supply issue, motor problem.	Check all wiring. Restart software and machine. Ensure stable power supply. Contact support if motors are faulty.

If you encounter issues not listed here, or if the suggested solutions do not resolve the problem, please contact Ortur customer support for further assistance.

## 8. SPECIFICATIONS

Key technical specifications for the Ortur Laser Master 2 (LU1-3 model):

- **Model:** Ortur Laser Master 2 LU1-3
- **Laser Module:** LU1-3 (Fixed Focus)
- **Luminous Power:** Approximately 4,000-4,500mW (15W electric power)
- **Wavelength:** 450±5nm
- **Engraving Area:** Approximately 400mm x 430mm (based on common Ortur Laser Master 2 models)
- **Motherboard:** 32-bit MCU chipset
- **Maximum Speed:** 3000mm/min
- **Material:** Aluminum, Plastic
- **Input Voltage:** 230 Volt (AC)
- **Item Weight:** Approximately 3.47 Kilograms
- **Supported Software:** LaserGRBL, LightBurn
- **Supported Image Formats:** NC, DXF, BMP, JPG, PNG

- **Operating System:** Windows XP, 7, 8, 10; macOS; Linux

# 32Bits Motherboard

For Smoother And Faster Carving

Specialized motherboard with 32 Bits MCU chipset, it could pre-process 32 instructions,



Image: A close-up view of the Ortur 32-bit motherboard, highlighting its advanced processing capabilities for smoother and faster carving.





Image: The Ortur LU1-3 laser module, showing its fixed focus design and key specifications such as wavelength and power output.

## 9. WARRANTY AND SUPPORT

Ortur provides a limited warranty for the Laser Master 2. Please refer to the official Ortur website or the warranty card included with your product for detailed terms and conditions.

For technical support, troubleshooting assistance, or spare parts, please visit the official Ortur support page or contact their customer service team. Provide your product model and serial number when seeking support to expedite the process.

**Official Ortur Website:** [www.ortur.tech](http://www.ortur.tech)