UM-USB-0258-V2

omtech

OMTech PRO QUANTUM 45 | CO_2 Cabinet Laser Engraver

User Manual

Read Carefully Before Use
Keep for Future Reference

BEAMING WITH POSSIBILITIES!

Thank you for choosing omtech!

Your new CO_2 laser engraving machine is intended for personal and professional use. When used under these instructions, it falls under the category of a **CLASS 1** laser product. But it includes a **CLASS 4** laser and some components remain extremely dangerous under improper and/or non-intended use. Never disable the preinstalled safety engravers and always use your laser safely and responsibly.

Read this manual carefully before operation. It provides important information regarding proper installation, adjustment, maintenance, and most importantly, safe operation of your laser. It is intended to be used in conjunction with your engraving software manual, as the software typically does not only provide image design but also serves as an alternative interface for the laser settings and machine controls. You and any other users of this engraver should thoroughly understand **BOTH** manuals before attempting to operate the laser.

Keep both manuals for future reference and provide them to **ANYONE** who will install, operate, maintain, or repair this machine. Both manuals should be included if this engraver is given or sold to a third party.

If you have any questions after reading these manuals, please contact our support team. We are here to assist you and will address your concerns as soon as possible.

@omtechlaser

We care about your experience!

If you encounter any issues with your engraver, visit our Help Center or join our official laser group for helpful hints and instructional videos.

Help Center

help.omtech.com

First Time Setup | Safety | Maintenance | Troubleshooting | FAQ | Hot Tips

If the issue remains unresolved, please contact our **support team**.

To request assistance, simply fill out the form below, take a photo of it (along with any relevant photos or videos if needed), and email it to us. Our service team will respond within **24 hours** to resolve your concerns.

Platform ☐ Amazon ☐ eBay ☐ Walmart

☐ Wayfair ☐ Other: _____ (please specify)

Order Information Order Number: _____

Tracking Number: _____

Recipient Name: _____

Purchase Date: _____

Subject of Inquiry _____

Official Website: omtech.com

Technical Support: support@omtech.com

Support Tel: +1 (949) 438-4949, Monday – Friday from 9:00 am – 5:00 pm (PT)

Address: Rygel Advanced Machines, 1940 E Deere Ave, Ste 100, Santa Ana, CA 92705, USA

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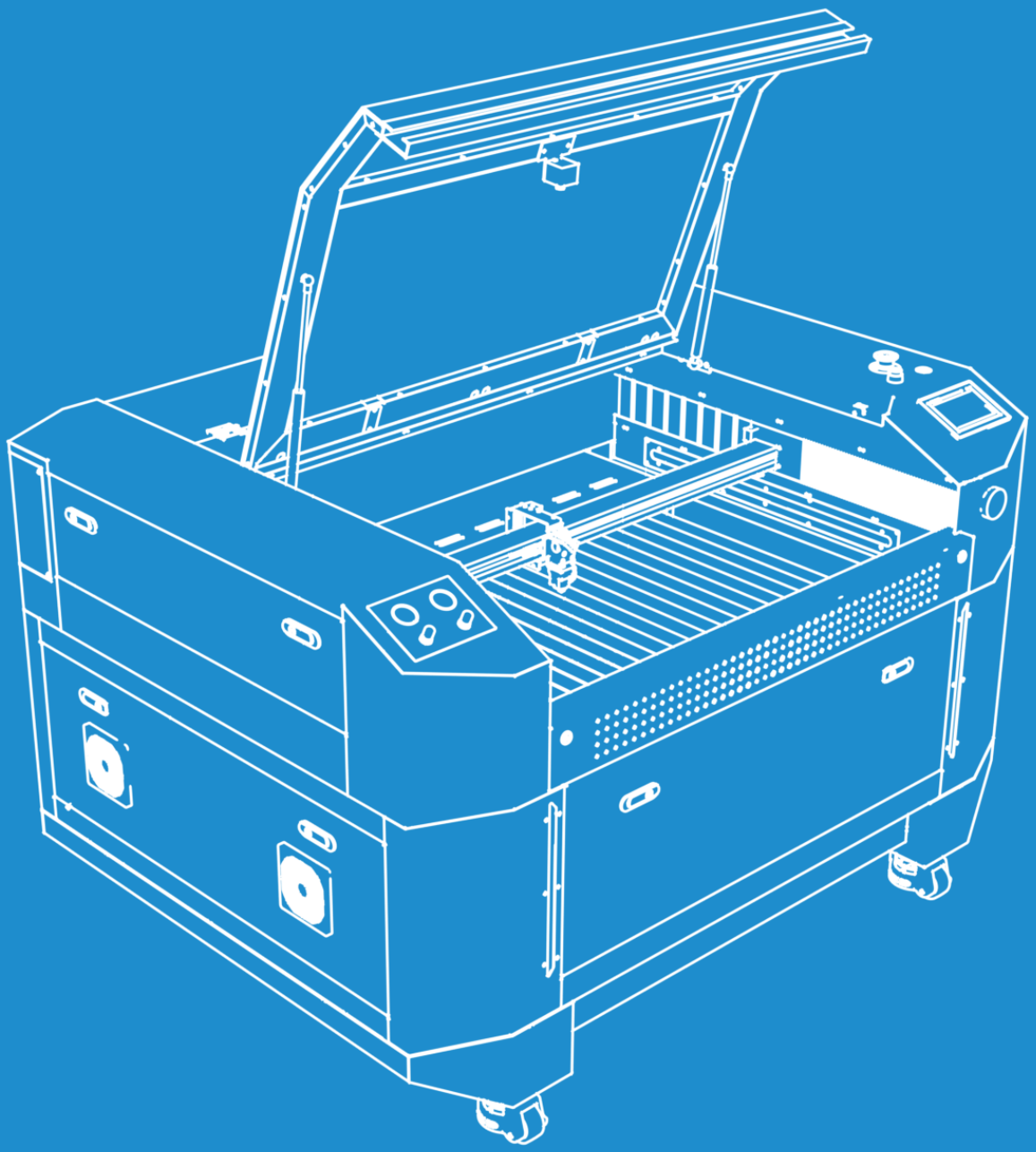


1 Safety Information

1.1 Disclaimer

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

1. **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.

2. **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 shall not be responsible for any violations of laws or regulations resulting from the use of OMTech products.

3. **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.

   Regular maintenance should be performed throughout the lifecycle of OMTech products. You are responsible for ensuring the products operate as intended.

   Always wear appropriate protective gear.

4. **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 and/or warranties (if any) for any third-party products used.

5. **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.

6. **Warranty**

   Refer to the sales page for warranty information.

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.

1.2 Symbol Guide

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

These items indicate an imminent hazard that **WILL** result in death or severe injury if not avoided.

These items indicate a potential risk that **COULD** result in death or serious injury, as well as significant equipment damage.

These items address similarly serious concerns about the laser beam.

These items address similarly serious concerns about electrical components.

These items address similarly serious concerns about fire hazards.

These items address pinching and crushing hazards.

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

These items address that a forklift is required for handling this machine.

These items address tips that help.

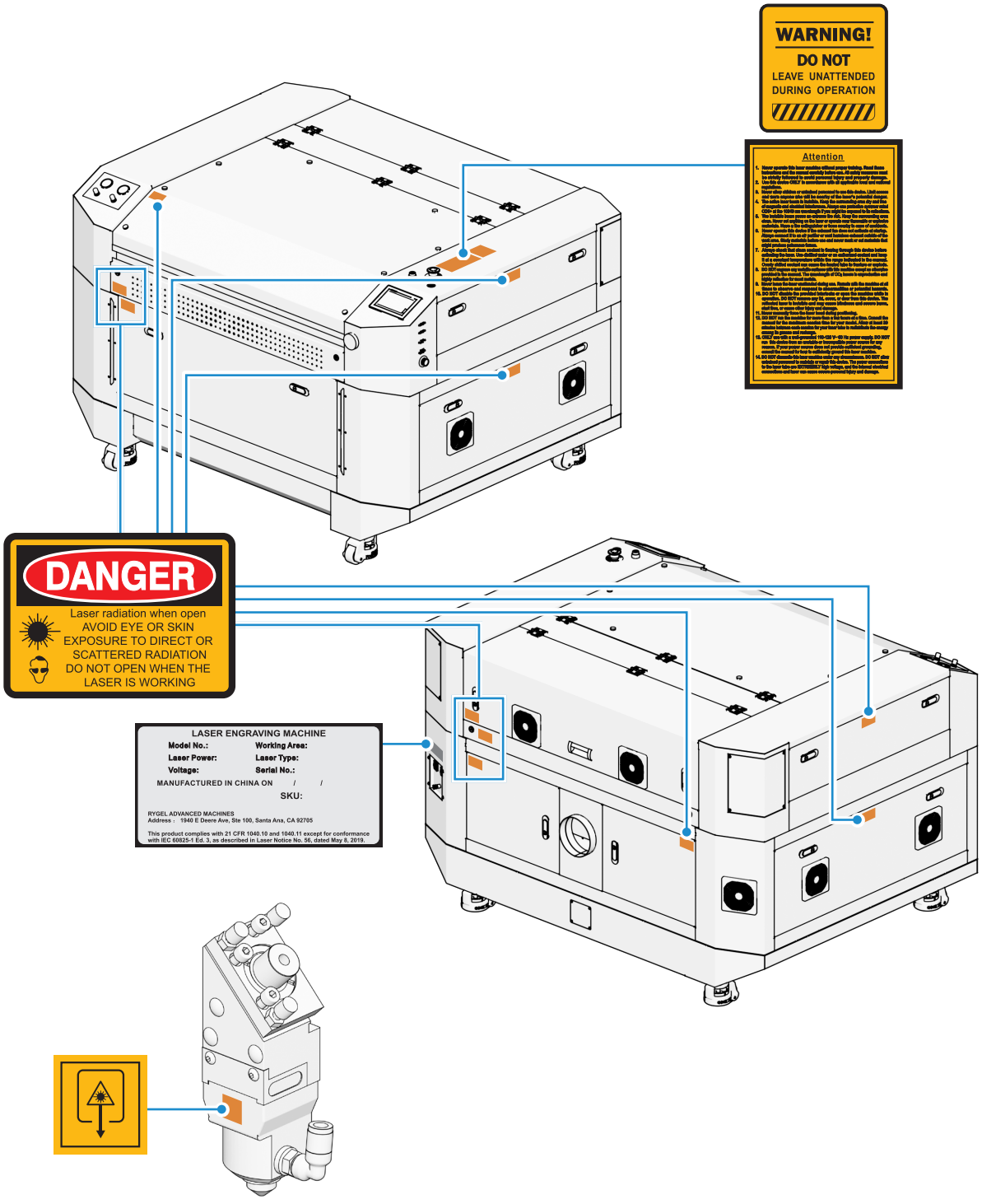
This product is sold in conformity with applicable EU regulations.

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

1 Safety Information

1.3 Safety Instruction Labels

- Your device should come with instruction labels in the following locations:



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

1.4 General Safety Instructions

- **ALWAYS** keep a fire extinguisher, water hose, or other flame-retardant system nearby in case of emergencies. Ensure that the phone number of your local fire department is clearly displayed in the vicinity. In the event of a fire, cut the electrical power before attempting to extinguish the flames. Before using an extinguisher, familiarize yourself with its proper range. Avoid using the extinguisher too close to the flame, as the high pressure could cause blowback and worsen the situation.
- **DO NOT** operate continuously for more than 5½ hours. Stop for at least 30 minutes between uses.
- **DO NOT** allow minors, untrained personnel, or anyone with a physical or mental impairment that precludes their ability to follow this manual and the software manual to install, operate, maintain, or repair this machine.
- This machine can be used by children aged 8 years and older, and by persons with reduced physical, sensory, or mental capabilities, or those lacking experience and knowledge, provided they are supervised or have been instructed on how to use the machine safely and understand the risks involved.
- Children should **NOT** play with the machine.
- Cleaning and user maintenance must **NOT** be carried out by children without supervision.
- Keep the machine and its cord out of the reach of children under 8 years old.

- Use this 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. **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 included with this machine if it is ever given or sold to a third party.
- Any untrained personnel near this machine during operation **MUST** be informed about its dangers and **FULLY** instructed on how to avoid injury during use.

1 Safety Information

1.5 Laser Safety Instructions

This machine 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.

When used according to these instructions, the machine is classified as a Class I laser product. However, the invisible engraving laser, the laser tube, and their electrical connections remain extremely dangerous. Unauthorized adjustments, controls, or procedures not specified in this manual may result in hazardous radiation exposure.

Improper use of the machine can lead to 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 gases during processing
- Direct exposure to the laser will cause bodily harm including serious burns and irreparable eye damage

- **DO NOT** modify or disable this machine's safety features or disassemble the laser machine. **ONLY** trained and qualified professionals are authorized to perform repairsmay repair it. Modifying, adjusting, or using incompatible equipment may result in dangerous radiation exposure and other serious injuries.
- **NEVER** leave any part of the machine open during operation, except for the pass-through doors when necessary. Never interfere with the laser beam or place any part of your body in its path during operation. When using the pass-through doors or when there is a risk of exposure to the laser beam, always wear personal protective equipment (PPE), including protective eyewear specifically designed to filter the wavelength of your machine's laser. The eyewear should have an optical density (OD) of 5+.
- **DO NOT** stare or allow others to stare continuously at the laser beam during operation even when the cover is closed and/or wearing protective eyewear.

- **ONLY** use this machine if its automatic shutoffs are functioning properly. When you first get this machine and whenever you notice any issues, test the shutoffs (see instructions below) before proceeding with any other work. Do not continue use if the shutoffs fail to engage. If this occurs, turn off the machine immediately and contact customer service or your repair service. Never disable these shutoffs.
- **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** ever under **ANY** circumstances use this machine if the water cooling system is not working properly. Always activate the water cooling system and visually confirm that water is flowing through the entire system before turning on the laser tube. Do not use ice water or water that has become hotter than 100 °F (38 °C). For best results, keep it between 60–70 °F (15–21 °C). Replace heated water or add sealed bottles of frozen water to cool it, while never allowing the system to run without water or allowing the water to become colder than 50 °F (10 °C). Immediately stop use if the water cooling system malfunctions.
- **DO NOT** use generic coolant or antifreeze in your cooling water, as they may leave corrosive residues and solidify inside your hoses and piping, causing malfunctions and even explosions. Use custom laser-safe formulations or use and store your machine in a climate-controlled area.
- **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 when working with materials listed in the Material Safety section of this manual. The laser settings and engraving process must be properly adjusted for specific materials.
- Ensure the area is kept free of other airborne pollutants, as they also pose a risk of reflection, combustion, etc.

1 Safety Information

1.6 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 2000 J.
- **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 a dedicated grounding cable firmly connected to the proper slot on the cabinet. Do not use with an ungrounded 3 to 2-prong adapter. The machine's grounding should be checked regularly for any damage to the line or loose connections.
- **NEVER** leave this machine unattended when it is connected to a power supply. If it behaves abnormally, immediately cut off **ALL** power to the machine and contact our customer service or your dedicated repair service. **ALWAYS FULLY** power off the machine (including using the emergency stop switch) after each use.
- If the supply cord is damaged, the machine should be scrapped or have the cord replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid hazards.

- The area around this machine should be kept dry, well-ventilated, and environmentally controlled to keep the ambient temperature between **41–104 °F (5–40 °C)**. For best results, keep the temperature at **75 °F (25 °C)** or below. Ensure the ambient humidity is non-condensing.
- **DO NOT** handle your water pump or the water it's submerged in while the pump is attached to its power supply. Place it in water before connecting it to power and disconnect it from power before removing it.
- Adjustment, maintenance, and repair of the electrical components of this machine must be done **ONLY** by trained and qualified 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 the system, it is recommended such testing only be done by the manufacturer, seller, or repair service.
- Unless otherwise specified, **ALWAYS** perform adjustments, maintenance, and repairs of the machine when it is turned off, disconnected from its power supply, and fully cooled.

1.7 Material Safety Instructions

- Users are responsible for ensuring that the 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 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 are responsible for ensuring that every person present during operation has sufficient PPE to avoid injuries from the emissions and byproducts of the materials being processed. In addition to the protective laser eyewear mentioned above, you may also need goggles, masks or respirators, gloves, and other protective outer clothing.
- Never use this laser engraver under any circumstances if the exhaust system is not functioning properly. **ALWAYS** ensure that the exhaust fans can remove the dust and gas produced by the engraving process in accordance with **ALL** applicable local and national laws and regulations. Immediately stop use if the exhaust fans or vent pipes malfunction. Periodically check the air assist intake filter to ensure it stays free of any dust or debris.
- Exercise special caution when working with conductive materials as the buildup of their dust and ambient particles may damage electrical components, cause short circuits, or produce other effects including reflected laser radiation.

1 Safety Information

ffThis machine **CAN** be safely used with the following materials:

CAN be used
Plastics • Acrylonitrile Butadiene Styrene (ABS) • Nylon (Polyamide, PA, etc.) • Polyethylene (PE) • High-Density Polyethylene (HDPE, PEHD, etc.) • Biaxially-oriented Polyethylene Terephthalate (BoPET, Mylar, Polyester, etc.) • Polyethylene Terephthalate Glycol (PETG, PET-G, etc.) • Polyimide (PI, Kapton, etc.) • Polymethyl Methacrylate (PMMA, Acrylic, Plexiglass, Lucite, etc.) • Polyoxymethylene (POM, Acetal, Delrin, etc.) • Polypropylene (PP, etc.) • Styrene **Others** • Cardboard • Ceramics, including Dishes, Tile, etc. • Glass • Leather • Paper & Paperboard • Rubber • Stone, including Marble, Granite, etc. • Textiles, including Cotton, Suede, Felt, Hemp, etc. • Wood, including Cork, MDF, Plywood, Balsa, Birch, Cherry, Oak, Poplar, etc.

For the recommended parameters for the most commonly engraved materials, see §5.6 Instructions for Specific Materials on Page 78.

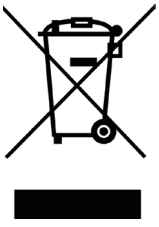
This machine **CANNOT** be used with **THE FOLLOWING MATERIALS OR ANY MATERIALS THAT INCLUDES THEM**:

CAN NOT be used
• Artificial Leather containing Hexavalent Chromium (Cr[VI]), due to its toxic fumes • Astatine, due to its toxic fumes • Beryllium Oxide, due to its toxic fumes • Bromine, due to its toxic fumes • Chlorine, including Polyvinyl Butyral (PVB) and Polyvinyl Chloride (PVC, Vinyl, Cintra, etc.), due to its toxic fumes • Fluorine, including Polytetrafluoroethylenes (Teflon, PTFE, etc.), due to its toxic fumes • Iodine, due to its toxic fumes • Metals, due to their conductivity and reflectivity • Phenolic Resins, including various forms of Epoxy, due to their toxic fumes • Polycarbonate (PC, Lexan, etc.), due to its toxic fumes

For all other materials, if you are unsure about its safety or laserability with this machine, seek out its material safety data sheet (MSDS). Alternatively, contact our support department for further guidance.

Pay especial attention to information about safety, toxicity, corrosiveness, reflectivity, and reaction(s) to high heat. Never operate the laser on any (such as PVC, teflon, and other halogen- containing substances) that can produce corrosive, hazardous, or even deadly fumes.

1.8 Disposal Safety Instructions



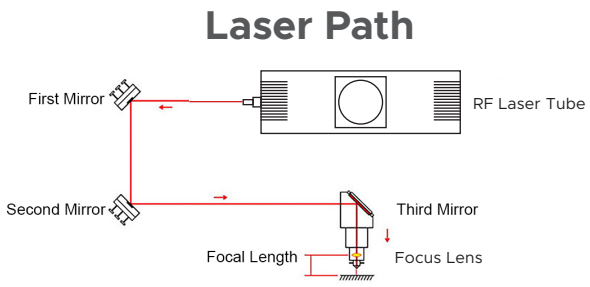
Electrical products should not be disposed of with household products. In the EU and UK, according to the European Directive 2012/19/EU for the disposal of electrical and electronic equipment and its implementation in national laws, used electrical products must be collected separately and disposed of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

2 Introduction

2.1 General Information

This manual is the designated user guide for installing, setting up, safely operating, and maintaining your laser engraver. It is divided into chapters covering general information, safety instructions, installation steps, operation and adjustment instructions, maintenance procedures, and contact information.

ALL personnel involved in this engraver's installation, setup, operation, maintenance, and repair should read and understand this manual, particularly its safety instructions. Some components are extremely high-voltage and/or produce powerful laser radiation. Not knowing or following these instructions may result in substandard performance and longevity, property damage, and personal injury.



Your laser engraver operates by emitting a powerful laser beam from an RF laser tube. The beam is reflected off three mirrors and passes through a focus lens, concentrating the light to cut and etch compatible materials. The first mirror is fixed near the end of the laser tube, the second mirror travels along the Y-axis, and the third mirror is attached to the laser head that travels along the X-axis. Because dust and debris from engraving can accumulate, the mirrors and the focus lens require regular cleaning. Periodic realignment may also be necessary to maintain proper laser path, using the adjustment screws.

With low-intensity use, the RF laser tube has an average lifespan of approximately 23,000 hours. Constantly operating above 70% of its maximum rated power may significantly reduce service life. Optimal performance and longevity are typically achieved using power settings between 5%–70% of the maximum rated power.

This device operates at high voltage and can draw high current at maximum settings. Always exercise caution: touch electrical components with one hand at a time, and connect the machine to a sufficiently rated dedicated circuit, ensuring that it can handle high current safely. Plan the electrical setup in advance, or reduce power settings to avoid overloading the circuit.

An exhaust system—typically either an external vent or a dedicated fume extractor—must be used with the provided fan to remove the dust and gases produced by the engraving process. Never operate the machine without both systems functioning correctly. Ensure the exhaust system complies with all applicable workplace and environmental regulations.

The active laser is invisible to the human eye. Never operate the laser with covers or access panels open to prevent permanent injury. Use protective eyewear rated OD5 or higher at 10.6 µm whenever the laser is active.

Some RF laser engravers broadcast signals in the radio spectrum for wireless connectivity. Special shielding or equipment may be required to avoid interference with licensed or emergency communications, especially in residential areas.

2.2 Designated Use

The OMTech Pro Quantum 45 is intended for engraving signs and logos on consumer products or applicable substrates. Its laser can process various materials, including wood and cork, paper and cardboard, most plastics, glass, cloth and leather, and stone. It can also be used on some specially coated metals. Use of this system for non-designated purposes or materials is not permitted.

2.3 Technical Specifications

Model		OMTech Pro Quantum 45	
Voltage		110–120 V AC, 60 Hz	
Processing Area		39.37 × 23.62 in (1000 × 600 mm)	
Max Material Height		8.27 in (210 mm)	
Max Processing Speed		165.4 ips (4200 mm/s)	
Max Processing Acceleration		3149.6 ips² (80000 mm/s²)	
Positioning Accuracy		±0.0008 in (±0.02 mm)	
Repeat Positioning Accuracy		±0.0004 in (±0.01 mm)	
Minimum Character Size		0.02 × 0.02 in (0.5 × 0.5 mm)	
RF Laser Tube	Rated Power	60 W	80 W
	Wavelength	10600 nm	
	Class	4	
	Expected Service Life at <40% / 40–70% / >70% Power	23,000 / 20,000 / 18,000 hr	
Integrated Centrifugal Fan	Rated Power	330 W	
	Max Airflow (±10%)	2904 gpm (660 m³/h)	
	Port Diameter	5.91 in (150 mm)	
Integrated Air Compressor	Rated Power	980 W	
	Max Flow Rate (±10%)	21.13 gpm (80 L/min)	
	Max Pressure	0.7 MPa	
	Air Tank Capacity	7.93 gal (30 L)	

Focus Lens	Diameter	0.79 in (20 mm)
	Thickness	0.08 in (2 mm)
	Focal Length	2.5 in (63.5 mm)
	Material	ZnSe
Molybdenum Mirror	Diameter	0.98 in (25 mm)
	Thickness	0.12 in (3 mm)
Required Operating Environment	Humidity Range	Non-condensing
	Temp. Range	41–104 ° F (5–40 ° C)
Provided Operating Software		RDWorks V8
Supported Software		LightBurn, CorelLaser
Supported Image Formats		.ai, .bmp, .dxf, .gif, .hpgl, .jpeg, .pdf, .plt, .png, .rd, .svg, .tiff, .tga
Dimensions (L×W×H)		63.39 × 48.82 × 40.94 in (161 × 124 × 104 cm)
Net Weight		959 lb (435 kg)

2 Introduction

2.4 Package List

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

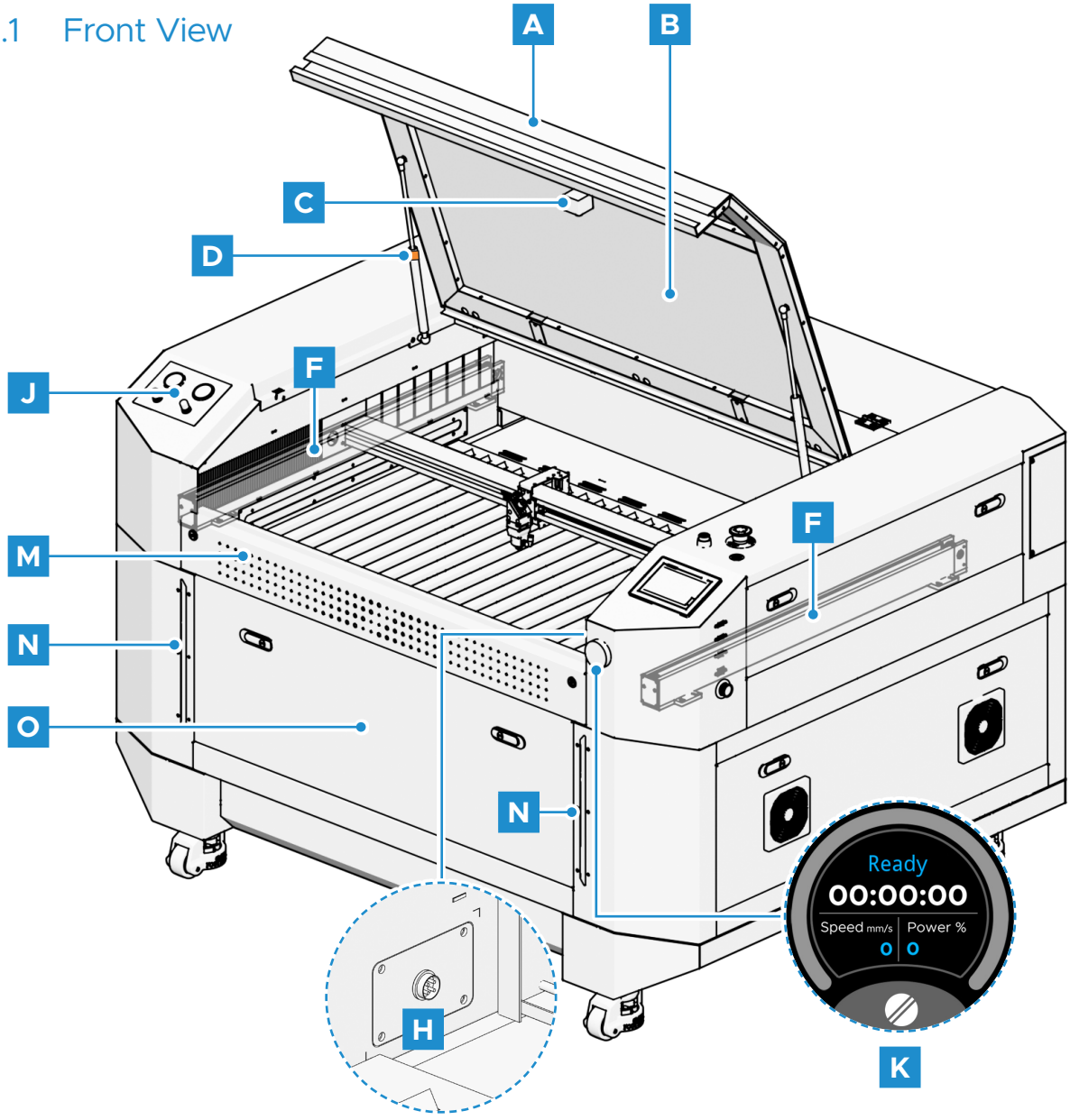
P

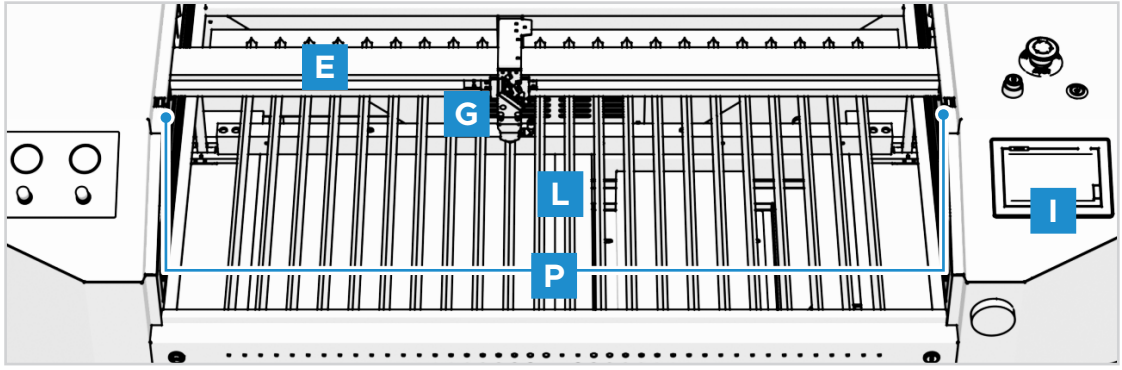
Item	Name	Qty.
A	Power Cords	2
B	USB Cable	1
C	Camera Cable	1
D	Ethernet Cable	1
E	Laser Keys	2
F	Access Keys	4
G	Exhaust Pipe Diameter 150 mm, Length 1.5 m	1
H	Pipe Clamp Diameter 150 mm	1
I	USB Drive with Engraving Software	1
J	Focus Lens Tools	2
K	Focal Height Rulers	2
L	Tape	1
M	Flathead Screwdriver	1
N	Phillips Screwdriver	1
O	Hex Wrenches	1 Set
P	Tool Box	1

2 Introduction

2.5 Components

2.5.1 Front View



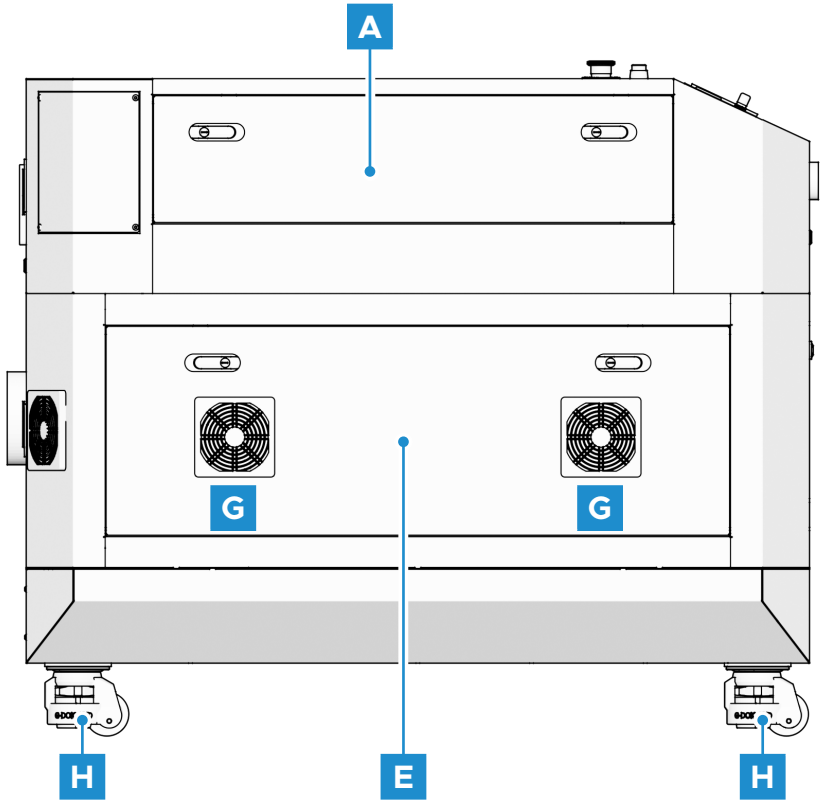


A	**Cover**	Provides access to the main bay for loading and unloading materials, adjusting the laser path, and performing maintenance.
B	**Viewing Window**	Protects you from direct laser exposure and reflections while allowing you to monitor the engraving process. However, you should never stare continuously at the laser during operation, even through the window.
C	**Camera**	Helps you position your designs precisely.
D	**Safety Lock**	Holds the cover securely in the open position and features a fall-prevention mechanism. Press the lock before closing the cover.
E	**X-Axis Rail**	Supports the movement of the laser head left and right across the workbed. Holds the 2nd mirror.
F	**Y-Axis Rails**	Support the movement of the X-axis rail up and down the workbed.
G	**Laser Head**	Holds the 3rd mirror, focus lens, air assist outlet, and nozzle. Equips with a focus sensor, its air path is controlled by the high/low air pressure knob on the air pressure control panel.
H	**Rotary Axis Port**	Connects four-pin rotary axes for engraving curved surfaces.
I	**Control Panel**	Offers parameter adjustment and immediate control of the engraving process, including manual movement of the laser head and laser firing. Also houses the emergency stop, and motorized workbed controls.
J	**Air Pressure Control Panel**	Provides direct adjustment and monitoring of the engraving air-assist system. Equipped with a high-pressure knob and gauge, and a low-pressure knob and gauge, allowing precise control and real-time display of airflow levels for different engraving and cutting needs. For details on panel functions, see §2.5.6 Air Pressure Control Panel.
K	**Status Display**	Displays the engraver's status, processing speed, laser power, and processing time.
L	**Workbed**	Adjusts in height to fit thin or thick materials and switches between the aluminum knife blade and steel saw blade platforms. Its open design allows better airflow beneath the material for stronger, faster, and cleaner engraving.
M	**Front Pass-Through Door**	Allows larger pieces of material to be fed through the workbed. Exercise caution when opening the door to avoid exposure to the laser beam or its reflections.
N	**Status Lights**	Indicate yellow when the engraver is in standby mode. Indicate green during active lasing. Indicate red when an error occurs.
O	**Front Access Door**	Provides access to the waste bins under the workbed.
P	**Interlocks**	Cut power to the RF laser tube automatically if the cover is raised.

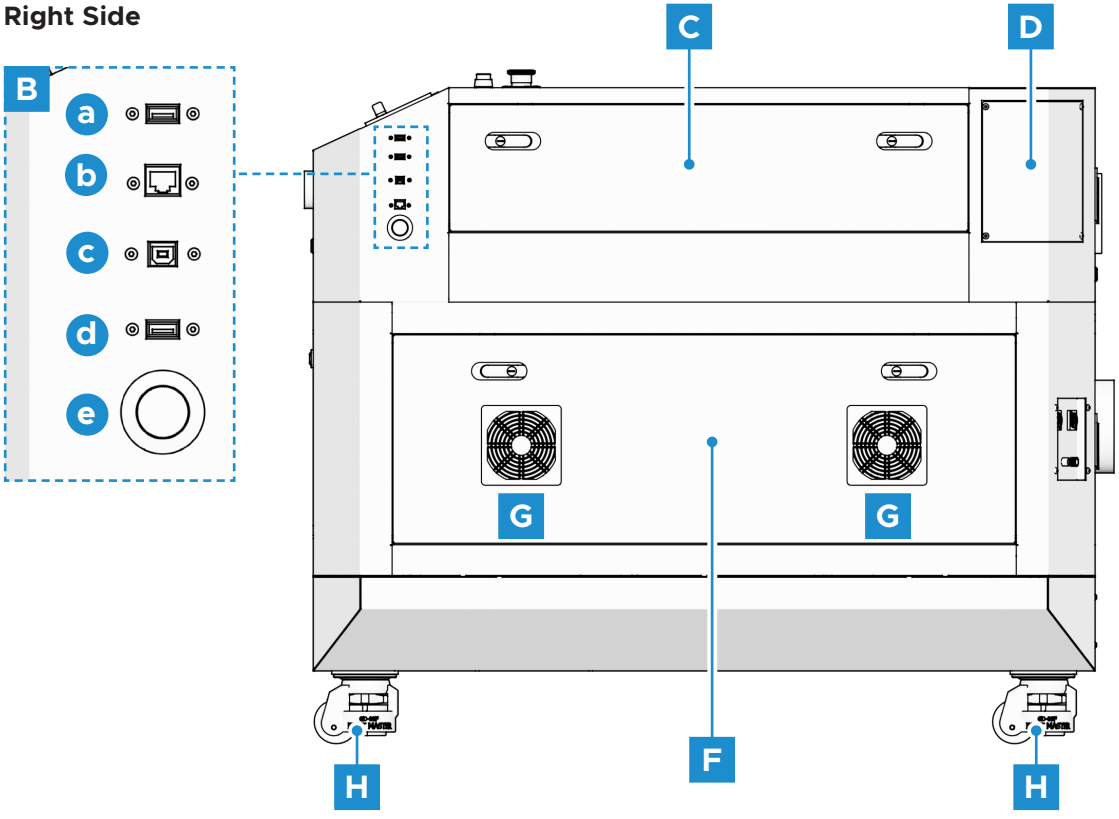
2 Introduction

2.5.2 Side View

Left Side



Right Side

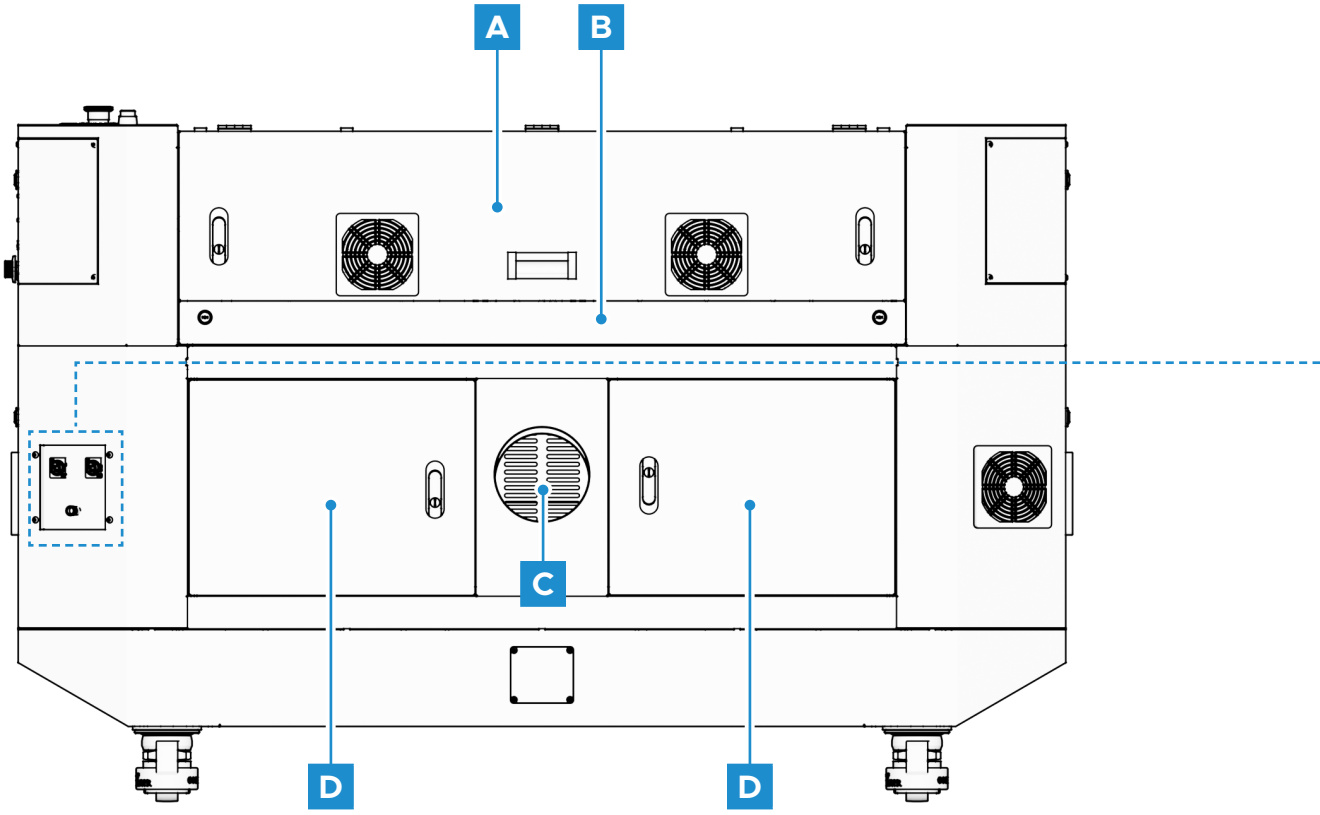


A	**Top Left Access Door**	Provides access to the left Y-axis rail and the 2nd mirror.	
B	**Connection Ports & Light Switch**	a	Connects the engraver's camera to your control computer and engraving software.
		b	Connects to your control computer through an Ethernet cable.
		c	Connects to your control computer through a USB cable.
		d	Connects to your USB flash drive, allowing you to access its files through the touchscreen.
		e	Controls the brightness of the internal LED lights.
C	**Top Right Access Door**	Provides access to the right Y-axis rail and its motor.	
D	**Extension Box**	Provides access to the RF laser tube.	
E	**Bottom Left Access Door**	Provides access to the air compressor, regulator, and digital control. Also allows access to the Z-axis motor and the large screws that move the workbed up and down, which should be lubricated as needed, typically once a month or every few months.	
F	**Bottom Right Access Door**	Provides access to the electronics bay, including the mainboard, engraver power supply, and other electrical connections. Always make adjustments only when the engraver is turned off and **FULLY** disconnected from the power supply.	
G	**Cooling Fans**	Keeps the engraver's electronic components from overheating. Ensure that they are well-ventilated and completely unobstructed during use.	
H	**Caster Wheels & Foot Pads**	**Caster Wheels** provide movement to the engraver, while **Foot Pads** hold the engraver steady to protect flooring.	

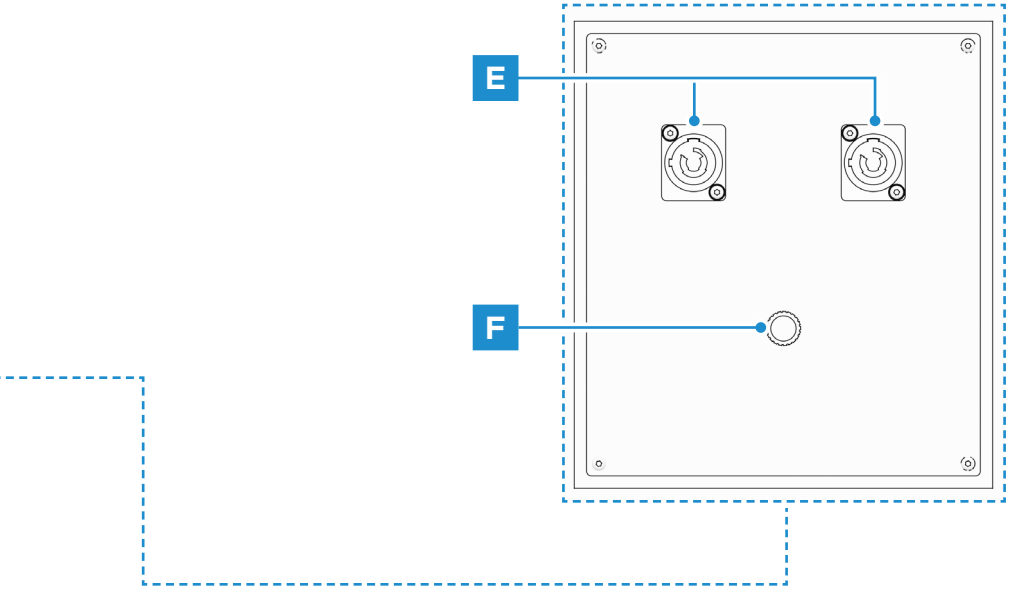
For all the engraver's access doors, unlock, open, and simultaneously rotate the handles on each end. When the latches are freed, carefully support the door as it opens to avoid damage.

2 Introduction

2.5.3 Rear View



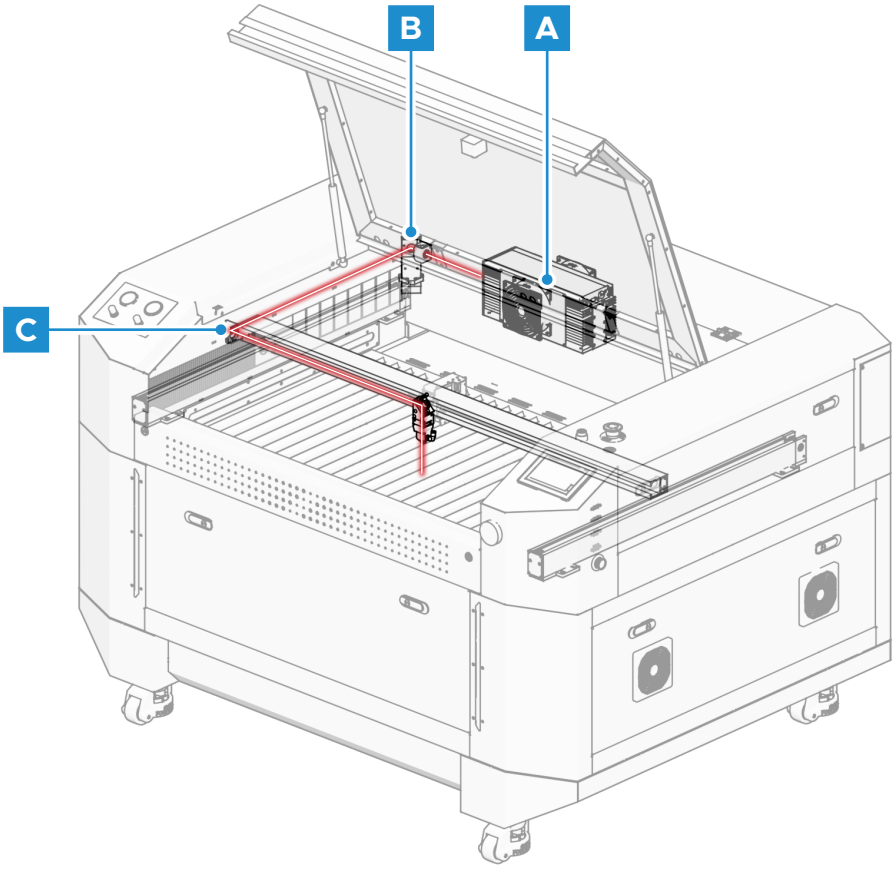
A	**Top Rear Access Door**	Provides access to the laser bay, including the RF laser tube, laser power supply, and 1st mirror.
B	**Rear Pass-Through Door**	Allows larger pieces of material to be fed through the workbed. Exercise caution when opening the door to avoid exposure to the laser beam or its reflections.
C	**Exhaust Vent**	Connects to the fan to remove gases and airborne debris from the workbed.
D	**Bottom Rear Access Doors**	Provide access to the X/Y axis drive and transformer through the left door, and the dust removal fan through the right door.



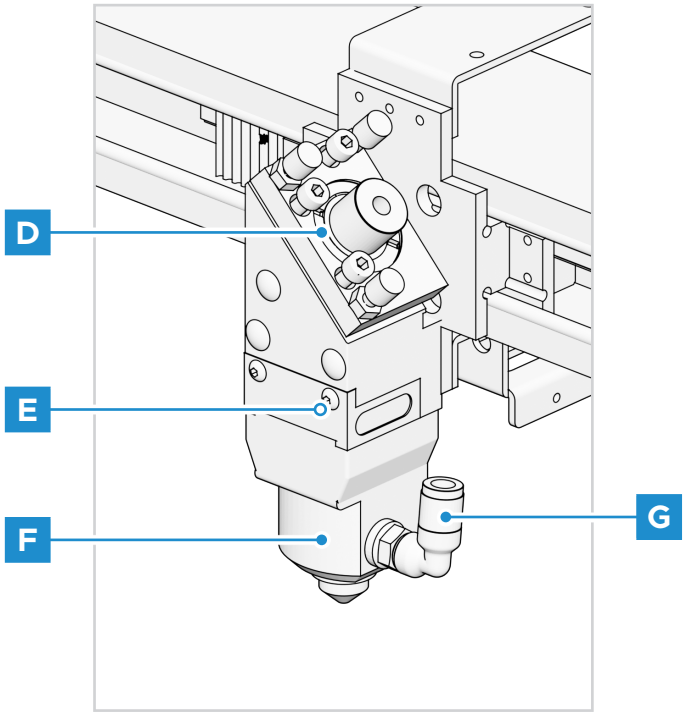
E	**Power Ports**	Provide the power supply for the engraver and the RF laser tube with two power cords. Each cord must be connected to a separate circuit, and the current for both power lines must be greater than 15 A.
F	**Ground Port**	Connects to the dedicated grounding cable for safety if applicable.

2 Introduction

2.5.4 Laser Path



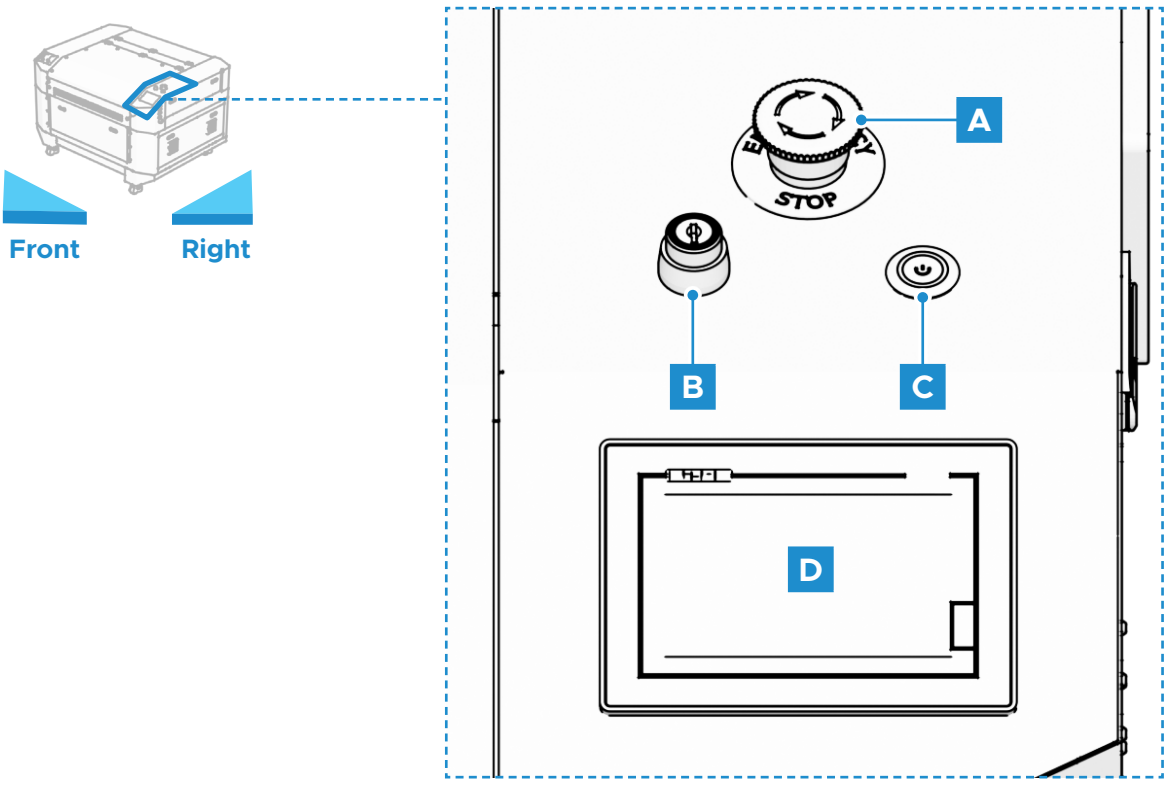
A	**RF Laser Tube**	Produces a powerful CO_2 laser within its sealed RF-excited chamber. The connection between the laser power supply and the RF laser tube carries strong RF energy and is very dangerous.
B	**1st Mirror**	Transfers the invisible engraving laser from the tube to the 2nd mirror. Its angle is adjustable, allowing precise alignment. Houses a temperature sensor to monitor the mirror's temperature.
C	**2nd Mirror**	Moves with the X-axis rail to guide the laser beam along the left Y-axis. Its angle is adjustable, allowing precise alignment. Houses a temperature sensor to monitor the mirror's temperature.



D	**3rd Mirror**	Moves with the laser head to transfer the laser from the 2nd mirror to the focus lens. Its angle is adjustable, allowing precise alignment. Houses a temperature sensor to monitor the mirror's temperature.
E	**Focus Lens**	Directs and focuses the laser onto the material. Maintain the correct focal length from the material's surface for optimal effect.
F	**Autofocus Block**	Installs within the laser head casing during standard engraving.
G	**Air Assist**	Blows pressurized air to extinguish sparks and remove dust and debris during engraving.

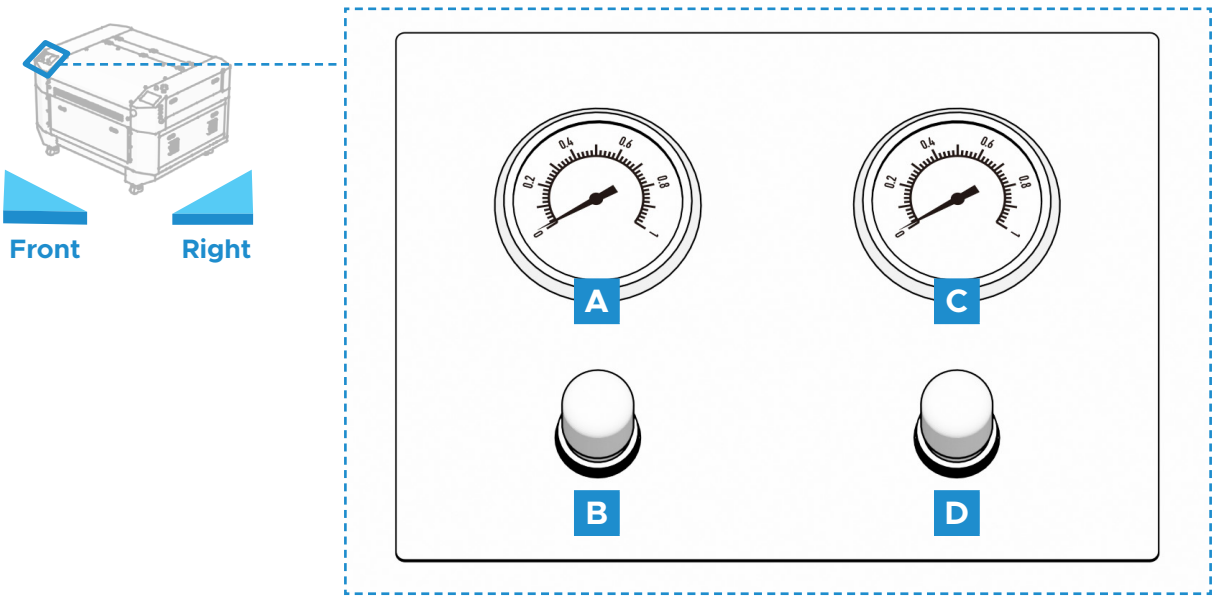
2 Introduction

2.5.5 Control Panel



A	**Emergency Stop Switch**	Cuts all power to the engraver immediately. Rotate the switch to release it before operation and push it down between sessions.
B	**Laser Key**	Turns the laser power supply on and off. Ensures that only authorized operators can use the engraver.
C	**Main Power Button**	Press to turn on the engraver's control system, LED lights, and cabinet sockets.
D	**Digital Touchscreen**	Serves as the main control panel for the engraver.

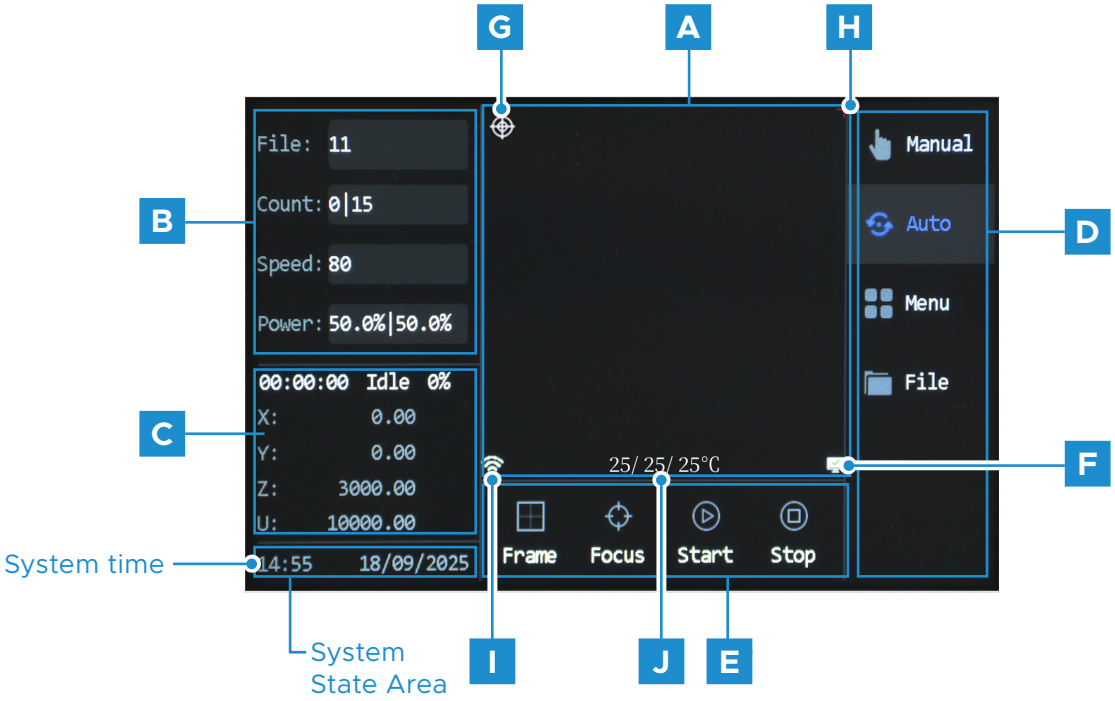
2.5.6 Air Pressure Control Panel



A	**Low-Pressure Gauge**	Displays the low-pressure air-assist output.
B	**Low-Pressure Knob**	Adjusts the low-pressure air-assist output during engraving.
C	**High-Pressure Gauge**	Displays the high-pressure air-assist output.
D	**High-Pressure Knob**	Adjusts the high-pressure air-assist output during cutting.

2 Introduction

2.5.7 Touchscreen



No.	Display Areas		Definitions&Functions
A	**Graphic Display Area**		Shows the currently loaded image and, during work, the position of the laser head.
B	**Parameter Display Area**	**File**	Shows the name of the file being processed.
		Count	Shows the batch count and the total count (the current batch count for work with the currently loaded file; the current total count for work with the engraver).
		Speed	Shows the speed value (the 1st route and the 2nd route).
		Power	Shows the power value (the 1st route and the 2nd route).
C	**Coordinates Display Area**		Shows the current position of the laser head along the X and Y axes according to the system's current orientation and the current bed height (U) and laser head position (Z).
D	**Menu Area**	**Manual**	Tap once to enter the manual menu.
		Auto	Tap once to enter the automatic function menu, which the system displays by default after being powered on.
		Menu	Tap once to enter the menu submenu.
		File	Tap once to enter the file management menu.

No.	Display Areas		Definitions&Functions
E	**Function Area**	**Frame**	Tap to trace the outline of the current design for sizing.
		Focus	Tap to enable the laser head to focus automatically.
		Start	Tap to start the current task.
		Stop	Tap to stop the current task.
F	**Keyboard Lock**		Tap the time strip to lock the control panel.  appears in the top-right corner. Tap again to unlock.
	Network Status		 indicates that the system is connected to the Internet.
G	**Position Mark**		 appears after the positioning icon is tapped in the manual menu.
H	**Screen Origin Position**		 marks coordinate point used as the display reference in the graphic area.
I	**Wi-Fi Connection Status**		Displays  when using AP mode and the engraver's hotspot is active. Displays  when using STA mode and the Wi-Fi connection is established. Displays  when there is no Wi-Fi connection.
J	**Mirror Temperature Display Area**		Displays the 1st mirror, 2nd mirror, and 3rd mirror's temperature.

3 Installation

3.1 Installation Overview

A complete working system consists of the following parts:

- A laser engraving cabinet

  The cabinet can use designs provided by the enclosed engraving software by direct or internet connection with your computer; it can also engrave designs loaded directly from a flash drive.

- An integrated cooling system
- A ventilation system adequate for the materials you're working with (fan and ducts included)
- All applicable connection cables
- Laser and access keys

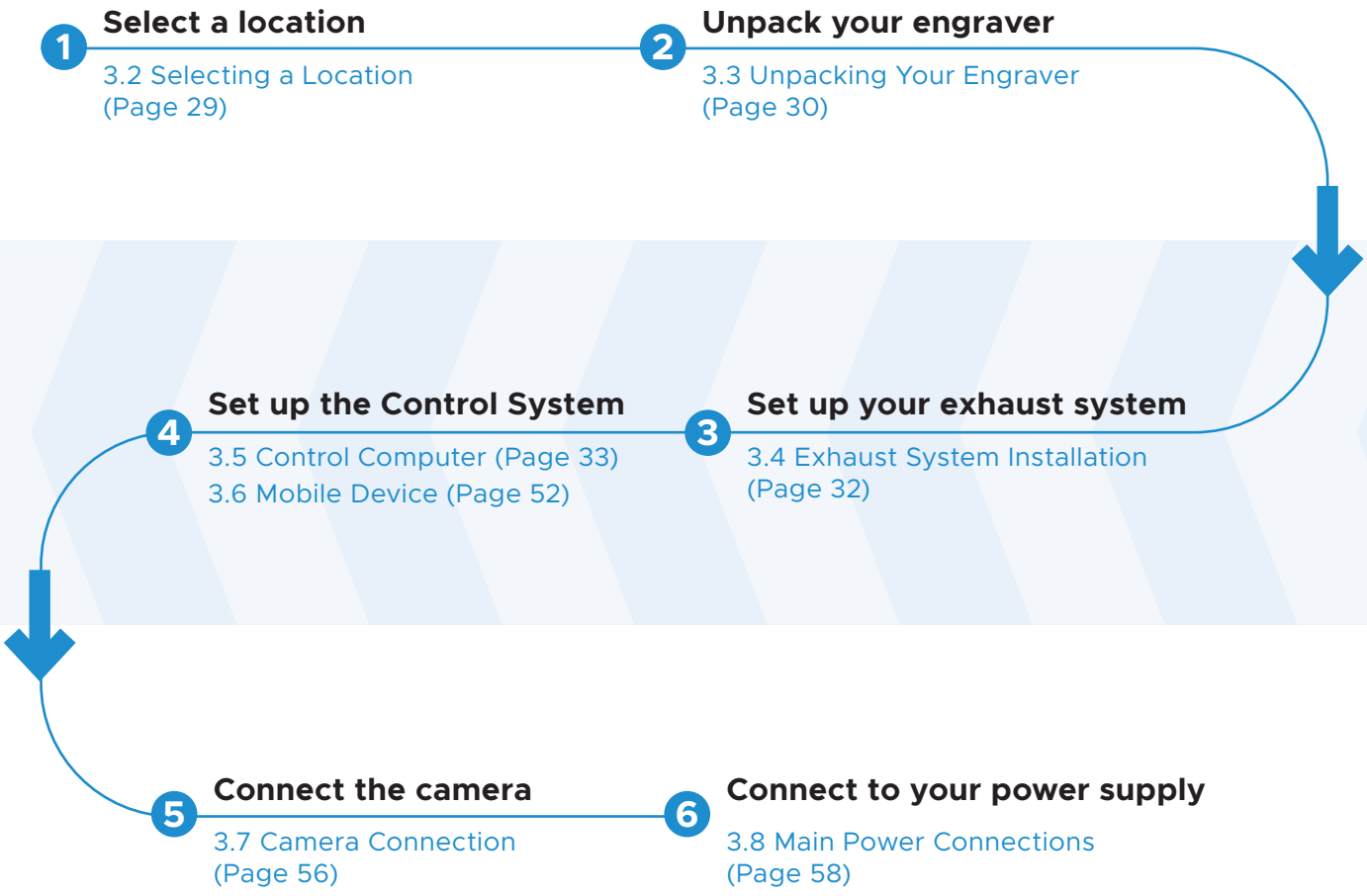
Use only the hardware, wiring, and power sources that came with or are compatible with this engraver. Installing equipment that your engraver is not designed to work with can lead to poor performance, shortened service time, increased maintenance costs, property damage, and personal injury.

Users can configure other accessories (such as a fume extractor or rotary axis) to suit their needs.

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.

Here is the process flow diagram for installation:

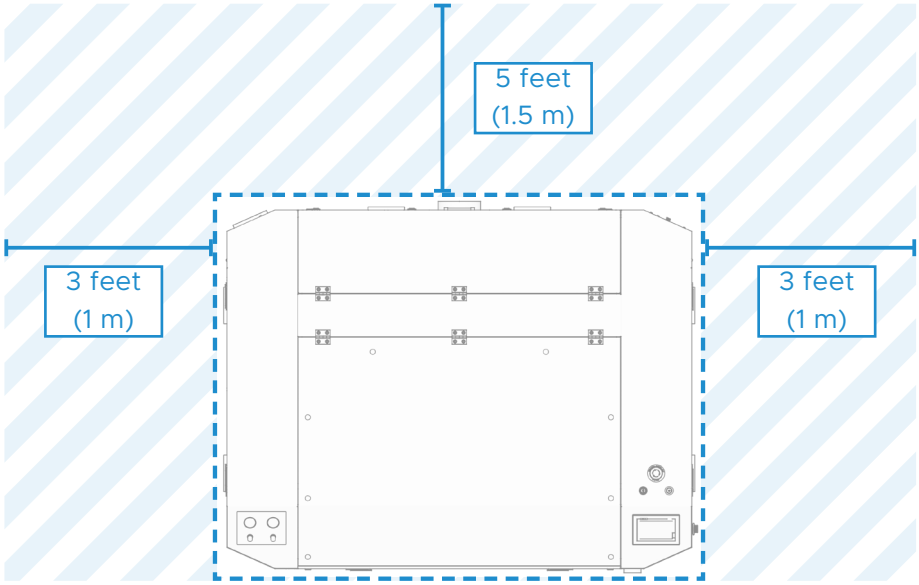


3 Installation

3.2 Selecting a Location

Before you install your engraver, select an appropriate location for its use.

- 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 provide an ambient temperature of 41–104°F (5–40°C) and non-condensing conditions. In particular, the temperature and humidity together should not be close to the dew point. It is also advisable to use a windowless room or to use blinds and/or curtains to avoid exposure to the potential additional heat of direct sunlight.
- Provide 5 feet (1.5 m) of clearance behind the engraver and 3 feet (1 m) of clearance to the right of the engraver for the electronic bay's fans for maximum efficiency.



- The location should be free of dust and other airborne pollutants, and it should be well-ventilated enough to process any fumes produced by the engraving process in accordance with all applicable laws and regulations. Depending on the materials to be processed, this may require the construction of a dedicated ventilation system.
- The power cord for the machine should be plugged into a compatible and stable power source via grounded 3-prong outlets on a special high-amperage circuit (at least 30 A).
- The location must be away from children, sensitive EMI engravers, and any combustible, flammable, explosive, or corrosive materials.
- It is highly recommended to have an extra work table nearby to avoid placing objects on or directly adjacent to the engraver, which could become a fire or laser hazard. In particular, never place anything on the extension box or other parts of the laser bay. The laser's accessory box—including its hex wrenches and nozzles—can be stored in the lower left bay but it is better to provide a separate location for it nearby.

3.3 Unpacking Your Engraver

Your engraver arrives in a wooden crate with its accessories (including this manual) packaged inside. You should have placed the crate in a spacious flat area for unpacking, ideally near where you plan to operate the machine permanently. If you have not already done so, finish removing the crate from around your engraver.

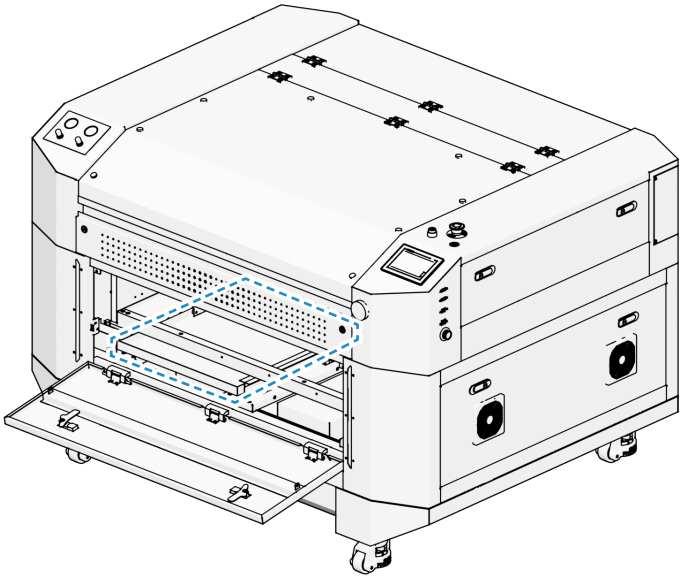
HEAVY LIFT!

Straining or crushing injury may occur from improperly lifting the machine or some of its parts. To reduce this risk, use a forklift (or other lifting equipment rated for the weight of this machine.

When your new engraver is delivered, the chiller is not filled with fresh laser-safe omtech antifreeze for safety during shipping. Users must fill the chiller with laser-safe antifreeze before operation.

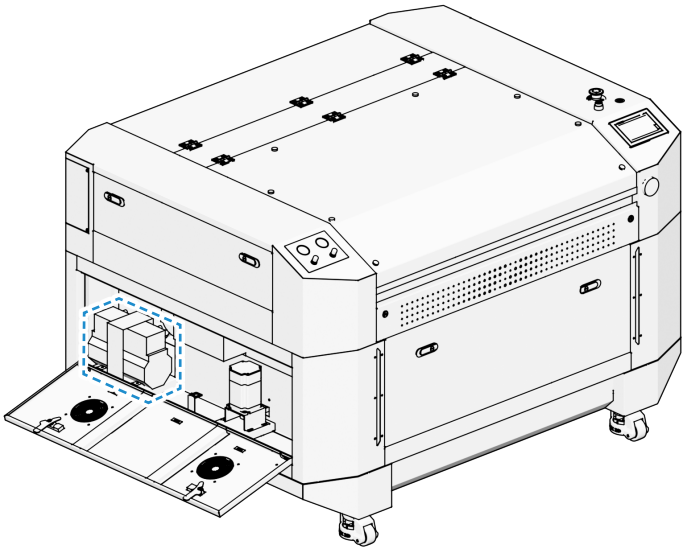
Any leak during or after unpacking should be carefully cleaned to avoid direct contact or inhalation of the fumes.

1. Roll the engraver slowly and carefully into place. Position the clamps to lock the engraver firmly in place.
2. Retrieve the access keys from the machine's main bay, along with an accessory toolbox.
3. Use the access key to open the front access door. Take the other accessory toolbox from the waste bin.

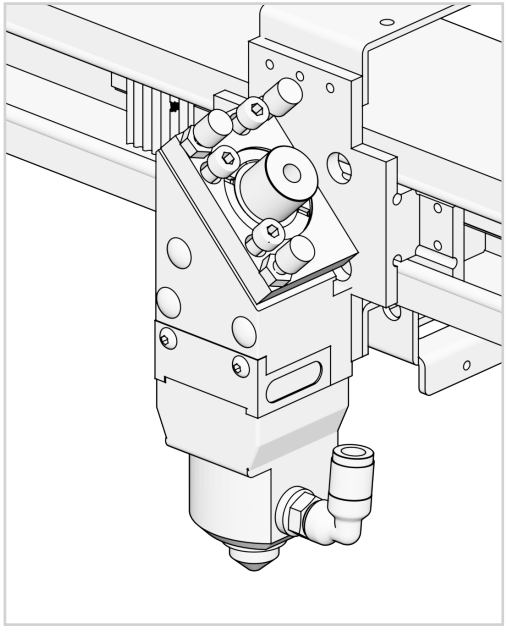


3 Installation

4. Check that you have received all listed in the package list. (See §2.4 Package List, Page 13)
5. Use the access key to open the bottom left access door. Remove the bracket securing the air compressor.



6. **CAREFULLY** remove any remaining interior packaging and straps, especially the ties and protective bags around the laser head, RF laser tube, and mirrors.
7. Carefully hold the laser head. Slide it back and forth, and side to side, to check for smooth movement. If movement is restricted, inspect for any remaining internal packaging or ties.



8. Open the top rear access door to check the laser bay carefully.
9. You may keep the packaging in case of future return but, if you dispose of it or any accessories, be sure to do so in compliance with applicable waste disposal regulations (See §1.8 Disposal Safety Instructions, Page 10).

3.4 Exhaust System Installation

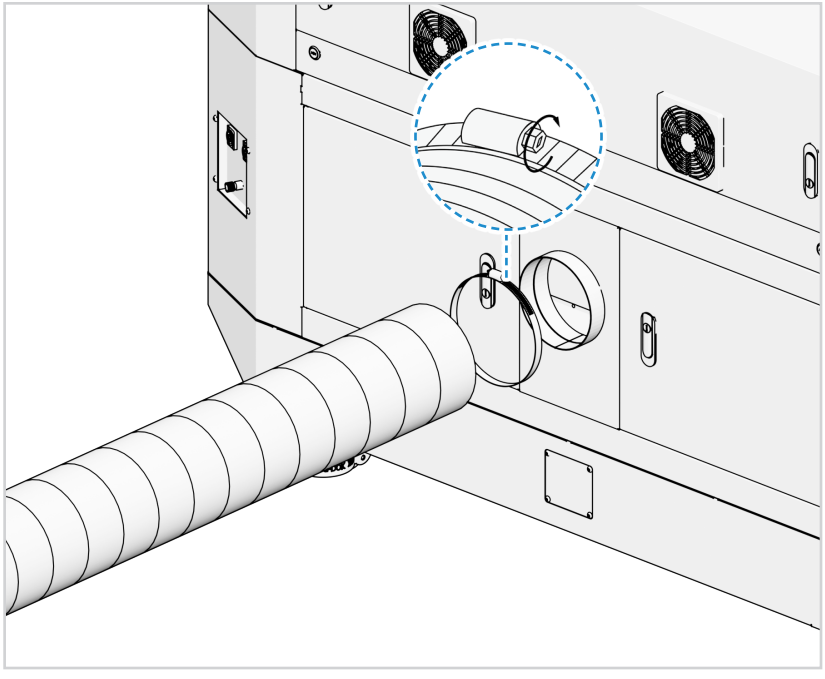
The exhaust system is used to remove fumes and dust produced during engraving to keep your workspace clean and safe.

The integrated centrifugal fan generates airflow to expel smoke, odors, and particulate matter produced during engraving from the laser cabin.

Attach the provided Ø150 mm exhaust pipe directly onto the exhaust vent on the rear of the engraver, fastening it into place with the pipe clamp. The pipe can be expanded to a full length of about 5 feet (1.5 m).

Plan the route of the exhaust pipe from the machine's vent to a fume extractor (not included) or—if the engraving fumes and debris are non-hazardous and comply with local and national air safety regulations—to a window or exterior vent. In general, the straighter the exhaust pipe, the more efficient the ventilation system and the slower dust and debris will accumulate inside the pipe over time.

NEVER operate the laser if the exhaust system is not removing the fumes and dust produced by your materials out of your work area. Always research materials before use and never operate the laser on any (such as PVC, Teflon, and other halogen-containing substances) that can produce corrosive, hazardous, or even deadly fumes.



3 Installation

3.5 Control Computer

Check the software manual for details on the requirements for the control computer. The control computer can be connected directly using the provided USB cable or through Wi-Fi. If the control computer is directly connected to the engraver, it should not be placed more than 15 feet (4.5 m) away to avoid possible interference to the signal on its line.

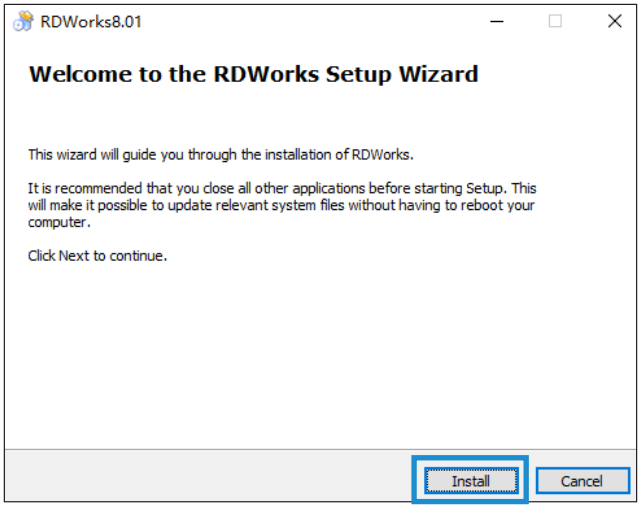
A Windows-compatible copy of RDworks V8 is provided on the USB flash drive that came with your engraver. Familiarize yourself with the software's image design features and laser control settings before using it to operate the laser.

Search for the model **RDC8445S** when first configuring your software. Ensure that you set the software to use an X-axis length of 1000 mm and a Y-axis length of 600 mm. The mechanical origin position (**ABS position**) of the laser head is at the rear right corner of the workbed.

3.5.1 RDWorks V8 Reverse Compensation

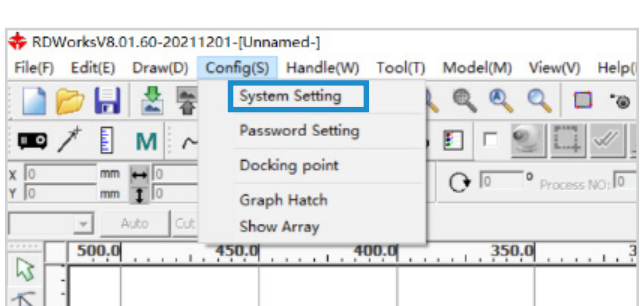
1. Insert the provided USB flash drive into a port on your control laptop. Find the file named **RDWorksV8Setup**.

2. Click open the file and click **Install**. Choose a file route that is suitable.



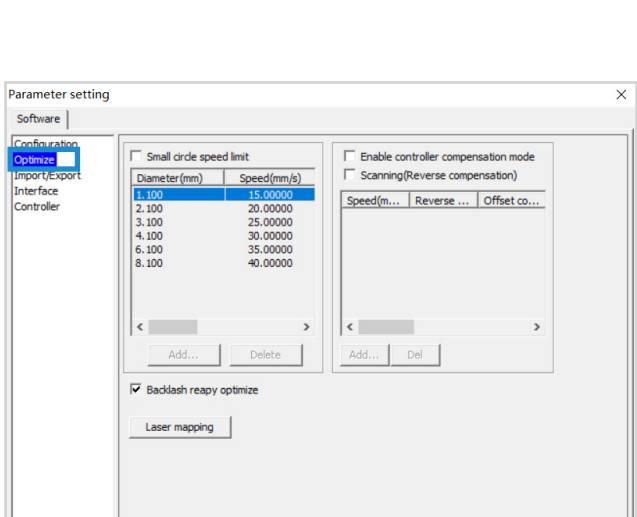
3. When the installation is finished, click to run the program.

4. Click **Config** and then **System Setting**.

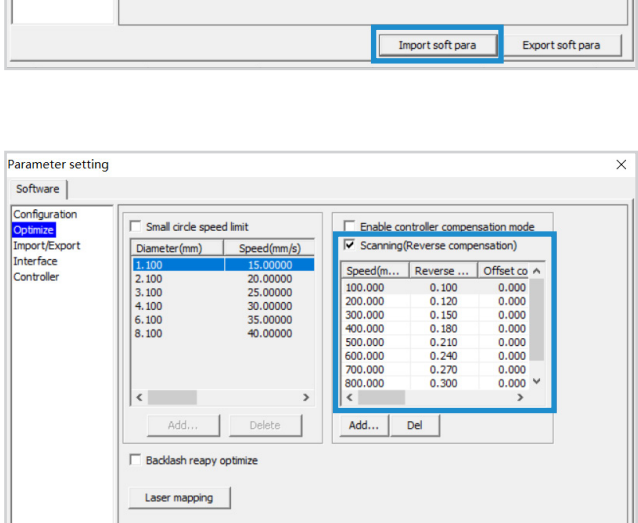


5. Click **Parameter setting** and then **Optimize** in the pop-up as shown. Click **Import soft para**.

6. Choose **Scanning (Reverse compensation)** under the directory of the provided flash drive.



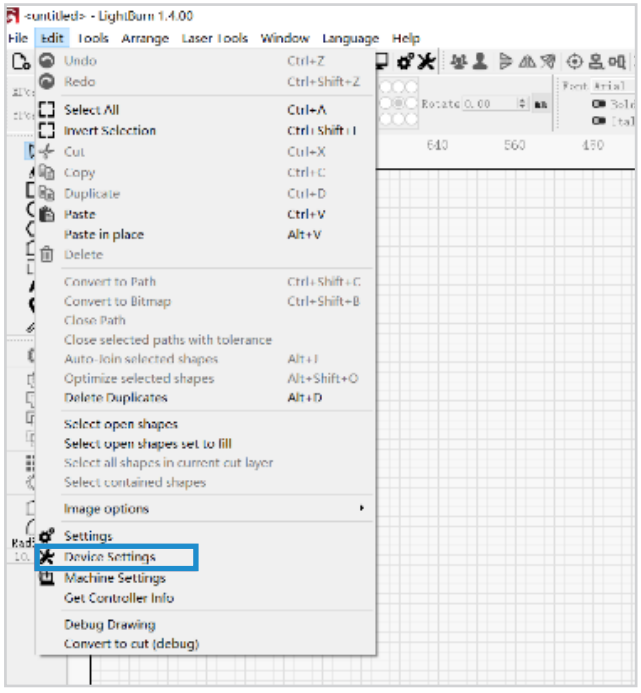
7. Click **Optimize** again to ensure that the Engraver Reverse Offset has been imported as shown. Tick the box before **Scanning (Reverse compensation)**



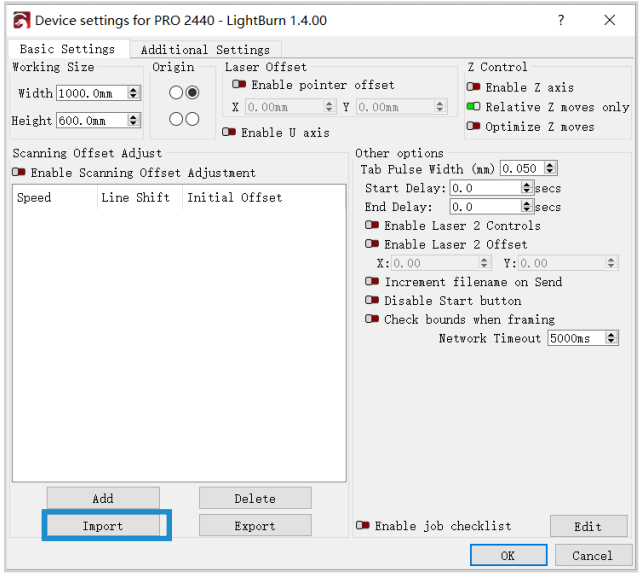
3 Installation

3.5.2 Lightburn Scanning Offset

1. Open your Lightburn, then click **Edit**, and then **Device Settings**.

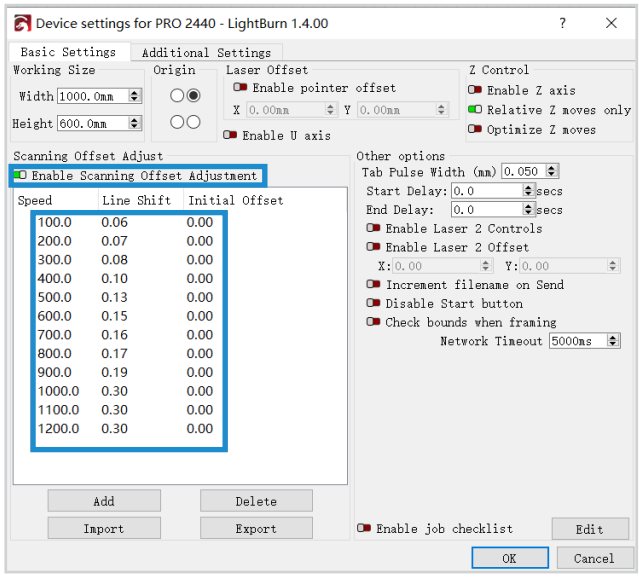


2. Click **Import** in the pop-up that shows up.



3. Find and choose **Scanning Offset Adjust** in the provided flash drive.

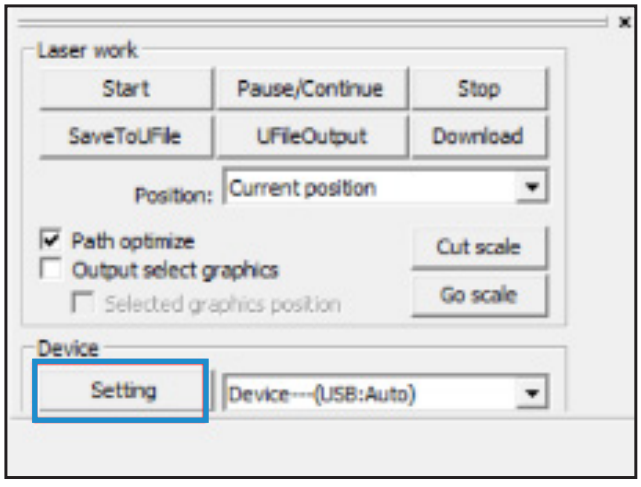
4. Enable the scanning offset adjustment by clicking green the toggle switch as shown.



3.5.3 Connection Through the USB Cable

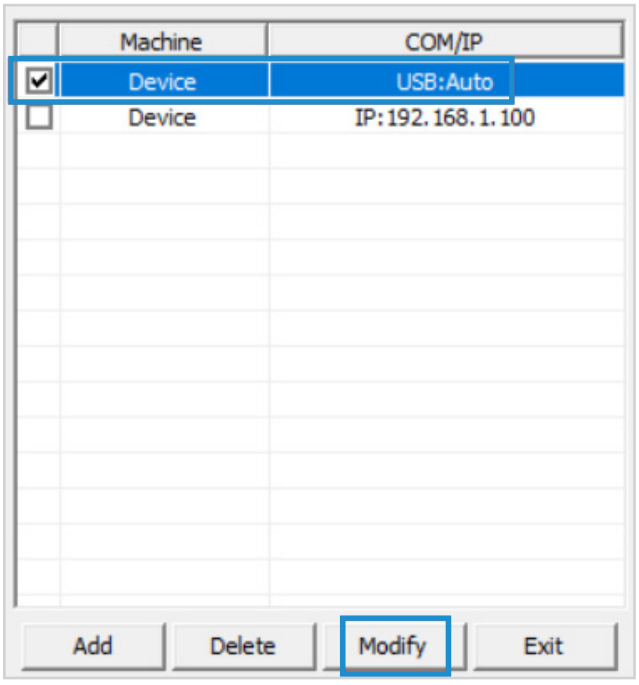
RDWorks V8

1. Initiate RDWorks V8 on your control computer and connect it to the engraver using the provided USB cable.
2. Click “Setting”.



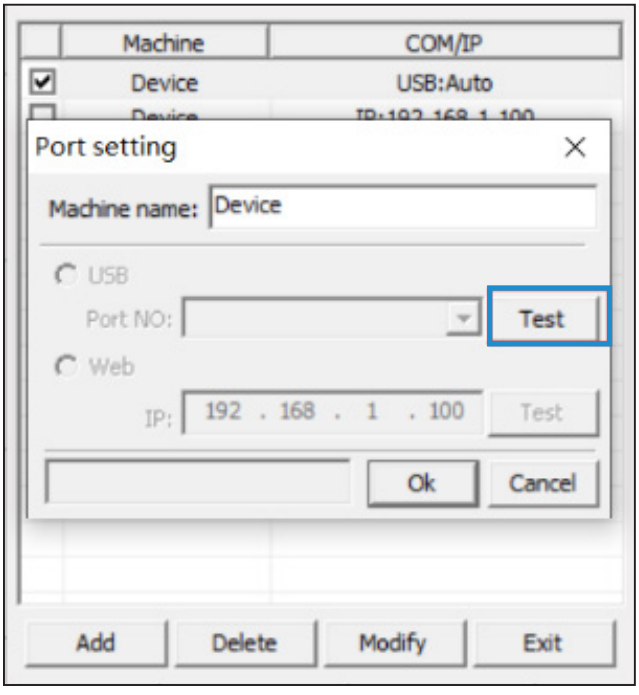
3 Installation

3. Click the box to select it as shown. Click **Modify**.

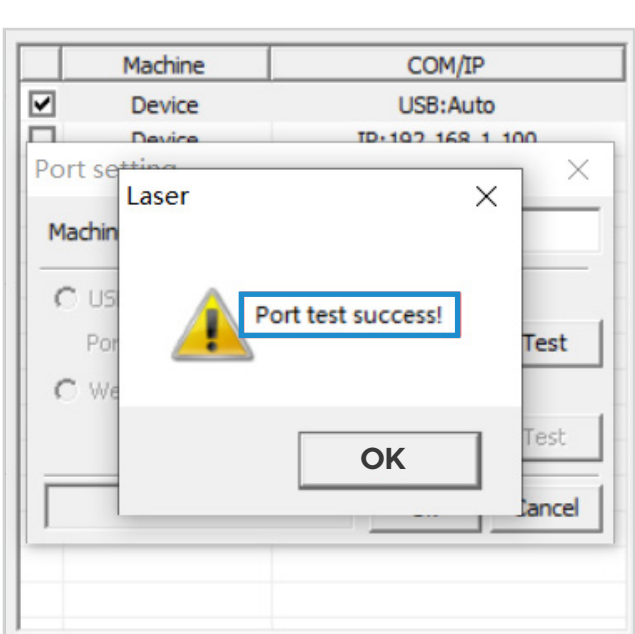


4. Click **Test** in the dialogue box that shows up as shown.

   The connection is successful when the pop-up as shown shows up.

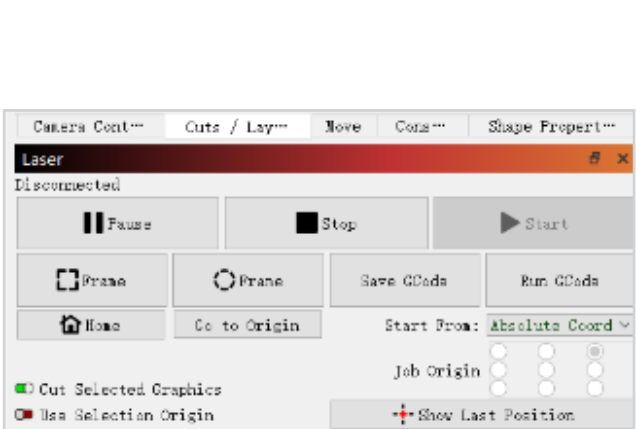


5. Click **OK** to confirm the connection and close the dialogue box.
6. Click **Exit** to return to the home interface.



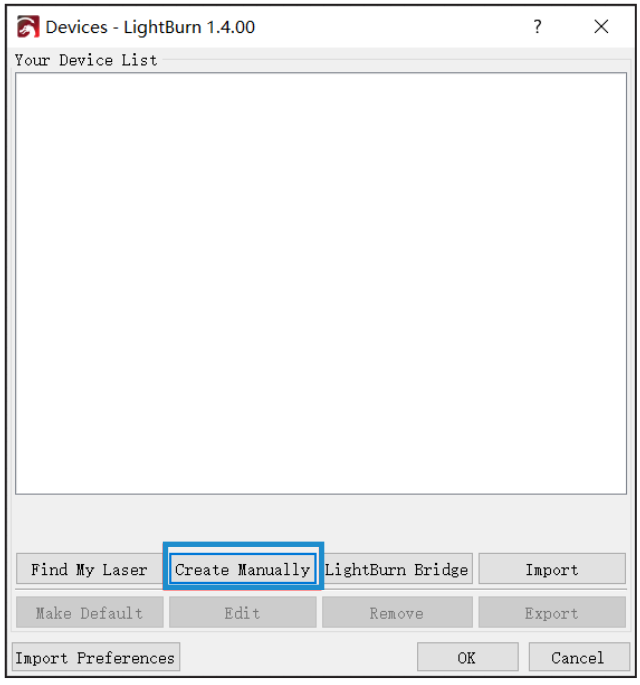
Lightburn

1. Open Lightburn on your control computer and connect it to your engraver using the provided USB cable.
2. Click **Device** as shown.

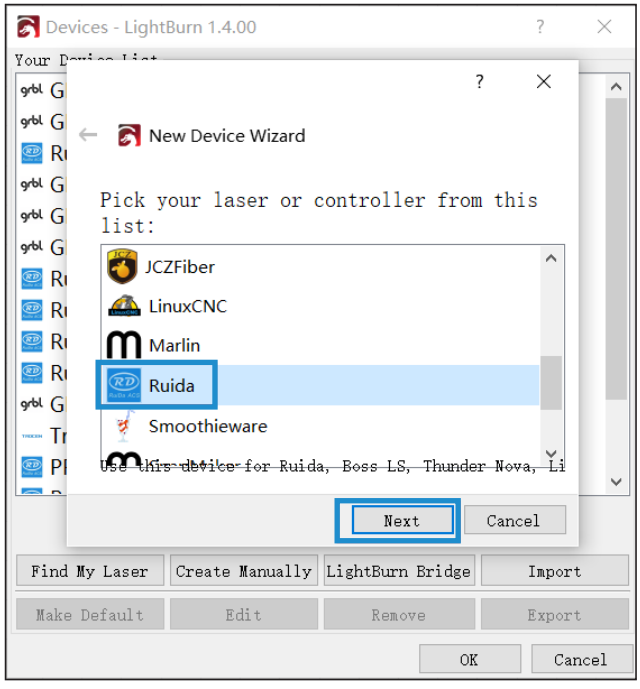


3 Installation

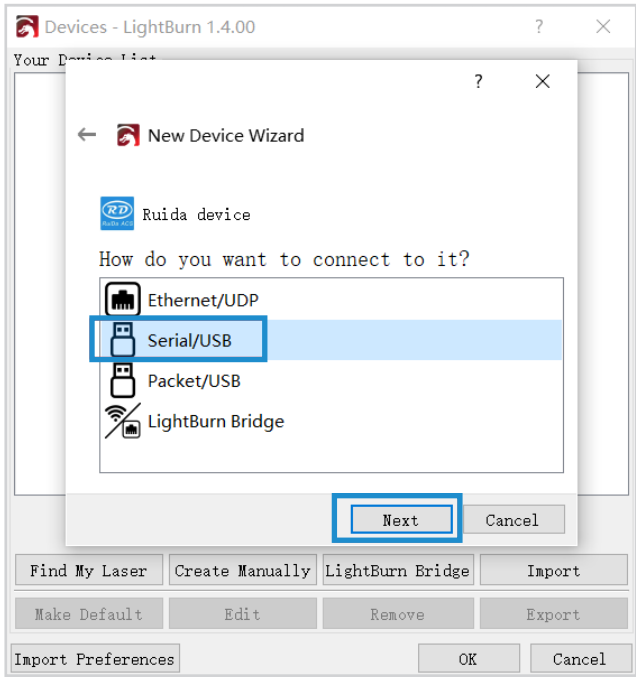
3. Click **Create Manually** in the pop-up that shows up.



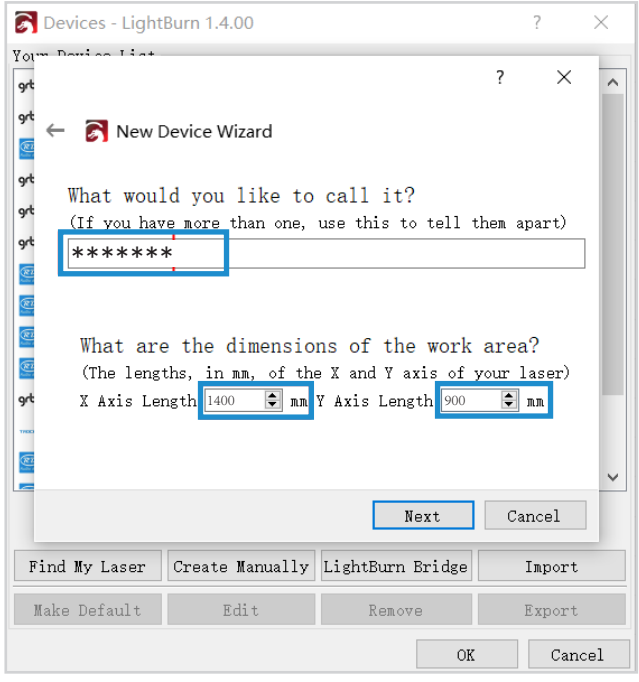
4. Choose **Ruida** and click **Next**.



5. Choose **Serial/USB** and then **Next**.

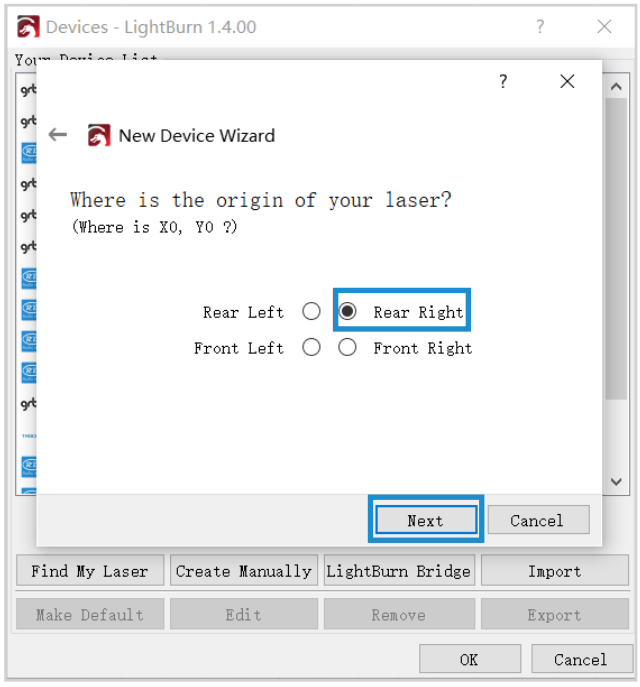


6. Enter the circled engraver name and X and Y axis length. Click **Next**.

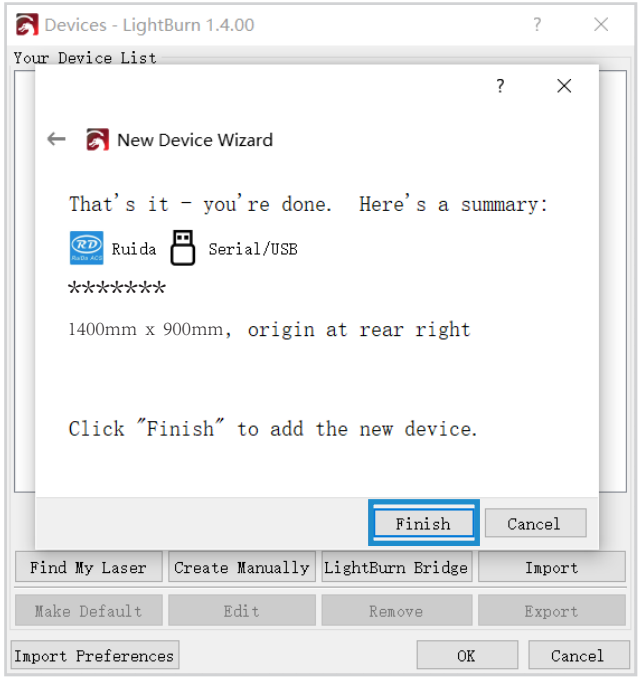


3 Installation

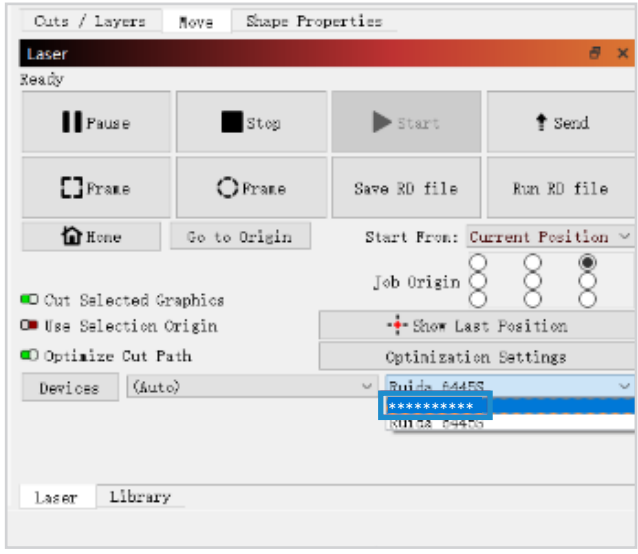
7. Set the origin to **Rear Right** as shown and click **Next**.



8. Confirm your configuration and click **Finish** to close the pop-up.



9. Click the device drop list in the lower right corner and choose **OMTech PRO QUANTUM 45**. The engraver is connected when the system shows **Ready**.



3 Installation

3.5.4 Connection Through Wi-Fi

- **DO NOT** connect your computer to the engraver with a network cable. The port marked with “Ethernet” on the engraver is for internet connection.
- To connect the computer to the machine via Wi-Fi, configure the computer’s IP address with the first three octets identical to the machine’s IP and a different fourth octet.

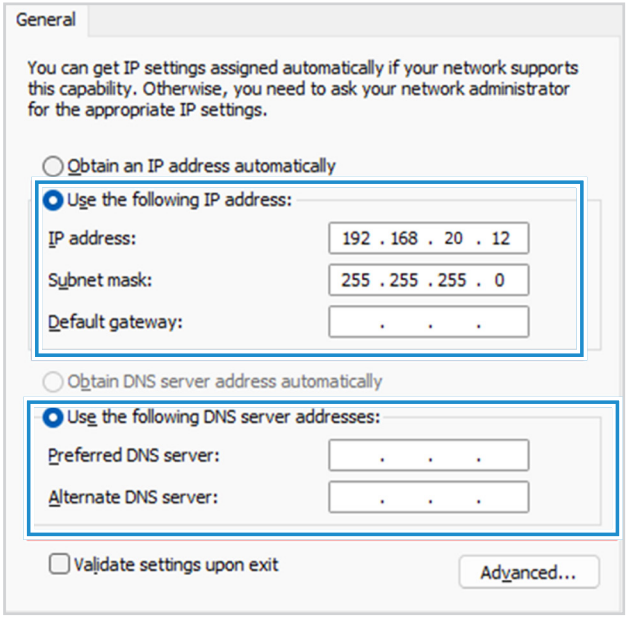
There are two Wi-Fi modes: **AP** and **STA**. **STA** connects the engraver and your computer to the same router, allowing both devices to access the existing network. **AP** turns the engraver into a hotspot, and your computer connects directly to the engraver’s hotspot, but no access to the wider network.

Use one of them to configure your engraver and control computer.

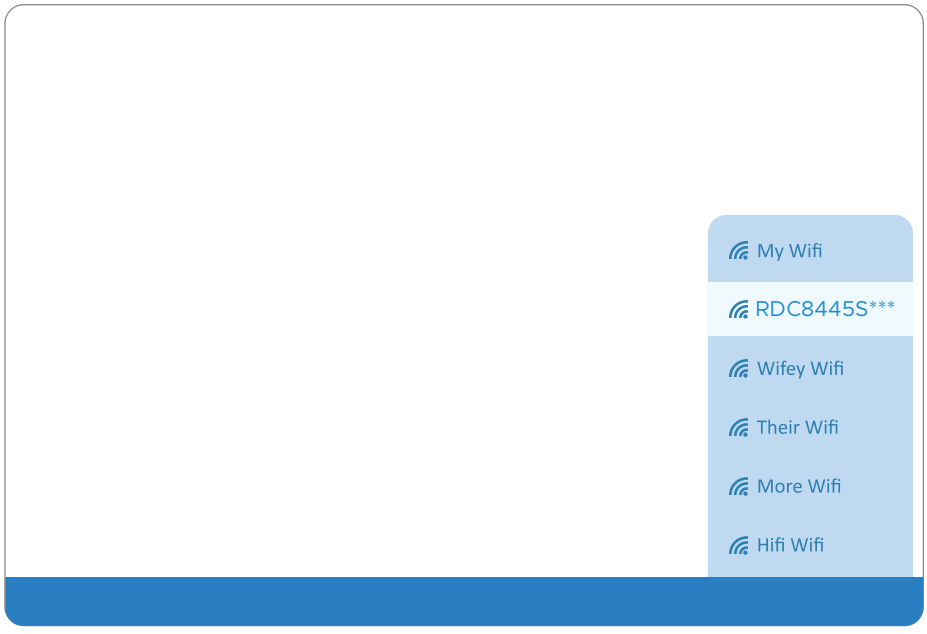
AP Mode

1. On the control panel, tap **Menu** > **SysCfg**. Tap ≪ to go to the previous page. Tap **WiFi** to enter the Wi-Fi settings.
2. Select **AP_5G** or **AP_2.4G** in **Mode**, then tap Write to enable the engraver’s hotspot. The hotspot name will display automatically and the default IP address is **192.168.20.1**.

3. When the screen indicates that the hotspot is on, turn off the engraver and restart it.
4. Configure your computer's TCP/IPv4 address. Enable **Use the following IP address** and **Use the following DNS server address**. Set the static IP to **192.168.20.xx** (not 1) and use the subnet mask **255.255.255.0**.



5. Connect your computer to the network **RDC8445S********* (no password required).



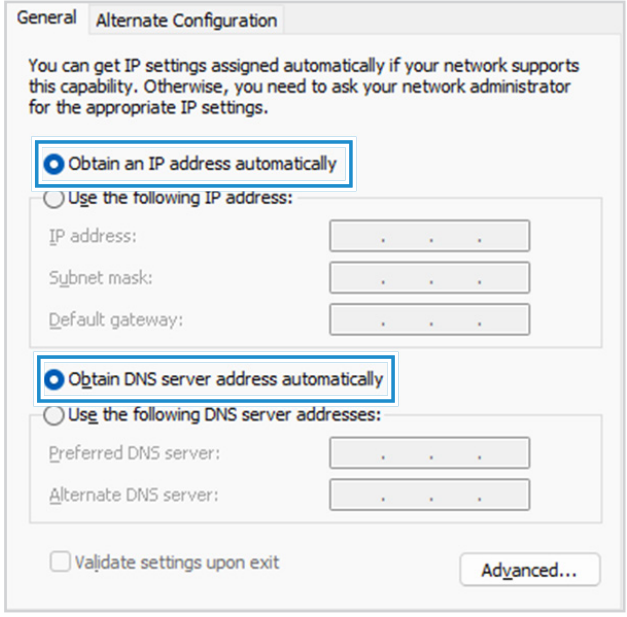
3 Installation

STA Mode

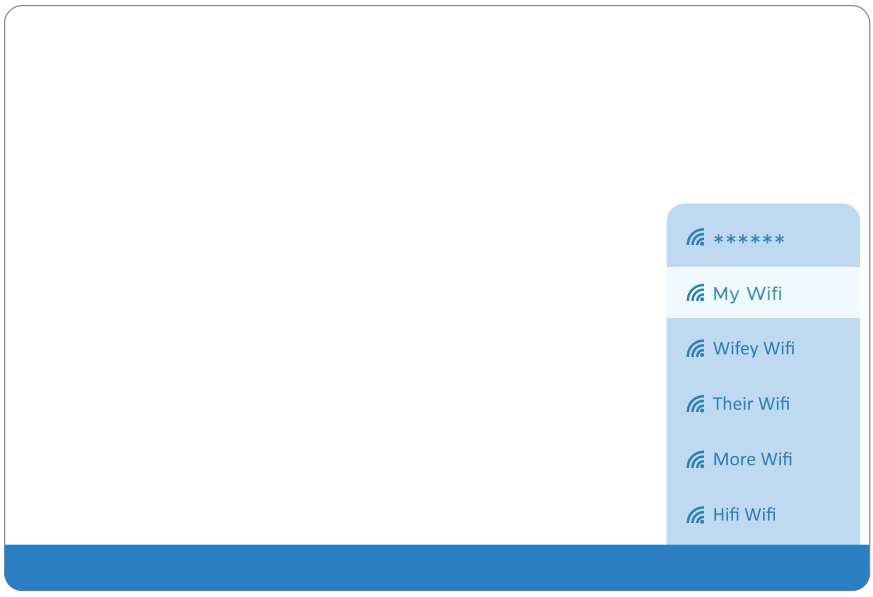
1. On the control panel, tap **Menu** > **SysCfg**. Tap ≪ to go to the previous page. Tap **WiFi** to enter the Wi-Fi settings.
2. Select **STA** in **Mode**. Enter your Wi-Fi network's name and password, then tap **Write** to connect the engraver to the Wi-Fi network.

   After the screen indicates that the Wi-Fi connection is successful, a system-distributed IP address will display automatically.

3. Configure your computer's TCP/IPv4 address. Enable **Obtain an IP address automatically** and **Obtain DNS server address automatically**.

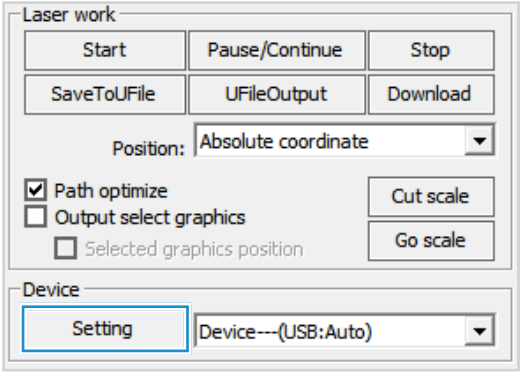


4. Connect your computer to the same Wi-Fi network as the engraver.

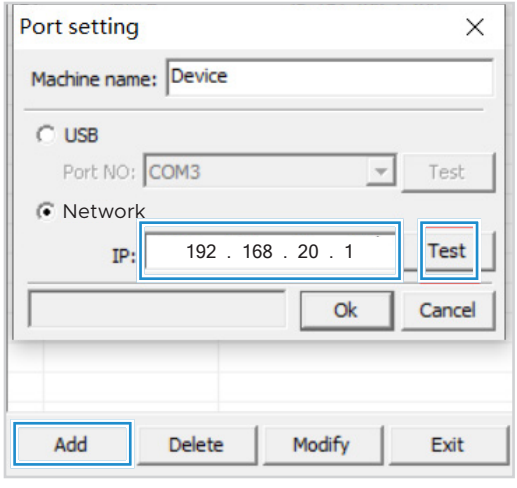


RDWorks V8

1. Open RDWorksV8. Click **Setting**.

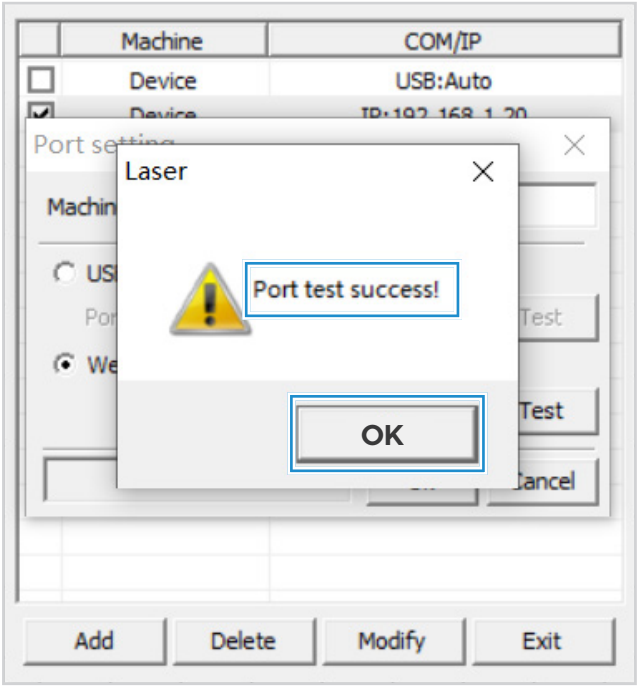


2. Click **Add**, then enable **Network**. For AP mode, set the IP address to **192.168.20.1**; For STA mode, enter the IP address generated by the engraver. Click **Test**.



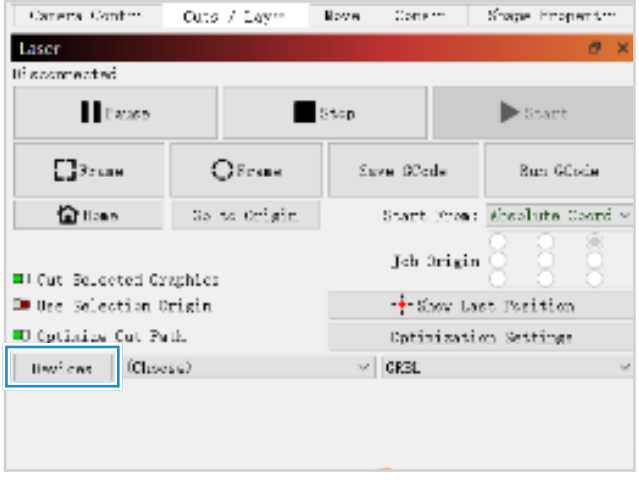
3 Installation

3. When the screen indicates that the test is successful, exit to the home page.

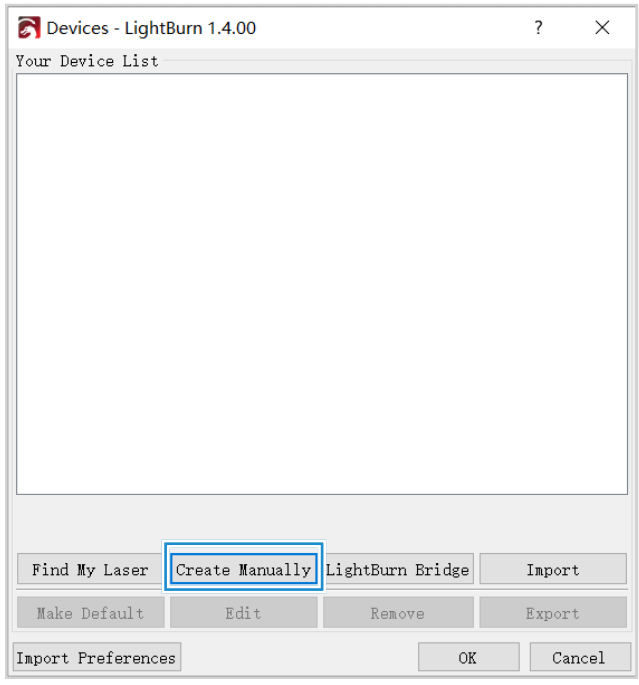


Lightburn

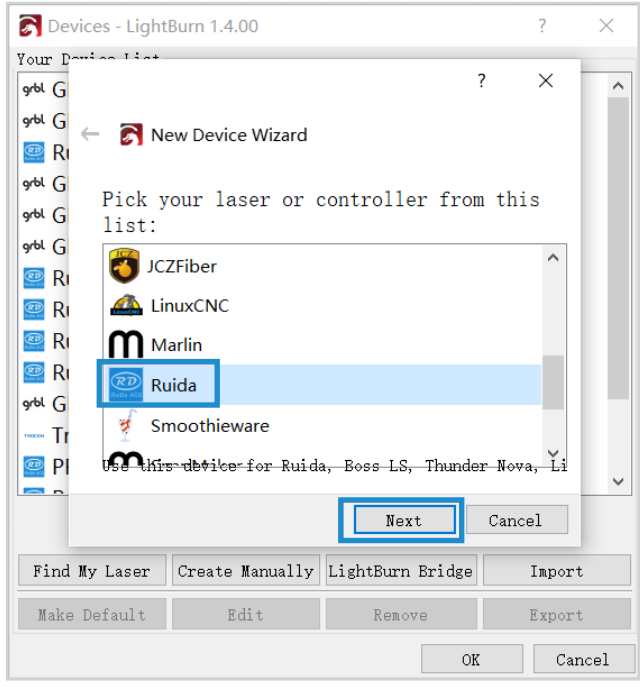
1. Open Lightburn and click **Device** in the lower right corner as shown.



2. Click **Create Manually** in the dialogue box.

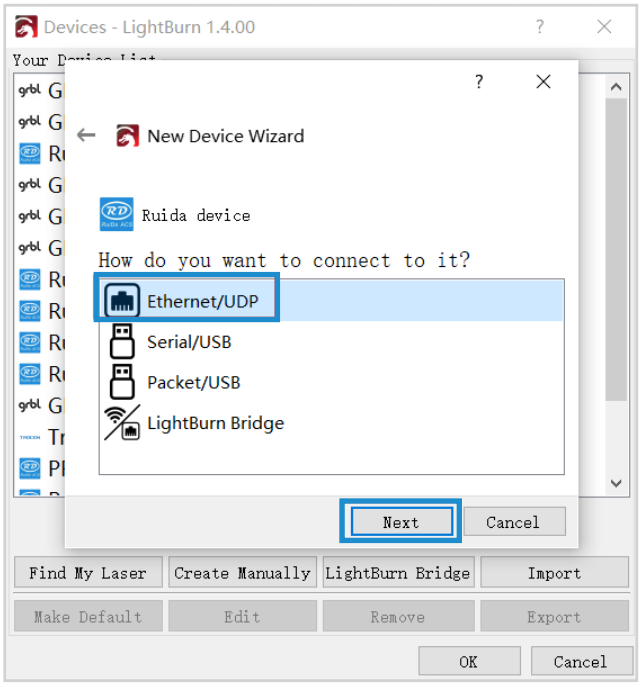


3. Choose **Ruida** from the list and click **Next**.

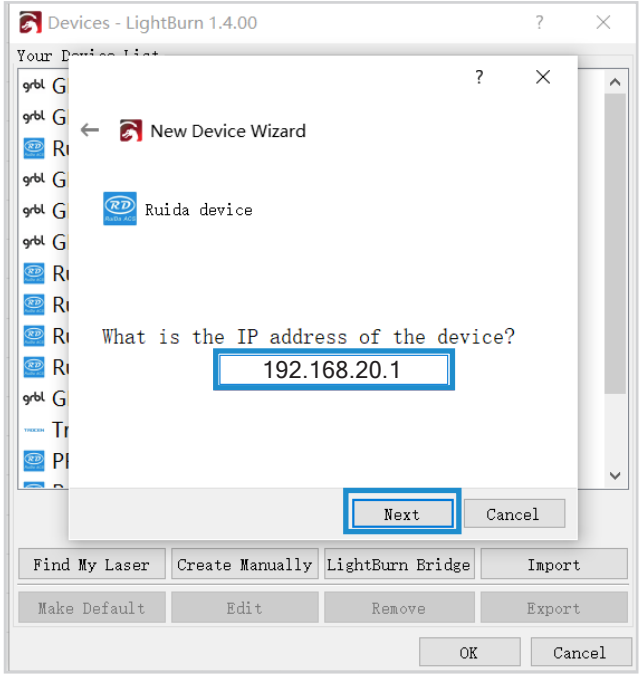


3 Installation

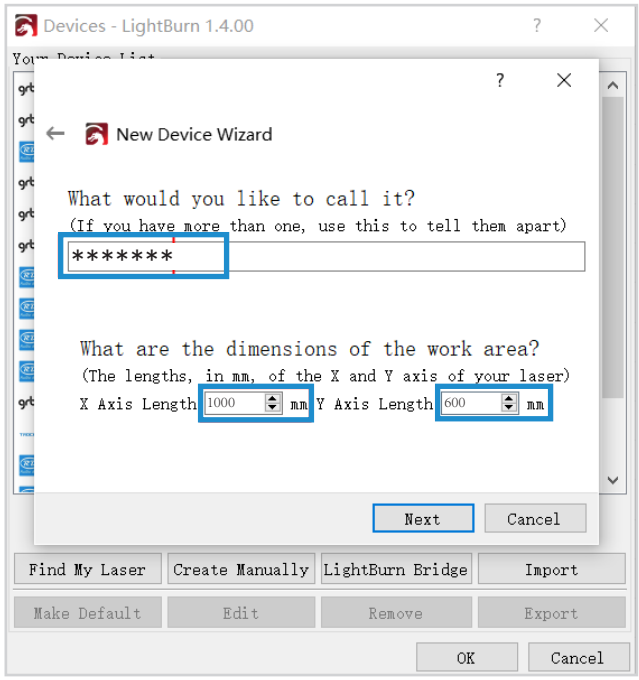
4. Choose **Ethernet/UDP** and click **Next**.



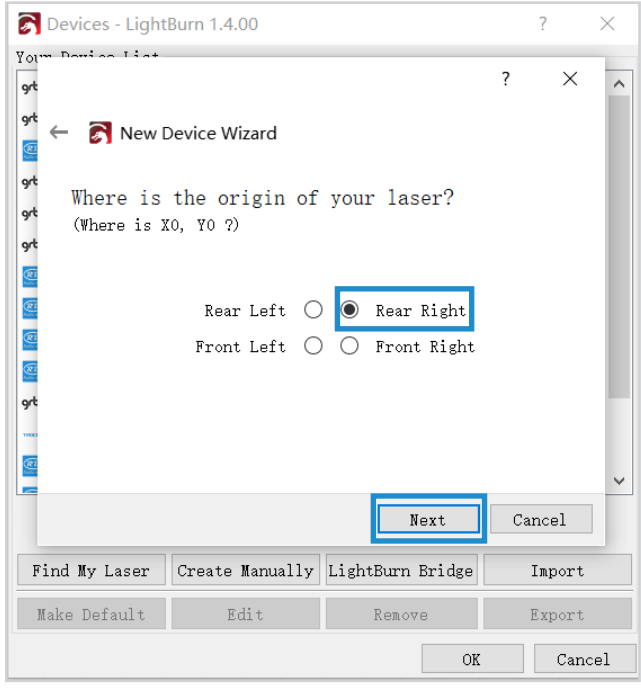
5. For AP mode, enter **192.168.20.1** as the IP address; For STA mode, enter the IP address generated by the engraver. Click **Next**.



6. Enter the engraver name **OMTech PRO QUANTUM 45**, X-axis length, and Y-axis length as shown. Click **Next**.

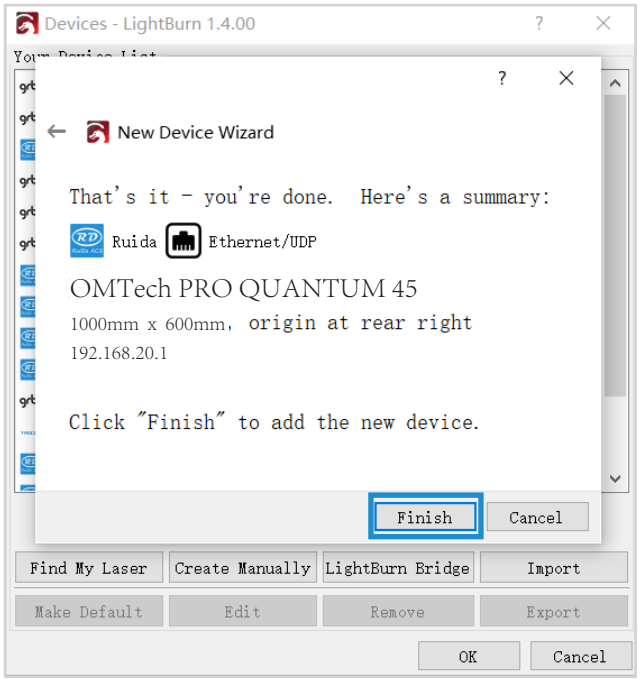


7. Set the engraver origin to **Rear Right** and click **Next**.

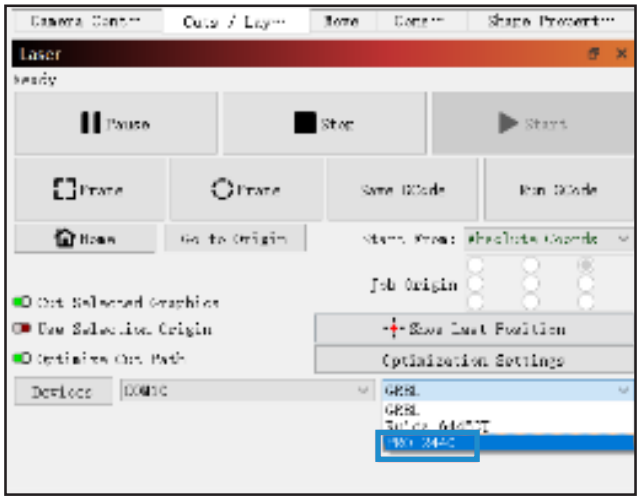


3 Installation

8. Confirm your configuration and click **Finish**.



9. Click the device drop-down list in the lower right corner and select the engraver's name. The system shows **Ready** when the engraver is connected.



3.6 Mobile Device

The engraver can also be controlled through your mobile app.

3.6.1 Mobile APP Installation

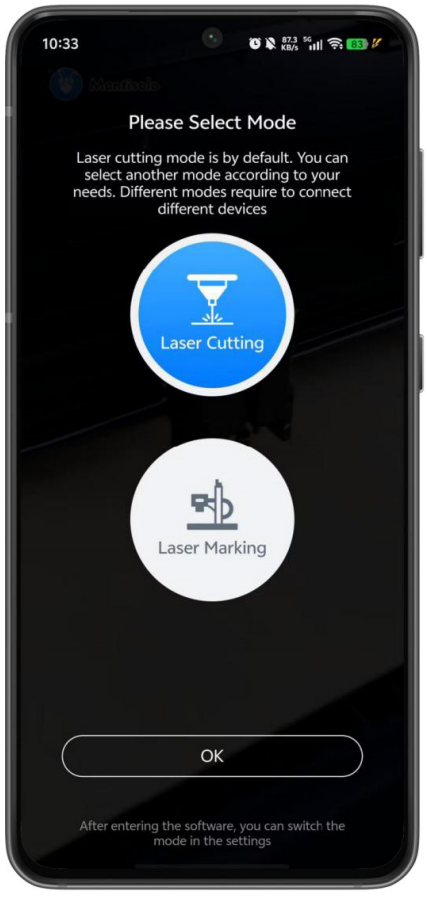
Download the **Mantisolo** app based on your mobile system: **Android** or **iOS**.

Mantisolo

Andriod

iOS

Launch **Mantisolo**. Agree to the privacy policy, then select a mode (**Laser Cutting** or **Laser Marking**). Tap **OK** > **Skip** to enter the homepage.



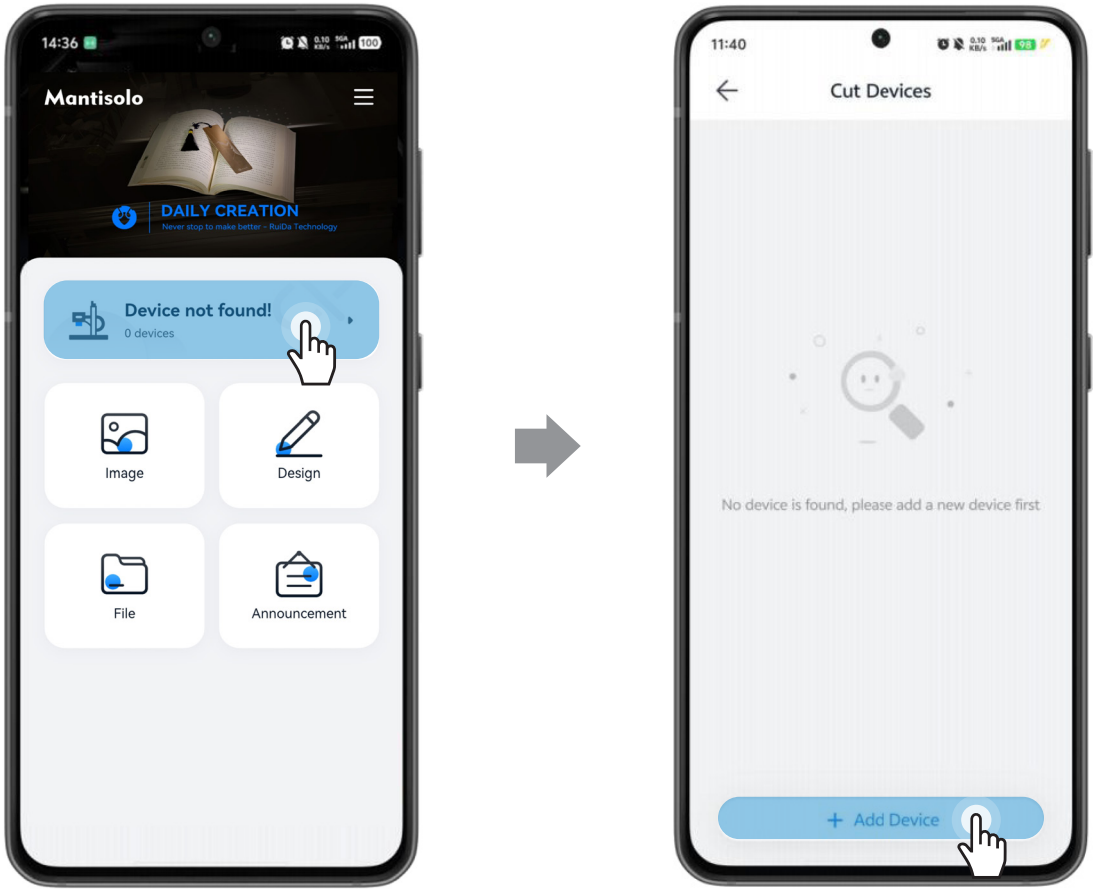
3 Installation

3.6.2 Connection Through Wi-Fi

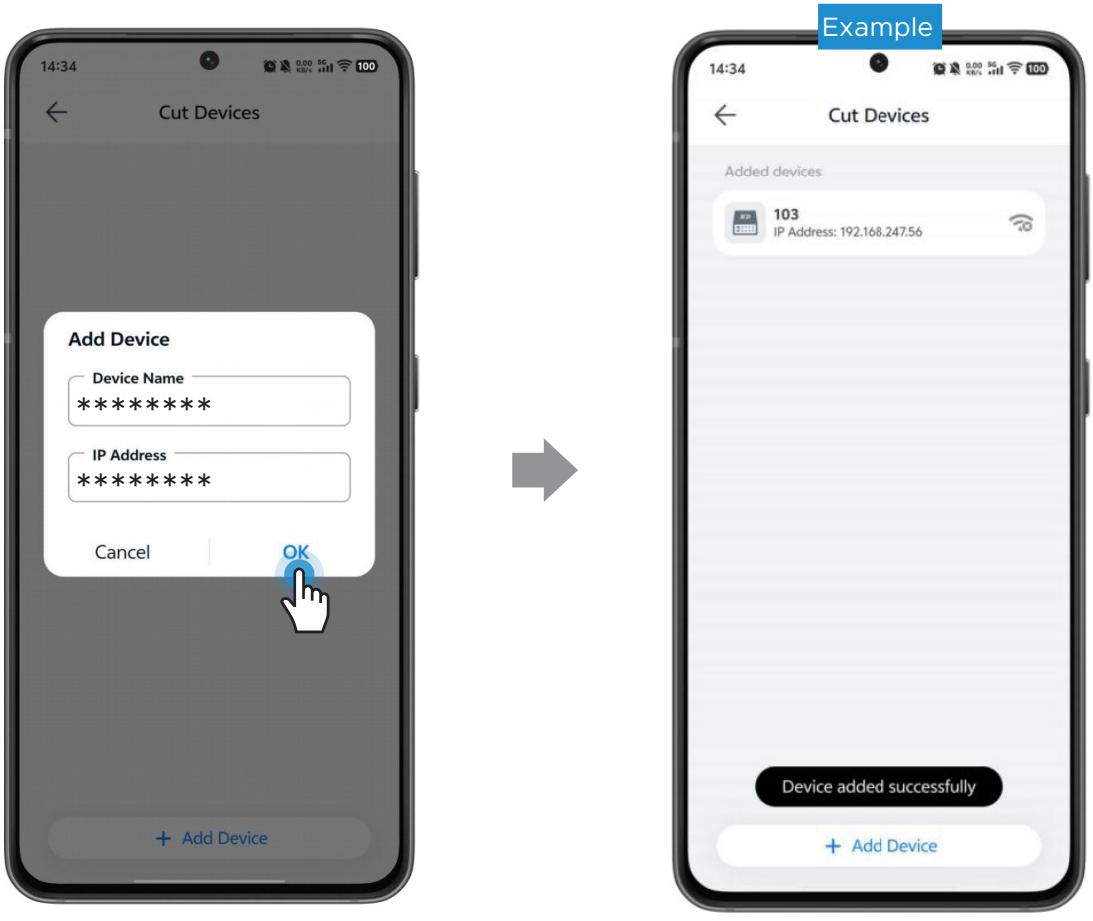
Ensure your mobile phone is connected to the Wi-Fi network. Connect the engraver to the same Wi-Fi network as the mobile phone. For detailed engraver settings, see §3.5.4 Connection Through Wi-Fi, STA Mode, **Steps 1–3**.

3.6.3 Device Connection

1. Tap **Device not found!** > **Add Device**.

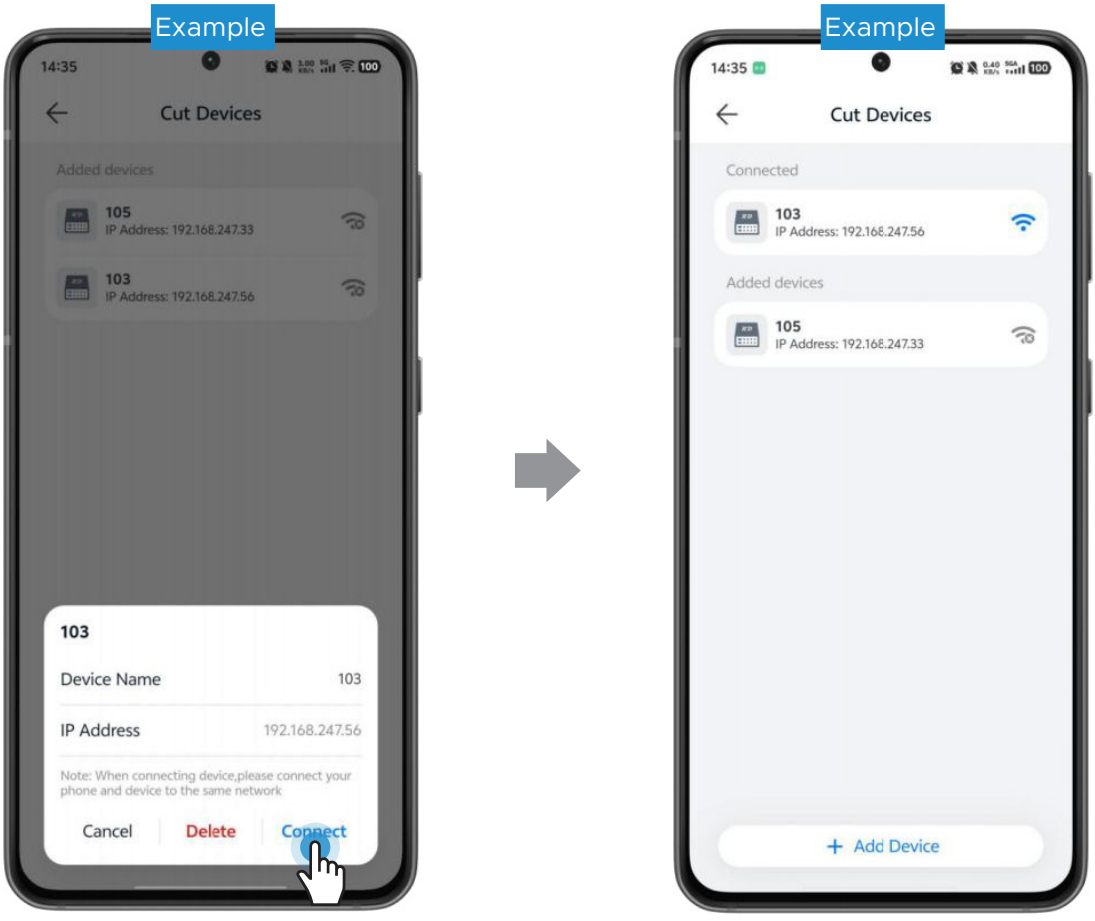


2. Enter the device name for your engraver and the IP address generated by the engraver. Tap **OK** to add the engraver.

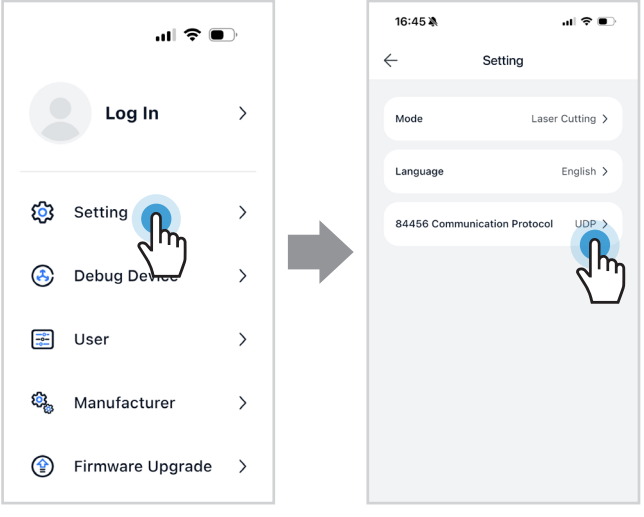


3 Installation

3. Select the added engraver and tap **Connect** to pair the mobile app with the engraver. Once the connection is successful, return to the homepage.

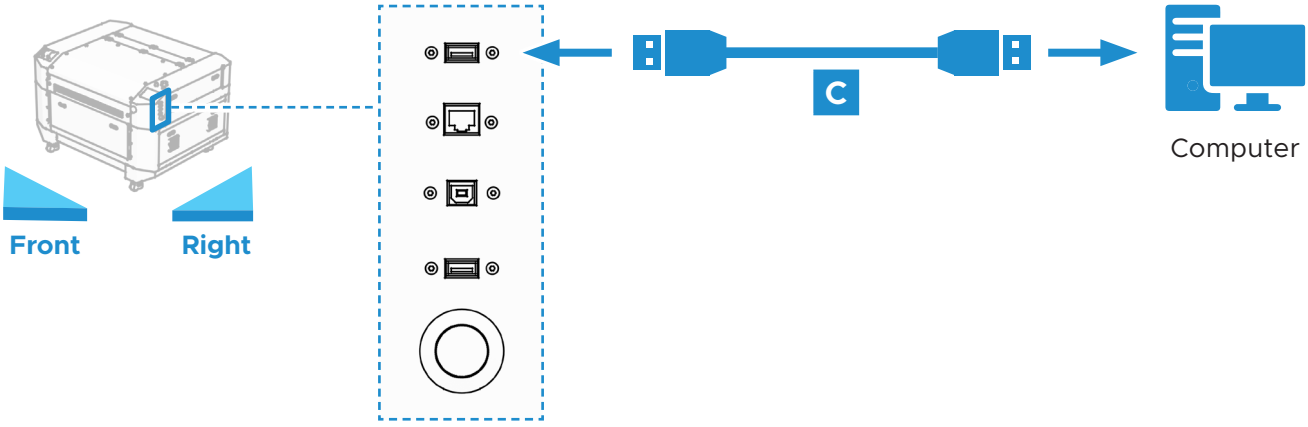


For iOS devices, open **Settings** in the side menu and set **84456 Communication Protocol** to **UDP**. This step is not required for Android devices.



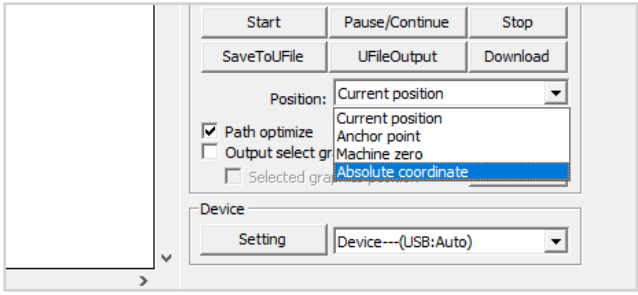
3.7 Camera Connection

1. Connect the camera cable from the **Camera** port on the rear of the engraver to your computer.

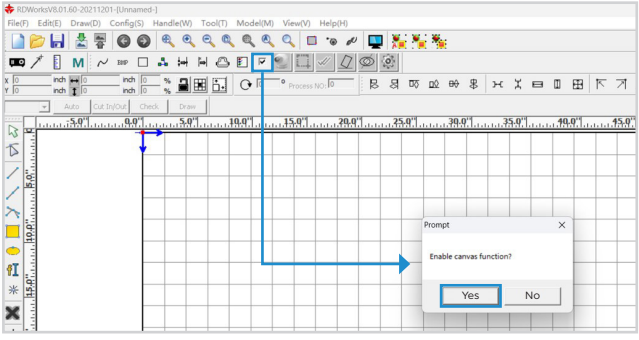


2. Configure the camera in RDWorksV8.

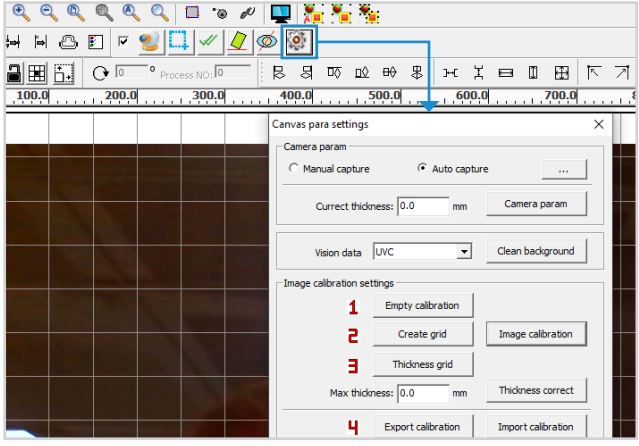
   a. On **Laser Work** at the lower right side of the main interface, change the **Position** value from **Current Position** to **Absolute Coordinates**.



   b. On the **Canvas Tools** toolbar, click the unlabeled check box to enable the canvas function and controls.

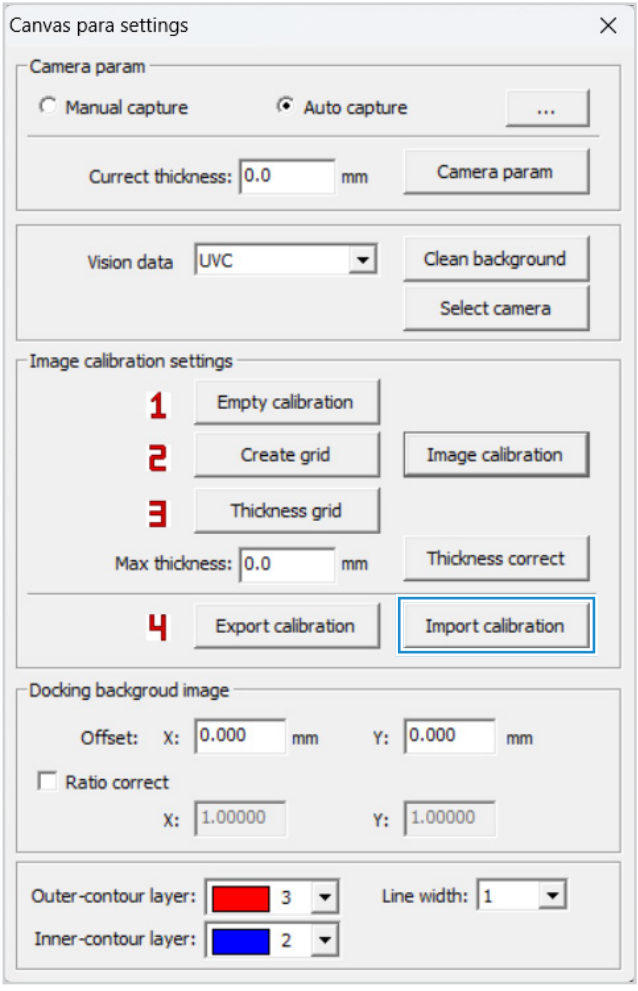


   c. Click on the gear icon nearby to open the **Canvas Para Settings** submenu.



3 Installation

d. Click **Import Calibration** and load the file named **RdworksV8 Camera calibration.caix** from the USB drive. RDWorks V8 supports full-frame calibration up to 39.37 × 23.62 in (1000 × 600 mm).



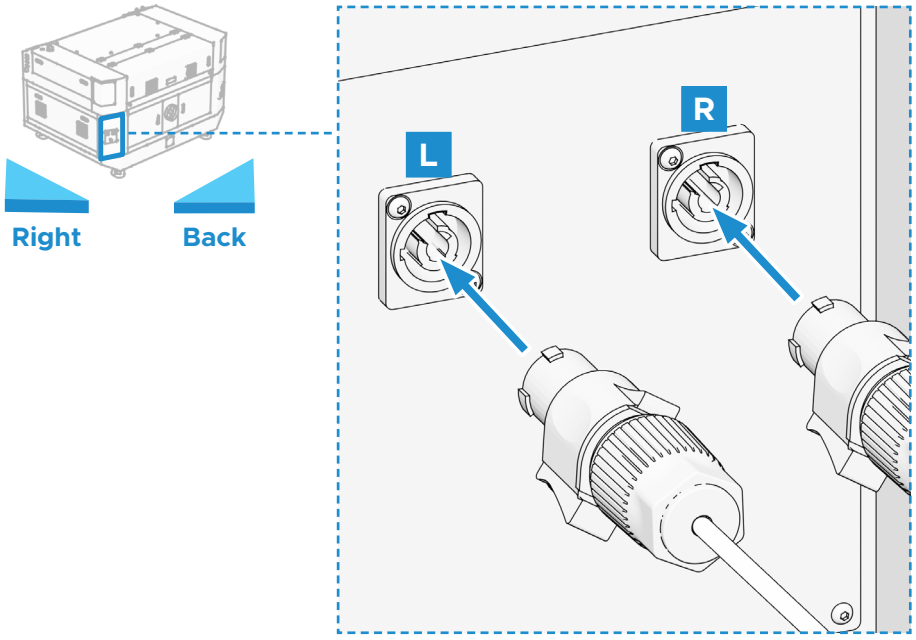
- The file named **Lightburn Camera calibration.caix** is for Lightburn.
- LightBurn supports camera calibration up to 19.49 × 19.49 in (495 × 495 mm).
- For more information on Lightburn settings, refer to the official Lightburn documentation, visit Lightburn's website for detailed parameter setup instructions or contact our customer service.

3.8 Main Power Connections

- Under **NO** circumstances should you switch on the engravers if the voltages do not correspond or if your circuits will be unable to handle the necessary load.
- Fluctuation along the lines should be less than 5%.
- **DO NOT** connect this engraver to standard extension cords, power strips, or surge protectors.
- The powerful laser is potentially dangerous, so users must securely ground the engraver to avoid the buildup of static electricity.
- **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.

1. Confirm that the label beside the connection sockets matches your power supply.
2. Connect the two power cords from the main power port (L) and laser tube power port (R) to grounded outlets.

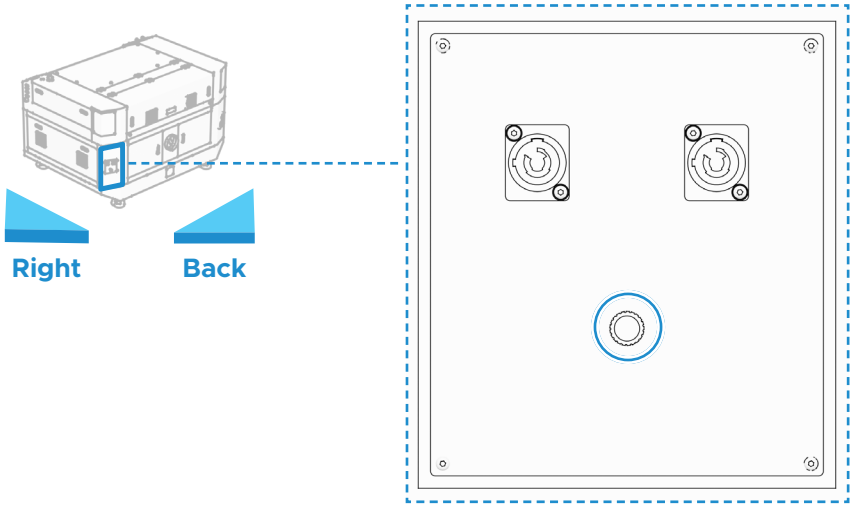
   The combined electrical load of this engraver's major components, with a combined peak load of about 30 A. If no dedicated high-amperage line is available, connect them to two separate 20 A circuits to ensure safe operation.



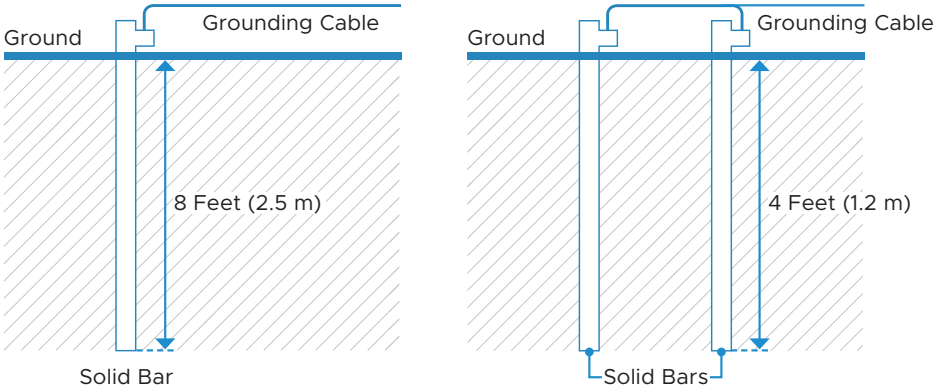
3 Installation

If the outlet is not grounded, use the grounding cable and connect it as follows:

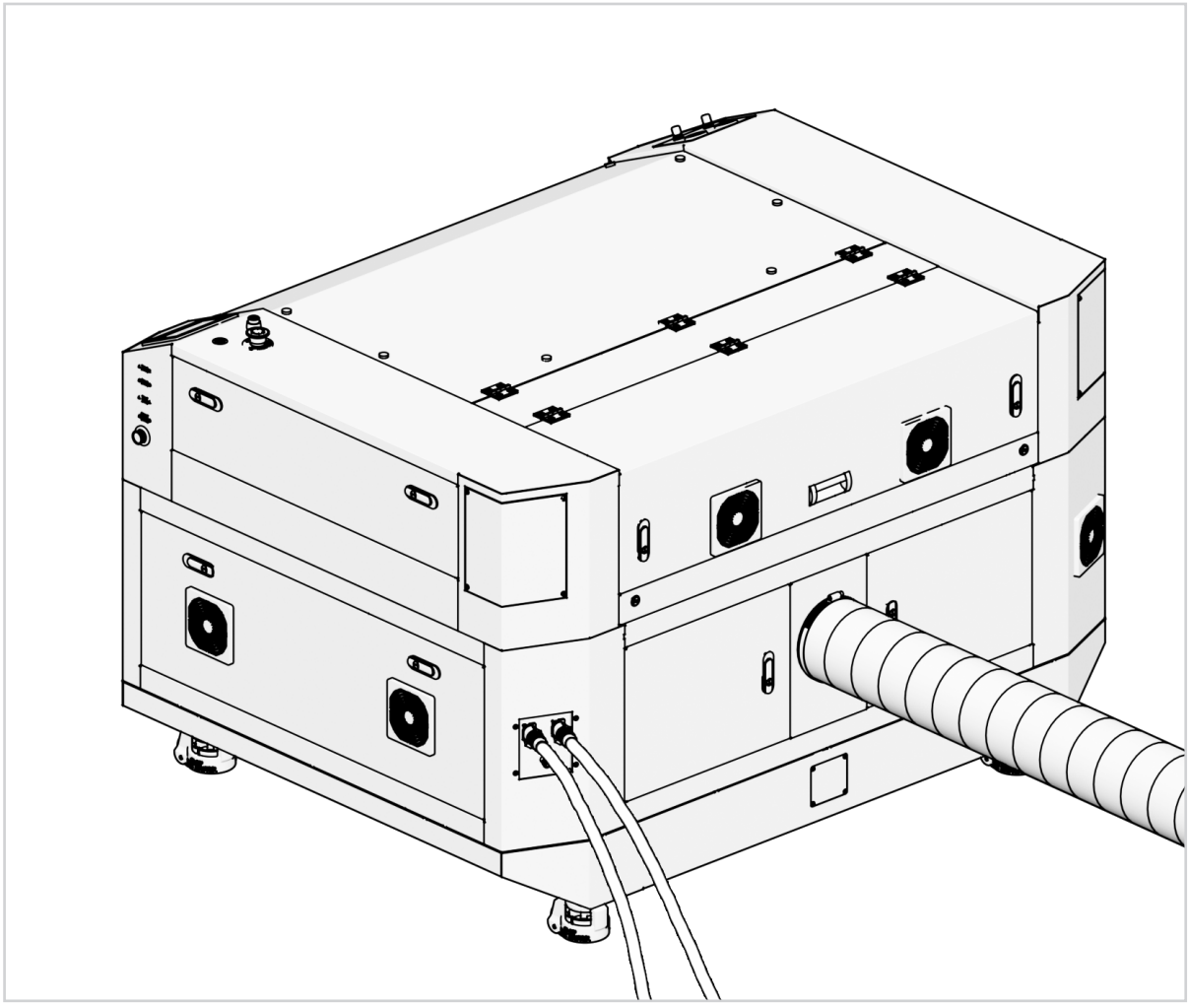
a. Fasten the near end of the grounding cable to the ground port at the back of the engraver.



b. Connect the far end of the cable to a single metal rod driven at least 8 feet (2.5 m) deep or to two separate metal rods driven at least 4 feet (1.2 m) deep into soil located at least 5 feet (1.5 m) from the machine.



With the hardware all set, proceed with the software and control computer.



4 Initial Testing

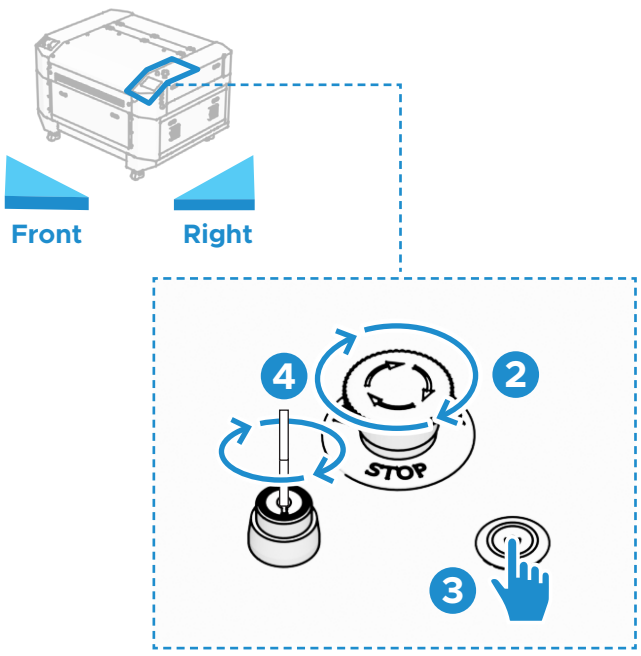
4.1 Emergency Shutoff

Because of the risk of fire and other hazards during engraving, this engraver includes a large and easy-to-reach emergency stop (E-Stop) button near the control panel. Press it down to stop the laser tube instantly.

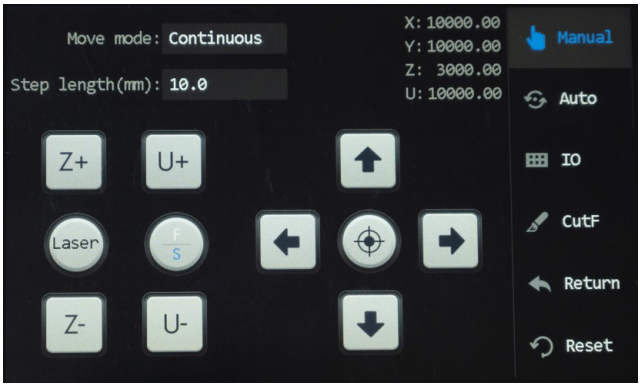
When your engraver arrives, its emergency stop button is already pressed and must be rotated up to allow the engraver to function. You should test that it works properly before conducting **ANY** other work with your machine.

1. Place a piece of laserable scrap material on the workbed under the laser head and close the cover.
2. Twist the emergency stop clockwise to release it.
3. Press the main power button to turn on the system.

   Confirm that the lights and fans have been activated.
4. Insert and turn your laser key to activate the laser power supply.



5. Tap the box next to Power in **Parameter Display Area** from the main menu. Set reset the maximum and minimum laser power to 12%. Tap **OK** to confirm the modification and exit the current menu.
6. Tap “Manual” in the main menu, and the following menu pops up.



7. Tap Z+, Z–, X+, X–, Y+, and Y– so that the laser head is about 1 or 2 inches above the laserable scrap.
8. Hold (laser) and the laser head should start firing laser beam continuously.
9. Hit the emergency stop and observe whether the laser stops instantly.

If the laser continues to fire, the laser key is not working and must be replaced before the engraver can be used. Flip off the circuit breakers and contact customer service.

4.2 Emergency Switch

1. Repeat steps 1–9 above.
2. Turn the laser key to its “OFF” postion and observe if the laser stops immediately.

If the laser continues to fire, the laser key is not working and must be replaced before the engraver can be used. Flip off the circuit breakers and contact customer service.

4.3 Cover Shutoff (Interlock)

Because of the risk of causing blindness, burns, and other injuries from direct exposure to the invisible engraving beam, this device also shuts off the laser automatically when the protective cover is raised during operation.

Test that the cover shutoff works properly before conducting any other work on your machine.

1. Follow the procedure above (See §4.1 Emergency Shutoff) for testing the emergency stop to start up your machine and fire a low-strength test beam into any piece of laserable scrap material.
2. Taking care to avoid exposure to any potential reflected laser light, open the cover as minimally as possible and attempt to fire the laser again.

If the laser fires, the automatic shutoff is not working and must be repaired before the engraver can be used. Turn off the machine and contact customer service.

4 Initial Testing

4.4 Laser Path Calibration

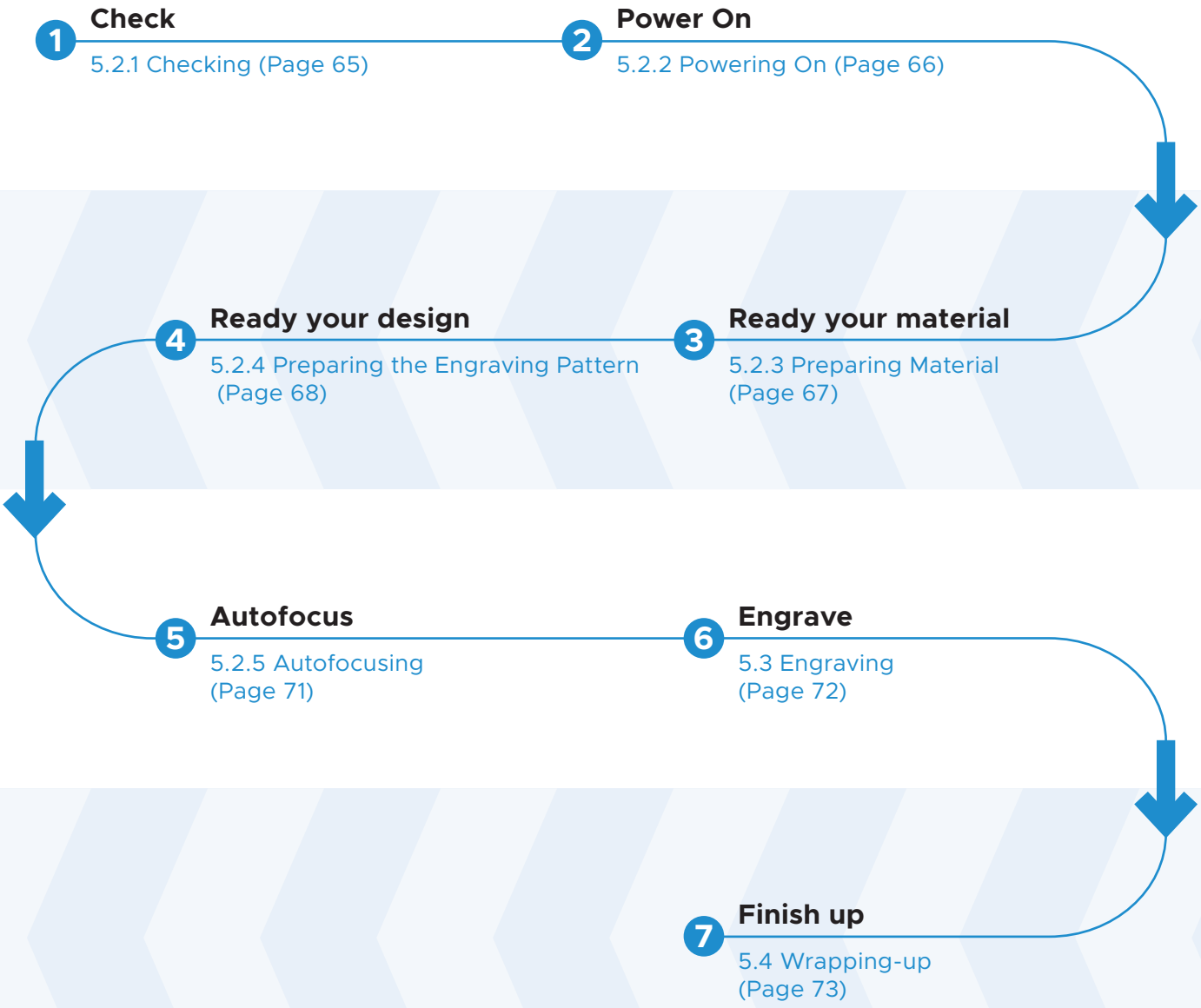
Although our factory calibrates your entire system during assembly, it is possible for the laser tube, the focus lens, and/or one or more of the mirrors to be jostled out of alignment during shipment. As such, it is recommended that you perform a full optical alignment test as part of setting up your machine. See §8.3 Laser Path Alignment for step-by-step guidance.

4.5 Security

For your own safety and that of passersby, this engraver can be locked shut using the provided key. It is recommended that you use it to lock the machine between sessions, preventing any unauthorized operation of the machine.

5 Typical Operation Sequence

5.1 Operation Overview



5 Typical Operation Sequence

Operate this laser engraver only in accordance with all the instructions provided in this manual. Failure to follow the guidelines detailed here can result in property damage and personal injury.

The engraver is operable either through:

- The built-in control panel,
- The USB cable connections with your computer,
- The engraver's in-built Wi-Fi module with your computer or mobile phone.

Most of the operations are automated. The, X+, X–, Y+, and Y– icons in the manual menu can be used to move the laser head along the X and Y-axis guide rails and the Z+, Z– can be used to raise or lower the workbed.

More often, you will create designs as graphic files on the control computer, load them on the engraver, and then engrave or cut them. The software can be used to create different layers with different power settings, speeds, and other parameters.

Place the material under the laser head, ensuring the laser head nozzle can make contact with the material. Once setup is complete, tap **Focus** to autofocus the laser head, tap **Frame** to preview the outline of your engraving design, tap **Start** to begin engraving, and **tap Stop** to stop and reset the laser head back to the origin.

5.2 Pre-Engraving Preparation

5.2.1 Checking

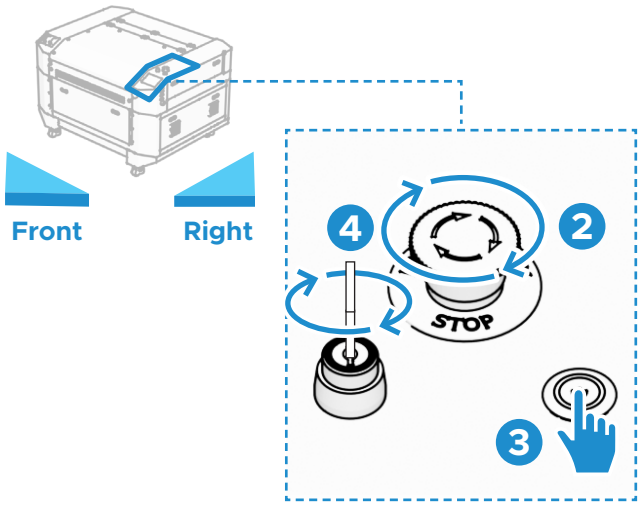
1. Ensure the power supply is ok.
2. Ensure proper ventilation.
    a. Turn on the fume extractor system and check its functionality.
    b. Ensure that any back-up ventilation systems are in place and running smoothly.

NEVER operate the laser if the fan and ducts are not working to purify or remove the fumes produced by the target material. Research materials before use and never operate the laser on any (such as PVC, teflon, and other halogen-containing substances) that can produce corrosive, hazardous, or even deadly fumes.

3. Open the engraver's cover, confirm the air assist is working well, blowing air through the nozzle.

5.2.2 Powering on

1. Turn on the fume extractor or an additional ventilation system.
2. Twist the emergency stop clockwise to release it. The laser head will automatically reset to the set zero point.
3. Press the main power button to turn on the system.
4. Use the laser key to activate the laser lock.
5. Rotate the light switch on the right side panel to adjust the light brightness for optimal viewing.



6. Wait until the engraver is in standby mode and ready for use.

After the RF tube is powered on, it requires a warm-up period. The tube will emit light only after approximately 30 seconds of preheating.

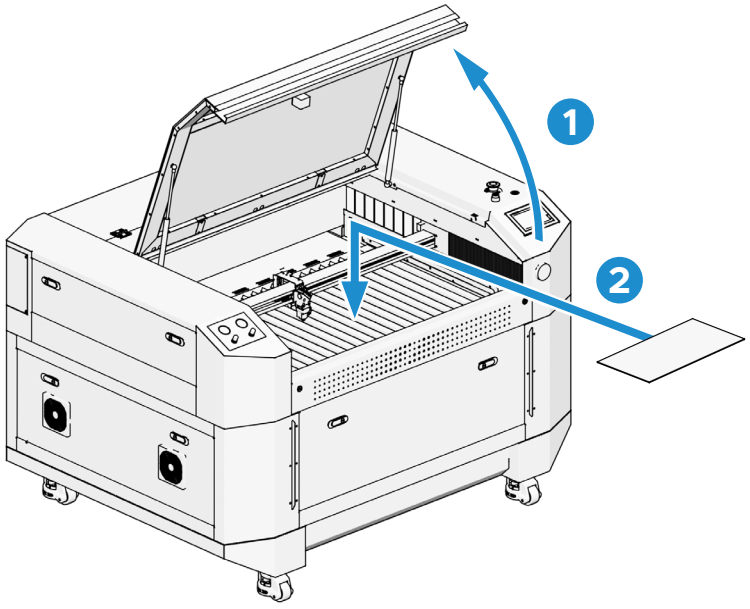
5 Typical Operation Sequence

5.2.3 Preparing Material

1. Open the engraver's cover.
2. Place a sample piece of your material on the workbed.

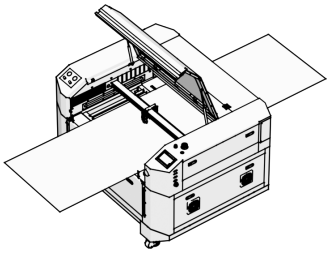
   The default location of the laser head's zero position is at the top right corner of the workbed. This can be changed by moving either your design or the engraver's origin position using the control panel or your engraving software.

   For instructions on material safety, see §1.7 Material Safety.



DO NOT insert anything through the pass-through doors other than the material once the laser is active. Pay special attention to the fumes and dust that may be released through these doors. Be sure that your ventilation system is strong enough to pull in all of the byproducts or wear the necessary PPE to ensure the health of users and passersby.

For heavier pieces of material, be careful to distribute its weight as evenly as possible across reinforced supports. For larger pieces of material, you may open the front or rear pass-through doors.

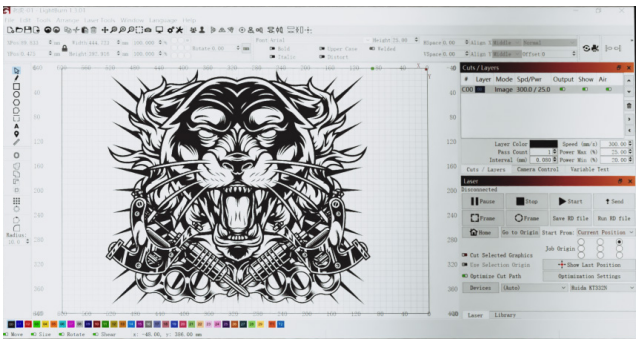


3. Close the engraver's cover.

5.2.4 Preparing the Engraving Pattern

Step 1. Create the design.

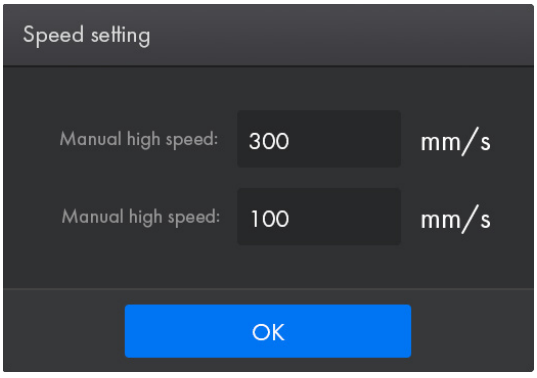
Create the design that you'd like to engrave or cut. (See §5.5 Rotary Operation (Optional) for engraving spherical or cylindrical objects.) You can do this directly in your engraving software or use any other graphics program to create the image and set its engraving parameters. Files should not exceed 128 MB in size. Larger images will need to be reduced in resolution or divided into pieces for separate engraving.



Step 2.Set the Parameters.

Speed Levels

1. Tap "Speed" in **Parameter Display Area** from the home menu, and the right pop-up shows up.

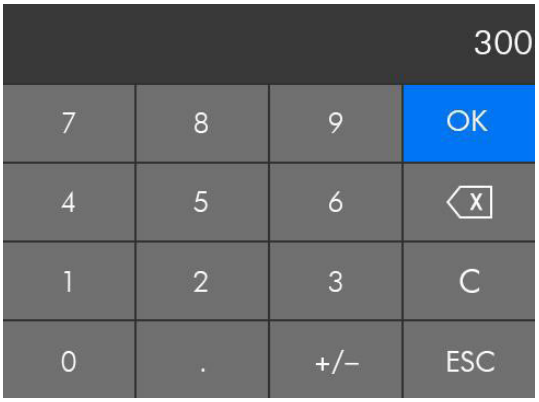


When the system is idle, the speed parameters controls the manual high speed and manual low speed. That is, the speed range that the laser head can be manually moved to reach, which is convenient for debugging and calibrating.

When the system is running or paused, those speed parameters control the processing speed of the laser head.

5 Typical Operation Sequence

2. Tap the parameter box to show the numeric keyboard as shown.
3. Set the value to that you desire.
4. Tap OK to confirm the modification and exit the current menu or tap ESC to cancel the modification and exit the current menu.

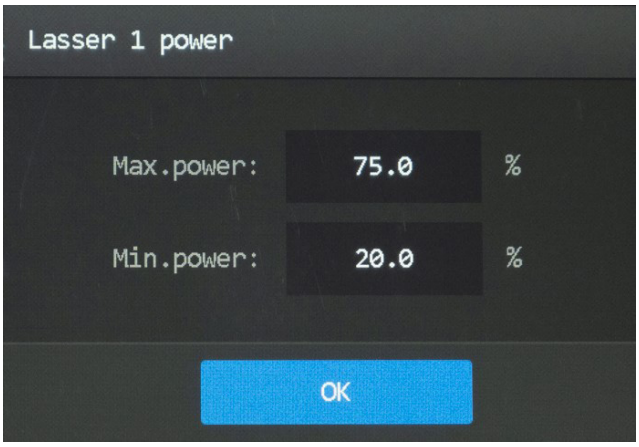


The exact speed value depends on the material, its thickness, among other things. To achieve the best resultant pattern, See §5.6 Instructions for Specific Materials for speed recommendation for specific materials.

Power Levels

- All powers are displayed as percentages (%) of the engraver's rated power. Running your laser above 70% risks shortening your laser's service life. If power settings of 70% or lower don't produce the desired results, it's generally better to first increase the energy per unit area by slowing down the laser or running more passes, rather than simply increasing the power setting.
- The threshold for the lowest setting is around 10% and the laser will not have sufficient voltage to fire at settings below this. It is NOT recommended to use the laser tube at full capacity either, especially for extended periods. The recommended maximum power setting is 70%, as prolonged use above that amount will shorten your laser's service life. To increase the engraving depth, raise the energy per unit area by increasing the laser's power, the number of loops, or by reducing the speed. Engraving too deep, however, reduces image quality, especially for coated materials.
- When working with new materials, remember that you should always start on the low end of settings. If the effect is not yet strong enough, you can always rerun the design loop several times or rerun it with more powerful settings until you create the effect that you want. You can also try grids of possible settings at first to find what works best with your material.

1. Tap Power in **Parameter Display Area**, and the following menu pops up.
2. Tap the parameter box to enter the power that you desire to use.
3. Tap **OK** to confirm the modification and exit the current menu.



The exact power value deepends on the material, its thickness, among other things. To achieve the best resultant pattern, See §5.3 for power recommendation for specific materials.

Step 3. Place a sample piece of your material on the workbed.

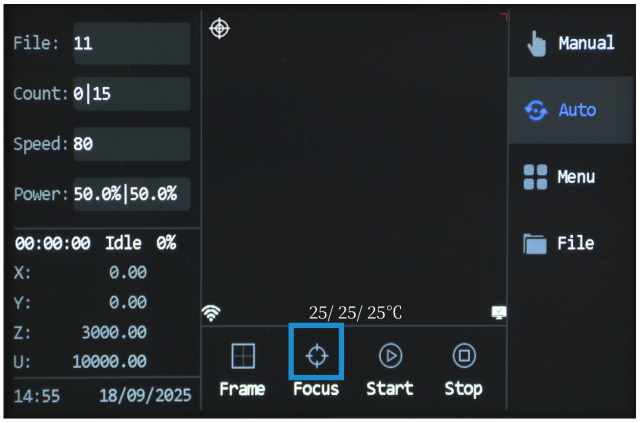
- The standard location is on the top right corner of the workbed. This can be changed by moving either your design or the engraver's origin position using the control panel or your engraving software.
- If you will be adjusting the laser head or its nozzles, it can be helpful to briefly cover the material with something soft and wide to catch any loose parts that might accidentally be dropped during the process. Remove any such material before engraving.
- For heavier materials, be careful to distribute its weight as evenly as possible across the reinforced supports. For larger pieces of material, you may open the front, rear, or side pass-through doors.

DO NOT insert anything through the pass-through doors other than the material once the laser is active. Pay special attention to the fumes and dust that may be released through these doors. Be sure that your ventilation system is strong enough to pull in all of the byproducts or wear the necessary PPE to ensure the health of users and passersby.

5 Typical Operation Sequence

5.2.5 Autofocusing

Tap the focus icon and the laser head should start moving toward the simple material, stopping when the correct focal height has been reached.



- It is recommended that you start each session by pressing . This lets you check that the laser will begin where you want and that your material is correctly placed.
- Activate the standard autofocus by tapping . The autofocus will be done automatically. The workbed will be moving upward and then keep moving upward even though the laserable material has contacted the laser head. This is normal. After pressing against the laser head for a while, the workbed will start moving downward and then stop at a perfect focal height.

5.2.6 Adjusting the High or Low Pressure Air

Adjust the high or low air pressure with the corresponding knob on the air pressure control panel based on your task.

- For engraving, use the low-pressure knob to adjust the pressure to around 0.1 MPa.
- For cutting, use the high-pressure knob to set the pressure to around 0.25 MPa.
- For thin or lightweight materials, such as paper, use low pressure to prevent the material from lifting or deforming due to airflow.

To adjust the air pressure:

1. Pull and rotate the knob to adjust the air pressure.
2. Press the knob to lock the pressure setting.

5.3 Engraving

1. Tap ▷ to engrave your design.
2. Tap ⊡ on the control panel to completely stop engraving, return to the beginning of the design, and reset the laser head back to its origin
3. Open the cover and check that the engraved pattern is desired. If not, adjust the parameters as needed. For details, see §5.6 Instructions for Specific Materials.
4. Remove the sample material and place the actual material for engraving.
5. Tap ▷ to initiate.
6. Inspect the processing speed, laser power, and processing time on the status display.

- **DO NOT** stare continuously at the active laser even while wearing laser glasses but watch during use for possible issues like sparks and be prepared to quickly extinguish a fire if necessary.
- To halt the engraving, tap ⊡ on the control.
- If there is ever an emergency situation such as a fire, **DO NOT** use the control panel to pause or stop the engraving. Hit the emergency stop button **IMMEDIATELY**.

5 Typical Operation Sequence

5.4 Wrapping-up

1. Once the laser has stopped, examine the quality of your first run and adjust the laser parameters on the control panel or in your engraving software as necessary to create the desired effect.
2. Once you have finished engraving, close your software and then turn off your machine in the following order:
   a. Turn and remove your laser key.
   b. Press the emergency stop.
   c. Allow time for the ventilation and cooling systems to continue running, cooling the laser, and removing any remaining fumes or dust.
3. Fully clean the workbed and check if the lens or any mirrors require cleaning. Use the bottom left access panel to remove, empty, clean, and replace the debris tray. Store everything neatly away.

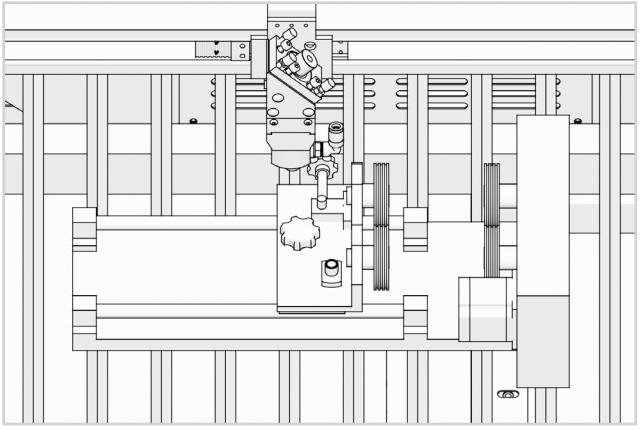
5.5 Rotary Operation (Optional)

This chapter uses a 4-wheel rotary axis as an example. We recommend using a test material before performing formal engraving.

5.5.1 Installing a Rotary Attachment

- OMTech PRO QUANTUM 45 does not come with a rotary attachment but is compatible with standard four-pin models.
- If the material has a large diameter, remove the steel saw bed or the aluminum knife bed along with the blade's support bar.

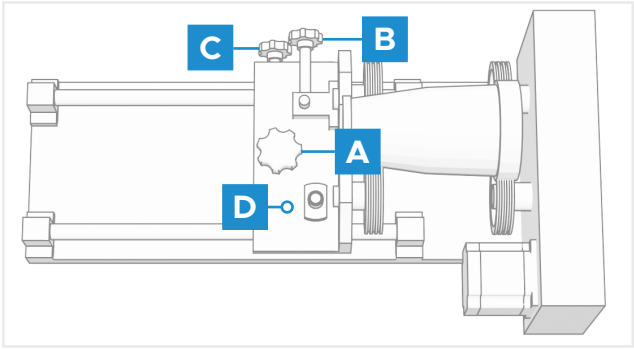
1. Place your rotary axis in an open area.



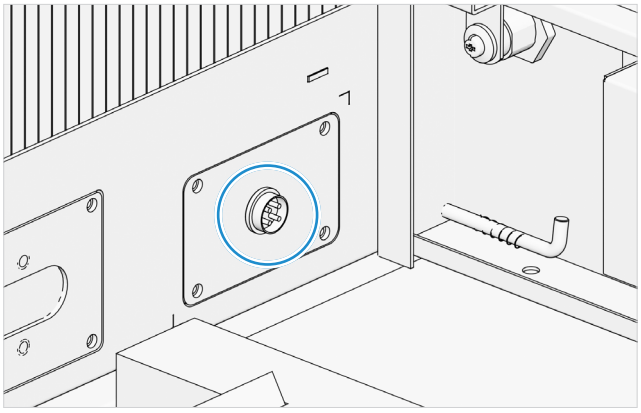
2. Put the material onto the rollers of the rotary axis and adjust its position using the knobs.

   a. Use Knob A to adjust the vertical position, and then use Knob B to tighten and secure it.

   b. Loosen Knob C, slide Base D to adjust the horizontal position, and then tighten Knob A to secure it.



3. Connect the rotary axis cord to the rotary port in the main bay.



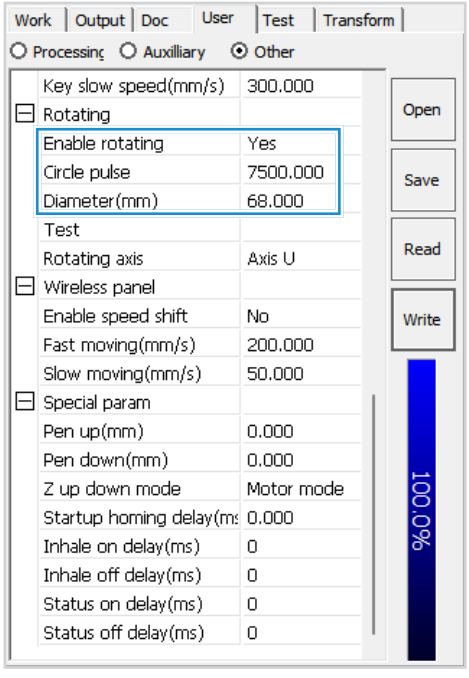
5.5.2 Engraving Procedures

1. Enable the rotary axis and set the circle pulse and wheel diameter in the software.

   RDWorks V8

   Click **User** > **Other**. Set the following parameters:

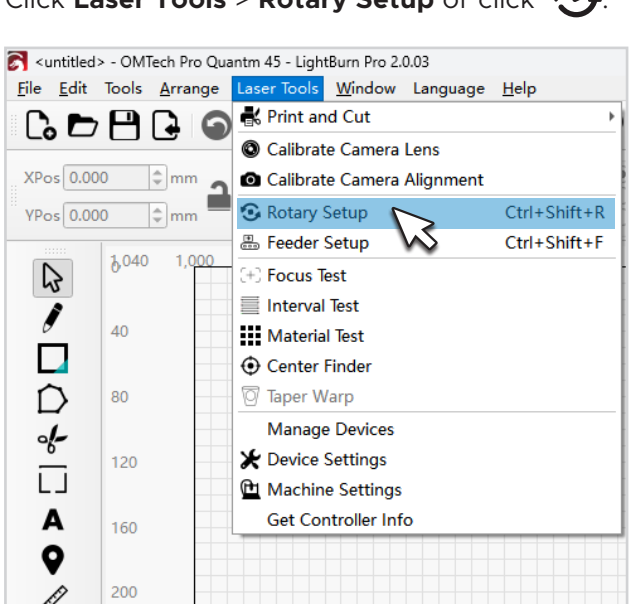
   - **Enable rotating**: Yes
   - **Circle pulse**: Driver subdivision × Gear ratio
   - **Diameter(mm)**: Your rotary axis wheel's diameter



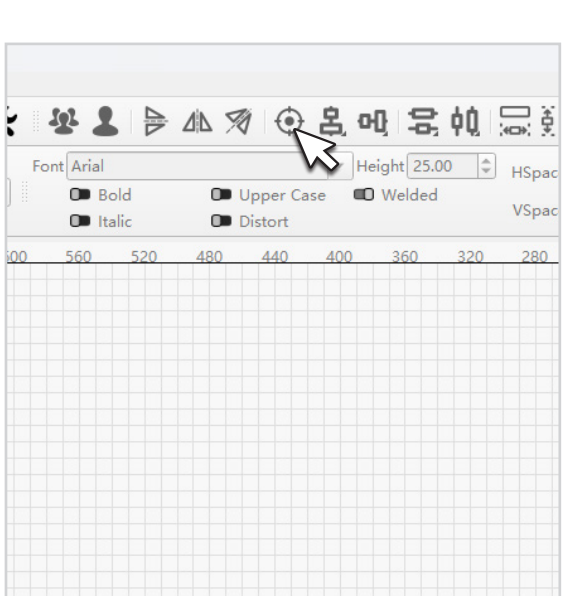
5 Typical Operation Sequence

Lightburn

a. Click **Laser Tools** > **Rotary Setup** or click .

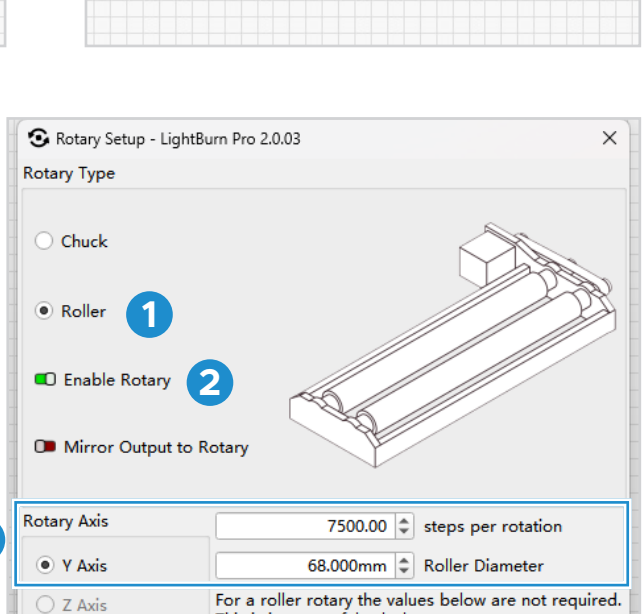


or



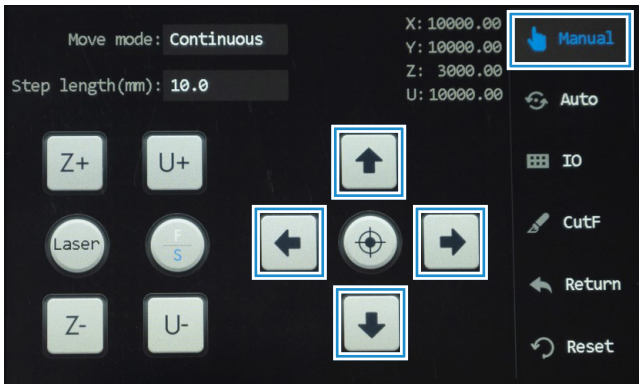
b. Set the following parameters:

- **Rotary Type**: Your rotary axis type
- **Enable Rotary**: On
- **steps per rotation**: Driver subdivision × Gear ratio
- **Roller Diameter**: Your rotary axis wheel's diameter

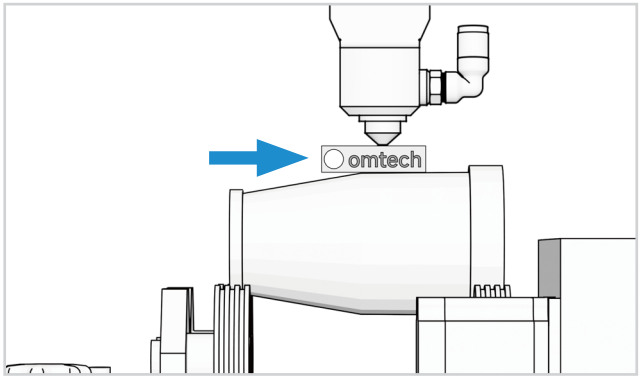


For the OMTech 4-wheel rotary axis, the recommended circle pulse is **7500** and the diameter is **68**, as shown in the figures.

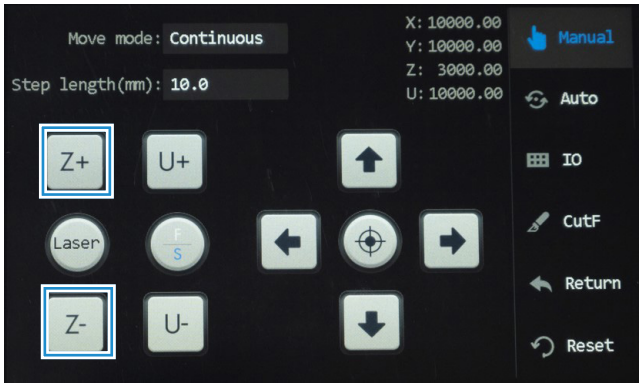
2. Tap **Manual** on the control panel. Use the four arrow icons to move the laser head over the material.



3. Place the provided focal height ruler between the laser head and the material.



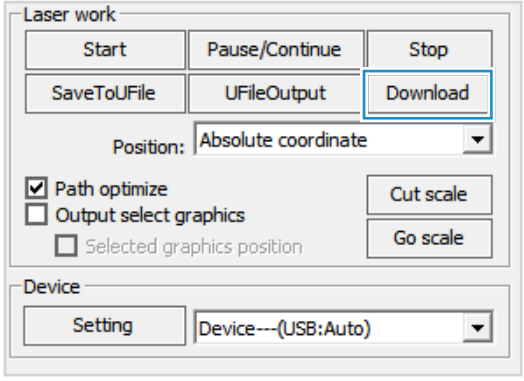
4. Use **Z+** or **Z-** on the control panel to lift or lower the workbed. Stop adjusting once the laser head gently rests above the ruler. Remove the ruler.



5. Create a design in the software and set the design's diameter. Download or send the design to your engraver.

   RDWorks V8

   Click **Download**.

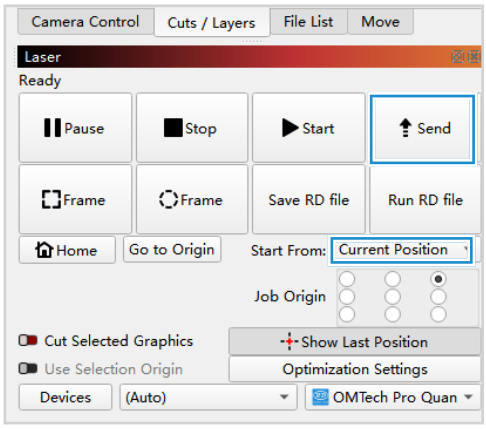


5 Typical Operation Sequence

Lightburn

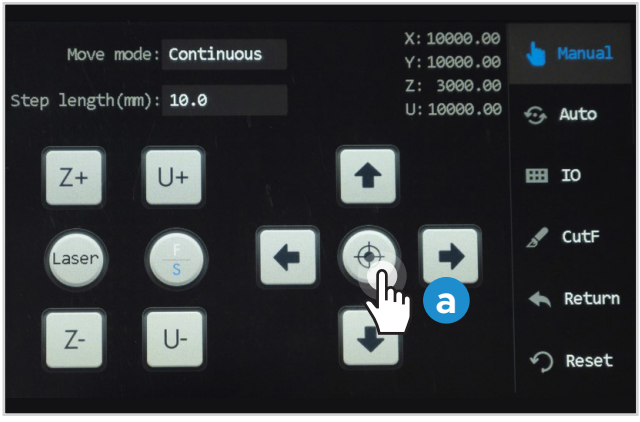
a. Select **Current Position** in **Start From**.

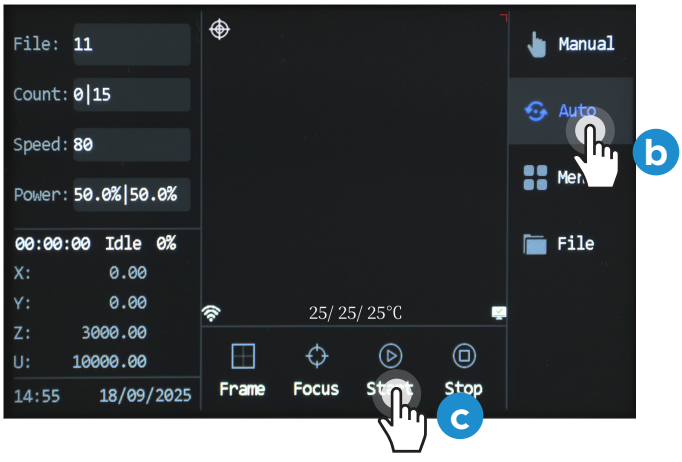
b. Click **Send**.



6. Tap ⌖ on the control panel. Then, click **Auto** > **Start** to begin engraving.

> The software (RDWorks V8 or LightBurn) does not start engraving. **ONLY** tap **Start** on the control panel to begin the job when using a rotary attachment.





7. After engraving, use a measuring tape (not included) to measure the design's diameter.
   - If the measured diameter matches the software settings, the engraving is successful.
   - If the measured diameter differs, adjust the circle pulse and engrave again. Calculate the latest pulse using: **Latest Pulse = (Actual Measured Size / Set Size) × Current Pulse**.

5.6 Instructions for Specific Materials

The following instructions are suggestions to help maintain a safe work environment with a range of materials. The user should research the safety and engraving requirements of their specific material to avoid the risk of fire, hazardous dust, corrosive and poisonous fumes, and other potential problems. Once the product is deemed safe and appropriate protective equipment has been set up, it can be helpful to engrave a test matrix of small boxes produced at various speed and power settings to establish the ideal settings for your design. Alternatively, start with low power and fast speed settings and rerun your design as many times as needed, using progressively greater laser intensity.

5.6.1 Ceramics

When engraving on ceramics, generally use moderate to high power. Using more loops rather than higher power and lower speed can help avoid cracking the material during work. Be mindful of the health risks posed by dust generated from ceramic engraving, especially for repetitive industrial applications. Depending on the material and the amount of work, a fan or even a full ventilation system may be required to address the problem. Similarly, operators and others in the work area may need to wear respiratory PPE, such as masks or respirators.

5.6.2 Glass

When engraving glass, generally use high power and low speed. Similar to ceramics, it can be helpful to run more loops at lower settings to avoid cracks. Care must be taken when engraving fiberglass and carbon fiber to avoid combinations of settings that produce a laser intensity great enough to damage the structural integrity of its component fibers, producing blurry markings. PPE should be worn to avoid exposure of the eyes, nose, mouth, and skin to the dust produced by working with either material, especially for repetitive industrial applications. Clothing worn while working with fiberglass should be washed separately afterwards.

5.6.3 Leather

When engraving leather products, generally use low to moderate power at high speed. Be especially attentive to the possibility of fire, as well as the dust produced in repetitive applications.

5.6.4 Metal

This engraver is not designed for cutting nor engraving metals.

5.6.5 Paper and Cardboard

When engraving various paper products, generally use low to moderate power and fast speed. Test samples from each batch, as only small parameter differences can separate effects that are too light from those that burn through the substrate. As with leather, be especially attentive to the possibility of fire, as well as the dust produced in repetitive applications.

5.6.6 Plastics

Plastics for engraving are available in many different colors and thicknesses and with many different coatings and surfaces. The majority of available plastics can be well engraved and cut with the laser. Plastics with a microporous surface yield the best result because less surface material needs to be removed. 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. High-resolution engraving can cause the same problem, so medium to low-resolution designs should be preferred for most plastics.

5.6.7 Rubber

The various compositions and densities of rubber cause slightly varying engraving depths. Testing various settings on sample pieces of your specific rubber is highly recommended for best results. When engraving rubber, generally use a consistent high-power setting and create your effects by varying the laser's speed. Microporous rubber materials require a significantly higher speed than standard rubber. Engraving any kind of rubber produces a considerable amount of dust and gas. Depending on the amount of work, breathing PPE and/or a full ventilation system may be required to address the problem.

5.6.8 Stone

When engraving various kinds of stone, generally use moderate power and moderate to fast speed. Similar to ceramics and glass, 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.

5.6.9 Textiles

When engraving textiles like cloth and fleece, generally use low power and fast speed. As with leather, be especially attentive to the possibility of fire and dust.

5.6.10 Wood

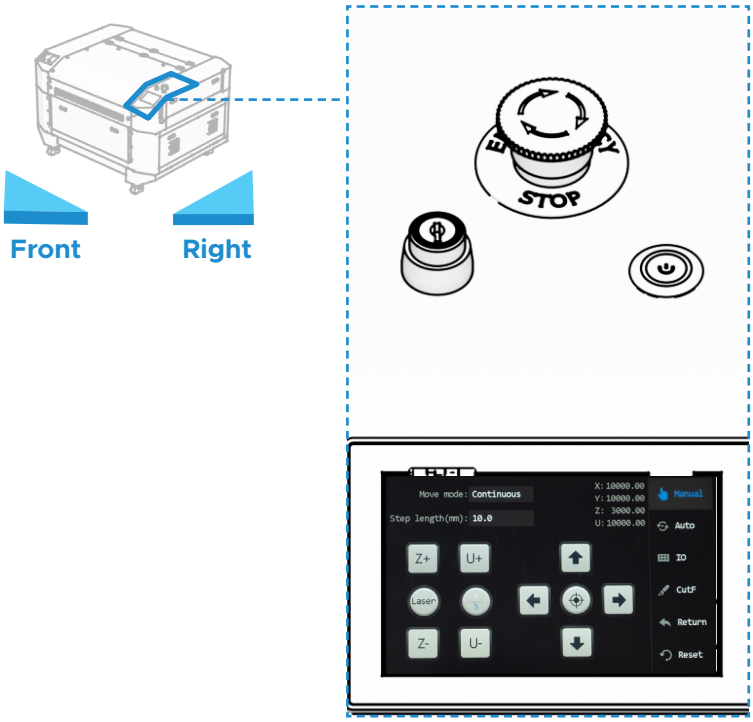
As with rubber, there is a huge variety of woods, and testing your specific material is essential to get the best results. In general, wood with consistent grain and coloring engraves more evenly. Knotted wood produces uneven effects, while resinous wood produces greater edge contrast. Some soft woods like balsa, cork, and pine engrave well (albeit with low contrast) at low or moderate power settings and high speed. Others like fir suffer from uneven fibers that usually produce a poor effect no matter what you do. Hard woods like cherry and oak engrave well at high power settings and low speed. Manufactured wood products can vary from brand to brand, mostly based on its glue composition and abundance. MDF works well but creates dark edges when cut.

In addition to the fire risk associated with any wood product, extra caution is needed with the fumes from adhesives used in plywood and other manufactured woods. Some adhesives are too hazardous to work with, while others require proper ventilation and respiratory PPE for prolonged industrial use. Wood toxicity should also be examined, as the dust from some natural woods including oleander and yew can also cause nausea and cardiac problems in high enough amounts.

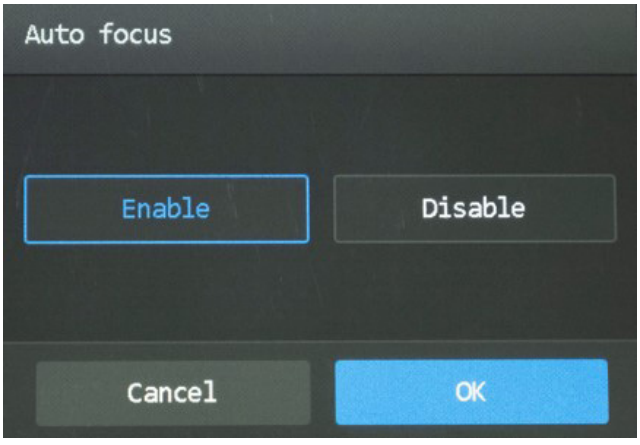
6 Touch Screen Operations

6.1 Overview

Operate this laser engraver only in accordance with all the instructions provided in this manual. Failure to follow the guidelines detailed here can result in property damage and personal injury.

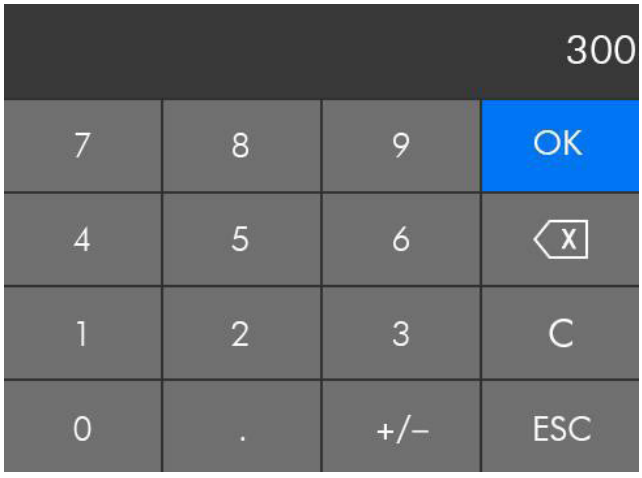


All the settings and parameters on the touchpad can be accessed and changed through tapping. For settings that pop out, their alterations and confirmations are done through tapping Enable or Disable. Tap OK to save the change.



For parameters with numeric values,

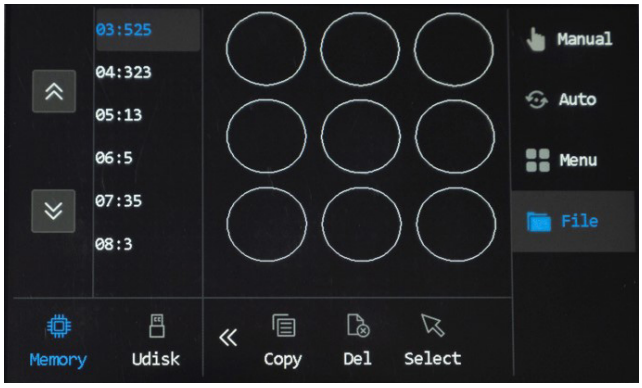
1. Tap the value to enter the value, and a numeric keyboard shows up as shown:
2. Enter the value needed and tap **OK** to save the change and exit the current menu. Tapping **ESC** cancels the modification and exits the current menu.



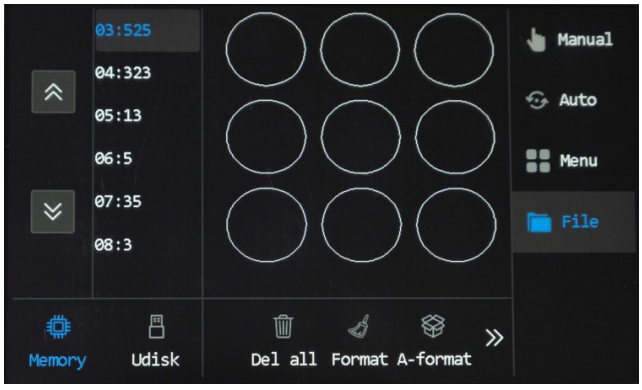
6.2 File Management

System Memory Files

In the main menu, tap **File**, and the following menu pops up.



Files are listed in the left column and a preview of a selected file is shown in the graphic display area. When there are multiple files, use the up and down icons to scroll through the file list.



6 Touch Screen Operations

To see the preview of a certain file, tap the file, and the preview shows up in the middle of the screen. Tapping the icon resembling a cursor readies the file for processing.

The memory and U disk icons in the lower left corner are used to switch between the system memory and a USB flash drive.

Icons	Functions
Copy	Copies the selected file to U disk.
Del	Deletes the selected file.
Select	Selects the currently selected file as processing file.
Del All	Deletes all memory files.
Format	Quickly releases memory.
A-Format	Formats system memory.

USB Files

- The system is compatible with FAT32 and FAT16 USB file formats. For best results, however, store your files under the root directory of the USB flash drive so that the system can recognize them quicker and easier.
- By default, the system dissects a file name exceeding 8 characters and shows it in more than one word. Additionally, the system cannot recognize files with names containing characters other than English letters and Arabic numerals. All files exported from the system to a flash drive are stored under the root directory of such storage gadget.

1. Tap **File** (if you haven't done this) to open the file management menu.
2. Tap **Udisk** to switch the memory route to the USB flash drive that's connected.

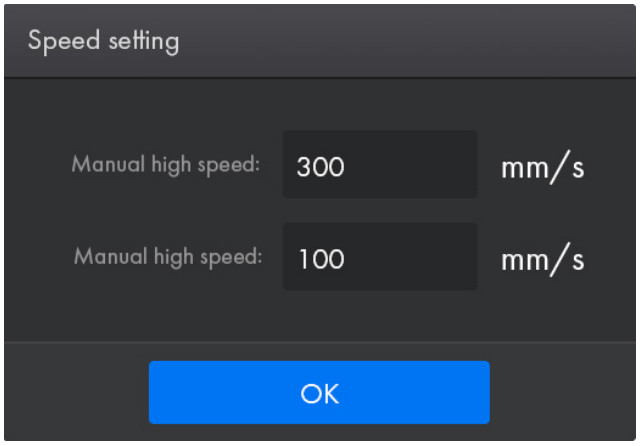
The 4 icons in the middle are for managing the USB files.

Icons	Functions
Copy	Copies the selected file from the flash drive to the system memory.
Del	Deletes the selected file.
Board	Upgrades mainboard program through the USB flash drive.
Hmi	Upgrades the control panel program through the USB flash drive.

6 Touch Screen Operations

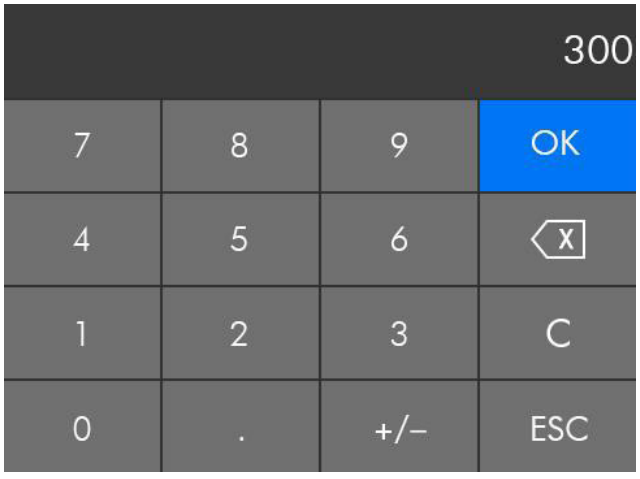
6.3 Setting Speed Levels

1. Tap **Speed** in **Parameter Display Area** from the home menu to open the speed settings.



- When the system is idle, the speed parameters controls the manual high speed and manual low speed. That is, the speed range to which the laser head can be manually moved, which is useful for debugging and calibration.
- When the system is running or paused, those speed parameters control the processing speed of the laser head.

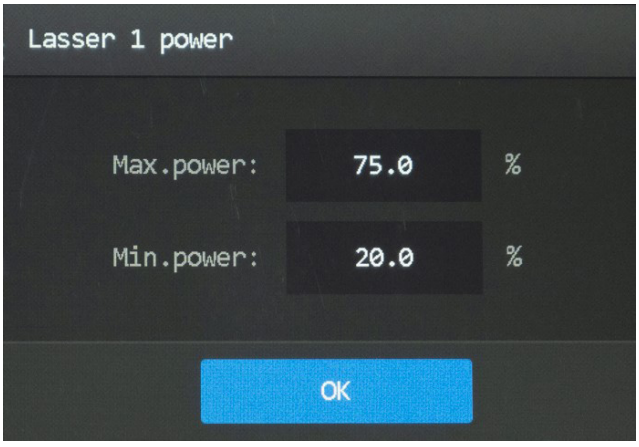
2. Tap the parameter box to show the numeric keyboard as shown.
3. Set the value you desire.
4. Tap **OK** to confirm the modification and exit the current menu or tap **ESC** to cancel the modification and exit the current menu.



6.4 Setting Power Levels

- All powers are displayed as percentages (%) of the engraver's rated power. Running your laser above 70% risks shortening your laser's service life.
- If you find power settings of 70% or lower do not produce the results that you need, for most materials it is better if you first attempt to increase the amount of energy per unit area by slowing the laser or running more loops before further increasing the power setting itself.

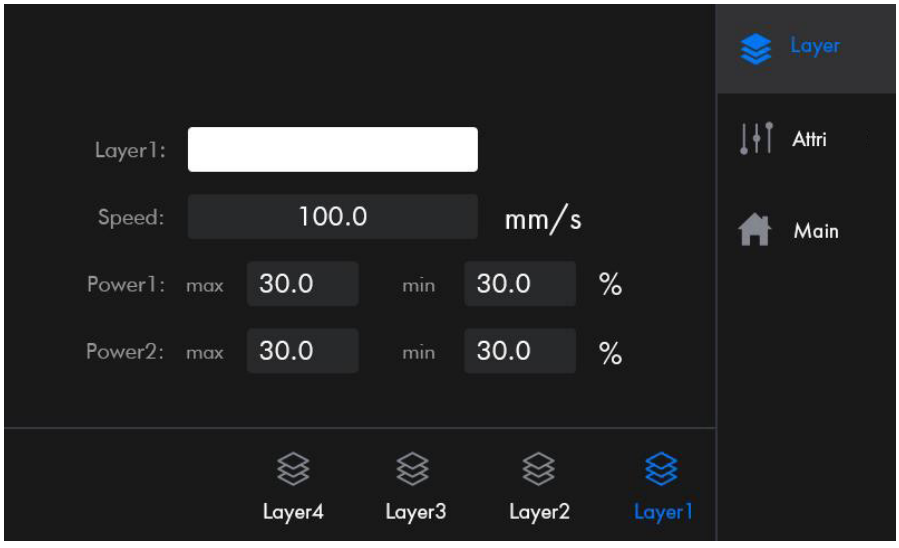
1. Tap Power in **Parameter Display Area** to open the power settings.
2. Tap the parameter box to enter the power that you desire to use.
3. Tap OK to confirm the modification and exit the current menu.



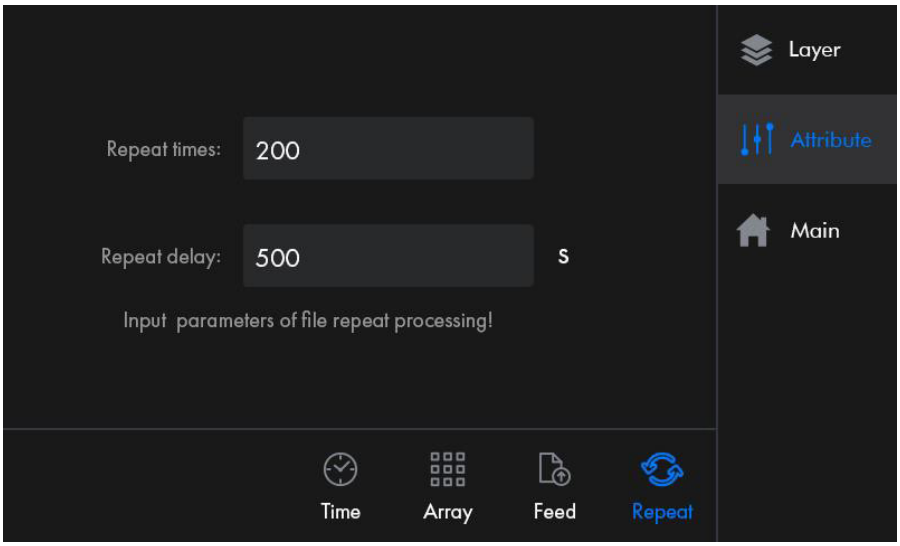
6 Touch Screen Operations

6.5 Setting File Parameters

When in the main menu, tap the filename of the file to be processed on the left upper corner, and the menu as shown pops up.



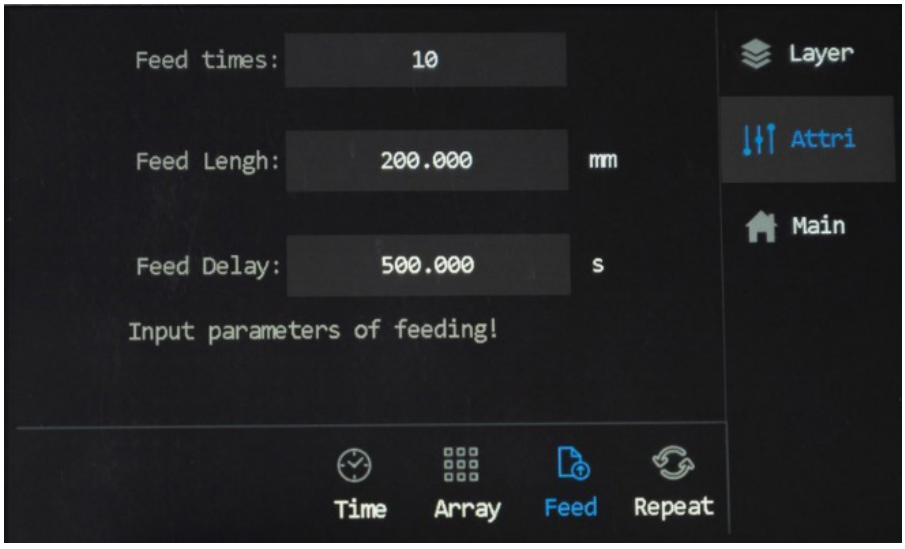
Submenus	Functions
Layer	Encompasses the speed and power, which can be customized for each layer of the file under this filename to your needs. At the bottom of the menu shows all the layers of the file. If the total number of layers exceeds 6, use the left/right arrows to browse through the layers. The corresponding layer information will be displayed synchronously after the icon of each button is tapped.
Attribute	Encompasses four parameters related to how a file is processed.



Icons	Functions
Repeat times	Sets how many times the process will be repeated.
Repeat delay	Sets the interval between two repeated processing.

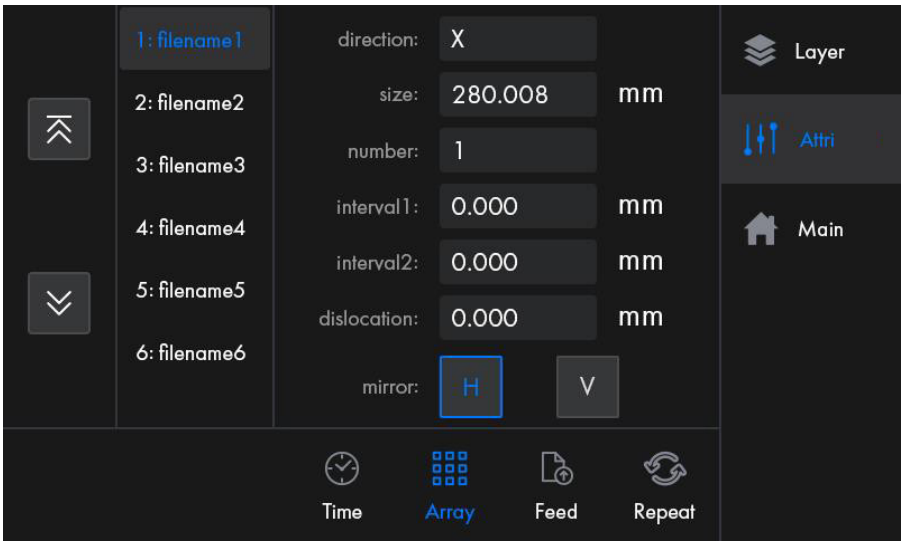
Once the repeat times and delay has been set and saved, the change will apply to all the files that are currently on the system's worklist unless it suffers a power breakout or being turned off.

6 Touch Screen Operations



Icons	Functions
Feeed Time	Sets how many continuous times the system feeds the laserable workpiece during one engraving task.
Feed Length	Controls the length of the workpiece that is conveyed onto the workbed.
Feed Delay	Sets the interval between two consecutive workpiece feeds.

Submenus	Functions
Array	Encompasses all the array information of the file under the filename that you have tapped in the main menu, including direction, size, number, interval1, interval2, dislocation, and mirror.



Listed on the left are all the array names for this file. Use the up and down button to scroll through all the array names. After being chosen, the information of the selected array is displayed as shown

Icons	Functions
Direction*	Determines how an array will be formed, along the X or Y axis.
Size	Determines the size of array elements. The alteration is disabled.
Number	Controls the number of array elements along the X/Y axis.
Interval 1	Controls the graphic element interval value of the odd-numbered rows of the array.
Interval 2	Controls the graphic element interval value of the even-numbered rows of the array.
Dislocation	Controls the dislocation value of the array graphics along the X/Y axis.
Mirror	H selected, even-numbered rows are mirrored in the X/Y direction; V selected, even-numbered columns are mirrored in the X/Y direction. Tap the icon blue to enable this feature.

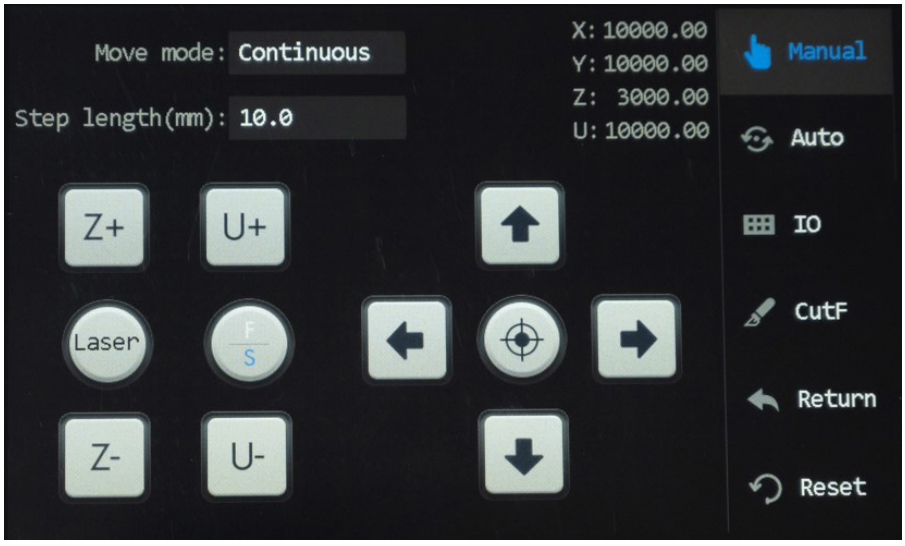
*Changes to this parameter automatically change other parameter values in this menu.

The array information of a file that contains multiple array names is not modifiable.

6 Touch Screen Operations

6.6 Setting Axes' Movement

Tap **Manual** in the main menu to open the manual options.



This menu is mainly for manual debugging, including axes (X, Y, Z, & U) motion, manual laser firing, positioning, IO diagnosis, frame cutting, return and system reset, and aligning the laser path. To exit this menu, tap **Auto**.

6.6.1 Movement Adjustment

Step Movement

To check that the laser head and the workbed can move normally for a set distance under manual mode:

1. Tap **Manual** in the main menu, and the menu above pops up.
2. Tap **Manual mode** and select **step**.
3. Set "Step length" to a value that you desire (other than zero). Tap (F/S) to use a set slow or fast speed.

> When **F** is in blue, the selected axis travels at a fast speed. When **S** is in blue, the selected axis travels at a slow speed. For speed adjustment, see §6.3 Setting Speed Levels.

4. Tap any axis icon, and the laser head or workbed should move for the distance that you set.

Continuous Movement

To check that the laser head and the workbed can move continuously under manual mode:

1. Tap **Manual mode** and select the other option than **step**.
2. Tap F/S to use a set slow or fast speed. When **S** is in blue, the selected axis travels at a slow speed. For speed adjustment, see §6.3 Setting Speed Levels.
3. Tap any axis icon, and the laser head or workbed should move as you tap the icon and stop as you release.

6.6.2 Manual Laser Firing

Tap laser and the laser head should fire a laser beam. The laser stops as the icon is released.

> Always ensure there is a laserable workpiece under the laser every time before you fire the laser.

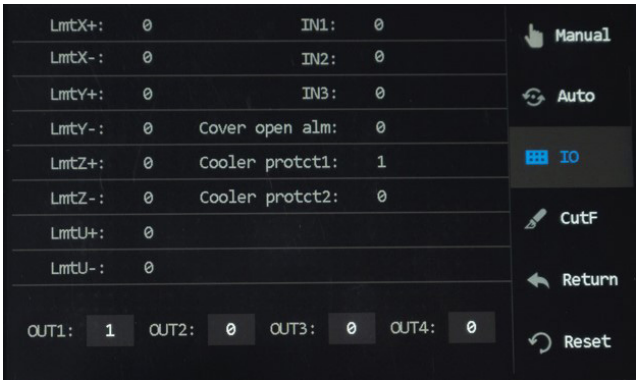
6.6.3 Laser Head Positioning

Tapping sets the current position of the laser head as a positioning point.

6.6.4 IO Diagnosis

Tap **IO** to open the **IO Diagnosis** menu.

The alteration of those parameters is currently disabled.

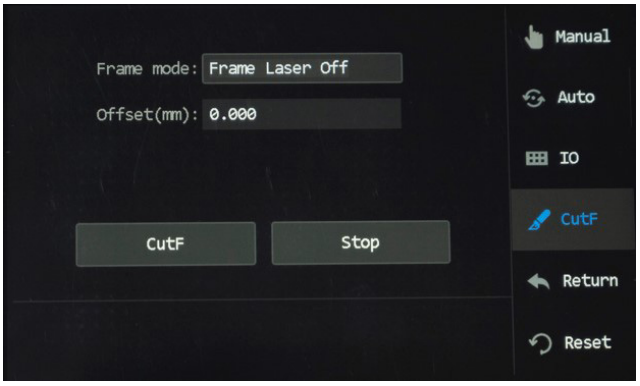


6 Touch Screen Operations

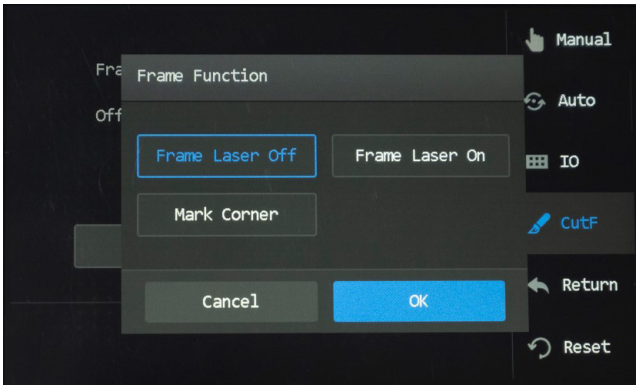
6.6.5 Frame Cutting

Tap **CutF** to open the **Frame Cutting** menu.

To cut a frame at a set distance from the outer circumference of the design file:

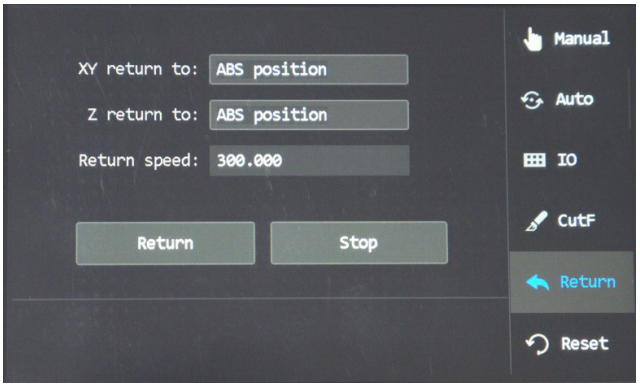


1. Tap the box after **Frame mode** and choose **Frame Laser On**. Choosing **Frame Laser Off** disables the laser. Tapping "Mark Corner" sets the laser to cut a hole at each corner of the frame.
2. Set your desired distance between the frame to be cut and the outer circumference of the design file.
3. Tap **CutF** and the laser should start firing. To stop, tap **Stop** to shut off the laser.



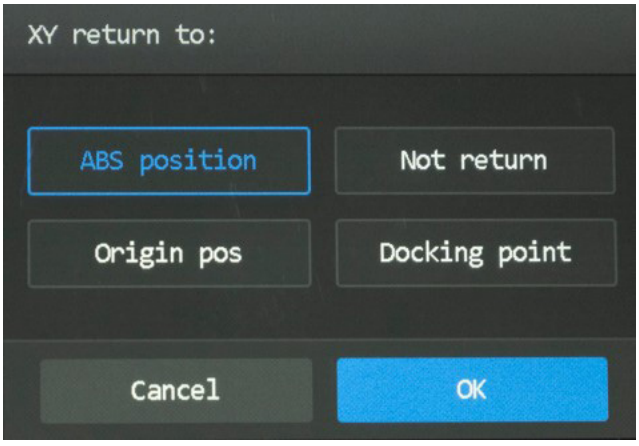
6.6.6 Setting Laser Head Return

Tap **Return** to enter the frame cutting setting menu as shown.



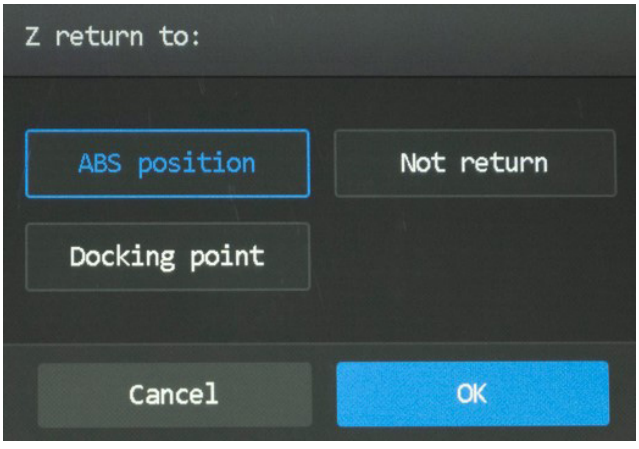
Under **XY return to**, there are four options for the laser head's return: **ABS position**, **Not return**, **Origin pos**, and **Docking point**.

Icons	Functions
ABS postion	Sets the laser head to return to the mechanical origin along the X and Y axis.
Not return	Keeps the laser head where it stops after an engraving task.
Origin pos	Sets the laser head to the default origin along the X and Y axes.
Docking point	Sets the laser head to return to a preset X and Y coordinates.



Under **Z return to**, there are three options for the laser head's vertical position: **ABS postion**, **Not return**, and **Docking point**.

Icons	Functions
ABS postion	Sets the laser head to return to the mechanical vertical origin
Not return	Keeps the laser head where it stops after an engraving task.
Docking point	Sets the laser head to return to a preset Z coordinate.



After selecting the options for the laser head to return, tap OK to return the laser head. As this happens, the system should be showing the status of the X, Y, and Z return at the bottom of the menu as shown above. To stop, tap **Stop**.

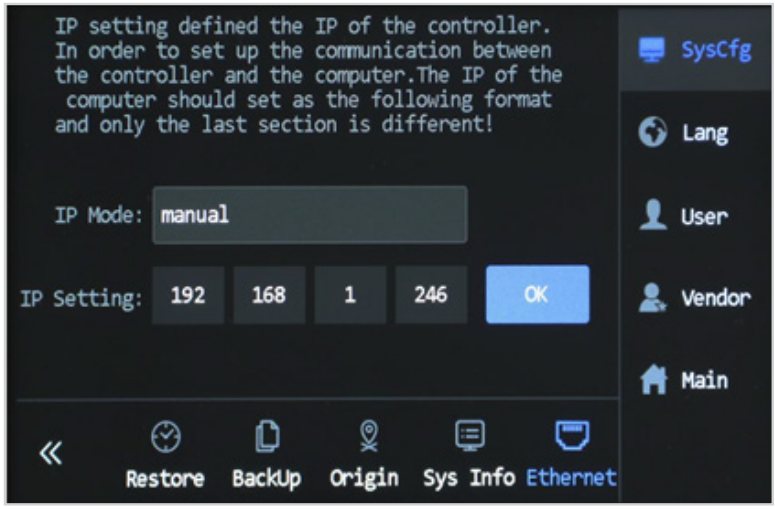
6.6.7 System Reset

Tapping **Reset** resets the system and modifications.

6 Touch Screen Operations

6.7 Menu Submenu

Tap **Menu** in the main menu to open the submenu.



This menu includes **SysCfg**, **Lang**, **User**, **Vendor**, and **Main**.

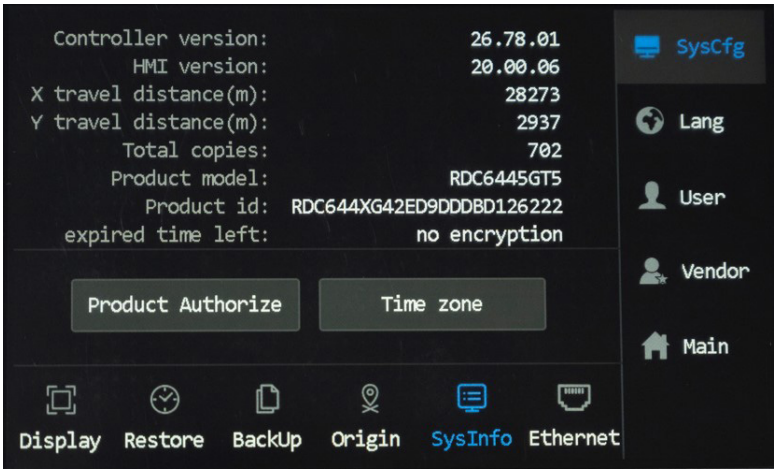
6.7.1 SysCfg

Ethernet

Tapping **Ethernet** accesses the IP setting. Tap to change the value and press OK to save your change.

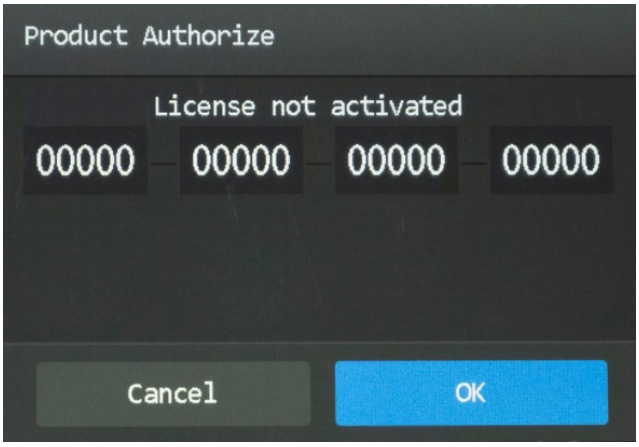
Sysinfo

Tapping **SysInfo** accesses the system information menu, where the product activation and time zone can be set.



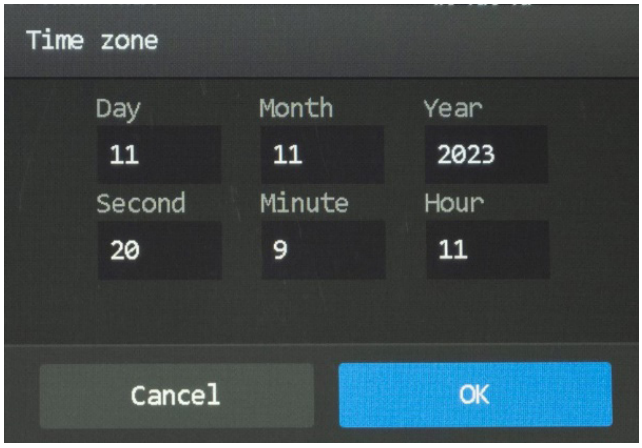
Product Activation

1. Tap **Menu>SysCfg>Sysinfo>Product Authorization** to open the product activation menu.
2. Enter your product authorization/activation code.
3. Tap **OK** to confirm. Tapping **Cancel** closes the pop-up and returns to the **SysInfo** menu.



Setting Time Zone

1. Tap **Menu>SysCfg>Sysinfo>Time zone** to open the time settings.



2. Tap to change the time.

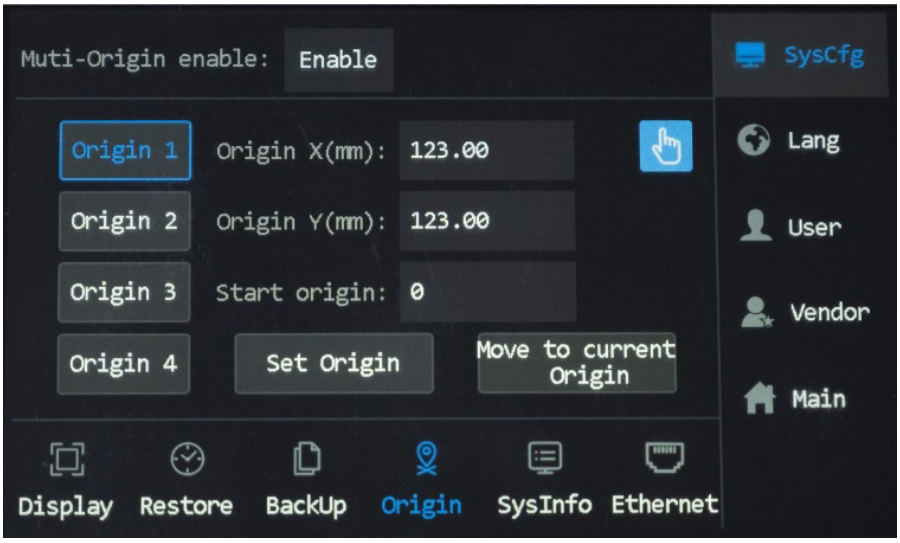
If the change is password protected, enter your passcode.

3. Tap **OK** to save your change. Tapping **Cancel** exits the current menu and returns to the **SysCfg** menu.

6 Touch Screen Operations

Setting Multi-Origins

Tap **Origin** from the **SysCfg** menu to open the origin settings.

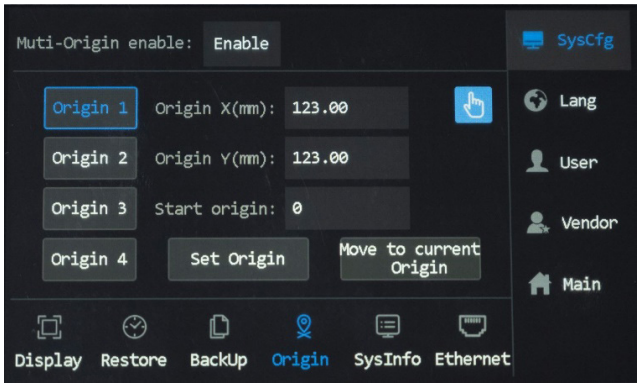


To enable this menu, tap the box after **Multi-origins enable** and set the option to Enable. With **Disable** selected, the system has a single default origin that the laser head returns to.

There are four customizable Origins. You can set them either through putting in desired coordinates or tapping keys to move the laser head to desired coordinates.

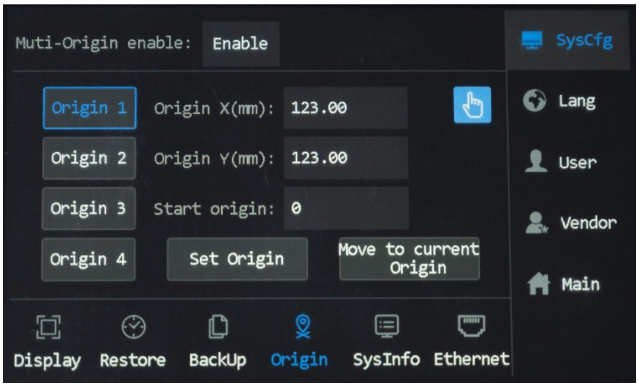
Inputing an Origin

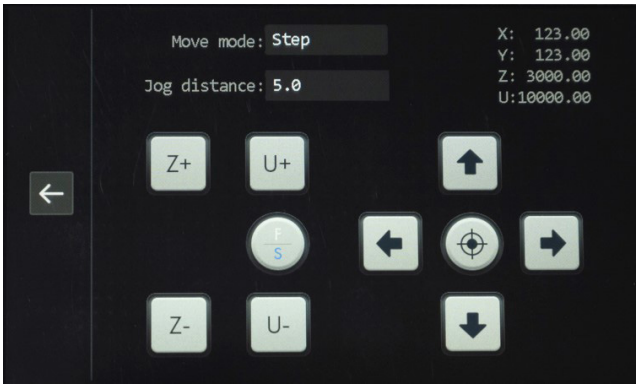
1. Tap to choose an origin, **Origin 1** as is in the case demonstrated on the right.
2. Put in your desired X & Y coordinates. If you are unsure whether the coordinates you inputted will be in the position you want the laser head to move to, tap **Move to current Origin**.
3. The laser head should automatically move to the coordinates you inputted. Adjust as needed.
4. After setting a desired origin, tap **Set Origin** to save. To delete and reset a set origin, tap **Cancel origin** and repeat step 2.



Manually Seting an Origin

1. Tap to choose an origin, **Origin 1** as is in the case demonstrated on the right.
2. Tap  to open the menu.
3. Use the keys (Z+, Z–) and the arrows to move the laser head to a desired position in relation to the workbed. (U+ and U– are disabled.) To change the way and distance the laser head moves, see §6.6 Setting Axes' Movement.
4. Once set, tap  to return to the origin menu.
5. Tap **Set Origin** to save the settings. To delete and reset a set origin, tap **Cancel origin** and repeat Step 2.



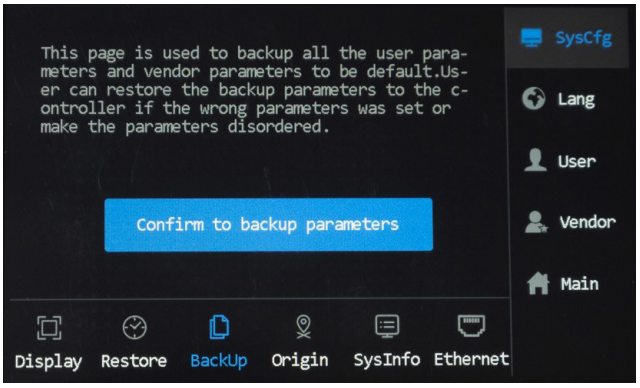


- The customized origins only work when "Multi-origins enable" is set to "Enable". When a set number of origins is set, say 4 origins, there will be 5 origins (0–4) for the laser head to start from, with 0 being the coordinates set by tapping the position mark from the main menu.
- Any two of the origins 1–4 can be set the same. For instance, origin 1 and 2 are set the same and they are both enabled. After the engraving is finished starting from origin 1, the system will automatically start from the same coordinates with origin 1. However, no one of the customized origins can be set to be the same as the 0 origin.
- When all customized origins are disabled, the laser head returns to the 0 origin by default.
- When a set of customized origins are enabled, the system will circle through the set sequence of the origins. For instance, there are 4 customized origins enabled and the engraving has been initiated from the main interface, the system will circle through the origins in the sequence that they are set.
- If the engraving is initiated directly and wirelessly from the control computer and the current position of the laser head is set as the origin, the laser head will start from the current coordinates regardless of the origins set by tapping SysCfg >Origin.

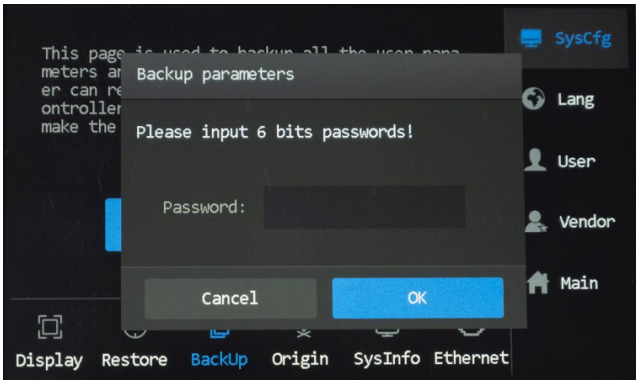
6 Touch Screen Operations

Backing up Factory Parameters

1. Tap **Back Up** to setup the backup parameters.
2. Tap “Confirm to backup parameters” to back up the current set parameter values.



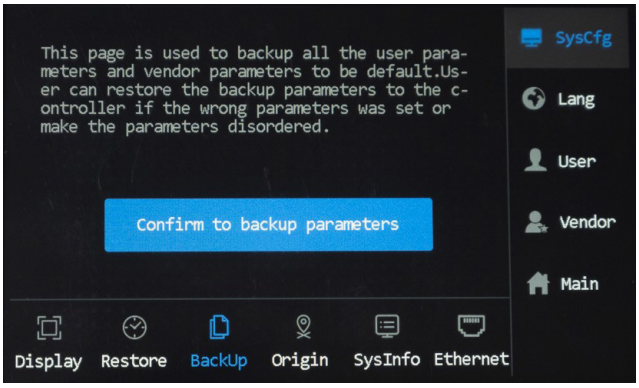
3. Enter your passcode in the pop up.



Use this feature upon powering on the engraver so that the factory defaults of the parameters can be stored for future restoration.

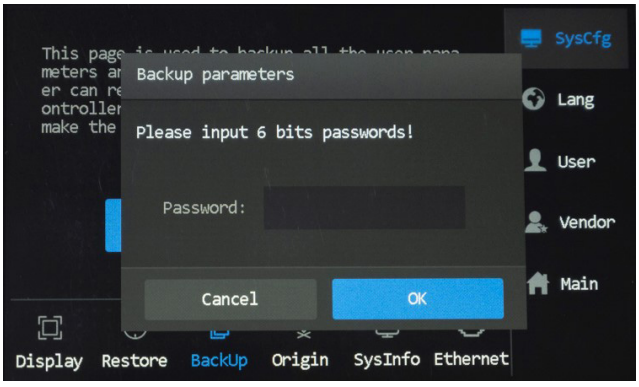
Restore Factory Parameters

Tap “Restore” to open the Restore options.



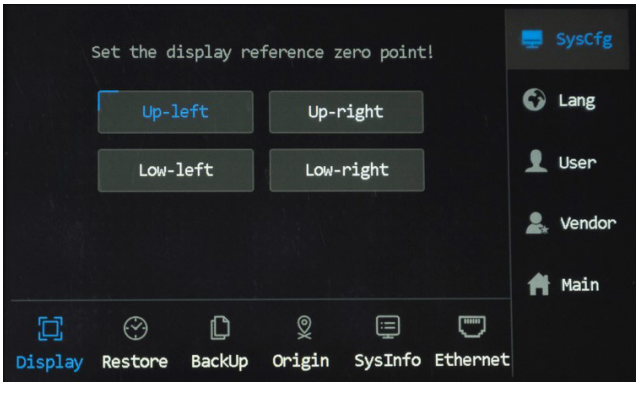
To restore factory parameter values:

1. Tap “Confirm” to restore default parameters to the controller.
2. Input in passcode 888888.
3. Tap OK.



Setting the Screen Orientation

1. Tap **Display** to open the display settings.
2. Tap one of the four options to set a different screen orientation.

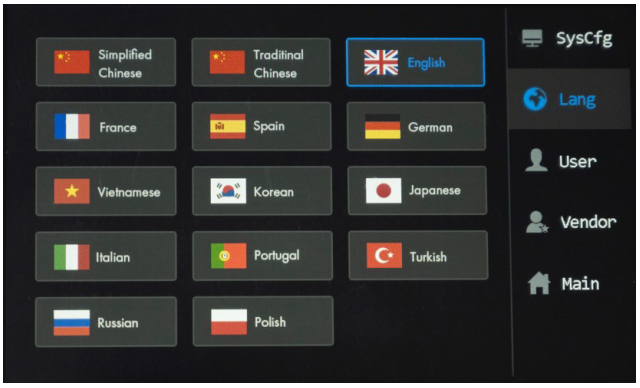


Note that your screen shows your engraving design the way you set your screen. For instance, if the screen origin is set at the Up- left, then a design will be shown in its original orientation. If you change the screen origin to Low-left, then the design will be shown flipped down along the X axis. If you change the screen origin to the Up-right, then the design will be shown flipped right along the Y axis.

6 Touch Screen Operations

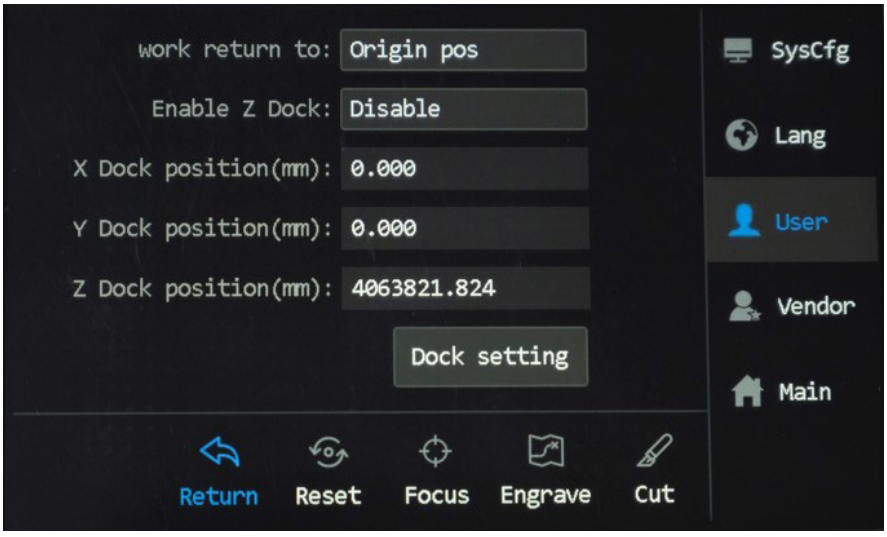
6.7.2 Language Settings

1. Tap **Menu>Lang** to open your language settings.
2. Tap to select a language. The change will take effect immediately after, and the system returns to the main menu automatically.



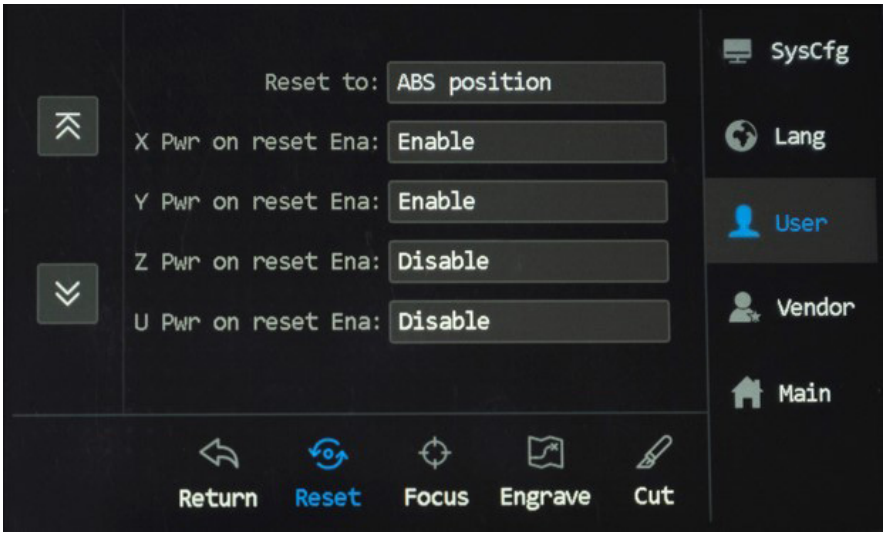
6.7.3 User Parameters

Return Submenu



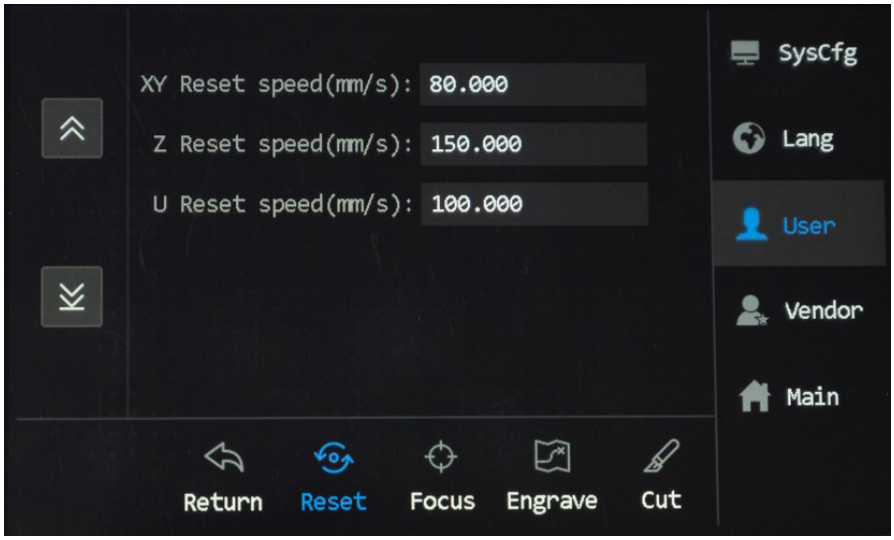
Parameters	Options	Functions/Meanings
work return to	**Origin pos**	Sets the laser head to return to the default origin.
	ABS position	Sets the laser head to return to the mechanical origin.
	Docking Point	Sets the laser head to return to the preset origin(s).
	Not return	Keeps the laser where it is.
Enable Z Dock	**Enable/Disable**	Enables and disables the laser head's return to a set Z coordinate.
X Dock position(mm)	**Numerical**	Sets the laser head to return to a set X coordinate.
Y Dock position(mm)	**Numerical**	Sets the laser head to return to a set Y coordinate.
Z Dock position(mm)	**Numerical**	Sets the laser head to return to a set Z coordinate.

Reset Submenu



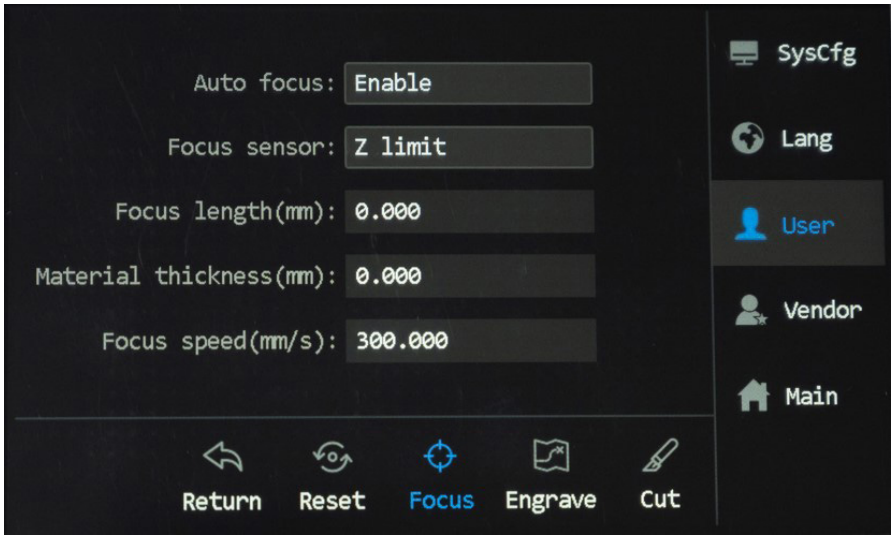
Parameters	Options	Functions/Meanings
Reset to	**Origin pos**	Sets the laser head to return to the default origin.
	ABS position	Sets the laser head to return to the mechanical origin.
	Docking Point	Sets the laser head to return to the preset origin(s).
	Not return	Keeps the laser where it is.
X Pwr on reset Ena	**Enable/Disable**	Sets the laser head to its X origin upon powering up.
Y Pwr on reset Ena	**Enable/Disable**	Sets the laser head to its Y origin upon powering up.
Z Pwr on reset Ena	**Enable/Disable**	Sets the laser head to its Z origin upon powering up.
U Pwr on reset Ena	**Enable/Disable**	Disabled

6 Touch Screen Operations



Parameters	Options	Functions/Meanings
XY Reset speed (mm/s)	**Numerical**	Sets the laser head's return speed along the X and Y axes.
Z Reset speed (mm/s)	**Numerical**	Sets the laser head to its Z origin upon powering up.
U Reset speed (mm/s)	**Numerical**	Disabled

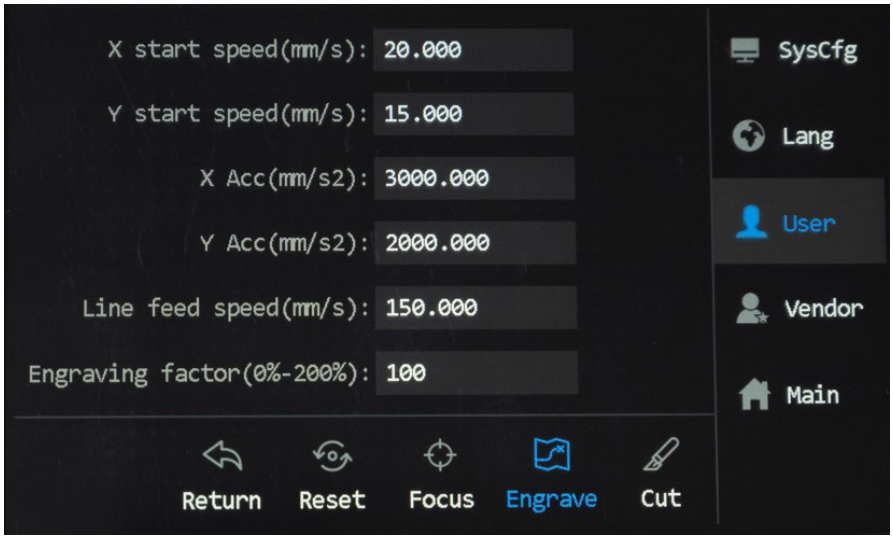
Focus Submenu



Parameters	Options	Functions/Meanings
Auto focus	**Enable/Disable**	Enables or disables the auto-focusing of the laser head.
Focus sensor	**Z limit**	Selects the focus sensor.
Focus length(mm)	**Numerical**	Sets the focal length.
Material thickness (mm)	**Numerical**	Sets the material thickness.
Focus speed (mm/s)	**Numerical**	Sets the focusing speed of the laser head.

6 Touch Screen Operations

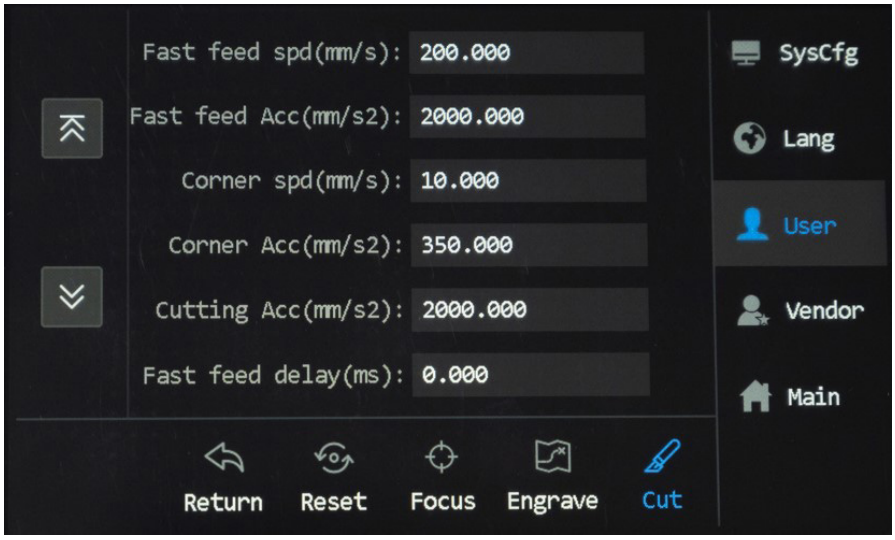
Engrave Submenu



Parameters	Options	Functions/Meanings
X start speed (mm/s)	**Numerical**	Sets the speed at which the laser head starts along the X axis.
Y start speed (mm/s)	**Numerical**	Sets the speed at which the laser head starts along the Y axis.
X Acc (mm/s^2)	**Numerical**	Sets the laser head's acceleration along the X axis.
Y Acc (mm/s^2)	**Numerical**	Sets the laser head's acceleration along the Y axis.
Line feed speed(mm/s)	**Numerical**	Sets the speed at which the laser head travels between lines.
Engraving factor*	**Numerical**	Sets the overall speed of the laser head.

*This parameter was set at the factory to match the Line feed speed and does need adjustment. If you have changed this by accident, contact the customer service to reinstate it or for customizing them.

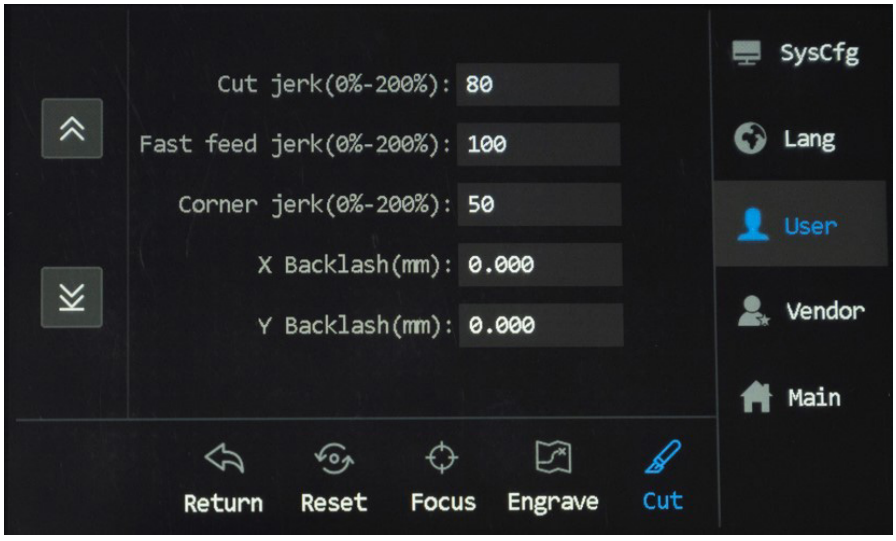
Cut Submenu



Parameters	Options	Functions/Meanings
Fast feed speed	**Numerical**	Sets the speed of the laser head when not firing laser beams.
Fast feed acc(mm/s^2)	**Numerical**	Sets the acceleration of the laser head when not firing laser beams.
Corner spd[1]	**Numerical**	Sets the speed of the laser head when making sharp turns.
Corner acc(mm/s^2)	**Numerical**	Sets the acceleration of laser head when making sharp turns.
Cutting acc(mm/s^2)	**Numerical**	Sets the acceleration of the beaming laser head.
Fast feed delay(ms)[2]	**Numerical**	Sets the time the laser head rests for after travelling without beaming.

- [1]If your engraving design has a lot of serrated or zigzag patterns, set the parameter at a value that best suits your design. Practice on scrap materials first.
- [2]When set to zero, the laser head doesn't rest after traveling without beaming. When set to a certain value, the laser head slows down upon the completion of traveling without beaming and rest for the set milliseconds.

6 Touch Screen Operations

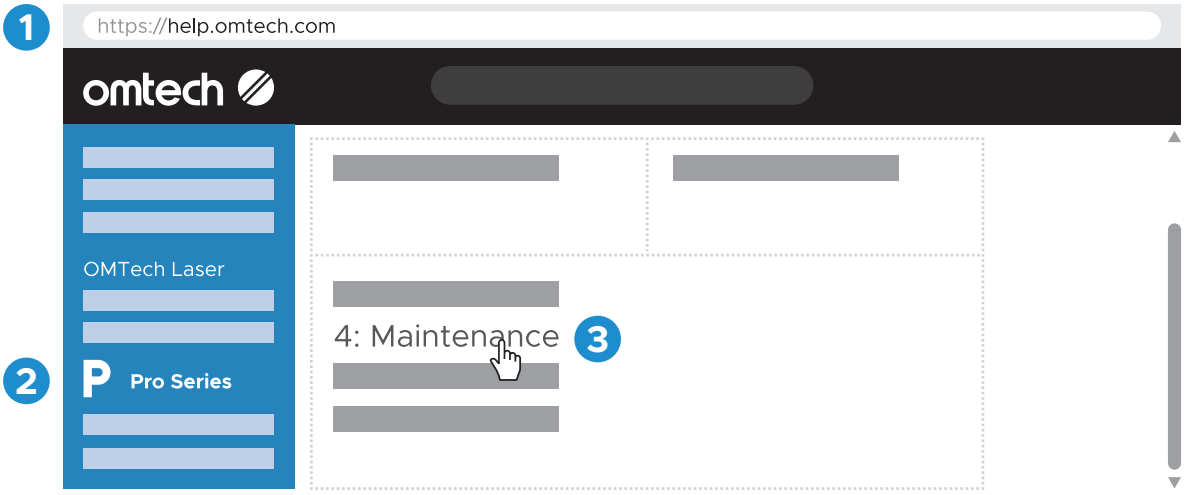


Parameters	Options	Functions/Meanings
Cut jerk (0–200%)	**Numerical**	Sets the speed of the laser head when beaming in percentages.
Fast feed jerk (0–200%)	**Numerical**	Sets the time the laser head rests for after travelling without beaming in percentages.
Corner jerk (0–200%)	**Numerical**	Sets the speed of the laser head when making sharp turns in percentages.
X Backlash	**Numerical**	Does not need adjusting.
Y Backlash	**Numerical**	Does not need adjusting.

7 Maintenance

To ensure normal use of the laser machine, regular maintenance is essential. Handle with care during maintenance as it contains high-precision components, and follow each part's procedures closely to prevent damage.

For maintenance not covered in this manual, visit the **Maintenance** section on our website, help.omtech.com, for real-time updates and assistance.



7 Maintenance

7.1 Maintenance Overview

The use of procedures other than those specified herein may result in hazardous laser radiation exposure. Before any cleaning or maintenance, always switch off the device and disconnect it from its power supply. Always keep the system clean, as flammable debris in the working and exhaust areas constitutes a fire hazard. **ONLY** allow trained and qualified professionals to modify or disassemble this device.

- Clean the workbed and empty the waste bin daily.
- The 3rd mirror and focus lens must be checked daily and cleaned if required.
- The other mirrors, exhaust system, and cooling fans must be checked weekly and cleaned if required.
- The beam alignment and the wiring connections—especially those for the laser power supply—should be checked weekly.
- The guide rails should be cleaned and lubricated at least twice a month.
- All other parts of the laser machine must be checked monthly and cleaned where required.
- In commercial settings, keep a cleaning and maintenance log in a clearly visible location near the engraver. Have operators date and sign the log as cleaning and maintenance are carried out.

7.2 Cleaning

7.2.1 Cleaning the Main Bay and Engraver

Main Bay & Engraver

***Cleaning Frequency:** Daily, after each use

- Disconnect the engraver from power before cleaning.
- After cleaning, thoroughly wipe the surfaces dry.
- **NEVER** allow water to come into contact with the electronic components.

*Depending on what you've been engraving, you might need to clean the engraver more or less often. However, we suggest cleaning it after each use for the best results.

Tools Needed:

- Paper towel
- Mild detergent

Viewing Window

Clean with mild cleansers and a lens or cotton cloth. **DO NOT** use paper towels as they can scratch the acrylic and reduce the cover's ability to protect you from laser radiation.

Main Bay Interior

Clean thoroughly with paper towels, removing any debris or deposits.

Debris Tray

1. Turn off and unplug the engraver.
2. Slide out the tray.
3. Empty loose waste, rinse dust and fine debris off, dry, and replace the tray.

Other Surfaces

Dust the other surfaces with a soft cloth or clean them using a mild detergent and then wipe clean before further use.

7 Maintenance

7.2.2 Cleaning the Focus Lens

The lens has a durable coating and will not be damaged with proper and careful cleaning. You should check the lens and the third mirror daily and clean them if there is any debris or haze on their surfaces. Your laser will be less efficient, and heat buildup from oil or dust can cause damage.

***Cleaning Frequency:** Daily, after each use

- Disconnect the engraver from power before cleaning.
- Completely wipe dry the surfaces after cleaning.
- **NEVER** allow water to come into contact with the electronic elements.
- Be careful in all of the following steps not to directly touch the lens surface with your hands or any dirty, oily, or abrasive surface. Use lens-safe gloves or cloths only.

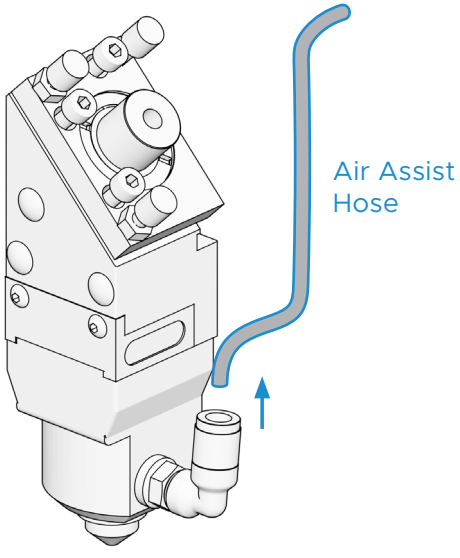
*Depending on what you've been engraving, you might need to clean the engraver more or less often. However, we suggest cleaning it after each use for the best results.

Tools Needed:

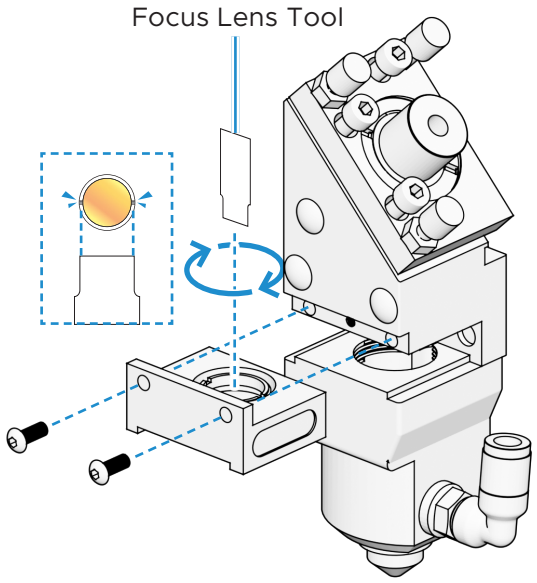
- Pressurized air
- Hex wrench set
- Cotton swab
- Lens cleaning fluid
- Lens-safe cloth/tissue
- Focus lens tool

To clean the focus lens:

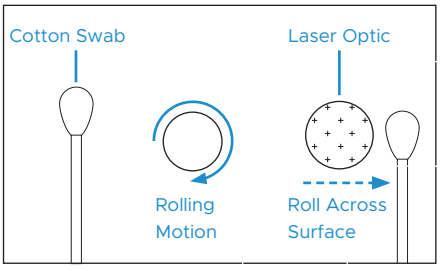
1. Move the workbed to about 4 inches (10 cm) beneath the bottom of the lens nozzle.
2. Move the laser head to a convenient location and put soft material underneath it so the lens will be protected if it accidentally falls loose during removal or replacement.
3. Remove the air assist hose from the laser nozzle.



4. Use an M3 hex wrench to loosen the two bolts. Carefully remove the middle part of the laser head and the bolts. Remove the lens from its casing using the provided focus lens tool.



5. Examine the lens's O-ring and—if necessary—clean it with a cotton swab and lens-cleaning fluid.
6. Remove any coarse dust from the lens as well as possible by applying pressurized air.
7. Examine the lens's surfaces. If it is necessary to clean it, begin by flushing its surfaces with lens-cleaning fluid.



8. Set it on a lens-safe cloth, apply more cleaning fluid, and allow about one minute for it to take effect. Gently wipe it clean with a lens tissue dampened with cleaning fluid. Repeat the process on the other side of the lens.

NEVER use the same cleaning tissue twice. Dust accumulated during the first use might scratch the other side of the lens during the second.

9. Examine the lens's surfaces again. Repeat the process above until no dust or haze is present.
10. Return the lens and its O-ring to their housing, being careful that the lens's rounded convex side is facing upward away from the workbed.
11. Carefully reassemble the laser head in reverse order and then restore the nozzle connections.

7 Maintenance

7.2.3 Cleaning the Mirrors

Camera, Mirrors, & Focus Lens

Cleaning Frequency: Daily, after each use

Disconnect the engraver from power before cleaning.

- The surfaces of these mirrors are scratch-prone. Avoid direct contact with fingers or pressing hard, which could cause scratches by grinding debris into the lenses.
- Remember to let the clean fluid used for cleaning dry before further use.

Tools Needed:

- Lens brush
- Laser-safe microfiber cloth/cotton swab
- Alcohol/laser-safe cleaning solution

To clean Mirrors 1, 2, and 3:

1. **DISCONNECT THE MACHINE FROM POWER**.
2. Thoroughly wash and dry your hands.
3. Blow any particulates off the mirror surface.
4. Drench the microfiber cloth in the cleaning solution, squeezing excess solution.
5. Wipe clean the mirrors in gentle, cicular motion.
6. Check the surfaces of the mirrors.

If any particulates or surface stains remain, repeat steps 3–6.

If any particulates or surface stains are still present after second cleaning, they are most likely permanently burned into surface. Replace the mirrors.

- The surfaces of these mirrors are scratch-prone. Avoid direct contact with fingers or pressing hard, which could cause scratches by grinding debris into the lenses.
- Remember to let the clean fluid used for cleaning dry before further use.

7.2.4 Cleaning the Exhaust System

Exhaust Pipe & Cooling Fans

Cleaning Frequency: Weekly*

*The rate of dust accumulation on the pipe and fans varies depending on the materials processed and the working environment's air quality.

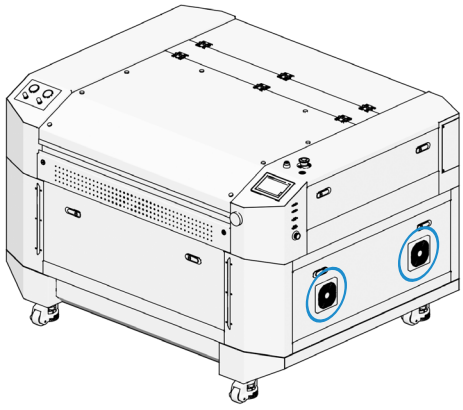
- Disconnect the engraver from power before cleaning.
- Allow the fluid used for cleaning to dry completely before reusing.

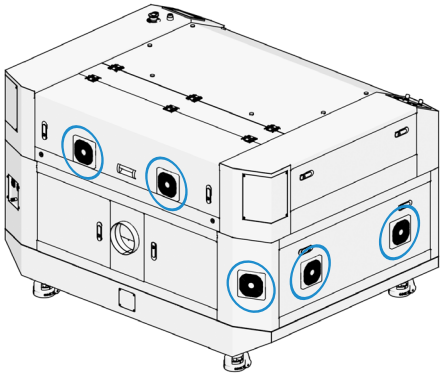
Tools Needed:

- Dust brush
- Vacuum
- Caulk
- Pressurized air

To clean the exhaust system:

1. Check the condition of the cooling fans in the access doors. Use a small brush, vacuum, or pressurized air to gently clear any visible dust.



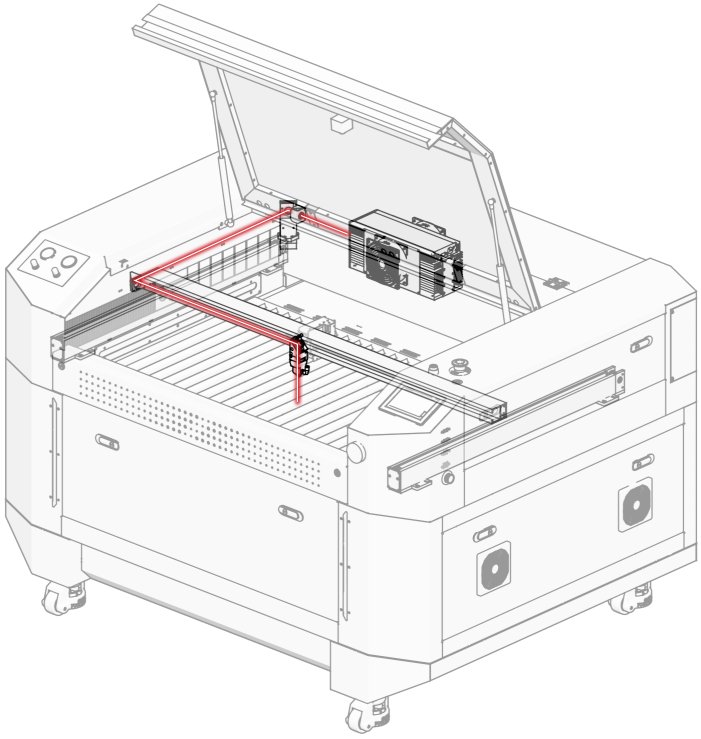


2. Check the seams and joints of the ducts for any damage or leaks. If any are found, immediately repair them. Caulk or special-purpose aluminum foil tape generally works best if available; standard duct tape can deteriorate over time, especially near heated components.

7 Maintenance

7.3 Laser Path Alignment

A properly aligned laser beam is important for the overall efficiency of the machine and quality of its work. This machine went through a complete beam alignment before shipping. When the engraver first arrives and about once a week during normal operation, however, it is recommended that users confirm that alignment is still at acceptable levels and that the mirrors and focus lens have not shifted due to the movement of the machine.



You will need to place a piece of tape at each stage of the laser path, marking it to confirm that that stage remains correctly aligned. When it is not, you will use the laser tube's brackets or the screws on the back of the misaligned mirror to correct the problem. Once the provided tape runs out, we recommend masking tape as it is easy to manage and use.

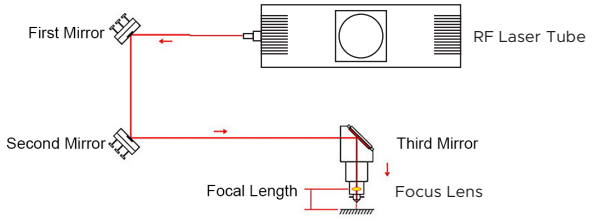
- Performing a beam alignment can expose the operator to small amounts of radiation if performed carelessly.
- Follow these procedures correctly and always take caution when performing a beam alignment.
- Perform a beam alignment at low power levels: 15% or less. Any higher percentage will cause the laser to ignite the testing tape instead of marking it. Be sure that you set the Max. Power (not Min.) to 15%

7.3.1 Laser Tube Alignment

- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to any of the mirrors.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always ensure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

Having a perfectly aligned laser path is paramount to your engraver's overall performance. Each of the Pro series went through a complete beam alignment before shipping.

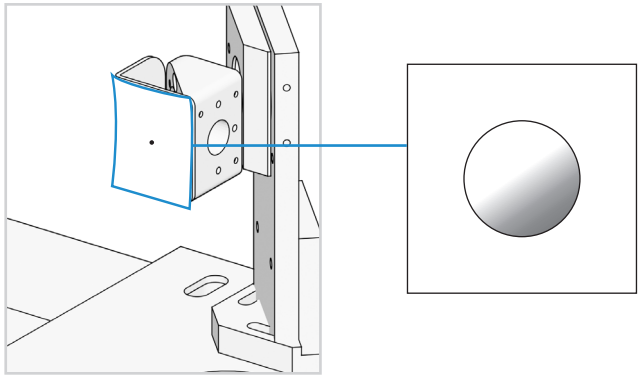
Upon first arrival and about once a week during normal operation, however, it is recommended that the alignment be checked. Refer to the diagram below for the basics of the alignment.



Tools Needed: Masking tape

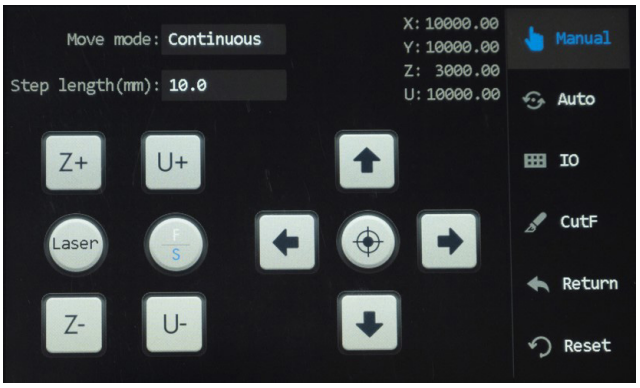
The RF laser tube is where the laser beam is generated. Once emitted from the tube, the laser hits Mirror 1 first. Follow the steps below to check the laser hits Mirror 1 right in the center.

1. Put on safety goggles and open the rear access door to expose the laser tube and Mirror 1.
2. Attach a piece of masking tape to the mirror's frame.
3. Close the cover



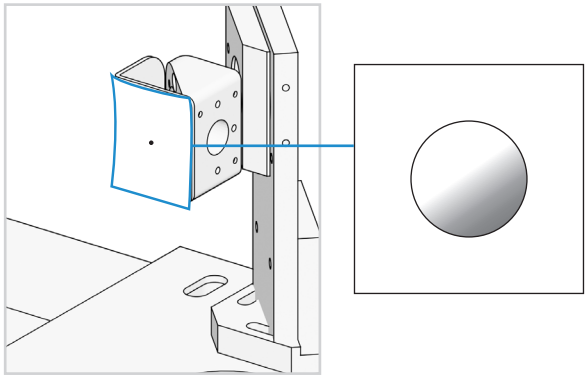
7 Maintenance

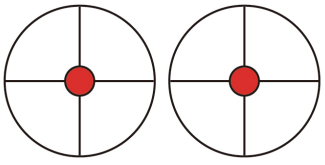
4. Turn on the machine and set the power level to 15% of the maximum power or lower.
5. Tap **Manual** in the main menu to open the manual settings.
6. Tap (laser) to manually fire the laser. You should be able to see a small mark on the tape. If it is not noticeable, tap again.



- Tapping (laser) activates the laser. Always ensure the path is clear between the laser and its target.
- Never allow foreign objects between the laser and its target. Avoid placing any part of your body in the laser path while pressing the (laser) button.

7. Check that the burnt hole on the tape is at its center.





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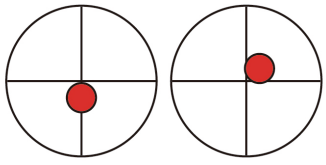


These marks require adjustment.

If not,

a. Cut the power to your laser.

b. Carefully adjust the laser tube in its brackets by loosening its bolts.

Be careful not to over-loosen any bolts and not to overtighten them. Only adjust one stand at a time.

c. Use rubber shims to elevate or remove the existing shim to lower the laser's position on the bracket.

d. Once the laser tube's elevation is adjusted, you will need to check the alignment of Mirror 1, 2, and 3.

e. When finished with adjusting the tube, repeat steps 2–8 until the burnt hole falls perfectly at the center of the tape.

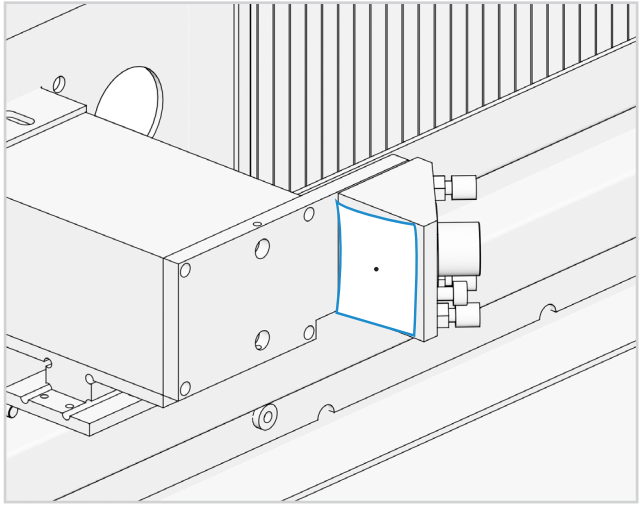
7.3.2 Mirror 1 Alignment

- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to any of the mirrors.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always ensure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

Once emitted from the laser tube, the laser beam hits Mirror 1, which reflects it to Mirror 2. To clarify, when the laser tube is properly aligned with Mirror 1, aligning Mirror 1 also aligns it with Mirror 2.

Tools Needed: Masking tape

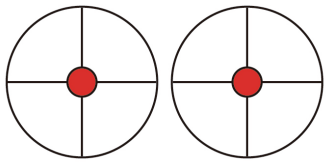
1. Tap **Manual** in the main menu.
2. Use the direction arrows on the control panel to send Mirror 2 to the back of the bed along the Y axis.
3. Attach a piece of masking tape to the mirror's frame.
4. Put on safety goggles and turn on the machine and set the power level to 15% of the maximum power or lower.
5. Close the cover.
6. Fire the laser.
7. Check that the burnt hole on the tape is at its center.



7 Maintenance

If not,

8. Cut the power to your laser and open the rear access door to expose Mirror 1 as shown.



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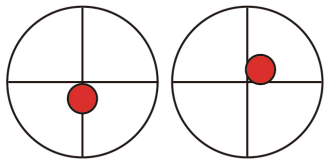
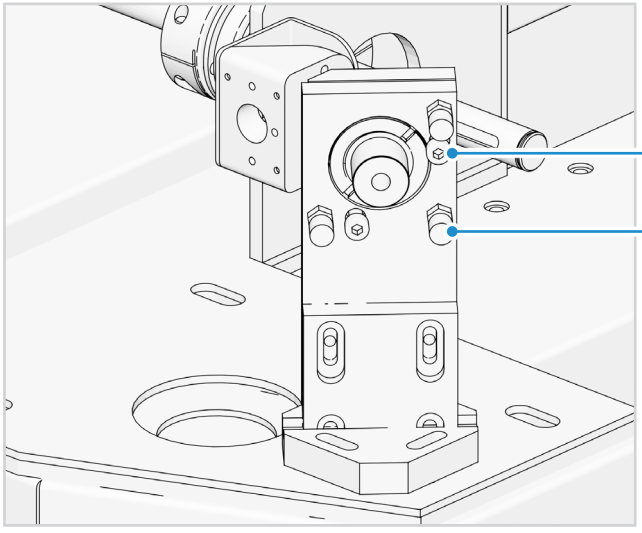
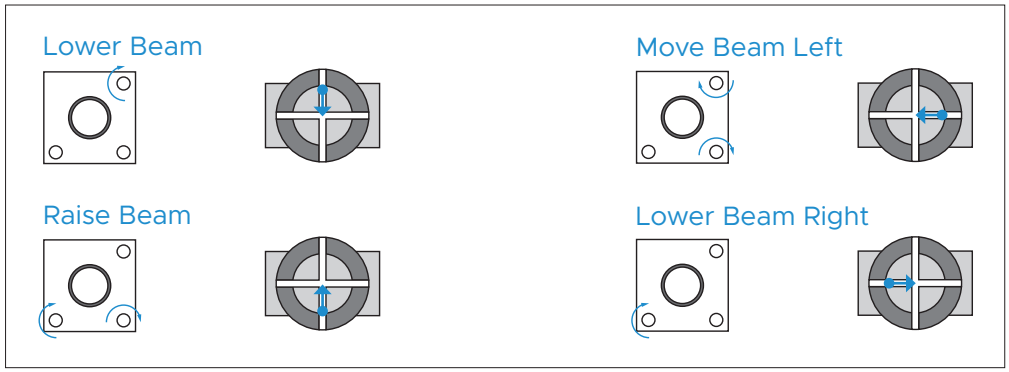


These marks require adjustment.



If the last burnt hole is way off-mark, you may need to loosen the mounting bolts of Mirror 1 to slide it into a better position before fine-tuning the setscrews.

9. Carefully turn the setscrews on Mirror 1 to adjust the angle and position of Mirror 1.



- Each screw adjusts a different position or angle.
- Keep track of which screw you are adjusting and the direction of adjustment.
- Do not turn the screw more than ¼ turn at a time and, especially at first, test the position of the laser after each adjustment so that you learn the effect of each change.

10. When finished with adjusting the setscrews of Mirror 1, repeat steps 3–9 until the burnt hole falls perfectly at the center of the tape.
11. When Mirror 1 is all set, use the direction arrows on the control panel to send Mirror 2 to the front of the bed along the Y axis.
12. Attach another piece of tape to the frame of Mirror 2.
13. Repeat steps 2–9 until the burnt hole on Mirror 2 is at the center of the tape.

7 Maintenance

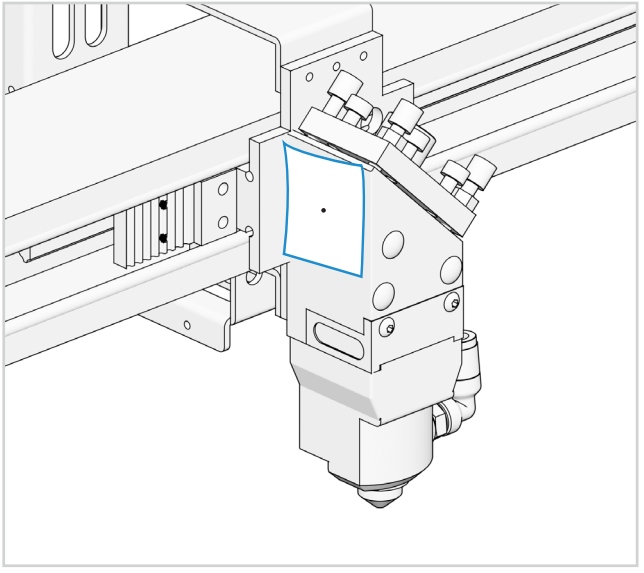
7.3.3 Mirror 2 Alignment

- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to the mirror.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always ensure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

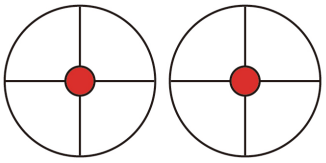
Once reflected by Mirror 1 and then Mirror 2, the laser beam hits Mirror 3. When the laser tube is properly aligned with Mirror 1, and Mirror 1 is aligned with Mirror 2, aligning Mirror 2 actually means aligning it with Mirror 3.

Tools Needed: Masking tape

1. Attach a piece of masking tape to the frame of Mirror 3.
2. Put on safety goggles and turn on the machine and set the power level to 15% of the maximum power or lower.
3. Close the cover.
4. Fire the laser.



5. Check that the burnt hole on the tape is at its center.



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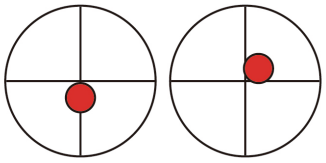


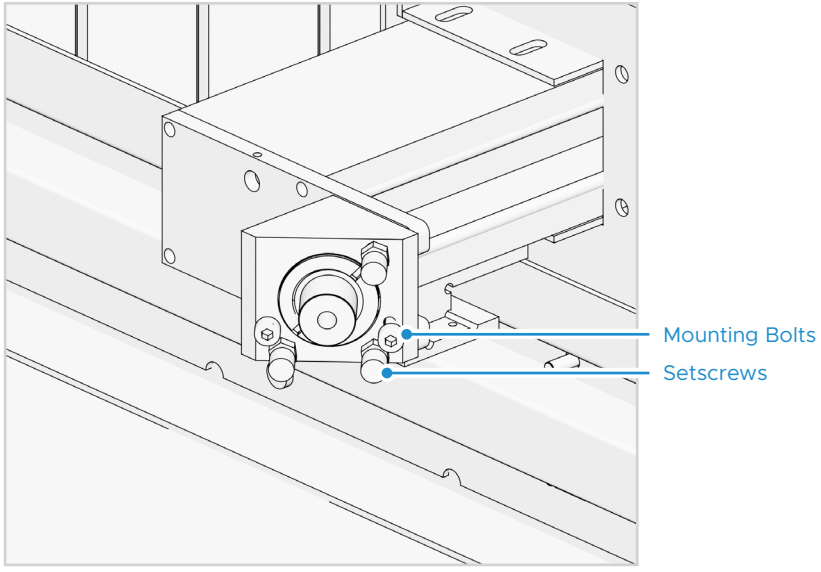
These marks require adjustment.

If not,

6. Cut the power to your laser.

> If the last burnt hole is way off-mark, you may need to loosen the mounting bolts of Mirror 2 to slide it into a better position before fine-tuning the setscrews.

7. Carefully turn the setscrews on Mirror 2 to adjust the angle and position of Mirror 2.



8. When finished with adjusting the setscrews of Mirror 2, repeat steps 2–6 until the burnt hole falls perfectly at the center of the tape on Mirror 3.

7.3.4 Mirror 3 Alignment

- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to the mirror.
- Less than 15% of the Max. power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always ensure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

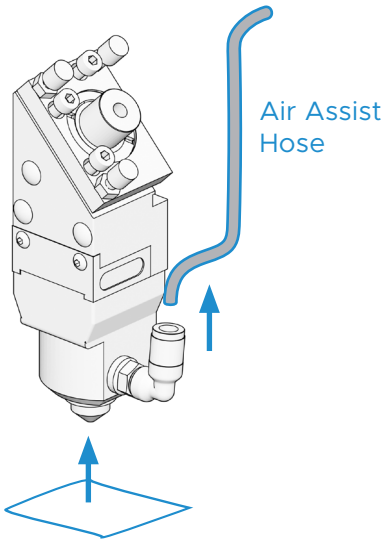
7 Maintenance

Tools Needed: Masking tape

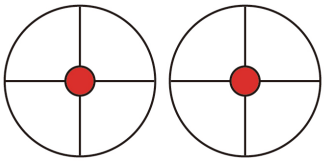
With the laser beam properly aligned through the laser tube, Mirror 1, and Mirror 2, it passes through Mirror 3, the final mirror, and eventually through the lenses in the laser head, where it is focused and fired onto the laserable material.

To align Mirror 3 with the workbed:

1. Detach the air assist hose from the laser head.
2. Attach a piece of tape to the laser head's aperture, applying some force. This will form a ring on the tape and help check the alignment.
3. Put on safety goggles and turn on the machine and set the power level to 15% of the Max. power (not Min.) or lower.
4. Close the cover.
5. Fire the laser.



6. Check that the burnt hole on the tape is at its center as shown.



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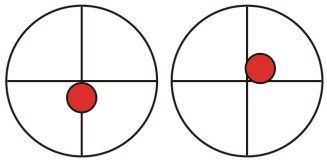


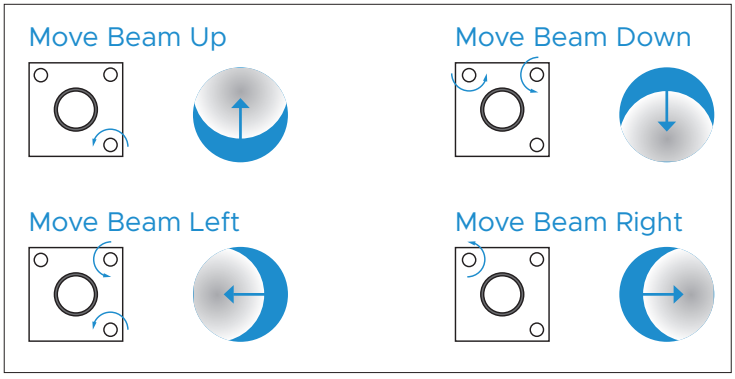
These marks require adjustment.

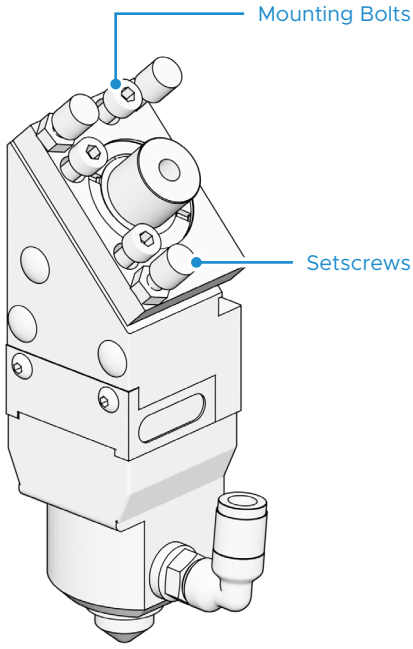
If not,

a. Cut the power to your laser.

If the last burnt hole is way off-mark, you may need to loosen the mounting bolts of Mirror 3 to slide it into a better position before fine-tuning the setscrews.

b. Carefully turn the setscrews on Mirror 3 to adjust the angle and position of Mirror 3.





- Each screw adjusts a different position or angle.
- Keep track of which screw you are adjusting and the direction of adjustment.
- Do not turn the screw more than ¼ turn at a time and, especially at first, test the position of the laser after each adjustment so that you learn the effect of each change.

7. When finished with adjusting the setscrews of Mirror 3, repeat steps 3–6 until the burnt hole falls perfectly at the center of the tape.
8. Use the direction arrows on the control panel to send Mirror 3 to the far right.
9. Repeat steps 3–6 until the burnt hole is at the right center of the tape.

When the laser is well centered along the entire path from the tube to the workbed, your laser mirrors are all correctly calibrated and (assuming they are clean) performing at optimum efficiency.

7 Maintenance

7.4 Lubrication

7.4.1 Rail

Lubrication Schedule: Every two weeks

Disconnect the engraver from power before lubricating the rail.

Tools Needed:

- Cotton cloth
- White lithium grease

1. Disconnect the engraver from power.
2. Gently move the laser head out of the way.
3. Wipe away all dust and debris along the X and Y axis rails with a dry cotton cloth until they are shiny and clean. Do the same to the Z axis screws.
4. Lubricate both the rails and screws with white lithium grease.
5. Gently move the laser head and X axis to coat the lubricant evenly along both rails.
6. Raise and lower the workbed to distribute the lubricant evenly along the screws.

7.4.2 Workbed Elevation Bolts

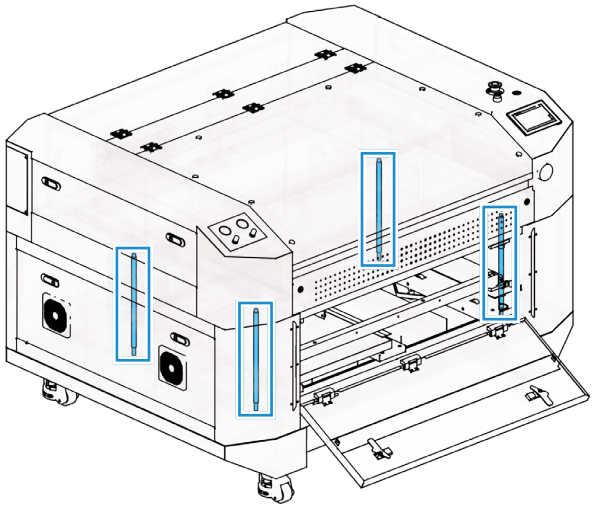
Lubrication Schedule: Every two weeks

- Disconnect the engraver from power before lubricating the rail.
- **KEEP YOUR HAND CLEAR OF THE MOVING WORKBED WHILE APPLYING GREASE**.

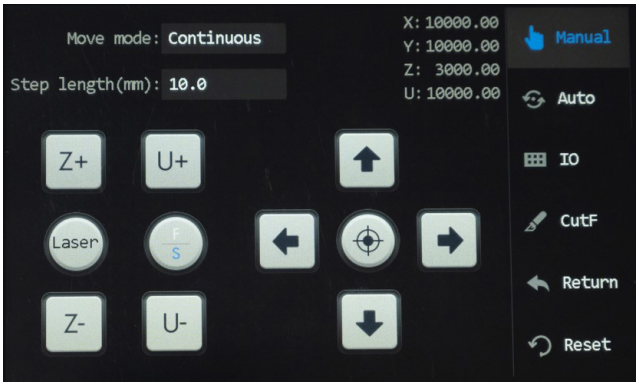
Tools Needed:

- Cotton cloth
- White lithium grease

1. Disconnect the engraver from power.
2. Open the front access door to access the bolts.



3. Tap **Manual** in the main menu to open the manual settings.



This menu is mainly for manual debugging, including axes (X, Y, Z, & U) motion, manual laser firing, positioning, IO diagnosis, frame cutting, return and system reset, and aligning the laser path. To exit this menu, tap “Auto” in this menu.

4. Clean any contaminated grease off the bolts using a piece of cloth.
5. Apply some new lithum grease at the middle of the bolts.
6. Use the up and down keys to move the workbed along it full stroke of motion along the bolts.
7. Raise and lower the workbed to distribute the lubricant evenly along the screws.

7 Maintenance

7.5 Parts Replacement

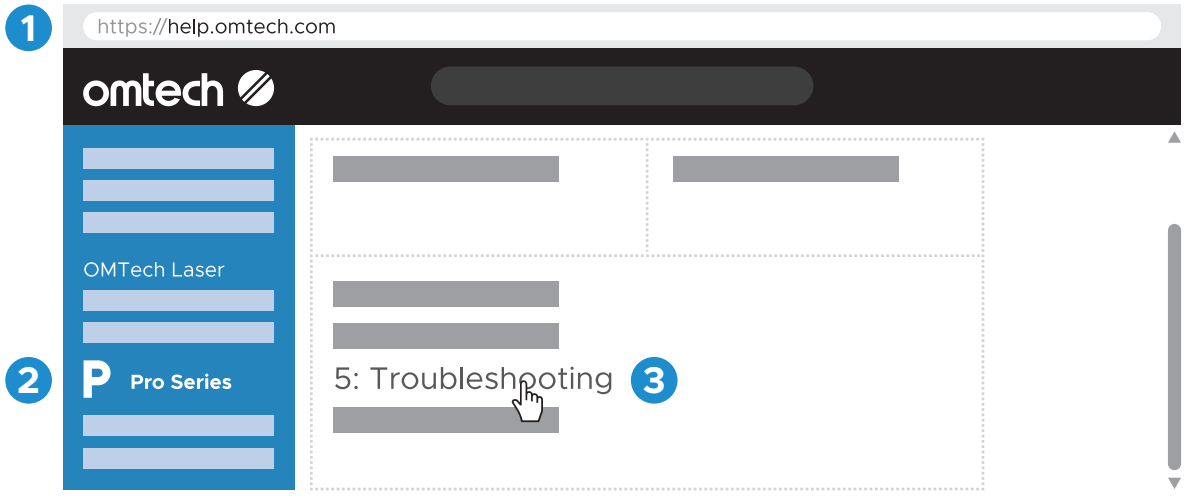
This engraver should not be modified or disassembled by anyone except trained and licensed professionals, but some consumable parts may require replacement after prolonged use. Contact your vendor or our technicians if you have any questions about fitment or installation. Using incompatible components is highly dangerous and waives all the manufacturer's liability for any damage or injury caused.

ALWAYS completely disconnect the engraver from its power supply before replacing any parts.

8 Troubleshooting

- Adjustment, maintenance, and repair of the electrical components of this cutter must be done **ONLY** by trained and qualified 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 cutter when it is turned off, disconnected from its power supply, and fully cooled. For maximum safety, wait about 3 minutes after turning the machine off before adjusting the electronic parts. This will allow time for the ground connection to clear any residual charge.

For common issues and solutions not stated in this manual, visit the **Troubleshooting** section at help.omtech.com for real-time updates and assistance.



User Manual

OMTech PRO QUANTUM 45 | CO_2 Cabinet Laser Engraver

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Rev. 10 Oct. 2025