Good-Laser

Good-Laser

# Light 640

CO2 laser cutting machine

# Product User Manual


Applicable to Light 640/960/1390/1610 models

Dongguan Henghao Laser Technology Co.,Ltd

www.good-laser.com info@good-laser.com

3 / F, Building 1, Haoxuan Bay Smart Tech Park, North Wang Road, Huangchongcun, Zhongtang Town, Dongguan City, Guangdong Province, China

# Introduction

## Definition and principle of CO2 laser cutting machine:

A CO2 laser cutting machine is for non-metallic laser cutting that usually relies on a laser power source to drive the laser tube to emit light. The light is refracted by several reflectors and then transmitted to the laser head, and then the focusing lens installed on the laser head focuses the light source into a point. This can generate extremely high temperatures on the material, instantly evaporating it into gas, which is then extracted by the exhaust fan to achieve the cutting process. Because the main gas filled in the laser tube is CO2, this laser tube is called a CO2 laser tube, and the cutting machine using this laser tube is called a CO2 laser cutting machine.

## The user manual description:

This manual is a guide for the installation and use of Good-Laser cutting machines; the manual is divided into 7 chapters, including general information, safety instructions, key components of each laser cutting system, installation steps, operating instructions, maintenance instructions, and after-sales service & technical support for the machine.

Firstly, it needs to be emphasized that the installation of each system must meet the requirements and be consistent with the installation requirements of Good-Laser, otherwise it will lead to problems such as machine malfunction, poor performance, shortened life or increased maintenance costs or even machine damage.

The purpose of these precautions is to understand the specific requirements for machine installation. Users should understand the precautions before operating the machine in order to install and use it correctly. If you encounter any installation problems, please contact our technical and customer service support.

## Notes:

* Please read this manual carefully before operating the machine.
* Due to machine upgrades and improvements, if there are differences in some details between the actual machine and the manual, please refer to the actual machine product.

# Contents

# Chapter 1 Summary

## 1.1 Basic information

Please read this manual carefully before installing or operating the machine. Failure to fully understand and follow the operating instructions may cause personal injury, property damage, fire, electric shock, equipment failure, performance degradation, and serious malfunction.

Please operate only with the equipment and spare parts provided with the machine or listed in the consumables list. The use of unofficial spare parts may invalidate the warranty. And all auxiliary equipment should be debugged according to the requirements of the basic machine.

## Tag Description

Warning: Exercise caution when operating the machine.

High voltage: Components with power, avoid injury.

Laser radiation: This area is a laser operation area, please be aware of laser hazards.

Fire Hazard: Risk of fire, do not operate machine unattended.

Tip: Help users simplify content to make operational information easier to understand.



## 1.2 Compatible Material

Good-Laser Light Series laser cutting machine can be used to cut and engrave various materials such as wood, rubber, acrylic, coated metal, tin, special steel and other compatible materials. Please follow the following processable material.

| Materials | | Line drawing | Cutting | Shallow engraving | Deep engraving |
|---|---|---|---|---|---|
| Wood board | Solid wood | √ | √ | √ | √ |
| | Plywood | √ | √ | √ | √ |
| | density board | √ | √ | √ | √ |
| Plastic | Acrylic | √ | √ | √ | √ |
| | ASB two-tone panel | √ | √ | √ | √ |
| | PET | √ | √ | √ | √ |
| Paper | Printing paper | √ | √ | √ | — |
| | Corrugated paper | √ | √ | √ | — |
| | Cardboard | √ | √ | √ | — |
| Textile | Cotton cloth | √ | √ | √ | — |
| | Denim | √ | √ | √ | — |
| | Felt | √ | √ | √ | — |
| Laser rubber | | √ | √ | √ | √ |
| Foam cotton | | — | √ | — | — |
| Bamboo | | √ | √ | √ | √ |
| Ceramic | | — | — | √ | √ |
| Glass | | — | — | √ | — |
| Metal（coated surface） | | — | — | √ | — |

Note: “√” means it can be processed, “-” means it cannot be processed.

1. The engraving process must be carried out with the machine adjusted.
2. For cutting applications with a laser tube power of 80W or above, a cutting table must be used.
3. If using the system in other potential risk areas is not in accordance with the designated purpose, the manufacturer assumes no liability for personal injury and/or damage to the machine caused by such use.
4. The laser cutting machine may only be operated, maintained and repaired by personnel familiar with the designated area of use and the hazards of the machine.
5. In the event of defects, the manufacturer assumes no liability for failure to comply with the operating, maintenance and repair instructions described in this operating manual.
6. Be careful when processing conductive materials (carbon fiber), conductive dust or particles in the surrounding air may damage electrical components and cause short circuits. Please note that these defects are not covered by the warranty.

## 1.3 Machine scrapping notes

Do not dispose of the machine with domestic waste! Electronic equipment must be disposed of in accordance with regional electrical and electronic waste disposal directives. If further questions arise, please confirm and seek professional advice from your supplier on how to dispose of the machine.



## 1.4 Machine Specifications

| Laser machine model | Light 640 | Light 960 | Light 1390 | Light 1610 |
|---|---|---|---|---|
| Laser power | 40W/60W/80W | 60W/80W/120W | 480W/120W/150W | 120W/150W/180W |
| Laser type | Sealed CO2 glass laser tube | | | |
| Working area | 600×400mm | 900×600mm | 1300×900mm | 1600×1000mm |
| Working platform | Honeycomb panel platform + aluminum blade platform | | | |
| Work platform lifting | support | | | |
| Z rail height | 150mm (5.9inch) | 230mm (9.1 inch) | 230mm (9.1 inch) | 230mm (9.1 inch) |
| Working platform size | 700x530mm (27.6″ x 20.9″) | 1000x730mm (39.4″ x 28.7″) | 1400x1030mm (55.1″ x40.6″) | 1700x1130mm (66.9″ x 44.5″) |
| Maximum material size (Front and rear doors closed) | 700x530x170mm (27.6″x 20.9″x6.7″) | 1000x730x230mm (39.4″x 28.7″x 9.0″) | 1400x1030x230mm (55.1″x 40.6″x 9.0″) | 1700x1130x230mm (66.9″x 44.5″x9.0″) |
| Maximum material size (Rear door open to penetrate) | 700x∞x20mm (27.6″× “∞” X 0.8″) | 1000x∞x20mm (39.4″x “∞” x0.8″) | 1400x∞x20mm (55.1″× “∞” x0.8″) | 1700x∞x20mm (66.9″x “∞” x0.8″) |
| Machine size (W x L x H) | 700x530mm (27.6″×20.9″) | 1000x730mm (39.4″x 28.7″) | 1400x1030mm (55.1″x 40.6″) | 1700x1130 (66.9″x 44.5″) |
| Machine weight | 130kg(287lb) | 310kg(683lb) | 430kg(948lb) | 470kg(1036lb) |
| Maximum working speed | 1000mm/s | | | |
| Repeated positional accuracy | 0.01mm-0.05mm | | | |
| Focus mode | Auto focus, manual focus | | | |
| Continue carving when the power off | Support | | | |
| Motion control system | Pull out storage drawer | | | |
| Working platform size | High speed simple servo motor, simple servo driver | | | |
| Communication connection mode | LAN cable connection, USB connection, | | | |

| Laser machine model | Light 640 | Light 960 | Light 1390 | Light 1610 |
|---|---|---|---|---|
| Repeated positional accuracy | Diameter of outlet 150mm | | | |
| Cooling system | Water cooling system | | | |
| Laser software | Good-Laser LightMaker （Support LightBurn） | | | |
| Processing technical | Line drawing, cutting through, deep carving, shallow carving | | | |
| Supported file formats | JPEG File:JPG,PNG,BMP，vector format:LPC,DXF,PLT,SVG | | | |
| Frequency（Hz） | 50/60Hz | | | |
| Phase | Single phase | | | |
| Full load current | 6A | | | |
| Power adapter | 230V alternating current | | | |
| Total power | ≤1.5KW | | | |
| Compatible Material | Wood, acrylic, leather, cloth, plastic, cardboard, rubber, two-color board, marble, glass anodized aluminum, other non-metallic materials. | | | |
| Safety standards | Tested by SGS laboratory and obtained the EU CE certificates, FDA Class 1 safety laser registration, working cabin cover opening protection function, water cooling protection system, temperature control automatic alarm system, leakage circuit protection system. Emergency stop protection system, optical path system, tempered glass observation system, working status indicator light, etc. | | | |



## Machine features

| | |
|---|---|
| Opening protection | Waterproof protection |
| Fire alarm protection | Dual air auxiliary control |
| Laser red dot positioning | Auto focus |
| Intelligent operation motherboard | Exclusive APP laser design, control, operation |
| Workbench lifting | Dual platform honeycomb work platform + aluminum blade platform |
| Can place unlimited length processing materials Rear straight-through door | Rear door open through |
| 2.0(50.8)focus lens | Working station indicator |
| Emergency stop | LCD operate panel |
| Safety key | 3D engraving |
| Industrial air extraction system | Integrated industrial water cooling system |
| Integrated air pump unit | New machine free installation operation |

## Optional accessory

| | | |
|---|---|---|
| Rotating shaft (optional) | Smoke filter (optional) | CCD camera (optional) |

## Power, voltage, circuit breakers and chillers

| | | | | | | |
|---|---|---|---|---|---|---|
| **Power demand** | 110 or 220V AC, 50 or 60Hz, single phase<br>The laser machine requires 110V or 220V voltage (customized by the original manufacturer): support both 50Hz and 60Hz, single phase. | | | | | |
| **Power dissipation** | 1600W | 1700 W | 1900W | 2000W | 2000W | 2200W |
| **Recommended circuit breaker** | 15A, 110V | 15A, 110V | 20A, 110V | 20A, 110V | 25A, 110V | 25A, 110V |
| | 10A, 220V | 10A, 220V | 10A, 220V | 10A, 220V | 15A, 220V | 15A, 220V |

## Environmental condition requirements

| | |
|---|---|
| **Environment temperature** | +15℃ to +35℃ / 59°F to 95°F |
| **Humidity** | 40% to maximum 70%, non-condensing water |
| **Altitude** | Under 1000m |

## Laser safety

| | |
|---|---|
| **Laser class** | CDRH Laser safety class |
| **FDA laser class** | Class 1 laser |
| **Certification** | Passed CE test certification, FDA Class A laser product registration |



## 1.5 Manufacturer label

The manufacturer's label is located on the back of the machine.

It is recommended that you record all data so that when your machine has problems or needs to be maintained, you can obtain the machine information and provide it to the manufacturer.

# Chapter 2 Safety

## 2.1 Basic safety information

All personnel involved in the installation, setup, operation, maintenance and repair of the machine must read and understand this user manual, especially the "Safety" section. It is recommended that users develop internal company instructions based on the professional qualifications of the personnel employed by the company and confirm in writing that employees have read and understood each time an operator manual is issued or an introduction/training is conducted.

## Work safety awareness

This machine may only be used by specially trained and authorized personnel.

The competence range for the different activities within the operating range of the machine must be clearly defined and adhered to so that no unclear competence issues arise in terms of safety. This applies in particular to activities on electrical equipment, which may only be performed by dedicated experts. For all activities related to installation, setting, operation, modification of operating conditions and methods, maintenance, inspection and repair, the shutdown procedures that may be provided in the operating manual must be adhered to.

## 2.1.1 Safety information for users and operators

1. It is not permitted to use operating methods that affect the safety of the machine.
2. The operator must ensure that he/she is a qualified operator.
3. The operator is responsible for checking the machine for visible damage and defects before starting work and immediately reporting any changes that affect the safety of the machine (Including changes during operation).
4. The operator must ensure that the machine is operated in an intact condition.
5. The operator must ensure cleanliness and accessibility around the machine through the corresponding instructions.
6. No safety components may be removed or interrupted (potential dangers may occur, such as severe burns, blindness, etc.) If safety components need to be removed during repair and maintenance, they must be restarted immediately after completing the maintenance and repair activities.
7. All preparations, modifications, replacement of workpieces, maintenance and repair work on the machine must be carried out by trained personnel with the equipment turned off.
8. Any unauthorized modifications and changes to the machine will invalidate the warranty. This does not apply to operations such as following the best safety precautions, general maintenance, adjustment and calibration of the machine.



## 2.2 Laser safety information

1. Based on the evaluation of the potential dangers of the laser machine, the machine is classified as a Class I safety level. Good-Laser Light series is a Class I safety level laser cutting machine. This depends on the guarantee of its safety protection housing and safety devices. Please note that improper operation and maintenance of the machine may change the state of the machine's safety level and cause harmful laser radiation.
2. The laser machine contains a Class II carbon dioxide laser that emits densely and is invisible. Without safety protection, direct emission or diffuse reflection is dangerous.
3. If there is no safety protection, operator exposed to laser radiation will have the following risks:
   - Eye: Burns the cornea
   - Skin: Burns
   - Clothing: Fire hazard
4. Do not attempt to modify or disassemble the laser, and do not start a modified or disassembled laser machine.
5. In addition to the above-mentioned operation and adjustment of the machine that will cause laser radiation, other improper operation behavibors may also cause harmful laser radiation.

## 2.3 Safety precautions when operating the machine

Good-Laser Light series are equipped with an integrated safety system that stops the laser work immediately when the protective cover is opened. If the cover is opened during processing, the work will be incomplete. If you want to interrupt the cutting or engraving process, press the "Pause" button first.
When using this machine, please remember the following safety precautions:

1. Place a carbon dioxide fire extinguisher near the laser cutting machine. Always place a maintained and inspected fire extinguisher.
2. Do not store any flammable materials inside the equipment, especially remove the residues of production materials in time to prevent fire hazards.
3. Keep the air flowing around the machine and do not cover the machine with anything when the machine is running.
4. It is forbidden to leave the machine unattended when it is running. If no one is watching, the fine materials may be ignited and damage the machine.
5. Use air assist. When performing vector cutting, please use the air assist function by default.

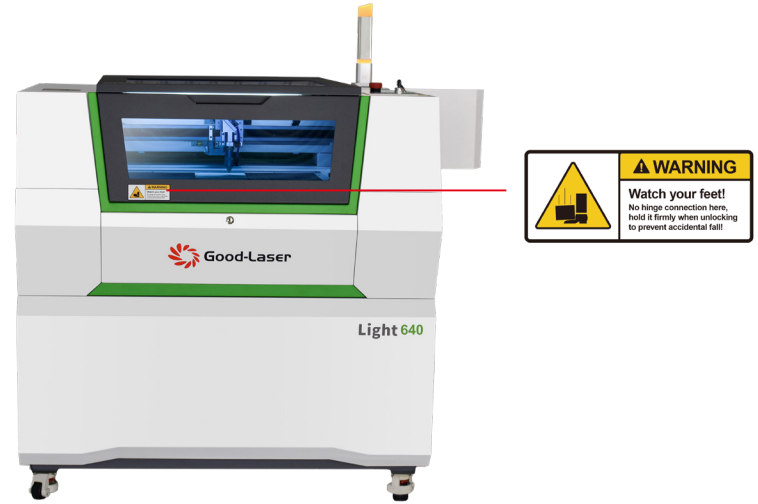
1. Lasers emit invisible radiation; safety glasses should be worn when maintaining these machines to ensure your safety.
2. Adjustments to the beam path must be made by specially trained personnel. Improper settings can result in uncontrolled emission of laser radiation.

1. It is forbidden to deactivate limit switches and safety devices. Otherwise, the resulting personal injury and machine damage are not covered by the warranty.
2. Before processing materials, please determine whether the materials will release toxic substances and whether the exhaust filtration equipment is suitable for handling these toxic substances: We would like to emphasize that when selecting filters and exhaust systems, it is your responsibility to consider the boundary values of dust, smoke and various exhaust gases in your country and region (the maximum emission concentration that cannot be exceeded).
3. Under no circumstances should you use lasers to process PVC (polyvinyl chloride).

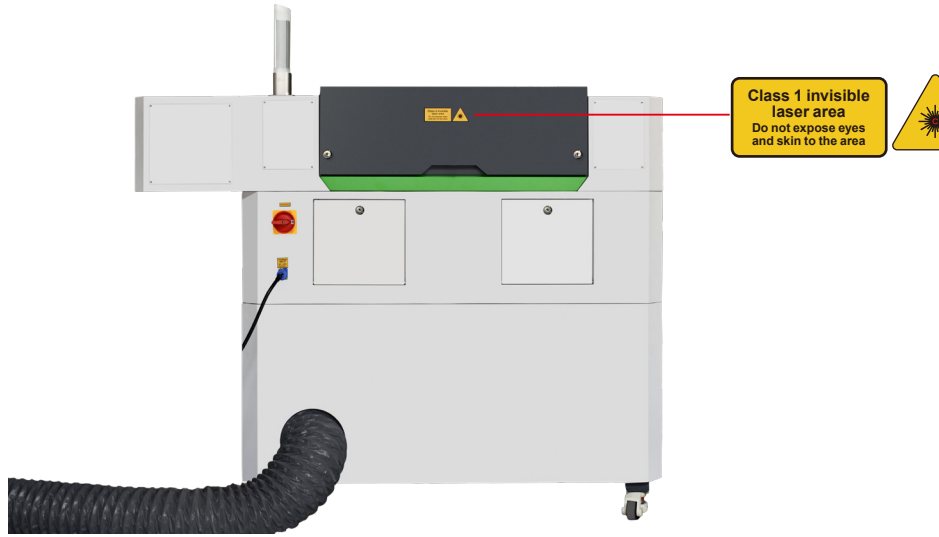


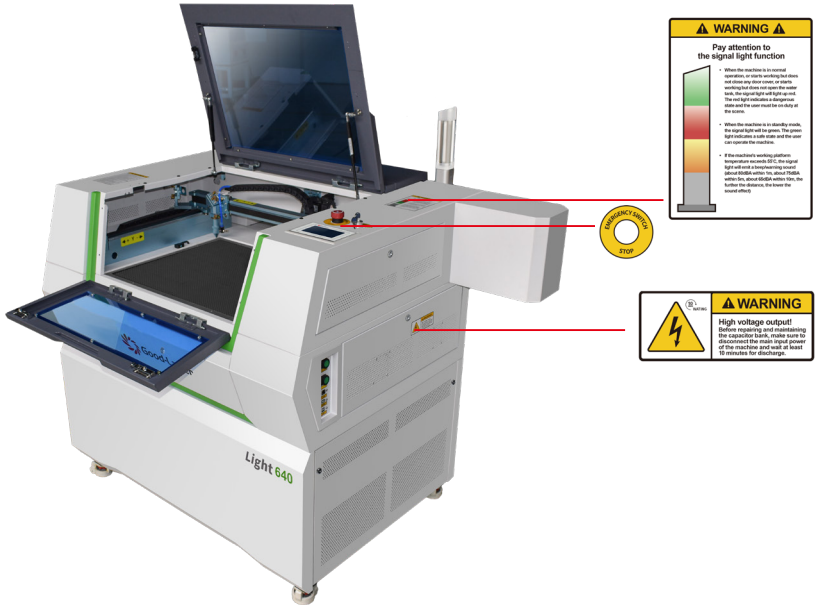
## 2.4 Warnings and information labels

Always read and understand the warning and information labels located throughout the machine. If a label is missing or damaged, it must be replaced immediately.


⚠ WARNING ⚠
Ecowatt Duct Fan
Model:HF-150PE
110-240VAC
0.94A(MAX)
70W 3000r/min 647m/h 503Pa
⚠ WARNING
High voltage output!
Before repairing and maintaining the equipment, make sure to disconnect the main input power of the machine and wait at least 10 minutes for discharge.
⚠ WARNING
Voltage hazard!
Do not touch the current!


Class 1 invisible laser area
Do not expose eyes and skin to the area


⚠ WARNING ⚠
Pay attention to the signal light function
EMERGENCY SWITCH
STOP
⚠ WARNING
High voltage output!
Before repairing and maintaining the equipment, make sure to disconnect the main input power of the machine and wait at least 10 minutes for discharge.

# Chapter 3 Machine installation process

## 3.1 Unbox the new machine

Good-Laser's Light series laser cutting machine products are packaged in wooden boxes, which contain the laser machine and accessories. After receiving the new laser cutting machine, please check it carefully and follow the steps to unpack and assemble the laser machine.

Please keep the wooden box, including the outer wooden box and the inner packaging equipment. It will be needed if returning the goods.
If you need to dispose of waste items, please check and comply with the local applicable waste disposal laws.
1. First, place the wooden box on a flat and spacious room or ground for packaging removal.
2. Take out the machine packaging box;
3. Take out the key and open the front door of the laser machine, take out the accessory tool box, and carefully check each item in the tool box.
4. You will see an accessory table on the machine, check if the accessories are all in the table.
5. Please remember to keep the key, warranty certificate and serial number of the machine, which may be needed when you need to seek technical support.
6. Take out the sponge and nylon tie from the inside of the machine, and then start to install the machine, please follow the instructions in this operation manual carefully.

## 3.2 Machine placement instructions

Before installing the laser cutting machine, please select a suitable location and follow the guidelines below:

1. Avoid exposing the machine to high temperature, dusty and high humidity environments. (Humidity should not exceed 70%).
2. Avoid exposing the system to mechanical shock.

1. Circuit breaker protection: Do not connect other devices to the same circuit as the laser machine power supply, make sure to use a dedicated circuit.
2. Do not open any access panels of the machine while the machine is plugged into the power supply.
3. Do not make or break any electrical connections to the machine while the machine is turned on.



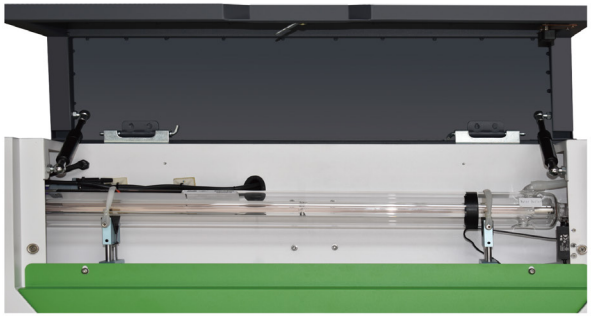
1. Avoid placing the machine in a location where the air is not circulating. It must be placed in a place with good air circulation. The location where the machine is placed is between 15℃ and 25 ℃ (59°F-77°F) in the room. Avoid excessive temperature or strong light. This is essential to maintain the consistency and reliability of the CO2 laser, metal RF or glass tube, and the machine itself. Please avoid the laser machine being in too high an ambient temperature and being strongly exposed to sunlight. If light is required, use blinds to block strong light.

2. The mechanical shock and vibration of the machine will have an adverse effect on the performance and life of the machine. After a period of use, the performance will be significantly reduced and the maintenance rate will increase. It may even be damaged. Placing the machine in an environment with appropriate temperature control, dust-free, moisture-free, flat ground, stable surface, and flat concrete floor, and using the officially recommended selection is are essential for the continued performance of the machine, which is are also a warranty and necessary condition.

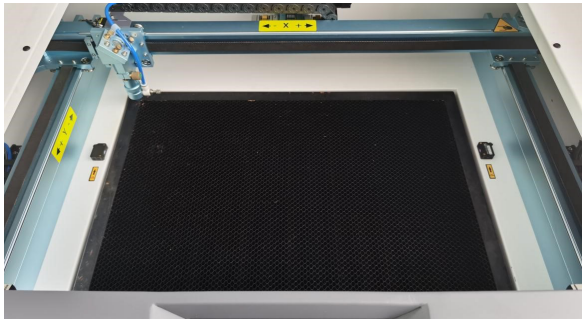
3. The laser cutting machine will generate noise during operation, especially at high power, the noise will be more obvious, Within the normal human physiological acceptable range, the maximum operating noise does not exceed 70dB.

## 3.3 Pre-installation instructions

1. Open the rear door cover and take out the sponge around the laser tube, as shown below:



2. Remove the nylon tie around the honeycomb panel and the transparent bag on the front of the honeycomb panel. As shown in the following figure:





3. Unlock the rotary emergency stop switch and insert the key switch, and turn the key switch to the on state (The whole machine must be turned on before using it for the first time).


4. After the machine has been fully inspected, please set and ensure that the four corner feet are re-secured. Tighten the red screws on the four sliding wheels at the bottom of the machine counterclockwise to lock them in place, as shown in the figure below.

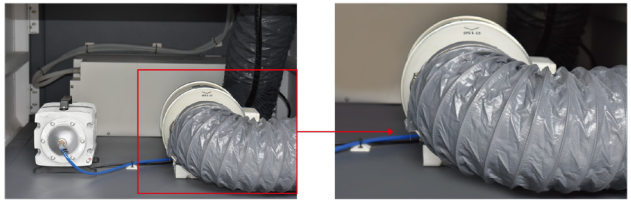
If you want to push move the machine to a different location, you can push to move the machine by loosening the red screws.

## 3.4 Exhaust system, Air system, Water cooling system

Good-Laser Light series laser cutting machines are all equipped with exhaust systems. The air system and water cooling system are already equipped and fixed inside the machine, so users do not need to install them separately. Except for some special cases, dealers require these parts to be separated. If these parts are separated, please contact your supply dealer.

### 3.4.1 Exhaust system

Proper fume extraction is essential to exhaust the flammable and toxic fumes generated during the laser process, This machine has been equipped with a professional exhaust system. including a blower rated for flow, volume and duty cycle, as well as properly installed ducting and peripherals. It can further reduce the odor of fine particles through an in-line filtration system.

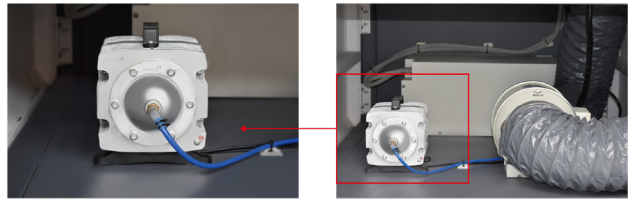


Do not start the machine without the exhaust system installed, plugged in and properly connected.



### 3.4.2 Air system

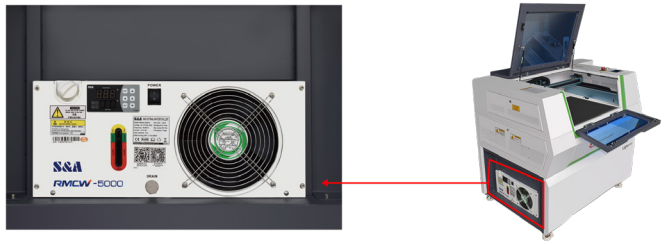
The included air pump that is fixed inside the machine provides dual-stage air assist control, which is a critical component. It helps maintain the focus lens and cools the cutting and engraving process. Air assist is also critical to reducing flames and clearing the debris field when cutting and engraving.



Please note that the air system function needs to be turned on and used at all times when using the vector cutting function.

### 3.4.3 Water cooling system

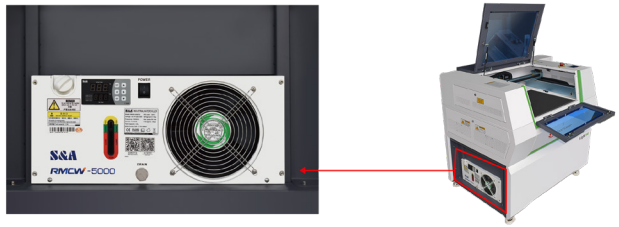
The machine integrates an industrial-grade professional active water cooling system to keep the laser tube cool during processing. Overheating can severely shorten the tube life and cause irreparable damage to the tube. The provided cooler only plays a cooling role, so it is crucial to prevent the laser cutting machine from freezing.



If there is not enough water in the water cooling tank (And the water must be pure water or distilled water without impurities, etc.), do not start the machine.

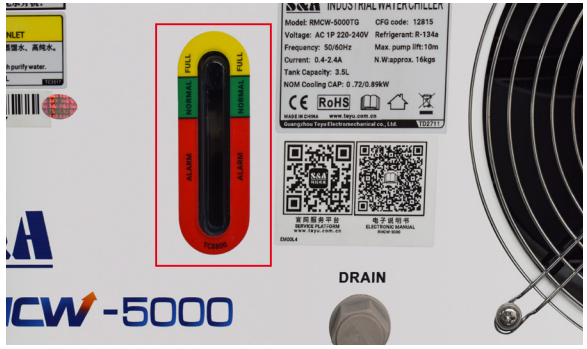
## 3.5 Fill water into the water cooling system

1. Open the safety door on the lower left side of the machine with the key.




2. Unscrew the tank lid.

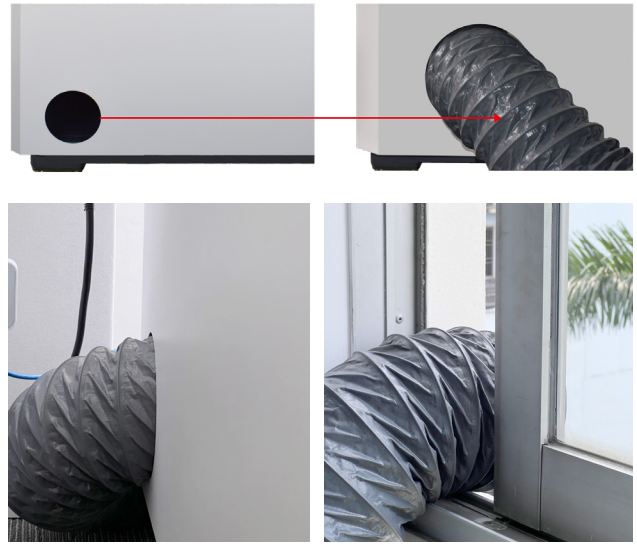
3. Fill the water tank with purified or distilled water until the water level on the water meter shows the green area. After running the cooler for a while, water will be injected into the laser tube of the machine. Please add waterpurified or distilled water again to keep the water level in the green area.






## 3.6 Remove the exhaust pipe

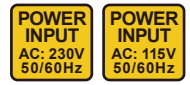
Use the key to open the safety door on the lower left side, take the other end of the exhaust pipe out of the bottom box and place it outdoors or at the air outlet.(If the machine is far away from the outdoors, you may need to equip it with a dust or smoke filter to ensure the air quality of the working environment).



## 3.7 Connect the power supply

Make the connections in exact order as described, otherwise static electricity may damage your computer and or the electronics of your laser cutting system.

The input voltage must comply with AC 230V 50/60Hz or AC 115V 50/60Hz. Please follow the standard label next to the connection socket. If the voltage is inconsistent, it will result in failure to turn on the device.



Connect one end of the power cord to the connection socket on the rear of the laser device (as shown below) and the other end to a protected electrical outlet.

## 3.8 Computer configuration requirements for connecting the machine to computer

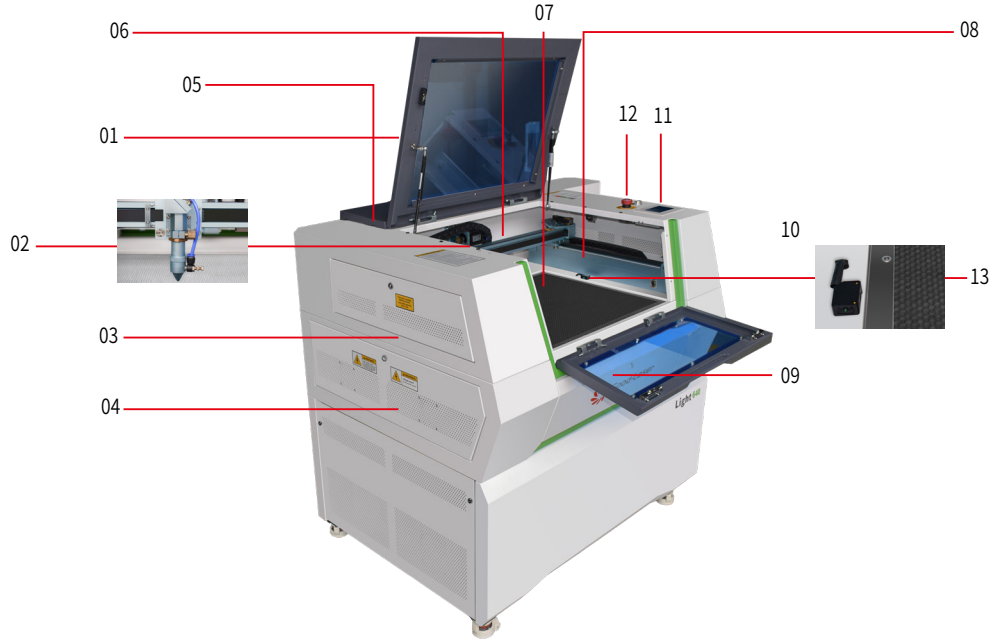
The following recommended computer system configurations are minimum requirements, When using a more powerful computer, images will be generated and displayed faster and the time required to transfer files from the computer to the machine will be shorter. If using the latest software versions, you may need to comply with additional requirements.

- Windows 10 (32-bit or 64-bit)
- Windows 8 (32-bit or 64-bit)
- Windows 7 (32-bit or 64-bit)
- Windows XP Vista (With service pack 1 or later)
- Windows XP (With service pack 2 or later)
- 1024 MB or RAM, 400MB hard disk space
- Pentium 3 or 4 processor or AMD Athlon™ XP
- 1024 x 768 or better display resolution
- 1 available USB port
- 1 available LAN Ethernet port



# Chapter 4 Operating machine

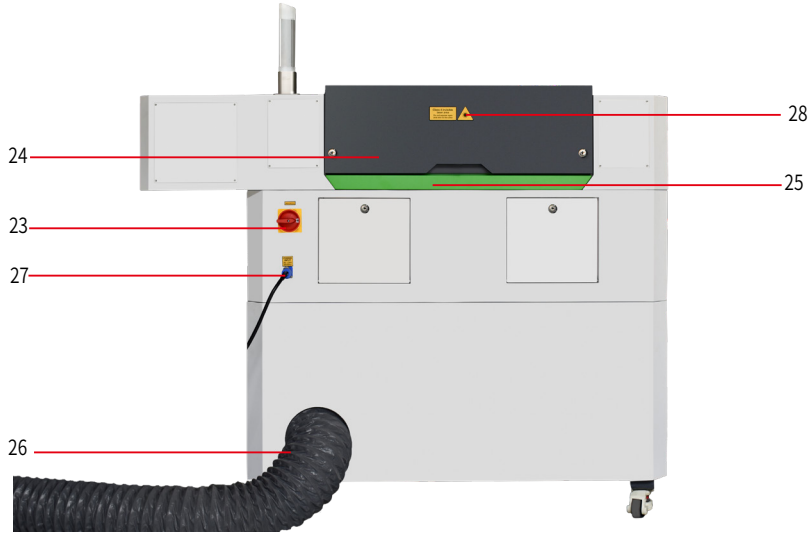
## 4.1 Overall view of machine




01. Top cover
02. Laser head
03. Upper left side door
04. Left door
05. Lower left side door
06. X axis
07. Honeycomb working platform + aluminum knife table
08. Y axis
09. Front door
10. Open cover protects sensor
11. Operate panel
12. .Emergency stop button
13. Autofocus sensor


14. LED illuminated lamp
15. USB drive port
16. U disk connection port (U disk interface)
17. LAN Cable port (LAN port)
18. Laser power switch
19. Automatic blow/manual blow switch
20. Lower right side door
21. Right side door
22. Upper right side door






23. Working status indicator
24. Laser tube rear cover door
25. Removable rear door for material penetration
26. Exhaust air duct
27. Main power socket interface
28. Manufacturer's labels

## 1. Top cover

When the top cover is opened, the machine is in a state where there is no data being processed. When the protective cover is opened in working mode, the machine motion system will stop, the laser source will be immediately turned off, and the laser head will stop working immediately. During the processing command, the "Pause" button must be pressed before the protective cover can be opened.

## 2. Laser head

The laser light source and red dot will be emitted from the laser head.

## 3. Upper left side door

Open the upper left side door for cleaning the second mirror or aligning the laser beam. This door is fitted with a shield to protect the sensor.

## 4. Left side door

Behind this door are installed the laser power supply, ammeter, interlock switch sensor inspection board, etc. Please open this door to check these parts and pay attention to the current.

## 5. Lower left side door

Open the door for adding purified/distilled water from the cold water tank.

## 6. X axis

Open the door for adding purified/distilled water from the cold water tank.The motion system is used to perform mechanical motion in the X direction, with the X axis visible in the working area.

## 7. Honeycomb work platform + aluminum knife table

The cellular honeybomb work platform is located on top of the blade bed and has indexing pins for alignment.

## 8. Y axis

The motion system is used to perform mechanical motion in the Y direction. The Y-axis is visible in the work area.

## 9. Front door

This door is equipped with interlock switches to protect sensors for cleaning up post-processing waste or removing cellular platforms.



## 10. Open cover protects sensor

This is where the open panel protection is located. During machine processing, once the main cover is opened, the laser will stop working immediately.

## 11. Operation panel

You can manually control the X-axis, Y-axis and Z-axis through the operation display panel, which also displays the working time, power, speed and the entire working time. It provides many function options. (For more detailed operation information, please refer to Chapter 4.3).

## 12. Emergency stops button

If any accidents happen during processing, such as laser catching fire, laser leakage, please turn off this emergency stop switch immediately, it will immediately cut off the laser power supply and motion power supply.

## 13. Autofocus sensor

Autofocus for the working platform.

## 14. LED illuminated lamp

Used to illuminate the work surface when tthe machine is turned on.

## 15. USB connection port (USB cable interface)

This USB port is used to connect the machine to a computer using a USB cable.

## 16. USB port (U drive port)

The USB flash drive is used to save files as USB flash drive files. The method is to press "Save to U file" on the software to save it to the USB flash drive, then insert the USB flash drive into the port of the laser cutting machine, and select the corresponding file to be cut/engraved through the panel operation to operate.

## 17. LAN Cable port (LAN port)

This port is used to connect the machine to a computer using a LAN cable.

## 18. Laser power switch

This switch is used to turn on or off the laser of the machine.

## 19. Automatic blow/manual blow switch

This switch is used to select the automatic or manual blow switch.

## 20. Lower right side door

After opening the lower right side door, you can see the air pump, exhaust duct, exhaust system and cold water system chassis fixedly installed on the bottom layer of the machine.

## 21. Right side door

Behind the right door are the laser controller, driver, power supply, main connection cables, etc. Please open this door to check these parts and contact professional maintenance personnel if repair is required. If necessary, repair the emergency stop button. This door is locked with an internal screw and an external lock.

## 22. Upper right side door

If you need to repair the motion shaft related accessories, the upper door on the right can be opened to view the related cable accessories and other details.

## 23. Working station indicator

It will display 3 different colors to indicate different working status.
Red means the machine is in abnormal alarm status;
Yellow means the machine is in standby states;
Green means the machine is running.

## 24. Laser tube rear cover door

After opening the rear door, you can observe the installation status of the laser tube and replace the laser tube. The machine is equipped with a laser tube, a red dot device, a beam combiner and the first reflector bracket. A flip cover protection sensor is installed in this cover door.

## 25. Removable rear door for material penetration

After the green cover is removed, an infinite length of sheet material can be placed on the work table by passing the material through this door.

## 26. Exhaust air duct

It is used to pull out the exhaust device.

## 27. Main power socket interface

Light series laser cutting machines are available with 24V DC and 36V DC power interfaces.

## 28. Manufacturer's labels

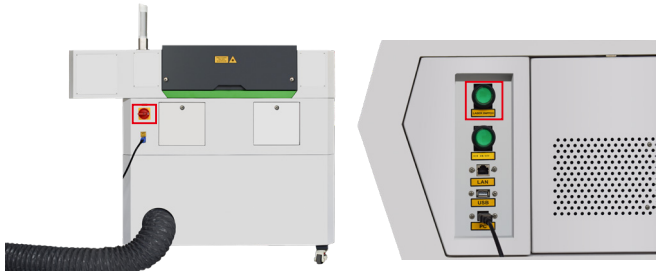
The manufacturer's labels displays all production information, including serial number, manufacturing date, product model number, etc.



## 4.2 Power switch

The main switch and laser power switch must meet the following conditions to start correctly:

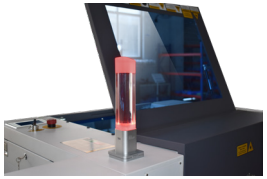
- The free motion level of mechanical movement is strictly controlled and there is no material under the working platform.
- All doors and covers closed.
- When turning on the machine power, please be sure to turn on the main switch first and then the laser power switch.
- When turning off the power of the machine, please be sure to turn off the laser power switch first, and then turn off the main switch on the back of the machine.



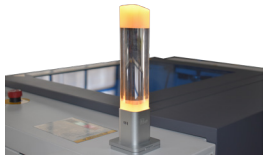
If all covers are closed, the machine will start the reset process immediately after switching on the power. When the reset process has been completed correctly, an audible signal sounds and the device is ready for operation. When the laser reset is completed, the operator panel displays the main screen.

Before starting the machine, please check and make sure there is no object in the operating space, which may limit or hinder the mechanical performance of the equipment. Please note that you should not press the "ESC" button during the reference process.

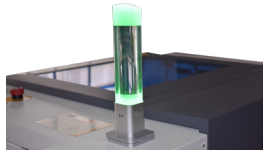
## Note: Indicator status description



When the red light is always on, it's indicating that the machine cannot process and the machine is in abnormal or alarm states.



Solid yellow means the machine is turned on and in standby mode.



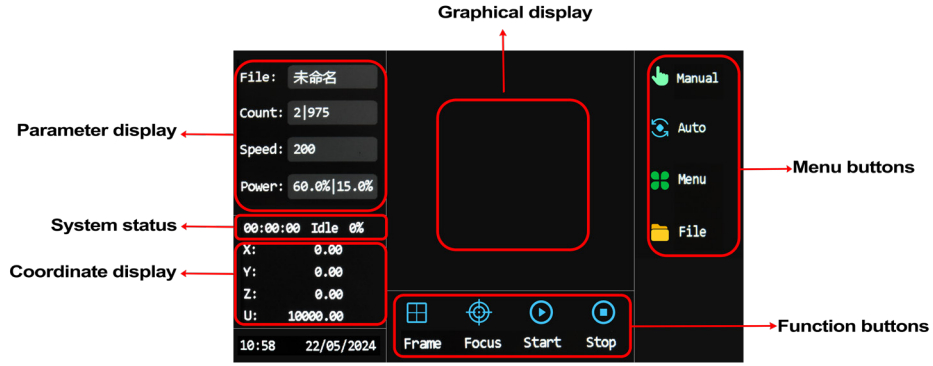
When the green light always on,it indicating that the machine is processing and in working condition.



# 4.3 How to use the operate panel

## 4.3.1 Main interface

After the machine is powered on, the system will automatically reset, the operation panel will open and display the main interface.




## Graphic display area

This area is used for file preview display and drawing the processed file image during processing.

## Parameter display area

This area is for display the current processing file name, piece value (number of current file pieces | total number of all files), speed value and power value.

## Coordinate display area

Display the X, Y, Z, and U axis coordinate values respectively.

## System status area

The system status (idle, paused, completed, running, feeding), processing time and processing progress are displayed respectively.

## Menu Area

| | |
|---|---|
| manual | Manual: Enter the manual function interface. |
| Auto | Auto: Enter the automatic function interface. The system is in this interface by default after power-on. |
| Menu | Menu: Enter the menu interface. |
| File | File: Enter the file management interface. |

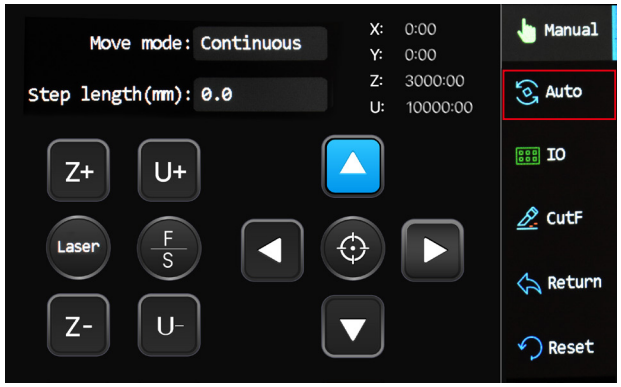
## Functional area

| | |
|---|---|
| Frame | Move frame: Perform a move frame operation on the current processing file to confirm the processing area range. |
| Focus | Focus: Auto focus. |
| Start | Start: Start processing. |
| Stop | Stop: Stop processing. |



## 4.3.2 Manual interface

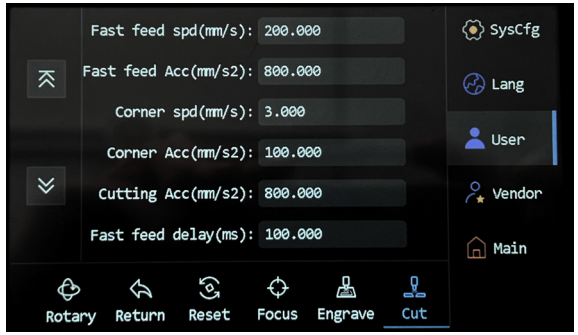
This interface is mainly used for manual debugging, including moving the laser head, spot shooting, positioning, IO diagnosis, cutting frame, returning to the original position and system reset. Press the "Auto" key to return to the main interface.




| | |
|---|---|
| Laser | Laser: Press this button to start the laser beam, and release it to turn it off. Usually, the Point Shooting button is only used when calibrating the laser lens. |
| Z+ Z- | Z+: Control the Z axis to rise Z -: Control the Z axis to descend. |
| F S | F/S: The axis movement speed can be switched. When F is blue, it is fast movement, and when it is switched to S, it is slow movement. |
| U+ U- | U+： Control the rotation axis to rotate forward U-: Control the rotation axis to rotate reverse. |
| ▲ ▼ ◀ ▶ | Direction buttons: Control the moving direction of the laser head. |
| | Positioning: Set the starting working position of the laser head. |
| IO | IO: You can enter the IO diagnostic interface to perform fault diagnosis and debugging on device components. |
| Cutf | Cut fram: Enter the cut border setting interface, and there are three border modes to choose from: light on, light off, and four-corner dotting. After selecting a mode, press the "cut border" button to start, and press the "stop" button to stop. |
| Return | Return: After selecting the return position, press the "Return" key to return, and the relevant movement status will be displayed at the bottom of the interface. Press the "Stop" key to stop the movement. |
| Reset | Reset: Click the “Reset” button to reset the syste. |

## 4.3.3 Menu interface

The menu functions include system settings, language settings, user parameters and manufacturer parameters submenus. The buttons at the bottom of the interface represent the function settings corresponding to each submenu.

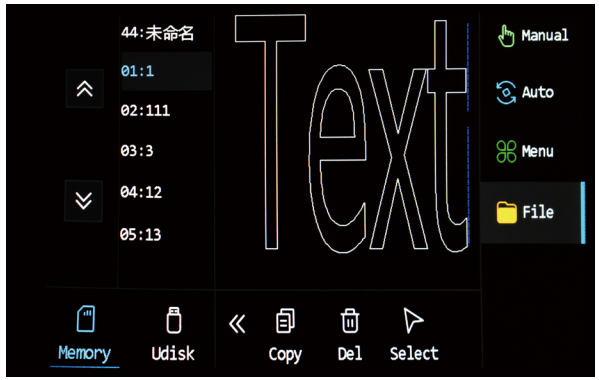



| | |
|---|---|
| Syscfg | System: Set the IP address of the device, view system information, etc. |
| Lang | Language: Set the language of the operation pane |
| User | User: View and set cutting parameters, engraving parameters, focus parameters, reset parameters and return parameters. |
| Vendor | Manufacturer: View and set feed parameters, rotation parameters, Z-axis control, speed parameters, system configuration, machine parameters, axis parameters, and laser parameters. |



## 4.3.4 File interface

The file function can preview and display memory files, and perform operations such as file selection.




| | |
|---|---|
| Memory | Memory: Switch to the file interface and read the file. |
| Udisk | USB drive： Switch to the file interface and read the file. |
| Copy | Copy: Copy the selected file to a USB drive. |
| De1 | Delete: Delete the selected file. |

## 4.4 Install Laser operate software LightMaker

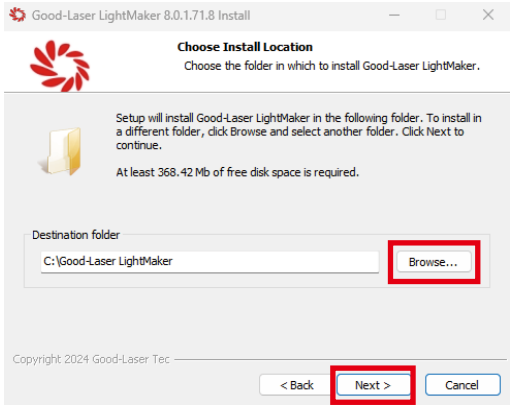
### 4.4.1 Software installation

1. Your machine comes with a USB drive, where you can find the software application manual and the software for your machine. Before installing the software, please insert the USB drive into your computer, then open the folder in the USB drive and double-click the Henghao Laser LightMaker software installation package.

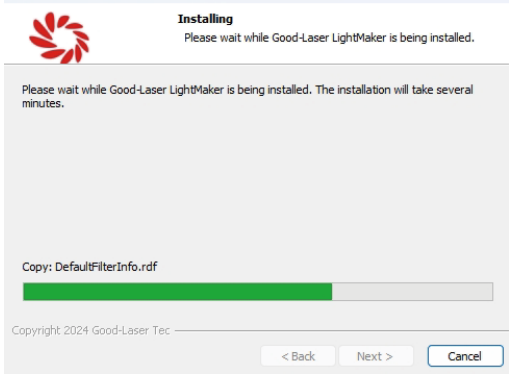

2. Open the software installation page and click Next.



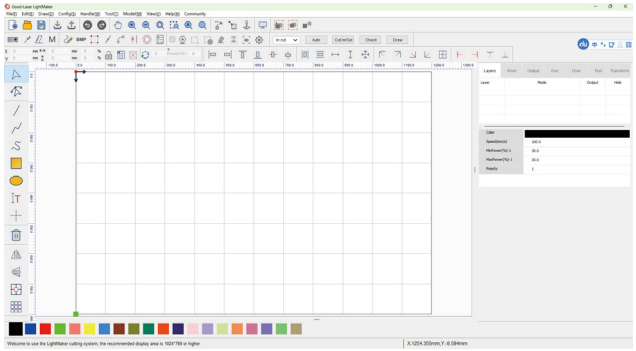

3. Click "Browse" to select the installation location, and click "Install" after confirmation.




4. Wait for the installation progress bar to complete and the installation will be successful.



5. The interface of the LightMaker software after installation is as follows:



## Troubleshooting

If you are unable to install the software, it is possible that your antivirus software is blocking the installation.
Disable all virus and spyware protection features. Once you have installed the software, return to the antivirus software and re-enable the disabled settings.



## 4.5 How machines are connected to software

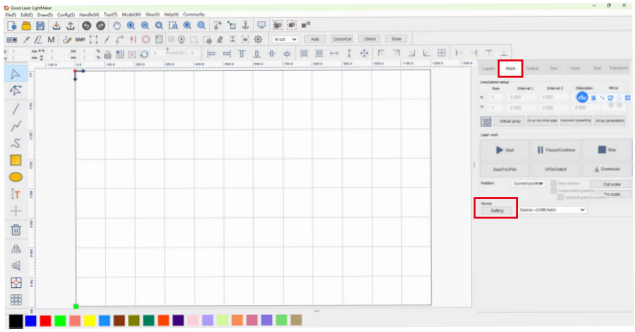
There are three ways to communicate between the machine and the software: USB cable, network cable, and WIFI. You can choose one of them according to the actual situation.

Tips: Using USB cable connection is the fastest and simplest way to connect. For users who use laser cutting machines for the first time, we recommend that you use USB cable to connect.

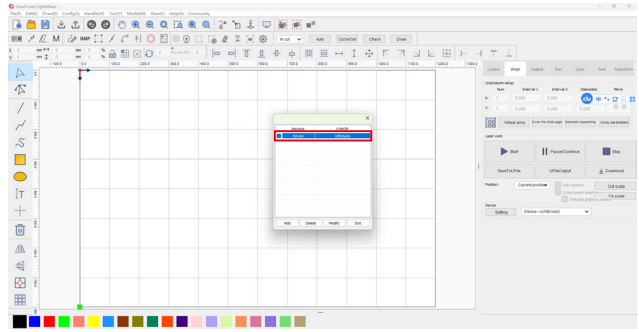
### 4.5.1 USB cable connection

1. Plug the USB cable into the USB connection port on the machine and the other end to your computer.

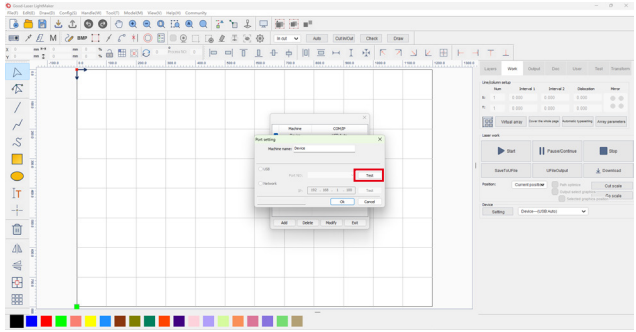
2. Open the LightMaker software and click the【Work】 Work area, then to the 【Setting】 Setting button at the bottom right of the software main interface.



3. Select the 【USB】 Device USB:Auto communication port and double-click to enter the connection mode window.



4. Double-click the communication port column, and click 【Test】 Test in the Set Port dialog box. After "Communication test successful" is displayed, click 【Confirm】 Cancel continuously. Then click【Exit】 Exit .



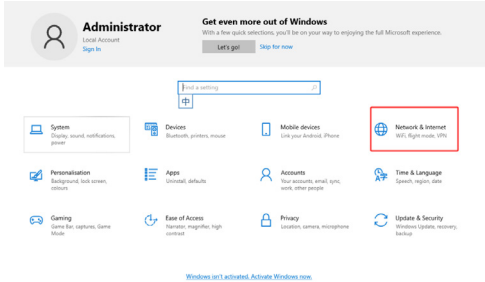
5. After completing the above operations, download and transfer the file to be processed to the machine for testing in LightMaker. If the file can be transferred to the device, it means the connection is succeed, and the machine can be operated and used normally.



## 4.5.2 LAN cable connection

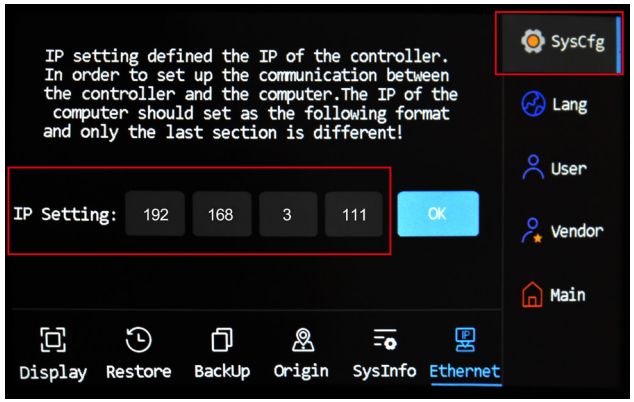
1. Plug the Ethernet cable into the network port of the machine and the other end into the computer.

2. Open "Network and Internet Settings" on your computer.

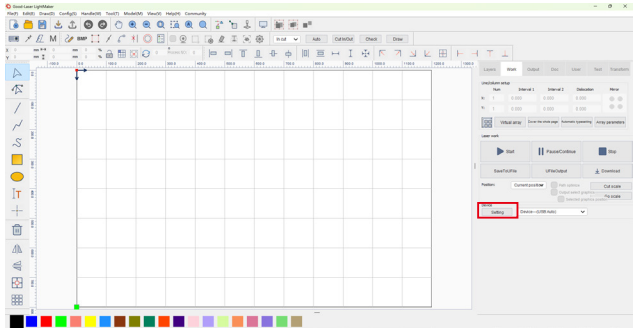



3. Check the IPv4 address of your computer

4. In the menu-system interface of the machine operation panel, set the IP address to 192.168.3.111. Keep the first three static codes of the IP address in the machine panel consistent with the IP address in the computer. The last static code needs to be set to a different number. For example, if the computer IP address is: 192.168.1.110, set the machine's IP to 192.168.3.111.

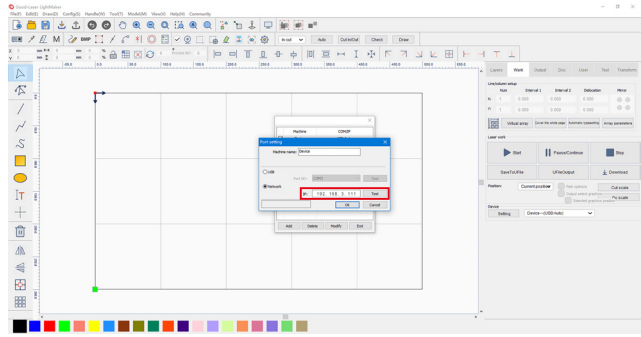



6. Open the LightMaker software on your computer, click the 【Setting】 Setting button in the lower right corner of the software main interface, and click 【Add】 Add in the dialog box that pops up.

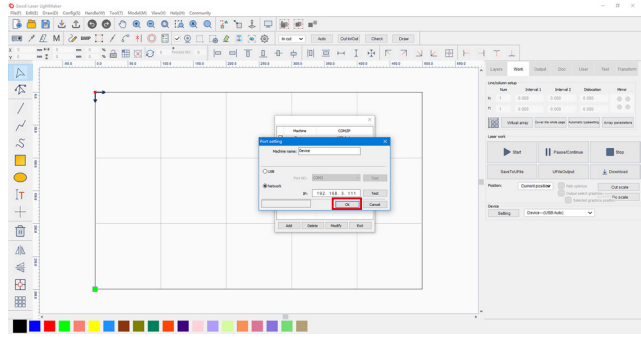




7. Select the【Network】 Device IP:192.168.1.100 communication port and confirm that the IP address is consistent with the IP address of the device operation panel. As shown above, the IP address of the machine panel has been changed to: 192.168.3.111. Copy the full IP address and enter it into the network IP address here. then click 【Test】 Test and after the pop-up window prompts, click【OK】 Ok



8. Established connection.

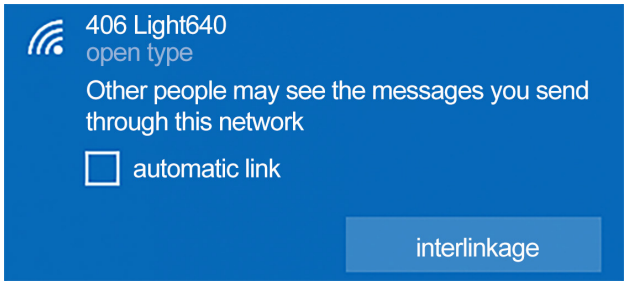


9. After completing the above operations, download and transfer the file to be processed in LightMaker to the device for testing. If the file can be transferred to the device, the connection is successful, which means that the machine can be operated and used normally.

## 4.5.3 WIFI connection

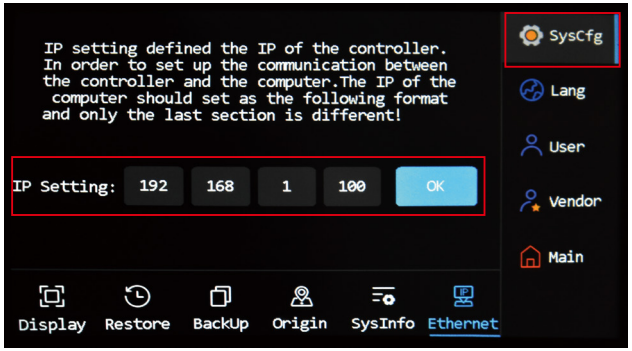
1. Plug the network cable into the network port of the machine and plug the other end into the router. Change the router to AP mode, wait for the blue flashing light of the router to turn from flashing frequently to being on, and then search for the corresponding WIFI signal on the computer.

2. Connect the computer to the WIFI signal sent by the router. Find the WIFI signal of the router with the suffix Light 640 on the computer (the signal name of the router can also be changed by yourself in the router manufacturer's operation background. If it has not been changed, just select the right signal sent by this router to connect). Click Connect after.

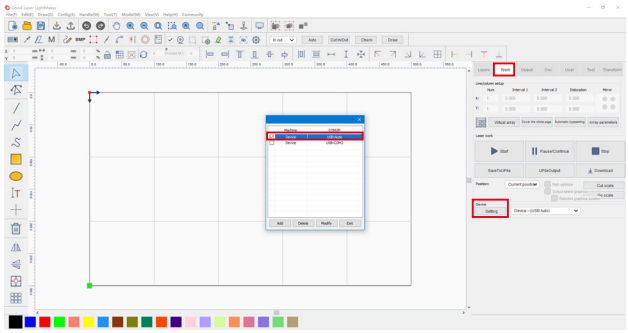




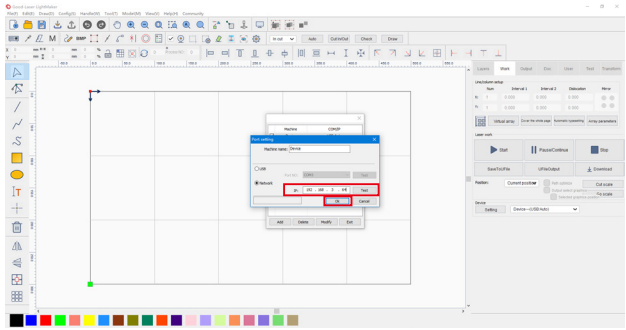

3. Set the IP address in the menu-system interfaceof the machine operation panel. The first three static codes in the IP address should be consistent with the computer (router) IP address.



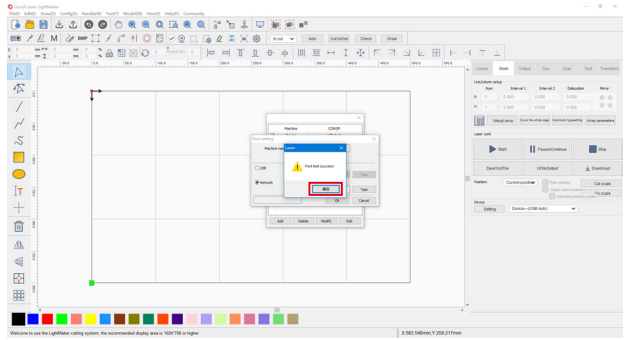

4. Open the LightMaker software on your computer, click the 【Setting】 Setting button in the lower right corner of the software main interface, and click【Add】 Add in the dialog box that pops up.



5. Select the【Network】 Device IP:192.168.1.100 port, confirm that the IP address is consistent with the IP address of the machine operation panel, click 【Test】 Test , and after the pop-up window prompts, click【OK】 Ok



6. Established connection.



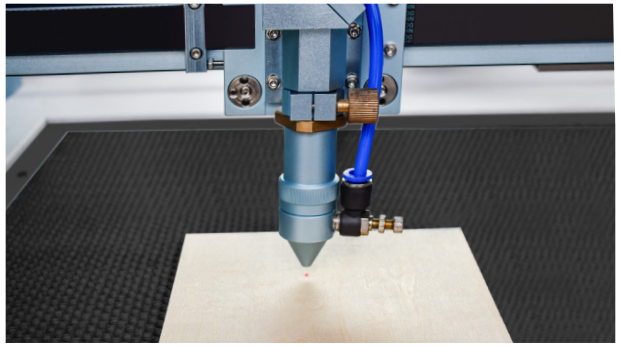
7. After completing the above operations, download and transfer the file to be processed in LightMaker to the machine for testing. If the file can be transferred to the machine, the connection is successful, which means that the machine can be operated and used normally.

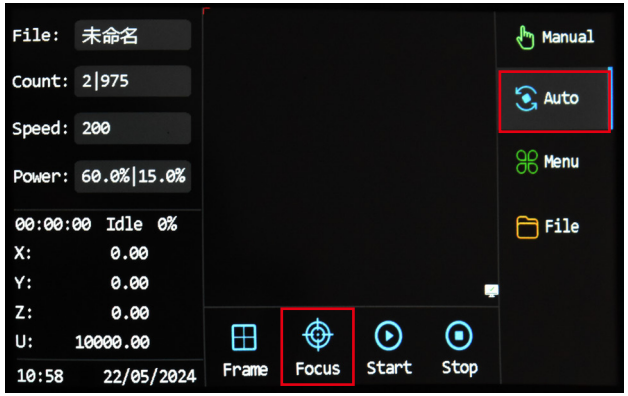


# 4.6 How to adjust the focus automatically

1. Please position the laser head in the middle of the workbench to prevent it from hitting the honeycomb table during z-axis reset/autofocus.

2. Then place the material between the autofocus sensors. Make sure to insert it all the way to the point where the laser head stops next to the ring. After that, go to the operation panel, select the automatic interface, click “Focus” the Z axis will move to do focusing. The autofocus operation is now complete.





# Chapter 5 Laser process

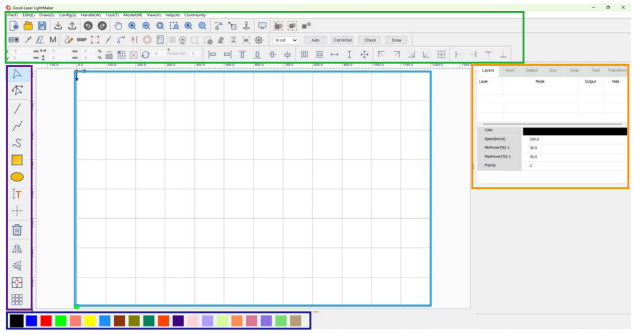
Before processing, please make sure that the materials being processed are legal and non-hazardous. Please refer to the following processing material table to compare the processing technology that can be performed.

## 5.1 Place material

1. Place the processing material on the machine workbench area and close the machine cover. Also make sure that all other safety doors of the machine are closed/locked and the air blow switch is turned on. Otherwise, the machine will issue a safety alarm and the laser head will not be able to start working normally.

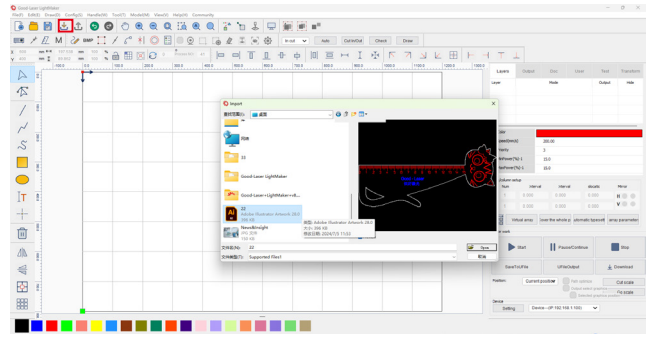
## 5.2 Open the software and import the laser drawing files

1. Open LightMaker laser software.
2. The main interface of the software is divided into five major areas: toolbar area (green frame area), drawing tool area (purple frame area), drawing area (light blue frame area), processing area (orange-yellow frame area), and color block area (dark blue frame area).

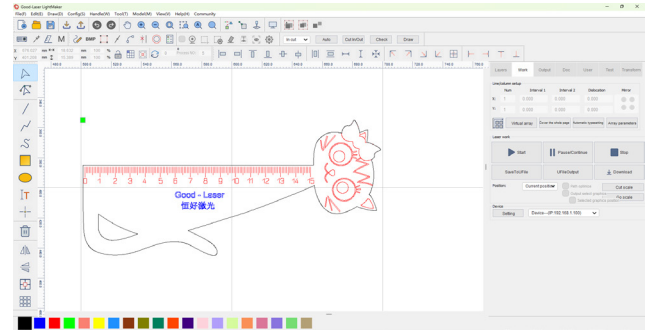




3. Click 【File】File(F) Import... to open or 【Import】 the drawn design drawings.



4. Successfully imported cutting drawings.



## 5.3 Processing parameter settings

1. Laser cutting machines can change the processing mode of the machine through different parameter settings. The main processing modes of laser cutting machines are cutting and engraving. And cutting can be divided into two types: cut through and cut without penetrating.

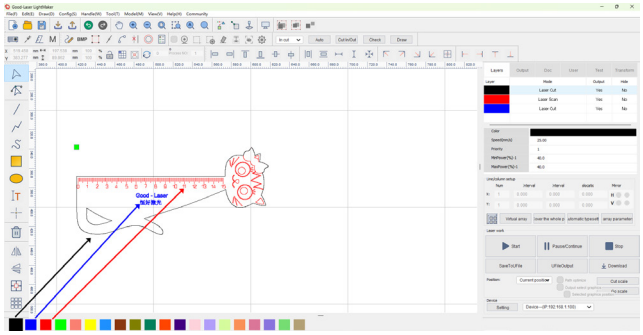
| Processing Technology | Effect | Process description |
|---|---|---|
| Cutting | Cut through | The power is high, the laser nozzle moves slowly, and the laser nozzle cuts the consumables along the curve of the layer. |
| | Cut without penetrating | The power is low, the laser nozzle moves fast, and the laser nozzle leaves processing marks on the surface of the consumables along the curve of the layer, and the consumables are not cut off. |
| Engraving | Engraving | The power is low and the laser nozzle moves fast. The laser nozzle performs scanning engraving in the closed curve area of the layer, leaving relief marks on the surface of the consumables. |

2. Differentiate the colors of graphics for different processing techniques. Click to select the corresponding graphics, move the mouse to the corresponding color block and select the corresponding color to distinguish what cutting/engraving effects need to be set for different graphics. As shown in the following figure:

Black: Graphics that need to be engrving.

Red: Graphics that do not need to be cut.

Blue: Graphics that need to be engrving.

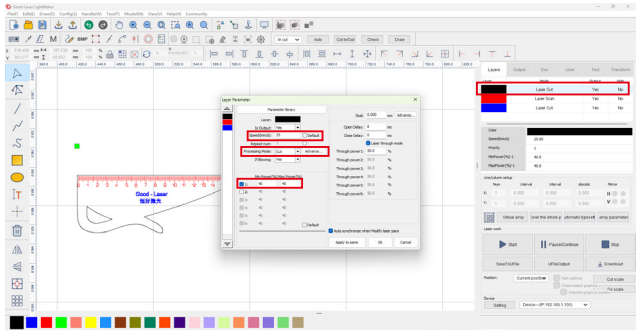




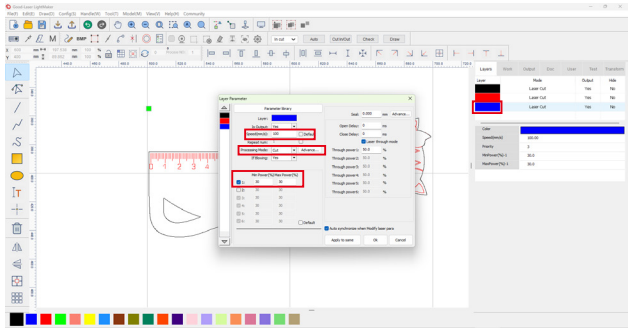
3. Double-click the corresponding color layer, and set the processing parameters of different layers in turn in the layer parameter dialog box that pops up.

- In this case, 3mm basswood plywood is used. First, set the parameters of the black layer, set the speed to "20" - the processing method to "laser cutting" - the minimum power (corner power) to "25" - the maximum power to "30";
- Set the parameters of the blue layer, set the speed to "300" - the processing method to "laser scanning" - the power to 20;
- Set the parameters of the red layer, set the speed to "100" - the processing method to "laser cutting" - the minimum power to "12" - the maximum power to "15".
- Since the focal length will affect the processing effect, the black layer needs to be processed last. Simply drag the black layer to the end.

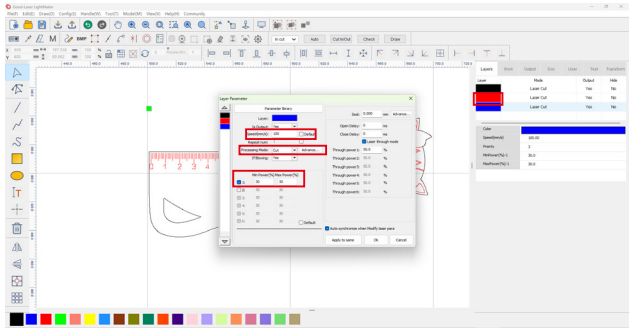
Black layer：



Blue Layer ：



Red layer:



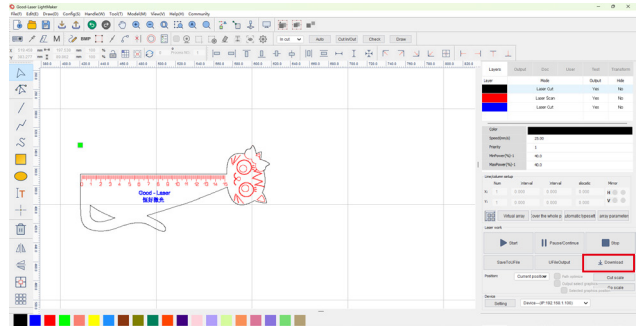
## Common material processing parameter table reference for cutting/engraving

| Material | Processing method | Speed | Minimum Power | Maximum power |
|---|---|---|---|---|
| 3mm Ply wood board | Laser cut | 25 | 40 | 40 |
| | Laser cut (Not cut through) | 200 | 10 | 20 |
| | Laser engrave | 300 | 12 | 12 |
| 3mm Acrylic | Laser cut | 10 | 50 | 60 |
| | Laser cut (Not cut through) | 100 | 15 | 20 |
| | Laser engrave | 300 | 20 | 20 |
| Paper | Laser cut | 200 | 20 | 20 |
| | Laser cut (Not cut through) | 200 | 10 | 12 |
| | Laser engrave | 300 | 15 | 15 |



## 5.4 Download the drawings to the machine

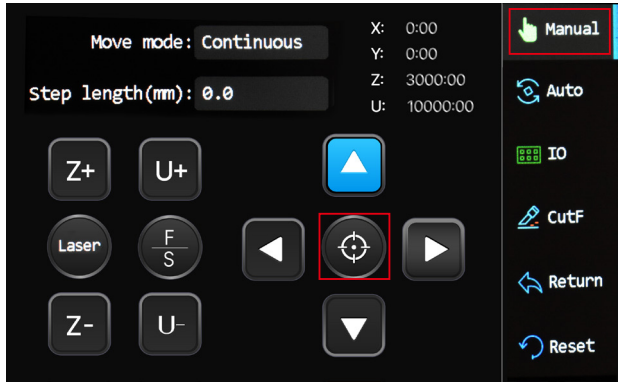
1. After setting the processing parameters, download the file to the machine for processing.



## 5.5 Operation panel starts cutting

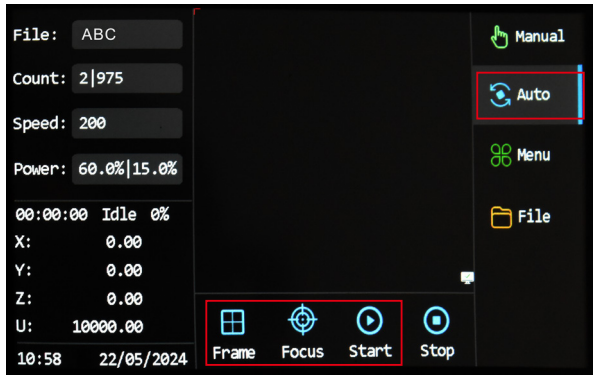
After setting the processing parameters, download the file to the machine for processing.

1. Click the 【Manual】manual button in the upper right corner of the operation panel. --- You can click the up, down, left, and right arrows buttons to move the laser head to the appropriate position above the material. --- Click the【Position】button to determine the starting point of the laser processing.



2. Click the【Auto】Auto button to enter the operation interface --- Click 【Focus】Focus to perform autofocus --- After autofocus is completed, click【Frame】Frame to confirm the processing range --- After confirmation, click【Start】Start to start processing.

- Click the 【Auto】Auto utton to enter the operation interface.
- Click the 【Focus】Focus button to automatically focus.（You can also skip this step. Our machine has an autofocus function. After clicking Start, the machine will automatically focus once before starting the cutting/engraving step.
- Click the【Frame】Frame button to define the working area.
- Click the【Start】Start button to start cutting.



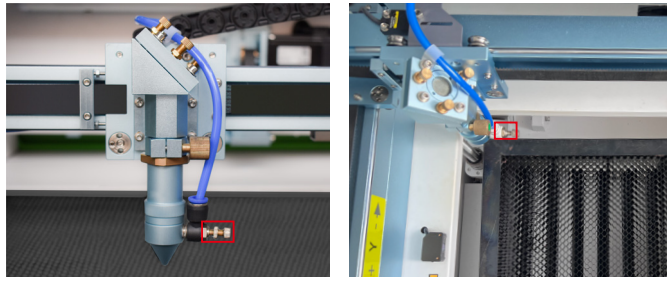

3. After processing is completed, open the top cover and take out the work piece.
Note: If you open the top cover while the machine is working, the laser head will stop working immediately and the indicator light will turn red to alarm mode. If you need to stop working completely, please click the [Stop] button on the operation panel. If you need to continue processing, close the top cover and click the Continue working button on the operation panel.



## 5.6 Operation area status indication

Note: During the operation of the machine, there must be a professionally trained laser operator observing to prevent accidents and failure to take timely response measures.


## 5.7 Air flow/blow valve regulation



5.7.1 To adjust the air volume, you only need to pinch the screw with two fingers and turn it clockwise towards the laser head to reduce the air volume. Conversely, turn it counterclockwise towards the laser head to reduce the air volume.

Tips: If you are processing wood materials, make sure to adjust the air volume to the maximum to minimize the blackening or yellowing of the cutting and engraving edges. When cutting acrylic or other plastic materials, reduce the air volume appropriately according to the thickness of the material to avoid jagged or uneven cutting edges.

# Chapter 6  Machine maintenance

## 6.1 Machine cleaning

Tips: If you do not follow the user manual‘s instructions to maintain and clean the machine, it may cause the danger of laser radiation. Remember to turn off the power and unplug the power plug before starting cleaning and maintenance work. Please keep the machine clean. Flammable materials in the machine's working area and ventilation area may cause fire hazards.

Check the machine at least once a week to see if there is any dust accumulation: In order to avoid machine wear and tear, the dirt on the machine must be cleaned in time. The frequency of cleaning the machine also depends on the machine's working time and processing materials: Only when the machine is clean can the machine's optimal working performance be guaranteed, while also reducing labor costs.

### General steps for cleaning the machine

1. Make sure the machine is turned off and unplugged, then open the machine protective cover.
2. Move the work platform to a position that is easy to clean, and clean the platform surface with window cleaner and a clean cloth.
3. Thoroughly remove the waste materials and dust piled inside the machine.
4. Clean the surface of the laser tube.
5. Wipe the doors and windows of the machine with cotton clo.

## 6.2 Optical parts cleaning

The lenses have a durable multi-layer coating and will not be damaged by proper and careful cleaning. You should check the focusing lens, mirrors and beam combiner according to the maintenance schedule. If a layer of fog or dirt is found, they must be cleaned.



It is recommended to clean the mirror/lens once a week to keep the machine running at peak efficiency. Please turn off the laser machine power before cleaning the optical parts. The lens cleaning fluid and cotton swab are as follows:


1. The lens cleaning fluid and cotton swabs are in the toolbox that comes with the machine.
2. The lens must be cleaned carefully with a clean cotton swab to avoid scratching the lens surface.
3. Do not touch the lens with your hands after wiping.
4. Do not use a cotton swab that has already been used to clean and wipe the lens to wipe it again.

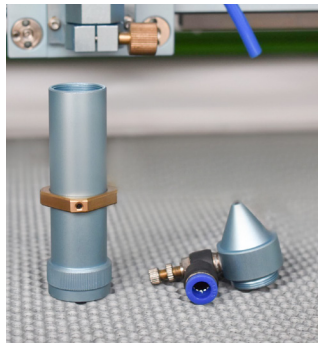
### 6.2.1 Clean focusing lens

Please follow the instructions below to clean the optics:
1. Move the working platform approximately 10 cm below the lens holder.
2. Move the work head to the center of the work surface.
3. Now you can unscrew the lens holder.
4. Carefully turn the lens holder and remove the nozzle from the lens holder.
5. Blow air onto the lens surface to remove as much coarse dust as possible.
6. Check the surface and, if necessary, clean the lens with lens cleaning fluid and a cotton swab.
7. Apply some lens cleaning fluid to one side of the lens. Allow the fluid to work for about a minute and then gently wipe with a cleaning swab soaked in lens cleaning fluid.
8. Finally, wipe this side of the lens with a dry cleaning swab and repeat the cleaning process on the other side of the lens. Never use a cleaning swab twice. Dust that has accumulated on the cleaning swab may scratch the lens surface.
9. Check the lens. If the lens is still dirty, repeat the cleaning process until it is clean.
10. Carefully insert the lens holder and secure.

## Please follow the instructions to remove the focusing lens

1. Carefully unscrew the front end of the laser head.


2. Unscrew the top of the laser head and remove it.

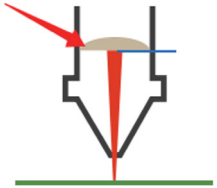



3. Use a cotton swab dipped in alcohol or cleaning fluid to carefully wipe the lens surface.



4. Use a cotton swab dipped in alcohol or cleaning fluid to carefully wipe the surface on the other side of the lens.

Tips: Please refer to the figure below for the installation direction of the focusing lens.

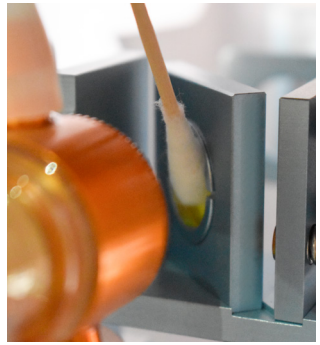


## 6.2.2 Cleaning the reflector mirror

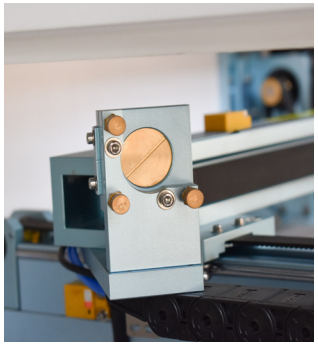
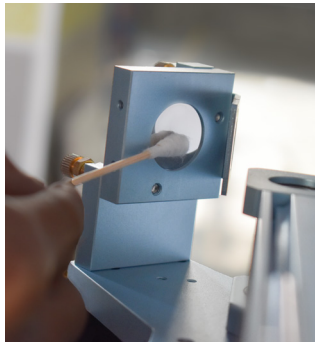
There are three mirrors in the operating area of the laser, and the reflectors need to be cleaned regularly.

Please follow the instructions below.
1. Blow air onto the mirror surface to remove as much coarse dust as possible.
2. Inspect the surface and, if necessary, clean the mirror using lens cleaning fluid and a cotton swab.
3. Apply some mirror cleaning fluid to one side of the mirror. Allow the fluid to work for about a minute, then gently wipe with a cleaning swab soaked in lens cleaning fluid.
4. Finally, wipe this side of the lens dry with a dry cleaning swab and repeat the cleaning process on the other side of the lens. Never use a cleaning swab twice. Dust that accumulates in the cleaning swab may scratch the lens surface.
5. Inspect the mirror and, if it is still dirty, repeat the cleaning process until the mirror is clean.

1st Reflector (The first reflector is installed in the rear box of the laser tube and can be seen by opening the upper right safety door.)

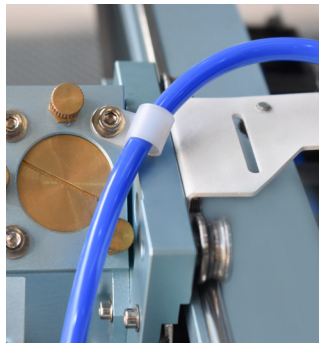



2nd Reflector (The second reflector is installed on the left side of the track.)

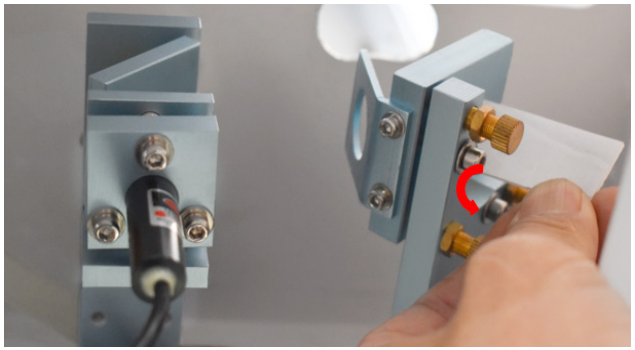


3rd Reflector (The third reflector lens is installed on the top of the laser head.)

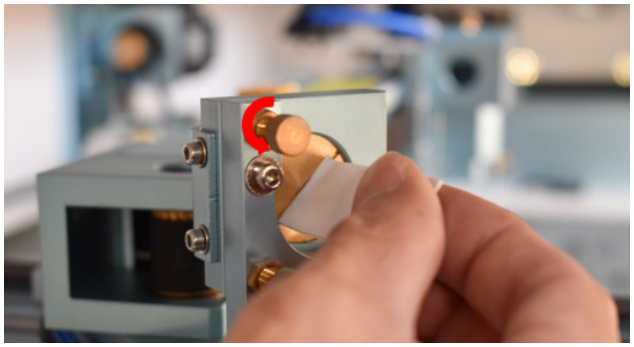



### 6.2.3 How to remove the lens/mirror

1st Reflector.

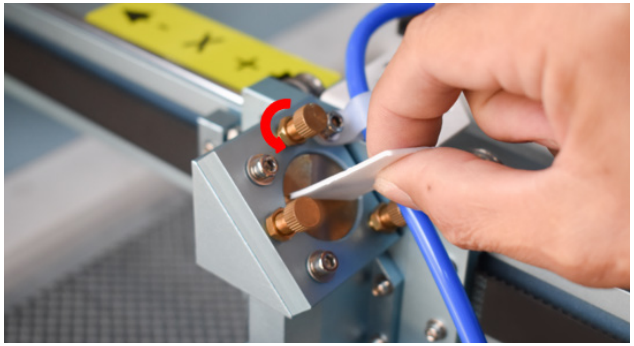


2nd Reflector.



3rd Reflector.

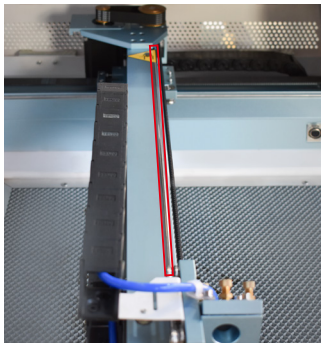
All three mirrors are use spring clips to hold the horizontal groove in the middle of the mirror, and then slowly rotate it counterclockwise to remove it.





## 6.3 XYZ rail maintenance

It is recommended to add lubricating oil (or anti-rust grease) to the guide rails/screws at least once a month.

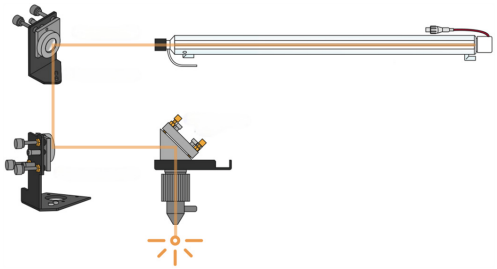


## 6.4 Replace the cooling water in the cooling unit

- It is recommended to change the water at least once a month. Before starting the machine, make sure the laser tube is full of water.
- It is recommended to check the water level every 3 days. If the water level is insufficient, add purified water/distilled water in time. The quality and temperature of cooling water will affect the service life of the laser tube.
- You need to use pure distilled water and keep the temperature below 35°.


## 6.5 Optical path inspection

After long-term use, the beam path may shift. This will reduce the efficiency of the laser beam or even result in no laser beam. At this time, you need to readjust the beam path.



## The 1st, 2nd and 3rd reflector polarization adjustment

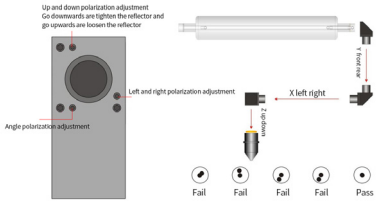
When the laser machine cannot cut through at normal speed and power on the material, first check whether the lens is too dirty. If the lens is normal, then the laser is polarized. There is another phenomenon that the right side can be cut through but the left side cannot, the inside can be cut through but the outside cannot, which is also caused by the reflector polarization.

The 1st, 2nd and 3rd reflector polarization adjustment.

1. First, set the laser power to 15-25.

2. Adjust the front and rear light sources.
Stick a piece of double-sided tape on the light inlet of the second reflector, and press the up button to move the second reflector into the machine, then click "Laser" to remember the position of the light spot, then move it to the outermost part and click "Laser" again to see if the first and second laser spots are completely repeated. If there is a deviation, adjust the adjustment screw on the first reflector, adjust the corresponding screw according to the direction of polarization, and repeat the test from the nearest light spot to the farthest light spot according to the above method and adjust several times until the two light spots completely overlap.

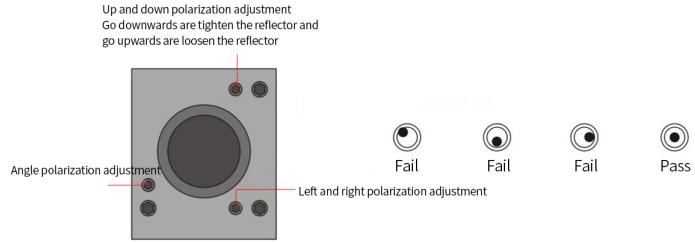
3. Left and right light source adjustment.
Stick a piece of double-sided tape on the light inlet of the third reflector, press the up button to move the third reflector into the machine, then click "Laser" to remember the position of the light spot, then move it to the far left and click "Laser" to see if the first light spot and the second light spot are completely repeated. If there is a deviation, adjust the adjustment screw on the second reflector according to the direction of polarization. Repeat the test and adjust several times from the nearest light spot to the farthest light spot according to the above method until the two light spots completely overlap.






## Focusing mirror light source adjustment

The focus light source adjustment is similar to the one-two reflector adjustment.
First, stick a piece of double-sided tape on the laser head light outlet, press "laser" to remove it, then look at the position of the light spot, and adjust the corresponding screw according to the direction of polarization. Repeat the test and adjustment several times until it is in the center of the light outlet.
When the double-sided tape is attached to the light outlet and removed, an inner circle and an outer circle will be printed on it.



## 6.6 Maintenance Plan

## 1. Daily checklist

- Check the lenses and mirrors for condensation and make sure to clean them after work
- Check the exhaust grille to ensure the exhaust fan is not blocked.
- Check the coolant level.
- Check the air filter on the compressor.
- Make sure there is no debris on the side of the cooling fan.
- The blower must be checked and cleaned if necessary.

## Recommend laser cutting machine maintenance matters:

| Maintenance items | Operation steps | Maintenance tools | Maintenance cycle |
|---|---|---|---|
| **Focus mirror** | (1) Remove the laser head<br>(2) Remove the focusing lens<br>(3) Clean the focusing lens<br>(4) Install the focusing lens<br>(5) Install the laser head | (1) Lens cleaning cloth<br>(2) Lens cleaning fluid or alcohol | Once a week |
| **Reflector lens** | (1) Clean the first reflector lens located at the laser tube<br>(2) Clean the second reflector lens located on the left side of the X-axis<br>(3) Clean the third reflector lens located above the laser head | (1) Lens cleaning cloth<br>(2) Lens cleaning fluid or alcohol | Once a week |
| **Waste collection chute** | (1) Open the waste hatch<br>(2) Clean up material debris and other waste<br>(3) Close the waste hatch | Vacuum cleaner or other cleaning tools | |
| **Machine surface** | (1) Clean the machine processing window and surface<br>(2) Remove dust from the machine's internal surface<br>(3) Remove honeycomb board waste and dust<br>(4) Clean the laser tube surface | (1) Window cleaner<br>(2) Clean cloth | |
| **Guide rails and lead screws** | (1) Add lubricant to the guide rails of the X-axis and Y-axis<br>(2) Add lubricant to the lead screw of the Z-axis | (1) Mechanical lubricant<br>(2) Brush | Once a month |
| **Beam Combiner lens** | (1) Clean both sides of the lens | (1) Lens cleaning cloth<br>(2) Lens cleaning fluid or alcohol | Once a month |
| **Ventilation channel** | (1) Clean the exhaust baffle at the rear of the waste bin<br>(2) Clean the air inlet of the exhaust fan<br>(3) Check whether the exhaust pipe is blocked | Vacuum cleaner or other cleaning tools | Once a month |
| **Water tank of cooling system** | Replace cooling water<br>(1) Open the drain port and drain the remaining water<br>(2) Add an appropriate amount of pure water or distilled water to the water inlet | Purified or distilled water | |
| | Clean the filter<br>(1) Unscrew the screws of the air inlet and outlet<br>(2) Remove the filter and clean it<br>(3) Replace the filter and tighten the screws | (1) Screwdriver<br>(2) Clean cloth | |



# Chapter 7 After-sales Service & Technical support

If you need more product information, please visit our website at: good-laser.com
If you need technical support, you can contact us in the following ways:
Service line：86 400-0606-086
Email: info@good-laser.com

Thank you for choosing Good-Laser products and wish you a pleasant use experience and journey.