

THUNDER LASER SYSTEMS



TITAN & TITAN PRO Series Unified User's Manual

For TITAN 27, 35, 51, 63 and
TITAN Pro 27, 35, 51, 63

Thunder Laser

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Introduction

This manual has been designated as the thunder laser systems, laser cutting machine installation and user guide; The manual is divided into five chapters, including general information instructions, safety instructions, the key components of every laser cutting systems and the installation steps, operation instructions and maintenance instructions from THUNDERLASER Company.

First, it should be emphasized that the installation of each system must meet the requirements, and make it consistent with the installation requirements of THUNDERLASER. If not, the machine will not working properly, poor performance, life shortened, maintenance costs increased and even machine damage .

The note is for getting a specific requirement of system installation, and we hope every customer try to understand these notes before installation and usage, thus you can correctly install and use. If you meet any installation problems, you can contact our technical staff and customer service staff.

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Chapter 1. General

1.1 General Information

Please read this documentation carefully before installation and operation.

Injury, death, loss of property, fire, electric shock, malfunction, reduced performance & machine life, and critical failures can result from not reading, understanding, and following the Operation Manual!

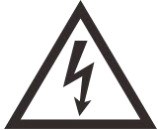
Operation of the system is permitted only with equipment and spare parts supplied or listed in the spare parts and consumables lists. The use of 3rd Party components may void the warranty.

Auxiliary equipment must be adjusted to the base machine (contact us for further info).

The following symbols are used throughout the Operation Manual:



Caution: Warnings to keep in mind when operating the laser.



High Voltage: Care must be taken to prevent injury and/or death.



Laser Radiation: Pay attention to the dangers of the laser beam.



Fire Hazard: High potential for fire. NEVER RUN UNATTENDED!



Tips: Helpful notes or info that simplify the use or understanding.

1.2 Designated

The THUNDER LASER TITAN & TITAN PRO SERIES are used for engraving and cutting of signs, stamps and suchlike.

A wide variety of materials such as rubber, acrylic, coated metal, tin, special steel, anodized aluminum, cork, cardboard, glass, leather, marble, several plastics and wood can be processed on the laser.



1. The engraving process must only be performed with a perfectly adjusted machine.
2. Use of the system in other areas is against the designated use. The manufacturer does not admit liability for damage to personal and/or equipment resulting from such use.
3. The system must only be operated, maintained and repaired, by personnel that are familiar with the designated field of use and the dangers of the machine!
4. Non-observance of the instructions for operation, maintenance and repair described in this Operation Manual excludes any liability of the manufacturer if a defect occurs.
5. Caution when processing conductive materials (carbon fibers), Conductive dust or particles in the ambient air might damage electrical components and lead to short circuits. Bear in mind that those defects are not warranted.

1.3 Disposal remarks



Do not dispose the machine with domestic waste!

Electronic devices have to be disposed according to the regional directives on electronic and electric waste disposal. In case of further questions, please ask your supplier. He might take care of proper disposal.

1.4 Technical Data / Device Specification

TITAN SERIES

	TITAN 27	TITAN 35	TITAN 51	TITAN 63
Working Area	27.6" x 19.7 (700 x 500 mm)	35.4" x 23.6" (900 x 600 mm)	51.2" x 35.4" (1300 x 900 mm)	63.0" x 39.4" (1600 x 1000 mm)
Table Size	31.1" x 23.2" (790 x 590mm)	39" x 27.2" (991 x 691mm)	54.7" x 39.1" (1391 x 995mm)	66.5" x 43.1" (1691 x 1095mm)
Z Axis Height	9"/230mm			
Max Work Height	7.2"/184mm			
Max. Speed	3000 mm/sec			
Motor	AC Servo Motor			
Drive	AC Servo Drive			
Work piece table	Solid metal blades & Honey comb table & Supports adsorption platform			
Max. table load	/	100kg	110kg	/
Net Weight	/	/	/	/
Standard Head	2.5" (63.5mm)			
Lens Diameter	20mm			
Mirror Diameter	25mm			
Beam Comb. Dia.	25mm			
Electricity Requirement	100-240V AC, 50 or 60Hz, Single phase Machine requires either 115v or 230V voltage(customized from factory); Support both 50Hz and 60Hz, single phase			
Power consumption	/			
Recommended circuit breaker	/			

Dimensions

	TITAN 27	TITAN 35	TITAN 51	TITAN 63
W x D x H	51.2"x41.1"x43.3" (1300x1045x1100mm)	59.1"x45.1"x43.3" (1500x1145x1100mm)	74.8"x56.9"x43.3" (1900x1445x1100mm)	86.6"x60.8"x43.3" (2200x1545x1100mm)

Max Part Size (W x L x H)

	TITAN 27	TITAN 35	TITAN 51	TITAN 63
Door Closed	/	38.98" x 29.13" x 9.06" 990x740x230mm	54.53" x 40.55" x 9.06" 1385x1030x230mm	/
Pass Thru	/	39.37" x ∞" x 2.56" (1000 x ∞ x 65mm)	55.12" x ∞" x 2.56" (1400 x ∞ x 65mm)	/

TITAN PRO SERIES

	TITAN PRO 27	TITAN PRO 35	TITAN PRO 51	TITAN PRO 63
Working Area	27.6" x 19.7 (700 x 500 mm)	35.4"x 23.6" (900 x 600 mm)	51.2"x 35.4" (1300 x 900 mm)	63.0"x 39.4" (1600 x 1000 mm)
Table Size	31.1"x 23.2" (790 x 590mm)	39"x 27.2" (991 x 691mm)	54.7"x 39.1" (1391 x 995mm)	66.5"x 43.1" (1691 x 1095mm)
Z Axis Height	9"/230mm			
Max Work Height	7.2"/184mm			
Max. Speed	3000 mm/sec			
Motor	AC Servo Motor			
Drive	AC Servo Drive			
Work piece table	Solid metal blades & Honey comb table & Supports adsorption platform			
Max. table load	/	100kg	110kg	/
Net Weight	/	352kg	/	/
Standard Head	3.0" (76.2mm)			
Lens Diameter	20mm			
Mirror Diameter	25mm			
Beam Comb. Dia.	25mm			
Electricity Requirement	100-240V AC, 50 or 60Hz, Single phase Machine requires either 115v or 230V voltage(customized from factory); Support both 50Hz and 60Hz, single phase			
Power consumption	/	1800W (I80&60W MOPA, 110V&220V	2000W(I80&60W MOPA, 220V); 2200W(I80&60WMOPA, 110V); 2100W(I120&100WMOPA, 220V); 2500W(1120&100W MOPA, 110V)	/
Recommended circuit breaker	/	10A(80&60W MOPA, 220V); 20A(I80&60W MOPA, 110V)	16A(I80&60W MOPA, 220V); 25A(I80&60W MOPA, 110V); 16A(1120&100W MOPA, 220V); 32A(1120&100W MOPA, 110V)	/

Dimensions

	TITAN PRO 27	TITAN PRO 35	TITAN PRO 51	TITAN PRO 63
W x D x H	51.2"x41.1"x43.3" (1300x1045x1100mm)	61.0"x46.0"x43.3" (1550x1168x1100mm)	6.8"x57.9"x43.3" (1950x1470x1100mm)	86.6"x60.8"x43.3" (2200x1545x1100mm)

Max Part Size (W x L x H)

	TITAN PRO 27	TITAN PRO 35	TITANPRO 51	TITAN PRO 63
Door Closed	/	38.98" × 29.13" × 9.06" (990×740×230mm)	54.53" × 40.55" × 9.06" (1385×1030×230mm)	/
Pass Thru	/	39.37" × ∞" × 2.56" (1000 × ∞ × 65mm)	55.12" × ∞" × 2.56" (1400 × ∞ × 65mm)	/

Features

Standard:

Open flap protection, Fire alarm protection, Dual air-assist control, Communication via WI-FI.
 Red Dot Pointer, Auto Focus, Smart board, Motorized Table, Honey Comb Table, Aluminum blade cutting table,
 Pass-Through Door, 2.5"(63.5mm) / 3.0"(76.2mm) Focus Lens, Warning light, Emergency Stop, Touch panel,
 Easily Adjustable Home Position, 3D Engraving, Maintenance mode, Air pump, Exhaust Fan, Vacuum Adsorption
 Platform.

Optional:

Rotary Attachment, High air compressor set (Includes water filter).

Control System

Laser power	Adjustable from 1 - 100% (typically 5-100%)
Interface Hardware	USB: connect to PC and U-disk Ethernet: connect to PC WIFI
Interface Software	LaserMaker - RDWorksV8
Operating Modes	Optimized raster, vector, and combined mode
Buffer Memory	1G standard

Laser Equipment

Laser Type:	Sealed Radio Frequency Laser Tube/MOPA Pulsed Fiber Laser
Pulse width(CO2 Laser):	0.1~140KHz
Pulse width(MOPA Fiber):	1~4000KHz
Wavelength:	10.6μm/1064nm
Red dot pointer:	Laser Power< 1mW
Wavelength of Red dot pointer:	630nm – 680nm

Cooling System

Machine Cooling System:	Air-Cooled
Tube Cooling System:	Air-Cooled

Ambient Conditions

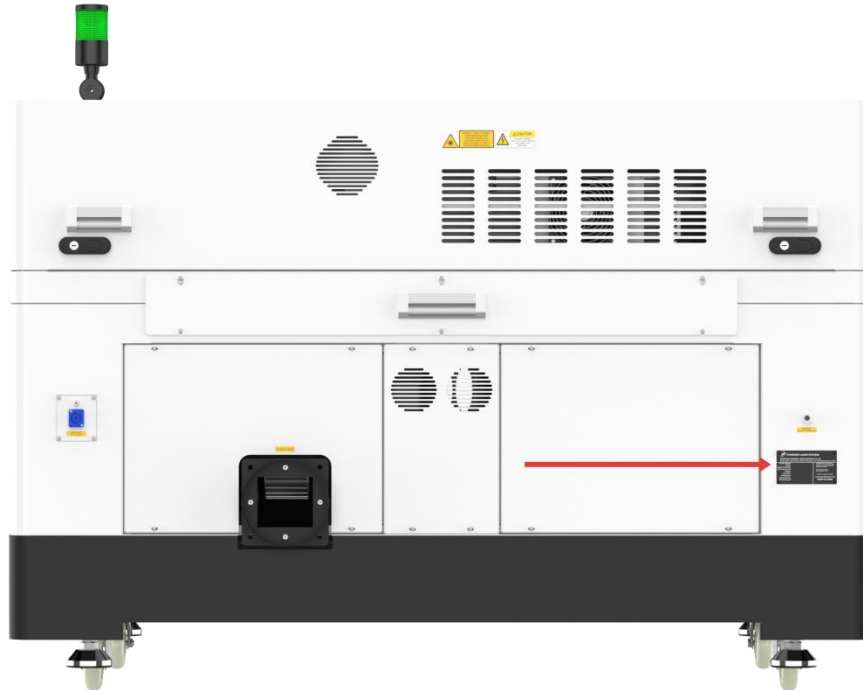
Ambient temperature	+15°C to +35°C / 59°F to 95°F
Humidity	40% to max. 70%, not condensing

Laser Safety

Laser class	CDRH Laser Safety Laser Class 1 CE compliant FDA approved
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1.5 Manufacturer's Label

The manufacturer's label is located on the back of the device (see Figure below).



It is recommended to record all of the data so that you always have this handy. You will need to supply your Serial Number to our Support Team on occasion.



Chapter 2. Safety

2.1 General Safety Information

All personnel involved in installation, set-up, operation maintenance and repair of the machine, must have read and understood the Operation Manual and in particular the "Safety" section. The user is recommended to generate company-internal instructions considering the professional qualifications of the personnel employed in each case, and the receipt of the instruction/Operation Manual or the participation at introduction/training should be acknowledged in writing in each case.

Safety-conscious of Working

The machine must only be operated by trained and authorized personnel.

The scopes of competence for the different activities in the scope of operating the machine must be clearly defined and observed, so that under the aspect of safety no unclear questions of competence occur. This applies in particular to activities on the electric equipment, which must only be performed by special experts.

For all activities concerning installation, set-up, start-up, operation, modifications of conditions and methods of operation, maintenance, inspection and repair, the switch-off procedures that may be provided in the Operation Manual must be observed.

Safety Information for the User and/or Operating Personnel



1. No working methods are permitted that affect the safety of the machine.
2. The operator must also ensure that no unauthorized persons work with the machine (e.g. by activating equipment without authorization).
3. It is the duty of the operator, to check the machine before start of work for externally visible damage and defects, and to immediately report changes that appear (including behavior during operation) that affect the safety.
4. The user must provide that the machine is only operated in perfect condition.
5. The user must guarantee the cleanness and accessibility at and around the machine by corresponding instructions and controls.
6. No safety components may be removed or disabled (again we emphasize the imminent dangers, for example severe burns, loss of eyesight, etc...). If the removal of safety components is required during repair and service, the replacement of the safety components must be performed immediately after completion of the service and repair activities.
7. Preparation, retooling, change of work piece, maintenance and repair activities **must only performed with equipment switched off** and by trained personnel.
8. **Any attempt to perform unauthorized modifications and changes to the machine can VOID THE WARRANTY.** This does not apply to preventative & general maintenance, adjustment and alignment, etc... that follow Thunder Laser's best practices.

2.2 Laser Safety Information



1. To assess the potential dangers laser systems pose, they are classified into 2 safety classes.

Thunder Laser TITAN & TITAN PRO SERIES are device of class 1. The integrated protective housing, interlock systems, and safety installations ensure compliance with Class 1 standards. Please note that improper and warranty operation of the device can override the status of Safety class 1 and can cause the emission of harmful radiation.

2. This laser engraving system contains a carbon dioxide (CO₂) laser of class 4 that emits intensive and invisible laser radiation. Without safety precautions the direct radiation or even diffuse reflected radiation is dangerous!

3. Without safety precautions, the following risks exist with exposure to laser radiation:

Eyes: Burns to the cornea

Skin: Burns

Clothing: Danger of fire

4. Never try to modify or disassemble the laser and do not try to start up a system that had been modified or disassembled!

5. Dangerous radiation exposure can result from the use of operation or adjustment equipment other than that described here, and if different operational methods are performed.

2.3 Safety Precautions when Operating the Device

Your Thunder Laser TITAN & TITAN PRO SERIES have an integrated safety system which immediately stops the job when the protection cover (Lid) is opened. An incomplete job will occur if the cover is opened during operation. Press the "PAUSE" button first if you want to interrupt an engraving process.

Please remember the following safety precautions when working with this device:



1. CO₂ Fire extinguishers should be placed near laser. Always keep properly maintained and inspected fire extinguisher on hand.
2. Do not store any flammable materials in the inside of the device. Particularly leftovers of produced materials have to be removed to prevent fire hazard.
3. Please maintain free airflow around this system at all times. Do not cover the machine while in operation.
4. Stay with the laser. Do not leave the laser unattended when it is working, small scraps can ignite and without supervision can destroy the machine if not checked.
5. Use Air Assist. Always use the system's Air Assist feature when vector cutting.



1. These lasers emit invisible radiation; safety glasses should be worn when maintaining these machines for your protection.
2. Adjustment of the beam path must be performed only by specially trained personnel. An improper setting can lead to uncontrolled emission of the laser radiation.

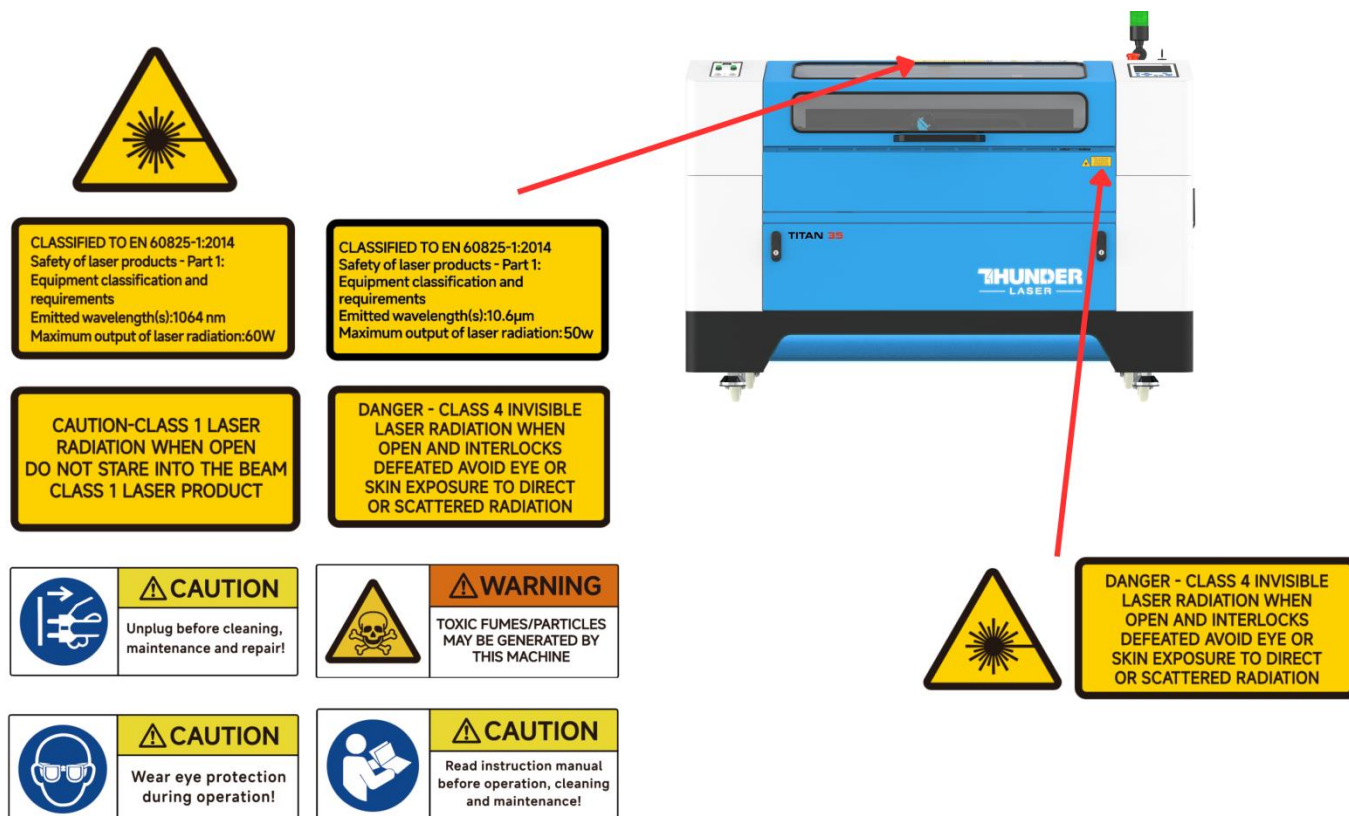


1. Do not disable limit switches or safety features as this can invalidate warranties and cause damage to you and the machine.
2. Before processing materials the user must verify whether harmful materials can be generated and whether the filter equipment of the exhaust system is suitable for the harmful materials. We emphasize that it is the responsibility of the user, to consider the national and regional threshold values for dust, fogs and gases when selecting the filters and the exhaust system. (The values for the maximum workplace concentration must not be exceeded.)
3. PVC (polyvinyl chloride) must under no circumstances be processed with the laser.

2.4 Warning and Information Labels



The warning and information labels in various locations if the machine should always be read carefully and understood. If labels are lost or damaged, they must be replaced immediately.



⚠ ATTENTION

1. The operator must read the operation manual carefully before operating the machine. Do not operate this machine without training.
2. Never leave the laser running unattended, and turn off the power to the machine when the job is complete.
3. Keep an eye on the machine while it is running and be prepared to pause the process, using an emergency stop if necessary.
4. This machine contains multiple risks of invisible laser radiation (heat) and high voltage. In the case of a fault, never try to disassemble the machine, contact service provider and turn off power.
5. Make sure the machine is well grounded before operating it.
6. Service, maintenance and repairs must be performed by trained professionals.
7. Do not operate this laser machine with any covers open or attempt to defeat any safety interlocks. If so can cause burns and possibly permanent damage to your vision.
8. The environment conditions of your production facility are crucial to the machines potential damage. Specifically avoid high humidity, airborne dust and fluctuating temperatures. Do not allow the machine to freeze.
9. The air inlet of the air cooling system is equipped with a dust-proof sponge, which is recommended to be cleaned once a month to ensure good heat dissipation of the laser source.
10. Do not store any flammable materials on or near the laser. The laser uses invisible radiation (heat) to vaporize/burnable materials. Fire is a known risk with CO₂ lasers.
11. Regular cleaning of reflective mirrors and the focusing lens is essential to prevent power loss.
12. Remove effluents and waste material from the interior of the machine, and regularly check and clear the extraction system to prevent buildup of soot and dust which can lead a fire.
13. Do not attempt to mark or cut reflective materials with CO₂ laser. This can result in reflected invisible laser radiation (heat), which will damage the machine.
14. Keep a serviced CO₂ fire extinguisher nearby the laser always. Dry power extinguishers will cause irreparable corrosion if used.
15. In the event of any uncontrollable event or failure of your system, always contact your service provider for professional assistance to resume work in a timely and safe manner.

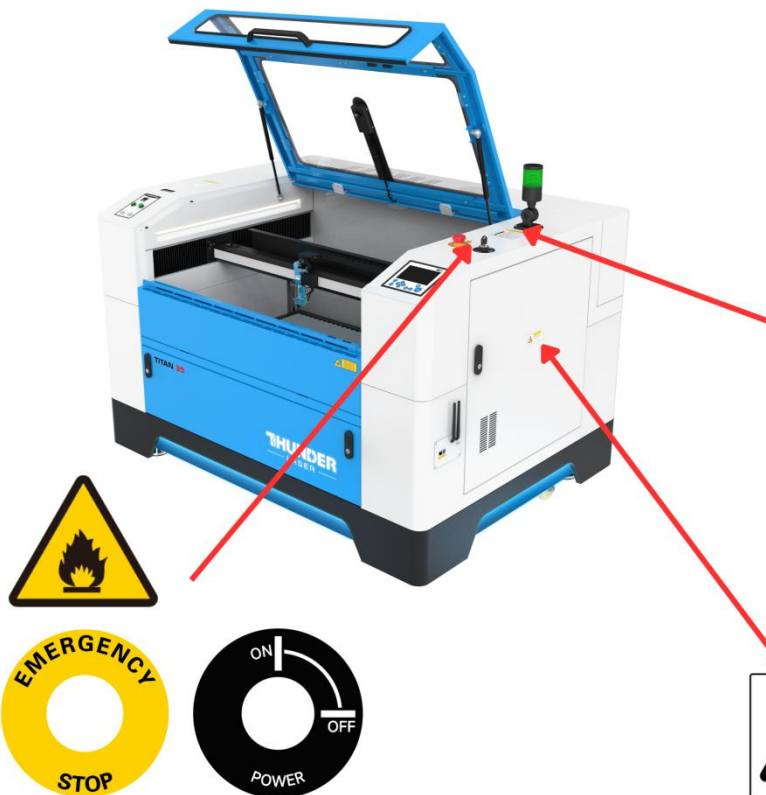
Thank you for your cooperation!



⚠ CAUTION

Dangerous voltage!
Take care to avoid coming into contact with electricity!

DANGER - CLASS 4 INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION



⚠ ATTENTION

Function of the signal lamp

Solid Red Light: The Laser machine is busy running a job or an alarm is present while running such as Doors Not Closed, High Heat Alarm, Low Air Assist Pressure.

Blinking Red Light: Operator has bypassed the door safety system. The operator must stay near the laser machine while it is busy running or door safety systems are bypassed.

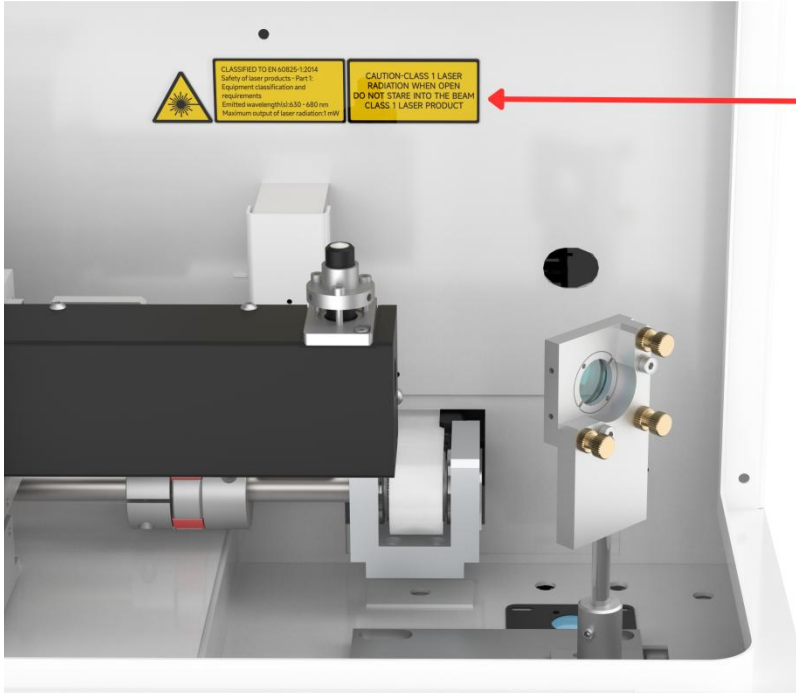
Solid Green Light: Laser machine is idle and is ready for Operation. The machine will accept new job file transfers and no alarms are present.

Buzzer: When the buzzer is beeping it is indicating a High Temperature Alarm on the Honeycomb table >55°C(131°F). The sound is Roughly 80dBA at 1m, 70dBA within 5m and 65dBA within 10m. Immediate action should be taken to mitigate the High Temp Alarm.



⚠ CAUTION

Dangerous voltage!
Take care to avoid coming into contact with electricity!



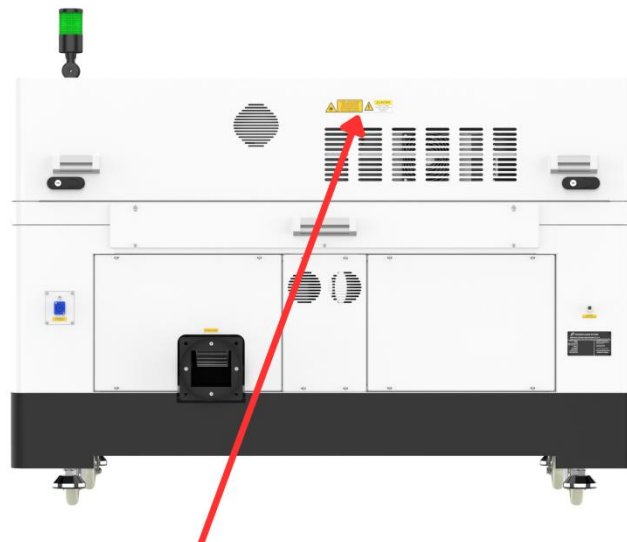
CLASSIFIED TO EN 60825-1:2014
Safety of laser products - Part 1:
Equipment classification and
requirements
Emitted wavelength(s): 630 - 680 nm
Maximum output of laser radiation: 1mW

CAUTION-CLASS 1 LASER
RADIATION WHEN OPEN
DO NOT STARE INTO THE BEAM
CLASS 1 LASER PRODUCT



CLASSIFIED TO EN 60825-1:2014
Safety of laser products - Part 1:
Equipment classification and
requirements
Emitted wavelength(s): 630 - 680 nm
Maximum output of laser radiation: 1 mW

CAUTION-CLASS 1 LASER
RADIATION WHEN OPEN
DO NOT STARE INTO THE BEAM
CLASS 1 LASER PRODUCT



**DANGER - CLASS 4 INVISIBLE
LASER RADIATION WHEN
OPEN AND INTERLOCKS
DEFEATED AVOID EYE OR
SKIN EXPOSURE TO DIRECT
OR SCATTERED RADIATION**



CAUTION

Dangerous voltage!
Take care to avoid coming
into contact with
electricity!

Chapter 3. Process of Installing

3.1 Unpacking

You receive your THUNDER LASER TITAN & TITAN PRO SERIES packed in a wooden box which contains the laser machine and additional accessories. The following steps give you an overview of the unpacking and assembly of the laser. Please follow these steps carefully.



Keep the packing box. You will require it in case of a return.

Dispose all waste according to the applicable waste disposal law.

1. Put the wooden box on a flat and spacious room for unpacking.
2. Remove the machine box; carefully remove the protective foam, wraps, films, etc...
3. Take out the key, open the door of the laser, remove the accessories box which contains all accessory parts required for the installation of the laser machine and check the contents carefully.
4. You will see an attachment table on the machine; please check whether the accessories are all on the table.
5. Please keep the keys and the warranty certificate as well as the model and serial number of the machine. If you need tech support we may ask you for this information.
6. Remove the sponges and nylon cable ties from inside the machine, and then start to install the machine, carefully following the instructions in this manual.

3.2 Location

Before you install the laser system, you should select an appropriate location. Follow the guidelines shown below:



1. Avoid locations where the system is exposed to high temperatures, dust and high humidity. (The humidity must not exceed 70% and the temperature must not be close to the dew point.)
2. Avoid locations, where the system is exposed to mechanical shocks.



1. Circuit Breaker protection: Do not connect other devices on the same circuit as the laser system. It requires a dedicated circuit.
2. DO NOT open any of the machine's access panels while the unit is plugged in. Opening a

panel may expose the operator to severe electric shock, invisible CO2 laser radiation, mechanical pinch points, burns, blindness, and other hazards. ALWAYS POWER OFF AND UNPLUG!

3. DO NOT make or break any electrical connections to the system while the unit is turned on.

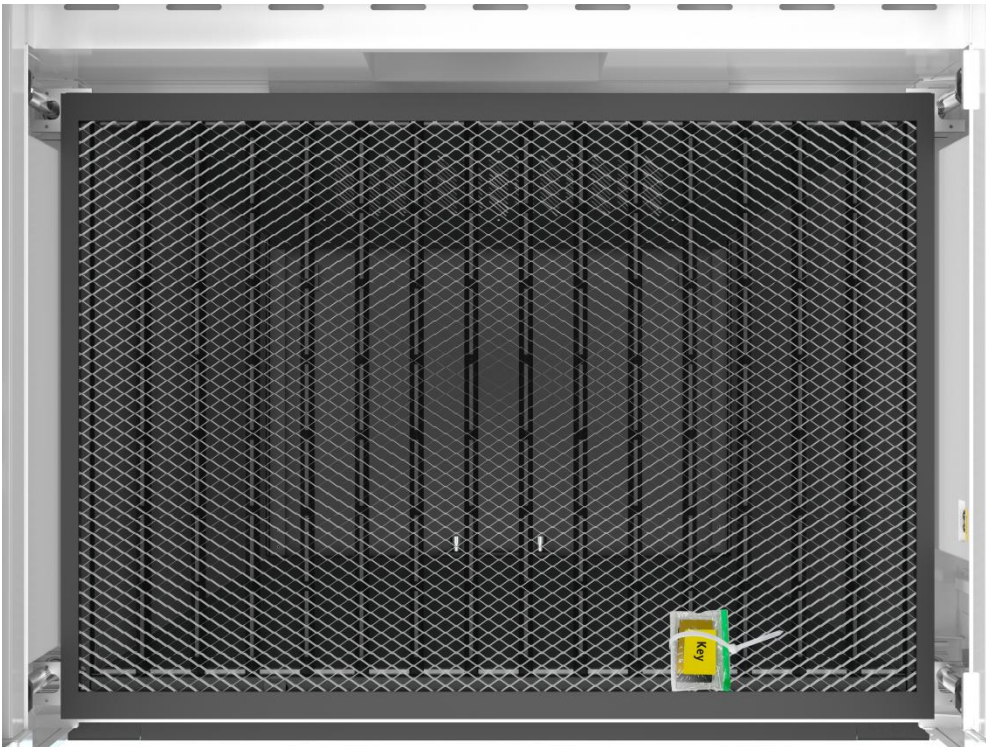


1. Avoid locations with poor air circulation; select a location close to ventilation (if available). Select a location, whose room temperature is between 15 °C and 25 °C (59° – 77° F).
2. This is fundamental to maintain consistent and reliable operation of a CO2 laser, Metal RF or Glass tube and the machine itself. Avoid higher ambient temperatures and strong exposure of the engraver to the sun. Use blinds, if required.
3. Mechanical shock and vibration of the laser will have detrimental effects on the performance and life expectancy of the machine. It will manifest (over a period of time) with a noticeable decrease in performance and increased maintenance required, possibly even damage. Setting your Thunder Laser up in a suitable temperature controlled, dust free, moisture free, level, stable surface (a level concrete floor) with the recommended extraction is critical to the ongoing performance of the machine. It is also a warranty condition.

3.3 Before Installation

1. Remove the nylon cable ties around the honey comb plate.

Remove the transparent bag from the front of honey comb plate, like below:





The transparent bag has a set of machine door keys, USB flash drive, and an engraving test sample. The USB flash drive stores software, manuals, libraries, etc... that you will need.

Reverse Offset/Scan Offset compensation settings for this specific machine are included. **These settings need to be entered into your RDWorks and/or Lasermaker settings to ensure the highest engraving quality.** Refer to the Ruida and/or Lasermaker Manuals for these necessary procedures.

2.Rotate the E-Stop switch in the direction of the arrows to reset. Familiarize yourself with the emergency stop button's operation and location.



4. When you have the machine in its final position, please be sure to re-fix the feet in all four corners.

Please see below:



The main power cable is in the tool box that came with the machine.

3.4 Exhaust System – Requirements

Proper fume extraction is imperative to evacuate the combustible and noxious fumes that are created during the lasing process. This machine must be equipped with an adequate exhaust system. This includes a blower of rated flow, volume, and duty cycle as well as properly installed ducting and peripherals. You can further reduce smells from fine particulate matter with an inline filtering system.



Connection - see section 3.7.4 connecting the Exhaust System.

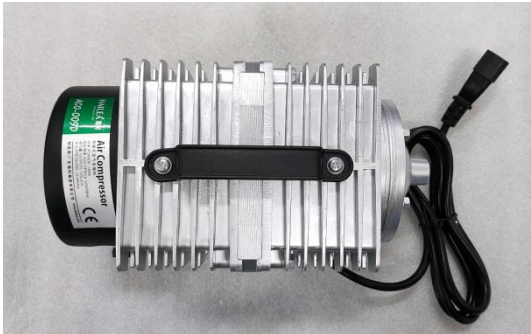


Do not start the machine without an adequate exhaust system.

3.5 Air System – Requirements

The included air pump supplies the dual stage air assist control and is a critical component. This helps keep the focusing lens clean and cool during the engraving process. Air assist is also critical when cutting to reduce flame-ups and clear the debris field.

When the equipment is connected to 220V power supply, the air pump is configured as HALI air pump; if it is connected to 120V power supply, it is configured as SENSEN air pump.

Power Supply	Compatible Air Pump	Pics
120V	Sensen Air Pump	
220V	HaiLea Air Pump	



Always use the system's Air Assist feature when vector cutting.

3.6 Computer – Requirements

The following recommendation represents the minimum requirements. When using a more powerful computer the graphics are generated and displayed faster and the computing times and the data transfer to the laser are reduced. To use the newest software version, you might have to abide other requirements.

- Windows 11 (32 bit or 64 bit)
- Windows 10 (32 bit or 64 bit)
- Windows 8 (32 bit or 64 bit)
- Windows 7 (32 bit or 64 bit)
 - Windows Vista (with Service Pack 1 or later)
 - Windows XP (with Service Pack 2 or later)
- 1024 MB of RAM, 400 MB of hard disk space
- Pentium® 3 or 4 processor or AMD Athlon™ XP
- 1024 x 768 or better monitor resolution
- 1 free USB interface
- 1 free Ethernet interface
- Mouse

These requirements are for Lasermaker and RDWorks.

3.7 Connections



Perform the connections exactly in the order described; otherwise electrostatic charging can damage your computer and/or the electronics of the laser system.

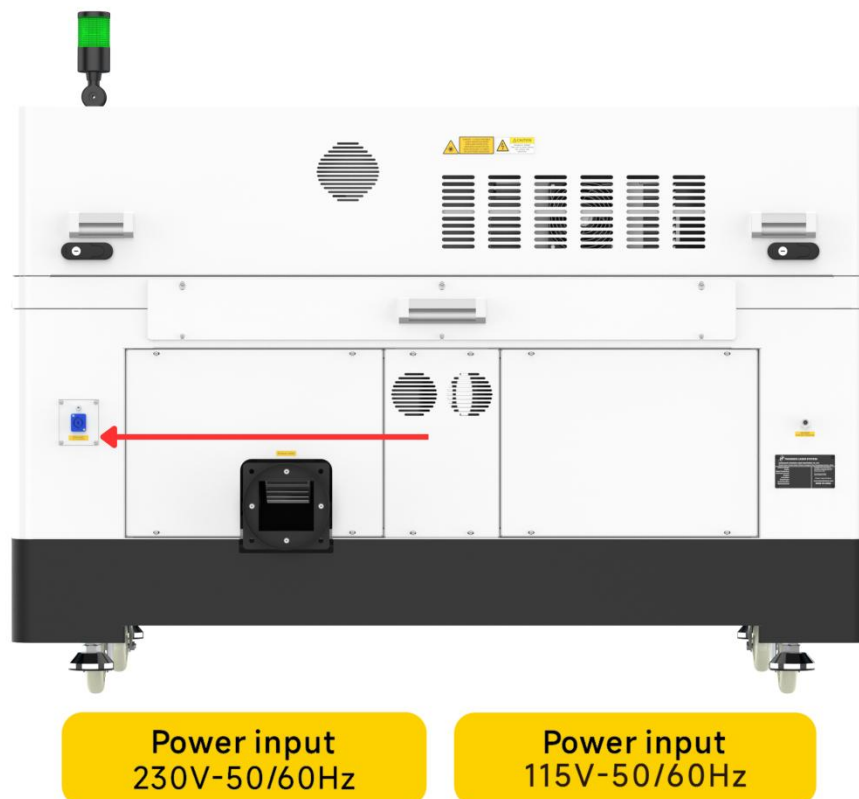
3.7.1 Connecting the Mains

Connect one end of the mains cable with the connection socket at the rear side of the laser device (see Figure below) and the other end with a protected power outlet.

Mains voltage and operating voltage must correspond (AC 230V 50/60 Hz or AC 115V 50/60 Hz) – see information label beside the connection socket.



Under no circumstances should you switch on the device if the voltages do not correspond.



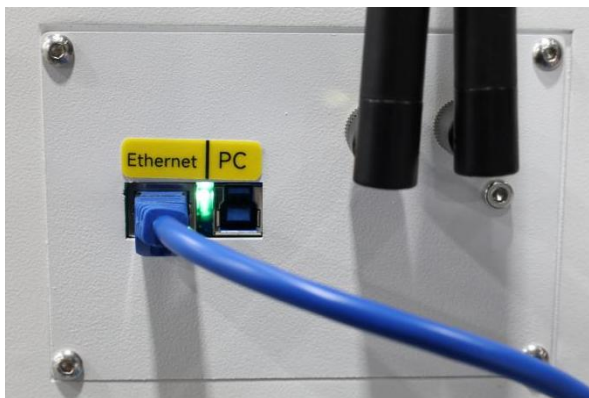
The mains cable is placed the front of the honeycomb table.

3.7.2 Connecting the Computer

For proper communication, the computer and the device should be connected to the same local network, with their IP addresses sharing the same first three octets (network segment). This requirement applies to both Ethernet and WiFi connections.

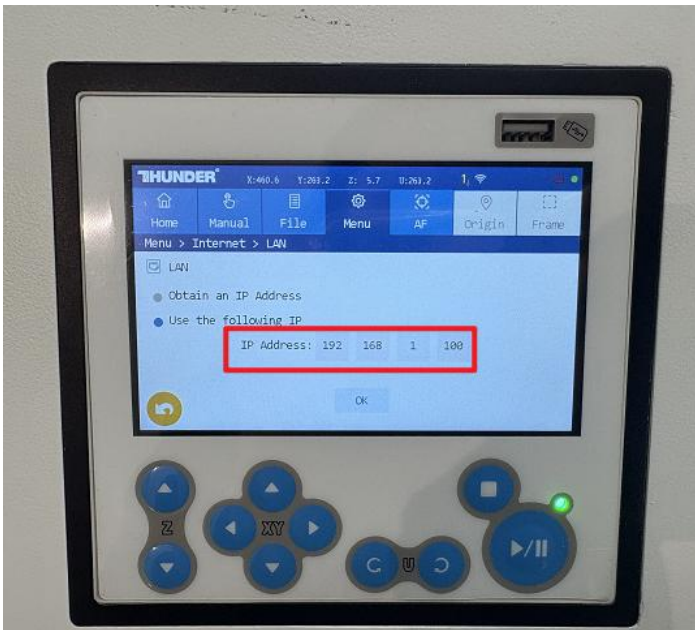
Ethernet Connection

1.First, connect the laser machine and PC with the Ethernet cable that provided with the machine.



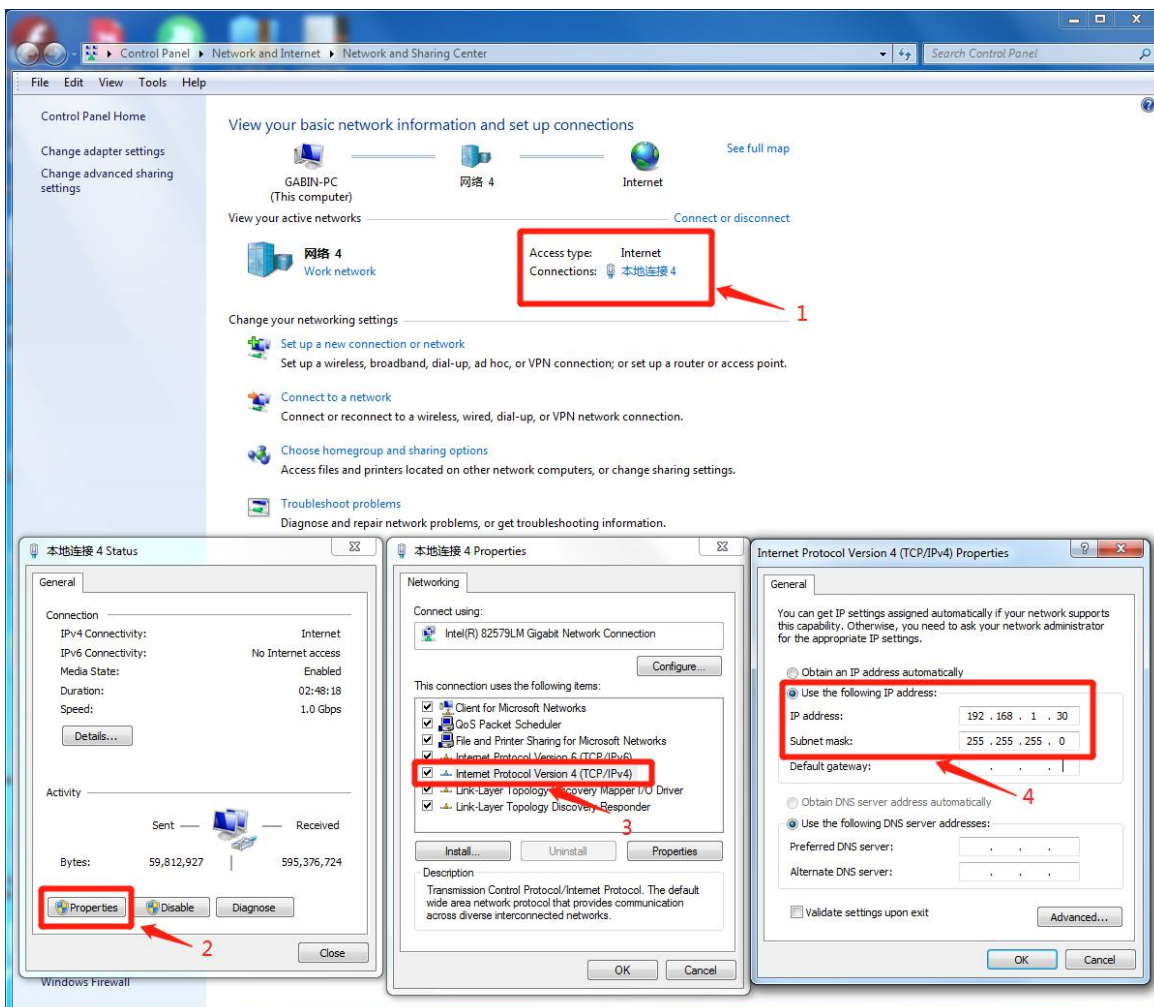
2. Find the IP address of your machine on the touch panel.





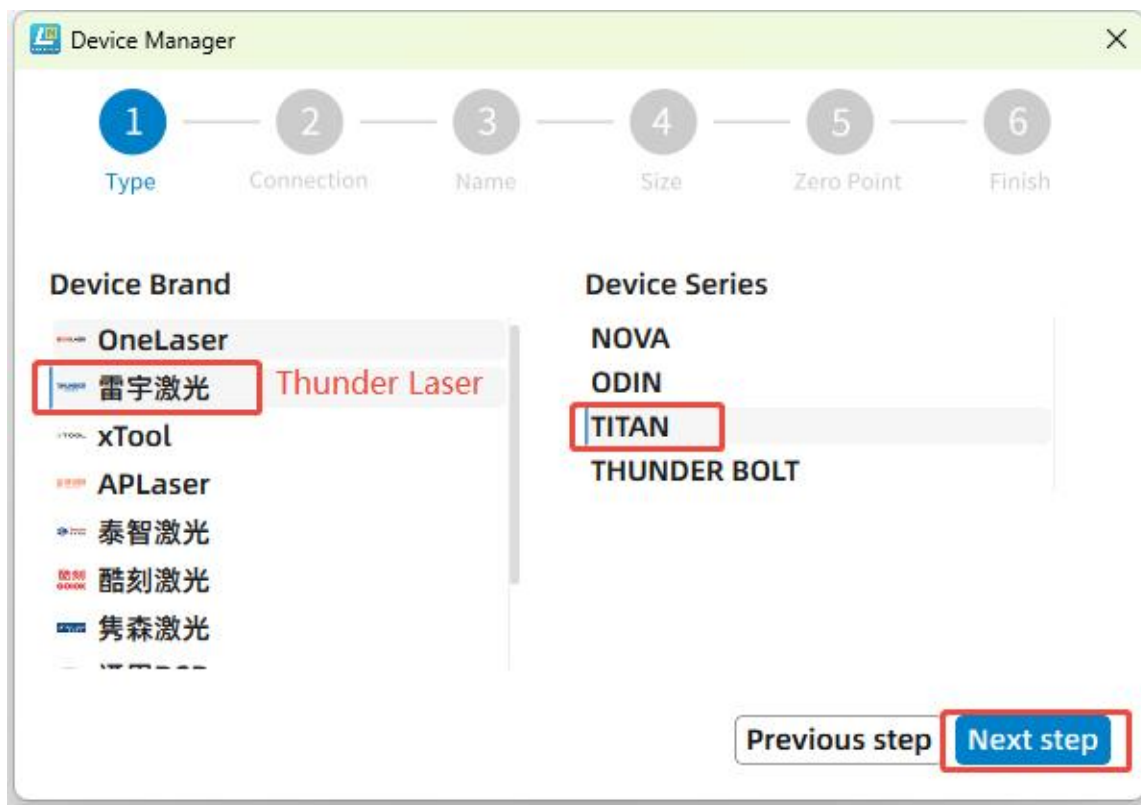
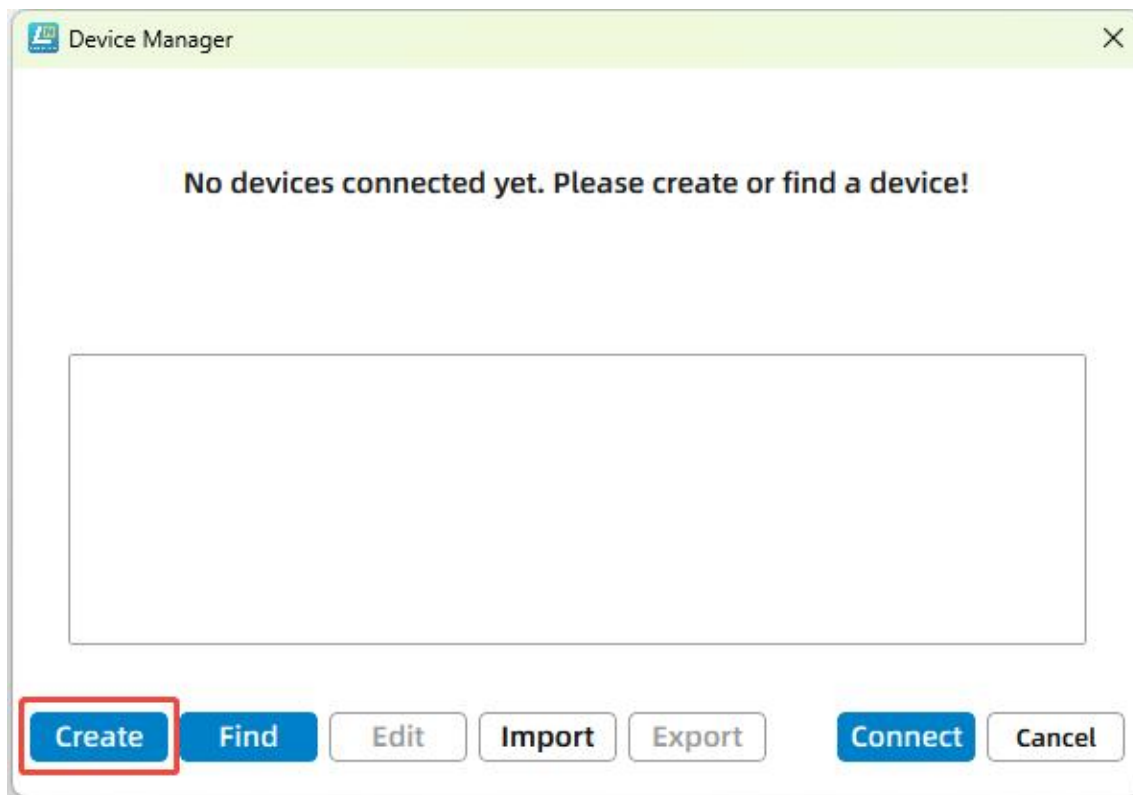
3. Configure computer.

a. Go to Start >> Control Panel >> Network and Sharing Center, configure the connection for local connection, like below.



4. Configure the software.

In LaserMaker:



Device Manager

✓

2

3

4

5

6

Type
Connection
Name
Size
Zero Point
Finish

Connection

☐ USB Serial

☒ TCP/IP Ethernet

192.168.1__.100

Test

Previous step

Next step

Device Manager

✓

✓

3

4

5

6

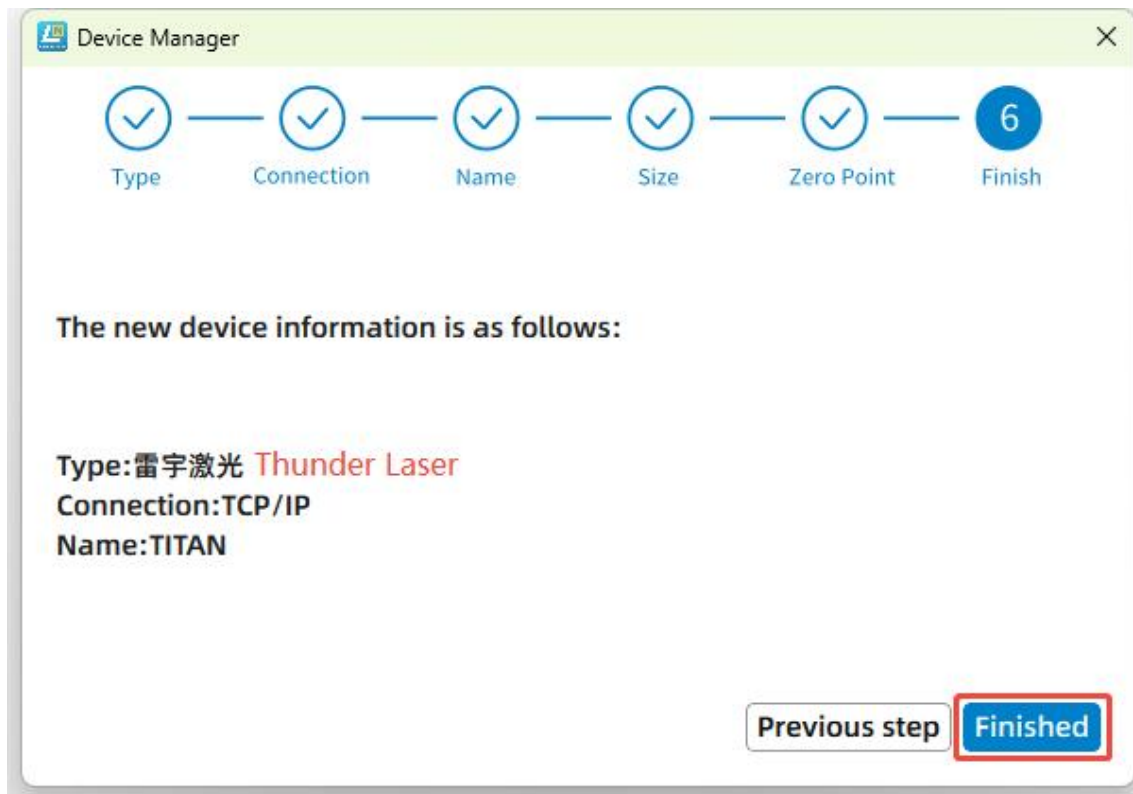
Type
Connection
Name
Size
Zero Point
Finish

Device name

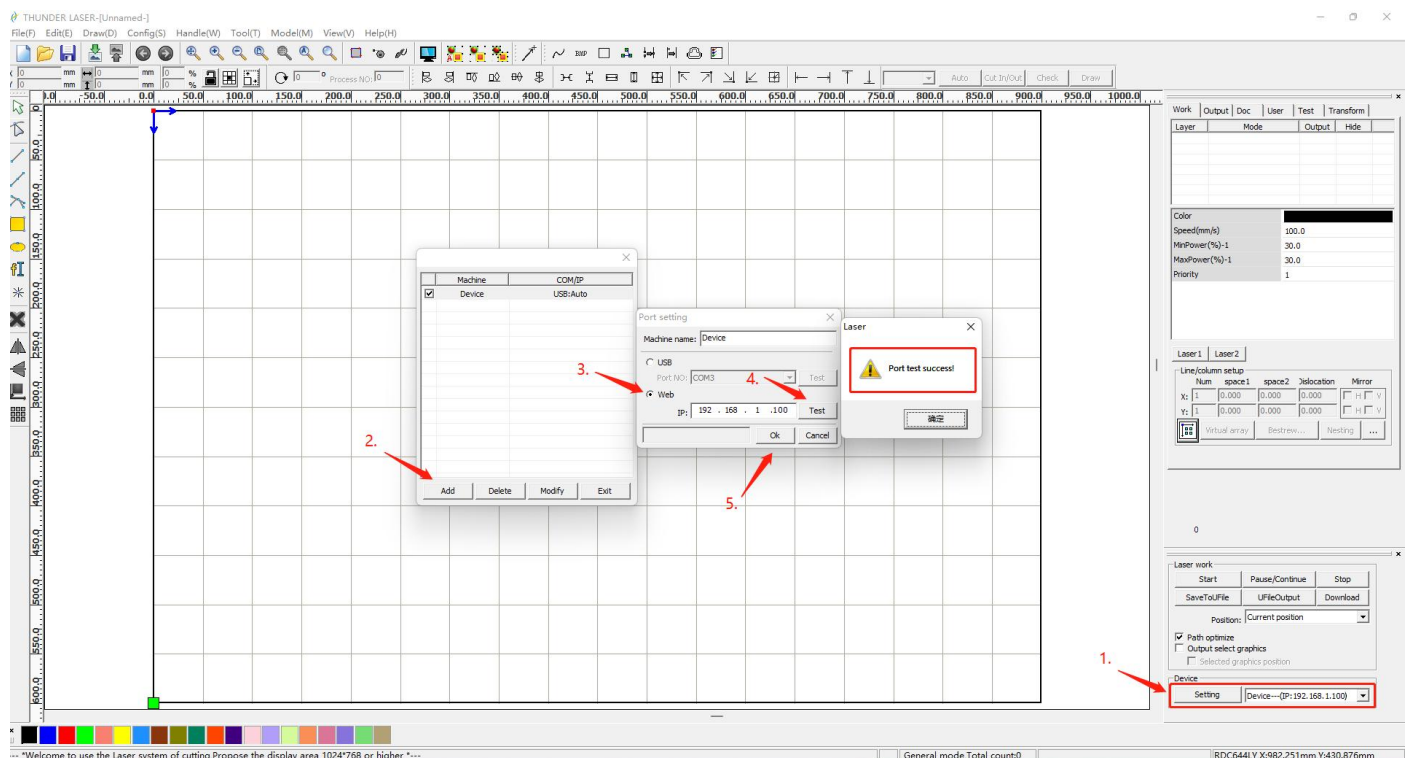
TITAN

Previous step

Next step



In RDWorks:



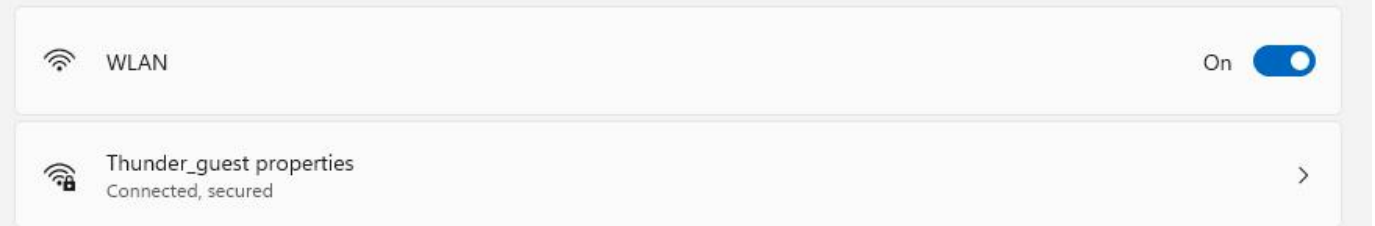
WIFI Connection

The machine also supports WiFi connection. To connect via WiFi:

1. Ensure that both the machine and your computer are connected to the same WiFi network.
2. On the touch panel, navigate to the network settings and confirm that the WiFi connection is established.



Network & internet > Wi-Fi



Since WIFI network speed may affect the stability of device connections, we recommend that customers configure a dedicated standalone router to establish a dedicated network environment in order to ensure optimal network performance.

3.7.3 Air System – Built - in Features and Considerations

To ensure precision and results in engraving and cutting, the TITAN & TITAN PRO SERIES have an air pump built into the machine for seamless operation.

When the machine is connected to the power supply and starts to work, the intelligent control system will immediately send commands to start the built-in air pump to provide stable air assistance for laser processing and guarantee the processing effect.



You can find the built-in air pump by unscrewing these four screws.

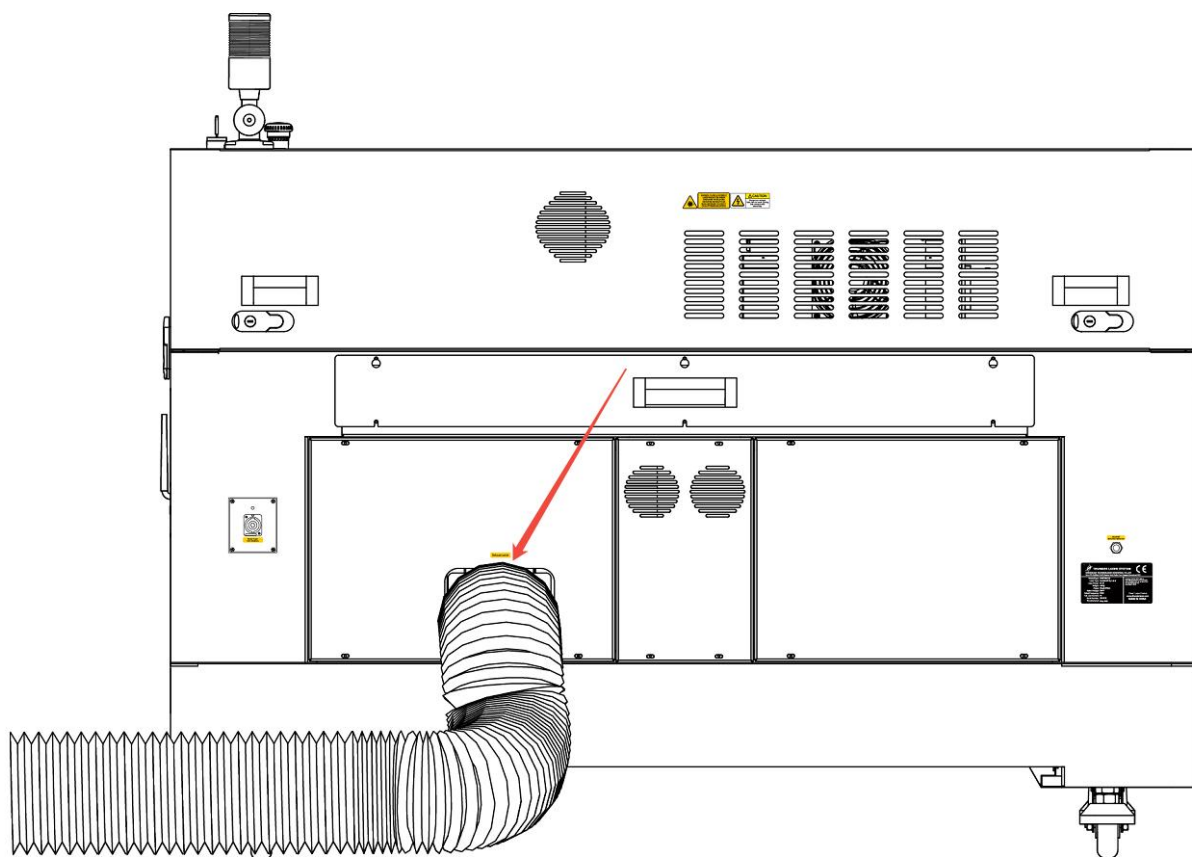


3.7.4 Exhaust System – Built - in Features and Considerations

Please note that the exhaust fan is built into the machine. It is vital to have a system with integrated exhaust in the laser system setup. It is strictly forbidden to operate the laser system without a functioning exhaust device. The exhaust system is responsible for removing dust, debris and odors from the engraving chamber and directing them out of the building or into a filtration unit.

How to set up the exhaust system

Insert one side of the gray exhaust pipe into the fan outlet and put the other side of the pipe outside where you work (If the machine is far from the outside of the room that the gas manufactured by the machine cannot be discharged; then you might need and dust/fume filter, it can keep the air quality of your working environment well). Please refer to the following pictures about how to install the exhaust pipe:

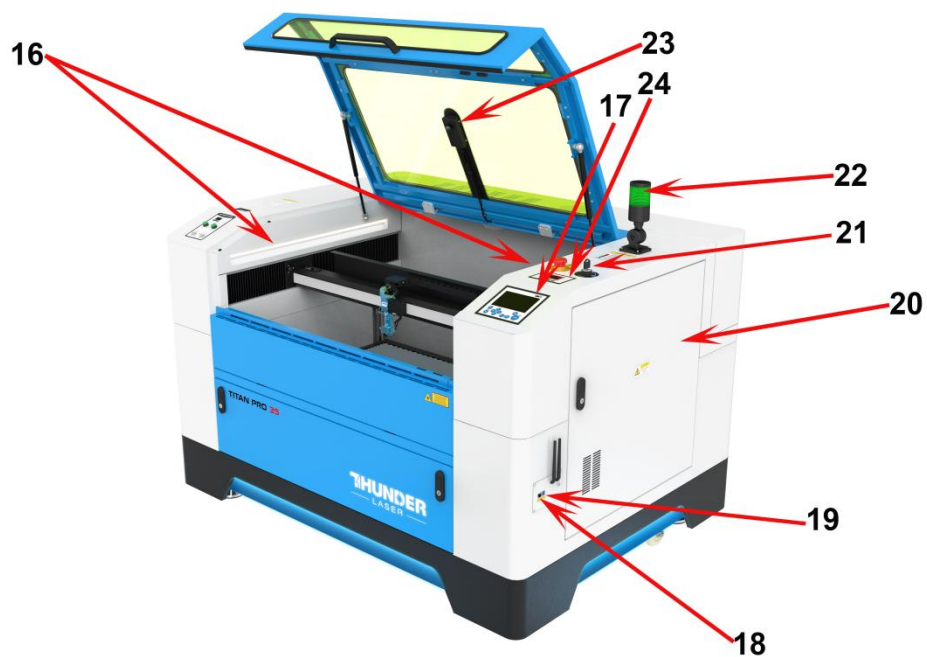
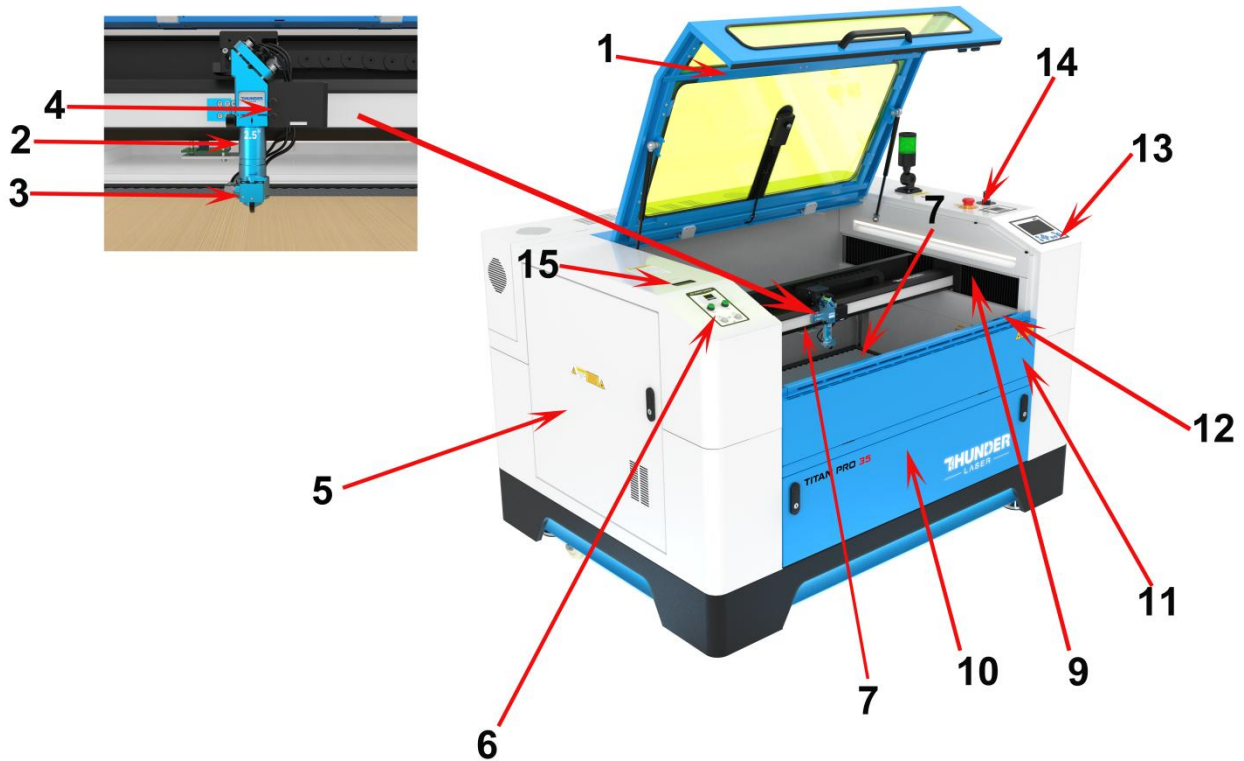


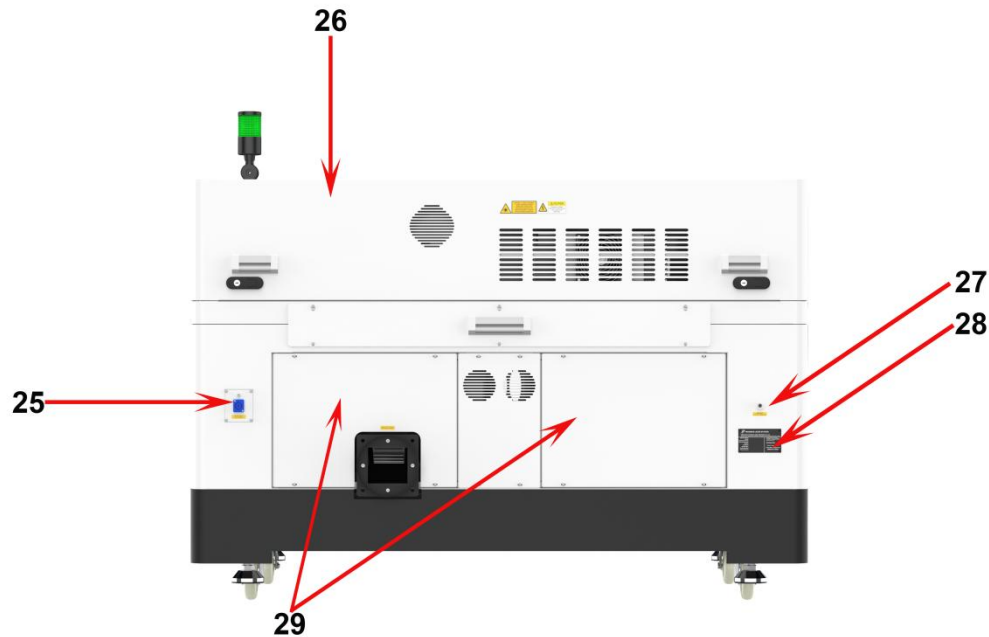
You can find the built-in exhaust fan by unscrewing these four screws.



Chapter 4. Operation

4.1 Machine View





- | | |
|----------------------------------|------------------------------|
| 1. Top flap | 19. PC connection port (USB) |
| 2. Laser head | 20. Right side door |
| 3. Auto focus sensor | 21. Key switch |
| 4. Head mounted camera | 22. Alarm lamp |
| 5. Left side door | 23. Over head camera |
| 6. Dual air-assist control panel | 24. Fiber control board |
| 7. X-axis | 25. Power supply socket |
| 8. Honey comb table | 26. Laser tube cover |
| 9. Y-axis | 27. Air assist port |
| 10. Front door | 28. Manufacturer's label |
| 11. Front up door | 29. Rear door |
| 12. Flap protection sensor | |
| 13. Touch panel | |
| 14. Emergency stop switch | |
| 15. PM2.5 Display Instrument | |
| 16. LED lamp | |
| 17. U-disk connection port | |
| 18. Ethernet port | |

1. Top flap

If the Top flap is opened, no data is processed. When the protection cover is opened during working, the motion system is stopped and the laser source is turned off. During processing of commands the protection cover must only be opened after pressing the "Pause" button.

2. Laser head

Laser beam and red dot pointer are all come out from the laser head.

3. Head mounted camera

This camera is widely used in the laser processing industry, playing a critical role in enhancing machining accuracy, enabling automated control, and ensuring quality monitoring.

4. Auto-focus sensor

Used for the automatic focusing of the work table.

5. Left side door

On TITAN24, there are installed the laser power supplier, Ammeter, Flap sensor checking board etc. Please open this door for checking these parts, but must pay attention to the electric current.

6. Dual air-assist control panel

You can adjust air volume for cutting or engraving if require. (Please view this chapter 4.9 for detail).

7. X-axis

The motion system is that performs the mechanical movements in X direction. The X-axis is visible in the working area.

8. Honey comb table

The honey comb plate sits on top of the blade bed and has indexing pins for alignment.

9. Y-axis

The motion system is that performs the mechanical movements in Y direction. The Y-axis is visible in the working area.

10. Front door

To clean the waste after working or remove the honey comb table. This door is installed with the flap protection sensor.

11. Front up door

Open this door to use pass-through door. This door is locked by using inside screws and outside locks.

12. Flap protection sensor

This is where Open flat protection exist. Laser will stop working once the cover is opened during working.

13. Touch panel

You can control the X-axis, Y-axis and Z-axis manually by the display panel, it also shows the working time, power, speed and the whole working time and affords many function options (Please view this chapter 4.3 for detail).

14. Emergency stop switch

Once there's an accident happen (laser catch fire, laser out leakage) during working, please turn off this switch immediately. It will be cut off the laser power and motion power immediately.

15. PM2.5 Display Instrument

Real-time monitoring of PM2.5 concentration, temperature and humidity in the working environment, with data displayed on the operation panel to help users assess air quality and environmental parameters.

16. LED lamp

It's used for lighting the working table once turn the Main switch on.

17. U-disk connection port(USB)

You can save the file as a U-disk File by press "SaveToUFile" on the software, then save it to the u-disk and insert the u-disk to the port of laser machine, then use the control panel to select and control it to work.

18. Ethernet port

This Ethernet port is for connecting computer.

19. PC connection port(USB)

This USB is for connecting computer.

20. Right side door

On TITAN24, there are laser controller, driver(Hybrid Servo Drive and Stepper Drive),TL-timer, and the main connecting cables etc.

On TITAN35/51/63, there are laser controller, driver(Hybrid Servo Drive and Stepper Drive), power supplier (both 24v DC and 36vDC),TL-timer, flap sensor checking board and the main connecting cables etc.

Please open this door for checking these parts, but must pay attention to the electric current. If you need to repair, please contact with professional maintenance staff.

21. Key switch

The laser machine will be start while you turn it on.

22. Alarm lamp

If laser machine is running a job or user starts it without closing door or water protection, the signal lamp is in red light. The red light indicates the dangerous situation and user must stay with the laser.

If laser machine is not at work, the signal lamp is in green light. The green light indicates the safety situation and the laser machine is ready for operation.

If temperature is higher than 55°C/131°F on working table, the signal lamp will make buzzing sound.

(roughly 80dBA within 1m,75dBA within 5m and 65dBA within 10m,the sound gets weaker as it travels).

23. Over head camera

The camera's function is to provide real-time observation of the work platform and to enable accurate identification, positioning, and cutting recognition.Once the computer is connected to the machine, the machine's work table can be viewed in real time via the software's camera control function.

Please note that the TITAN 27, 35 and TITAN PRO 27, 35 come standard with one camera; the TITAN 51, 63 and TITAN PRO 51, 63 come standard with two cameras.

24. Fiber control board

This feature is only available on the TITAN PRO Series. Provides repetition frequency and 8-bit digital control of laser power and pulse width modulation.

25. Power supply socket

To connect the main power and the extend power according the label information.

26. Laser tube cover

There are installed the laser tube, red dot pointer device, beam combiner and the first reflective mirror mount. This door is installed with the flap protection sensor.

27. Air assist port

This port is for connecting hoses of the air compressor.

28. Manufacture's Label

It's show you the laser information like serial number or manufacturing date etc.

29. Rear door

On TITAN24, there are power supplier (both 24v DC and 36vDC)

On TITAN35/51/63, there are installed the laser power supply.

Please open this door for checking these parts, but must pay attention to that electric current.

4.2 ON/OFF Switch

The mains power ON/OFF switch

The following conditions must be fulfilled for correct start up:

Unrestricted freedom of motion of the mechanics

No materials under the engraving table

Protection covers closed

Then turn the key switch to on



Then this page will pop up.

Starting Program

The following steps will be performed:

- Power on the laser
- Move the laser head to origin

Confirm and move

Click **"Confirm and move"**

www.thunderlaser.com
tech@thunderlaser.com

Tel: (86) 18103043363

If all covers are closed, immediately after being switched on, the device starts the referencing process. When the referencing process is completed correctly, an acoustic signal sounds and the device is ready for operation. The operation panel will display the home screen when the laser is completed resets.



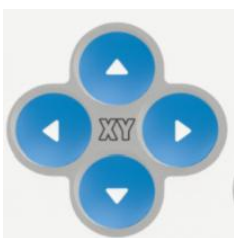
Before switching on the device, the user must make sure that no objects of any kind are located inside the operating space, which could limit or obstruct the mechanics of the device.

4.3 How to use the display

4.3.1 Function of the Buttons



✧ Arrow buttons: control the movement of the Z-axis.



✧ Arrow buttons: control the movement of the laser head.



✧ U movement button: Use this to control the rotary.



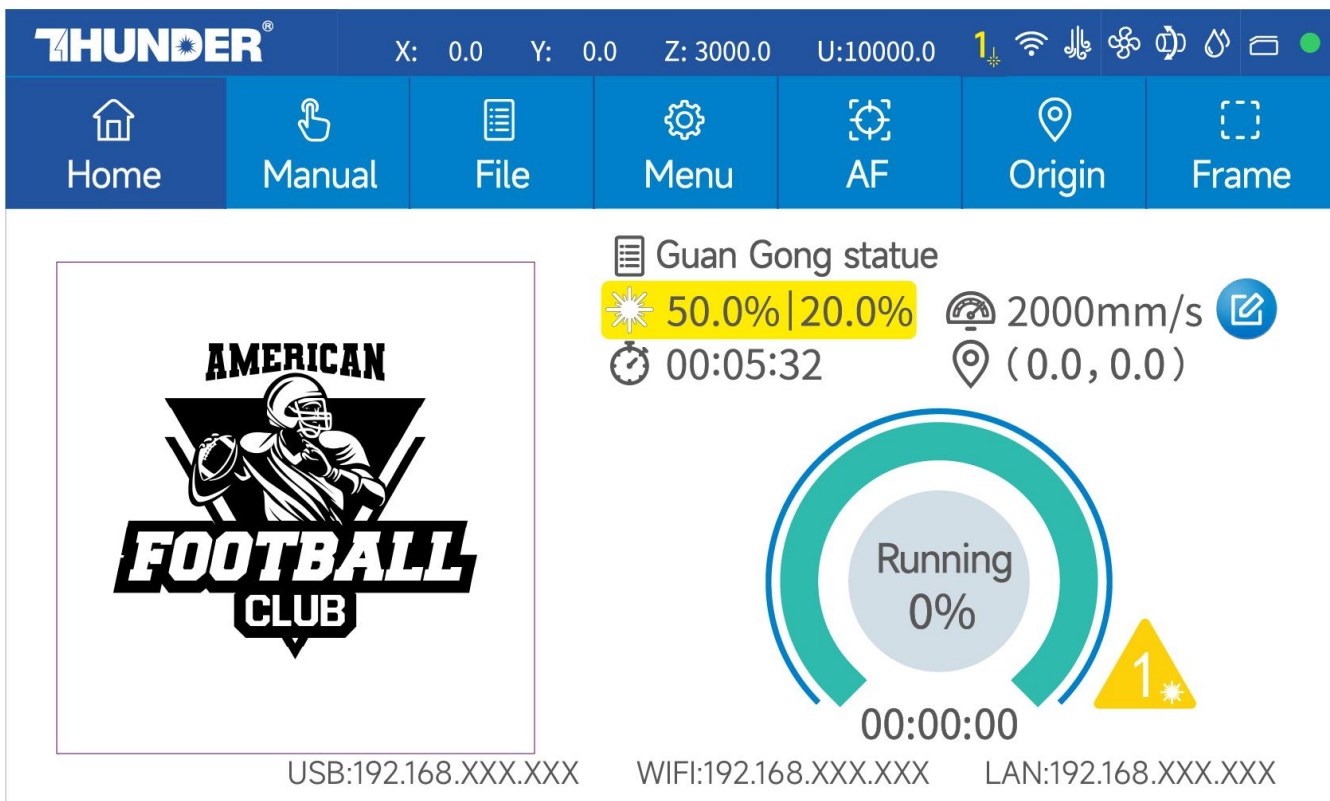
- Start-Pause/Stop button: Use these buttons to start or pause a file.

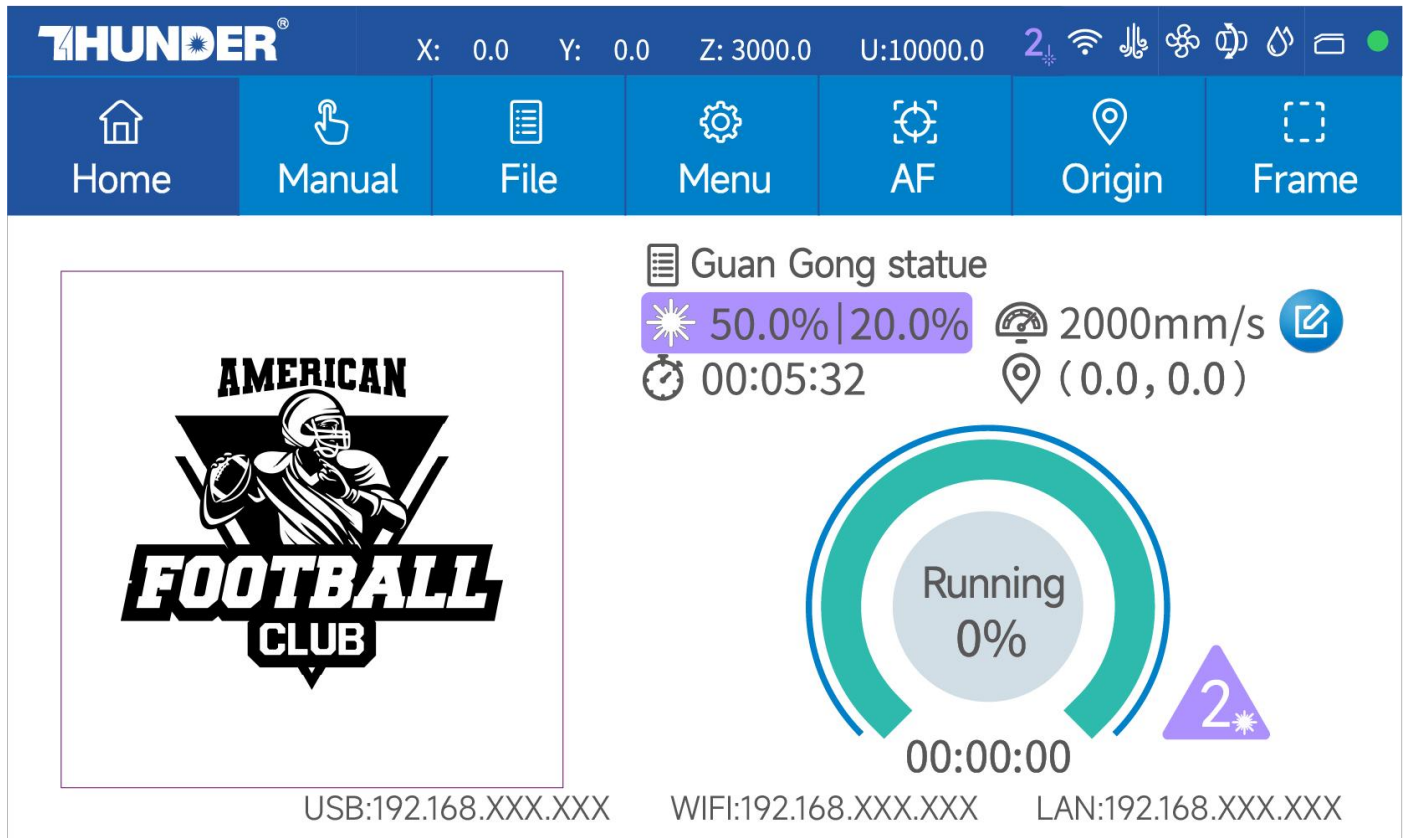


- USB disk connector: To connect a U-disk

4.3.2 The main interface

● Home page





Name: The name of the file.

Power setting: Max power and min power.

Speed setting: Running speed of your job.

Working time: The running time of this job.

Coordinates: The coordinate of origin you set.

Processing progress: Check the processing status of the job.

IP address: Show the IP address of machine.

Air assist: It will be displayed when the machine is in standard mode. Intelligent mode as default settings.

Exhaust: It will be displayed when the machine is in standard mode.

Laser source : It will be displayed when the Laser One/Two is activated.



Rotary: It will be displayed when the rotary is connected.



Water protection: Only for DC tubes.

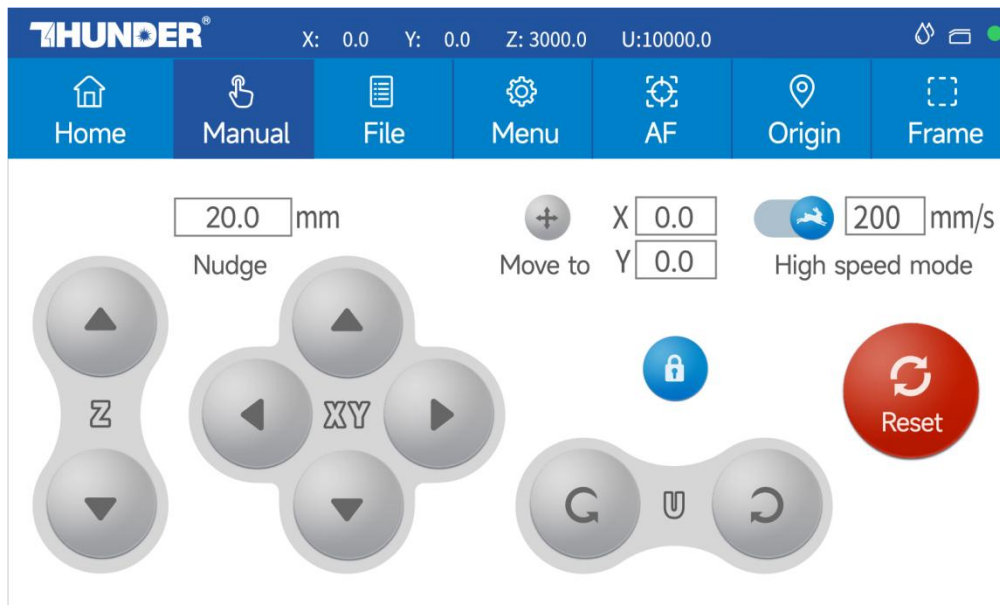


Door protection status: All doors are closed when it's gray. It's red when a door is opened.



Status: It's green when the machine is idle. Red when running a file.

● Manual page



20.0 mm

Nudge

Nudge: Set the travel distance when moving each axis manually.



X 0.0

Move to

Y 0.0

Target position: Set a coordinate, then the laser head will move to here.

200 mm/s

High speed mode

Mobile mode: Change the mode.

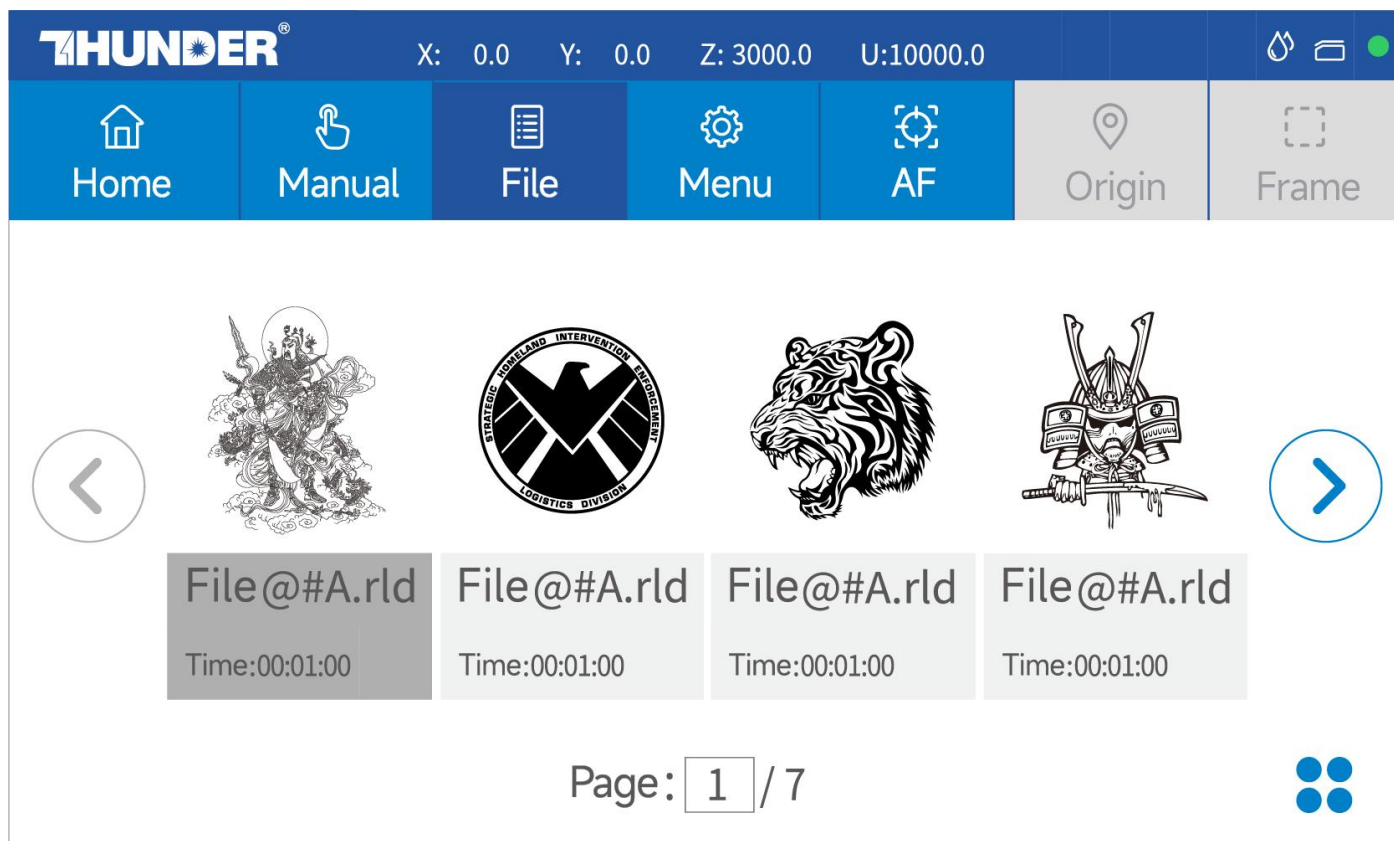


Reset button: To reset X/Y axes.



Lock button: Lock or unlock the manual buttons.

● File page



Check all files in this page.

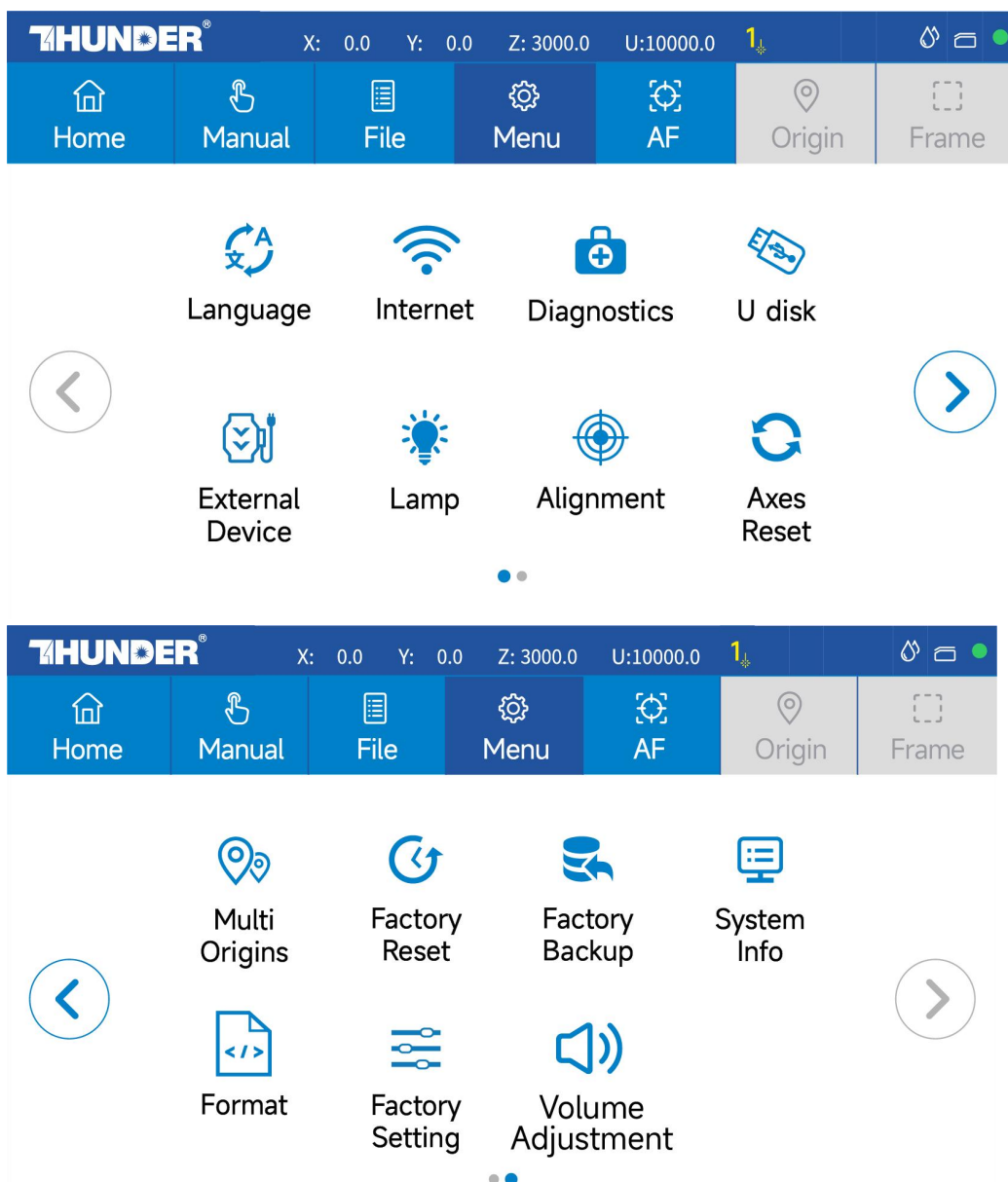


Settings: check more settings of file.



Select and hold a file for 2 seconds to select it to run.

● Menu page



Language: Change the language of panel.

Internet: You can connect and set up network connections, including WiFi, LAN, and USB connections, through this menu.

Diagnostics: the “Diagnostics” interface shows some system input information, such as limiter status, and the status of the door protection etc.

U disk: Upload files via U-disk.

External Device: Switch the intelligent and standard mode. And set delay time for exhaust and air assist time.

Lamp: Adjust the brightness of led lamp.

Alignment: Check and adjust the laser beam, manually switching between laser one and laser two.

Axes Reset: Reset all axes.

Multi Origins: Set multi origins.

Factory Reset: Reset the vendor settings.

Factory Backup: Set the current setting as vendor settings.

System Info: Check all info of your machine.

Format: Permanently delete all files and data, and check the hard drive for bad sectors.

Factory Setting: Adjustment of equipment parameters.

Volume Adjustment: Enables or disables audible feedback for touch buttons.

● Others



Auto focus button: Click this button to auto focus after placing the materials on working bed.



Origin button: Click this button after selecting a file.



Frame button: Click it to run a frame of your file after setting an origin.

4.4 Optional Lenses

4.4.1 How to use different Lens

The TITAN SERIES supports the installation of four types of lenses: 1.5 inches, 2 inches, 2.5 inches, and 4 inches. The 2.5-inch lens is included as standard, while the other three are optional and need to be purchased separately.



The TITAN PRO SERIES supports the installation of five types of lenses: 1.5 inches, 2 inches, 2.5 inches, 3 inches, and 4 inches. The 3-inch lens is included as standard, while the other four are optional and need to be purchased separately.



Four types of lenses can be used for engraving and cutting, and different lenses can be chosen based on the actual application.

The 1.5-inch lens is suitable for fine engraving and cutting of thin materials.

The 2-inch lens is suitable for general engraving and cutting.

The 2.5-inch lens is suitable for general engraving and cutting.

The 3-inch lens is exclusive to TITAN PRO SERIES and is suitable for medium-depth engraving and cutting of moderately thick materials. In addition, the series' **dual laser source** feature is only compatible with 3-inch lenses.

The 4-inch lens is suitable for general engraving and cutting materials with a thickness of 10mm and above.

4.4.2 How to replace different lens



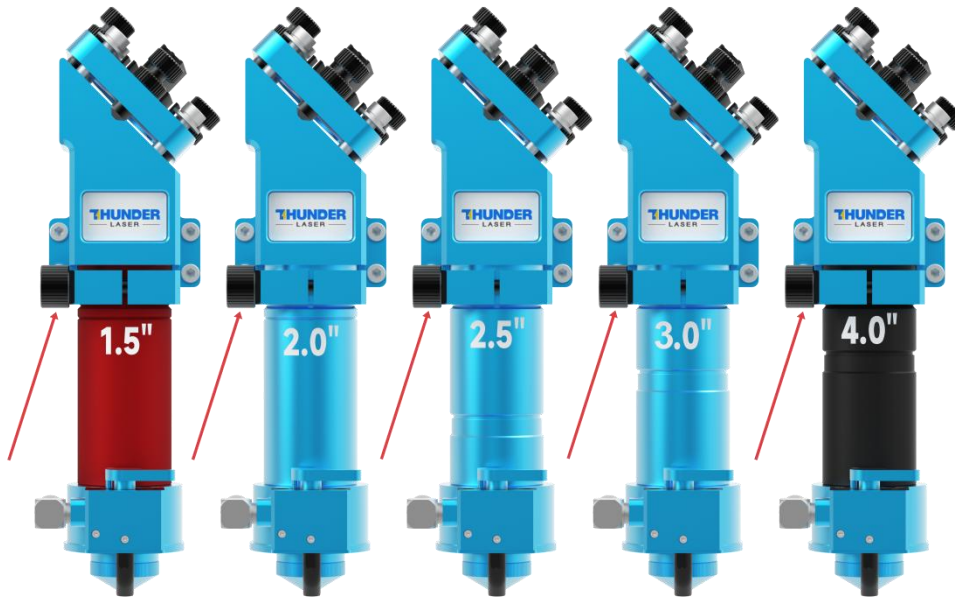
Please follow these steps:

1. Press the tracheal joint and remove the black air pipe.
 2. Hold the lens tube by hand, loosen the copper screw, and remove the entire lens tube.
 3. Remove the blue cone head part.
 4. Reinstall the new lens tube in its original position.
- (Note: Be sure to reconnect the air pipe, insufficient blowing may damage the lens)
5. When reinstalling, pay attention to the installation position of the black rubber ring.

TITAN series

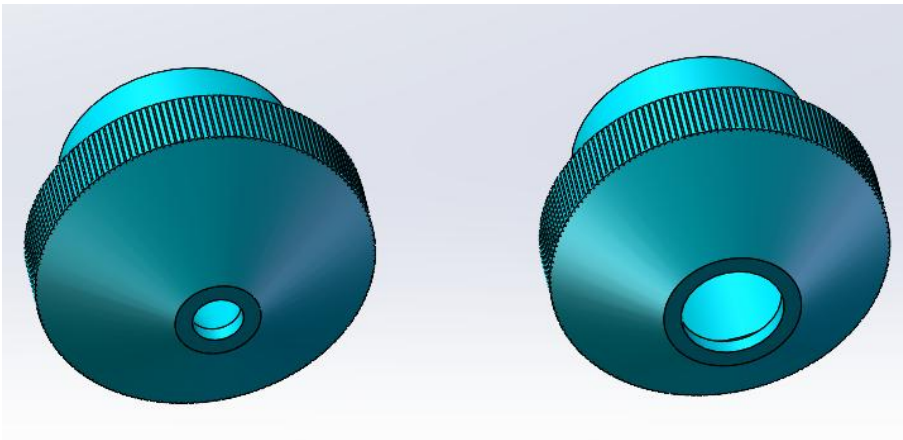


TITAN Pro series



4.4.3 How to use different nozzle

The TITAN & TITAN PRO SERIES are compatible with two nozzles, one is 3mm (standard), and the other is 6mm (optional). The 6mm nozzle is stored in the toolbox.



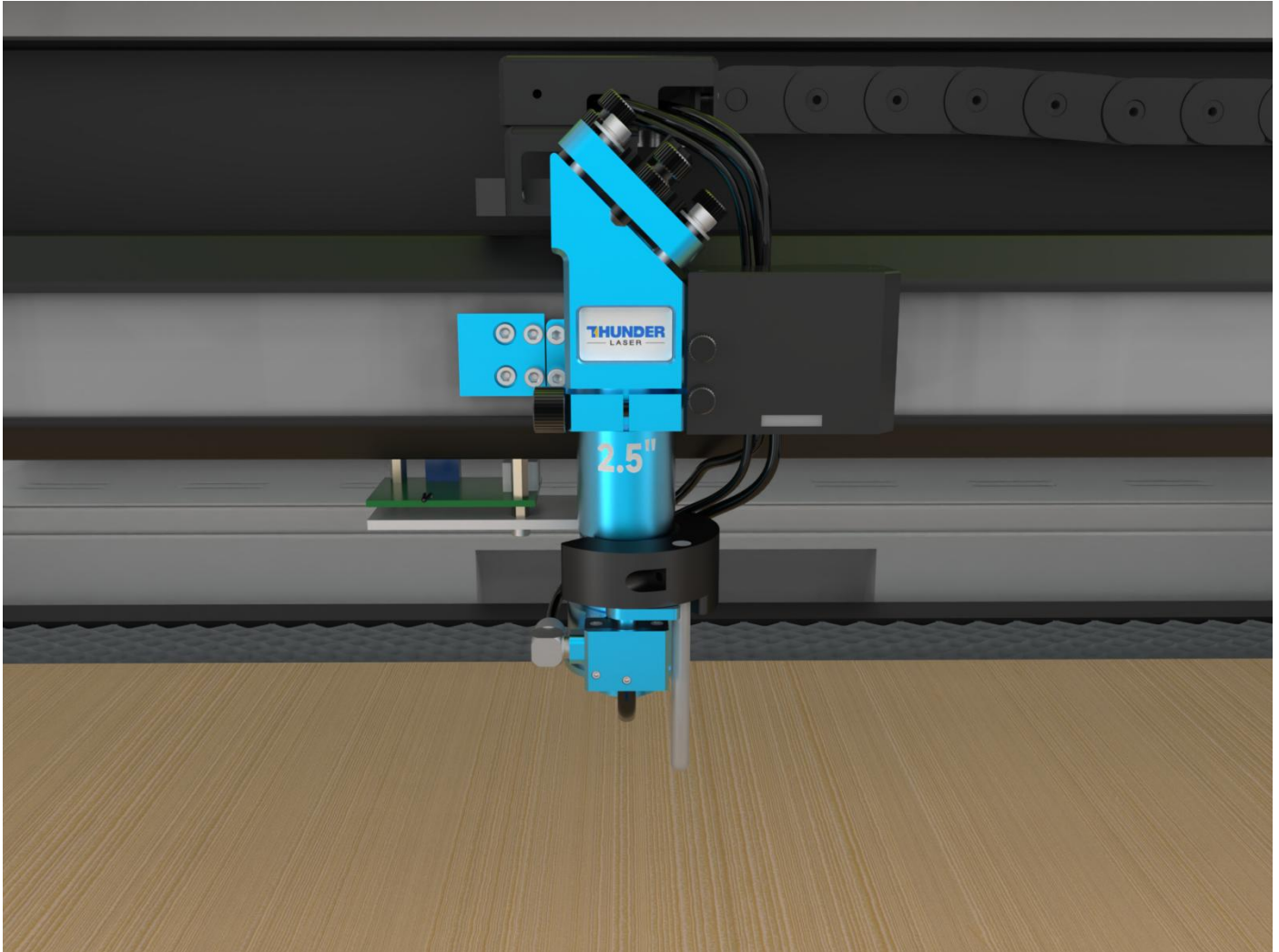
A nozzle has a very narrow outlet (approx. 3mm), which provides high air flow to blow directly on the cutting gap. This nozzle is excellently suited for cutting wood, as this prevents soot formation in the cutting gap.

The other nozzle has a large outlet (approx. 6 mm), which provides the air assist to blow the material more slowly and not directly on the cutting gap. This nozzle is excellently suited for cutting acrylic, as this prevents white mark in the cutting edge. Besides, when engraving wood, for example, particles that have been removed and smoke / gases are gently distributed and extracted in the working area. So you get a clean, almost unaffected by smoke traces engraving.

4.5 How to focus

- Manual focus

The laser machine comes equipped with a manual focusing tool that is attached to the cone module. Then raise the honeycomb table up with Touch panel, and the bottom of the tool touches the material surface, it means completing the focusing process.



- Auto focus

In the TITAN & TITAN PRO SERIES, place the material on the honeycomb table and move the laser head above the material. Press the auto focus function on the panel: **AF button**.



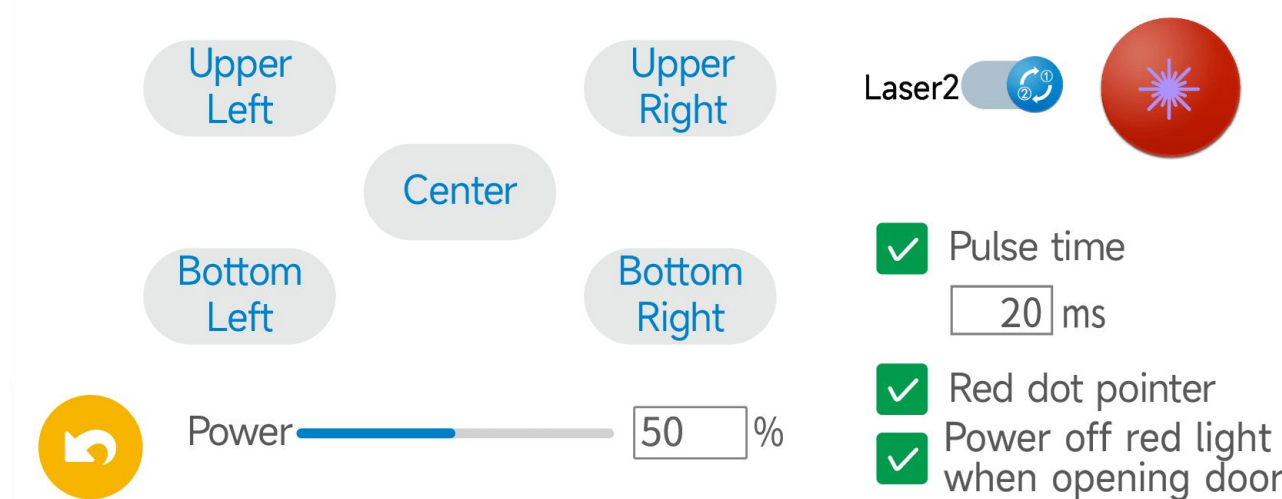
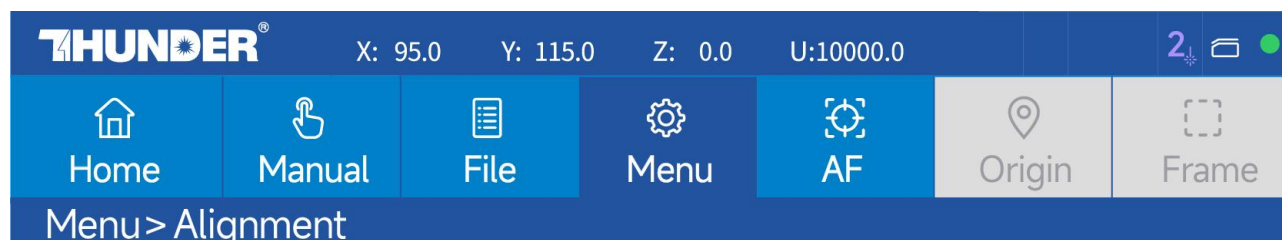
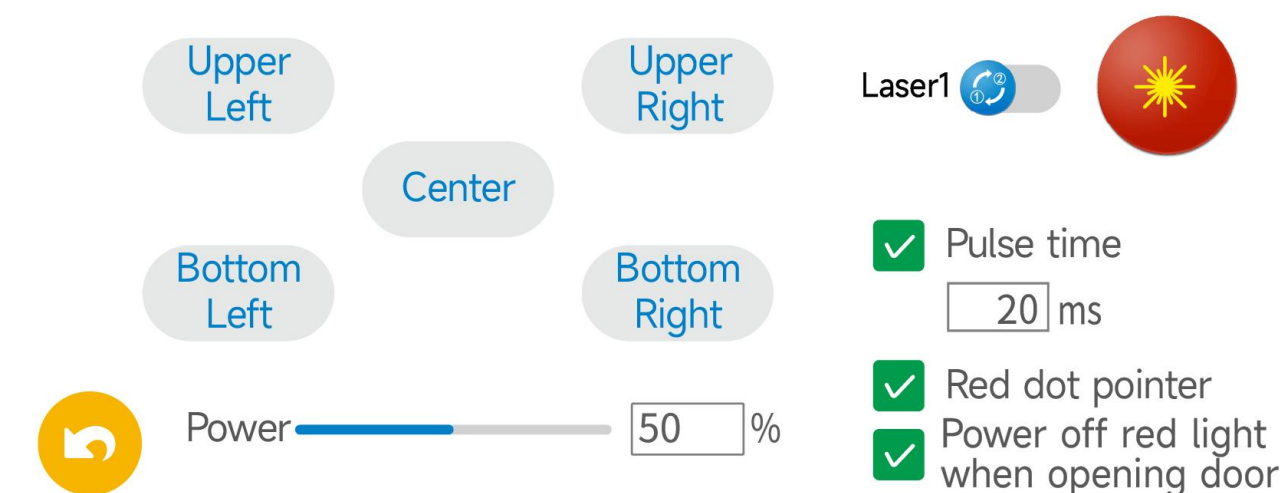
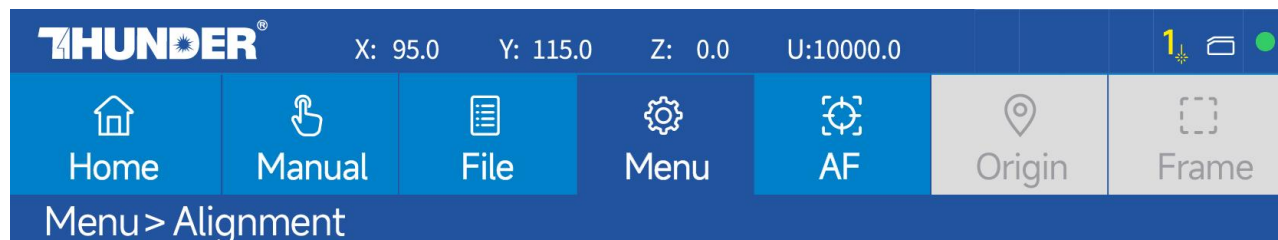
The platform will automatically rise, then lower to the appropriate height after triggering the sensor, indicating that the automatic focus is complete.

4.6 How to switch the Laser Sources Manually

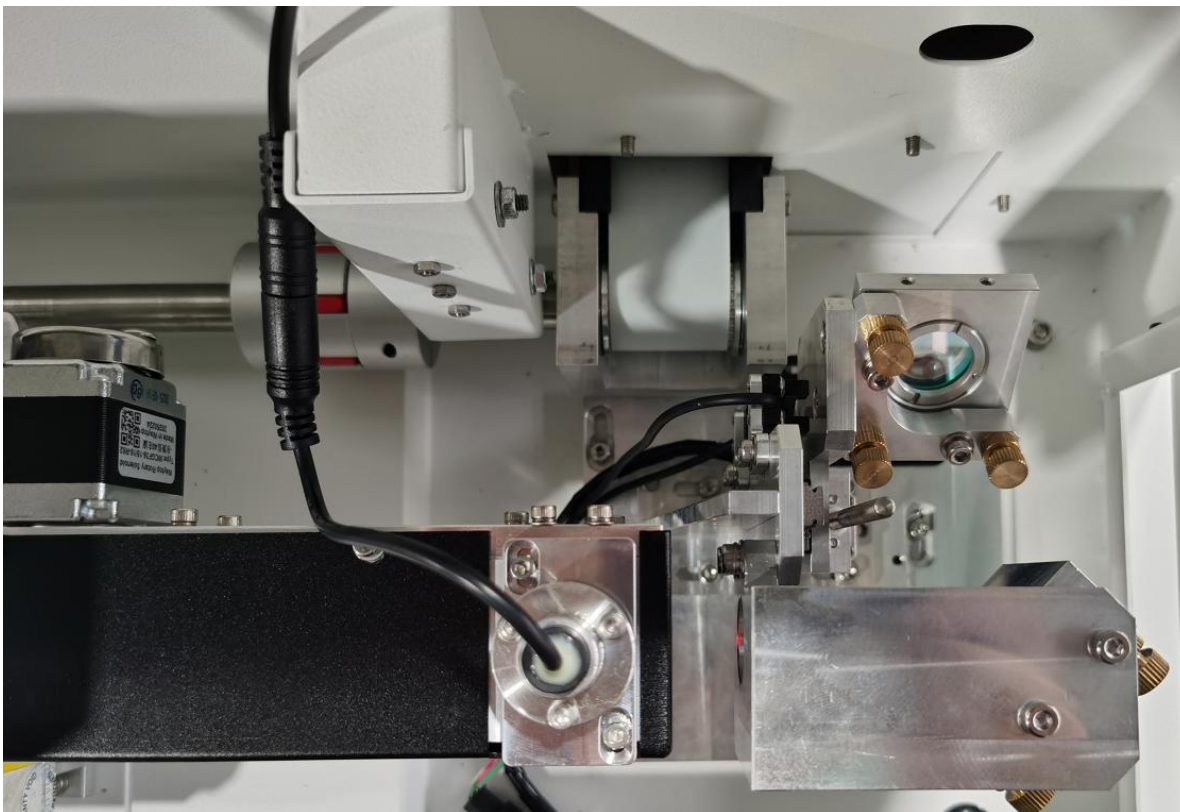
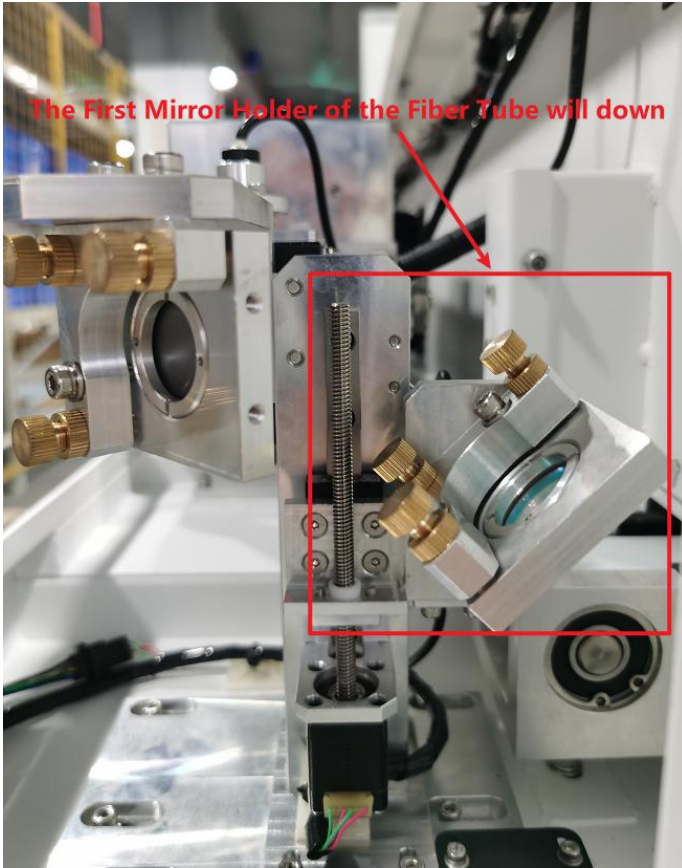
Checking laser and beam path correctness in maintenance mode requires manual switching of the Dual Laser Source function.

TITAN PRO SERIES supports the installation of both Fiber and CO2 laser sources, how to switch as follows:

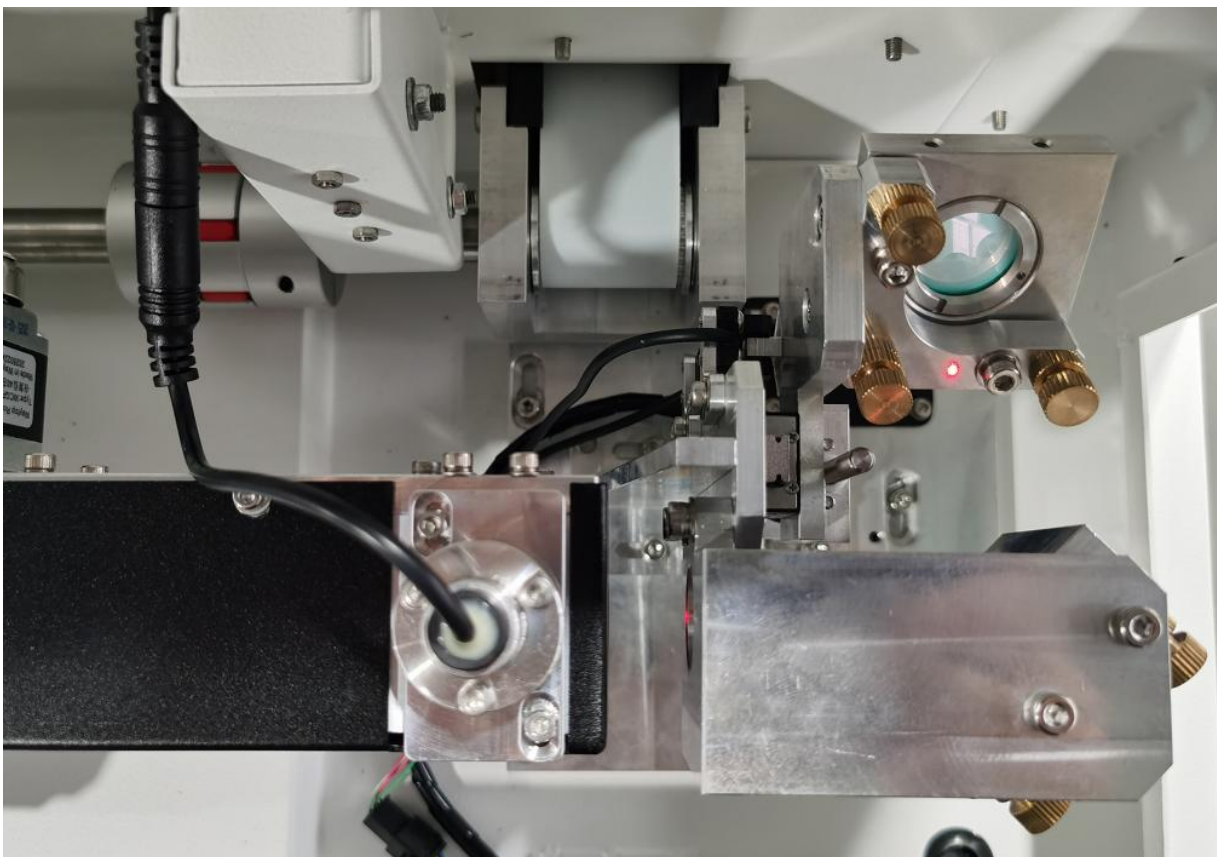
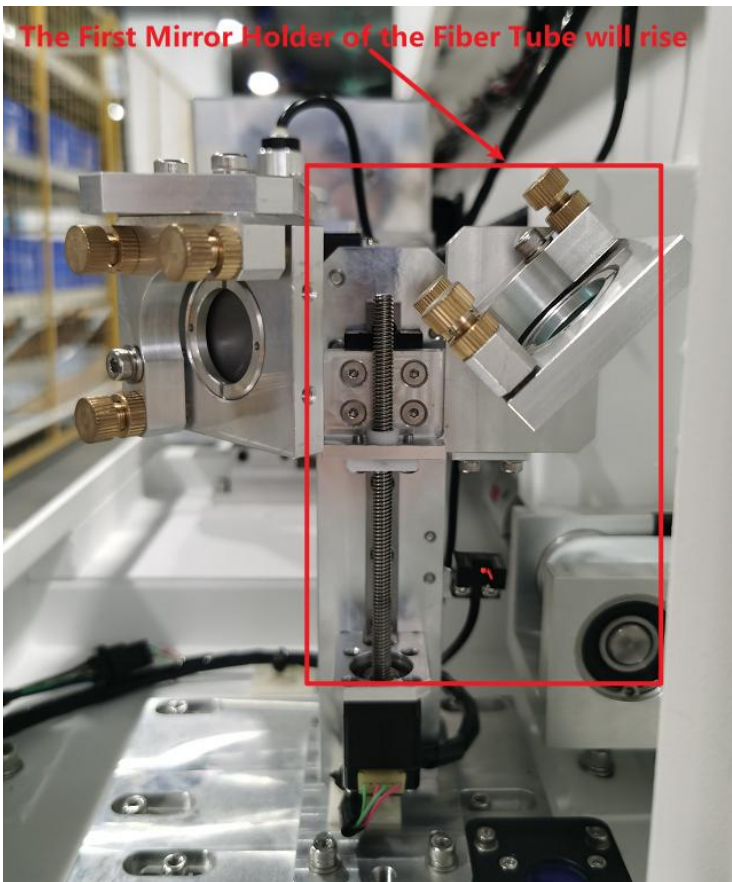
1. Click Menu button on panel >> Click the Alignment >> By clicking on the Laser 1 button, the machine switches to Laser 2 and displays the corresponding laser source in the icon in the upper right corner .



2. When switching, the lead screw motor of the fiber holder module drives the first mirror of the fiber to move.
- ① When using the RF tube, the first mirror holder of the fiber moves away to make room for the first mirror of the RF tube, allowing the RF tube's beam to reach the second reflector on the guide rail and ultimately the laser head. In this state, the RF tube can emit a beam, while the fiber cannot.



② When using the fiber, the first mirror holder of the fiber moves to the designated beam-emitting position (aligned with the optical path of the RF tube), allowing the fiber's beam to reach the second reflector on the guide rail and then the laser head. At this point, the fiber can emit a beam, while the RF tube cannot.

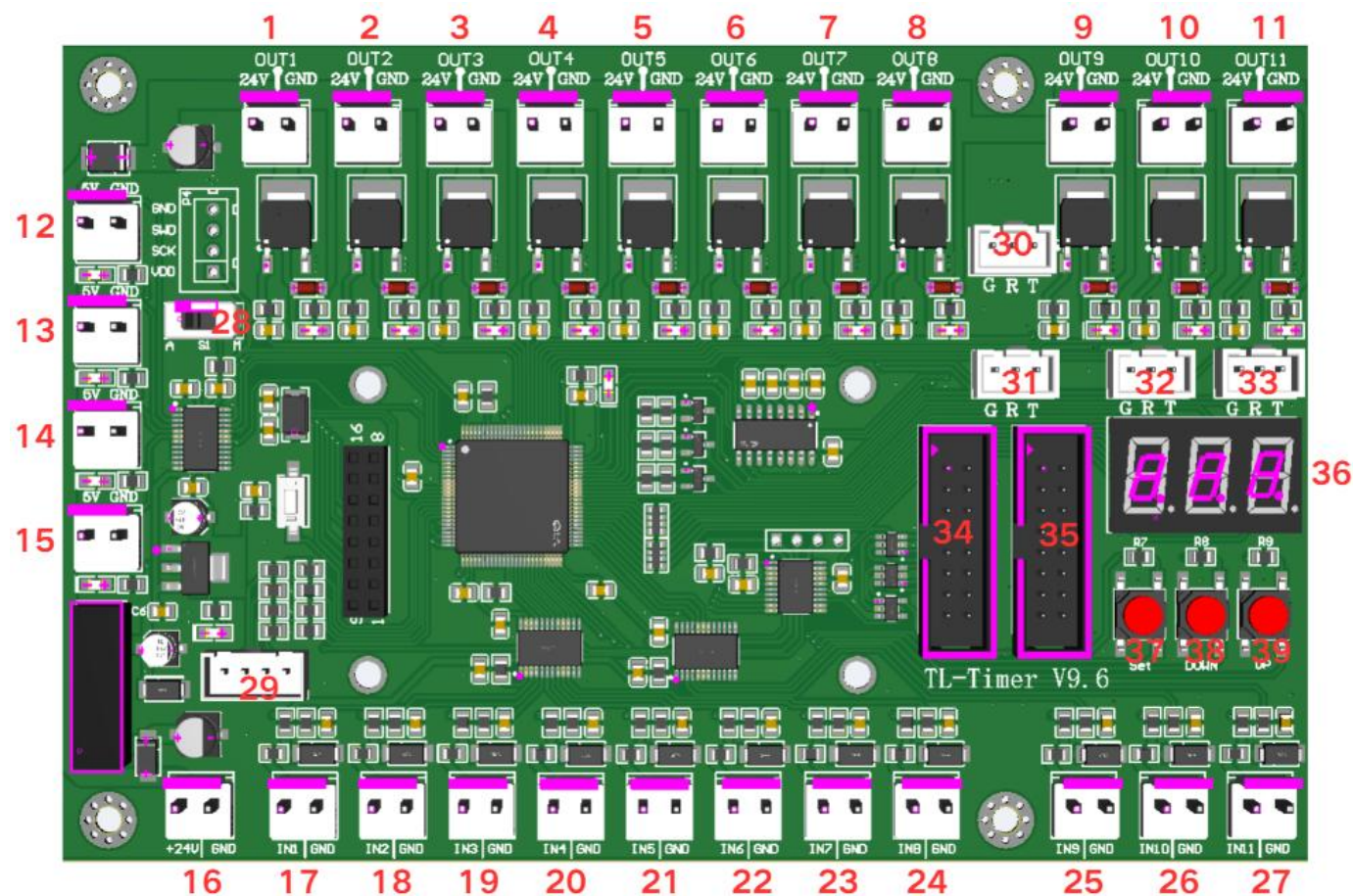


4.7 How to use the TL-Timer

The TL-Timer is an additional tool for laser machines.

It will control laser machines periphery like air pump, exhaust fan, warning lights, heat alarm detector, electrical locks and lot of other stuff automatically.

This will increase the ease of use of your laser machine.



About TL-Timer controller interface and buttons description:

1. OUT1: Control the green light of warning light; When the machine is not at work, the warning light is in green color;
2. OUT2: Control the red light of warning light; When the machine is working or getting around alarm message on LCD panel, the warning light turns red;
3. OUT3: Control the exhaust fan; Delay shutdown is set to 30 second (Factory default settings, change it if required) ;
4. OUT4: Control air assist with "Low volume"; Delay shutdown is set to 20 second (Factory default settings, change it if required) ;
5. OUT5: Control air assist with "High volume"; Delay shutdown is set to 20 second (Factory default settings, change it if required) ;
6. OUT6: Control the fire alarm system; When A high temp is detecting on working area, the alarm system will be active, the warning light alarms and the machine stops working immediately;
7. OUT7: Control the power for rotary device;
8. OUT8: Power supply for turning on the laser tube;
9. OUT9: Used to control the X-axis and Y-axis switching power supply;

10. OUT10: Light control for machine interior lighting;
11. OUT11: Controls the rotation of the Optical Shutter motor;
12. 5V DC Voltage Power Output 1, control the power for red light pointer;
13. 5V DC Voltage Power Output 2, spare interface;
14. 5V DC Voltage Power Output 3, Control of Fan Control Boards and Fiber Patch Board switch input;
15. 5V DC Voltage Power Output 4, Control the RF tube enable signal of the Fan Control Board;
16. 24V DC Voltage Power Input;
17. In1: Spare interface;
18. In2: Temperature detection;
19. In3: Optical Shutter Limit of Fiber detection;
20. In4: Control air assist with "Low volume";
21. In5: Control air assist with "High volume";
22. In6: Temperature detection;
23. In7: Optical Shutter Limit of RF tube detection;
24. In8: Contactor switch input;
25. In9: Emergency stop switch input;
26. In10: Emergency stop switch input;
27. In11: Fan Control Board switch input;
28. Auto and manual mode switch;
29. Expansion Interface 1: Connect Fan Control Board to detect laser status;
30. 232 Serial Port 1: Communication with autofocus board ;
31. TTL Serial Port 1: Spare interface;
32. TTL Serial Port 2: Spare interface;
33. 232 Serial Port 2: Communication with controller;
34. Expansion Interface 2: Connect IO Expansion Board;
35. Expansion Interface 3: Connect Door Sensor Checking Board;
36. LED lights display, set the delay time for viewing each interface and enter;
37. "Set" button, select each "OUT" interface and confirm the setting;
38. "DOWN" button, reduce time of delay shutdown;
39. "UP" button, increase time of delay shutdown;

The TL-Timer is installed inside the lower right hand door panel, see below.

Operation:

Normal use:

The TL-Timer is selected Auto mode as factory setting.

Under Auto mode, when the laser is not at work, air assist and exhaust fan won't be on; When the laser is working, the air assist and exhaust fan starts, after the job finished, the air assist will stop after 20 second, exhaust fan will stop after 30 second.

Under Manual mode, when the laser is powered on, the air assist and exhaust fan will be on all the time

Each "OUT" interface has a freely adjustable delay time from 0-99 seconds.

Set up delay time:

Generally, there's only need to set up the delay time for air assist and exhaust fan, so they can be delay to shutdown according to your need. The default for air assist is 20 second, and for exhaust fan is 30 second.

Click “Set” button to select from OUT1 to OUT8 interface and the LED light display will show you the delay time in second for each interface. On each interface, click “down” or “up” button you can change the value, then click “Set” button to confirm and go into the next interface. On the OUT8 interface, click again the “Set” button, the display will be off and exit the delay time setup.

4.8 How to use air-assist control

4.8.1 Internal Blow Assist Function

The air-assist system is an essential auxiliary feature for laser processing. Optimal operation requires:

- **Cutting:** High-volume airflow for efficient material removal
- **Engraving:** Low-volume airflow for precision surface treatment

An integrated pressure sensor provides real-time monitoring, enabling precise airflow adjustment to match specific processing requirements.



How to adjust air volume if require?

For High volume mode,

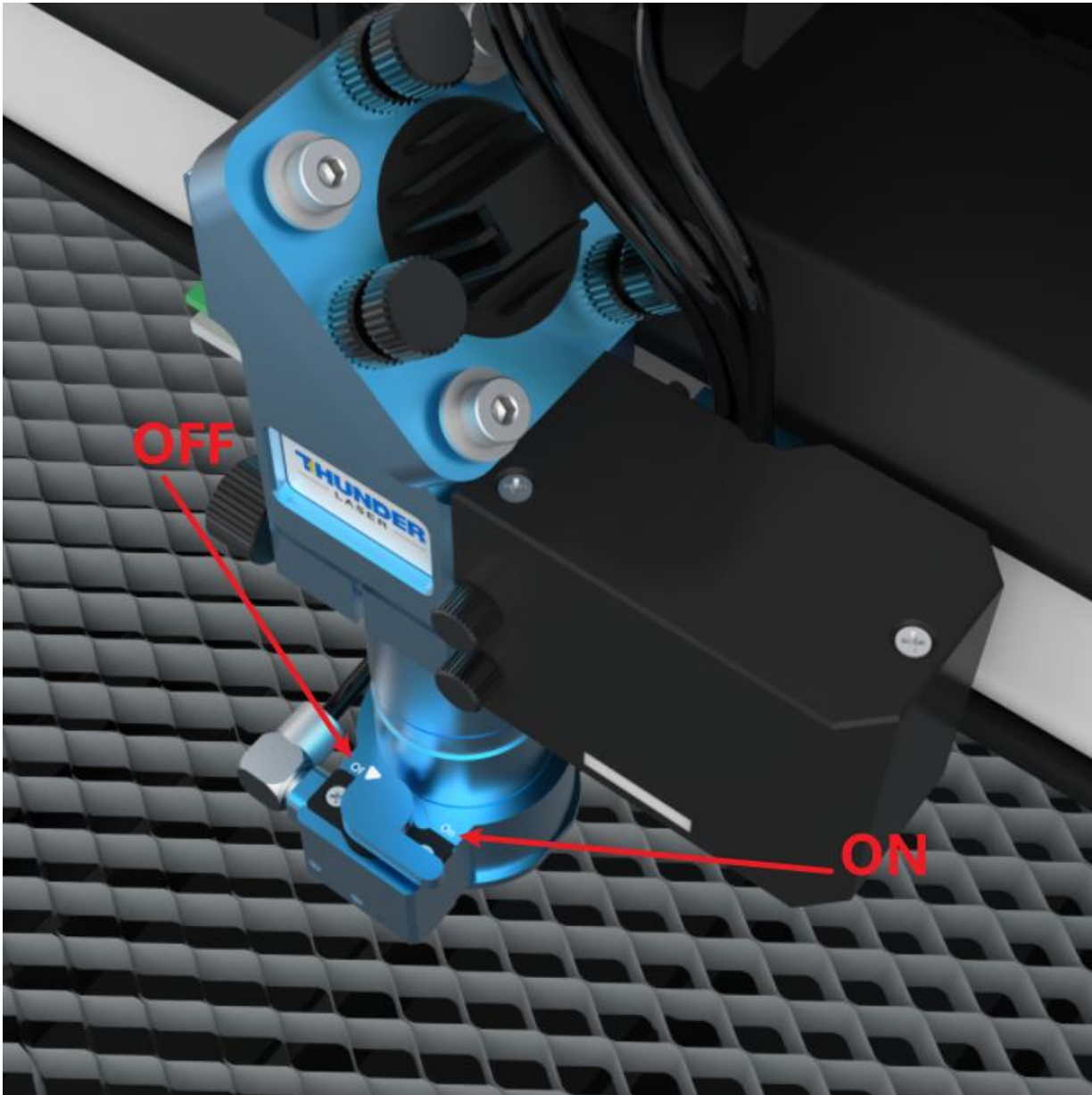
1. Make sure machine is not at work and laser switch is off
2. Click the left green button to start the air-assist with high volume
3. Check the air volume under the laser head
4. On left flow control valve, loose the locked nut then rotate the adjusting screw to control the air volume to mean your requirements.
5. Fix the locked nut after finished.

And for Low volume mode, you do it the same.

4.8.2 External Blow Assist Function

The TITAN & TITAN PRO SERIES are equipped with an external air blow function (also known as side air blow), which is controlled by a separate valve and works in conjunction with the Internal Blow Assist Function. The external air blow is mainly from the side air blow, with a small amount of air blowing out of the nozzle, which effectively prevents dust from getting into the nozzle and blocking the autofocus sensor.

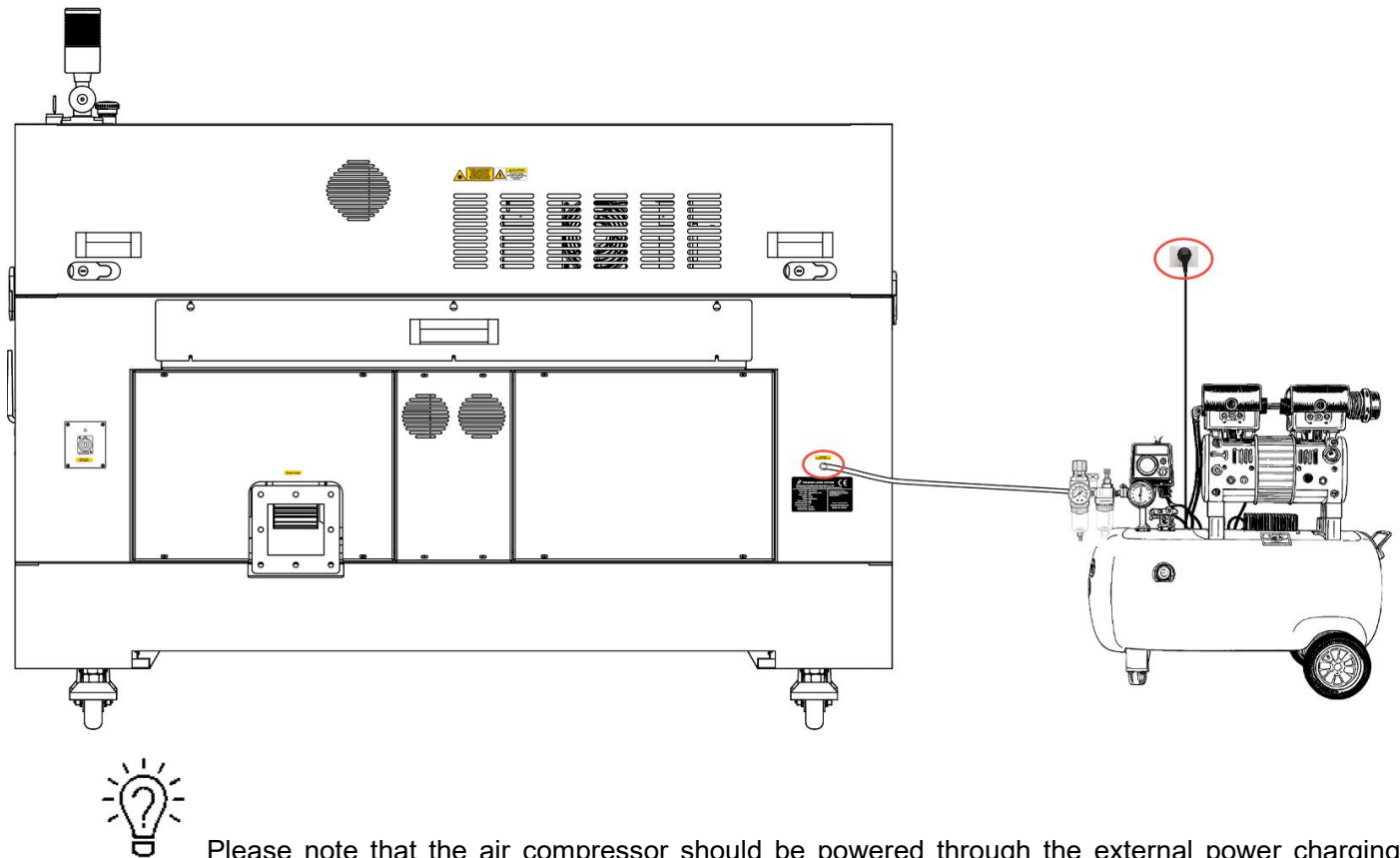
When the arrow of the blow-off valve is pointing “off” the external blow-off is off and only the Internal Blow Assist Function is used; when the arrow is pointing “on” the external blow-off is on and the Internal Blow Assist Function can be used at the same time.



If you need more air volume, it's much better to use a large air compressor instead of an air pump for air assist.



For how to connect the air compressor you can refer to the following connections.



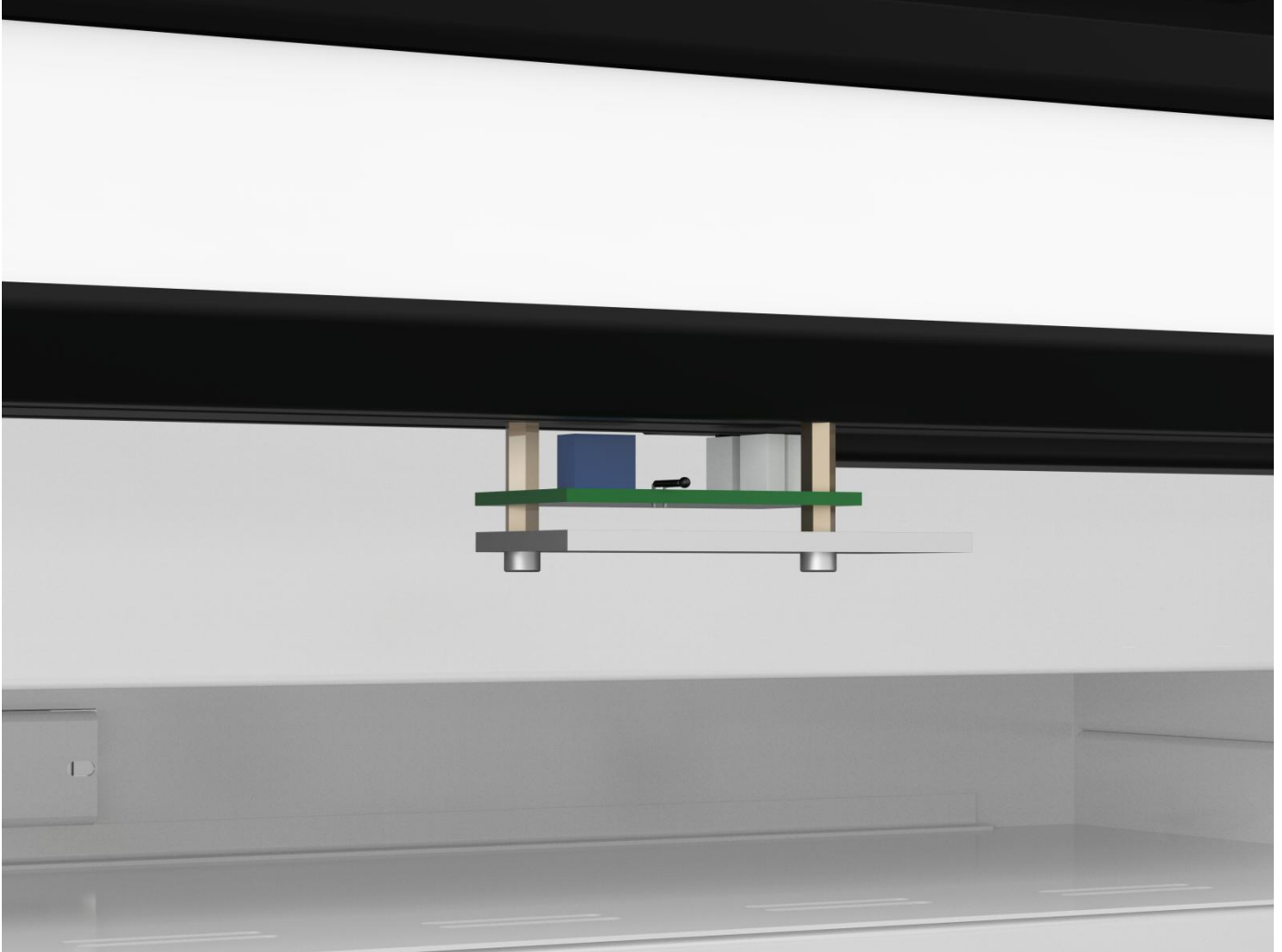
Please note that the air compressor should be powered through the external power charging connector and should never be connected directly to the machine to ensure the safety and proper operation of the equipment.

4.9 How the heat alarm system works

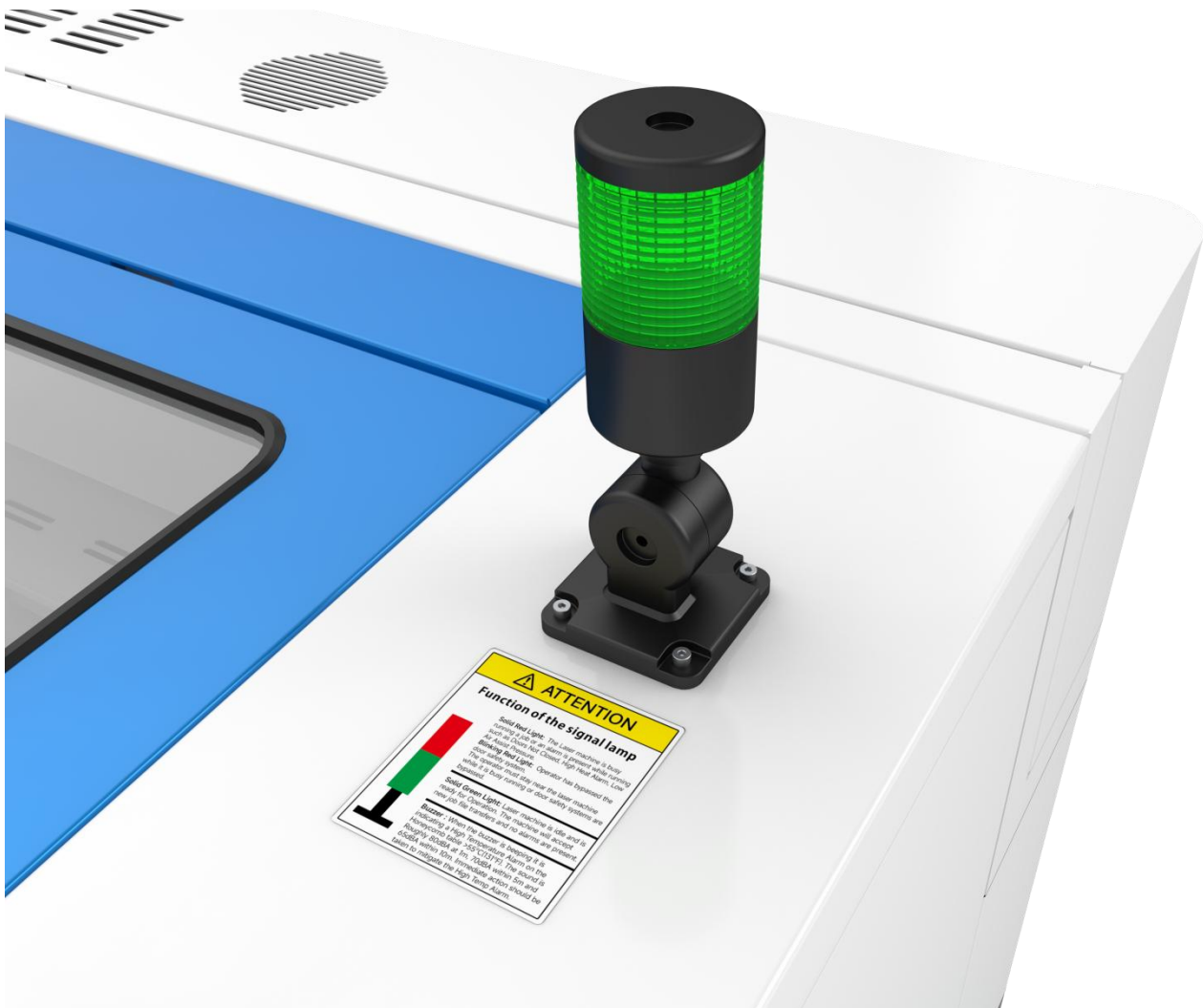
The heat alarm system is an additional tool for laser machines.

Some materials such as acrylic, wood and so on, can easily catch fire, particularly during cutting.

The heat alarm system has a smart board with temperature sensor which will be reacted by an abnormal temperature (higher than 55°C/131°F) on working table. It will trigger at a certain temperature then signals to TL-Timer board to stop laser processing and give a warning sound, so operator can active fire control in time to reduce the potential losses and risks.



The warning sound comes from signal lamp (roughly 80dBA within 1m, 75dBA within 5m and 65dBA within 10m, the sound gets weaker as it travels).



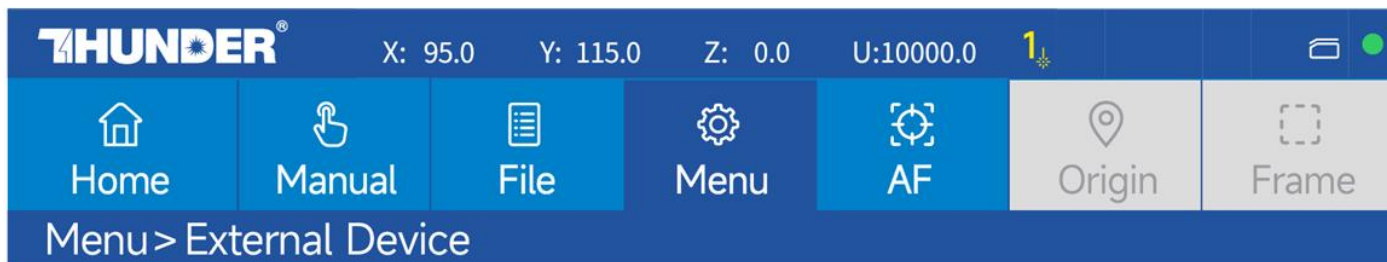
When heat alarm system is activated, the warning sound will beep all the time until user restart the machine.

Fire Hazard: High potential for fire. **NEVER RUN UNATTENDED.**

4.10 How to use the Vacuum Adsorption Platform function

This function is to form a negative pressure by pumping out the air to firmly fit the processing material to the working table surface, to ensure that the material remains stable during laser processing, to effectively avoid processing errors caused by material displacement, and to improve processing accuracy and efficiency.

You can be switched on via the operation panel, the path is: Menu >> External Device >> Start Adsorption Platform.



Intelligent mode ☒

In intelligent mode, the higher the output power of the laser, the faster the air cooling system will operate, otherwise, the slower it will be.



Air pump and exhaust fan start delay s

Air pump end delay s

Exhaust fan end delay s

Start Adsorption Platform Open ☒ Close

4.11 The First Time Running the Laser



To be safe, never ever run the laser system unattended.

Yours first engraving tests

The following steps describe how to successfully engrave a first pattern. Please follow the individual steps:

1. Switch on the laser and click **"Confirm and move"** , then wait for a beep to note the machine is initialized, and the laser head will do the reset and find the home from top left corner.

Starting Program

The following steps will be performed:

- Power on the laser
- Move the laser head to origin

Confirm and move

2. After machine finish resetting, adjust the height of working table, place the material usually on the top left corner of the working table.

- ① Move down the working table;
- ② Place the material;
- ③ Move up the working table;

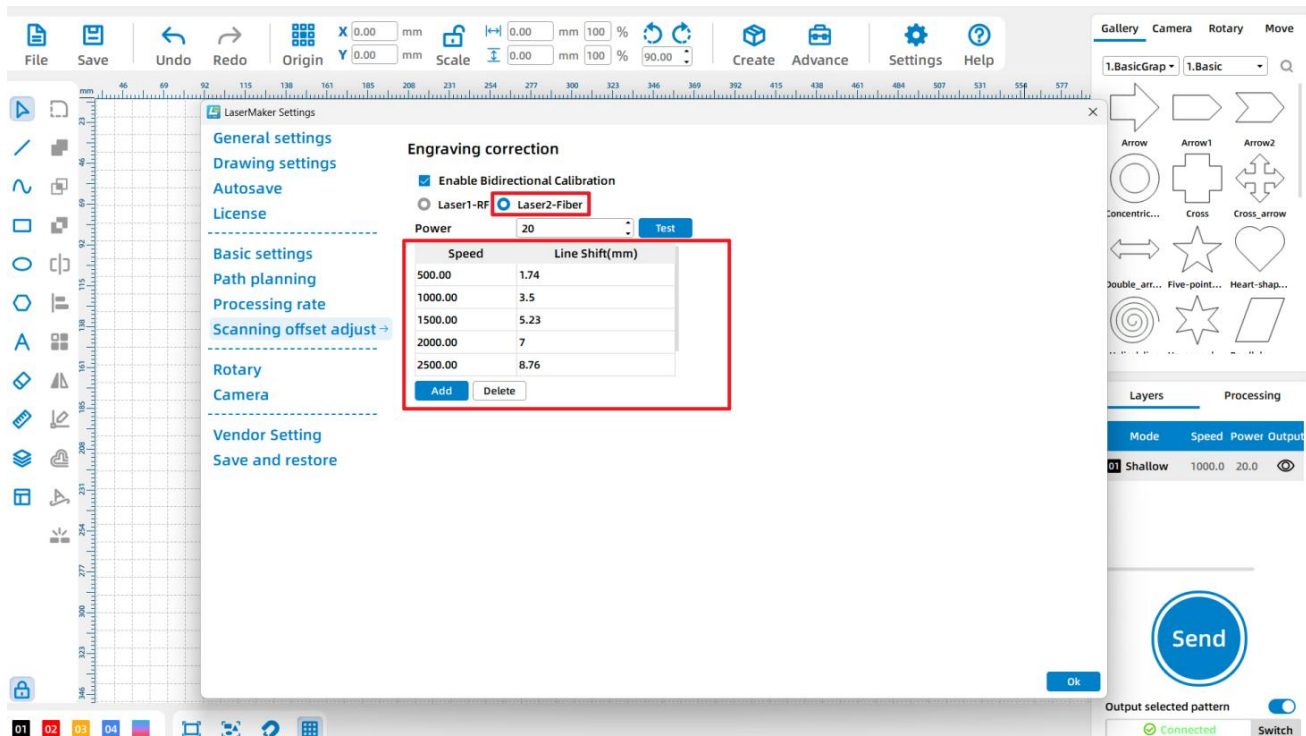
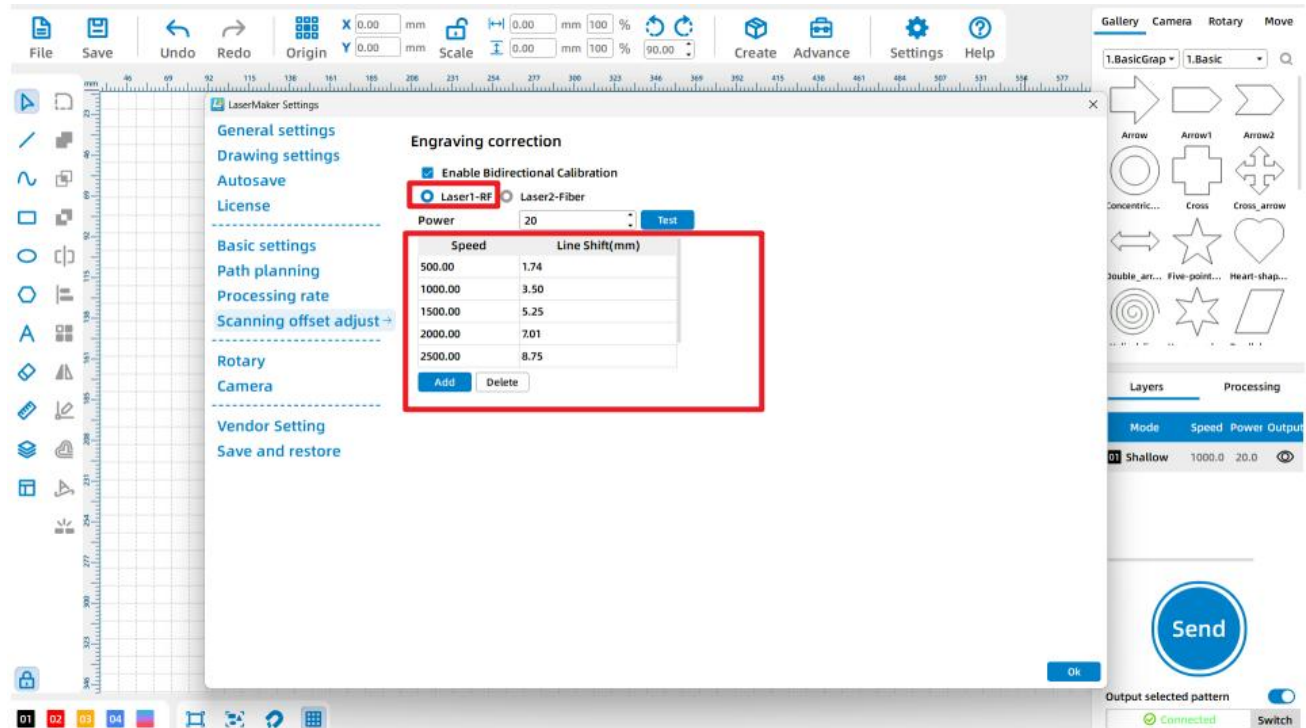
3. With the help of the focus tool, adjust the focus distance.

4. Connect the machine with an USB cable or Ethernet cable.

5. Open the software to set up/read the values on the “Scanning(Reverse compensation)” check box.

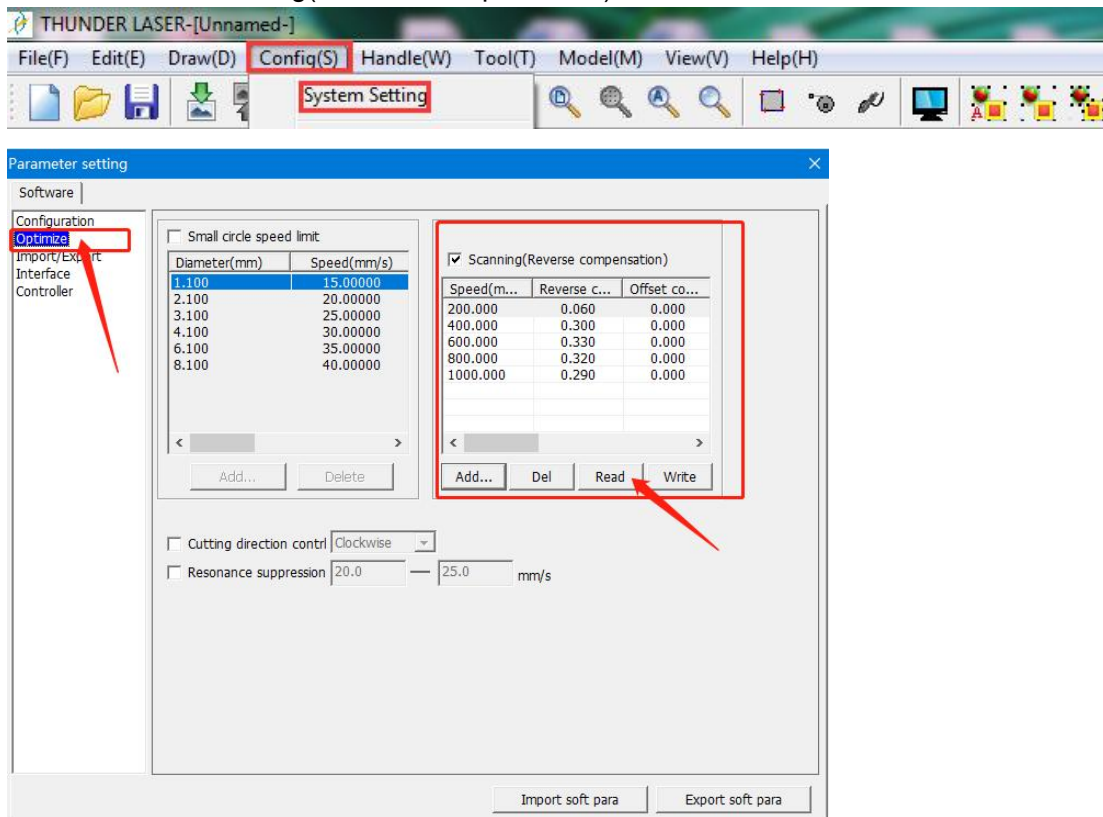
In LaserMaker

Click Settings>>Scanning offset adjust



In RDworks

Open Config(s)>>system setting>>Optimize>>Scanning(Reverse compensation),and there are some default values on the “Scanning(Reverse compensation)” check box.



NOTE:

- ①Please make sure the unit is in mm instead of inch.
- ②If the machine is TITAN PRO SERIES, there will be two corresponding sets of scanning compensation values.

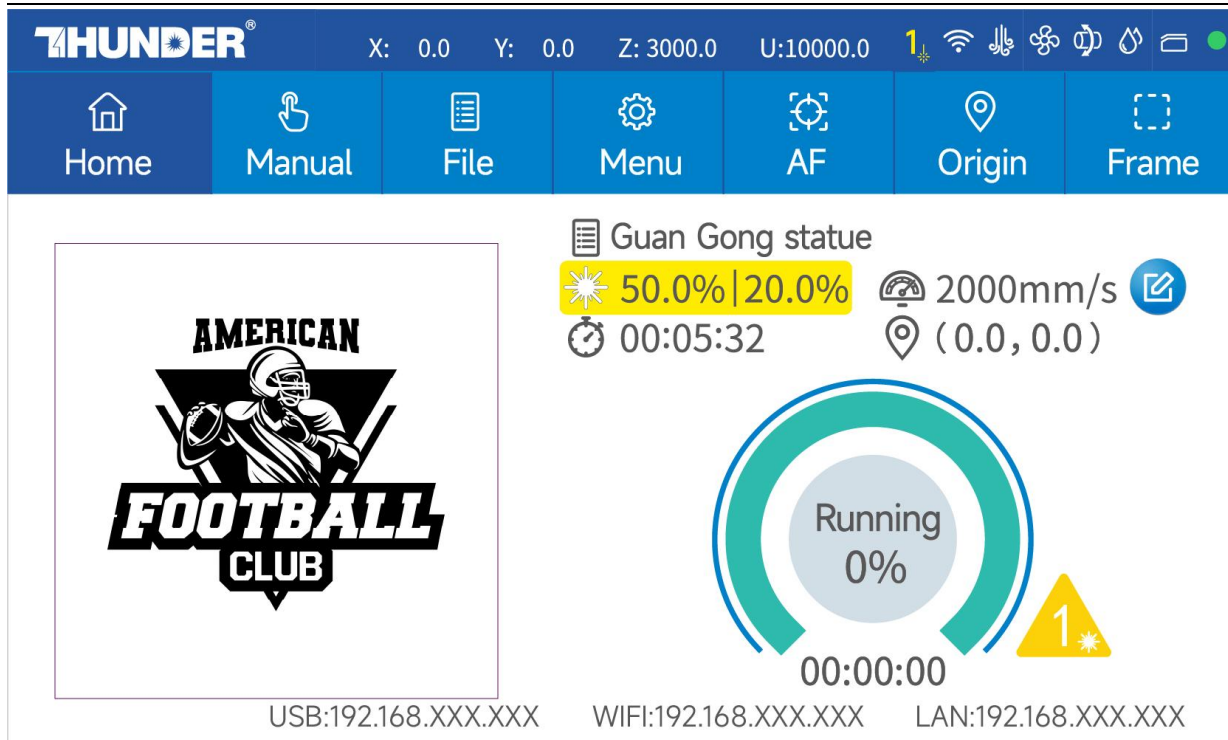
The particular values are showing with a picture in folder of laser software on the USB flash drive and on the Anodized aluminum piece that came with your machine.

6. Create sample text for engraving directly on RDWorks, then set up the parameter and download the file to your machine.

More details for how to use software please watch the instruction video below.

<https://www.thunderlaser.com/videos/>

7. Click “Original” and “Frame” on the display, please make sure that the material is in the right location and there is enough space for working.



- ① Control arrow button to move the laser head;
- ② Click “Origin” button to select the start point;
- ③ Click “Frame” button to be sure the working area;

8. Finally press the “Start-Pause” button in the display, to start the engraving process.

9. While the laser is engraving, you can generate the next graphic.

10. When the engraving is complete, the laser machine will give out the notification sound and the laser head will go back to the original point, and the warning light will return to the green light, then you can repeat engraving.

4.12 How to use the Dual Laser Sources

TTITAN PRO SERIES supports the dual light source function. The following steps provide a detailed, step-by-step guide on how to use it.

In a dual laser source setup operating simultaneously, the machine follows the sequence of layer parameters.

Once Laser 1 completes processing its assigned Layer 1, it stops emitting, and the laser head moves along the Z-axis to adjust to the correct focal length for Laser 2.

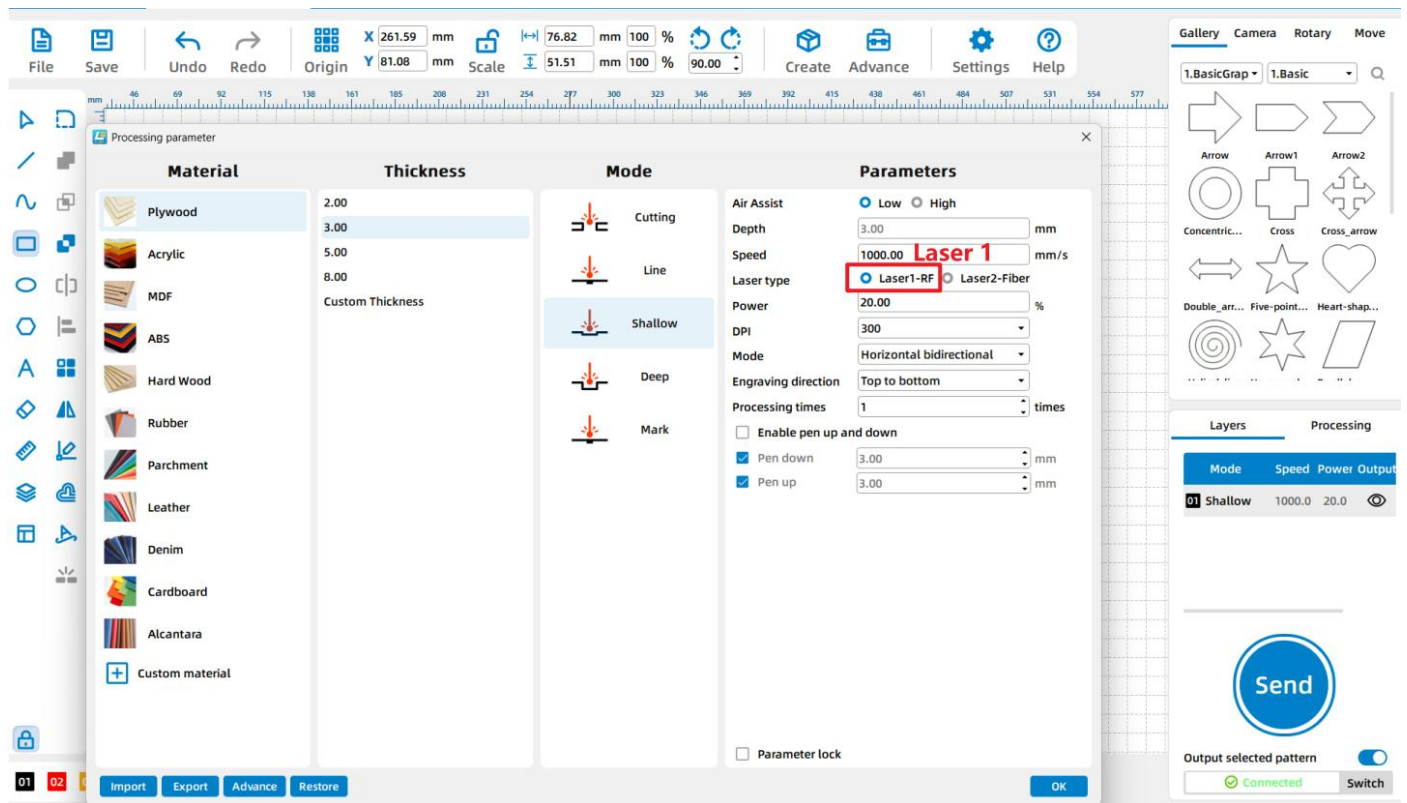
Mirror 1 then switches automatically, and the machine continues processing by switching to Layer 2, where Laser 2 begins emitting.

Before enabling the Dual Source feature, ensure that the scanning compensation values for both laser sources are correct and that your machine supports this function.

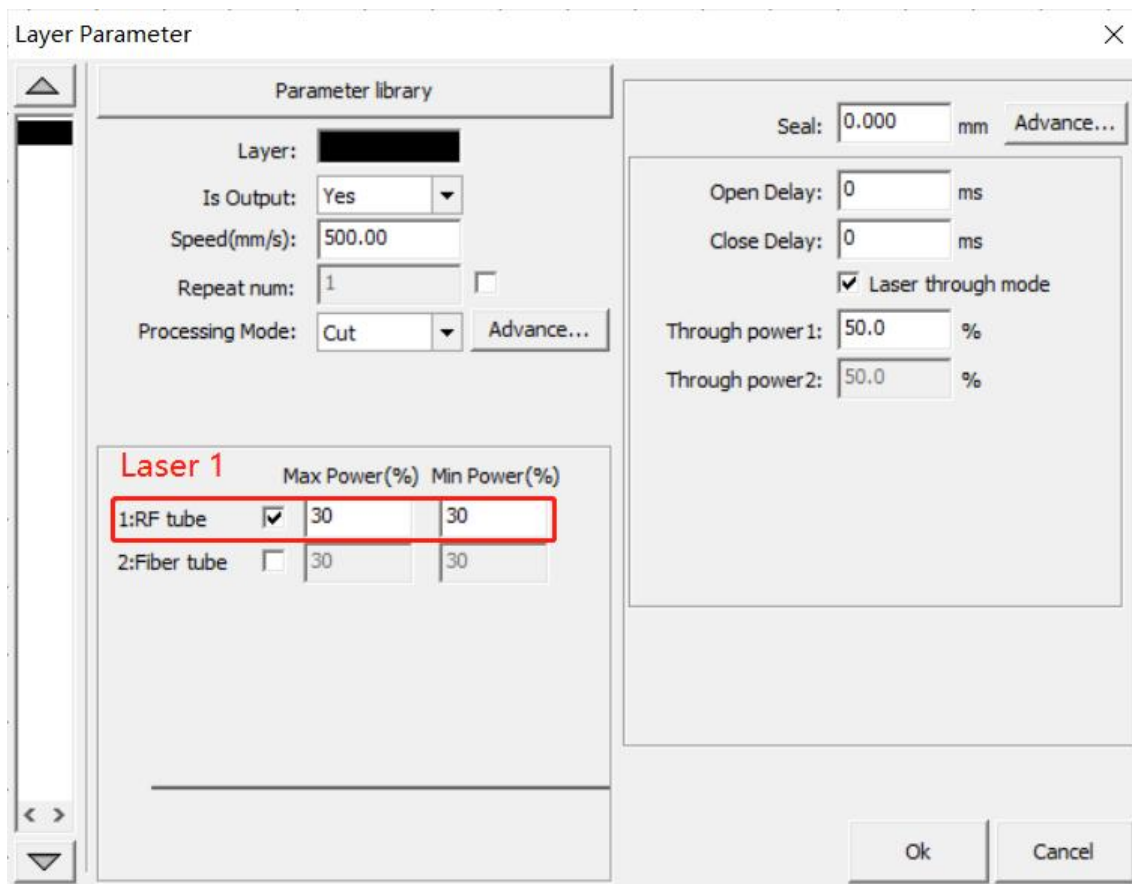
1. Using CO2 Laser only

①Open the Layer Parameters, select Laser 1, and configure the processing settings such as power and speed.

In Lasermaker:



In RDWorks:

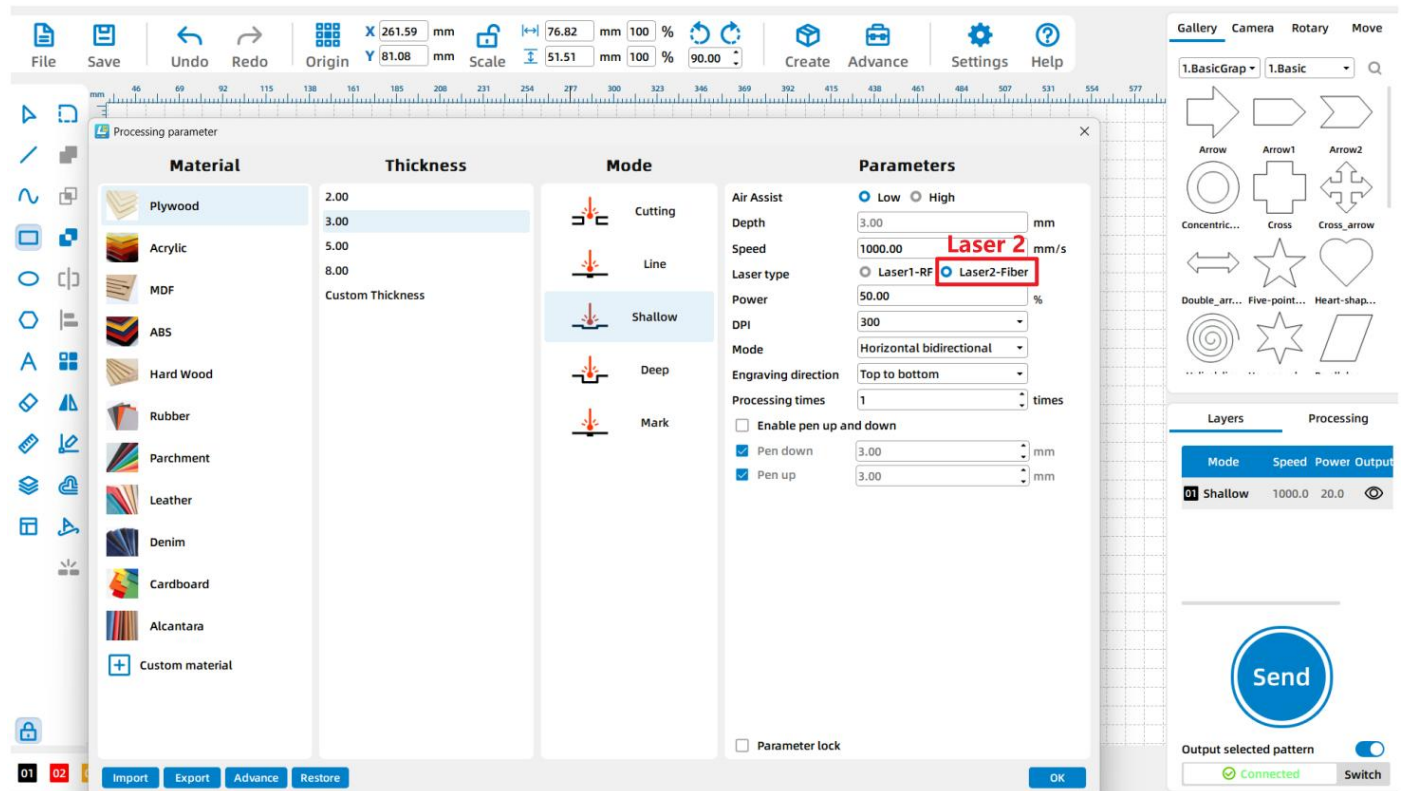


② Send the file to the machine and start working.

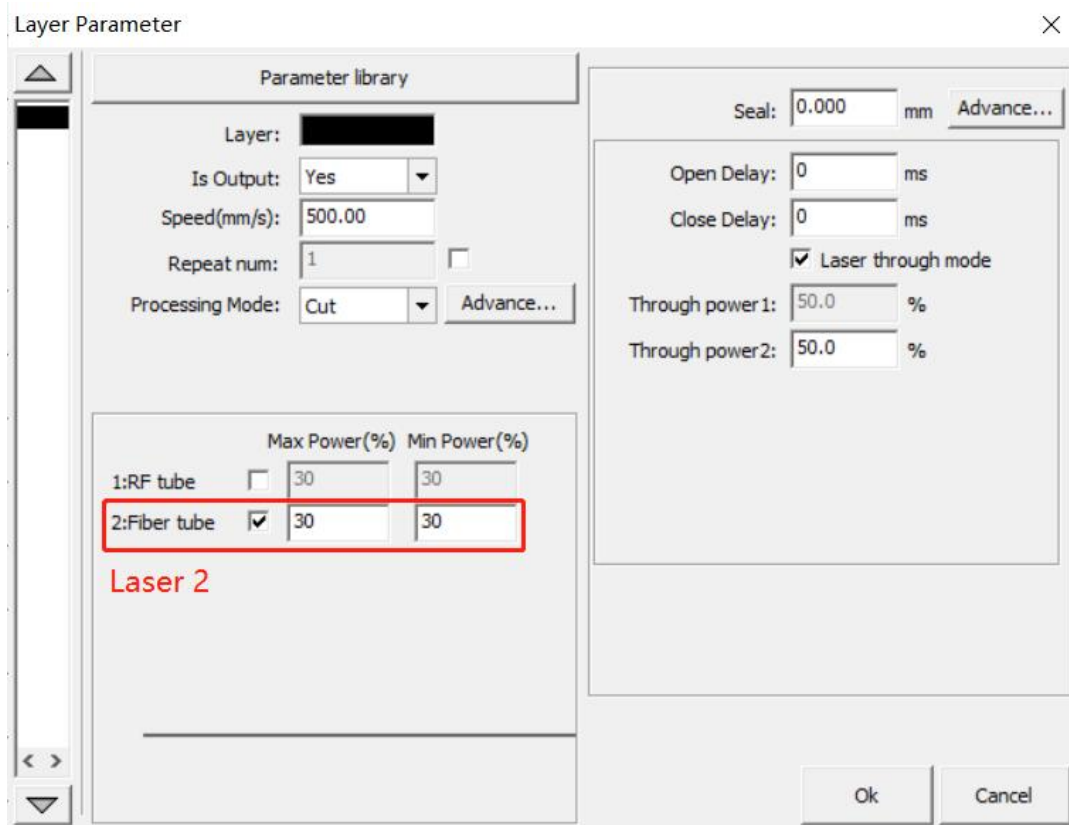
2. Using Fiber Laser only

① Open the Layer Parameters, select Laser 2, and configure the processing settings such as power and speed.

In Lasermaker:



In RDWorks:



② Set the Frequency and Pulse Width using the Adjust Switch.



Esc Button: Exit and return to previous menu.

+/- Button: Controls the movement of checkboxes up and down and increases and decreases the value.

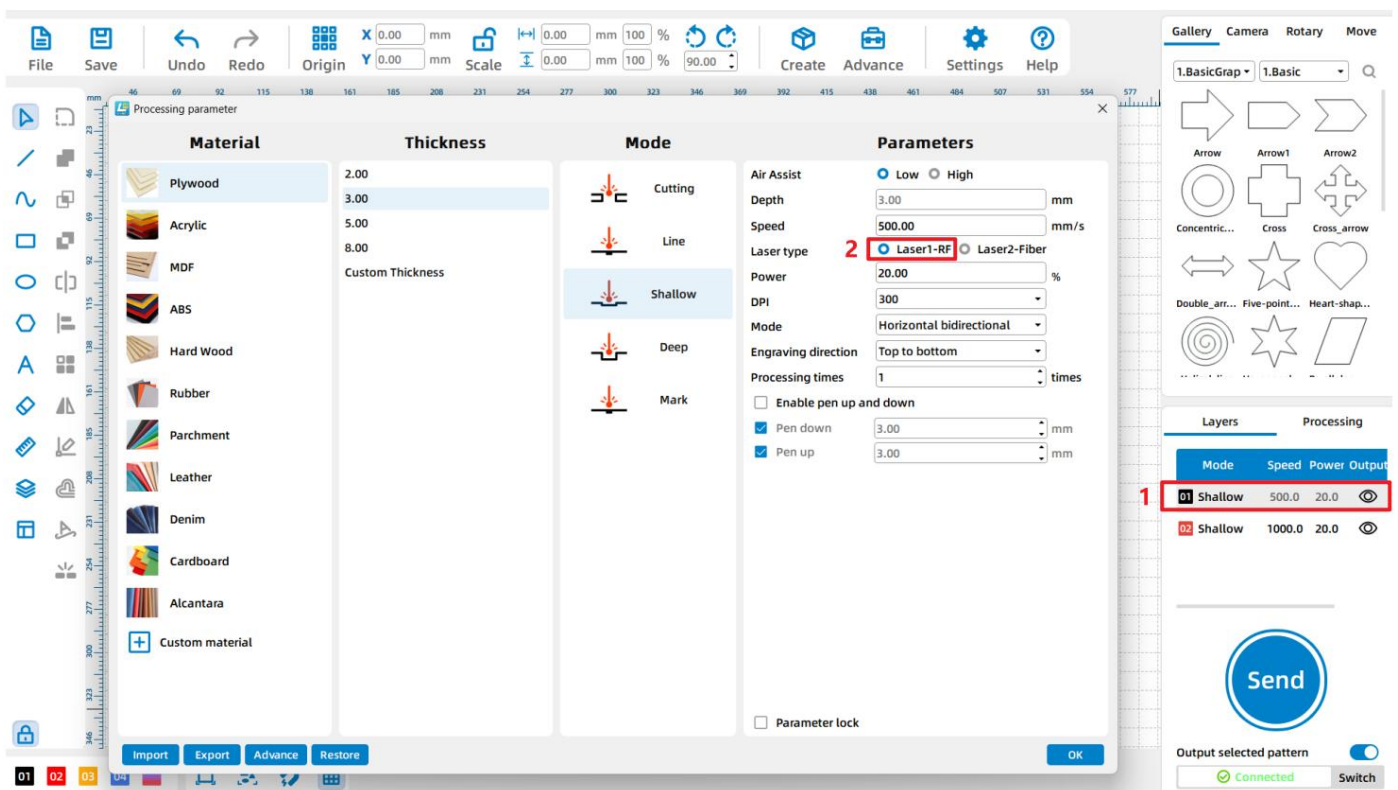
Enter Button: Go to the next menu or save the modifications.

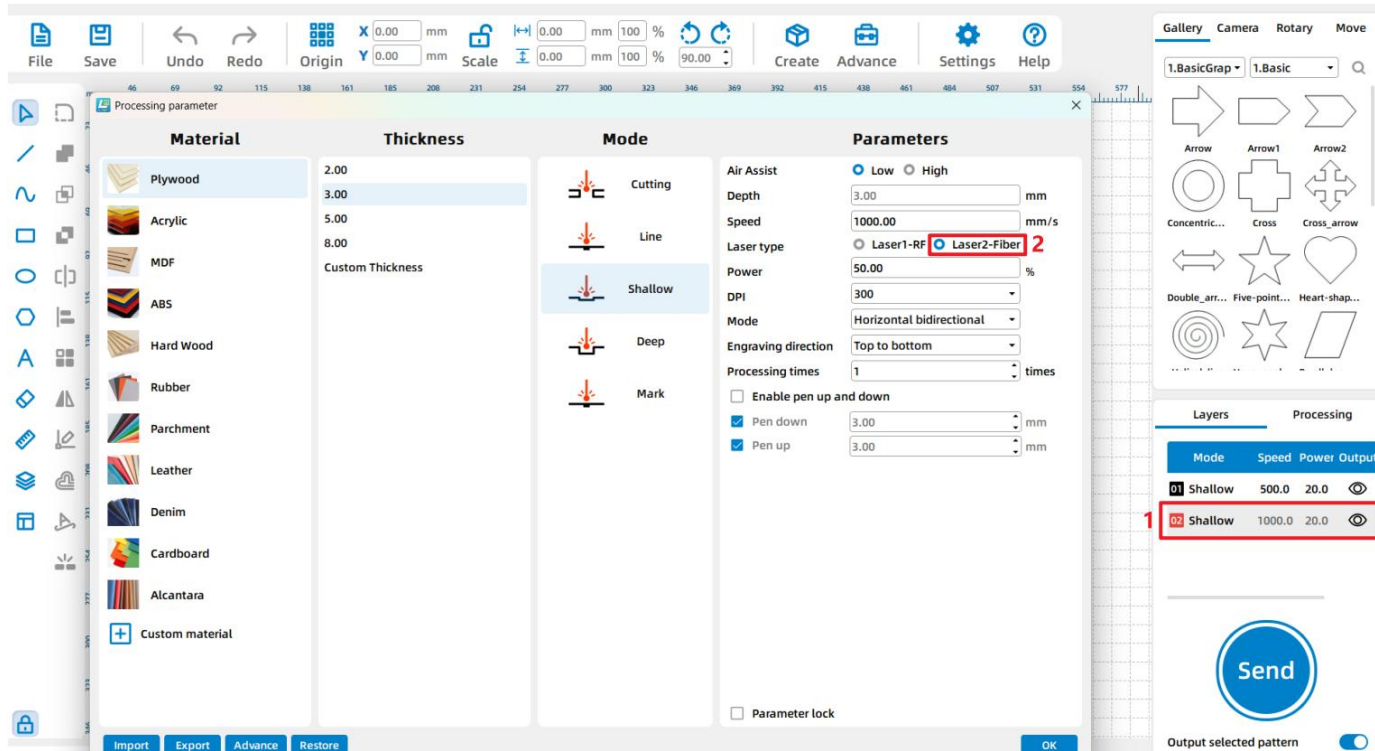
③ Send the file to the machine and start working.

Using both CO2 and Fiber Lasers

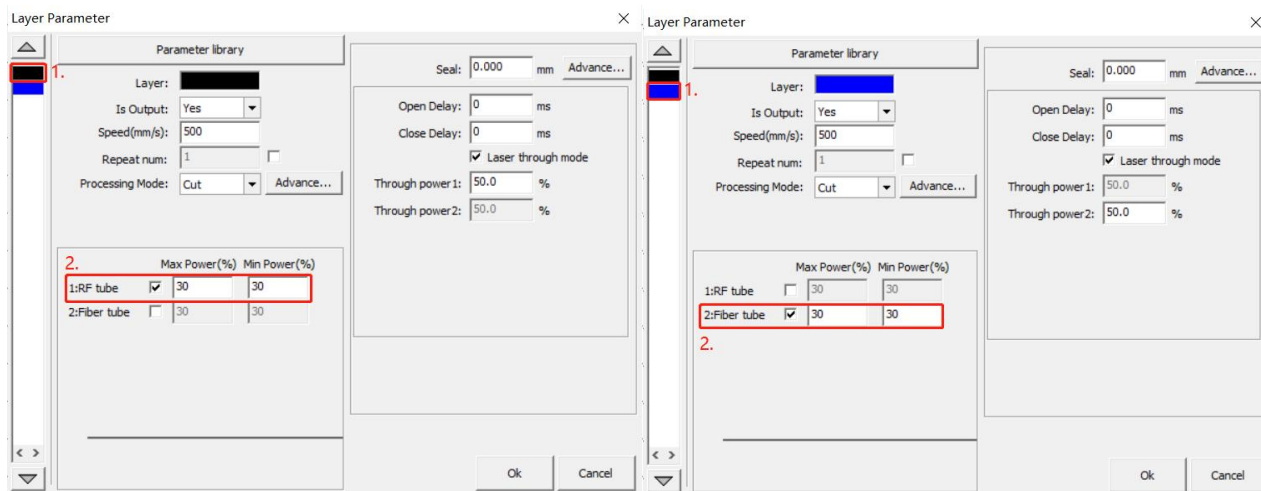
① Open the Layer Parameters, create multiple layers, and set the corresponding laser to each layer.

In Lasermaker:





In RDWorks:



②Set the Frequency and Pulse Width using the Adjust Switch.



Esc Button: Exit and return to previous menu.

+/- Button: Controls the movement of checkboxes up and down and increases and decreases the value.

Enter Button: Go to the next menu or save the modifications.

③Send the file to the machine and start working.

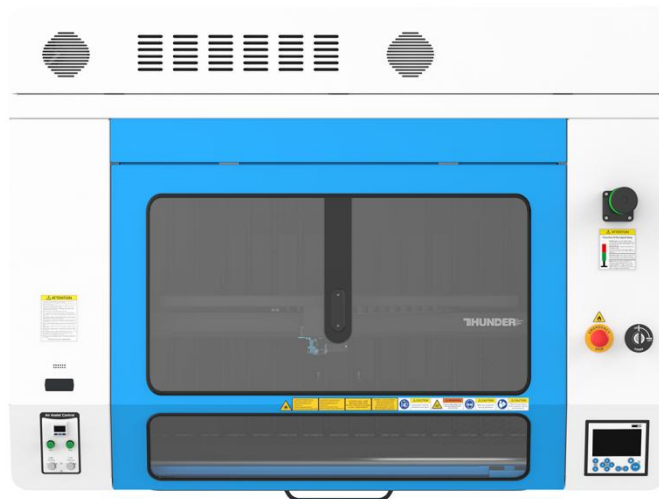
4.13 Workstation Area Indication

Side view



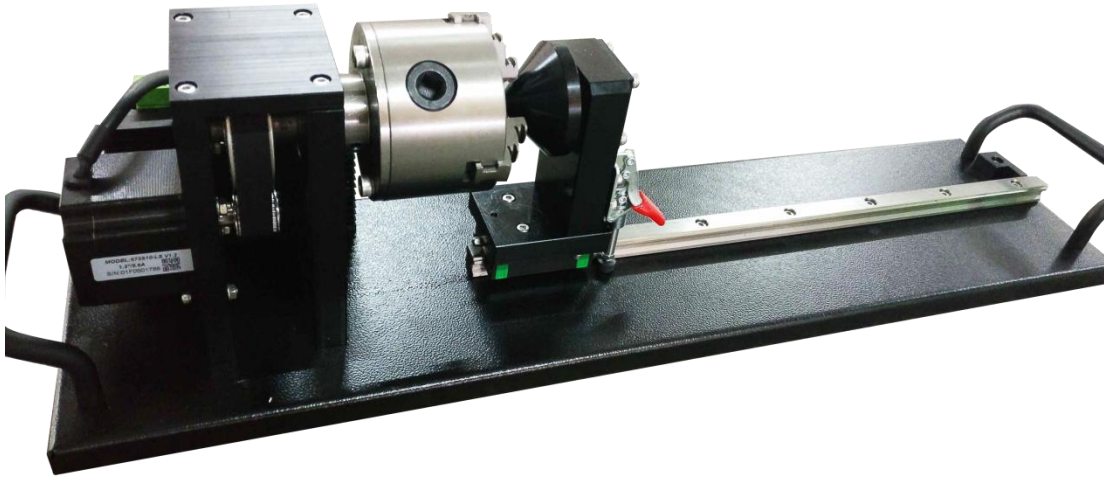
Work station
area occupied
by operators

Plain view



Work station area occupied by operators

4.14 How to use the Chuck Rotary axis Attachment



The chuck rotary axis attachment is the optional item.

Specification:

W×D×H	23.62"×5.91"×6.69"/600mm×150mm×170mm
Max working length	11.42"/290mm
Max working diameter	3.94"/100mm

To install and set-up the rotary axis attachment proceed as described as follows:

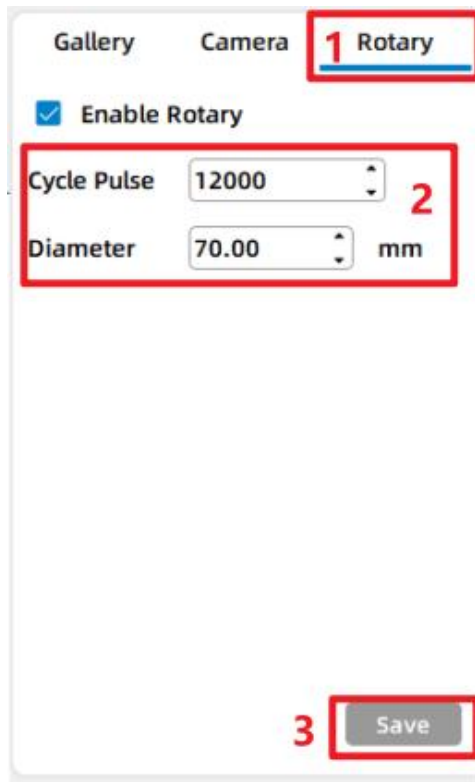
1. Move the working table to the lower position, then switch off the laser and open the top lid.
2. Put the rotary axis attachment onto the working table and align the rotary attachment with the x-axis are parallel, with the jaw chuck closest to where the rotary attachment plugs in.
3. Connect the rotary. The connector is located inside the right front of the laser. Like below:



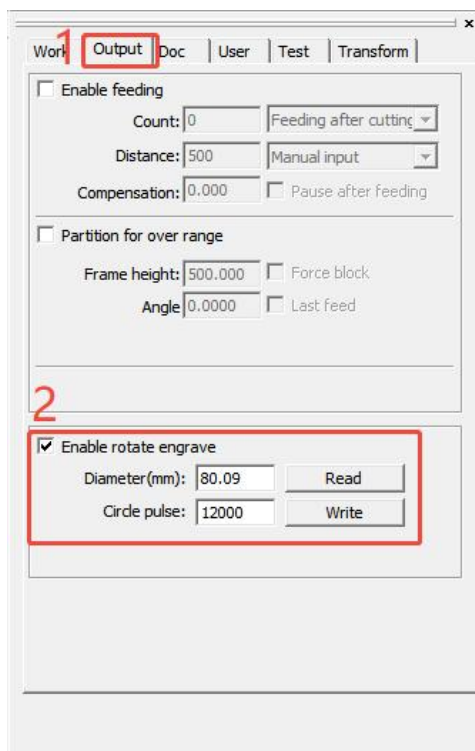
4. Measure the outer diameter of your cup. Please note that for irregular work pieces, measure the outside diameter of the position to be machined.

5. Adjust and fit the workpiece into the rotary.
6. Set your focus; please use manual focus. It is not recommended to use the auto focus with a rotary.
7. Set your origin.
8. Select “Output” and then input the diameter of the object and the circle pulse.

In Lasermaker:



In RDWorks:



9. Select "Download", click “Frame” on the touch panel, please make sure that the material is in the right location and there is enough space for working.
10. Finally, press the “Start-Pause” button on the panel to start the engraving or cutting process.

4.15 For Laser Engraving

The engraving depth can easily be varied through the laser power or the speed. To increase the engraving depth, reduce the speed or increase the power setting. This way you increase the amount of energy per area unit. Engraving too deep, however, reduces the quality of the details. With coated materials the required power depends of the kind and thickness of the coating. With power set too high the individual lines become too thick and a sharp picture cannot be achieved. The resolution of the graphics should usually be at 500 dpi. The dpi setting (number of laser dots per inch) depends on the material. The lower this setting is, the lower the resolution of the engraved picture will be. This, however, reduces flaming and increases the energy of a pulse, which can improve the overall result (e.g. when engraving some sorts of plastic materials).

1. 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 micro-porous surface seem to give the best result, because less surface material needs to be removed. As most plastic materials have a low melting point, a low pip setting should be selected to reduce the danger of melting.

2. Acrylic

There are two different types of acrylic – cast and extruded. The cast acrylic becomes white or mat after engraving, the extruded acrylic remains clear. Use extruded acrylic for engravings that are filled with paint and cast acrylic for normal engravings. Cast acrylic can be best engraved without protection foil. It is better to engrave the entire surface with a low energy setting.

3. Engrave the rubber stamp

The various mixtures and densities of rubber plates cause a slightly varying engraving depth. The settings in the overview table give a good indication. Since engraving a standard rubber material requires a relatively high laser power, the laser power is principally set to 40% or more high and only the speed is varied. Due to their lower density, so-called micro porous rubber materials allow a significantly higher engraving speed. Test the rubber first, to find out the correct speed setting.

The Lasermaker software using the engraving function, you can choose “Ramp Effect” or common engraving, once you choose “Ramp Effect” and you will need to set a minimum power lower than Max Power, generally we set it to about 15%, and input a value with the Ramp Length what you want, but if you want to make it better, you may need to test different kinds of power and speed by yourself, then you can get the best result.

Engraving rubber produces a considerable amount of dust and terrible gas. Therefore a well-dimensioned exhaust system and its regular maintenance are very important.

Chapter 5. Maintenance

5.1 Cleaning the Laser Machine



Caution – use of controls or adjustments or performance of procedures other than those specified here in may result in hazardous laser radiation exposure.

Before starting cleaning and maintenance work always switch off the device and unplug the mains plug.

Always keep the system clean, as flammable parts in the working area or exhaust area rise the fire hazard.



You should check at least once a day, whether dust has accumulated in the engraving system. In case of soiling the machine must be cleaned. The cleaning interval strongly depends on the material that is being processed and the operating time of the device. Please bear in mind that only a clean machine guarantees optimal performance and reduces the service costs.

General Cleaning Notes:

1. Make sure, that the device is switched off and unplugged. Open the protective cover.
2. Move the working table into a position in which it is easiest for you to clean the surface with a window cleaning agent and paper towels.
3. Thoroughly remove all loose dirt particles and deposits in the interior of the machine.
4. Clean the cover of the laser tube.
5. You can clean the viewing window with a cotton cloth. Do not use paper towels as they could scratch the acrylic.

5.2 Cleaning the Optical Parts

The lens has a durable multi-coating and won't be damaged by correct and careful cleaning. You should inspect the focus lens and the mirrors and the beam combiner according the maintenance plan. If you discover a veil of haze or dirt, you must clean them.



It is suggested to clean the mirrors/lens before work every day in order to run the machine at max efficiency.
Please turn off the power of laser machine before cleaning the optical parts.

Lens cleaning fluid and swabs are as follows:



1. Lens cleaning fluid and cotton swabs are in the tool box that came with the machine.
2. The lens must be cleaned carefully with a clean cotton swab to avoid scratching the surface of the lens.
3. Do not touch the lens with your hands after wiping.
4. Never use a cleaning swab twice.

Follow the instructions below for the cleaning of optical parts:

www.thunderlaser.com
tech@thunderlaser.com

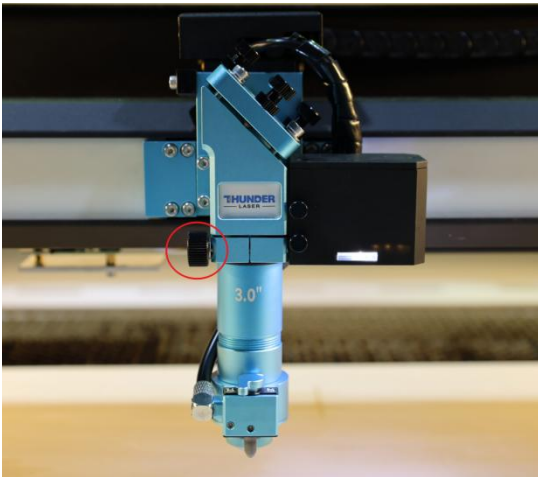
Tel: (86) 18103043363

5.2.1 Cleaning the Focus Lens

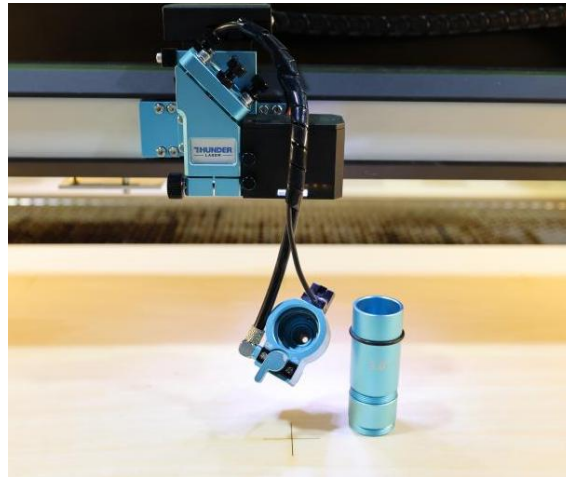
1. Move the working table to a distance approx. 10 cm under the lens holder.
2. Move the working head into the center of the working surface.
3. Now you can unscrew the lens holder.
4. Remove the nozzle from the lens holder by carefully turning the lens holder.
5. Remove the coarse dust as good as possible by blowing air onto the lens surface.
6. Check the surface and if necessary clean the lens with the lens cleaning liquid and swabs.
7. Put some lens cleaning liquid on one side of the lens. Leave the liquid to take effect for approximately one minute and then gently wipe it away with cleaning swabs soaked with lens cleaning liquid.
8. Finally, dry this side of the lens with dry cleaning swabs and repeat the cleaning process on the other side of the lens. Never use a cleaning swabs twice. Dust accumulated in the cleaning swabs could scratch the lens surface.
9. Examine the lens. If it is still soiled, repeat the cleaning process until the lens is clean.
10. Carefully insert the lens holder and fix it.

How to take out the focus lens, please just as following the picture indicated:

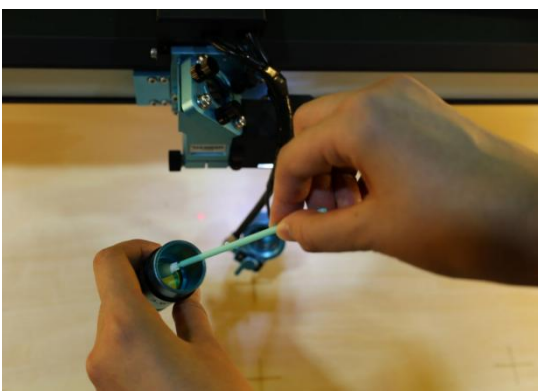
1. Remove the laser head



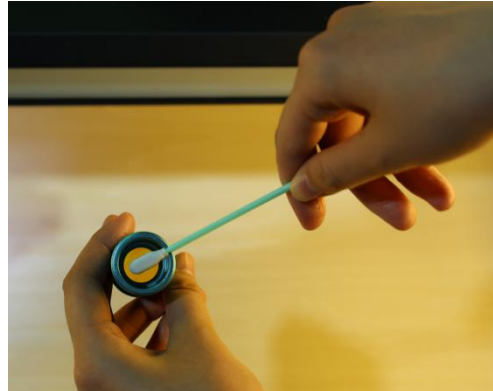
2. Divide the laser head



3. Clean concave side of lens with swabs



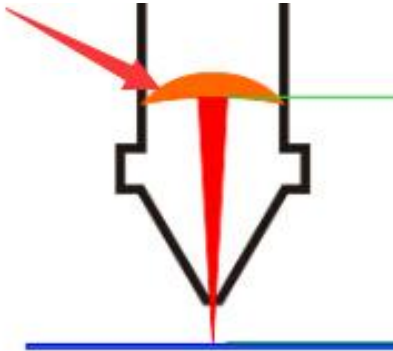
4. Clean convex side of lens with swabs



How to take out the lens, and please just as following the picture:



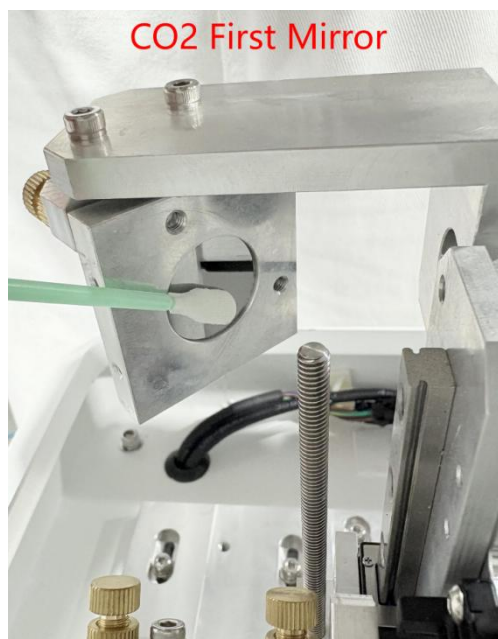
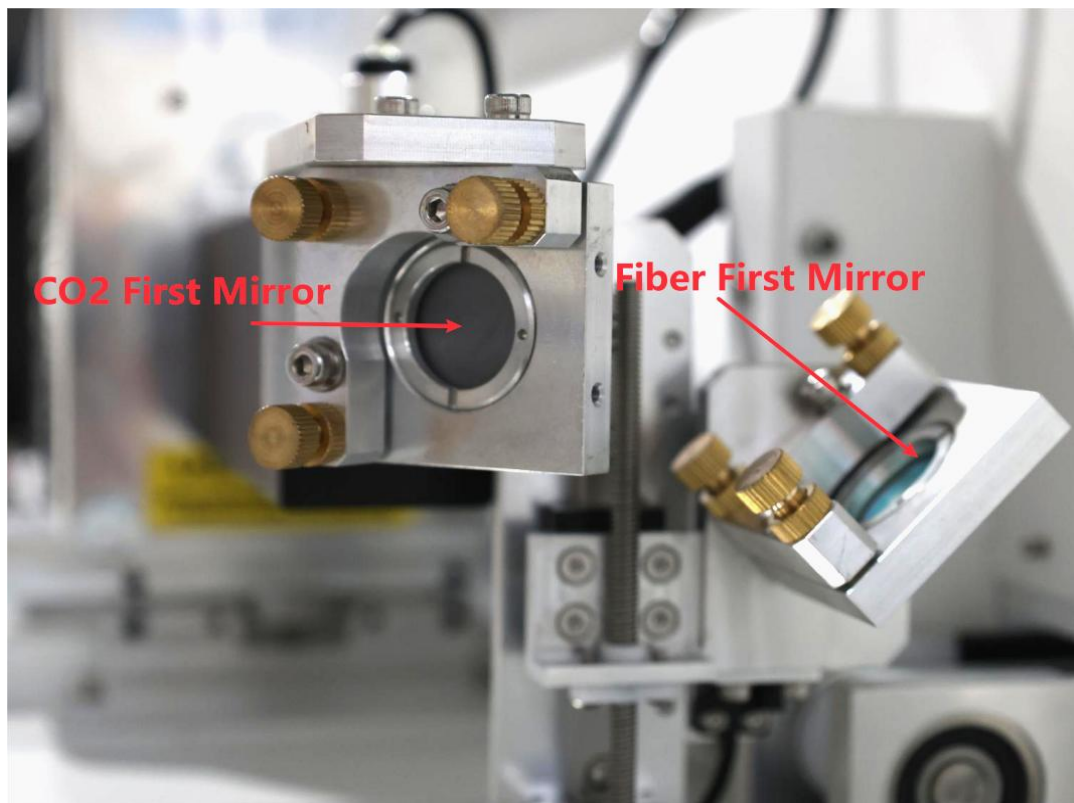
Note: please refer to the figure below for the installation direction of the focusing lens.



5.2.2 Cleaning the Mirrors

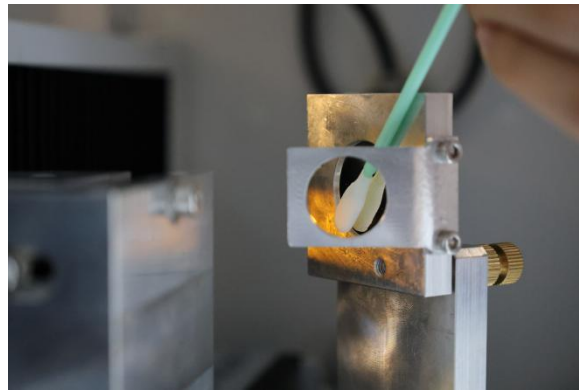
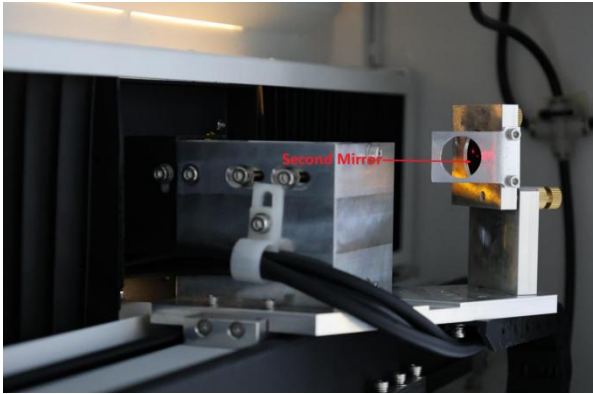
There are three mirrors in the operating area of the laser, which may have to be cleaned if they are soiled. To clean the reflector, follow the instructions below.

1. Remove the coarse dust as good as possible by blowing air onto the mirror surface.
2. Check the surface and if necessary clean the mirror with the lens cleaning liquid and swabs.
3. Put some lens cleaning liquid on one side of the mirror. Leave the liquid to take effect for approximately one minute and then gently wipe it away with cleaning swabs soaked with lens cleaning liquid.
4. Finally, dry this side of the mirror with dry cleaning swabs and repeat the cleaning process on the other side of the mirror. Never use a cleaning swabs twice. Dust accumulated in the cleaning swabs could scratch the mirror surface.
5. Examine the mirror. If it is still soiled, repeat the cleaning process until the lens is clean.

The Mirror#1

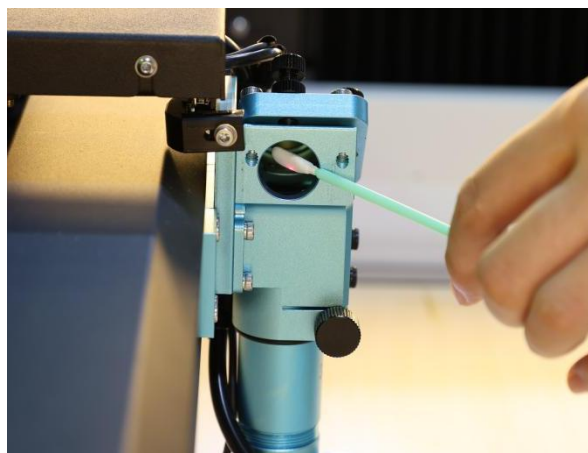
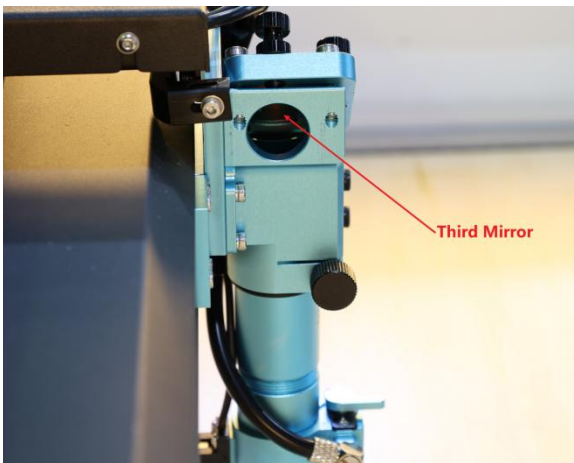
The 1st mirror is installed in the rear box of the laser tube, open it then view the right side.

The Mirror#2



The 2nd mirror is installed on the left side of X rail.

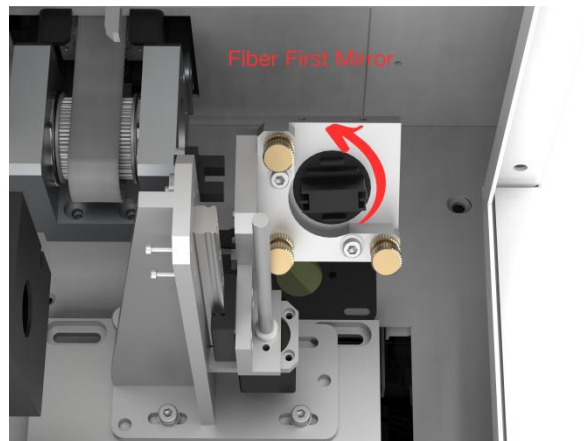
The Mirror#3

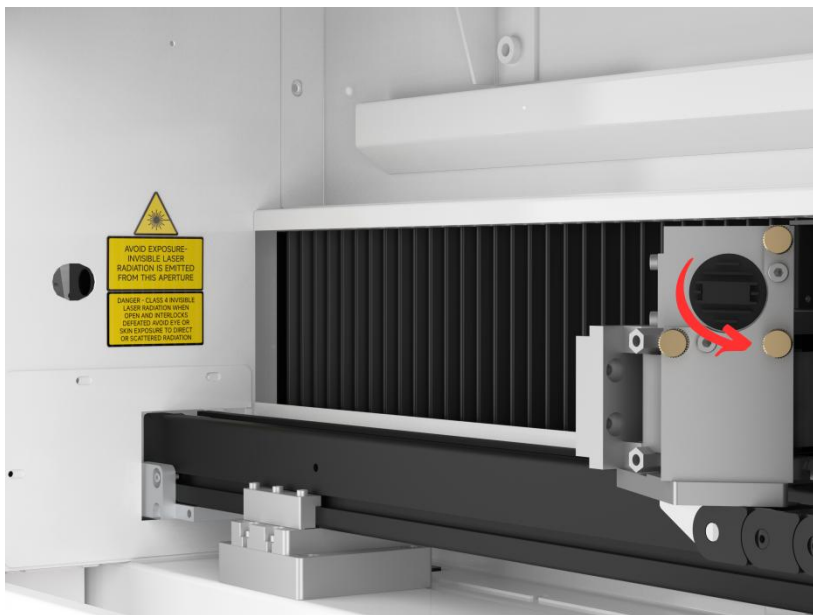
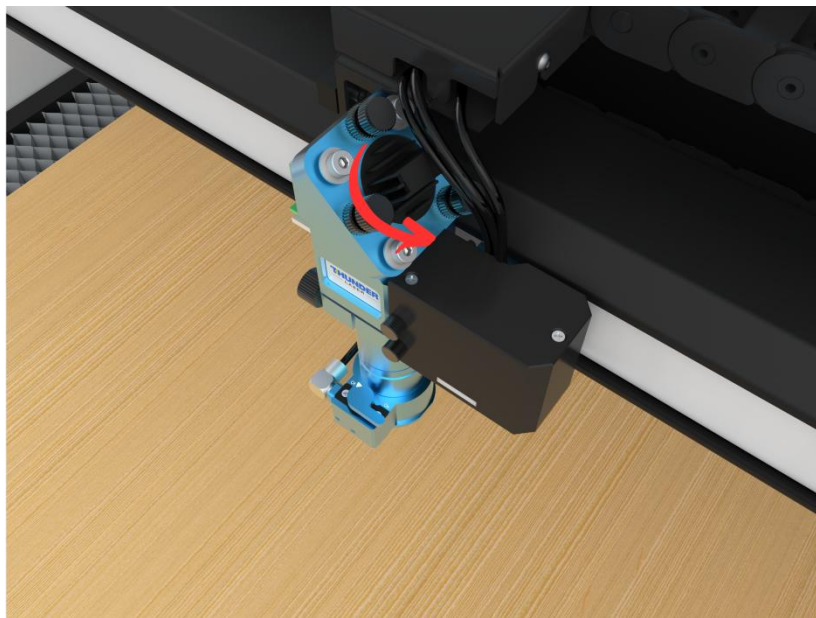


The 3rd mirror is installed on the top of the laser head.

How to take out the mirror#1 #2 and#3, and please just as following the picture indicated:

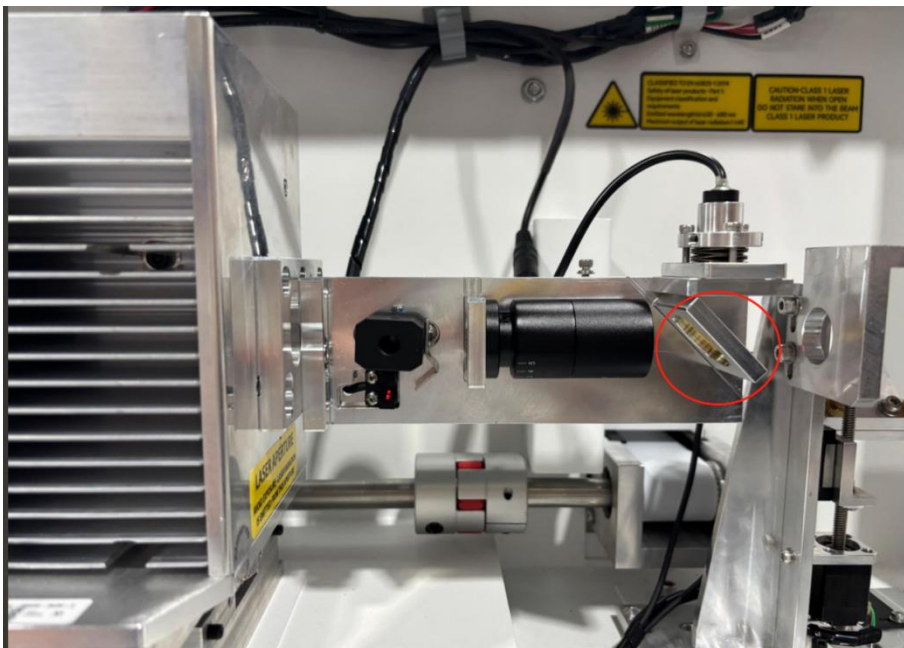
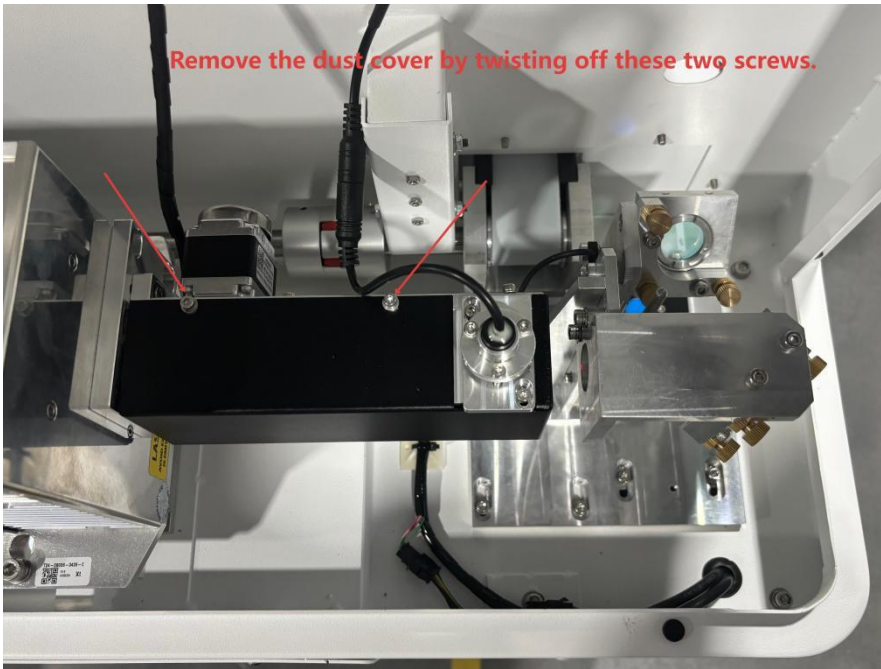
1. The mirror#1



2. The mirror#2**3. The mirror#3**

5.2.3 Cleaning Laser Combiner

1. The laser combiner is mounted inside the dust cover, so you will need to remove the dust cover before you can find it.



2. Remove as much coarse dust as possible by blowing air onto the lens surface.
3. Inspect the surface and clean the laser combiner with lens cleaning solution and a cotton swab if necessary.
4. Apply some lens cleaning fluid to one side of the swab. Let the liquid work for about a minute, and then gently wipe with a cleaning swab dipped in the lens cleaning fluid.
5. Finally, dry this side of the laser combiner with a dry cleaning swab and repeat the cleaning process on the other side of the lens. Do not reuse the cleaning swab. Dust accumulated on the cleaning swab may scratch the surface of the lens.
6. Check the laser combiner. If dirt is still present, repeat the cleaning process until the lens is clean.
7. Reinstall the dust cover back on after completing the cleaning.

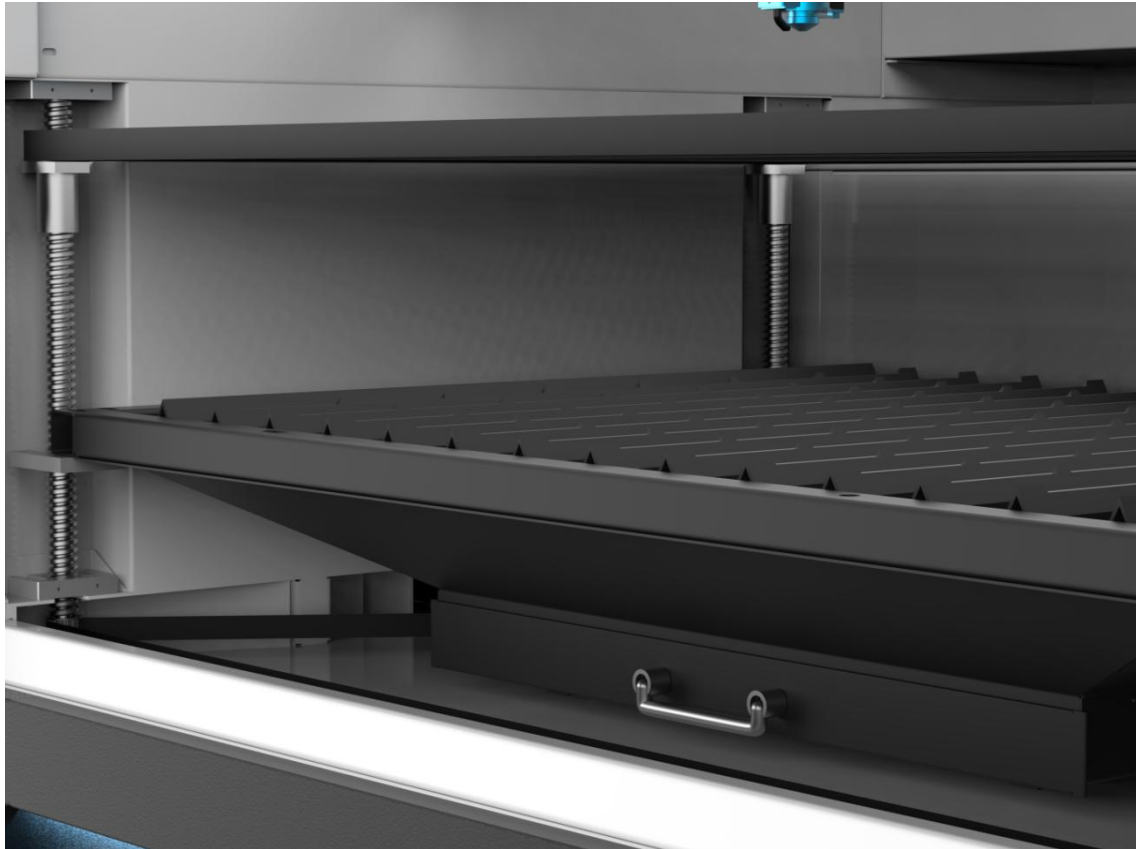
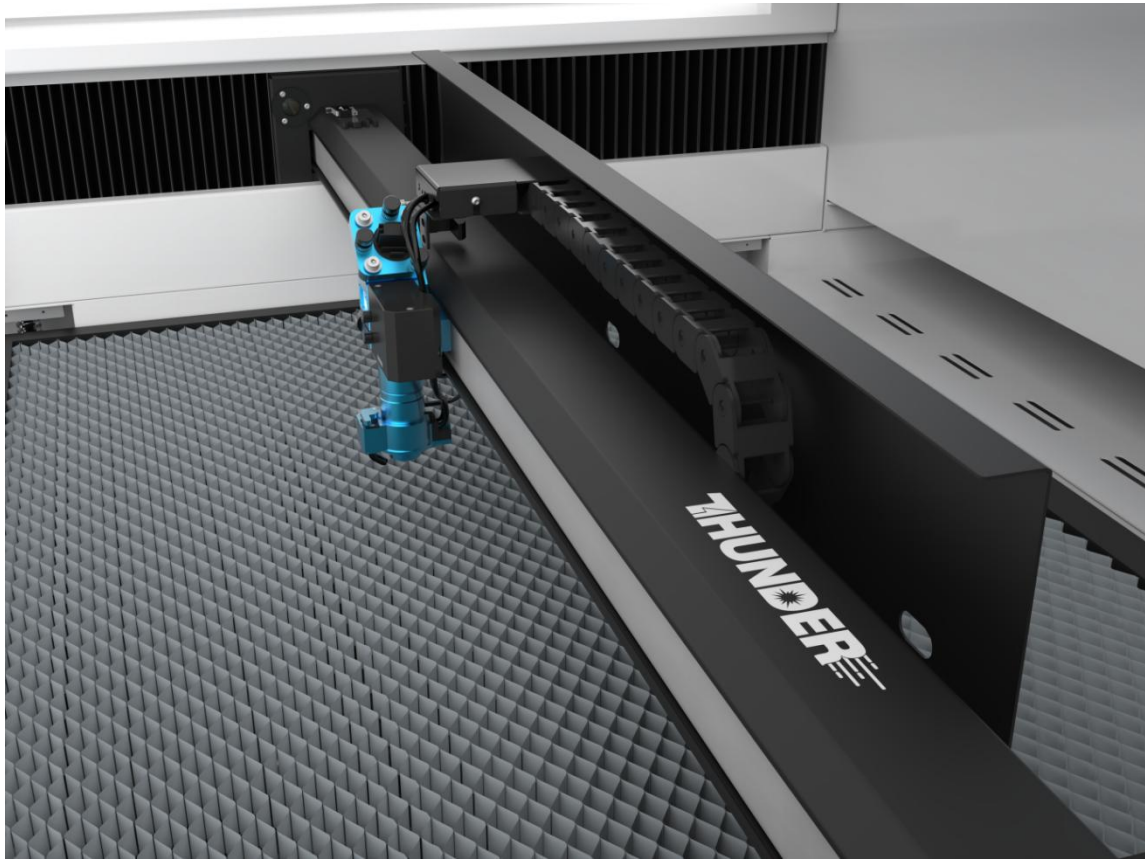
5.3 Maintain the Screw of the Dual laser Source Switching Motor

It is suggested to add lubricant oil (or Rust Preventative Grease) to the screws of the Dual laser Source Switching Motor at least every two weeks.



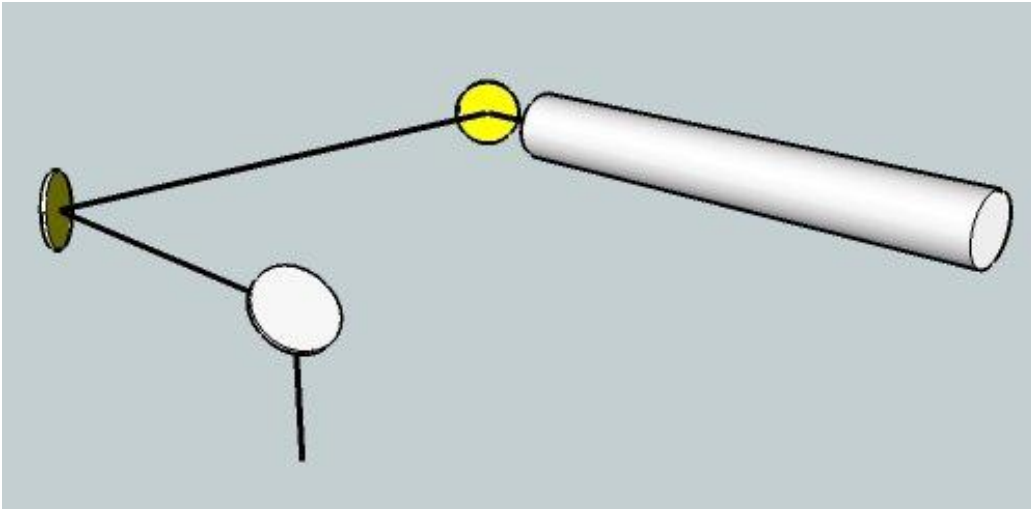
Please note that insufficient lubrication may cause the screw of the Dual laser Source Switching Motor to Stuck during operation and not successfully switch the dual laser source function.

5.4 Maintain the X/Y/Z Rails



It is suggested to add lubricant oil (or Rust Preventative Grease) to the rails/screws at least every two weeks.

5.5 Check the Beam Path



After being used for a long time, the beam path might be defective. This will reduce the efficiency of the laser beam or even cause no laser beam. At this moment, you will need to re-adjust the beam path again.

If you need to know that about adjust the laser beam path of the video on YouTube released by our company and please link to the URL:

[How to adjust the laser beam path](#)

5.6 Cleaning the cooling system

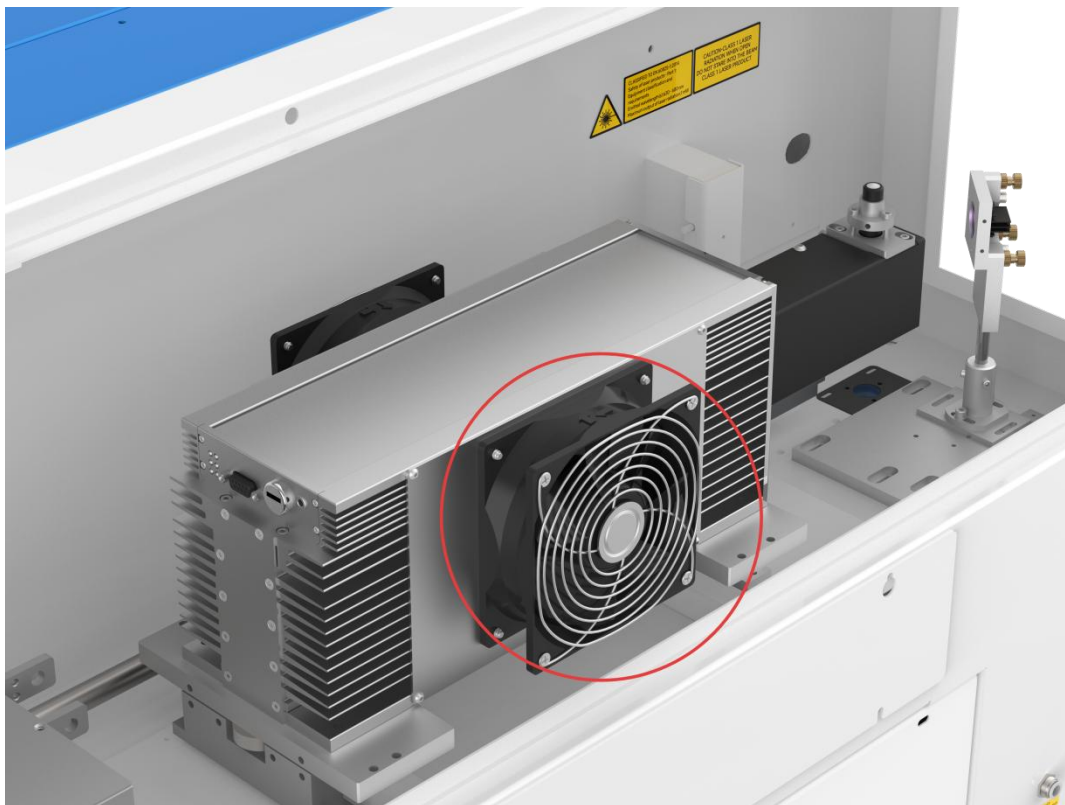
For the RF and Fiber tube, providing a good heat dissipation environment for it determines the stability of its beam output, so it is necessary to regularly clean the dust on the cooling fan of the tube and the machine.

It is suggested to use an air blow gun to blow the dust away, as shown in the pictures:

1. Use the air blow gun to blow away the dust on the fan inside and dust from the sponge and mesh.



2. Use the air blow gun to blow the dust on the Laser tube.
Clean the RF tube.



If you have a TITAN PRO SERIES, it is equipped with an optional dual laser source, so you will also need to clean the fiber tube.



5.7 Maintenance Plan

1. DAILY CHECK LIST

- ① Check Mirrors and lens for condensation and make sure it is clean after work
- ② Check exhaust grille to ensure there is no blockage for exhaust fan
- ③ Check air filter on compressor
- ④ Ensure cooling fans on sides are free from debris

- ⑤ The air blower must be checking and cleaning if required.

2. WEEKLY CHECK LIST

- ① Clean debris from under laser bed
- ② Clean X & Y & Z axis rails and lubricate as required
- ③ Clean Acrylic/Tempered glass covers in lid
- ④ The beam combiner must be checking every weekly, and cleaning if required.
- ⑤ Clean the screw of the dual laser source switching motor and lubricate as required.

THE END