ACMER

LASER ENGRAVER

ACMER P3

MANUAL V 1.0

Thank you for choosing our product and placing your trust in our brand. We are committed to providing high-quality products and exceptional service to all our customers, and we greatly appreciate your support.

To help you utilize and maintain your product, we offer several support options:

Social Media Channels:

Join our Facebook group and follow our Facebook page by scanning the QR code below

Facebook Group:
https://www.facebook.com/groups/1614455505653986

Facebook:
https://www.facebook.com/profile.php?id=100088576630671

Online Video Learning:

Learn how to operate the laser engraving machine through our official YouTube channel (@acmerlaser)

Email Support:

Contact our after-sales team directly through the support email: support@acmer3d.com

Thank you

1. CONTENTS

1. Contents 02

2. Disclaimer and Safety Guide 03

3. Specifications 04

4. Package List 05

5. Machine Introduction 06

6. Installation Steps 07

7. Software Installation and Usage 11

8. Mobile App Installation and Usage Guide 34

9. FAQ 41

10. Machine Maintenance and Cleaning 46

11. After Sale 51

2. Disclaimer and Safety Guide

1. The laser engraving machine produces laser, and it is strictly forbidden to aim the laser at any living being.

2. When using the laser engraving machine, the operator and people nearby must wear laser safety glasses. Do not operate the laser without protective eyewear (laser safety goggles)!

3. Minors (especially children under 14 years old) must use the machine under the full supervision of an adult!

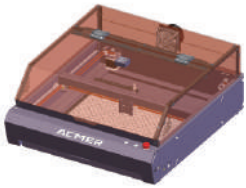
4. Do not touch the laser beam during operation, as it may cause personal injury.

5. During engraving and cutting, ensure the machine is within the operator's line of sight.

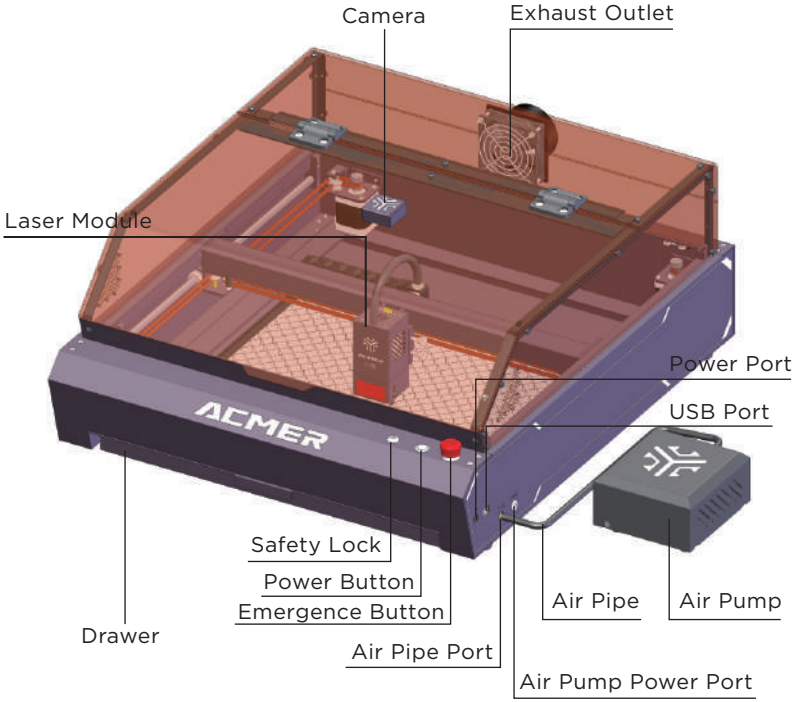
3. Specifications

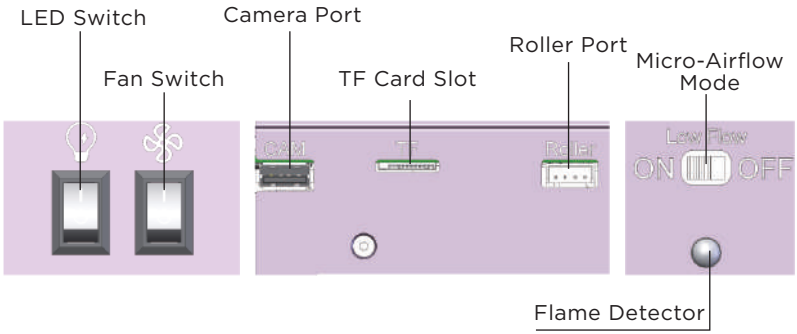
Machine Size	577*655*286mm
Engraving Size	P3 24W / 2W IR: 400*400mm P3 48W / 2 in 1: 400*390mm
Machine Weight	19Kg
Laser Output Power	10W Diode + 2W IR(2 in 1) / 2W IR / 24W Diode / 48W Diode
Focal Length	P3 2 in 1: 5mm P3 2W IR: 23mm P3 24W /48W Diode: 8mm
Power Input	DC 24V
Communication Method	USB / APP / TF card
Software	LightBurn / LaserGRBL / ACMER App
Operation System	macOS, Windows, Linux, Android, iOS
Engraving Materials for Diode Laser	Wood, bamboo, paper, plastic, leather, PCB board, aluminum oxide, non-reflective coating and lacquered metal, ceramic, stainless steel, some dark opaque acrylic, etc.
Engraving Materials for IR Laser	Silver, brass, copper, galvanized iron, aluminum, stainless steel, acrylic, plastic, leather, rubber, silicone, black ceramic tiles, stone, lacquered wood boards, PCB boards, electrical wood, etc.
File Format	NC, DXF, BMP, JPG, PNG, etc.
Engraving Accuracy	0.01mm
Fuselage Material	Aluminum profile

4. Package List

 Machine	Laser Module	Air Pump
Power Adapter	Laser Safety Goggles	USB Cable
Air Pipe	Engraving Materials	Tools
Smoke Exhaust Pipe	Hose Clamp	

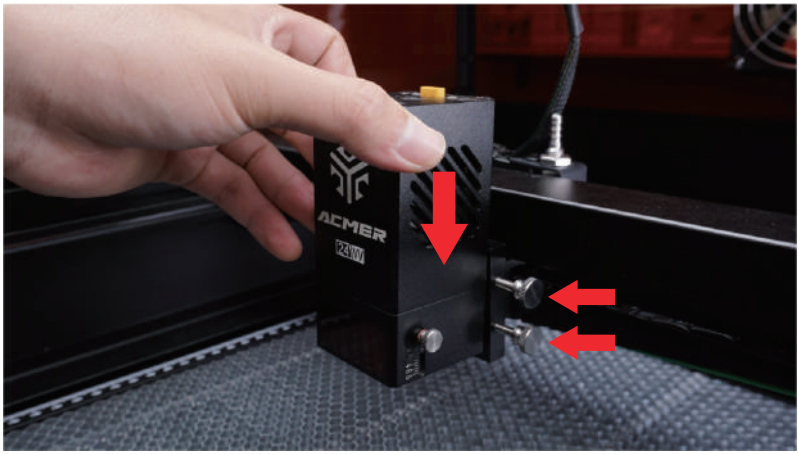
5. Machine Introduction



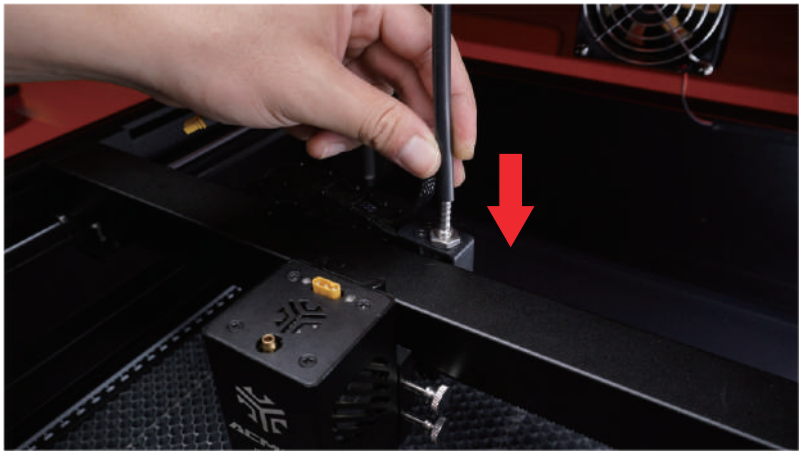


6. Installation Steps

6.1 Install the Laser Module and Air Pipe

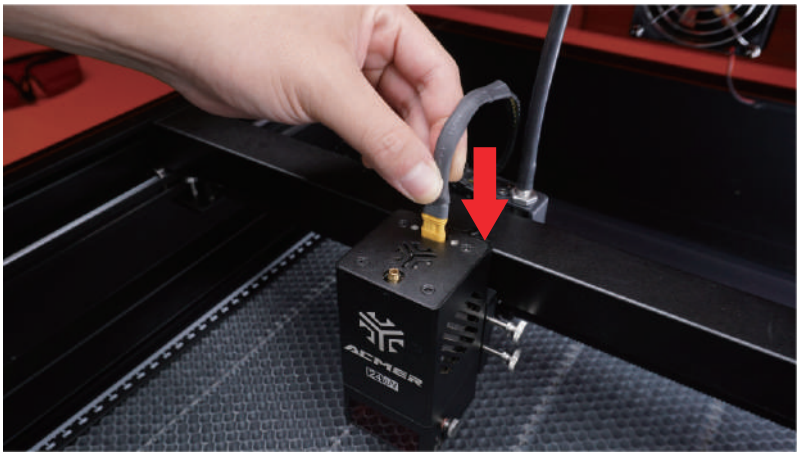


Step 1: Insert the laser module into the slider and tighten the locking screws.

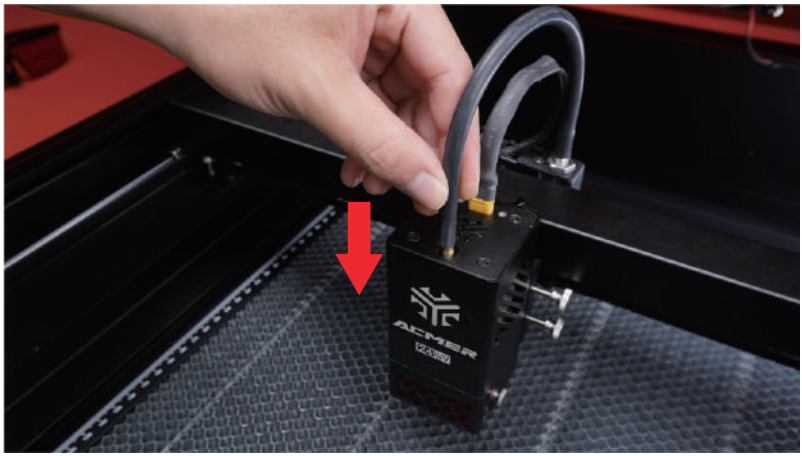


Step 2: Insert the small air pipe into the X-axis connector.

6.2 Connect the Laser Power Cord and Air Pipe



Step 1: Connect the laser power cord.



Step 2: Connect the air pipe.

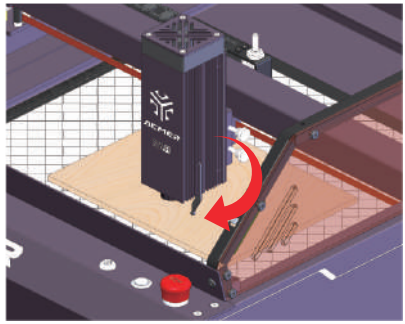
6.3 Install the Air Pump

Step 1: Connect the air pump power cord

Step 2: Connect the large air pipe between the air pump and the machine.

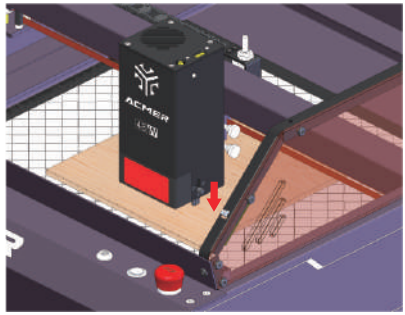
6.4 Place the Engraving Material and Adjust

24W Diode Laser Module



2W IR Laser Module

2 in 1 Dual Laser Module

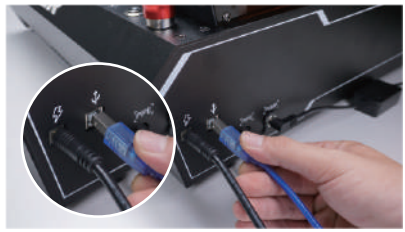


48W Diode Laser Module

Tip: The focus is complete when the focus rod end contacts the surface of the engraving material.

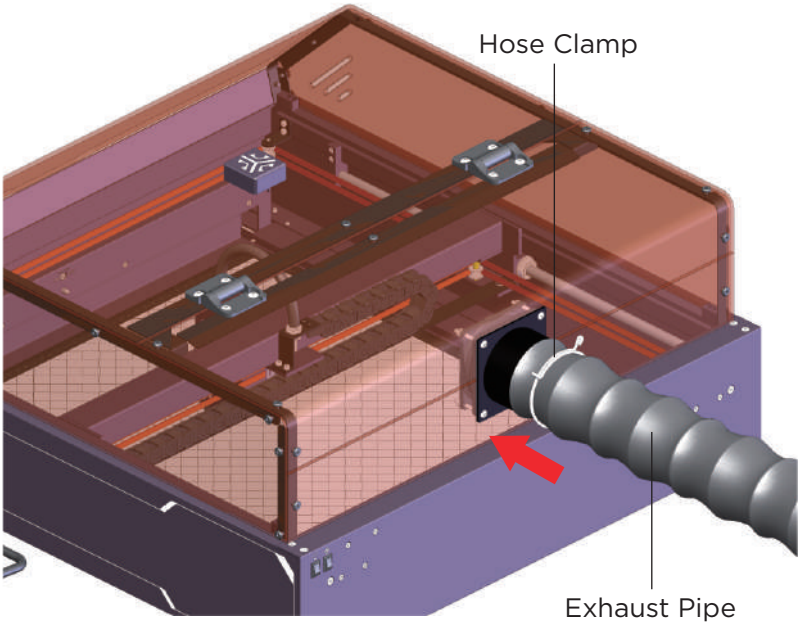
6.5 Connect the Power and USB Cable

Step 1: Connect the power cord.



Step 2: Connect the USB cable.

6.6 Connect the Exhaust Pipe



First, slide the hose clamp onto the exhaust pipe.

Then, insert the exhaust pipe into the exhaust outlet at the back of the machine.

Use the hose clamp to secure the exhaust pipe to the outlet.

7. Software Installation and Usage

The ACMER laser engraving machine supports the mainstream laser engraving software LaserGRBL and LightBurn.

LaserGRBL is an open-source, easy-to-use and feature-rich software that is very suitable for beginner users. However, LaserGRBL only supports Windows systems (Win XP/Win 7/Win 8/XP/ Win 10/Win 11), and it does not support camera positioning and rotary module functions.

For Mac users, you can choose to install LightBurn, which is also an excellent engraving software. It supports camera positioning functionality and has more diverse features, but the price is $60 (first-time installation can be trialed for free for one month). This software also supports the Windows system.

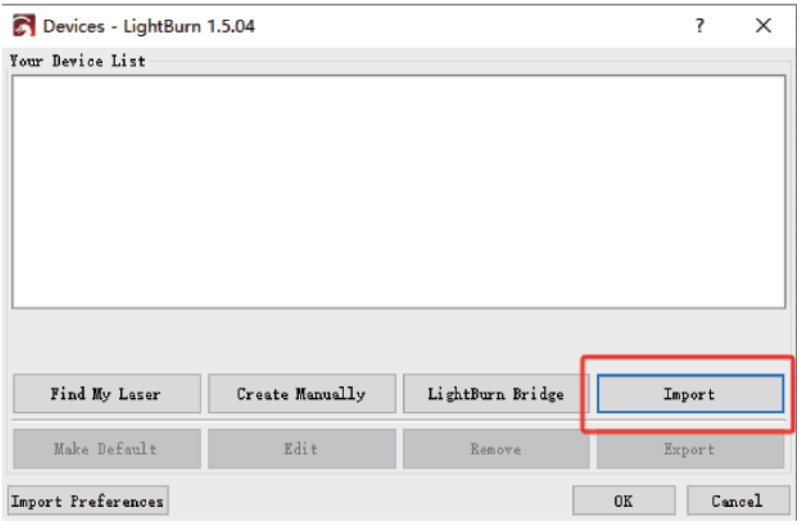
If you want to download and install LaserGRBL, you can directly obtain the data from the TF card, or you can visit the LaserGRBL official website for the download. LightBurn users can visit the LightBurn official website for the download.

Tips:
If this is the first time your computer is using this machine, please install the corresponding driver on the computer side. You can obtain the driver installation program from the "Software/Drivers" folder on the TF card!

7.1 LightBurn

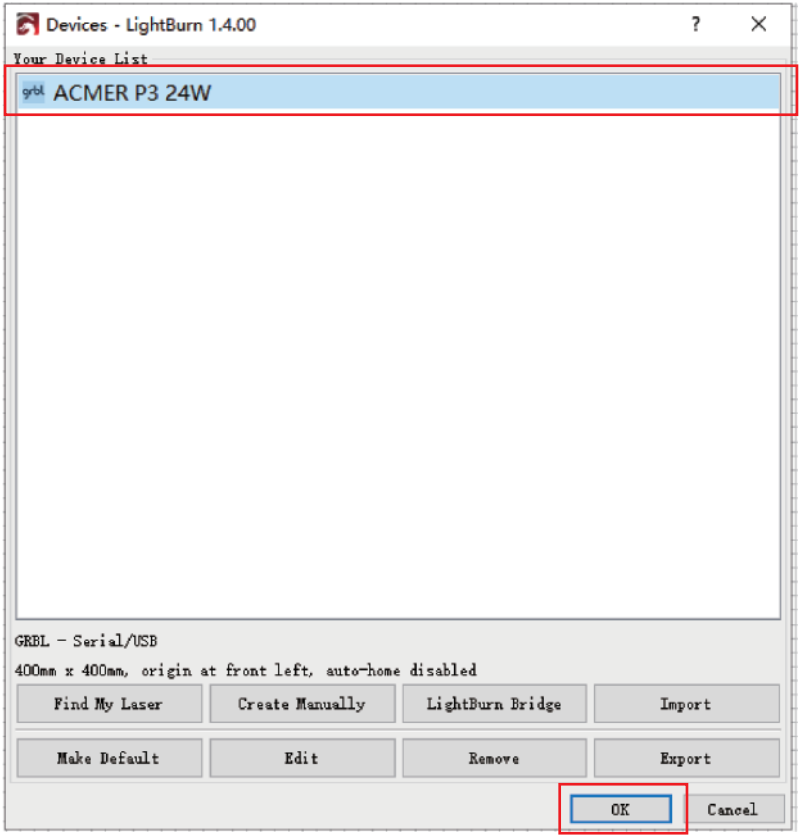
7.1.1 Machine Connection

7.1.1.1 Choose “Devices” then Click “Import”

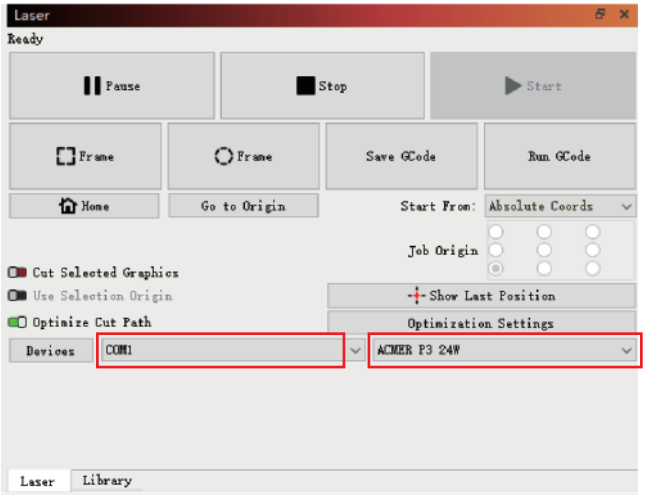


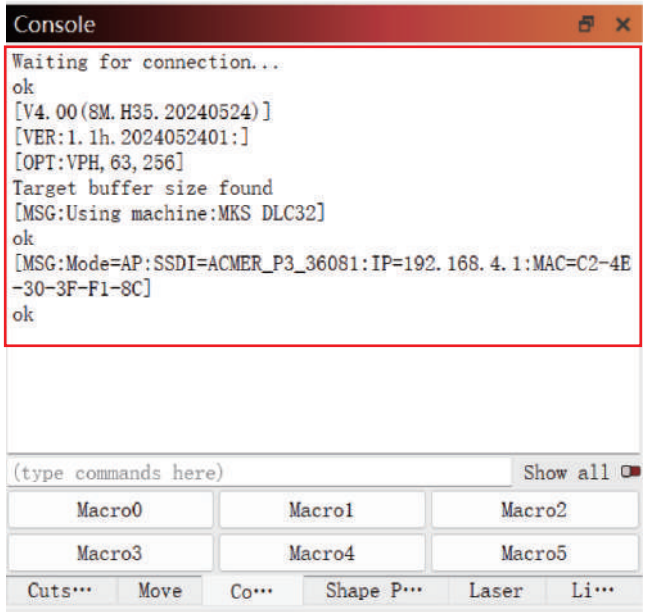
7.1.1.2 From the "Software/" folder on the TF card, find the configuration file corresponding to your product. For example, if your machine is the P3 24W, select the "ACMER P3 24W.lbdev" file, then click "Open".

7.1.1.3 Select the configuration file you just imported, then click "OK".



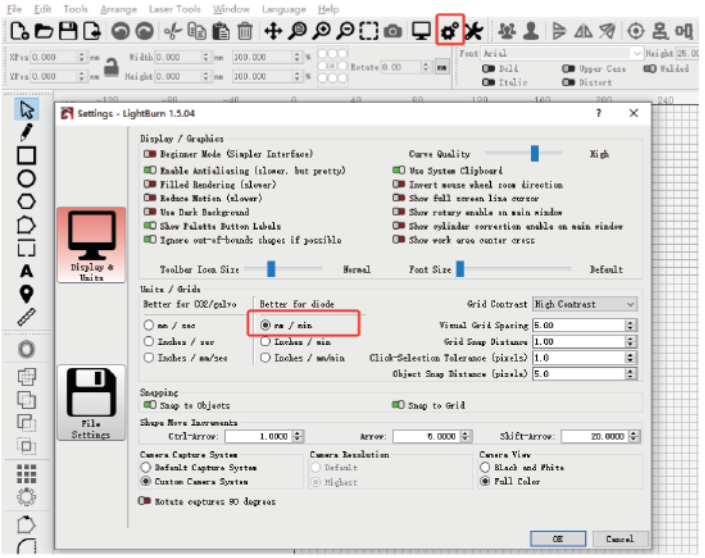
7.1.1.4 Return to the main interface, select the correct port and configuration, and the connection is successful when the text shown in the control window appears.





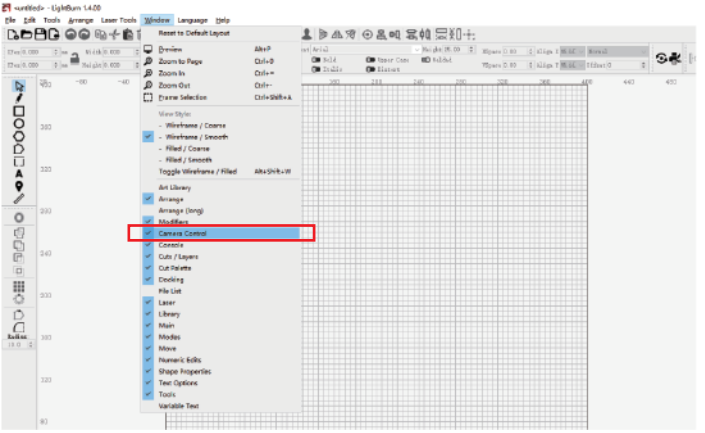
7.1.2 Software Settings

Click "Setting" and set the machine's speed unit to "mm/min".

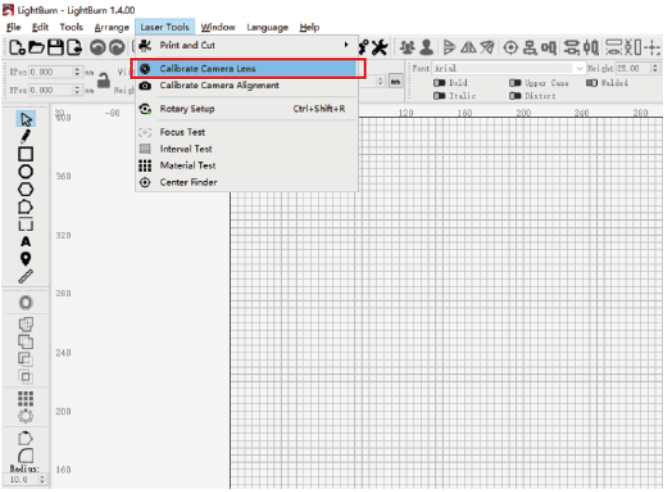


7.1.3 Camera Calibration

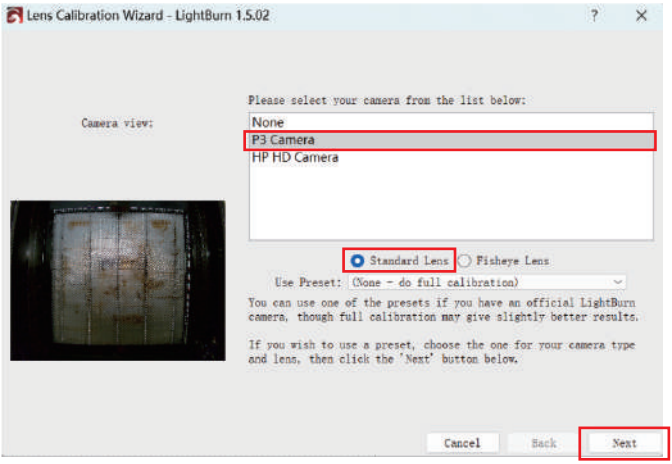
7.1.3.1 Find "Window" in the software toolbar, then click "Camera Control" to confirm it is checked and bring up the camera control window.



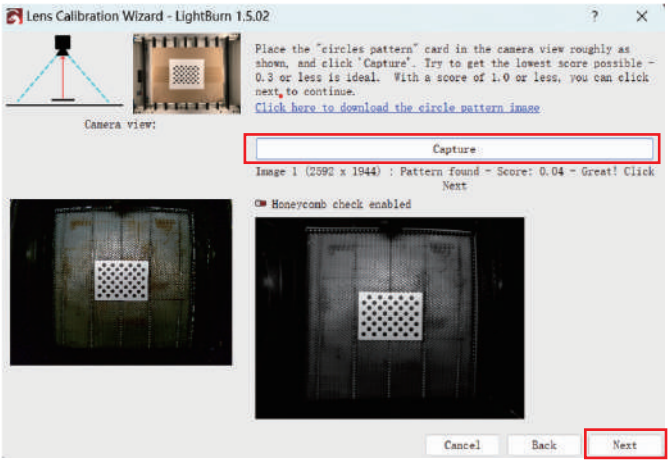
7.1.3.2 Find "Laser Tools" in the software toolbar, then click "Calibrate Camera Lens" (the interface may differ between software versions).



7.1.3.3 Select "P3 Camera" - "Standard Lens", then click Next.

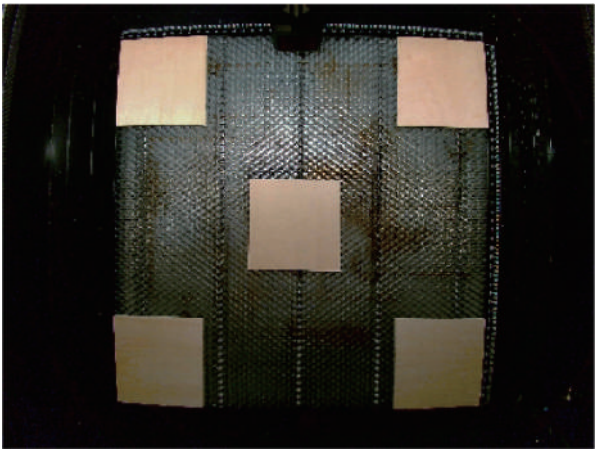


7.1.3.4 Uncheck the "Capture Honeycomb Board" option, and place the calibration card in the specified location per the prompts. The first step is to place it in the center, then click "Capture" and "Next".



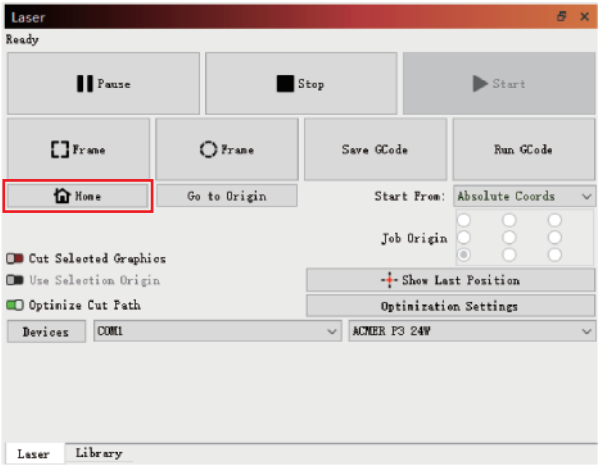
7.1.3.5 Calibrate each position in sequence as prompted by the software until the camera calibration is complete, then click "Finish".

7.1.3.6 After the calibration steps, 24W, 48W, 2-IN-1 users should place 5 pieces of 100*100 wood boards in the corresponding positions as shown; 2W IR users should place 5 pieces of 100*100 white ABS boards in the corresponding positions. Adjust the laser focal distance correctly.

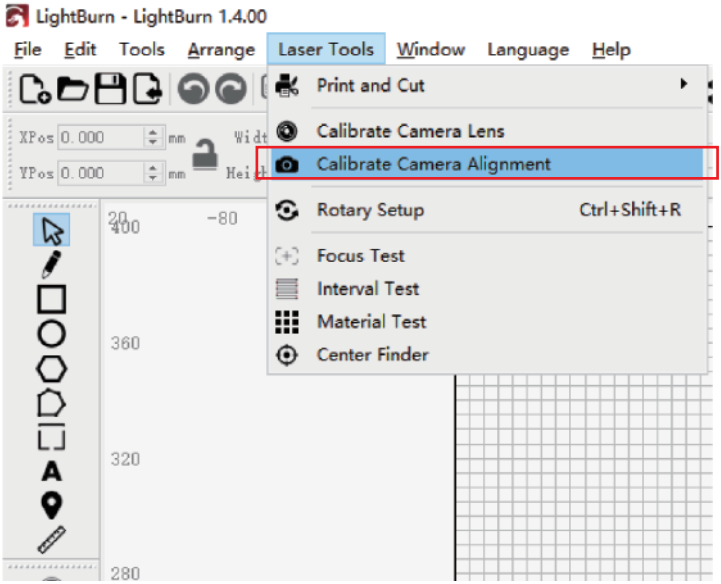


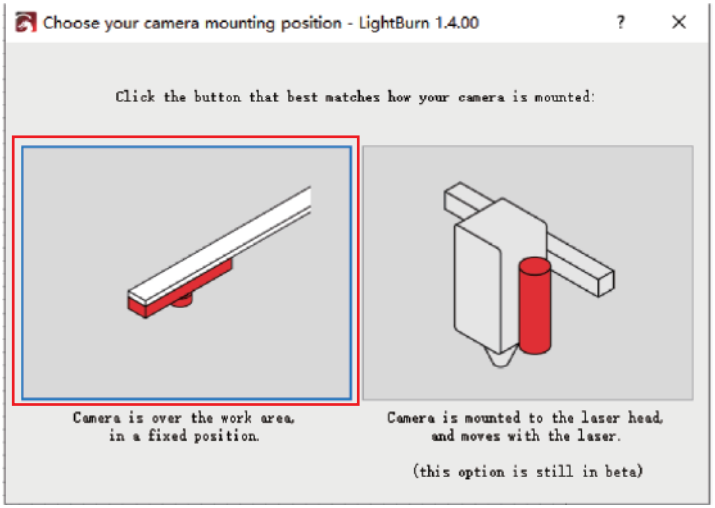
7.1.3.7 Return to the home page and home the machine.

Note: After homing is complete, do not directly move the laser module or engraving material by hand in subsequent operations! Otherwise, it will cause inaccurate positioning!

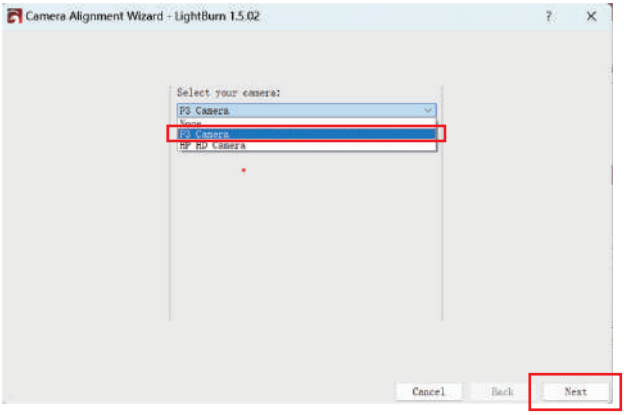


7.1.3.8 Select: "Laser Tools" -> "Calibrate Camera Alignment", then click on the "Camera is over the work area".



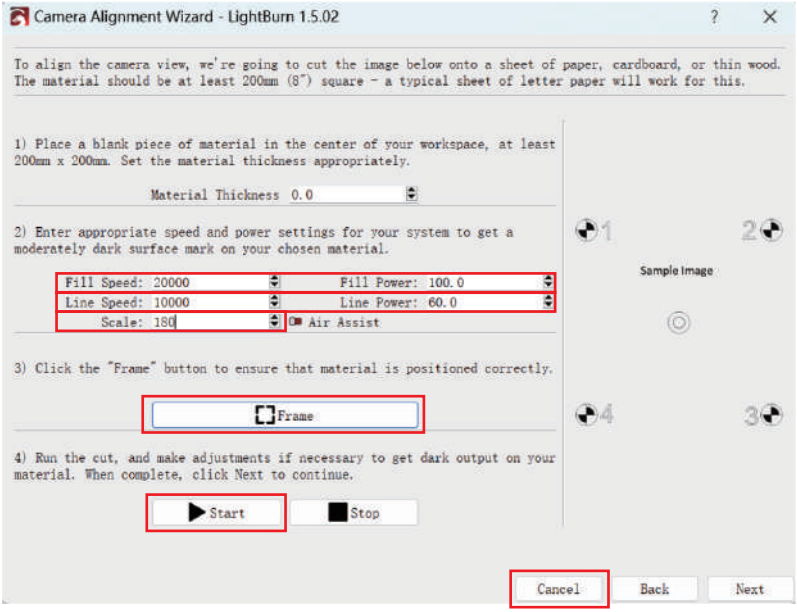


7.1.3.9 Select "P3 Camera" and click "Next".

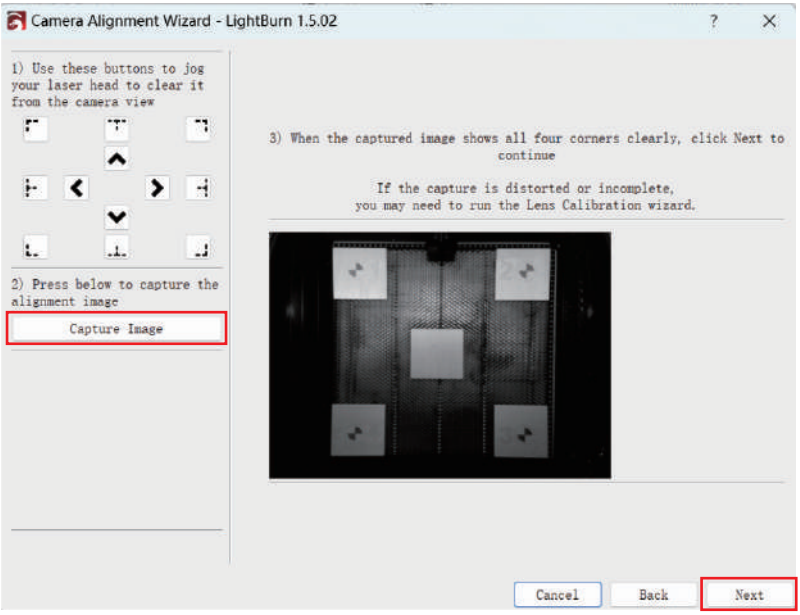


7.1.3.10 Adjust the power and speed (refer to the parameter table below according to your actual purchased product), then enter the value of 180 in the Scale item. Click “Frame" to preview the engraving range, and finally click "Start" to start engraving. After the engraving is complete, click "Next".

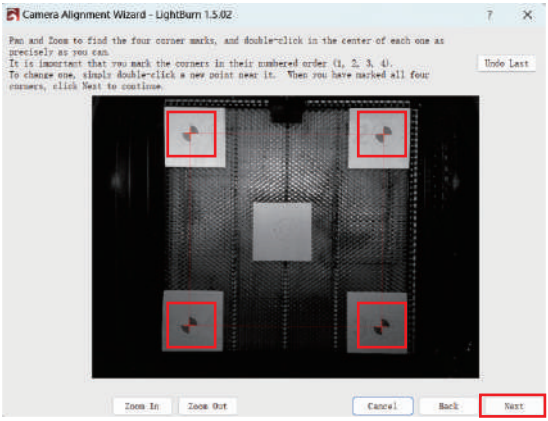
Power / Speed Reference	
24W	Fill Speed: 20000 Fill Power: 100 Line Speed: 10000 Line Power: 60
48W	Fill Speed: 20000 Fill Power: 50 Line Speed: 10000 Line Power: 30
2-IN-1	Fill Speed: 10000 Fill Power: 100
2W IR	Fill Speed: 20000 Fill Power: 100 Line Speed: 10000 Line Power: 60



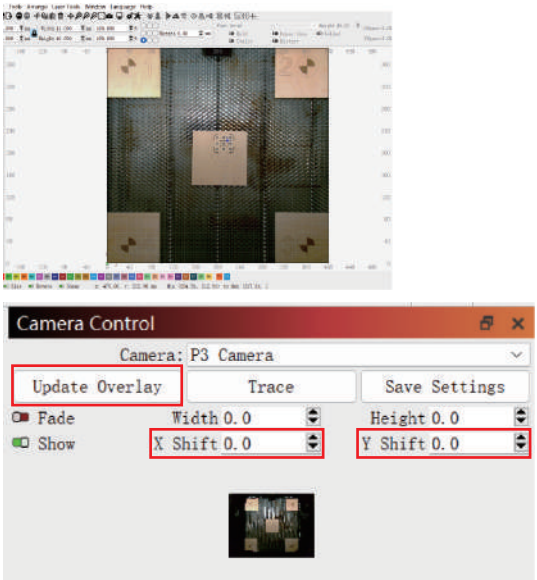
7.1.3.11 Move the laser to a blank area, click "Capture Image", and then click "Next".



7.1.3.12 Mark the intersections of the four corner patterns in sequence as prompted, then click "Next".



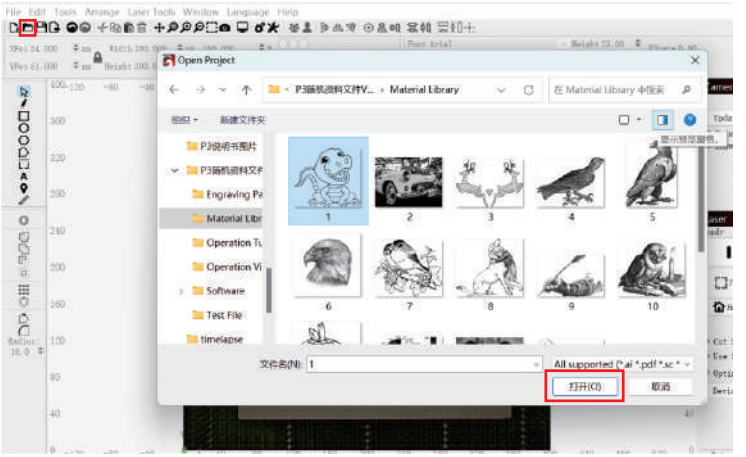
7.1.3.13 In the "Camera Control" window, click "Update Overlay". Draw a rectangle to engrave. After the engraving is complete, click "Update Overlay" again to update the screen and observe whether the engraving pattern overlaps. If there is no overlap, you can adjust the X and Y offsets through the "Camera Control" window to align them.



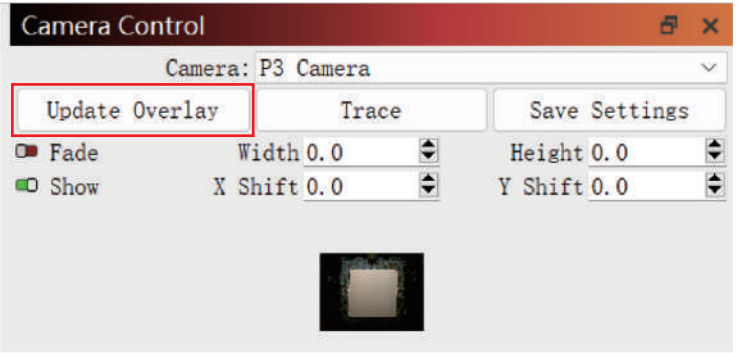
7.1.4 Start Engraving

7.1.4.1 Remove the previously used engraving material for camera calibration, place the new engraving material, and refer to the previous step to adjust the laser working focal distance.

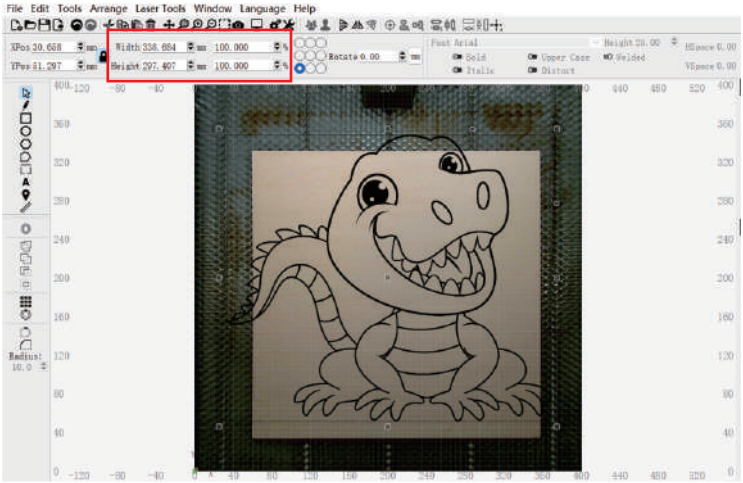
7.1.4.2 Click the "Open" button in the software toolbar, select the engraving file, and click "Open"



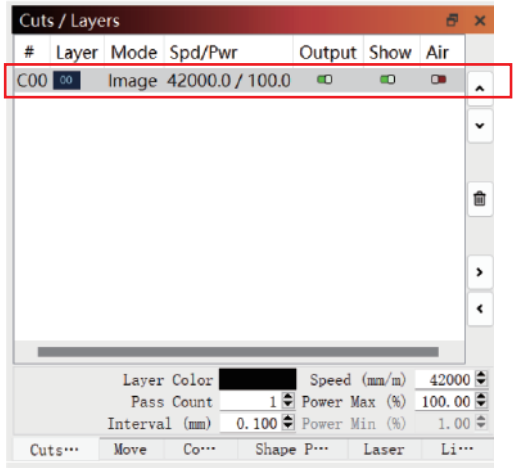
7.1.4.3 After importing the file, click "Update Overlay" in the "Camera Control" window.



7.1.4.4 Find the function key to adjust the size of the pattern in the software toolbar, select the engraving pattern, and adjust it to the desired size (the engraving pattern size should not exceed the size of the engraving material).



7.1.4.5 Click "Cuts/Layers", double-click the layer corresponding to the engraving pattern to enter the engraving parameter setting page.



7.1.4.5

① Set the engraving speed and power (it is recommended to refer to the engraving parameter table for the specific parameters);

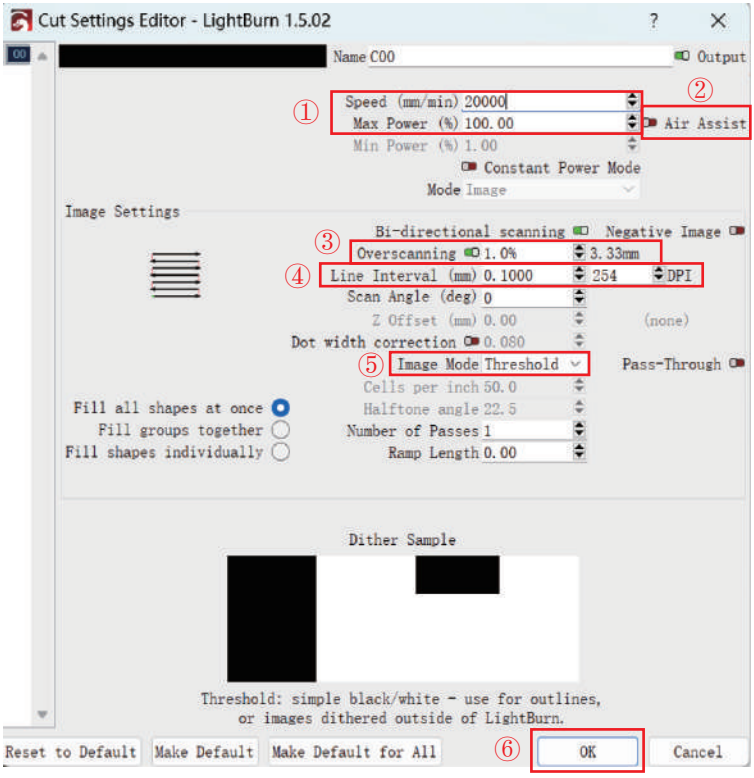
② Turn the air pump on or off;

③ Set the "Overscanning" parameter to 1%;

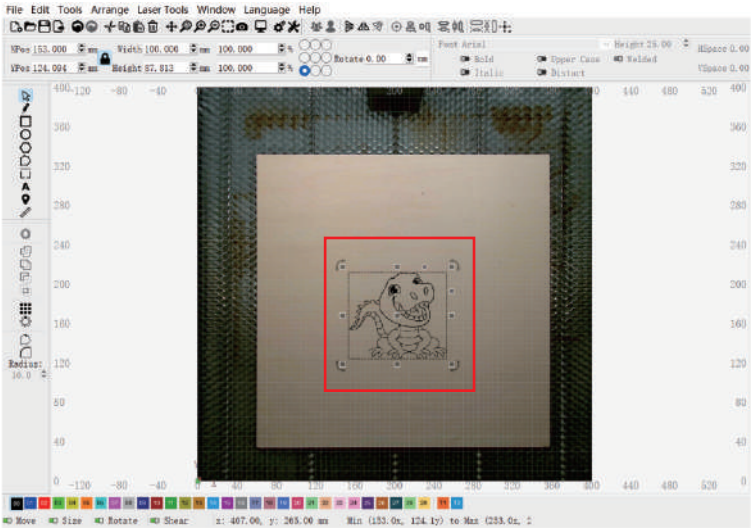
④ Set the Line Interval(please refer to the engraving parameter table);

⑤ Select the Image Mode

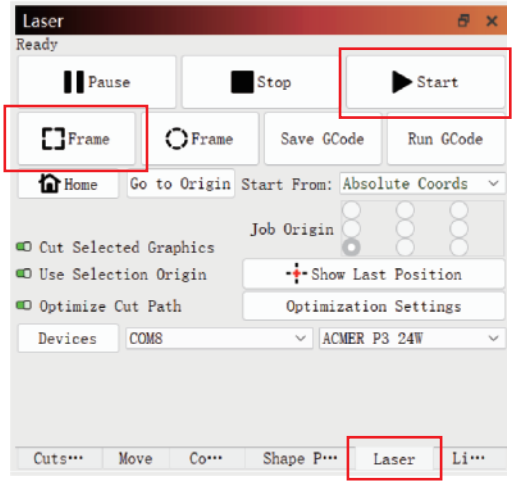
⑥ After the setting is complete, click "OK".



7.1.4.6 Select the engraving pattern with the confirmed size, then press and hold the left mouse button and drag the engraving pattern to any position you want to place it on the engraving material.



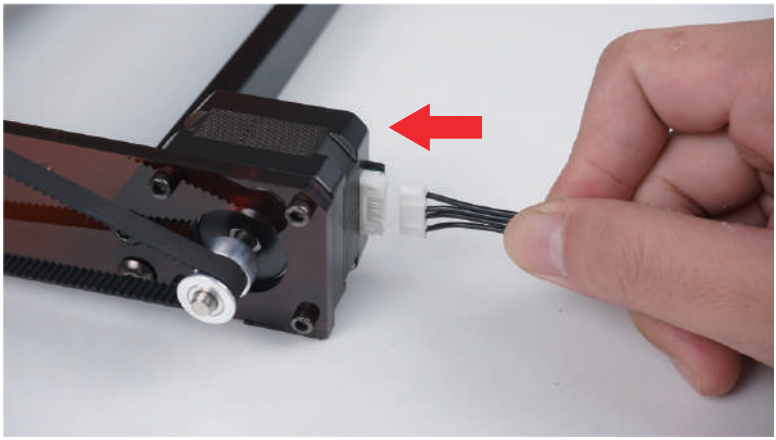
7.1.4.7 Click the "Laser" window, click “Frame" to preview the engraving area, and if there are no issues, click "Start" to begin engraving.



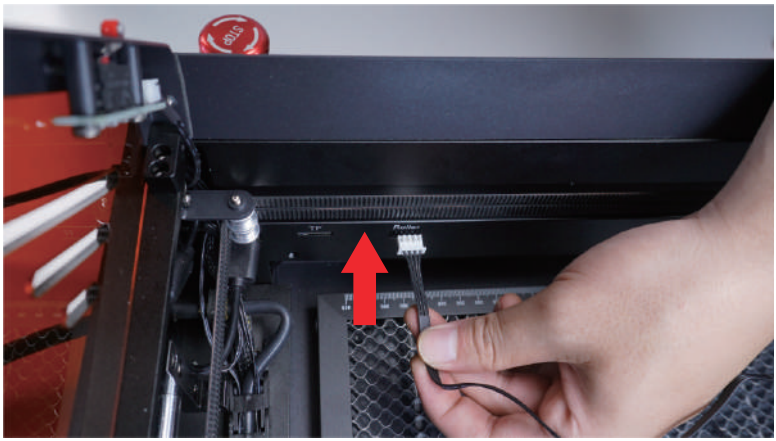
7.1.5 How to Use the Rotary Module

Note:Before using the rotary module, you need to remove the drawer and raise the entire machine to a height where the rotary module can be used normally. (It is recommended to use the ACMER riser kit)

7.1.5.1 Connect the rotary module to the engraving

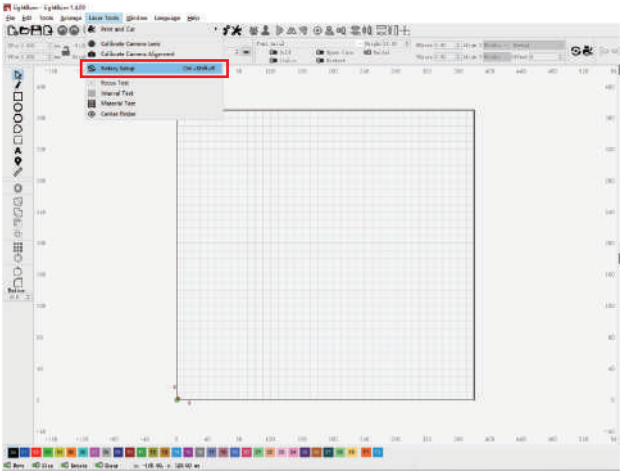


Step 1 Connect one end of the cable(come with the rotary module) to the rotary module motor.

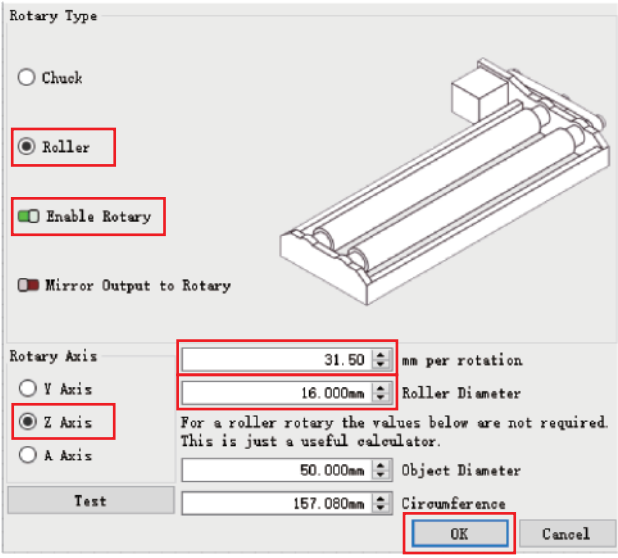


Step 2 Connect the other end of the cable to the interface on the front of the machine frame.

7.1.5.2 Find "Laser Tools" - "Rotary Setup" on the software toolbar.



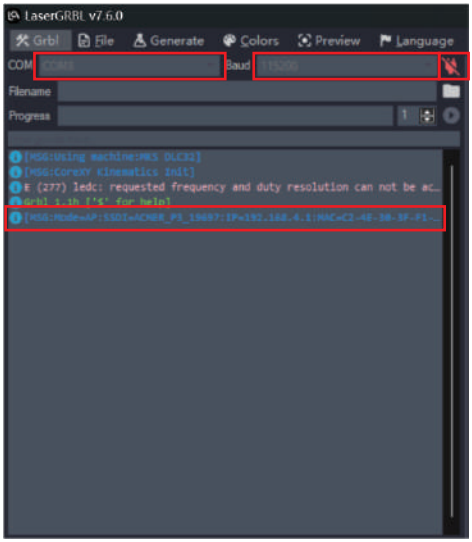
7.1.5.3 Choose "Roller", click "Enable Rotary", and select the Z Axis as the Rotary Axis. Then enter the value of [31.5] in the "mm per rotation" field, enter the value of [16] in the "Roller Diameter" field, and click OK to use the rotary module.



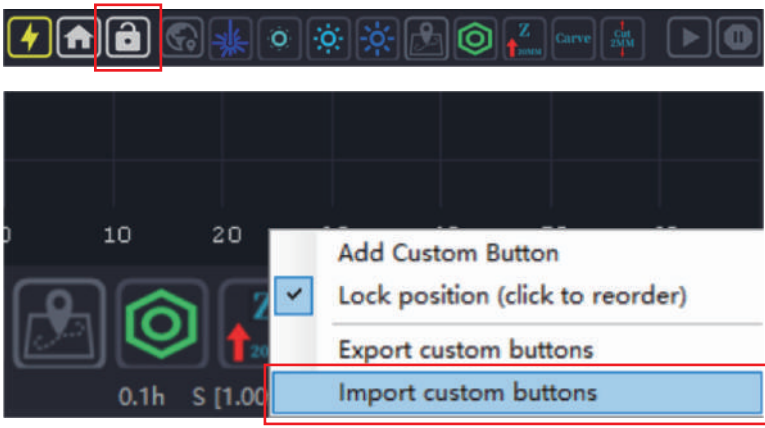
7.2 LaserGRBL

7.2.1 Machine Connection

7.2.1.1 Select the corresponding COM port, check that the baud rate is "115200", click connect, and the control window will display a string of text indicating a successful connection.



7.2.1.2 Click the "Unlock" button, move the mouse to the blank area in the lower right corner of the controls, right-click and select "Import custom buttons".

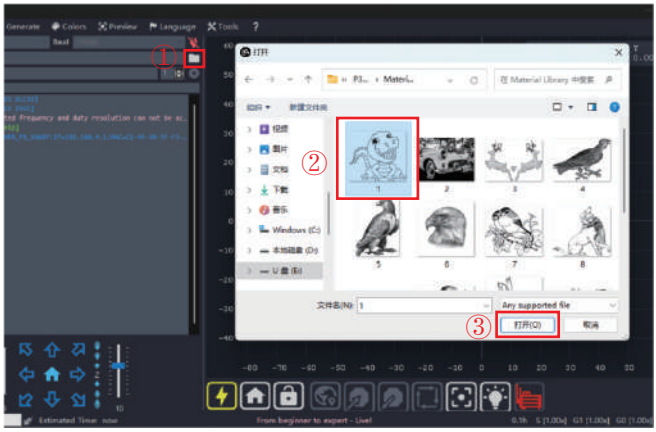


7.2.1.3 In the "Software" folder of the TF card, select the "CustomButtons" file. After importing, click "OK" or "Yes" for all the prompt windows.

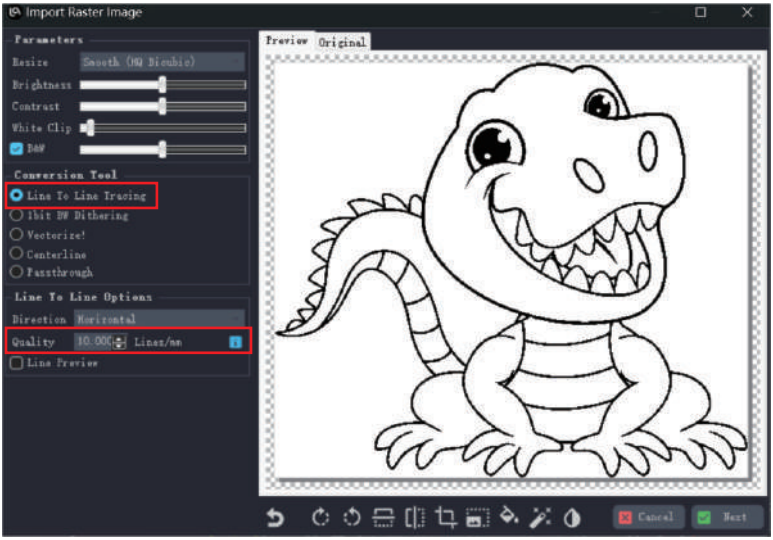
Mac	2024/4/22 10:27	文件夹
Win	2024/4/22 10:27	文件夹
ACMER P3 2-IN-1.lbdev	2024/6/11 10:05	LBDEV 文件
ACMER P3 2W-IR.lbdev	2024/6/11 10:06	LBDEV 文件
ACMER P3 24W.lbdev	2024/6/11 10:05	LBDEV 文件
ACMER P3 48W.lbdev	2024/6/11 10:04	LBDEV 文件
CustomButtons	2022/11/17 15:39	This file contains...
LaserGRBL-v4.9.4	2022/11/22 17:47	应用程序
LightBurn-v1.1.04	2022/5/12 13:15	应用程序
MKSLaserTool_setupV1.0.6	2022/2/9 11:06	应用程序

7.2.1.4 Click the "Air Pump" button to control the air pump on/off.

7.2.1.5 ① Click the "Open File" button;
② Select the engraving file;
③ Click "Open".

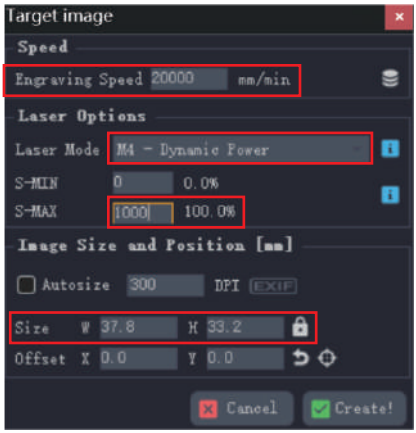


7.2.1.6 Select an image, click open. Then select the engraving mode, refer to the engraving parameter table to enter the line spacing parameters, and click "Next". (0.1 in the parameter table corresponds to 10 in the software)



7.2.1.7 According to the engraving material, refer to the engraving parameter table to set the corresponding engraving speed and power, laser mode ("M3" for cutting, "M4" for engraving), and engraving size.

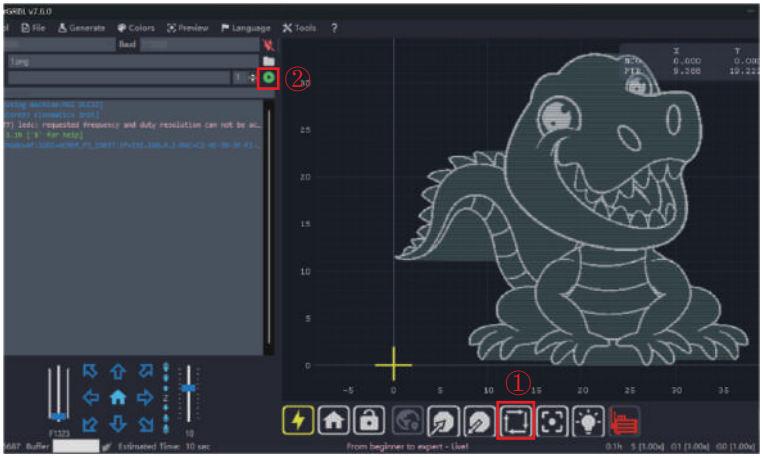
(Note the power unit, 1000 in the software is equivalent to 100% power in the parameter table)



7.2.1.8

① Click preview to check the engraving range;

② Confirm the engraving range and start engraving.



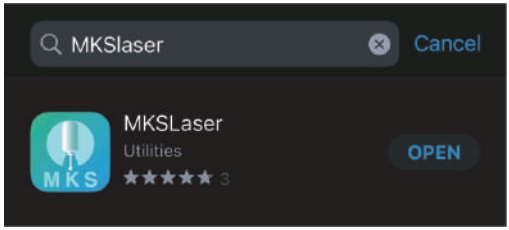
Note: LaserGRBL currently does not support the use of the rotary module. We apologize for the inconvenience!

8. Mobile App Installation and Usage Guide

8.1 Download and Install the App

8.1.1 Android users can scan the QR code below to download and install the app.

8.1.2 iOS users can search for "MKSLaser" in the app store to download and install the app.



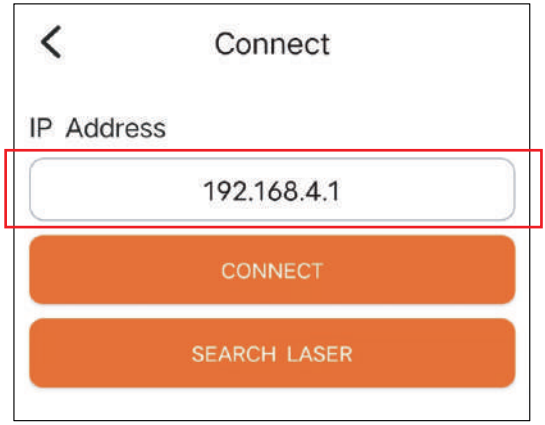
8.2 App Connection Guide

8.2.1 Insert the TF card into the card slot on the back of the front frame of the machine.

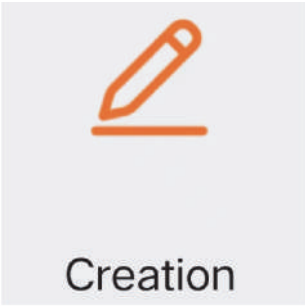
8.2.2 After powering on the machine, use your phone's WIFI function to search for the network name "AC-MER_P3_XXXXX" and enter the password to connect. The initial password is: 12345678.

8.2.3 Open the mobile app and click the icon in the top left corner.

8.2.4 Enter the IP address (the default IP address is "192.168.4.1"), then click "CONNECT" to connect.

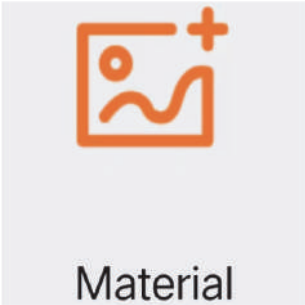


8.3 Functional Introduction

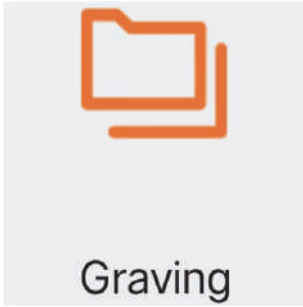


You can use this function for self-creation, such as doodling and writing. You can also access your phone's photo album or take photos for engraving.

This function can be used to control the motion of the laser and also to return the laser to the origin.



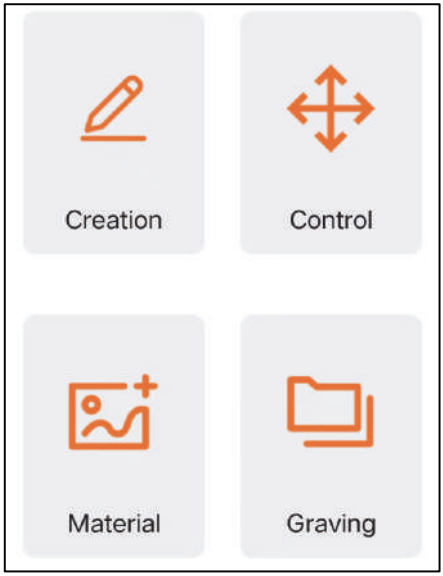
You can select the engraving files prepared for you by ACMER.



You can store the programs generated by the computer software on the TF card and access the files on the TF card for offline engraving through this function.

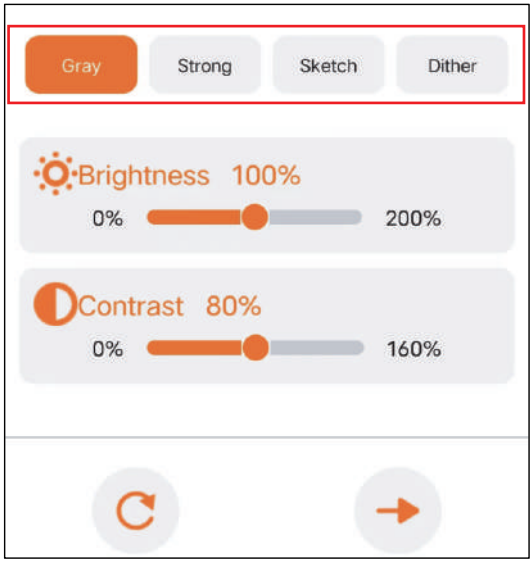
8.4 Usage Guide

8.4.1 Click "Material"

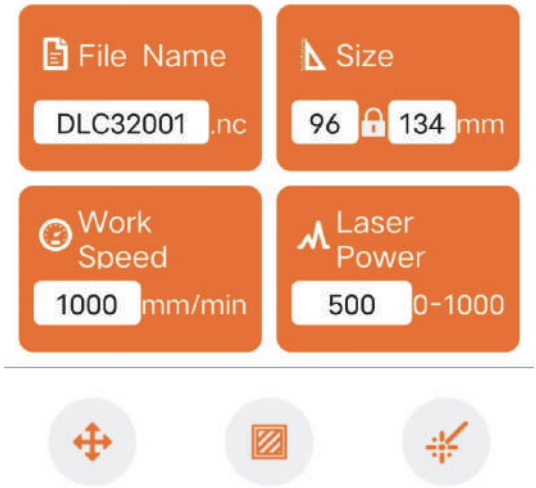


8.4.2 Select the material you want to engrave;

8.4.3 Select the engraving effect you want;

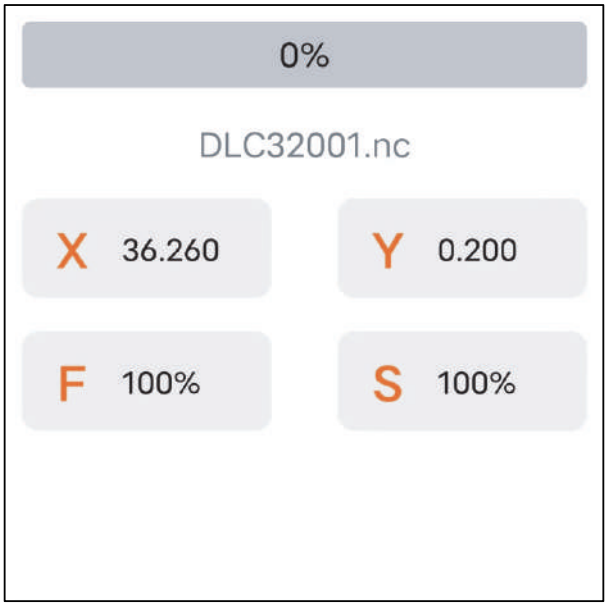


8.4.4 Set your engraving size and set your engraving parameters based on your engraving material.



8.4.5 Click upload and wait for the upload in image one; click "Confirm" to start engraving after the upload is successful in image two;

8.4.6 Wait for the engraving to complete.

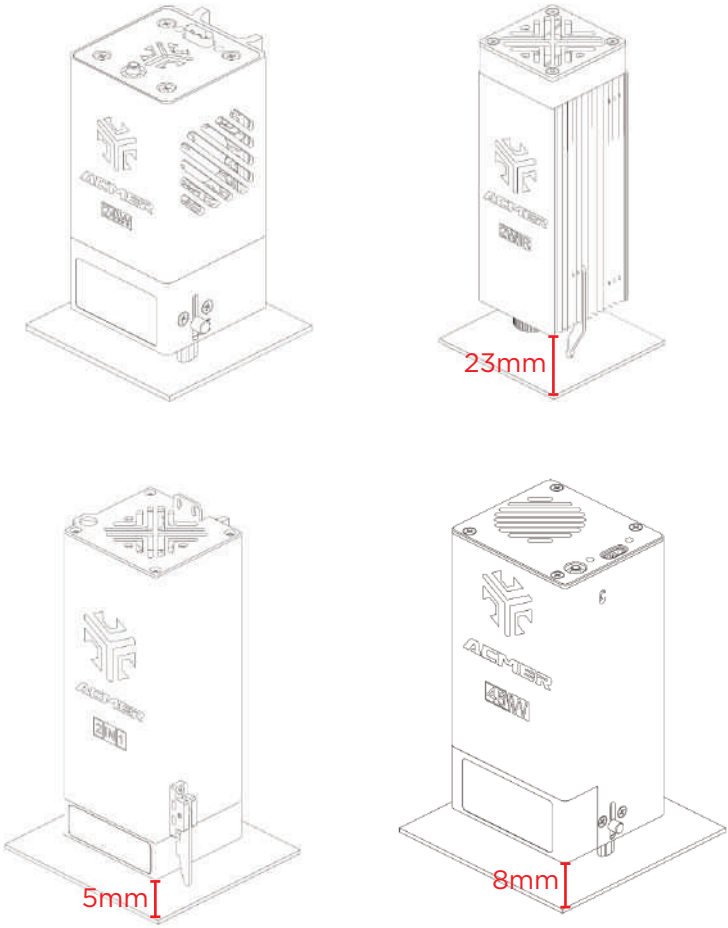


9.FAQ

Q1. Poor engraving or cutting effect (IR laser does not have cutting capability):

1. Check if the laser module's wires are loose.

2. Check if the laser's working focal distance is correct, using the focus rod that comes with the laser.



3. Check if the surface of the engraving material is flat.

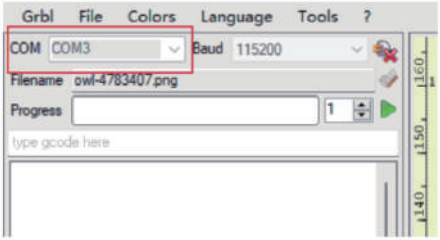
4. For cutting, try lowering the speed and increasing the number of cutting passes. Refer to the engraving parameter table for specific parameters.

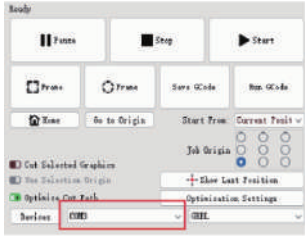
5. For engraving: if the engraving is too deep, try increasing the speed and reducing the power. If the engraving is too shallow, try reducing the speed and increasing the power. Refer to the engraving parameter table for specific parameters.

Q2. The machine cannot connect to the computer

1. Check if the CH340 driver is installed. If not, you can find the CH340

2. Check if the selected COM port is the one for this specific machine.





3. Try using a different USB cable for the connection.

4. Try connecting to another computer.

Q3. The machine makes noise during operation:

1. It is normal for the machine to have some light noise during operation, such as the cooling fan of the laser, the exhaust fan, and the high-speed motion of the structure.

2. Manually move the X and Y axes to check if there is any obvious sticking or binding.

3. Inspect if any screws have become loose or fallen off.

4. Check if the transmission components such as the timing belts, guide rail, and optical axis are obstructed by any foreign objects.

5. Apply the provided lubricating grease to the optical axis and guide rail to keep them lubricated.

Q4. How to adjust the timing belt tension

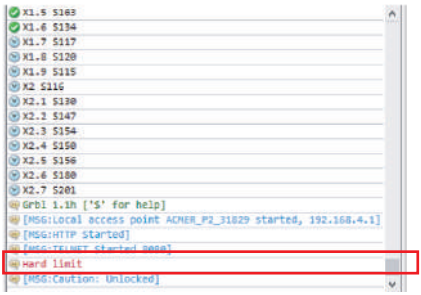
Use a screwdriver to turn the two screws on the back of the machine (refer to the diagram for the specific location). Turning the screws clockwise tightens the timing belt. Turning the screws counter-clockwise loosens the timing belt by pushing the screws inward. Note that the tension on the two timing belts should be maintained as consistent as possible.

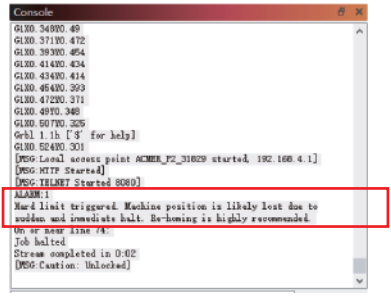
Q5. The machine stops working during operation

1. If the machine lid is opened while the machine is working, the machine will pause its operation. In this case, do not arbitrarily move the laser or the engraving material. Just close the lid, and the machine will resume its work.

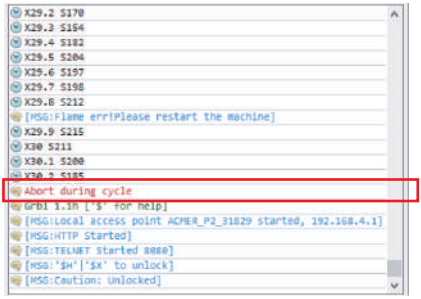
2. Check if the machine power is properly connected, and if the power indicator light is on normally.

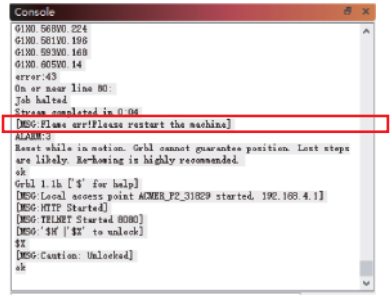
3. Check if the machine limit switch is obstructed by foreign objects, causing it to be triggered by mistake. You can check the control window for the error warning as shown in the picture below.





4. Check if there is any flame produced during the engraving process, in which case the control window will display the following prompt.





Q6. The machine camera is blurry or unable to capture images.

1. Check if the camera lens is obstructed or dirty by foreign objects.

2. Check if the camera's data cable on the front frame has become loose or disconnected.

3. Detach the camera and inspect if the terminal wires have become loose or disconnected.

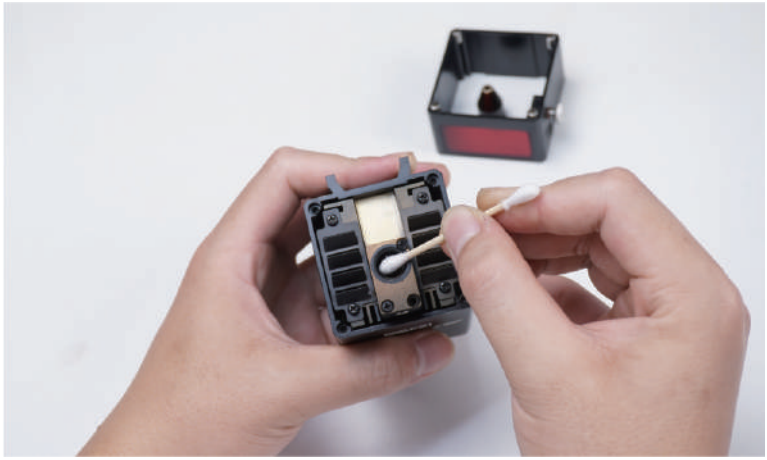
4. Check if the machine is connected to the computer through a docking station or adapter (it is recommended to directly connect the machine's USB cable to the computer's data port).

10. Machine Maintenance and Cleaning

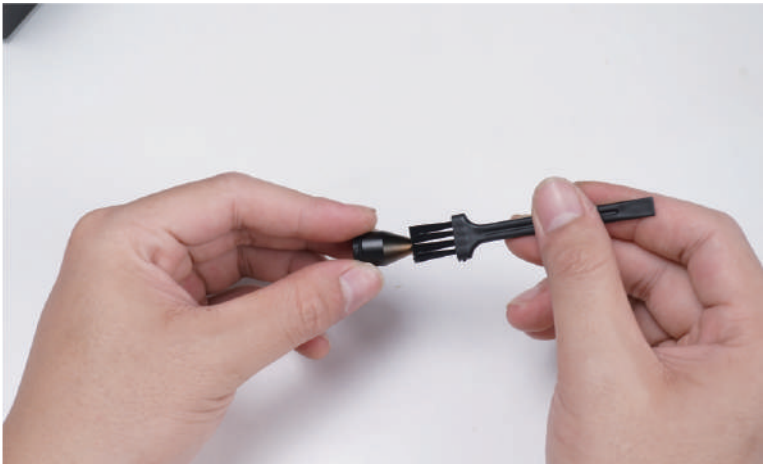
10.1 Laser Maintenance and Cleaning

10.1.1 When the laser is used continuously for 4-5 hours, remove the light shielding cover and the nozzle to check if the laser lens is dirty.

10.1.2 If the lens is dirty, use a cotton swab to wipe it clean and keep the lens free of contamination.



10.1.3 If the laser nozzle is dirty, use the black bristle brush to clean the dirt off the nozzle.

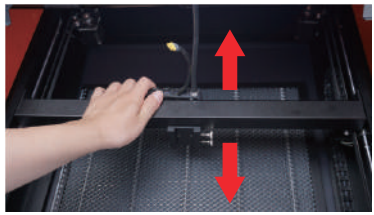


10.1.4 If there is a lot of dust on the laser cooling fan, use the yellow bristle brush to sweep away the dust.

10.2 Maintenance and Cleaning of Guide Rail and Optical Axis

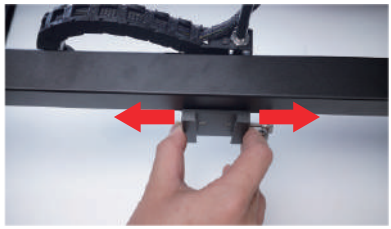
10.2.1 First, turn off the power to the machine. Use a lint-free cloth to wipe the dirt off the two Y-axis optical rails.

10.2.2 Take out the lubricant, squeeze out a small amount, and apply it to the optical rails. Manually move the Y-axis to distribute the lubricant evenly along the rails.



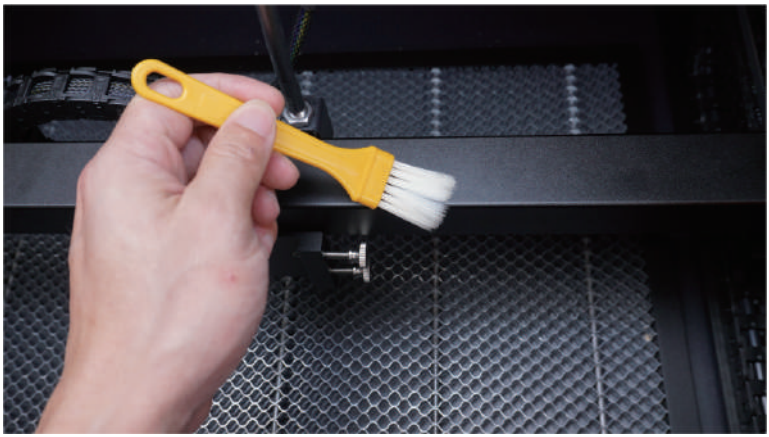
10.2.3 Remove the drawer, flip the machine over so the bottom is facing up, and use a lint-free cloth to wipe the dirt off the guide rail on X-axis.

10.2.4 Squeeze out a small amount of lubricant and apply it to the guide rail. Flip the machine back over so the top is facing up, and manually move the X-axis to distribute the lubricant evenly along the rail.

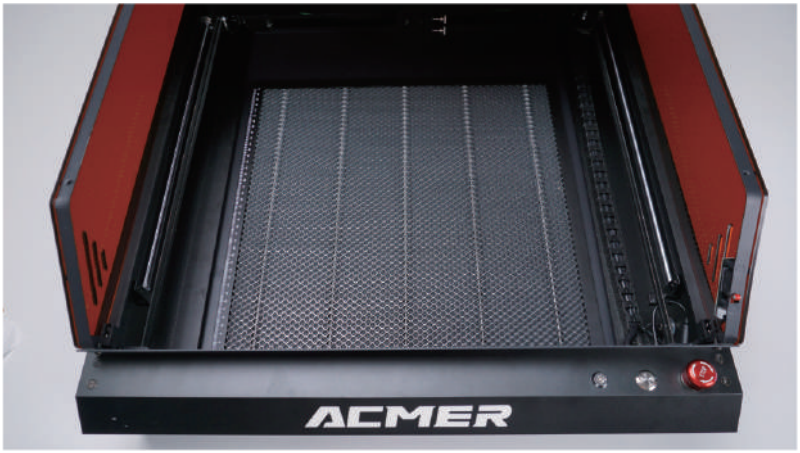


10.3 Machine Body Maintenance and Cleaning

10.3.1 Turn off the power to the machine. Then, use the yellow bristle brush to sweep the dust and dirt on the machine body into the drawer.



10.3.2 Remove the drawer, dump out all the waste and dust, and wipe it clean with a lint-free cloth. Then, put the drawer back into the machine. The image below shows the completed cleaning.



10.3.3 Use a lint-free cloth to wipe the inside and outside of the machine body, the inside and outside of the acrylic cover, and the camera clean. (If possible, you can use a lint-free cloth dampened with alcohol to wipe it even cleaner.)

11 After Sale

To ensure high-quality after-sales support, we recommend visiting our official website (acmer-laser.com) for detailed information on after-sales and warranty.

Additionally, our Frequently Asked Questions (FAQs) page provides answers to common questions to help you better utilize the product.

If you have any questions or need further assistance, please feel free to contact us via email at support@acmer3d.com. Our support team will provide you with prompt assistance to ensure timely resolution of your issues.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

MADE IN CHINA

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https://www.facebook.com/groups/1614455505653986

Shenzhen Titan International development technology Co., LTD

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