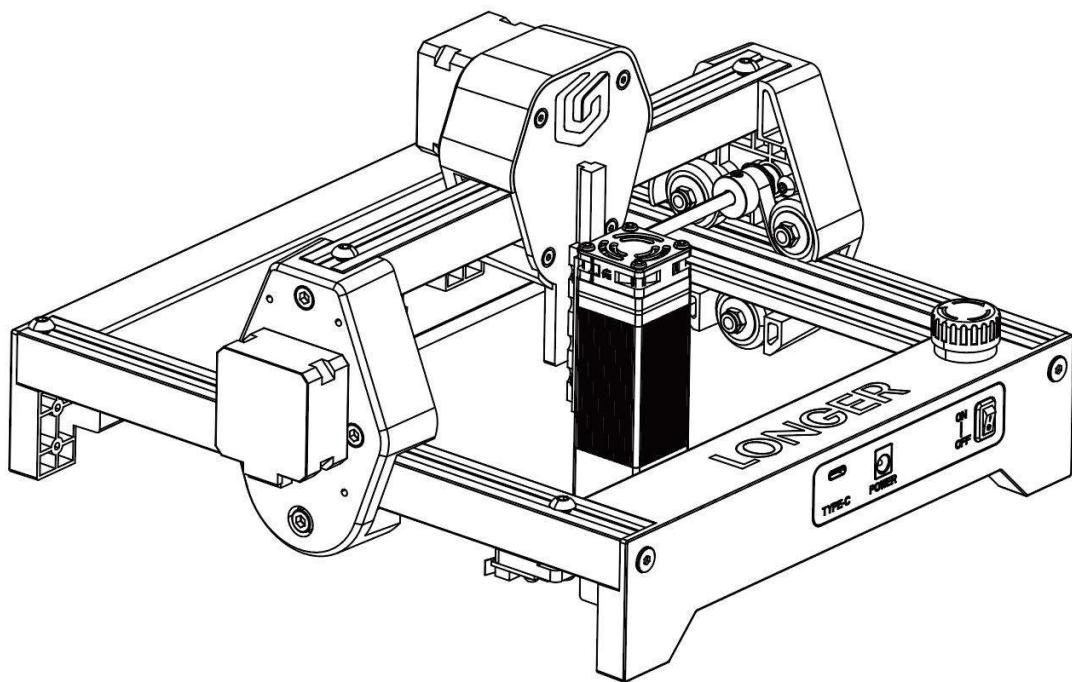


RAY5 mini Laser Engraver User Manual V1.0



Shenzhen Longer Technology Co., Ltd.

Dear customer:

Thank you for choosing the LONGER RAY5 mini Laser Engraver!

Whether you're experienced with engraving machines or purchasing one for the first time, we highly recommend reading this manual carefully. The installation steps and safety precautions outlined here will help you avoid unnecessary damage or frustration.

For more information, please refer to:

1. Email: support@longer.net
2. Technical Support: [\(+1\)888-575-9099](tel:+18885759099)
3. Facebook ID : [Longer Global](#)
4. Facebook Group : [Longer Laser Engraver Official Group](#)
5. YouTube Channel: [Longer Official](#)

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A. Safety Precautions

- (1) The **RAY5 mini** engraves and cuts materials using a high-energy diode laser beam. Hazards associated with this include the risk of fire, the generation of hazardous and/or irritating toxic fumes, and most importantly, potential damage to eyes and skin.
- (2) Laser engravers are classified into several internationally recognized classes based on their power and risk of injury. The **RAY5 mini** falls under Class IV (Class 4 according to IEC standards, which align with the U.S. FDA classification).

Laser Class	Class Definition
Class I	Class I laser radiation is not considered hazardous.
Class IIa	Class IIa laser radiation is not considered hazardous if viewed for periods less than or equal to 1×10^3 seconds, but may pose a chronic viewing hazard if viewed for periods longer than 1×10^3 seconds.
Class II	Class II laser radiation is considered to be a chronic viewing hazard.
Class IIIa	Class IIIa laser radiation is considered to be, depending on the irradiance, either an acute intrabeam viewing hazard or a chronic viewing hazard, and poses an acute hazard if viewed directly with optical instruments.
Class IIIb	Class IIIb laser radiation is considered to be an acute hazard to the eyes and skin from direct exposure.

Class IV	Class IV laser radiation is considered to be an acute hazard to the skin and eyes from both direct and scattered exposure.
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The high-energy laser beam can cause severe eye injuries, including blindness, and serious skin burns.

Improper use of controls or modification of safety features may result in serious eye injuries and burns.

Please wear Personal Protective Equipment (PPE). Safety glasses are designed to filter specific ranges of laser wavelengths. The **RAY5 mini** comes with safety glasses specifically designed for the LONGER Laser Module.

- DO NOT look directly into the laser beam.
- DO NOT aim the laser beam at reflective surfaces.
- DO NOT operate the laser without PPE for all individuals in the vicinity of the **RAY5 mini**.
- DO NOT allow unsupervised access to the **RAY5 mini** by children.
- DO NOT allow pets near the **RAY5 mini**.
- DO NOT modify or disable any safety features of the laser system.

DO NOT touch the high-energy laser beam.

(3) We strongly recommend placing the machine in a well-ventilated room. Ensure that the door seals properly and the windows have curtains to effectively prevent direct exposure to the laser beam, smoke, vapors, particles, and other potentially toxic substances. Additionally, you can consider Longer's protective covers for added safety in the future.

(4) The high-energy diode laser beam can generate extremely high temperatures as it burns away material during engraving and cutting. Some materials are flammable and may catch fire, producing flames, fumes, and smoke.

(5) It is strongly recommended that a fire extinguisher be located near the **RAY5 mini**. The extinguisher should be halogen or multi-purpose dry chemical. Additionally, it is advised to place a 'fire extinguisher ball' beside the **RAY5 mini**, either as an alternative or in conjunction with the fire extinguisher.

- DO NOT use materials that are highly flammable, explosive or produce toxic by-products.
- DO NOT remove the material from the cutting bed before it has cooled.
- **DO NOT leave the RAY5 mini operating unattended.**

- ALWAYS clean up clutter, debris, and flammable materials with the laser **RAY5 mini** bed after use.

(6) During the engraving process of the **RAY5 mini** laser engraving machine, different materials may produce different pungent odors. Always use the **RAY5 mini** laser engravers in open and well-ventilated areas.

(7) Environmental requirements

The **RAY5 mini** laser engraver operates best within a temperature range of 10° C to 30° C and a humidity range of 20% to 50%. Outside of these conditions, the engraver may not deliver optimal engraving results.

(8) Below is a list of some of the most well-known hazardous materials that SHOULD NOT be engraved or cut. If a material is not listed, do not assume it is safe to use. Always obtain the Safety Data Sheet (SDS) from the material's manufacturer when handling unknown materials.

Material	Reason to avoid engraving / cutting it
PVC (Polyvinyl Chloride)	PVC emits chlorine gas when laser cut or engraved. This toxic gas can damage the optics and motion control system of the laser engraver. Engraving or cutting PVC will void the warranty of your

	laser engraver.
Lexan / Thick Poly-carbonate	Polycarbonate is often used in the laser engraver's window because it effectively absorbs infrared radiation—the same light frequency used by the engraver for cutting and engraving. This makes the laser cutter ineffective at cutting polycarbonate materials.
ABS	ABS melts when exposed to a laser beam instead of vaporizing, which is the ideal reaction for laser engraving. As a result, ABS doesn't leave a crisp image but instead creates a gooey deposit on the surface.
HDPE	HDPE melts easily and is highly flammable when exposed to a laser beam.
Polystyrene Foam	Polystyrene melts and catches fire easily when exposed to a laser beam, and only very thin pieces can be cut.
Fiberglass	Fiberglass consists of glass and epoxy resin. Etching is the best method for marking glass, while epoxy resin emits toxic fumes during laser engraving, making fiberglass unsuitable for laser engraving.
Polypropylene	Polypropylene melts and catches fire easily, with the melted material continuing to burn and forming pebble-like drips that harden on the surface.
Coated Carbon	Coated carbon fiber emits noxious fumes. While carbon fiber can

Fiber	be cut with some fraying, this is not the case when it is coated.
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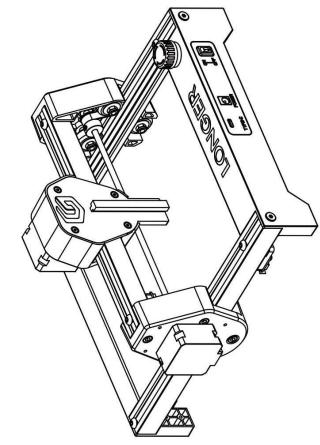
(9) The **RAY5 mini** has built-in technology and algorithms to ensure the safety of its users and the surrounding environment. That said, it is important to understand that the **RAY5 mini** is not a toy and should be operated with care and respect.

B. Product Information

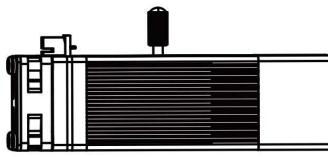
1. Product Specifications

Features	Features	Features
Model	RAY5 mini	Laser Power
Laser Source	Single diode laser with FAC	Laser Wavelength
Working Area	130*140mm	Cutting Depth
Engraving Speed	12,000mm/min	Engraving Precision
Support Formats	jpg, bmp, png, dxf, svg, ai, tiff, etc.	Lifespan
Warranty Period	One year	Material of Machine
Connection	WI-FI, USB, APP	Safety Certifications
Supported Systems	Windows; MacOS; Linux;Android;iOS	Product Dimensions
Gross Weight	2.185kg	Net Weight
Power Adapter	AC Input 100-240V 50/60Hz 1.5A, DC Output 12V-2A 24W or 12V-3A 36W	
Applicable Materials	engraving or cutting on Wood, acrylic, leather, cloth, metal, ceramics, etc.	

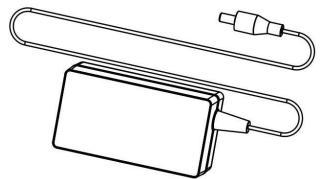
2. Product Accessories List



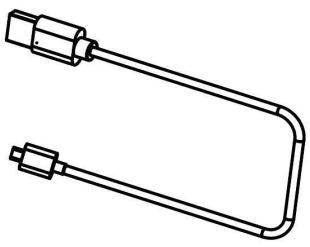
Machine Frame



Laser Module



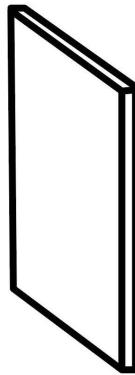
Power Adapter



Data Cable



Protective Goggles



Focus Block

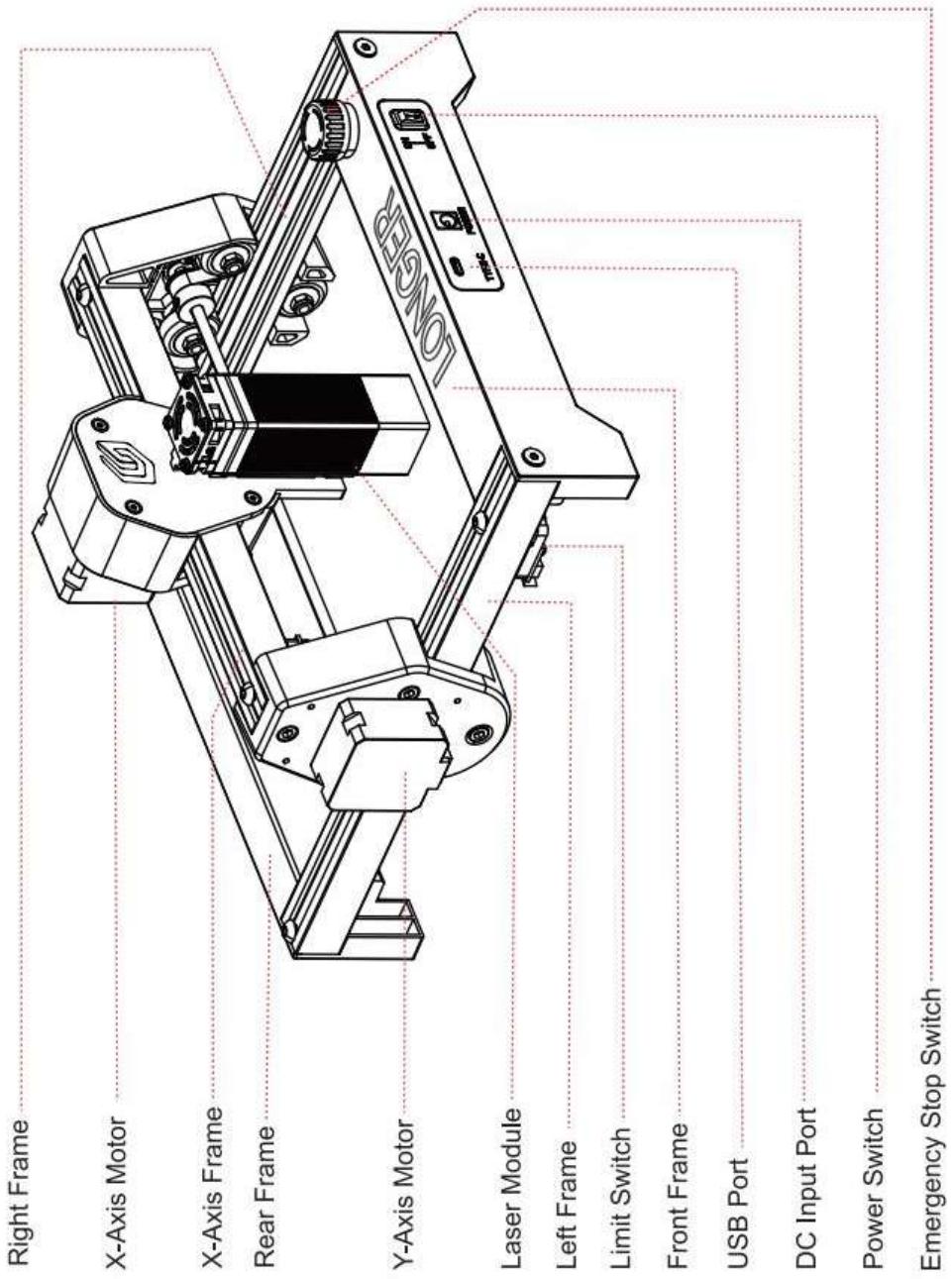


Wooden Brush



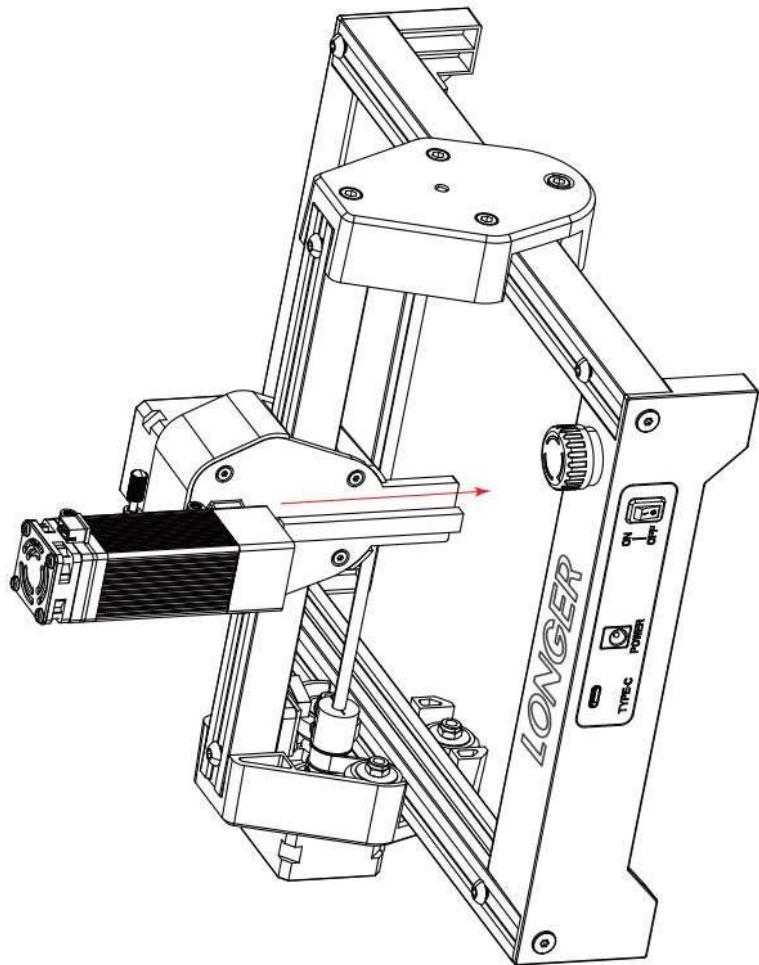
Wrench

3. Product Parts Overview



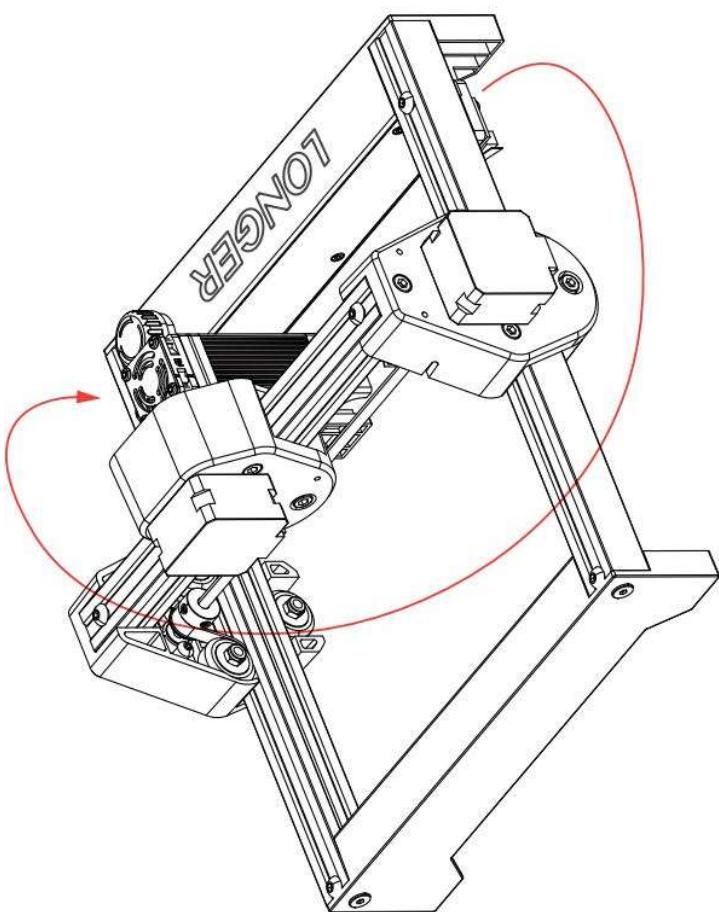
C. Quick Installation

1. Install the Laser Module onto the X-axis Frame



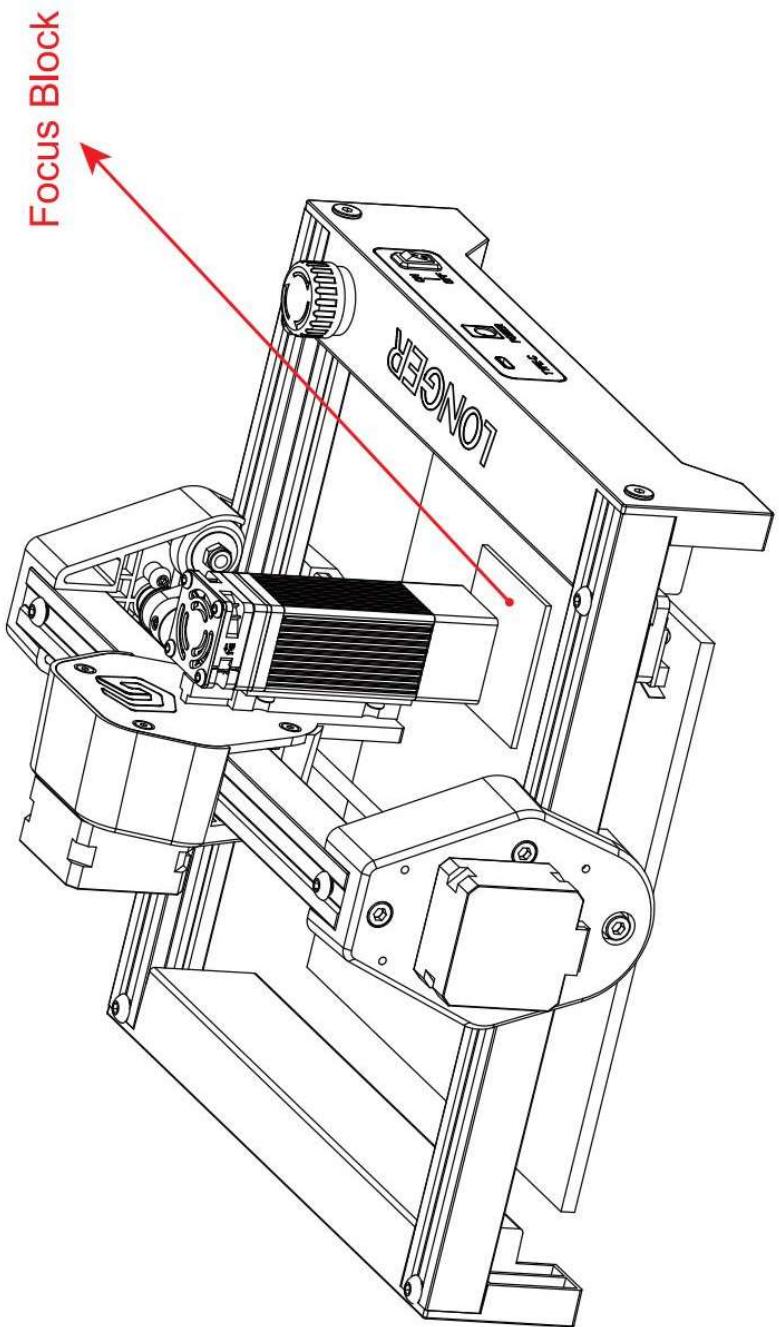
- (1) First install the laser module onto the X-axis frame, then tighten the M3*14 handle screw to secure it in place.

(2) Connect the cable to the laser module
as shown in the figure.



2. Adjust the Focus

Loosen the M3*14 handle screw. Place the 2mm focus block on the engraving surface. Move the laser module downward until the bottom of the light shield touches the surface of the focus block. Then, tighten the M3*14 handle screw.



D. LaserGRBL Software Operation

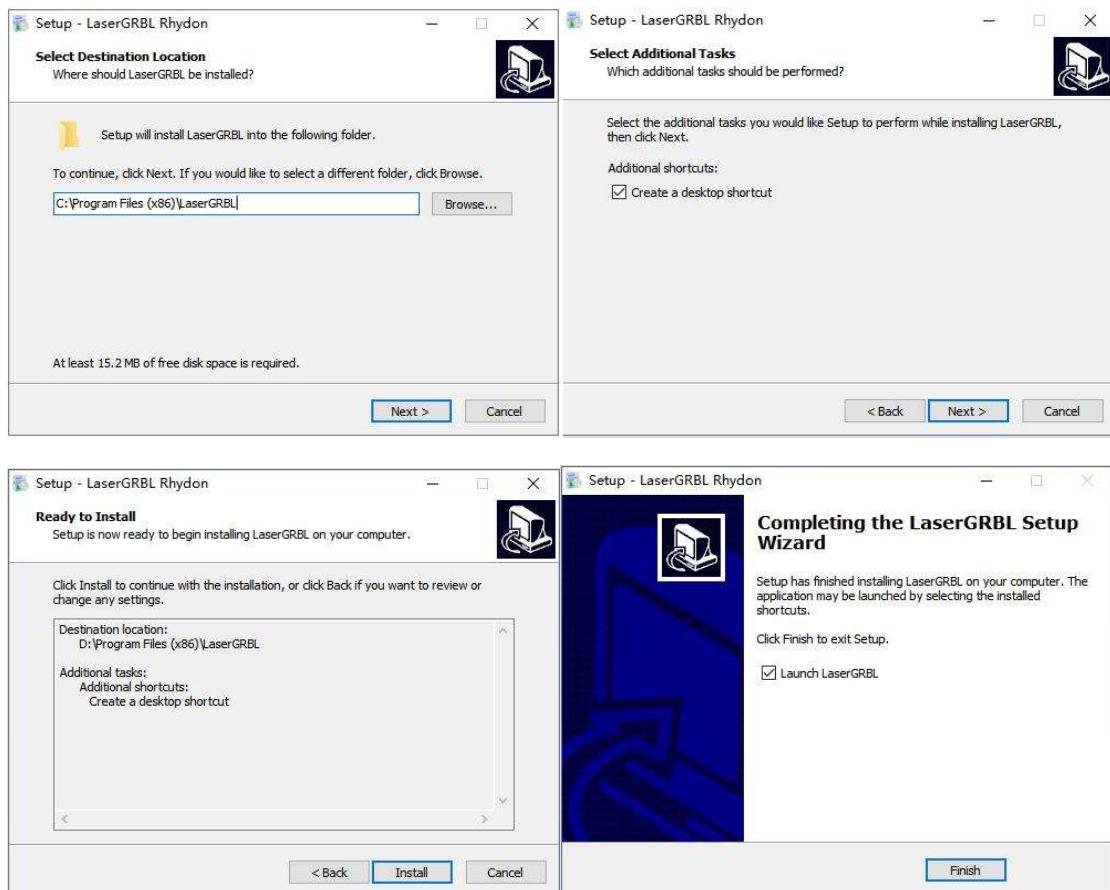
LaserGRBL is an easy-to-use, fully free software designed specifically for laser engravers, and it runs only on Windows. Please ensure to save or back up your data regularly during use to avoid data loss. However, LONGER is not responsible for any data loss caused by third-party software.

1. Software Download and Installation

Download LaserGRBL from the following link:

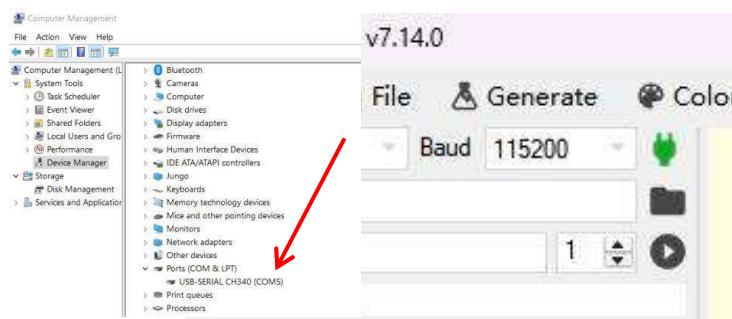
<https://lasergrbl.com/download/>. Then, click Next > Next > Install >

Finish to complete the installation.

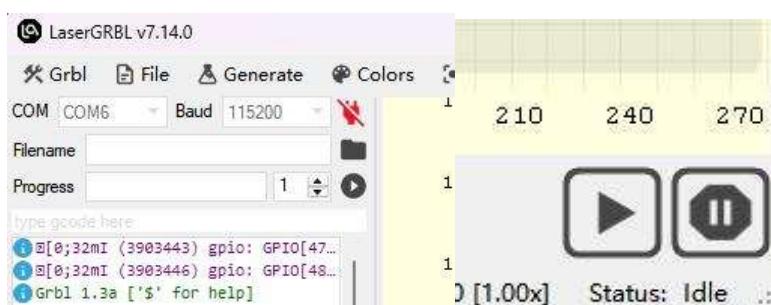


2. Connect RAY5 mini to LaserGRBL

You need to connect the engraver to LaserGRBL software first. For Windows, right-click This PC and select **Manage**, then click **Device Manager**. Expand Ports (COM & LPT), find the port corresponding to the CH340 driver, and select it from the COM port list. Set the baud rate to **115200 baud rate**, and click  to connect.

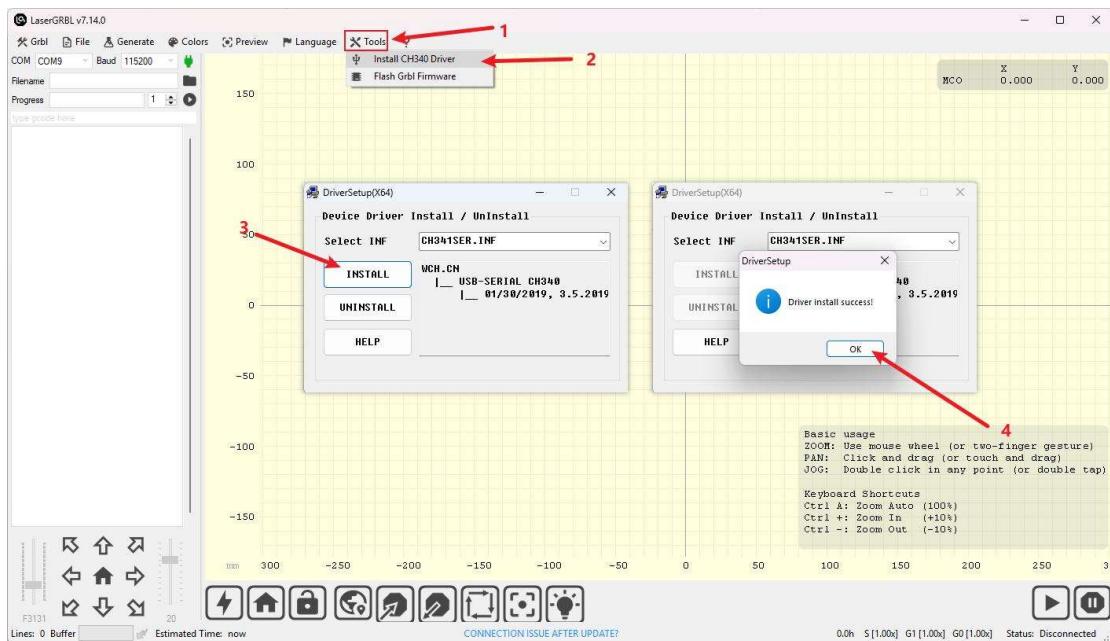


When connected to the correct port, GRBL will reply with a “welcome message” showing the GRBL firmware version. On the bottom-right of the LaserGRBL interface, it will show “Status: Idle”.

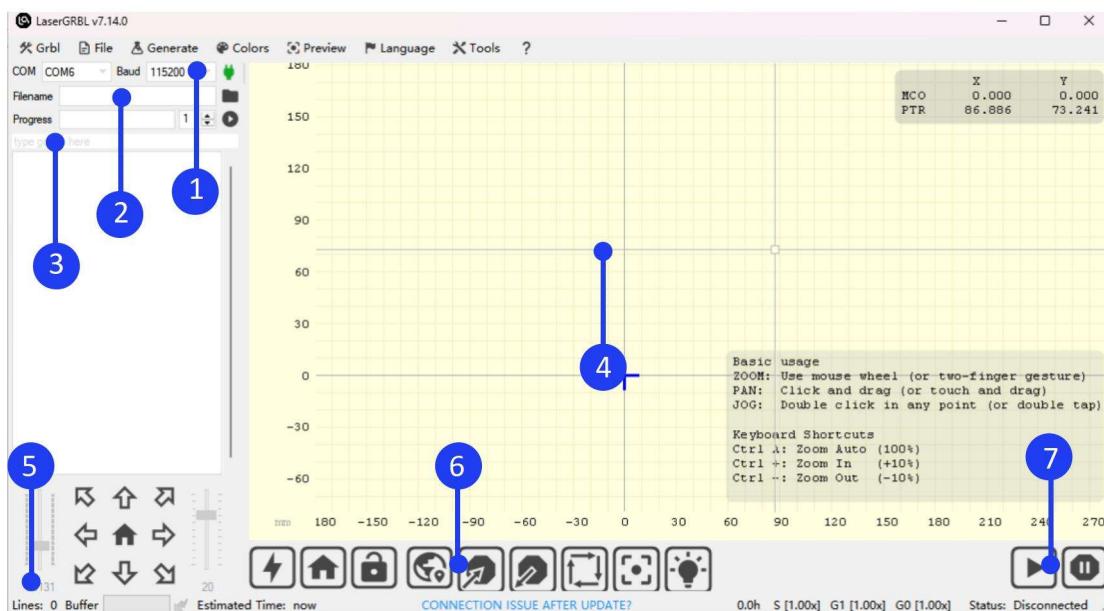


If no ports are listed in the drop-down, it means no engraver was found, which could indicate it's not plugged in correctly, is not powered, or the PC is missing a driver. In that case, click the Tools

menu to install the CH340 Driver from LaserGRBL software.



3. Main Interface of LaserGRBL



① **Connection Control:** Here you can select the serial port and set the proper baud rate for the connection.

② **File Control:** This shows the loaded filename and the engraving

process progress. The green "Play" button starts program execution.

③ Manual Commands: You can type any G-Code line here and press "Enter." The commands will be added to the command queue.

④ Engraving Preview: This area shows a preview of the final work. During engraving, a small blue cross will indicate the current laser position in real time.

⑤ Jogging Control: Allows manual positioning of the laser. The left vertical slider controls movement speed, while the right slider controls step size.

⑥ Grbl Reset/Homing/Unlock: These buttons send the soft-reset, homing, and unlock commands to the GRBL board. To the right of the unlock button, you can add custom user-defined buttons.

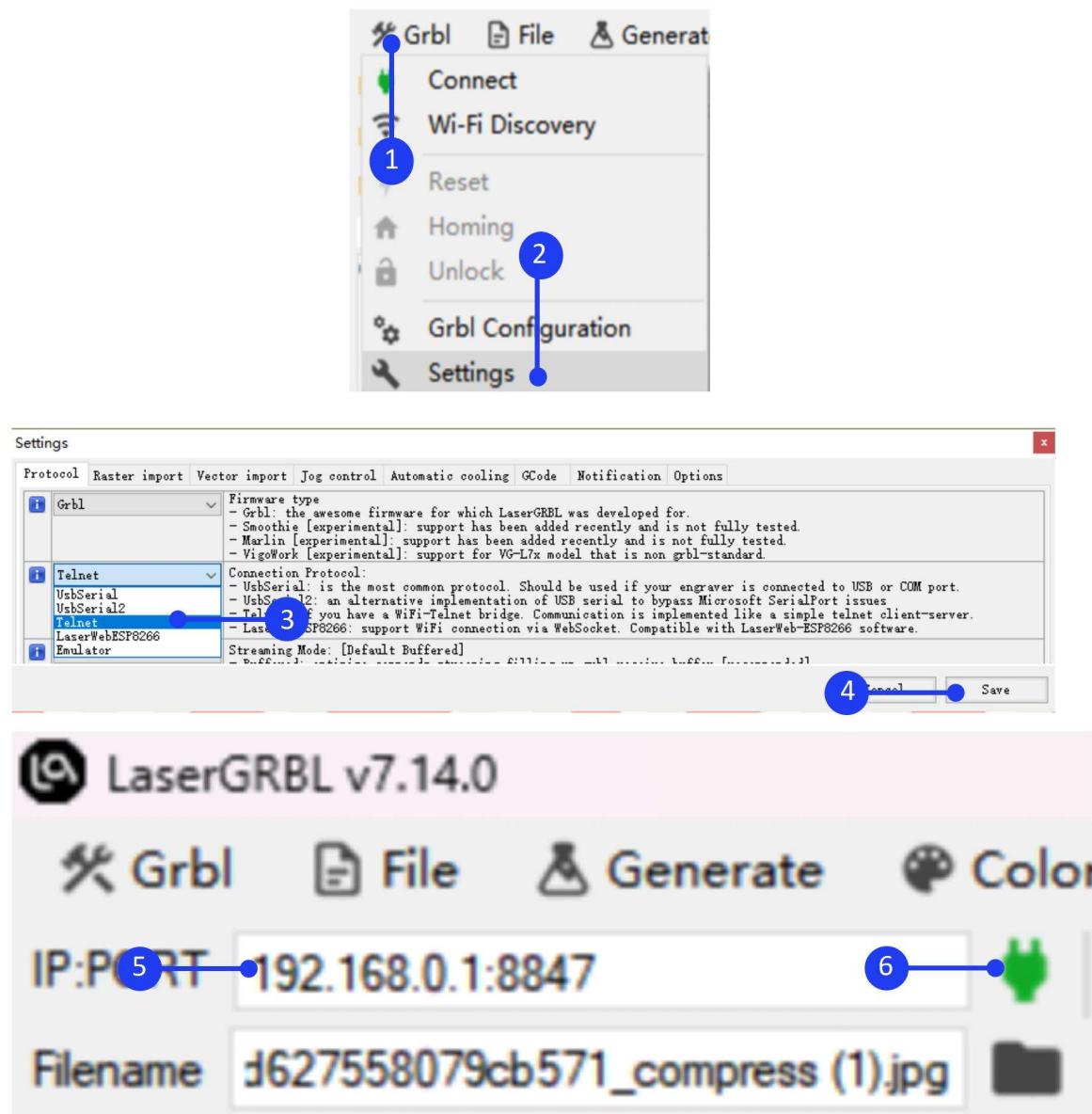
⑦ Pause and Resume: These buttons allow you to suspend and resume the engraving process.

4. Connect RAY5 mini to LaserGRBL via Wi-Fi

There are two modes for connecting the **RAY5 mini** to LaserGRBL via Wi-Fi: STA and AP mode. The difference is that in AP mode, the computer has no network connection, while in STA mode, the computer can maintain its network connection.

1) Connect **RAY5 mini** to LaserGRBL via Wi-Fi

Run LaserGRBL, click **Grbl > Settings**, select **Telnet** for the **Connection Protocol**, and click **Save**. Connect the computer to the Wi-Fi network starting with **LongerLaser_XXXX**, input password **12345678**, input the **192.168.0.1:8847** in IP:PORT, click  to connect.



2) Connect RAY5 mini to LaserGRBL via Wi-Fi in STA Mode

Run LaserGRBL, click **Grbl > Settings**, select **Telnet** for the

Connection Protocol , and click Save. Enter the following commands in the console: \$radio mode=sta

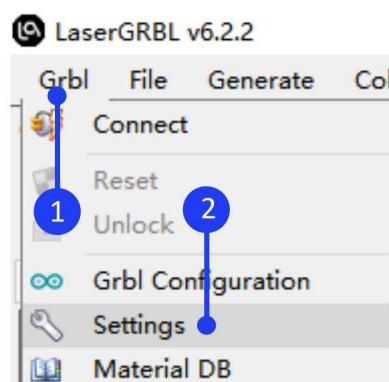
\$sta/ssid=Your_SSID

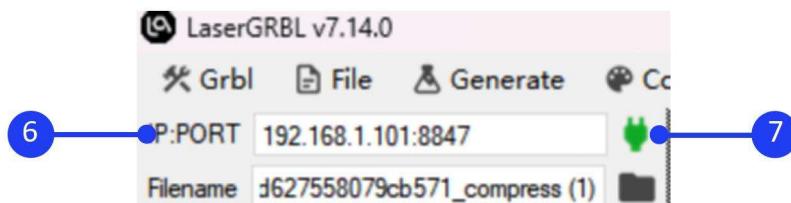
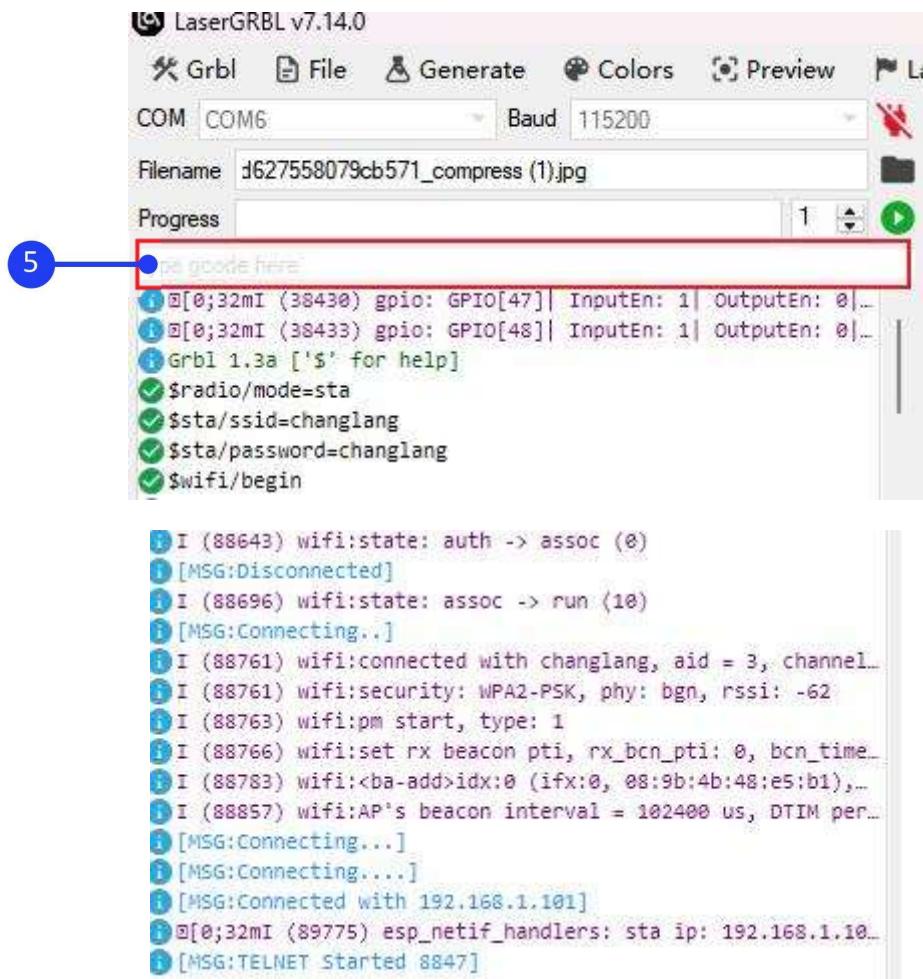
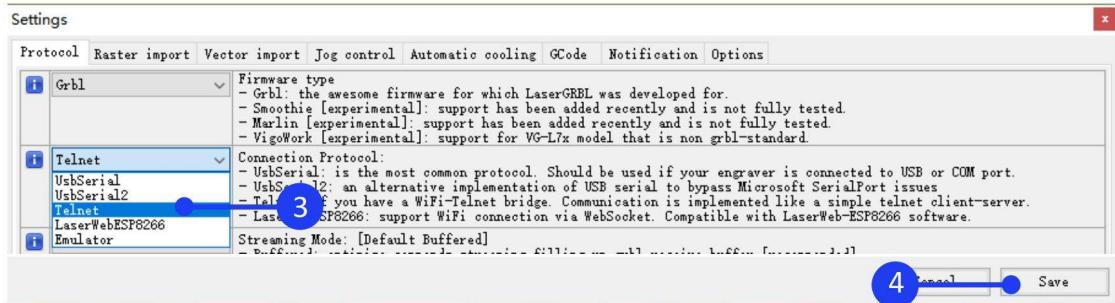
\$sta/password=Your_PassWord

\$wifi/begin

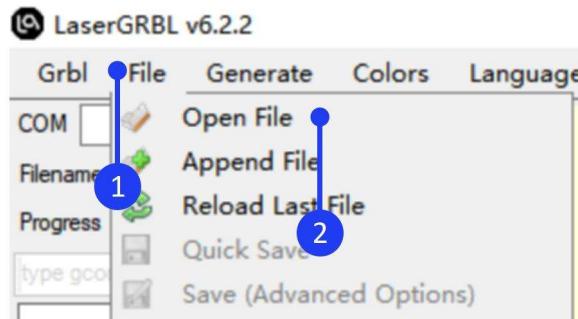
change Your_SSID and Your_PassWord to your WIFI account and password in \$sta/ssid and \$sta/password command,Press Enter after each command. Now you switch to STA mode. After the connection is successful, the console prompts the the IP address.

Please note that the computer network and WIFI must be in the same LAN (local area network). Input IP and port such as 192.168.1.101:8847 in IP:PORT, click  to connect



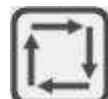


5. Create a Project in LaserGRBL



Click [File > Open](#) File to add the design you want to engrave. Set the Quality to 20 Lines/mm (quality has two values options, 20Lines/mm or 10Lines/mm. For those who require high precision, it can choose 20Lines/mm. For those who require high efficiency, it can choose 10Lines/mm). Click [Next](#) then refer to the parameter table to set the appropriate engraving power (S-MAX) and speed. Please note that the laser mode should be selected as [**M4-Dynamic Power**](#), and the value of [S-MAX](#) should be 10 times the target laser power. For example, if the laser power is set to 100%, S-MAX should be set to 1000%; if the laser power is 60%, set S-MAX to 600%. Next, [adjust the size](#) of the image to scale the design. If the design position falls outside the working area, you can set the XY axis [offset](#) to adjust the graphic's position.

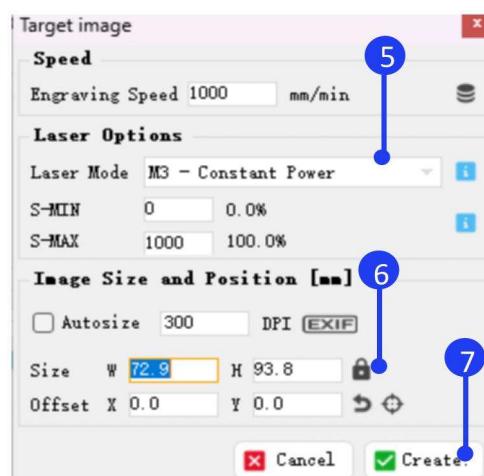
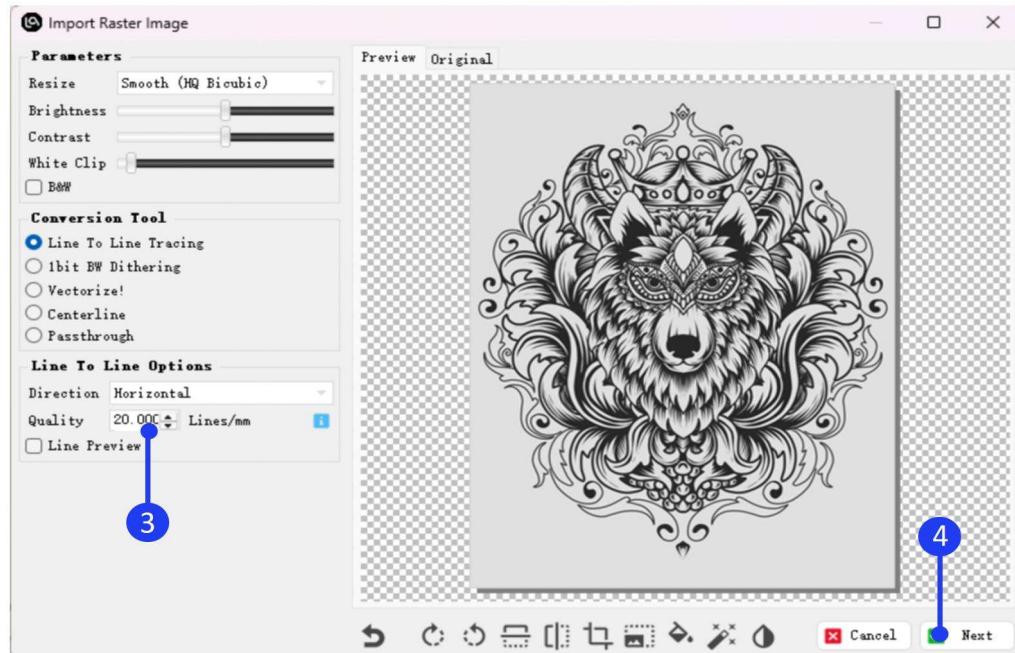
After successfully importing the graphics and setting the parameters, it needs to set the focus of **RAY5 mini**, focusing with the focus block,

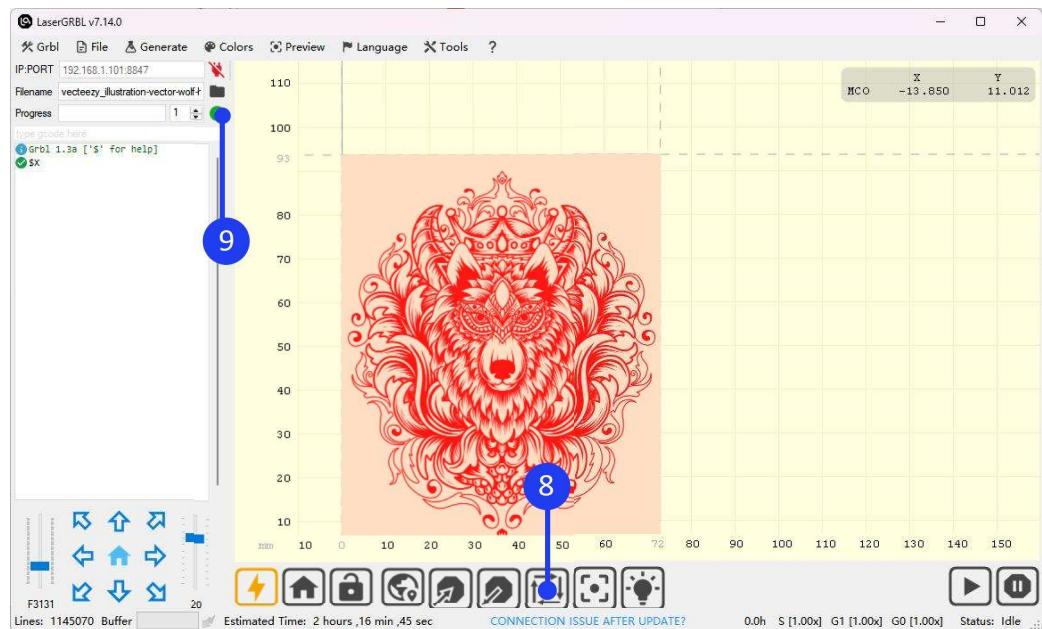


then click **Frame button** to determine the material placement, and finally click  **Start button** to start engraving.

For more detailed information on LaserGRBL software operations,

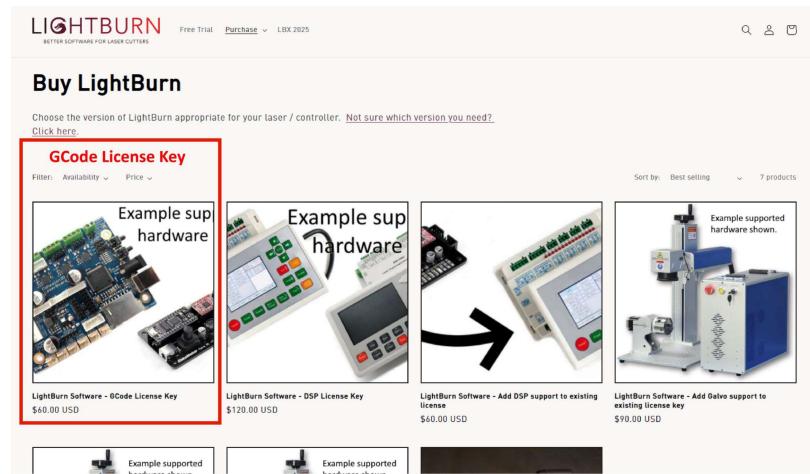
<https://lasergrbl.com/usage/>.





E. LightBurn Software Operation

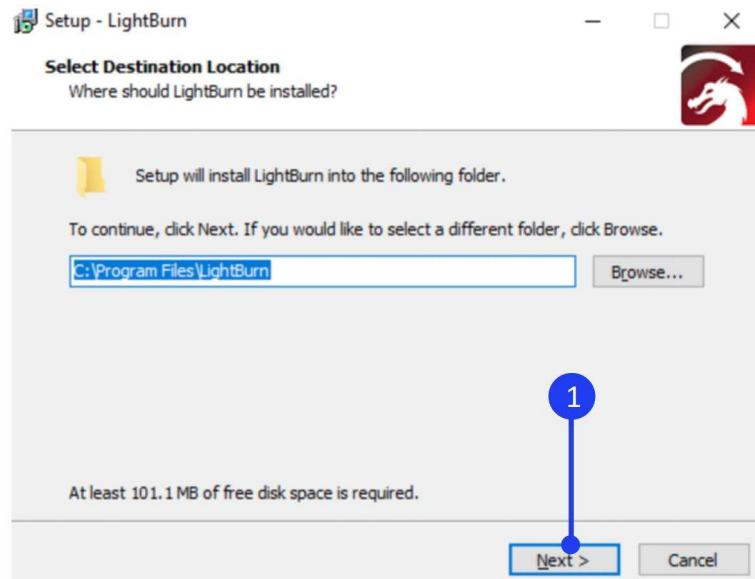
LightBurn is a professional layout, editing, control, and paid software for engravers, compatible with Windows, MacOS, and Linux. It offers a 30-day free trial period. Please remember to save or back up your data regularly to avoid data loss; however, LONGER is not responsible for any data loss caused by third-party software. If the software has been installed previously, or if the 30-day trial period has expired, you will need to purchase a license key to continue using it, according to LightBurn's trial policy. To purchase a license and obtain your key code, please visit the LightBurn online store and select the "GCode License Key".

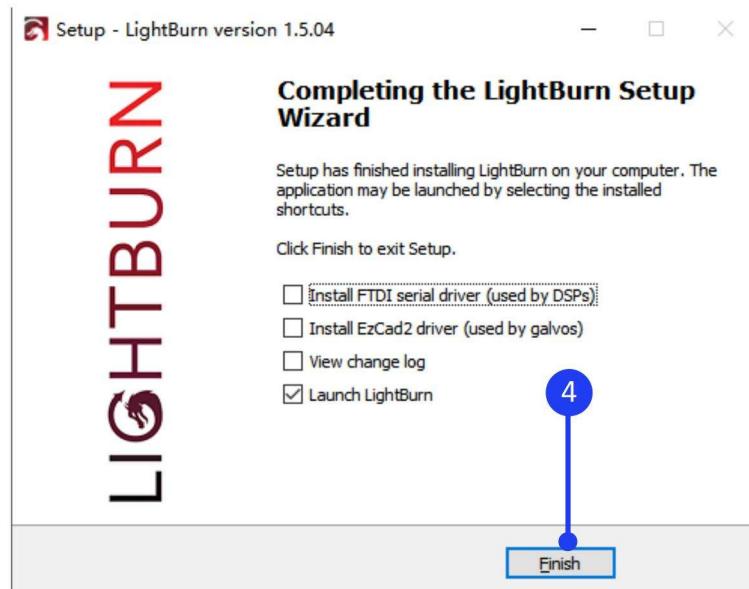
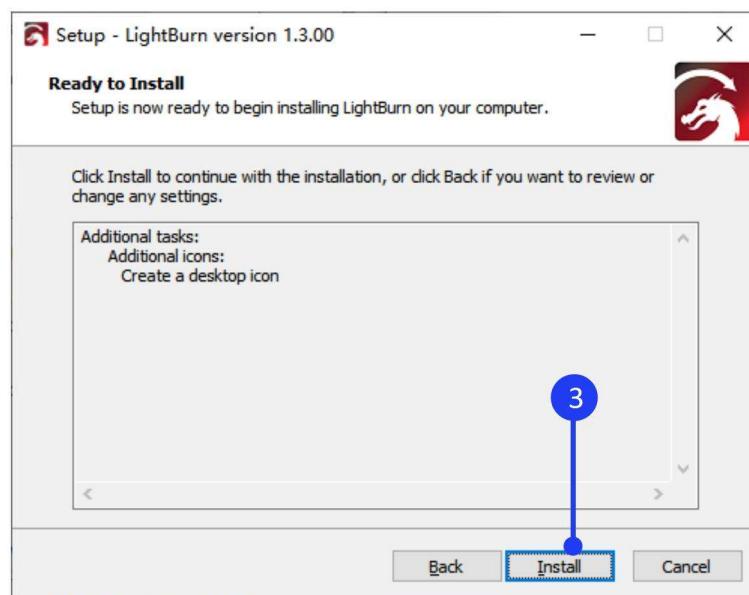
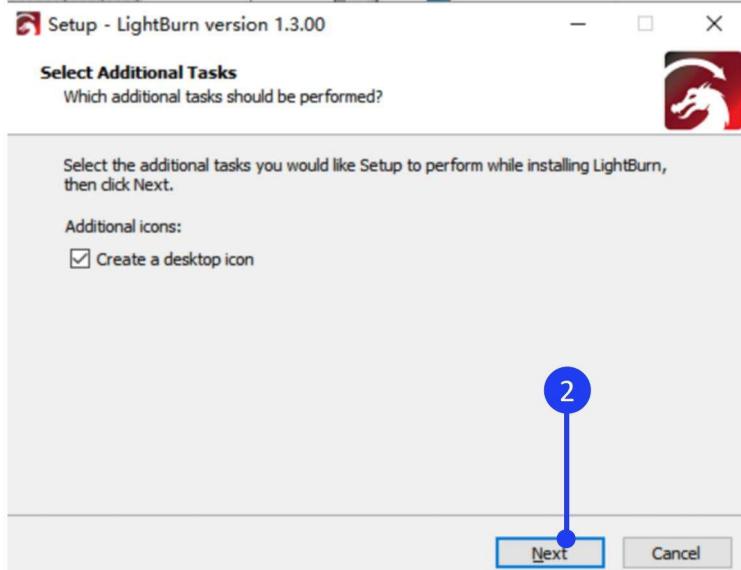


The screenshot shows the LightBurn software purchase page. At the top, there's a navigation bar with 'LIGHTBURN' and 'BETTER SOFTWARE FOR LASER CUTTERS'. Below it, a search bar and user icons. The main section is titled 'Buy LightBurn' with a sub-instruction: 'Choose the version of LightBurn appropriate for your laser / controller. Not sure which version you need? Click here.' A red box highlights the first item: 'GCode License Key' with a price of '\$60.00 USD'. Other items shown include 'LightBurn Software - DSP License Key' (\$120.00 USD), 'LightBurn Software - Add DSP support to existing license' (\$60.00 USD), and 'LightBurn Software - Add Galvo support to existing license key' (\$90.00 USD). Below the products are three buttons labeled 'Example supported'.

1. Software Download and Installation

Download LightBurn from the following link:
<https://LightBurnsoftware.com/pages/download-trial> to install the trial version of LightBurn.





For **Mac** users, after downloading the .DMG file, double-click it and drag LightBurn into the Applications folder. When launching LightBurn for the first time, open a **Finder** window, navigate to the **Applications** folder, hold the Control key, and click the LightBurn icon. From the menu, select '**Open**'. When MacOS prompts you to confirm if you want to open the program, click Yes. It will then be listed as an exception in your launcher, and you can launch the application normally from there.



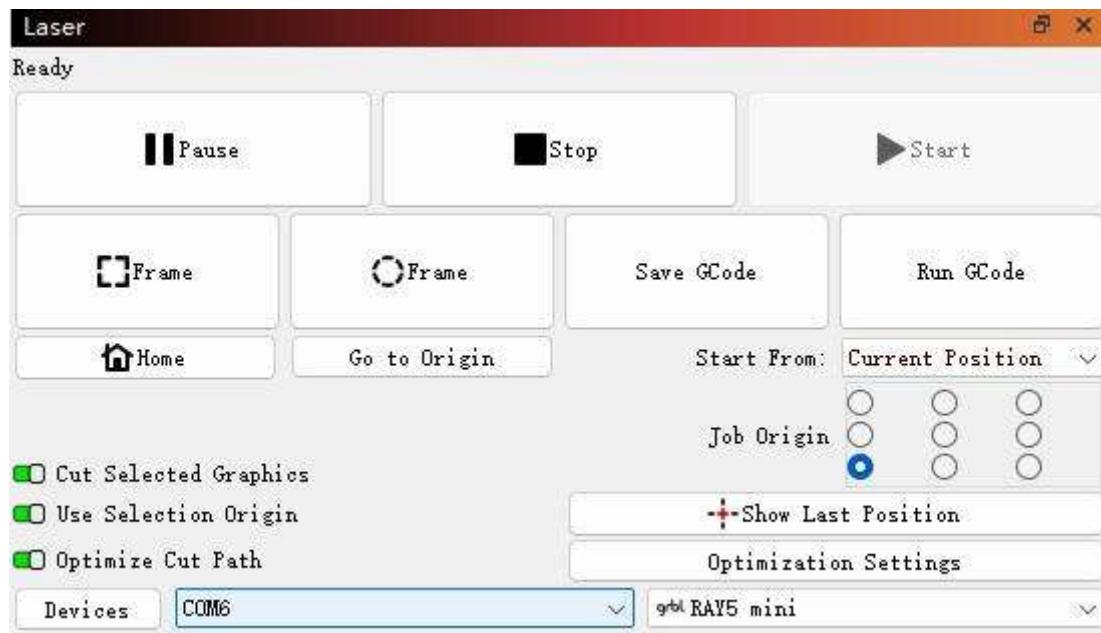
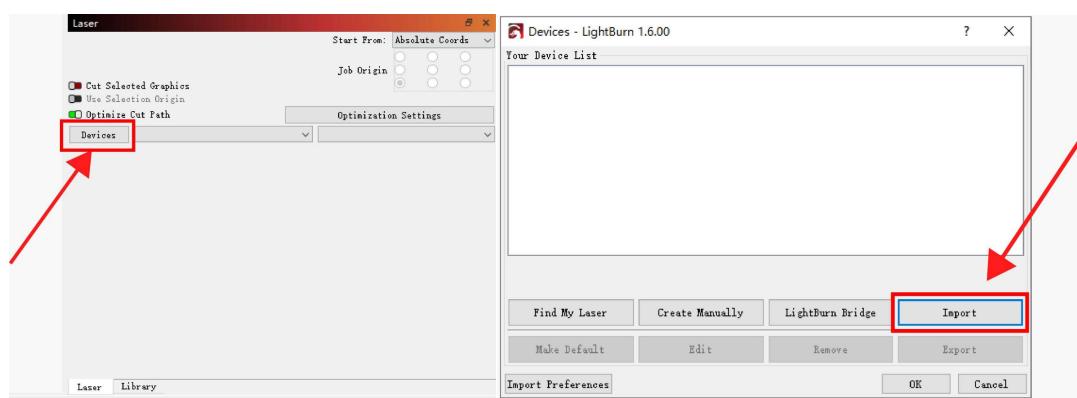
2. Import Configuration File

Before using LightBurn with **RAY5 mini** for the first time, you need to import the **RAY5 mini.lbdev** configuration file. Download it from the following link:

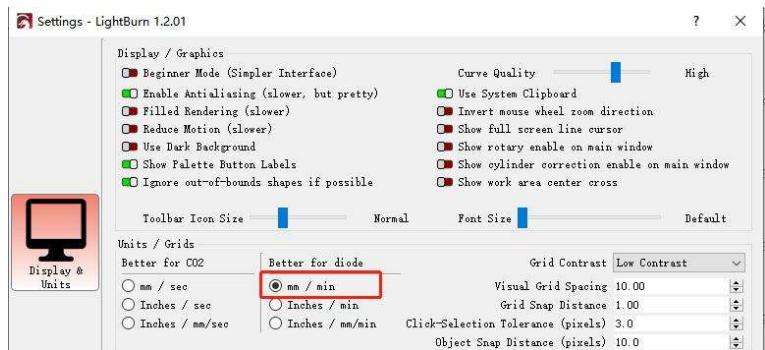
<https://www.longer3d.com/pages/download-firmware>

When launching LightBurn for the first time, the 'New Device Wizard' will appear. If not, click **Devices** in the Laser control module

to manually import the engraver. Click **Import**, select the **RAY5 mini.lbdev** file, and click OK to add the configuration to LightBurn. Once successfully imported, the macro commands will appear in the Console window, and **RAY5 mini** will be listed under Devices in the Laser window.



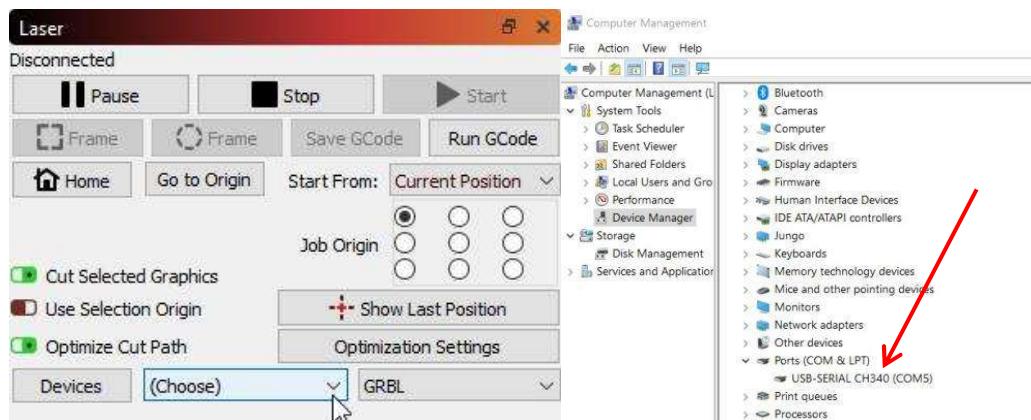
After adding the device, it is recommended to set the speed unit to mm/min. To do this, go to **Edit** in the taskbar, select **Settings**, choose **mm/min** as the unit, and click OK.



3. Connect the RAY5 mini to LightBurn

To use LightBurn, the engraver must be connected to the software first.

For Windows, right-click This PC and select **Manage**, then click **Device Manager**. Expand Ports (COM & LPT), find the port corresponding to the CH340 driver, and manually select it in LightBurn by clicking (**Choose**) in the **Laser** window.



For MacOS, go to About This Mac > Overview > System Report, then select USB under Hardware. If the driver is installed automatically, USB Serial will appear. In LightBurn, select cu.wchusbserial by clicking (**Choose**) in the **Laser** window.

If no ports are listed in the drop-down, it means no engraver was found, which could indicate that the device is not plugged in correctly, is not powered on, or the driver is missing. In that case, download the CH340 driver from the following link and install it:

<https://drive.google.com/drive/folders/1Sc-TKuez-mz--38Vp6DeL-pGmQcQdHW4>.

For macOS Version 15:

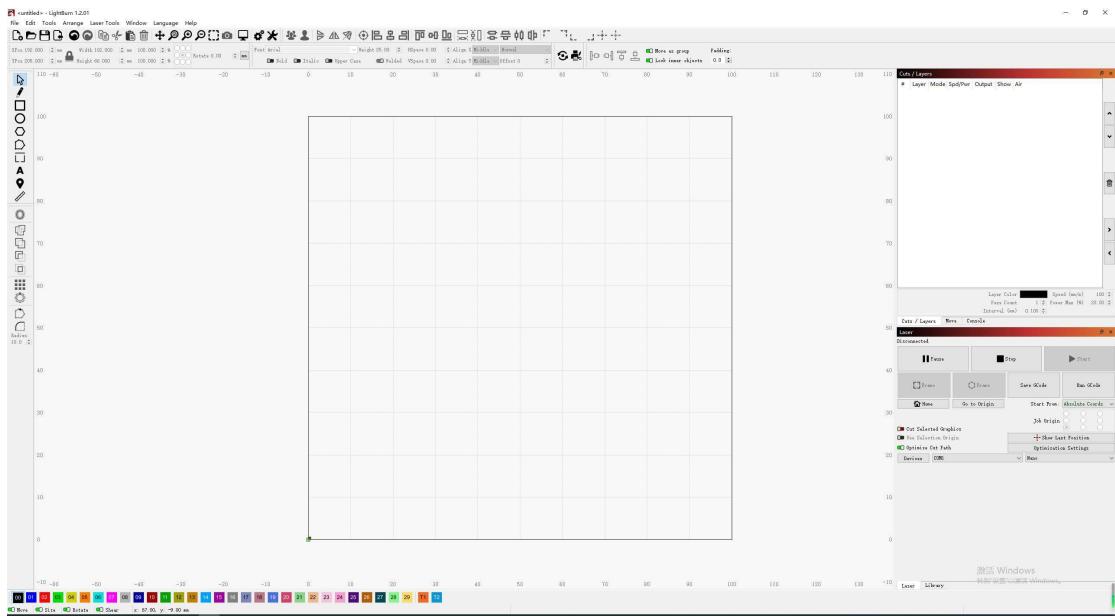
<https://www.youtube.com/watch?v=JX-XsjLFei0>

For macOS Version 14 and Earlier:

<https://www.youtube.com/watch?v=FBd1uEA9QUw>

4. The Main Window of LightBurn

The default layout of the LightBurn main window includes several key sections: Menus, Main Toolbar, Creation & Modifier Tools, Color Palette, Cuts/Layers, Laser Window, Move Window, and more.



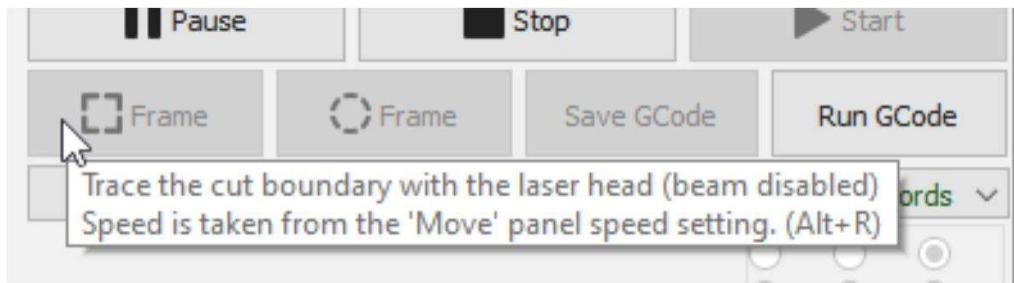
Menus: The menu bar at the top of the main window provides access to almost every feature available in LightBurn, like File, Edit, Tools, etc.



Main Toolbar: The main toolbar in LightBurn provides quick access to commonly used functions, such as opening or importing files, saving, using the clipboard (copy & paste), and moving or zooming the view. Right beside it is the Arrangement toolbar, which contains frequently used tools for arranging and aligning shapes.



Tooltips: If you hover the mouse over a control, a small bit of text will pop up to describe that button or feature. For example, in the



[Creation & Modifier Tools](#),

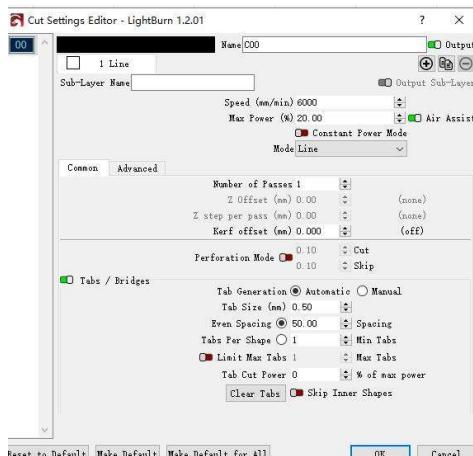
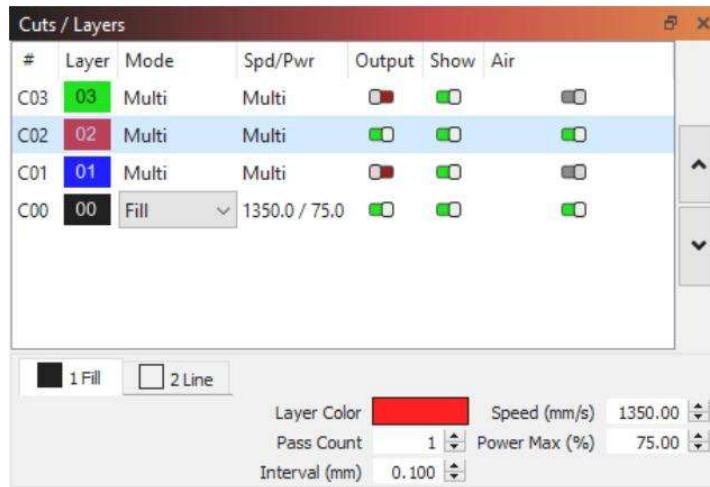


and [Color Palette](#), these colors are used to assign different parameters to the shapes in your design. If a design is selected, clicking a color entry will apply that color to the shapes in your selection. The colors currently in use in your design will also appear as entries in the Cuts / Layers window, where you can choose the operations each color will represent.

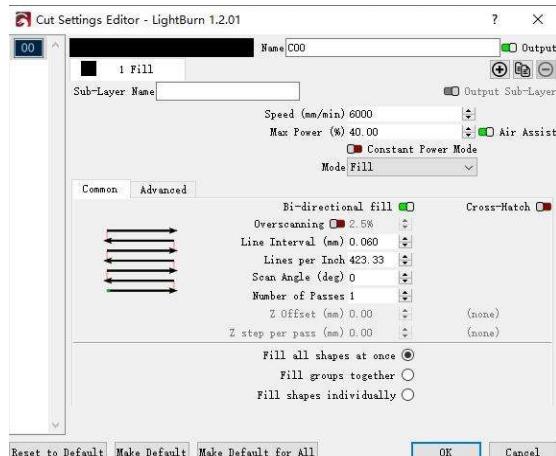


[Cuts / Layers:](#) The first column shows the name you've assigned to this layer, followed by the color, Mode (Line, Fill, both, or Image), and then the speed and power settings. It also shows the options to enable or disable sending this layer to the laser or displaying it in the workspace. Below the layer list, you can see and change the basic settings for the currently selected layer. Double-clicking an entry in the layer list will bring up a larger Cut Settings Editor with a

more complete set of options.



Line mode



Fill mode

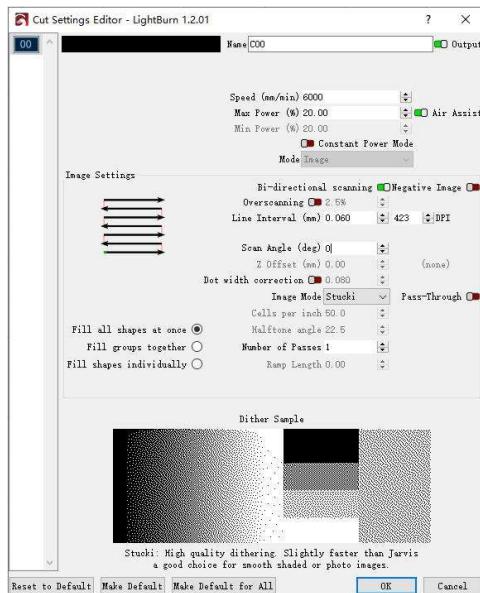
Double-clicking an entry in the layer list will bring up the full Cut Settings window, allowing you to edit all the settings. There are three modes commonly used: Line, Fill, and Image.

In [Line mode](#), the laser follows the exact path of the selected design, tracing the lines with the beam enabled at the set power and speed. If the laser moves quickly or with low power, it will likely etch the surface. If it moves slowly and with high power, it will cut through

the material. The difference between surface marking and cutting is primarily in the power and speed settings.

Fill mode allows the laser to scan line by line to fill in the selected shape. This mode fills closed shapes but not open ones.

Image mode is specifically for images and controls how LightBurn renders the image data on the laser. There are three commonly chosen image modes: Atkinson, Stucki, and Jarvis.

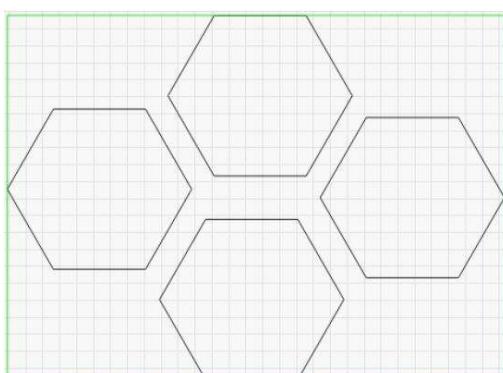


Laser Window: The Laser Window is used to select the active machine, test the framing (the artwork's outer bounds), run and stop the machine, and choose the file processing, order, and artwork positioning within the workspace.

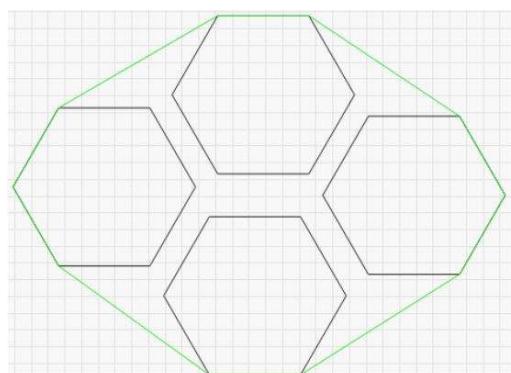


There are two Frame buttons used to preview the position of the job on the laser.  The first is a standard rectangular frame, also called a 'Bounding Box'. This is the smallest rectangle that will fully contain the selected shapes. The second is  O-Frame button, also known as the 'Rubber Band Frame,' which traces a path around the selected design, similar to a rubber band stretched around it. The speed and laser power during framing can be adjusted in the MOVE window. Due to software limitations, the maximum speed during framing is 12,000 mm/min.

These two different frame effects are illustrated in the following figure:

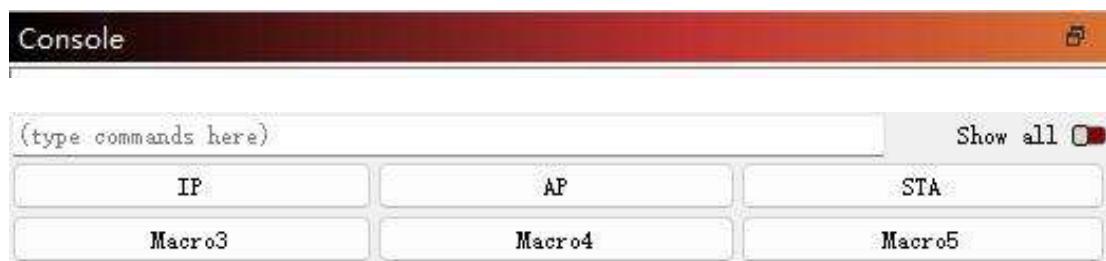


Rectangular frame



O-Frame

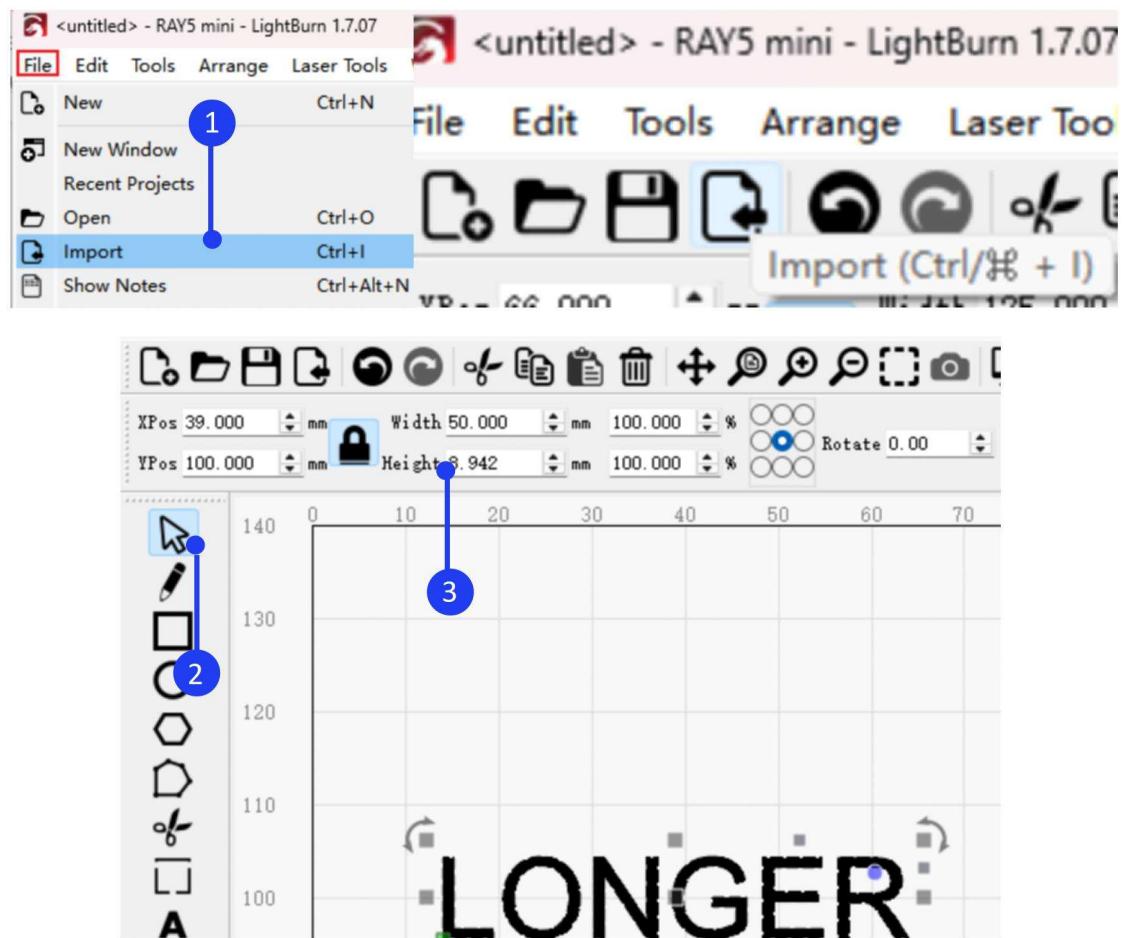
Console Window: The Console window displays messages from the controller and commands sent to it by LightBurn, and some macro commands designed for **RAY5 mini** engraver. You can also input direct commands to the engraver through this window, such as \$\$ to display GRBL settings, or \$X to unlock the machine if it has been locked due to an alarm or error. The Console window will also display alarm or error messages sent by the laser's controller, indicating any issues with the machine's operation.



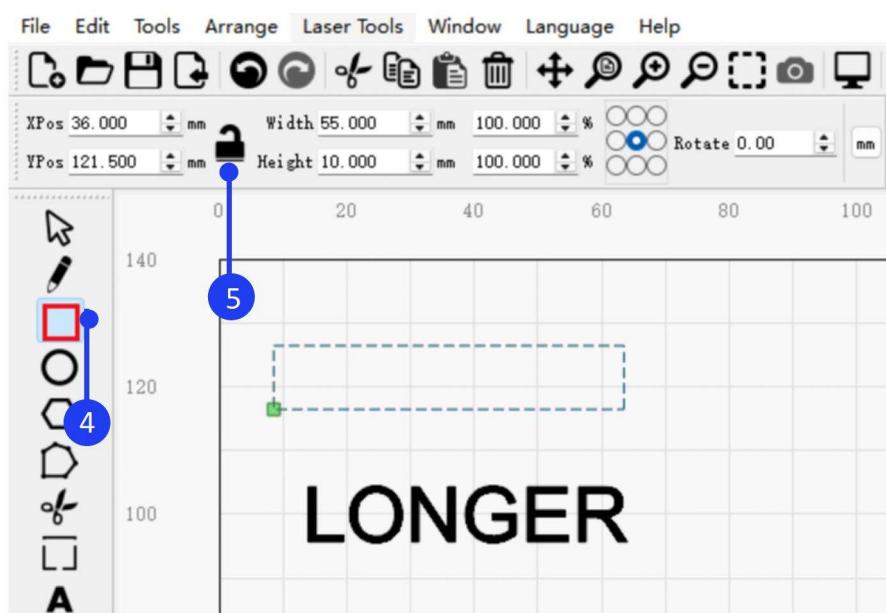
5. Create a Project in LightBurn

Generally, creating an engraving task involves importing graphics, editing them, setting parameters, previewing, framing, and engraving. For example, to engrave the LONGER LOGO and cut after engraving:

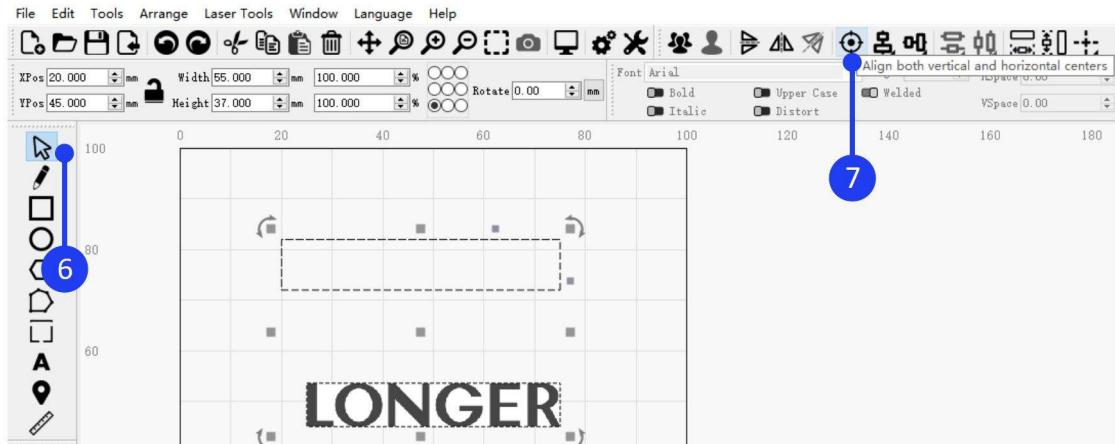
Click [File > Import](#) or click  import icon in the Toolbar to add the image to LightBurn. Select the image by clicking  select icon, then adjust the image width to 50.00mm. The height will automatically adjust in proportion to the width.



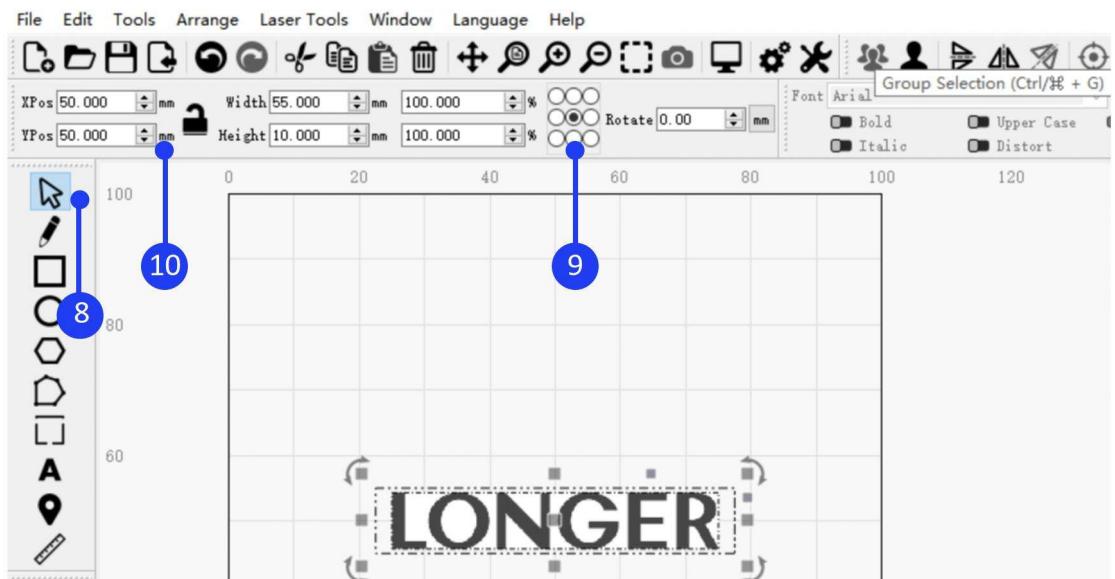
 Click  Create rectangle. Then, click  to unlock and set the rectangle's width to 55.00mm and height to 10.00mm.



Click  **Select** button, hold down the Shift key on the keyboard, select both the rectangle and image, and click  **Align Center** button on the toolbar to center-align the image and rectangle.



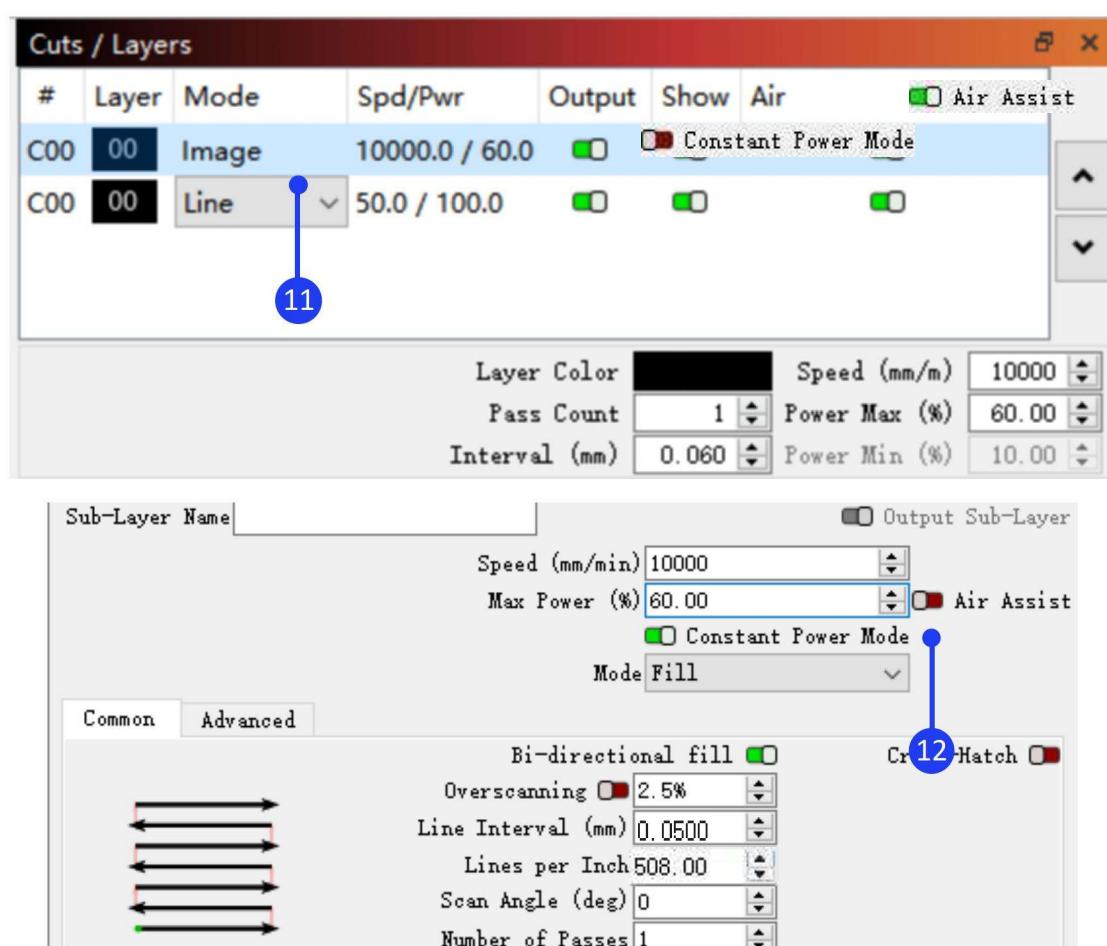
Set the coordinate point to the center of the image and enter the XY position coordinates as 50, 50 to move the design to the center of the working area.

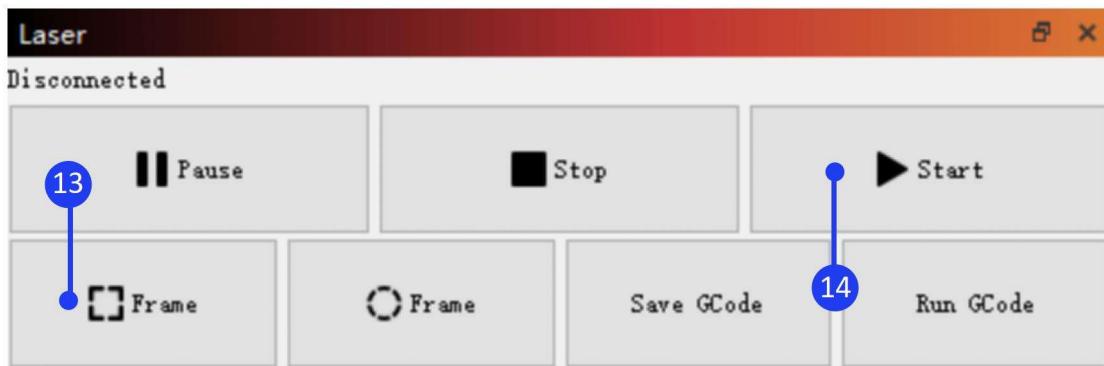


Click on different layers in the **Cuts and Layers** window to set the corresponding parameters, and **disable Constant Power Mode**

(Please note : For image or fill engraving, the Y interval is 0.05mm

The Y interval has two options: 0.05mm for high precision or 0.10mm for high efficiency.) Adjust the specific parameters according to the actual materials and parameter table. Then, adjust the focus of the **RAY5 mini** and click **Frame** button  to confirm the engraving placement. Finally, click **Start** .





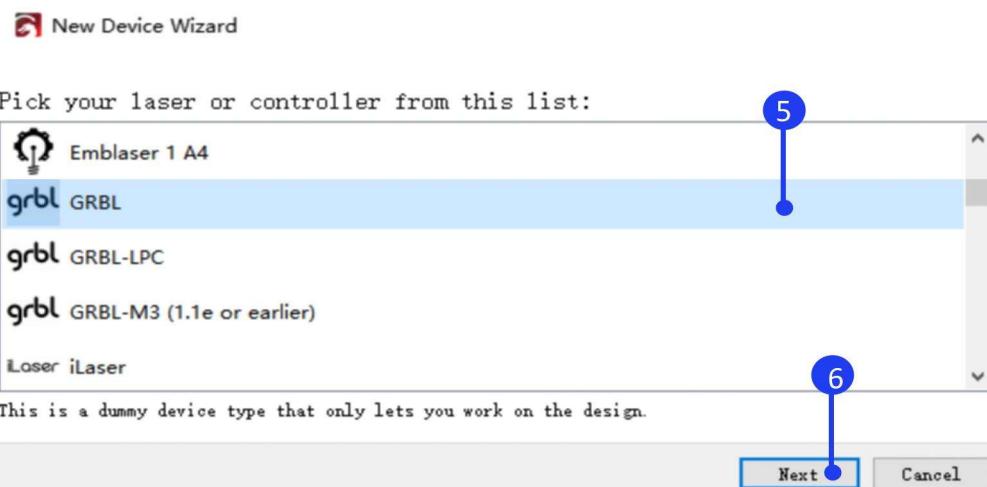
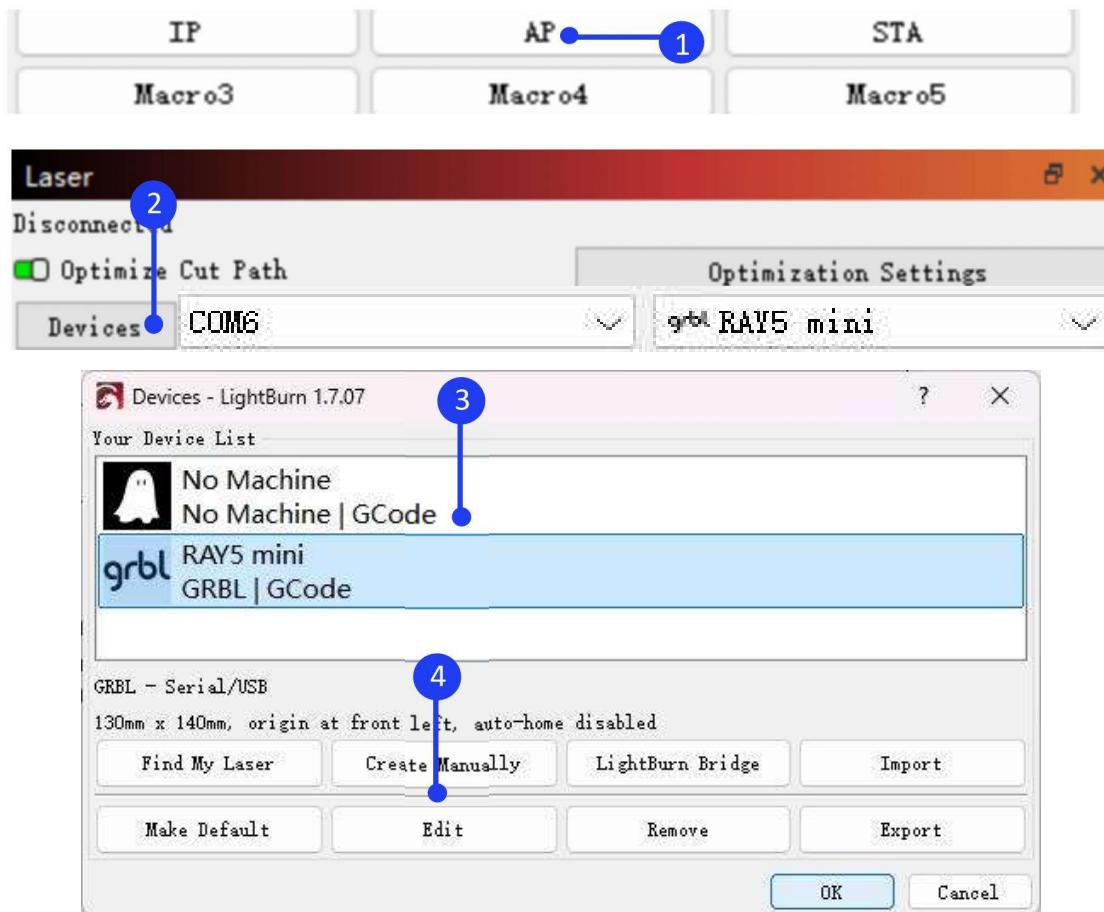
6. Connect RAY5 mini to LightBurn via Wi-Fi

There are two modes available for connecting the **RAY5 mini** to LightBurn via Wi-Fi: STA mode and AP mode. The main difference is that in AP mode, the computer does not have network access, while in STA mode, the computer can maintain its network connection.

1) Connect **RAY5 mini** to LightBurn via Wi-Fi in AP Mode

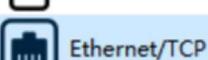
Run LightBurn and [connect your PC to **RAY5 mini**](#). In the Console window, click '[AP](#)' to set the Wi-Fi to AP mode. Next, connect your computer to the Wi-Fi network that starts with [LongerLaser_XXXX](#) and enter the password [12345678](#). In the Laser window, click Devices, select **RAY5 mini**, then click Edit > GRBL > Next > Ethernet/TCP > Next, then input 192.168.0.1 > Next > Next > Next > Finish > OK. Click [Device Settings](#), enter 8847 in the Network Port field, and click OK

OK.



◀  New Device Wizard**grbl** GRBL device

How do you want to connect to it?



7

8

Next

Cancel

◀  New Device Wizard**grbl** GRBL

What is the IP address of the device?

192.168.0_.1_ |

9

10

Next

Cancel

◀  New Device Wizard

What would you like to call it?

(If you have more than one, use this to tell them apart)

RAY5 mini|

What are the dimensions of the work area?

(The lengths of the X and Y axis of your laser)

X Axis Length 130 mmY Axis Length 140 mm

11

Next

Cancel

◀  New Device Wizard

Where is the origin of your laser?

(Where is X0, Y0 ?)

Rear Left Rear RightFront Left Front Right Auto "home" your laser on startup?

12

Next

Cancel

←  New Device Wizard

That's it - you're done. Here's a summary:

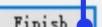
grbl GRBL  Serial/USB

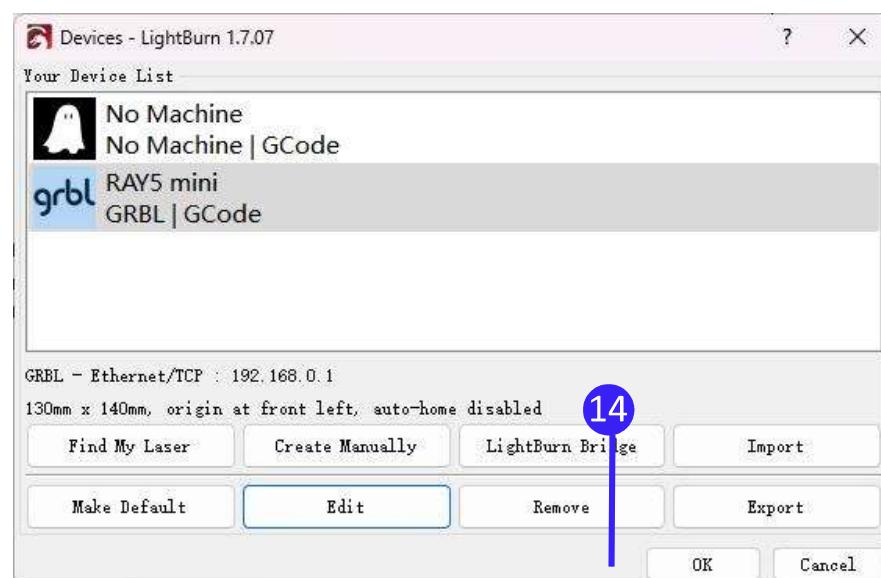
RAY5 mini

130mm x 140mm, origin at front left

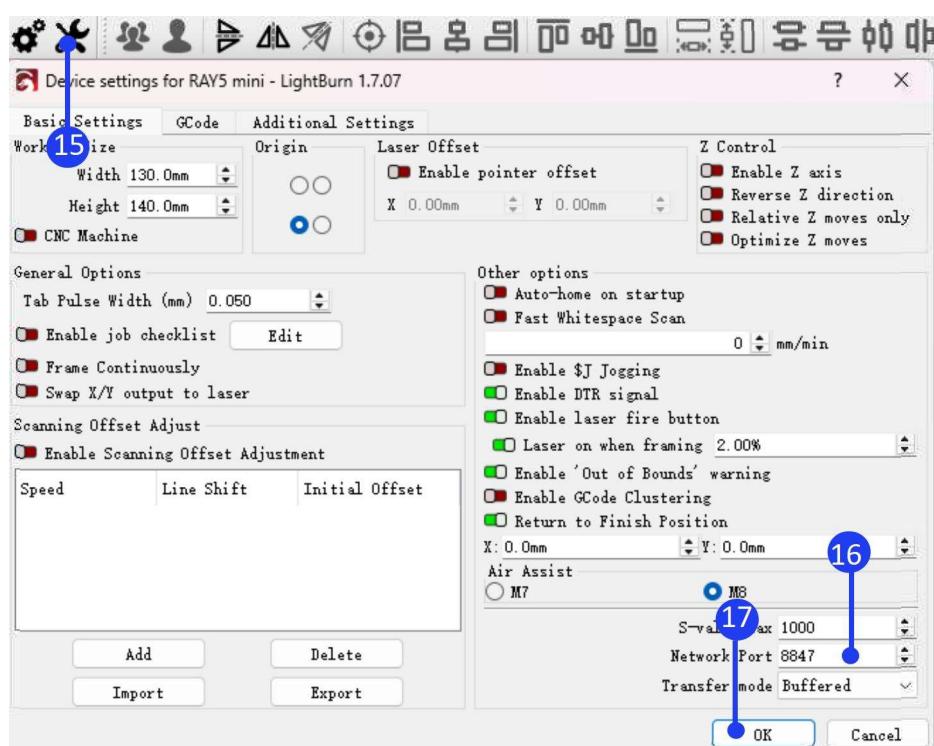
Click "Finish" to add the new device.

13

 Finish Cancel



14



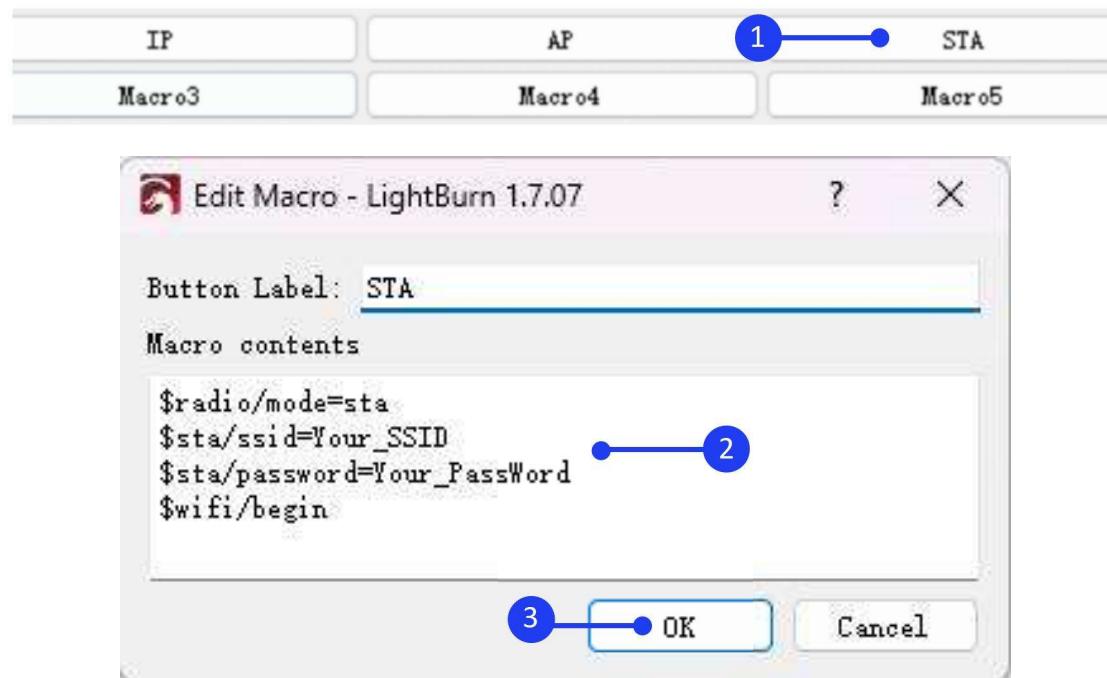
16

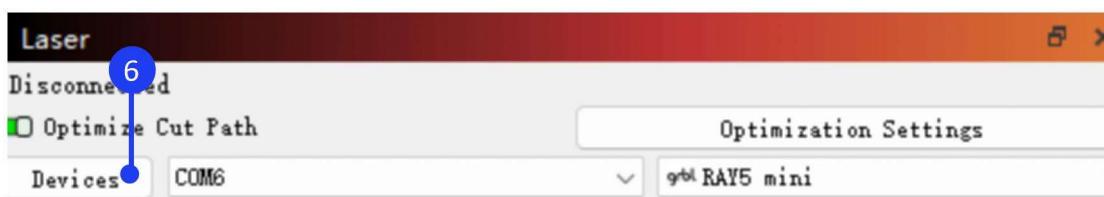
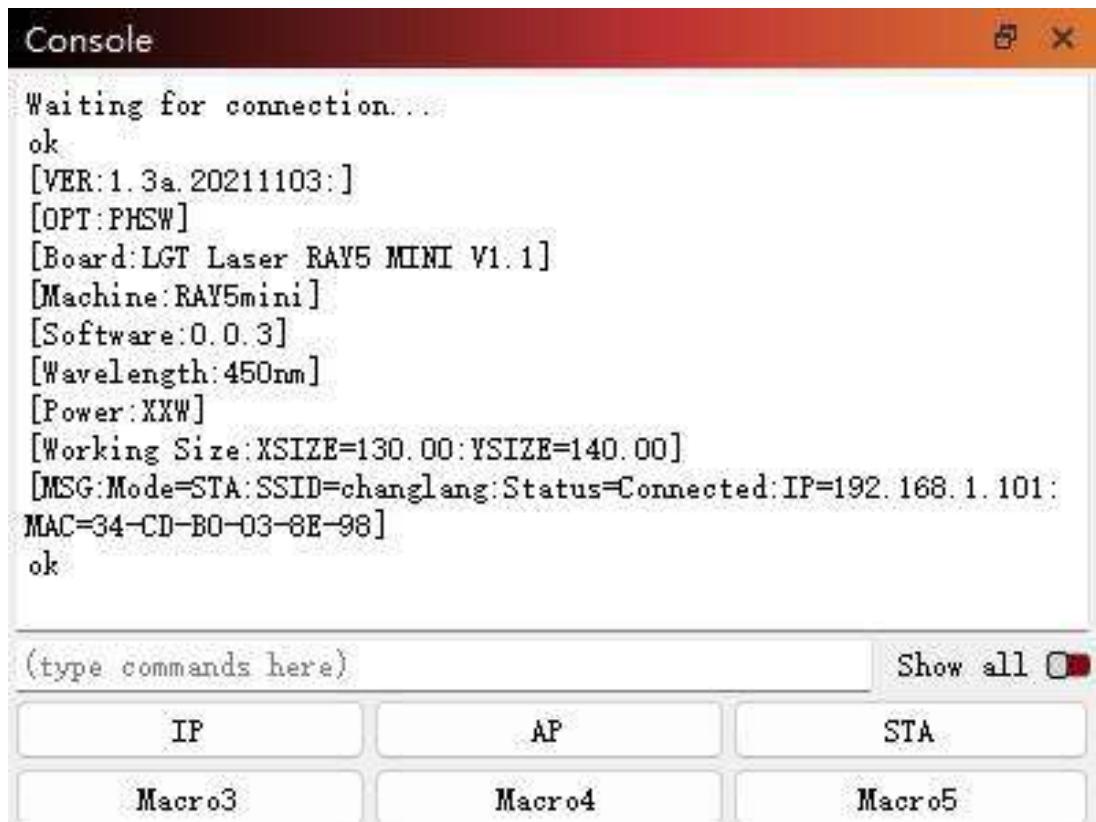
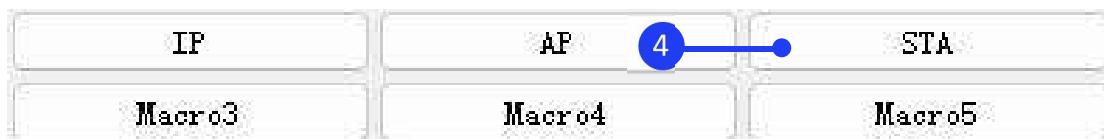
S-value: 1000

OK Cancel

2) Connect RAY5 mini to LightBurn via Wi-Fi in STA Mode

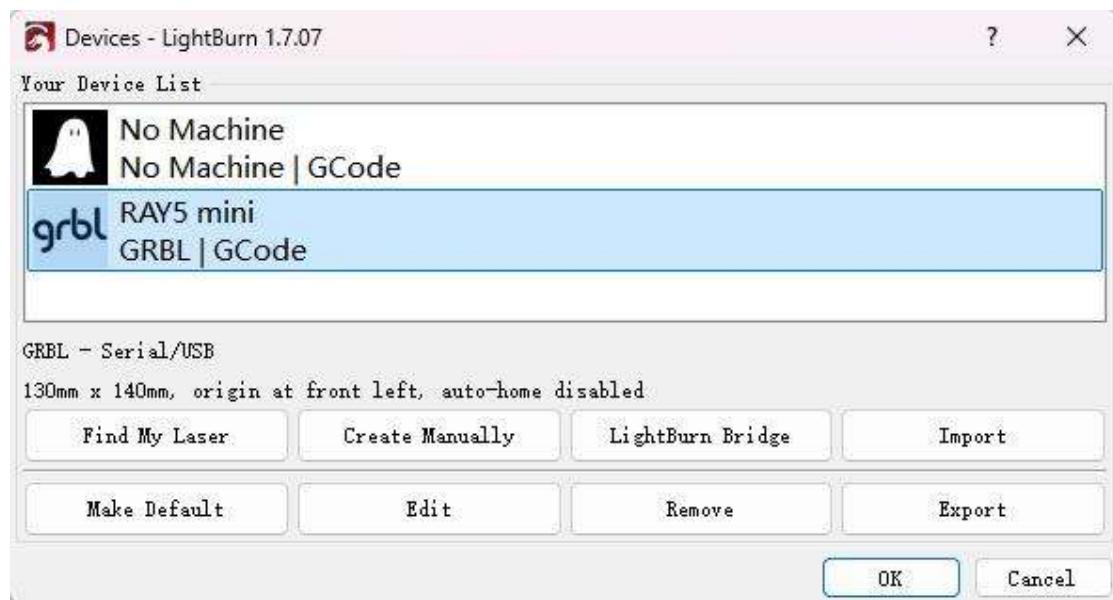
Run LightBurn and [connect your PC to the RAY5 mini](#). In the Console window, right-click 'STA' to set the Wi-Fi information, and [change Your_SSID and Your_PassWord to your WIFI account and password](#) in \$sta/ssid and \$sta/password command. Click OK, then left-click 'STA' to switch to STA mode. Once the connection is successful, the console will prompt 'status = connected' along with the [IP address](#). Please note that [both your computer network and Wi-Fi must be on the same Local Area Network \(LAN\)](#). In the Laser window, click Devices, select **RAY5 mini** then click Edit > GRBL > Next > Ethernet/TCP > Next , then input the IP address > Next > Next > Next > Finish > OK. Click [Device Settings](#), enter **8847** in [Network Port](#) field, and click OK.





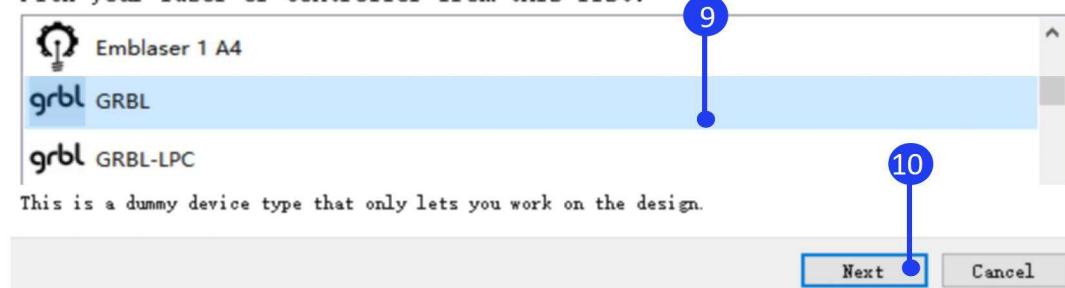
7

8



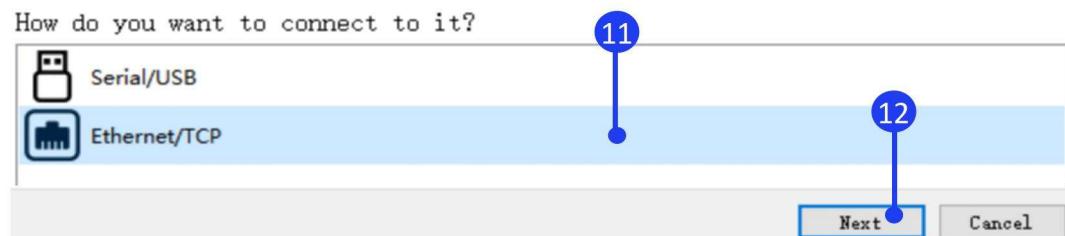
New Device Wizard

Pick your laser or controller from this list:



New Device Wizard

grbl GRBL device



←  New Device Wizard

grbl GRBL

What is the IP address of the device?

192.168.1___.101

13

14

←  New Device Wizard

What would you like to call it?

(If you have more than one, use this to tell them apart)

RAY5 mini

What are the dimensions of the work area?

(The lengths of the X and Y axis of your laser)

X Axis Length 130 mm

Y Axis Length 140 m

15

←  New Device Wizard

Where is the origin of your laser?

(Where is X0, Y0 ?)

Rear Left Rear Right

Front Left Front Right

Auto "home" your laser on startup?

16

←  New Device Wizard

That's it - you're done. Here's a summary:

grbl GRBL  Ethernet/TCP

RAY5 mini

130mm x 140mm, origin at front left

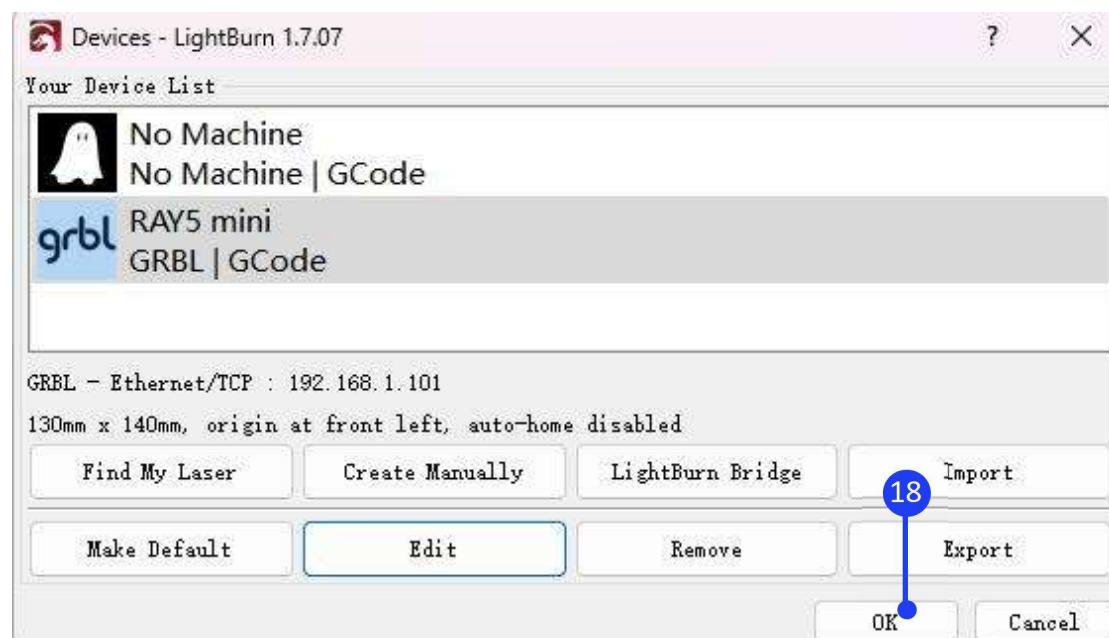
192.168.1.101

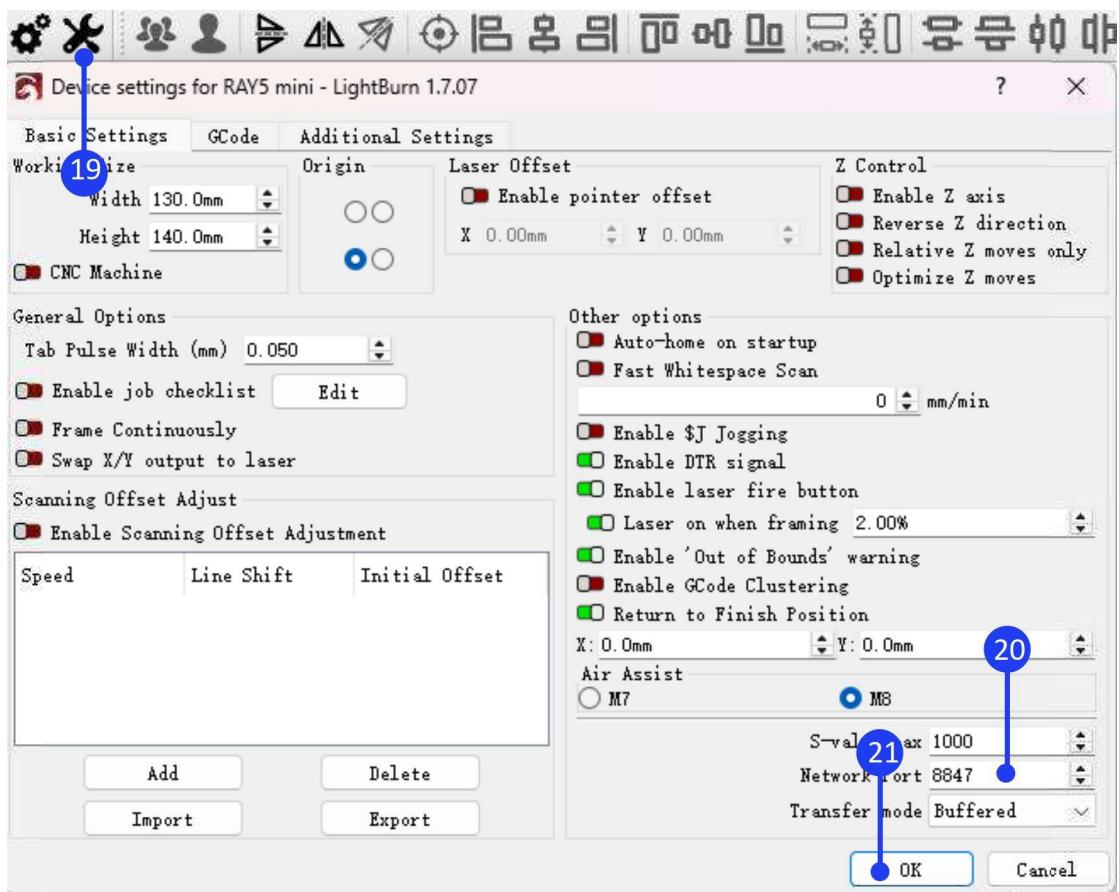
Click "Finish" to add the new device.

17

Finish

Cancel





F. APP Operation

1. Download and Installation

To download the LaserBurn app for Android, search for "LaserBurn" in Google Play or visit the following link:

https://play.google.com/store/apps/details?id=com.longer.longerlaser&hl=en_US

For iOS devices, search for "LaserBurn" in the Apple App Store or visit the following link:

<https://apps.apple.com/us/app/laserburn/id6451089363>

Alternatively, you can download the app from LONGER's official website:

<https://www.longer3d.com/pages/longer-app>

You can also scan the QR code to download the app:

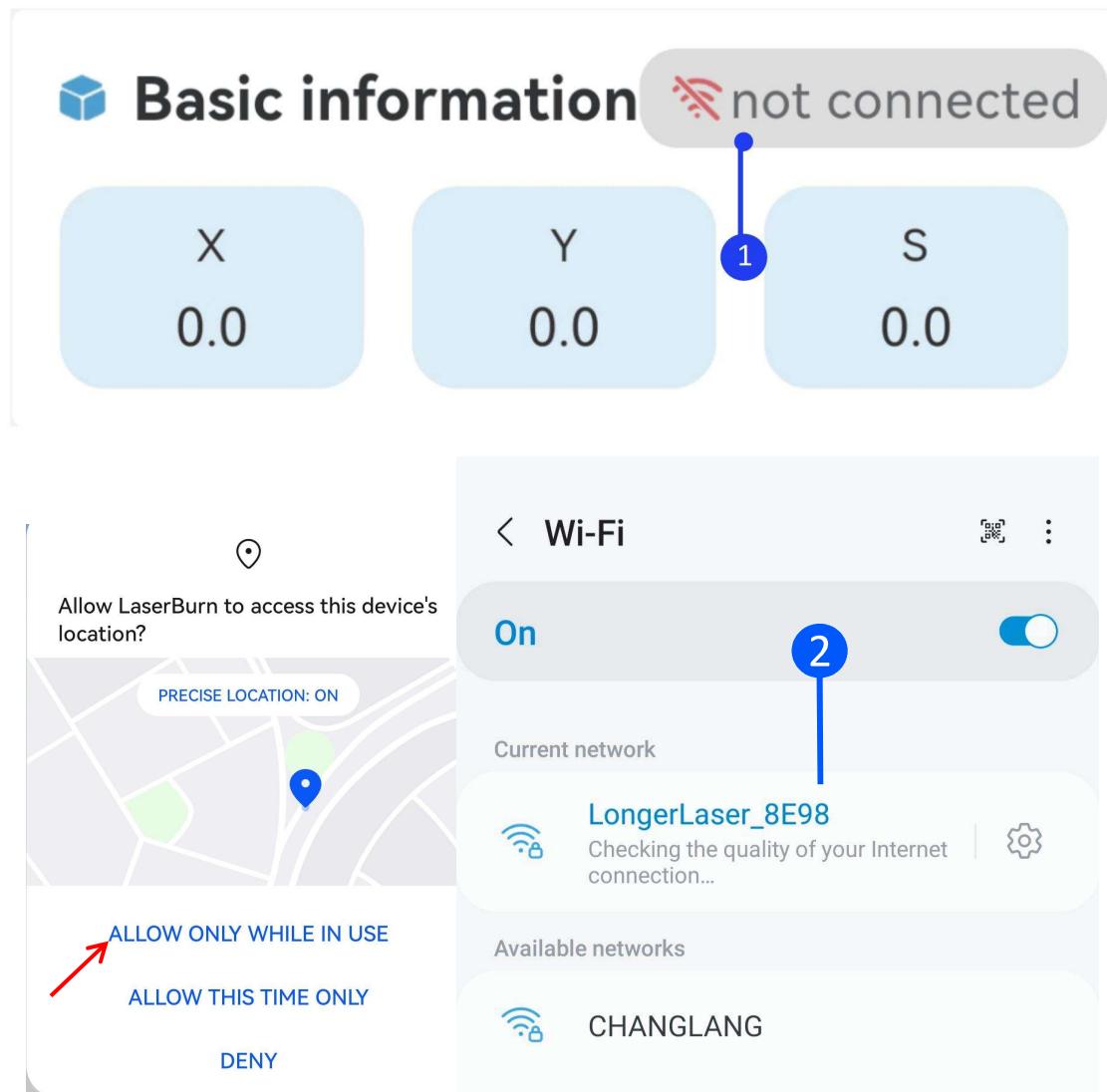


For complex grayscale engraving, it is recommended to transfer the image to your mobile phone's album and then import it into the app for engraving, as this method tends to produce better results.

2. Connect to Wi-Fi in AP mode

Note: There are two modes, AP and STA, for connecting the **RAY5 mini** via Wi-Fi. The key difference is that in **AP mode**, the phone will lose internet access, while in **STA mode**, it can stay connected to the network.

- 1) Run the LaserBurn app and go to the Home page. Click the not connected icon  . When prompted with ‘Allow LaserBurn to access this device?’ , select ALLOW ONLY WHILE IN USE to ensure the app can search for the RAY5 mini's Wi-Fi network.



Open your phone's WLAN settings, search for the Wi-Fi network starting with [LongerLaser_XXXX](#) and connect using the password [12345678](#) . Then, enter the IP address [192.168.0.1](#) , click [Connect](#),

and wait for the "connection succeeded" confirmation message.

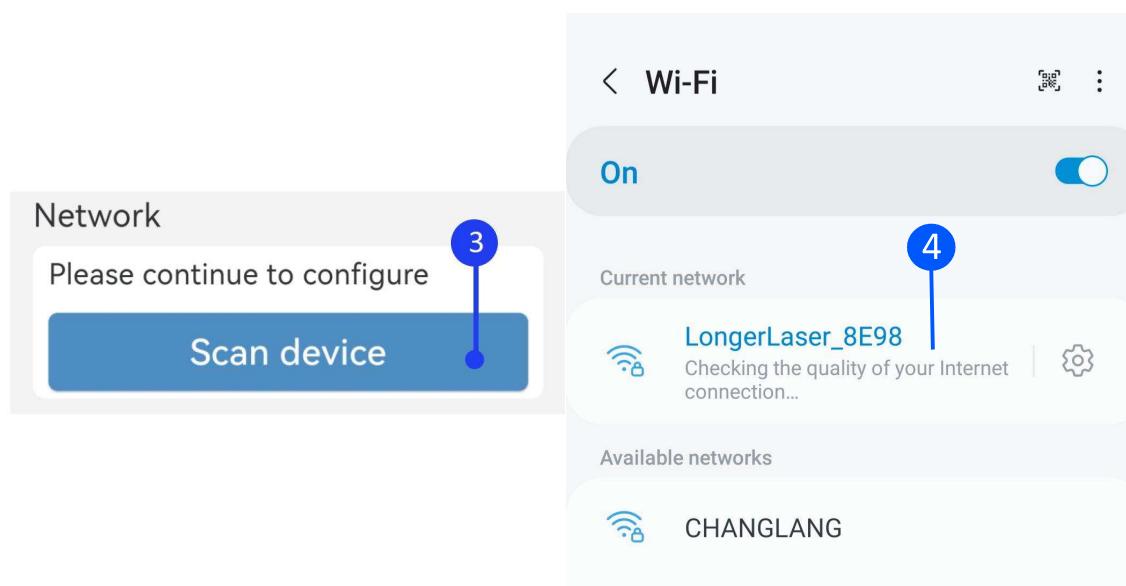


3. Connect to Wi-Fi in STA mode

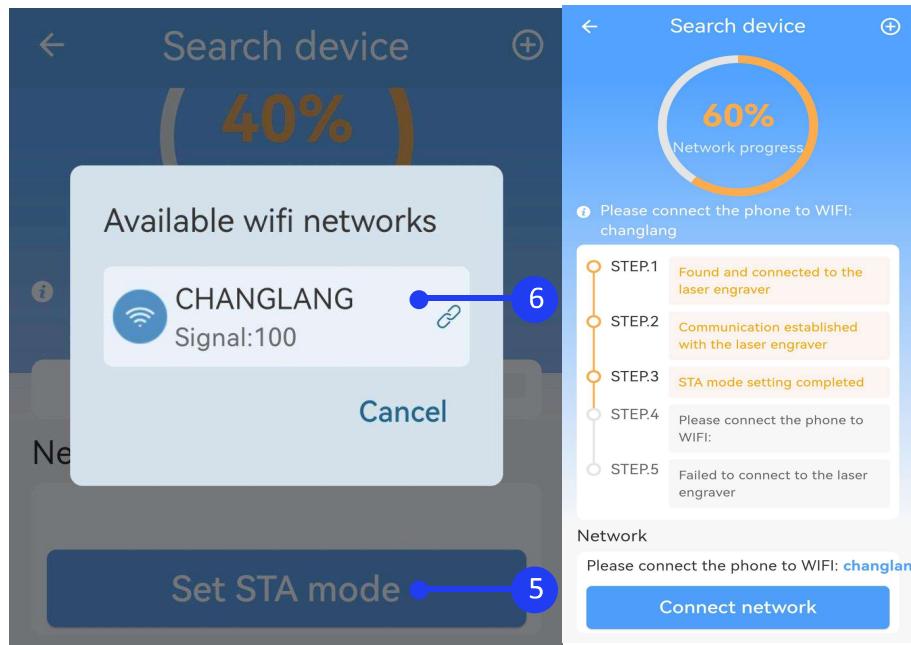
- 1) Open your phone's **WLAN** settings. Run the LaserBurn app, go to the Home page, and click the **not connected** icon  , to enter the network configuration page. Click **Add**  in the upper right corner.



- 2) Click Scan device, search for the WIFI network starting with **LongerLaser_XXXX**, and connect using the [password 12345678](#) .

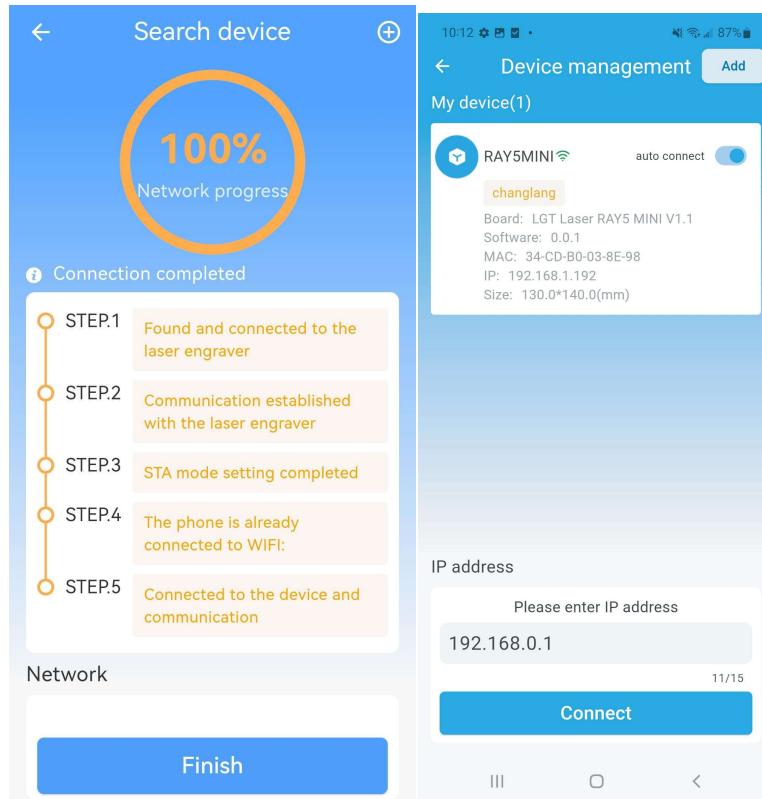


- 3) Once connected, return to LaserBurn and select Set [STA mode](#) to connect the **RAY5 mini** to a router (supports [2.4G only](#)). Enter the router's password. The indicator light on the front of the **RAY5 mini** will turn orange (breathing light) while connecting and switch to green if the connection is successful. If the connection fails, the indicator will remain orange, and you will need to restart the process from step 1).



- 4) Return to LaserBurn, click **Connect network** at the bottom of the page, and ensure your phone is connected to the same Wi-Fi network as set in STA mode. Wait for network configuration to complete. When the connection is successful and the progress reaches 100%, click **FINISH** to return to the device list.

Note: Once the device is connected, clicking anywhere on the device list will disconnect it. Conversely, clicking when disconnected will automatically reconnect your phone to the device.



4. Creation



In the creation interface, you can import graphics through various

methods, including drawing, text, QR codes, photo albums, cameras, material library, etc.

1) Draw

Draw simple images, such as circles, rectangles, triangles, etc.



Layer:00 Speed:6000 Power:10.0

S	/	\	O	□	△
Size W:	25.0	Lock	H:	50.0	
Position X:	30.0		Y:	25.0	
Rotate	0°				

Add Edit Layer

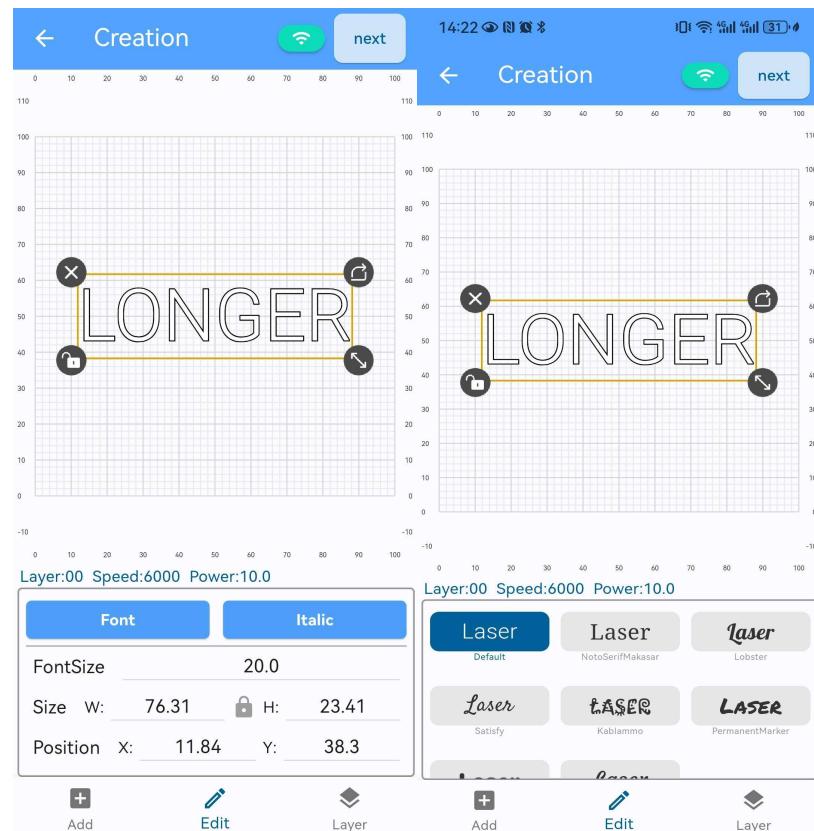
Layer:00 Speed:6000 Power:10.0

S	/	\	O	□	△
Size W:	25.0	Lock	H:	50.0	
Position X:	15.98		Y:	23.48	
Rotate	45°				

Add Edit Layer

Enter a value in **Size** to scale the graphic proportionally or hold down the button  to drag. If you need to adjust the length and width separately, click the button  to unlock the proportional lock. Enter a value in **Position** to change the Graphic's position, or select and move it within the canvas by dragging. Enter a value in **Rotate** to rotate the graphic counterclockwise to the corresponding angle, or hold down the button  to rotate it freely. If you click the button , the size, position or angle of graphic can only be changed by entering a value. Clicking the button  will delete the graphics.

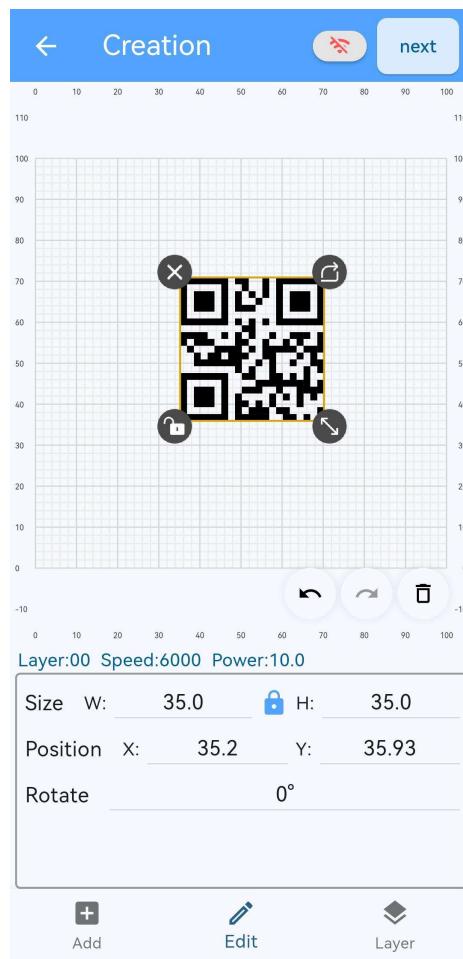
2) Text



Enter text and adjust the font, text size, position and angle.

3) QR code

Generate a QR code based on the input content and adjust its size, position, or angle.



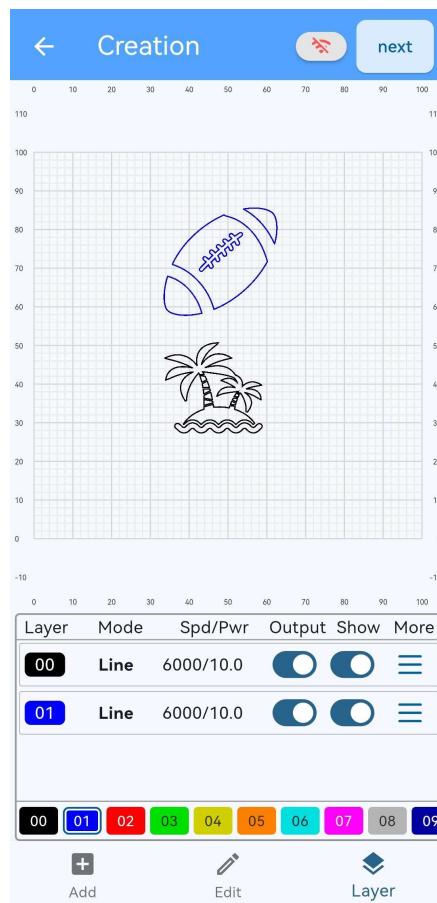
4) Layer

Layer mode: Set line or fill

Laser type: Choose from 2.5W or 3.5W 450nm Blue light

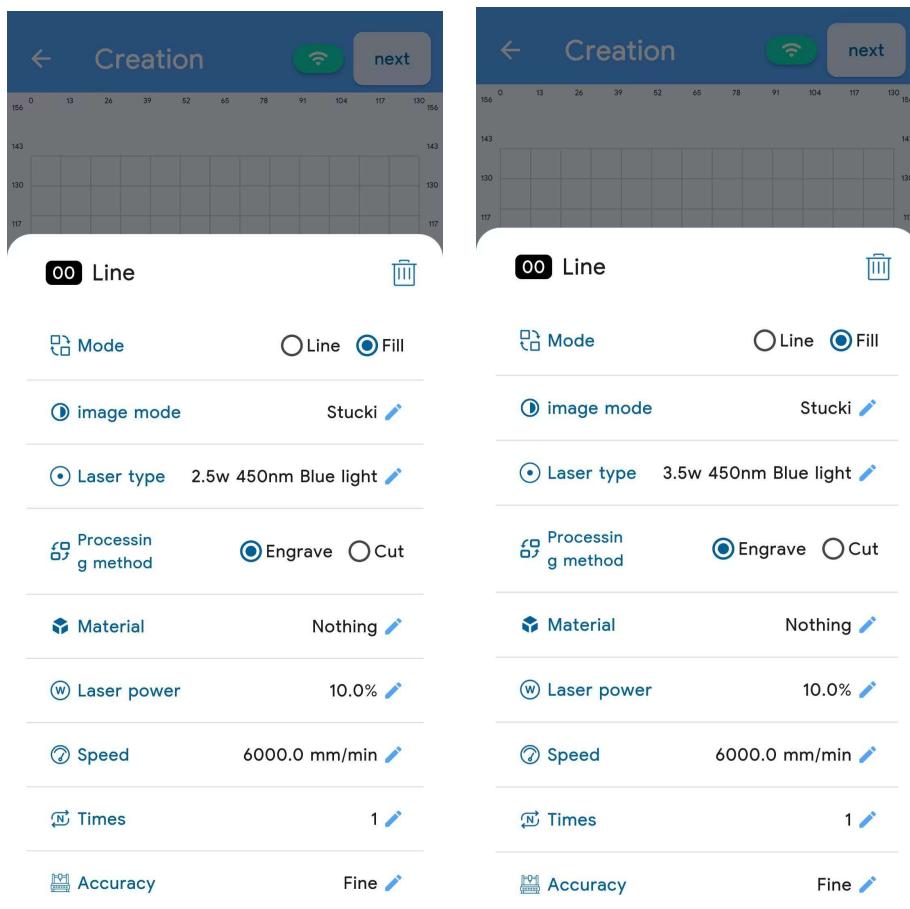
Processing method: Engrave or cut

Material: Choose the corresponding material from the material library, and the app will automatically set the appropriate parameters based on the selected processing method and laser power. If adjustments are needed, click the edit button to modify the settings.



Different colored layers allow you to set specific parameters for your design, enabling you to engrave or cut multiple files simultaneously. You can customize parameters such as layer mode, laser type, processing method, material, laser power, speed, number of passes,

and accuracy. Up to 11 parameters can be set in the app. To set the parameters, select the design, click Layer, and choose the corresponding colored layer.



5) Album

Import pictures from your mobile phone album.

6) Camera

Use your phone's camera to take pictures and import them into the app.

7) Undo



Undo the last operation. The app supports up to 20 steps of undo.

8) Redo



Redo the last undone operation. The app supports up to 20 steps of redo.

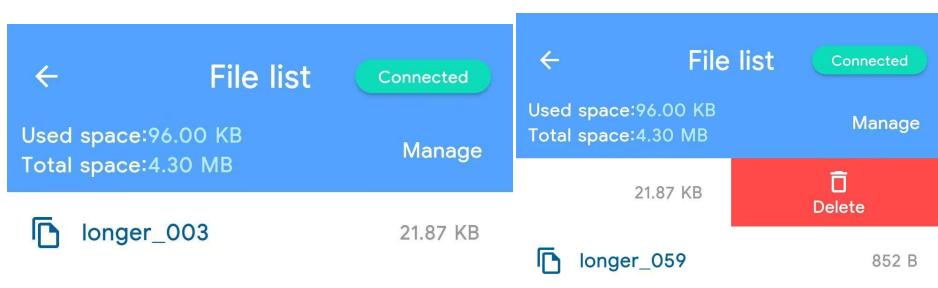
9) Clear



Clear all graphics from the canvas.

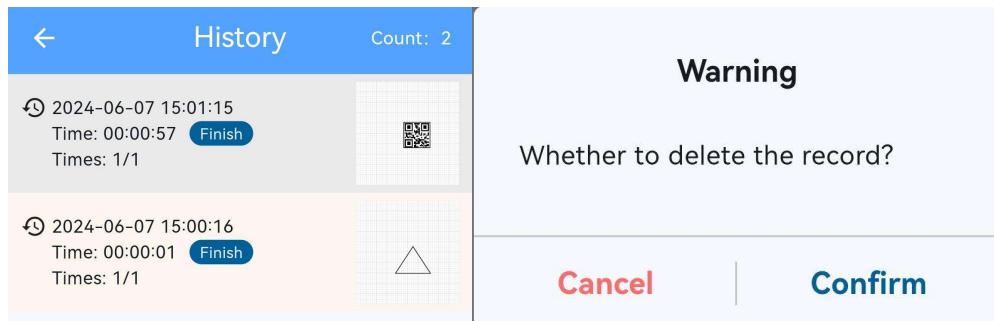
5. Files

When connected to the engraving machine, you can preview the files uploaded to the **RAY5 mini**. To delete a file, select it from the list and slide it to the left. When the available memory is nearly full, please delete unnecessary files to ensure new files can be uploaded.

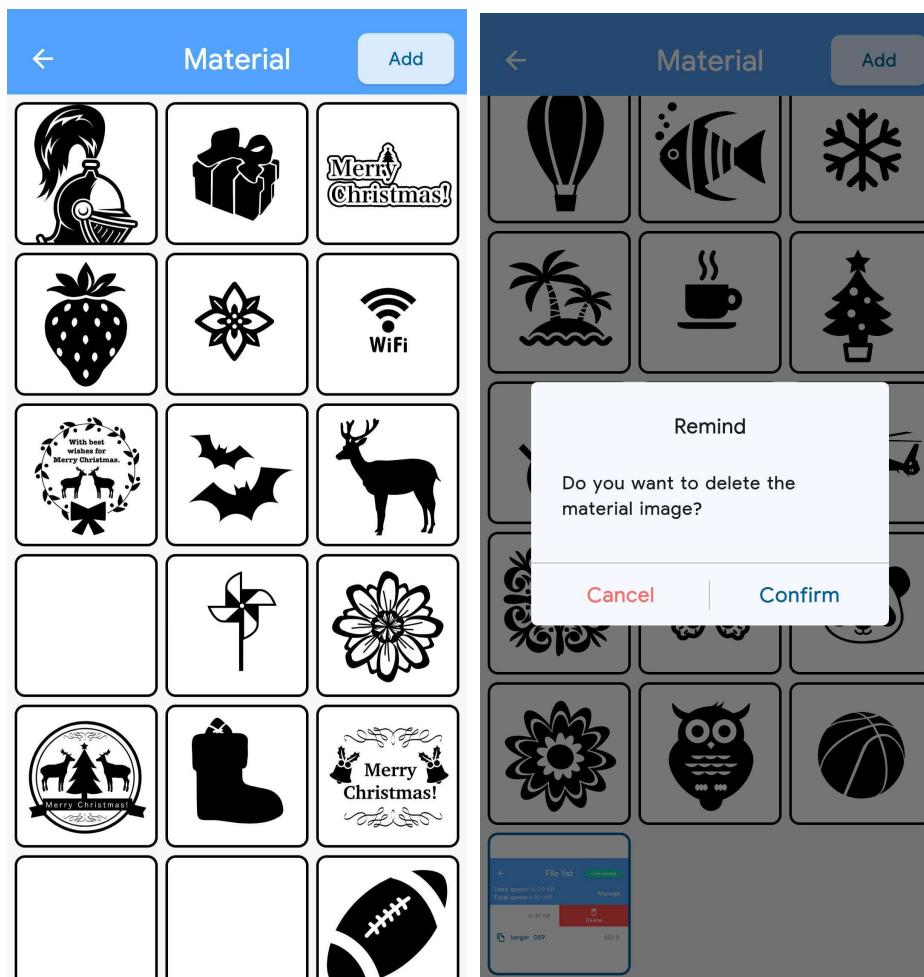


6. History

The History section displays a list of graphics from previous operations on the app. To delete unwanted images, simply long-press a file in the list.



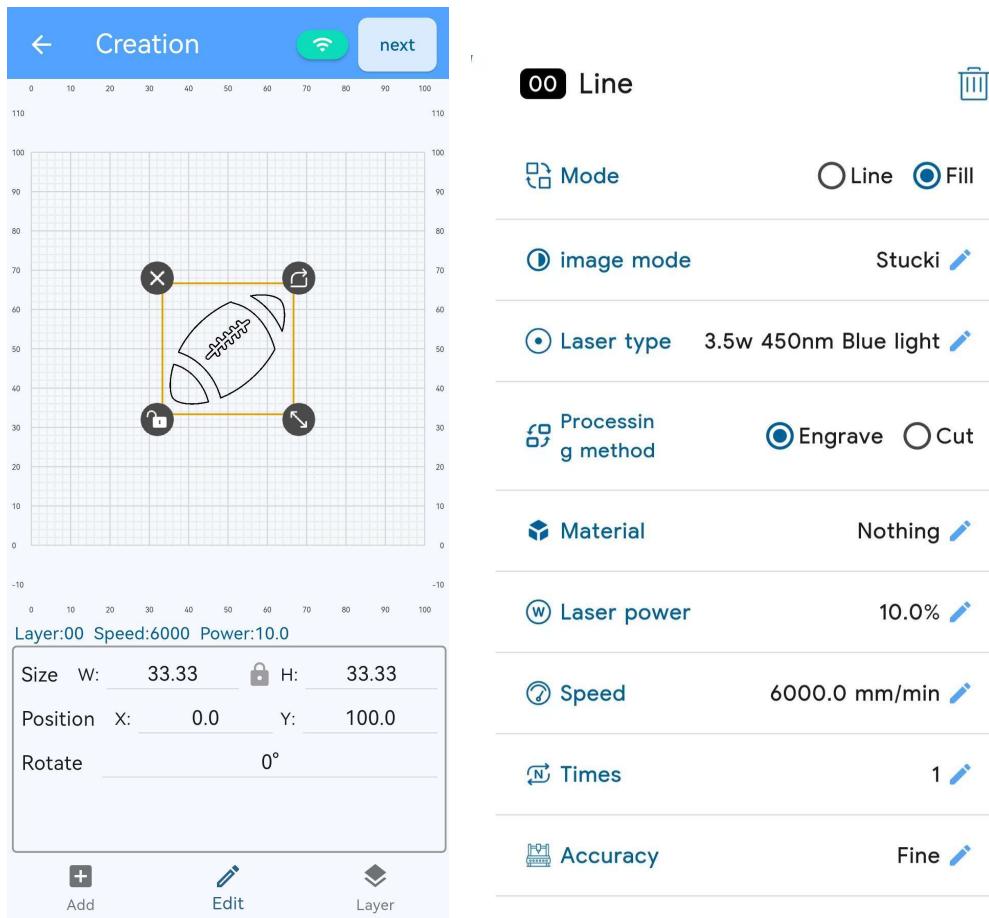
7. Material



The Material section is the graphic library within the app. To add graphics, click the ADD button in the upper right corner to import from your phone's album or memory. You can delete self-imported images by long-pressing them, but built-in images cannot be deleted.

8. Create a Project in LaserBurn APP

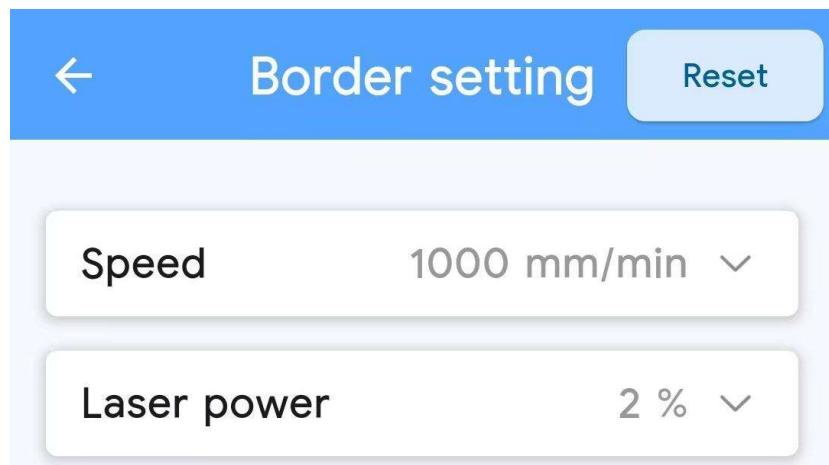
- 1) Run the LaserBurn app and connect it to the **RAY5 mini**. Add a graphic, click **Edit** to set the size and position, then click **Layer** to adjust the graphic parameters. After setting, click **next** in the upper right corner.



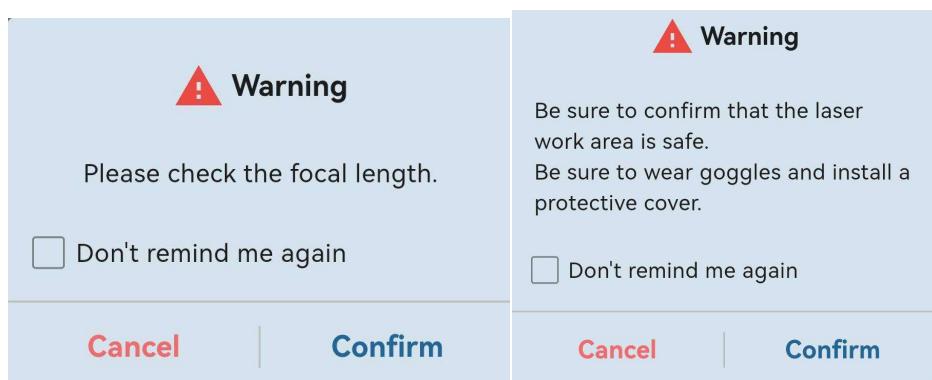
There are 4 values for accuracy: Ultra Fine, Fine, Fast, and Ultra Fast.

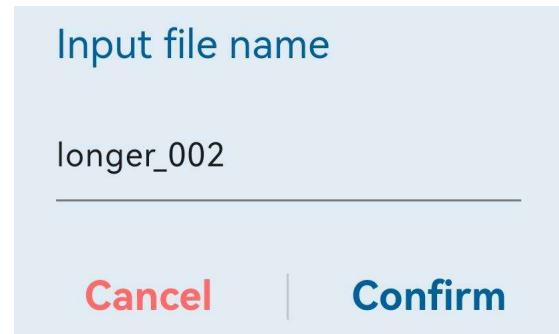
The default value is Fine. For more precision, select Ultra Fine. For more efficiency, select Fast or Ultra Fast.

- 2) Click **Border setting** to set the speed and patrol power. After setting, click **frame** to patrol the border. After confirming that the engraving position is correct, click **Start** to start engraving.



3) Once you've confirmed the focus is properly adjusted and goggles are worn, click Confirm to confirm the file name. The file will then upload to the **RAY5 mini**. After the upload is complete, click **Confirm** to start the engraving task.





- 4) The app will display the task progress. You can click **Pause** to pause the task or click **Stop** to cancel it. When the task is completed, a 'Work completed' prompt will appear. Click **Confirm** to return to the Home page.

