

# MOPA Laser Marking Machine

## User Manual



Read Carefully Before Use  
Keep for Future Reference

# Preface

Thank you for choosing our laser equipment.

This fiber laser marking machine is intended for personal and professional use.

Read this manual carefully before operation. It covers the details of correct installation, adjustment, maintenance, and—most importantly—safe operation of your new laser. It is intended to be used in conjunction with the manual for its engraving software, as the program not only provides image design but also serves as the main interface for the laser settings and machine controls. You and any other users of this machine should thoroughly understand **BOTH** manuals before attempting to operate the laser.

Both manuals should be included if this machine is given or sold to a third party.

If you have any questions, after reading these manuals, please contact us and our support department will address your concerns as soon as possible.

# Disclaimer

Read this disclaimer completely and carefully before proceeding with the rest of the manual content.

## 1. **As-Is**

This OMTech product is sold 'as is' and without any express or implied warranties, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

## 2. **Product Modifications**

Any modifications or alterations to OMTech products void any warranties and may result in damage or injury. OMTech shall not be liable for any damages resulting from such modifications or alterations.

## 3. **Compliance with Laws**

Customers shall be liable for ensuring that the use of OMTech products complies with all applicable laws and regulations in their respective jurisdictions. OMTech assumes no responsibility for any violations of laws or regulations resulting from the use of OMTech products.

## 4. **Correct Use**

Always use OMTech products only as directed in the accompanying manuals. Failure to follow instructions may result in injury or damage.

Always ensure the assembly, installation, operation, maintenance, or repair of OMTech products is carried out by a competent person.

Always make maintenance regularly throughout OMTech products' lifecycles; you have the liability to keep the products operating as intended.

Always wear appropriate protective gear.

## 5. **Third-Party Products**

OMTech shall not be liable for any damages or losses resulting from the use of third-party products in conjunction with OMTech products. Customers shall refer to the third-party's guidelines or/and warranties (if any) for any third-party products used.

## 6. **Limitation of Liability**

OMTech shall not be liable for any direct, indirect, punitive, incidental, special, or consequential damages to property or life, whatsoever arising out of or connected with the use or misuse of OMTech products. In no event shall OMTech's liability exceed the value of the products sold.

This disclaimer states the entire obligation of OMTech with respect to OMTech products. If any part of this disclaimer is determined to be void, invalid, unenforceable, or illegal, including but not limited to the warranty disclaimers, liability disclaimers, and liability limitations set forth above, the invalid or unenforceable provision will be deemed superseded by a valid and enforceable provision that most closely matches the intent of the original provision and the remainder of the agreement shall remain in full force and effect.

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# **1. Introduction**

## **1.1 General Information**

This manual is the designated user guide for the installation, setup, safe operation, and maintenance of your fiber laser marking machine.

All personnel involved in the installation, setup, operation, maintenance, and repair of this machine should read and understand this manual, particularly its safety instructions. Substandard performance and longevity, property damage, and personal injury may result from not knowing and following these instructions.

Your laser marking machine works by emitting a powerful laser beam from its fiber laser source, sending that beam through a fiber optic cable, focusing its power through the galvanometer lens, and using this focused light to etch designs into certain substrates.

This laser marking machine uses a nanoscale fiber laser source. Its single-mode output, good heat dissipation, high efficiency, and compact structure make it ideal for high-precision laser marking.

With typical use, this machine has an average lifespan around 100,000 working hours. However, constantly running your laser above 80% of its maximum rated power can significantly shorten its service life. It is recommended to use settings from 10–75% of the maximum rated power to enjoy optimal performance and longevity.

Note that this is a high-voltage machine and, as a safety precaution, it is recommended to only touch its components with one hand at a time during use.

Note also that this machine does not have a protective housing. It is thus recommended to use a special room or to raise protective screens around the work area. The active laser is invisible to the human eye and anyone in or near the working area **MUST** use special protective eyewear when the laser is in use to avoid potentially permanent injury.

## 1.2 Symbol Guide

The following symbols are used on this machine's labeling or in this manual:



These items present a risk of serious property damage or personal injury.



These items address similarly serious concerns with regard to the laser beam.



These items address similarly serious concerns with regard to electrical components.



Protective eyewear should be worn by anyone around this machine during operation.



This product is sold in conformity with applicable EU regulations.



This product contains electrical components that should not be disposed of with regular garbage.

## 1.3 Designated Use

This laser marking machine is intended for engraving signs and logos on consumer products or applicable substrates. This laser can process a wide variety of metals including steel, aluminum, titanium, brass, copper, tungsten, carbide, and chrome. It can also be used with stone and some hard plastics such as acrylic.

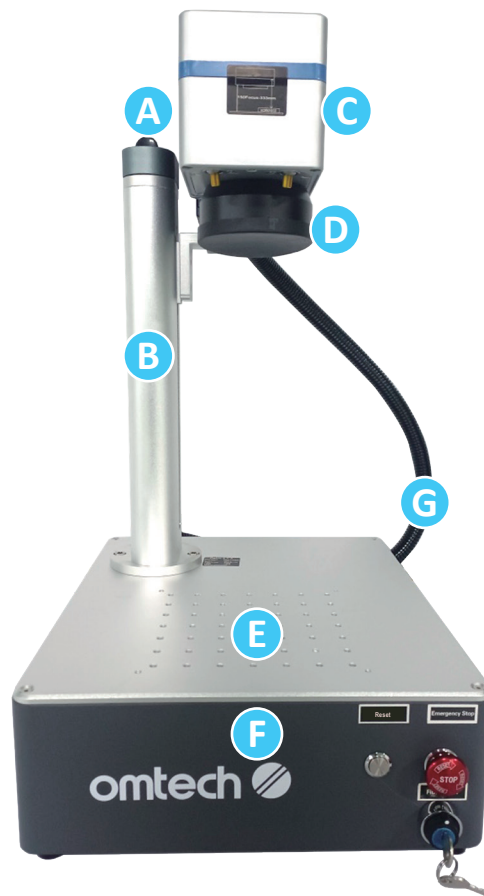
### **Warning**

- *Use of this system for non-designated purposes is **NOT** permitted.*
- *The system **MUST** be operated, maintained, and repaired by personnel familiar with the field of use and the dangers of the machine and the material being engraved including its reflectivity, conductivity, potential for creating harmful or combustible fumes, etc.*
- *Laser beams are dangerous. The manufacturer and/or seller bear(s) no responsibility and assume(s) no liability for any improper use of this machine or for any damage or injury arising from such use. The operator is obliged to use this laser marking machine **ONLY** in accordance with its designated use, the other instructions on the machine and in its manuals, and all applicable local and national laws and regulations.*

## 1.4 Specifications

Product Model		LYF-20MP	LYF-30MP	LYF-60MP
Voltage		AC 110–120V , 60 Hz	AC 110–120V, 60 Hz	AC 110–120V, 60 Hz
Overall Rated Power		600W	600W	600W
Processing Area		9.8×13.4 in. 250×340 mm	11.8×13.4 in. 300×340 mm	11.8×13.4 in. 300×340 mm
Max. Marking Speed		393.7 ips 10000 mm/s	393.7 ips 10000 mm/s	393.7 ips 10000 mm/s
Marking Accuracy		0.01 mm	0.01 mm	0.01 mm
Marking Depth		0.001 in. 0.04 mm	0.003 in. 0.08 mm	0.004 in. 0.1 mm
Field Lens	Focal Length	210 mm	210 mm	210 mm
	Aperture	150×150 mm	150×150 mm	150×150 mm
Beam Combiner Lens Size		ø20×2 mm	ø20×2 mm	ø20×2 mm
Applicable Rotary Axis Type		D50/D60 (Need to replace field lens with focal length below 150mm)		
Laser	Model	YDFLP-E2-20-M7-S-R	YDFLP-E2-30-M7-S-R	YDFLP-E2-60-M7-M-R
	Type	Fiber MOPA	Fiber MOPA	Fiber MOPA
	Rated Power	20W	30W	60W
	Adjustable Power Range	0~100%	0~100%	0~100%
	Expected Service Life	100,000 hr.	100,000 hr.	100,000 hr.
	Wavelength	1064 nm	1064 nm	1064 nm
	Modulation Frequency	1–4000 kHz	1–4000 kHz	1–4000 kHz
	Pulse Width	2–500 ns	2–500 ns	2–500 ns
	Class	IV	IV	IV
	Operating Temperature Range	32–104°F 0–40°C	32–104°F 0–40°C	32–104°F 0–40°C
Required Operating Software		EZCad	EZCad	EZCad
Laser Safety Goggles Protection Level		OD 6+	OD 6+	OD 6+
Applicable Computer System	EZCad	Windows 7/8/10/11		
	Lightburn (not Included)	Windows 7/8/10/11, MacOS		
Applicable Image Formats		BMP, GIF, JPG, JPEG, DXF, DST, AI, etc.		
Dimensions		15.7×13.4×21.3 in. 40×34×54 cm	15.7×13.4×21.3 in. 40×34×54 cm	15.7×13.4×21.3 in. 40×34×54 cm
Net Weight		39.7 lb. 18 kg	39.7 lb. 18 kg	39.7 lb. 18 kg

## 1.5 Components

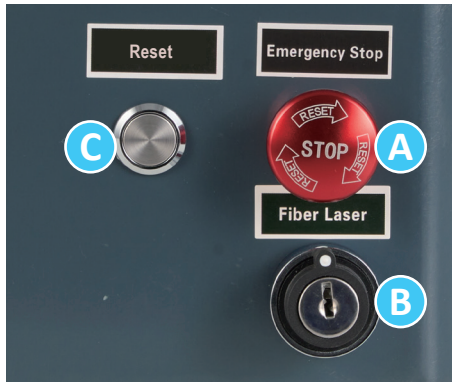


### Main Parts

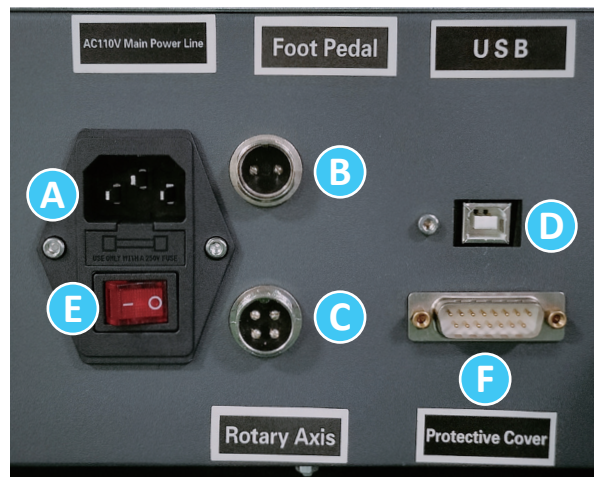
No.	Name	Function
A	Focus Adjustment Wheel	This wheel moves the laser arm up and down for the correct focus alignment across different materials and thicknesses.
B	Support Column	The support column holds the laser arm and provides stability and support to the machine's moving parts.
C	Galvo Scanning Head	The high-speed galvanometer scanning head focuses the laser beam to a fine point, directing it to proper locations on the target material during engraving.
D	Field Lens	The field lens creates vivid markings on flat surfaces by maintaining a consistent, focused laser spot size across its working area.
E	Worktable	This worktable holds the target material and has optional positioning holes for aligning and positioning the marking targets accurately.
F	Control Box	It houses the control system and various electronics that are responsible for controlling and managing the operation of the machine.
G	Laser Cable	It transmits the laser beam from its source to the marking head.



## Control Buttons













No.	Name	Function
A	Emergency Stop Button	Due to risks of fire and other hazards during engraving, this engraver includes this large and easy-to-reach emergency stop button on the control panel. It stops the machine instantly by pressing it down in the event of an emergency. Turning it clockwise releases the button.
B	Fiber Laser Switch	It controls the startup and shutdown of the mainboard. Insert the key and turn it clockwise to activate the mainboard; turn it counterclockwise to shut down the mainboard. The key will not be removed when the mainboard is activated.
C	Reset	It turns on the laser power supply. Press it when turning on the machine; Press it after temporarily opening and closing the cover if you have a protective cover; No need to press it when turning off the machine.
D	Focus Button	It controls the startup and shutdown of the red dot guider. Press the button down to activate the red dot guider; press it again to shut down the red dot guider.



## Connection Inputs

No.	Name	Function
A	Power Cord Input	This 3-pin port enables the machine to be connected to the power supply with a standard 3-prong power cord.
B	Foot Pedal Cord Input	This port enables a foot pedal (not included) to control the laser activation.
C	Rotary Axis Cord Input	This port enables the use of a rotary axis (not included).
D	USB Cord Input	This port connects the device to your computer.
E	Power Switch	This switch controls the startup and shutdown of the machine. Flip the switch to <b>I</b> to turn on the machine; flip the switch to <b>O</b> to turn off the machine.
F	Protective Cover	This connects an optional protective cover and powers the cover's interlock(s).

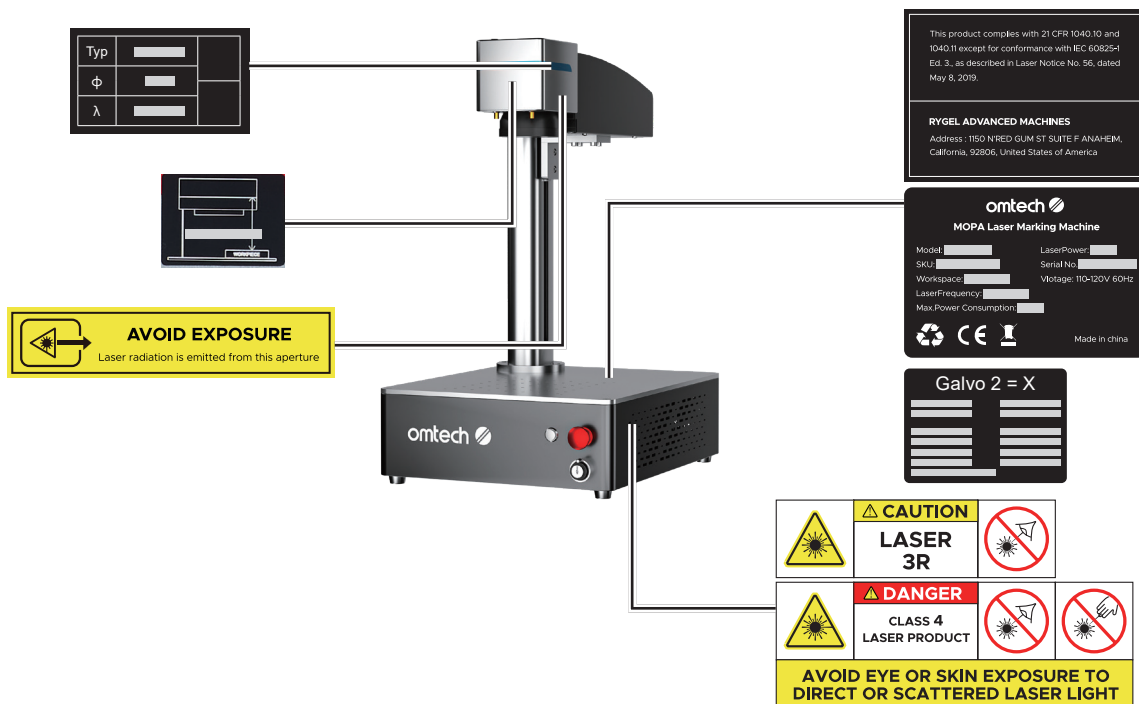
## 1.6 Package List

No.	Item Name	Qty.	
A		Control Box with Laser Arm	1
B		Support Column	1
C		1.5 m U.S. Standard Power Cord	1
D		5 m USB Cord	1
E		USB Flash Drive	1
F		Laser Safety Goggles	1
G		300 mm Ruler	1
H		Hex Wrench	1
I		A Set of Installation Screws	1
J		Position Lock Bars	2

## 2. Safety Information

### 2.1 General Safety Instructions

- Your machine should come with instruction labels in the following locations.



If any of these labels is missing, illegible, or damaged, it must be replaced.

- Use this laser marking machine **ONLY** in accordance with all applicable local and national laws and regulations.
- Use this machine **ONLY** in accordance with this instruction manual and the manual for the engraving software included with it.
- ONLY** allow this machine to be installed, operated, maintained, repaired, etc. by others who have also read and understood both manuals. Ensure that this manual and the software manual are both included with this machine if it is ever given or sold to a third party.
- DO NOT** operate this machine continuously for more than 5 hours. Stop every 5 hours for at least ½ hour.
- DO NOT** leave this machine unattended during operation. Observe the machine throughout operation and, if anything seems to be operating strangely, immediately cut off **ALL** power to the machine and contact either our customer service or your dedicated repair service. Similarly, ensure the machine is **FULLY** turned off in the correct order after each use.
- DO NOT** allow minors, untrained personnel, or personnel suffering from physical or mental impairment that would affect their ability to follow this manual and the software manual to install, operate, maintain, or repair this machine.
- Any untrained personnel who might be near the machine while it is in operation **MUST** be informed that it is dangerous and fully instructed on how to avoid injury during its use.
- ALWAYS** keep a fire extinguisher, water hose, or other flame retardant system nearby in case of accidents. Ensure that the local fire station's phone number is clearly displayed nearby. In the case of a fire, cut electrical power before dousing the flame. Familiarize yourself with the correct range for your extinguisher before use. Take care not to use your extinguisher too close to the flame, as its high pressure can produce blowback.



## 2.2 Laser Safety Instructions

This machine is **CLASS IV** laser product which complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

**Caution:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Used without care, it can cause serious property damage and personal injury including but not limited to the following:



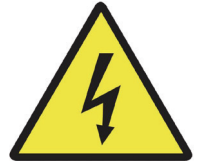
- The laser will easily burn nearby combustible materials.
- Some working materials may produce radiation or harmful gasses during processing.
- Direct exposure to the laser will cause bodily harm including serious burns and irreparable eye damage.

As such,

- **NEVER** interfere with the laser beam.
- **DO NOT** place any part of your body under the laser lens during operation. Take measures to protect yourself from potentially reflected laser beams including the use of screens or personal protective equipment.
- **NEVER** attempt to view the laser directly without protective eyewear. **ALWAYS** wear safety goggles or glasses designed to filter the specific wavelength of your laser marking machine's laser with an optical density (OD) of 5+. For best results, use those that came with the whole package. As even seemingly matte materials can produce harmful reflected beams, care should be taken to keep anyone without protective eyewear from observing the machine during operation. **EVEN WITH** protective eyewear, do not stare or allow others to stare continuously at the laser beam during operation.
- **DO NOT** leave potentially combustible, flammable, explosive, or corrosive materials nearby where they could be exposed to the direct or reflected laser beam.
- **DO NOT** use or leave sensitive EMI equipment nearby. Ensure the area around the laser is free of strong electromagnetic interference during any use.
- **ONLY** use this machine as described in the **Material Safety Instructions** section of this manual. The laser settings and engraving process must be properly adjusted for specific materials.
- Ensure the area is kept free of airborne pollutants, as these might pose a similar risk of reflection, combustion, etc.
- **NEVER** use this marking machine with the fiber source's housing opened, as the closed laser light path is necessary to prevent laser radiation leakage.
- **DO NOT** modify or disassemble the laser and do not use the laser if it has been modified or disassembled by anyone except trained and skilled professionals. Dangerous radiation exposure and other injury may result from the use of adjusted, modified, or otherwise incompatible equipment.

## 2.3 Electrical Safety Instructions

- **ONLY** use this machine with a compatible and stable power supply with less than 5% fluctuation in its voltage.
- **DO NOT** connect other machines to the same fuse, as the laser system will require its full amperage.
- **DO NOT** use with standard extension cords or power strips. Use **ONLY** surge protectors rated over 2000J.
- **ONLY** turn on the power to this machine when it is well grounded, either via a firm connection to a 3-prong outlet or via the dedicated grounding cable firmly connected to the slot on the back of the main tower. For details on grounding, see **Electrical Grounding** (Page 11).
- Turn the machine on and off using its power buttons in the correct order. The laser has a separate power supply that is separately grounded. Pushing all the buttons at once, too quickly, or in the wrong order may send electrical current to an ungrounded component, causing short circuits and other electrical hazards.
- **ONLY** use this machine with one hand at a time. The laser is powered by an extremely high voltage connection and placing two hands on the machine at one time during operation has the potential to create a closed circuit with the human body, resulting in electrical shock.
- The area around this laser marking machine should be kept dry, well ventilated, and environmentally controlled to keep the ambient temperature between 32–104°F (0–40°C). The ambient humidity should not exceed 70%.
- Adjustment, maintenance, and repair of the electrical components of this machine must be done **ONLY** by trained and skilled professionals to avoid fires and other malfunctions, including potential radiation exposure from damage to the laser components. Because specialized techniques are required for testing the electrical components of this marking system, it is recommended such testing only be done by the manufacturer, seller, or repair service.
- Unless otherwise specified, **ONLY** undertake adjustment, maintenance, and repair of the machine when it is turned off and disconnected from its power supply.



## 2.4 Material Safety Instructions

- Users of this fiber marking machine are responsible for confirming that materials to be processed can withstand the heat of the laser and will not produce any emissions or byproducts either harmful to people nearby or in violation of any local or national laws or regulations. In particular, **DO NOT** use this machine to process polyvinyl chloride (PVC), Teflon, or other halogen containing materials under any circumstances.
- Users of this fiber laser are responsible for ensuring that every person present during operation has sufficient PPE to avoid any injury from emissions or byproducts of the materials being processed. In addition to the protective laser eyewear discussed above, this may require goggles, masks or respirators, gloves, and other protective outer clothing.
- Users **MUST** exercise special caution when working with conductive materials as buildup of their dust and ambient particles may damage electrical components, cause short circuits, or produce other effects including reflected laser radiation.

This machine can be safely used with the following materials:

- Aluminum
- Brass
- Carbide
- Gold
- Silver
- Steel
- Stone, including Granite, Marble, etc.
- Titanium
- Tungsten

This machine can be used with some other metals, hard plastics, and other materials with some care. For other materials, if you are unsure about its safety or laserability with this machine, seek out its material safety data sheet (MDS).

Pay especial attention to information about safety, toxicity, corrosiveness, reflectivity, and reaction(s) to high heat. Alternatively, contact our support department for further guidance.

See **Instructions for Specific Materials** (Page 17) for the recommended parameter values for the most commonly engraved materials.

This machine **CANNOT** be used with the following materials or with any materials which include them:

Materials	Reasons
Artificial Leather containing Hexavalent Chromium (Cr[VI])	Due to their toxic fumes.
Astatine	
Beryllium Oxide	
Bromine	
Chlorine, including Polyvinyl Butyral (PVB) and Polyvinyl Chloride (PVC, Vinyl, Cintra, etc.)	
Fluorine, including Polytetrafluoroethylenes (Teflon, PTFE, etc.)	
Iodine	
Phenolic Resins, including various forms of Epoxy	Due to their high flammability when exposed to the concentrated laser.
Paper and Paperboard	

## **3. Installation**

### **3.1 Overview**

A complete working system consists of the following parts:

- Fiber laser source
- Laser arm with the galvanometer lens
- Computer (not included) with EZCard software
- All applicable connection cables
- Support column
- Working platform

Users can also configure other additional accessories (such as a rotary axis) to suit their needs.

#### **Warning**

- Use **ONLY** the hardware, wiring, and power sources that came with or are compatible with this machine. Installing equipment that your machine is not designed to work with can lead to poor performance, shortened service time, increased maintenance costs, property damage, and personal injury.
- Please note the specific requirements of your system's installation. Every customer **MUST** understand these notes before installation to execute a proper setup and achieve safe laser performance. If you have any installation questions or problems, contact our technicians and customer support team.
- Any auxiliary equipment **MUST** be adjusted to the base machine. Queries may be directed to the dealer or manufacturer of such equipment.

### **3.2 Location Selection**

Prior to assembling your laser marking machine, select an appropriate location for its use meeting the following conditions:

- Be sure that it meets all of the requirements discussed in the **Safety Information** above.
- The location should be stable, level, dry, and climate controlled to ensure an ambient temperature 32–104°F (0–40°C) and an ambient humidity under 70%.

#### **Warning**

*The temperature and humidity together should **NOT** be close to the dew point.*

- It is recommended to use a windowless room or to use blinds and/or curtains to avoid exposure to the potential additional heat of direct sunlight.
- The location should be free of dust and other airborne pollutants and well ventilated enough to process any fumes produced by the engraving process in accordance with all applicable laws and regulations.

***Note:** Depending on the materials to be processed, this may require construction of a dedicated ventilation system.*

- It should be away from children; combustible, flammable, explosive, or corrosive materials; and sensitive EMI machines.
- The power cord should be plugged into a compatible and stable power source via a grounded 3-prong outlet.

#### **Warning**

***NO** other item should be drawing current from the same fuse.*

- There should be fire-fighting equipment nearby and the local fire station's phone number should be clearly displayed.
- It is highly recommended to have an extra work table nearby in order to avoid placing objects on or directly adjacent to the machine, which could become a fire or laser hazard.

### 3.3 Electrical Grounding



Poor grounding **WILL** cause equipment failure and create a serious electrical shock hazard. The manufacturer and/or seller bear(s) no responsibility and assume(s) no liability for any damage, accidents, or injuries caused by bad grounding connections.

This machine employs a powerful laser. As discussed in the **Safety Information** above, it is extremely high voltage and potentially dangerous, so users **MUST** securely ground it to avoid the buildup of static electricity.

Electrical grounding must meet the following conditions:

- Using a standard 3-prong outlet will provide sufficient grounding.

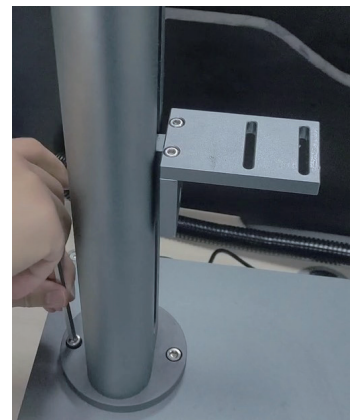
#### **Warning**

*If you do not have access to a 3-prong outlet, you **MUST** use the grounding cable and ensure its proper connection.*

- The far end of the cable should be securely connected to a metal rod driven at least 10 feet (3 m) deep into soil located at least 5 feet (1.5 m) from the machine.
- The resistance along the line should be no greater than 5  $\Omega$ .

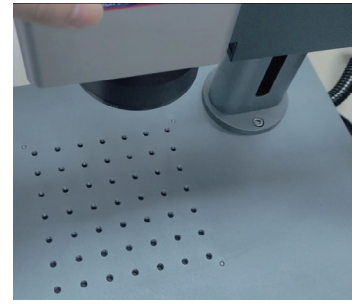
### 3.4 General Instructions

1. Align the two holes on the bottom of the support column with the corresponding holes on the working platform.
2. Insert and tighten 2 screws to fix the support column by using the provided hex wrench.





3. Place the laser arm on the mounting bracket of the support column and align the holes on the laser arm with the holes on the bracket while confirming that the scanning head is above the center position of the processing area.



4. Insert and tighten 4 screws to fix the laser arm by using the provided hex wrench.



5. Connect the machine to the power supply with the provided power cord.
6. Connect the machine to your computer with the provided USB cord.

*Note: The computer should not be placed more than 15 feet (4.5 m) away from the laser marking machine in order to avoid possible interference to the signal in its line.*

7. Install the EZCad software to your computer with the provided USB flash drive.

**Note:**

- See the separate EZCad instruction manual for instructions on installing the software and the requirements for the computer.
- Familiarize yourself with your software's image design features and laser control settings before beginning operation of the laser itself.

## 4. Operation

### 4.1 Overview

This section will address only some of the options and features provided by the operation software. Before beginning to use the machine, make sure that you have read this entire manual (particularly the **Safety Information** (Page 7) above), the separate software manual, and any and all warning decals provided on the machine itself.

#### **Warning**

Operate this laser marking machine **ONLY** in accordance with all the instructions provided in this manual. Failure to follow the proper guidelines detailed here can result in property damage and personal injury.

## 4.2 General Instructions

### 4.2.1 Turning on the Machine

1. Put on the provided laser safety goggles.

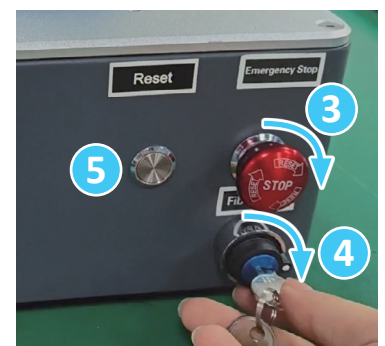


Ensure that anyone else who might be exposed to direct or reflected laser beams is also wearing protective eyewear.

2. Toggle the power switch to **I**. The red light should come on when the machine is on.



3. Turn the emergency stop button clockwise to deactivate the emergency stop system.
4. Insert the key and turn it clockwise.
5. Press the **Reset** button to turn on the laser power supply.



6. Press the focus button on the scanning head to turn on the red dot guider.

The two red dots should be displayed on the working platform when the red dot guider is on.



#### **4.2.2 Adjusting the Focus**

1. Place the test material on the processing area and ensure the red dots are displayed on the test material.

*Note:*

- *Make sure the material can be engraved by this machine. See **Material Safety Instructions** (Page 9) for details.*
  - *The test material should be the same as the actual material.*
2. Rotate the focus adjustment wheel clockwise to lower the scanning head or rotate it counterclockwise to raise the scanning head until the two red dots merge into one.

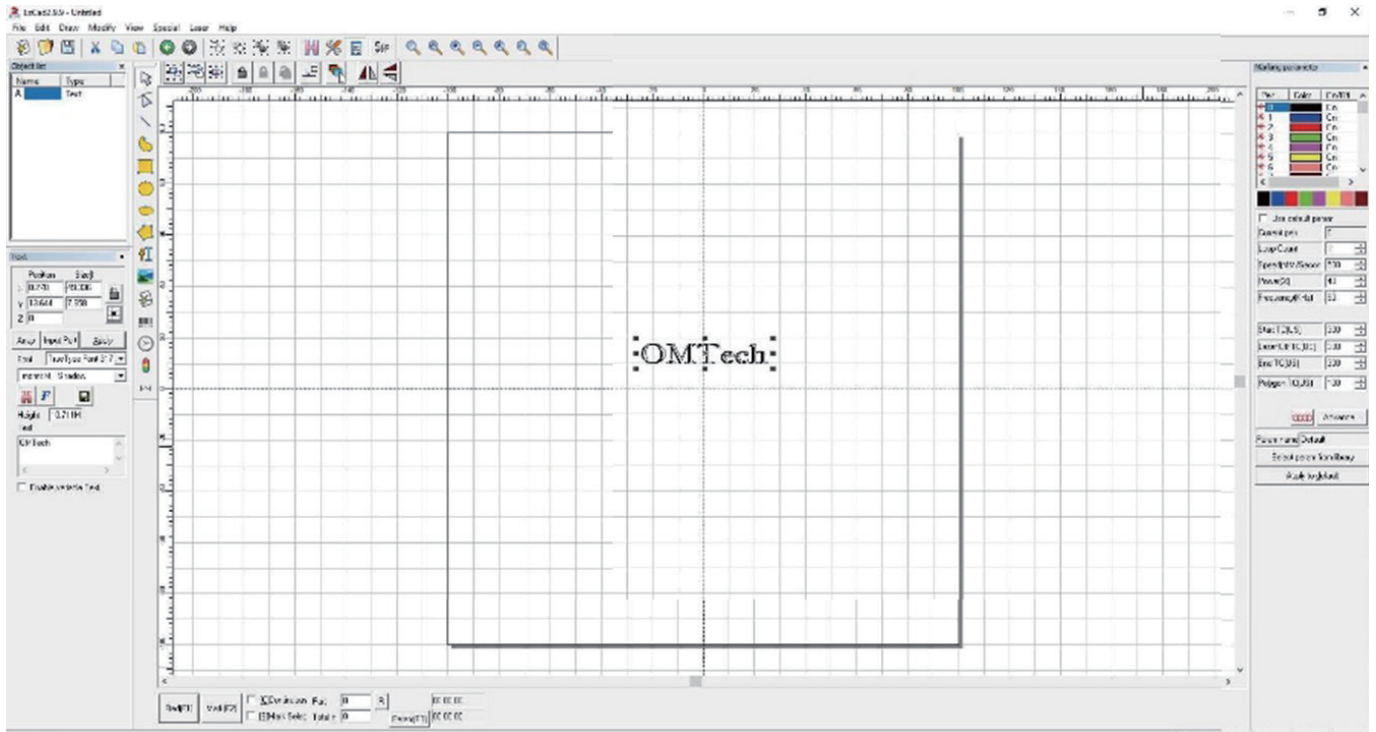


3. Use the provided ruler to measure the distance from the bottom line of the scanning head to the surface of the test material. Make a note of the distance for future reference.

### 4.2.3 Using the EZCad Software

1. Make sure your computer has been already connected and EZCad has been already running.
2. Restart the computer to establish a connection between the computer and the laser marking machine's control board.
3. Load or create a design in EZCad.

For more details about software instructions, see EZCad Instruction Manual.



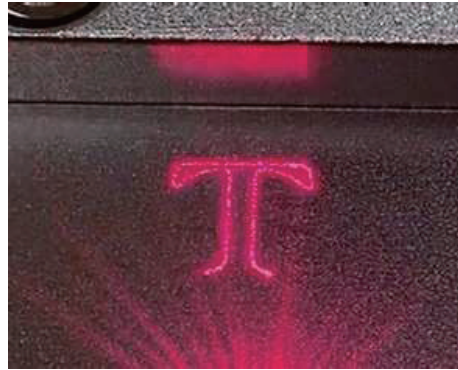
4. Customize your contrast and engraving depth by adjusting the engraving parameters in EZCad.
  - To darken an image, use a higher frequency setting. To lighten it, use a lower one.
  - To increase engraving depth, increase the amount of energy per unit area by reducing the speed parameter or increasing the laser's power or the number of loops.
  - For recommended settings for specific materials, see **Instructions for Specific Materials** (Page 17).

**Note:**

- Engraving too deep, however, reduces image quality, especially for coated materials.
- Constantly using settings over 80% will shorten the expected service life of your laser.
- Resolution should usually be set to 500 dots per inch. Reducing your image resolution can be helpful in some cases, reducing flaming and increasing the energy of the pulse in a way that improves the quality of the resultant image in some materials such as some plastics.

#### **4.2.4 Testing the Engraving Effect**

1. Activate the laser guidance system by clicking **Red** in EZCad or pressing the **F1** on the computer.  
The design should be displayed in red light on the working platform showing where the laser will fire.



2. Place a piece of laserable test material to display the design at the desired engraving position.  
*Note: The test material should be of the same material as the actual one you are going to mark.*

3. Click **Mark** in EZCad or press the **F2** key on the computer to engrave your design.

#### ****Danger****

*When an unexpected situation occurs, press the emergency stop button immediately to halt the machine's operation.*

4. Examine the quality of your first run and adjust the laser parameters in EZCad as necessary to create your desired effect.

#### **4.2.5 Engraving the Design**

1. Replace the test material with the actual material.
2. Click **Mark** in EZCad or press the **F2** key on the computer to engrave your design.

#### **4.2.6 Finishing-up**

After you have finished engraving your design:

1. Disconnect your computer.
2. Press the emergency stop button.
3. Turn the key counterclockwise to turn off the laser.
4. Press the focus button to turn off the red dot guider.
5. Press the power switch to the “OFF” position.
6. Disconnect the machine from the power supply.
7. Clean the worktable.

## 4.3 Instructions for Specific Materials

When engraving a new material, it can be helpful to engrave a test matrix of small boxes produced with various speed, power, and frequency settings to home in on the exact effect that you are looking for. To speed the process, here are some general guidelines for commonly engraved materials.

However, these are only guidelines for your convenience and it is the responsibility of the user to consult material safety data sheets and other sources to ensure the safety of working with various materials and setups. Some of the materials listed will require additional workspace and personal protective equipment in addition to this laser marking machine.

### Metals

When engraving metals, generally use high power, a low frequency, and low to medium speed settings. To avoid using your laser marking machine at greater than 80% power for extended periods, you can also get similar effects by reducing the power somewhat while also increasing the number of passes or decreasing the engraving speed.

Be mindful that some metals will produce conducting, reflective, and/or toxic dust. Softer metals naturally produce more dust during engraving, while harder metals can require higher power settings that also produce more dust. In addition to the risk to the user's skin and eyes, there may be enough dust produced (especially for repetitive industrial applications) that a full ventilation system is required to address the problem. Similarly, operators and others in the work area may need to use breathing PPE such as masks and respirators.

**Aluminum:** Bare aluminum requires a somewhat higher frequency than other metals and will never produce a strong black mark similar to those created by engraving steel. When darker marking is required, consider employing anodization or producing a deep engraving that can be darkened by using black epoxy or other filler. Anodized aluminum requires a little more speed but a very low frequency. Powder Coated Metals: Metals with a powder coating usually require a very high frequency and, for best results, at least 3 passes to remove the coating and polish the bare lower layer.

**Precious Metals:** Gold and similarly soft metals should be engraved with less power but a moderate speed. Silver and other semidurable metals are best engraved at a slightly higher power and slightly slower speed, but still not at the same power and speed as steel or aluminum.

### Plastics

When engraving plastics, generally use low power and high speed settings. Marking and engraving with too much power or at too low a speed can concentrate too much energy at the point of contact, causing the plastic to melt. Among other problems, this may produce, poor engraving quality, noxious fumes and even fires.

### Stone

When engraving various kinds of stone, generally use moderate power and speed at low frequency. As with ceramics and metals, be mindful of the dust created (especially for repetitive industrial applications) and take similar measures to ensure the safety of users and others in the work area.

## 5. Maintenance

### **Warning**

- Unless otherwise specified, **ONLY** perform adjustment and maintenance of this machine when the power is turned off and the power supply has been disconnected.
- **ONLY** allow trained and skilled professionals to modify or disassemble this machine.

Observe the following guidelines when maintaining the machine:

- Keep the workroom clean and dust-free at all times.
- Ensure the machine is fully powered off when not in use.
- Cover the galvanometric lens when it is not in use.
- Clean the worktable after use with a cloth wetted with greater than 75% rubbing alcohol. **NEVER** clean this machine with abrasive or caustic cleansers, with aerosol sprays, or with enough water to enter any electrical component.
- **ALWAYS** allow surfaces to fully dry before further use.
- If removing dust from the machine's vents using a vacuum, **ONLY** use the lowest power setting to avoid damage to internal components.

### **Warning**

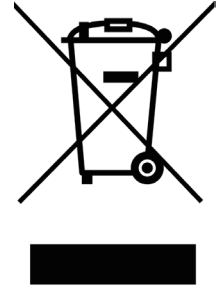
**NO** other servicing should be done by the operator. **DO NOT** attempt to service or replace other parts yourself.

## 6. Troubleshooting

Potential Problems	Possible Solutions
No laser output	Correct the focus by adjusting the height of the laser arm.
	Correct the software parameters if they are invalid or mistaken.
	Have a technician fix or establish the connection between the laser and the mainboard.
	Have a technician fix or establish the connection between the laser and its power supply.
	If either the fiber laser source or its power supply have worn out, have a technician replace them.
No engraving despite laser output	Confirm that the material can be safely engraved with this machine.
	Correct the focus by adjusting the height of the laser arm.
	Adjust the software parameters to create greater intensity.
	Have a technician check the control panel, scanning lens, and its power supply. Correct any problems or replace the part.
Other laser errors	Have a technician check the fiber laser source and the mainboard. Correct any problems or replace the part.

## 7. Disposal

Electrical products should not be disposed of with household products. In the EU and UK, according to the European Directive 2012/19/EU for the disposal of electrical and electronic equipment and its implementation in national laws, used electrical products must be collected separately and disposed of at the collection points provided for this purpose. Locations in Canada and the US may have similar regulations. Contact your local authorities or dealer for disposal and recycling advice.



## Contact Us

Thank you for choosing our laser equipment for your home or shop! For a .pdf copy of the latest version of this manual, use the appropriate app on your smartphone or other engraver to scan the QR code to the right.

Come join the OMTech community at our official laser group on Facebook or visit the company forums at [omtechlaser.com](http://omtechlaser.com). Check our YouTube channel for helpful hints and instructional videos. If you encounter any problem regarding your engraver, do not hesitate to contact customer service with your order number at [support@omtechlaser.com](mailto:support@omtechlaser.com). Our teams will respond within 24 hours to make things right. You can also reach us at (949) 438-4949.

We are Rygel Advanced Machines, you can find us at 1150 N Red Gum St Ste F, Anaheim, California 92806, USA.

Thank you and we hope you will choose us again for all your laser needs!



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