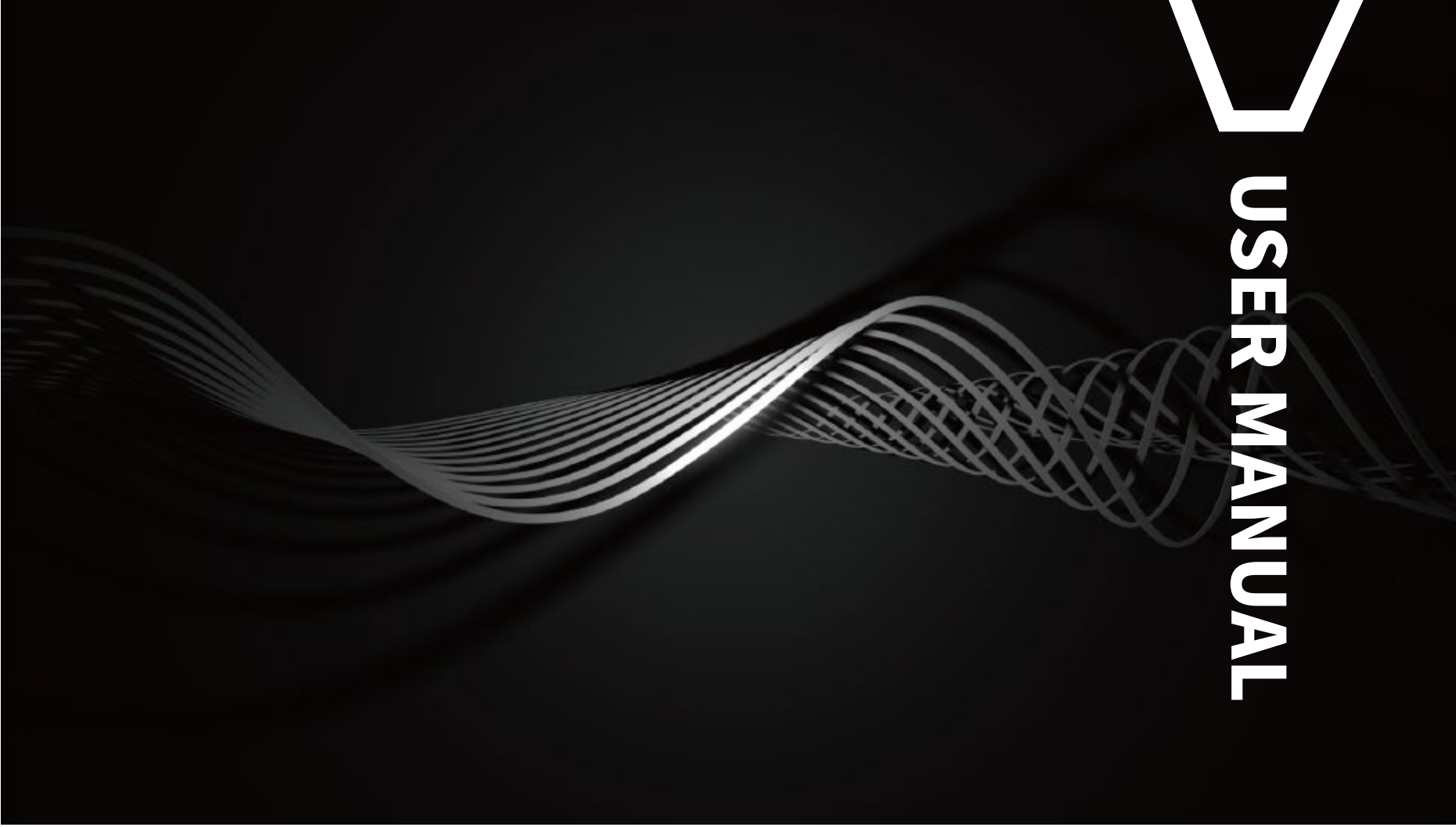

Laser Engraver

4240 Laser Engraving Machine

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2.Specifications

Product size	600 x 540 x 285mm
Bluetooth	Yes
Working area	420 x 400mm
Power supply	24V 2A
Stepping motor	42 x 48mm
Limit switch	Yes
Precision	0.01mm
Optical power	5000mW / 10000mW
Laser wavelength	450±5nm
Light spot	0.08 x 0.08mm (5000mW) / 0.12 x 0.12mm (10000mW)
Interface	3 pin (12V, GND, PWM)
System	Windows XP / 7 / 8 / 10, Mac OS
Application (Material)	White paper, wood, cardboard, plastic, leather, PCB board, alumina, non-reflective coated, painted metal, stainless steel, ceramic, acrylic, etc

3.Accessory List

3.1 Mechanical / Electrical Parts List

❶ X-axis gantry

❷ 2 x 445mm X-axis
(One with scale,
one without scale)

❸ 2 x 560mm Y-axis
(One with scale,
one without scale)

❹ 4 x Footstand

❺ Laser module

❻ Power adapter (24V / 2A)

❼ Control board
(with wiring and
limit switches)

❽ USB cable(1.5m)

3.2 Screw / Other Parts List

❾ 2 x 670mm synchronous belt

❿ 2 x M5*8 screw

⓫ 4 x M5*10 screw

⓬ 4 x M5*20 screw

⓭ 4 x M3*8 screw

⓮ 4 x M5*16 screw

⓯ 4 x M3 T nut

⓰ 2 x M5 T nut

⓱ 4 x M2.5*10 screw

⓲ 4 x M3*10 screw

3.3 Tool / Accessories Parts List

⓳ 3 x Allen wrench
(4mm, 2.5mm, 2mm)

⓴ 6 x Cable tie

㉑ Fixed-focus plate

㉒ U disk(2G)

㉓ 4 x Linden plank

㉔ 2 x Stainless steel sheet

㉕ Open spanner

㉖ M2.5 Screwdriver

4.Installation Guide

4.1 Bottom Frame

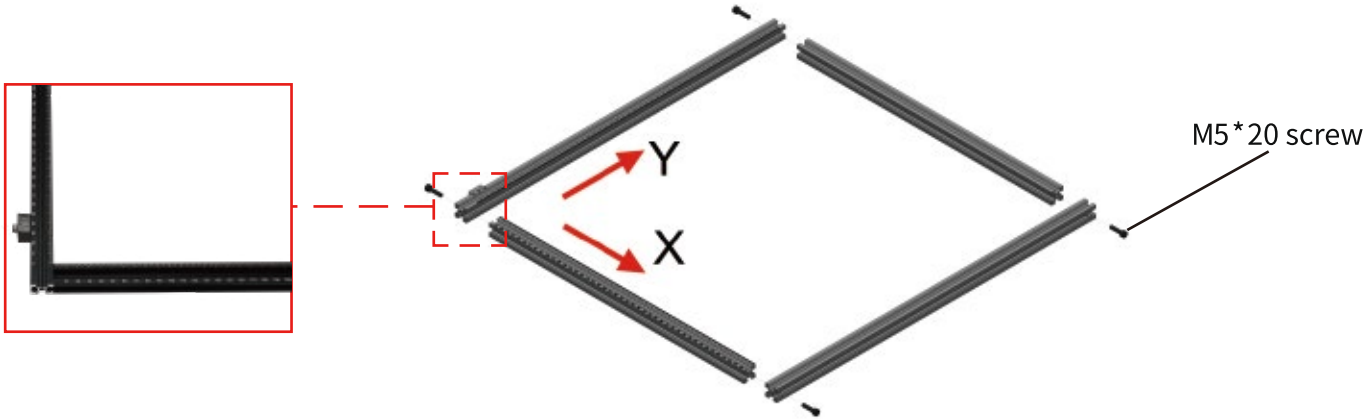
What you will need

❷ 2 x 445mm X-axis

❸ 2 x 560mm Y-axis

⓬ 2 x M5*20 screw

1. Place the 4 axes as shown below, and pay attention to the direction of the two with scale.
2. Fix the base with M5*20 screws as shown in the figure.



4.2 X-axis Gantry & Footstand

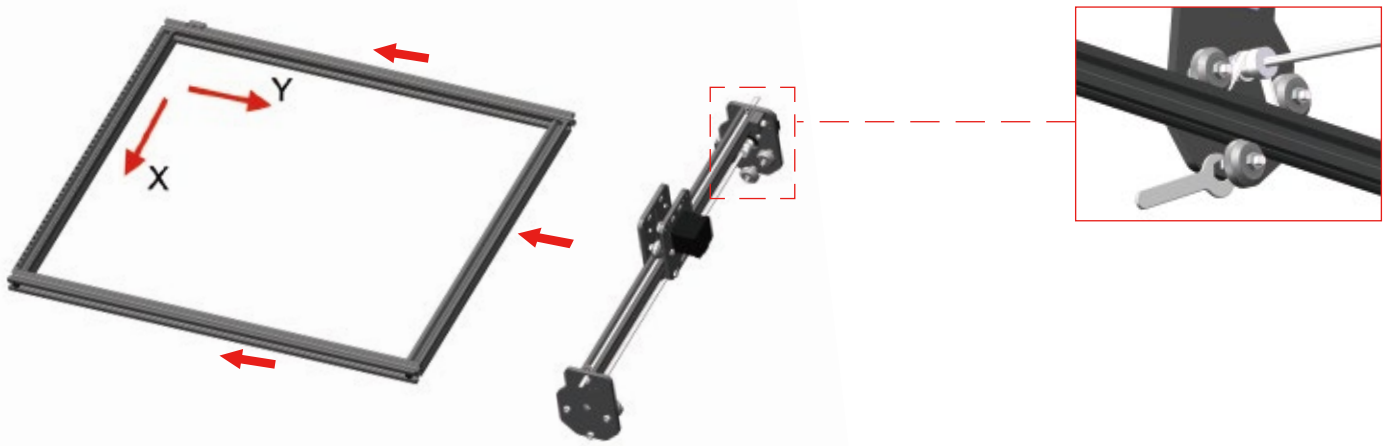
What you will need

❶ X-axis gantry

25 Open spanner

Install the X-axis gantry on the bottom frame as shown in the figure below.

Note: The open spanner can be used to adjust the eccentric nuts on both sides of the X-axis gantry for proper tightness.



4.3 Synchronous Belt

What you will need

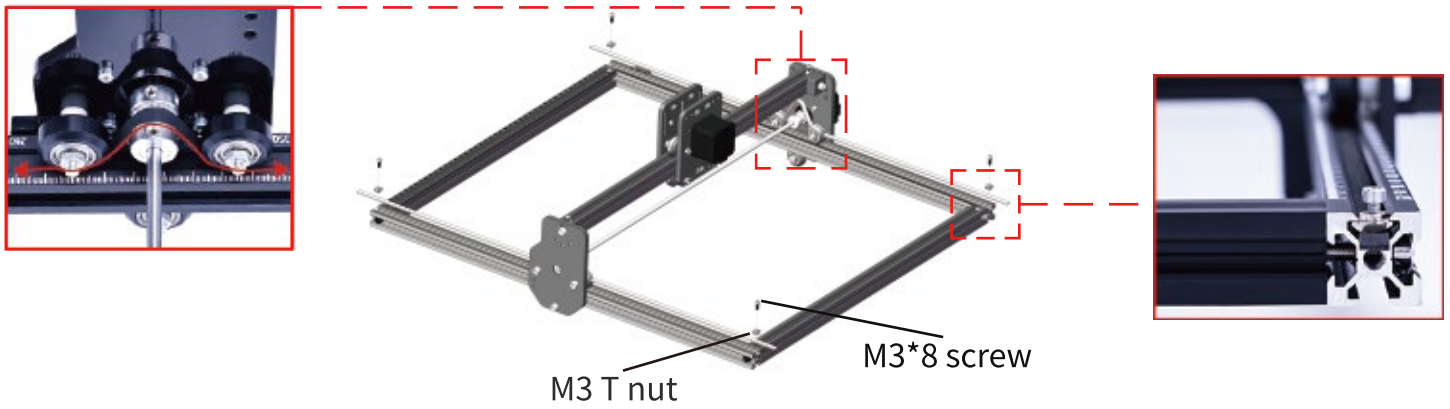
❾ 2 x 670mm synchronous belt

⓭ 4 x M3*8 screw

⓯ 4 x M3 T nut

1. Install the two synchronous belts of Y-axis as shown in the picture.
2. Fix the belts with M3 screws and M3 T nuts.

Note: The synchronous belts should not be installed too loose or too tight.



4.4 Footstand

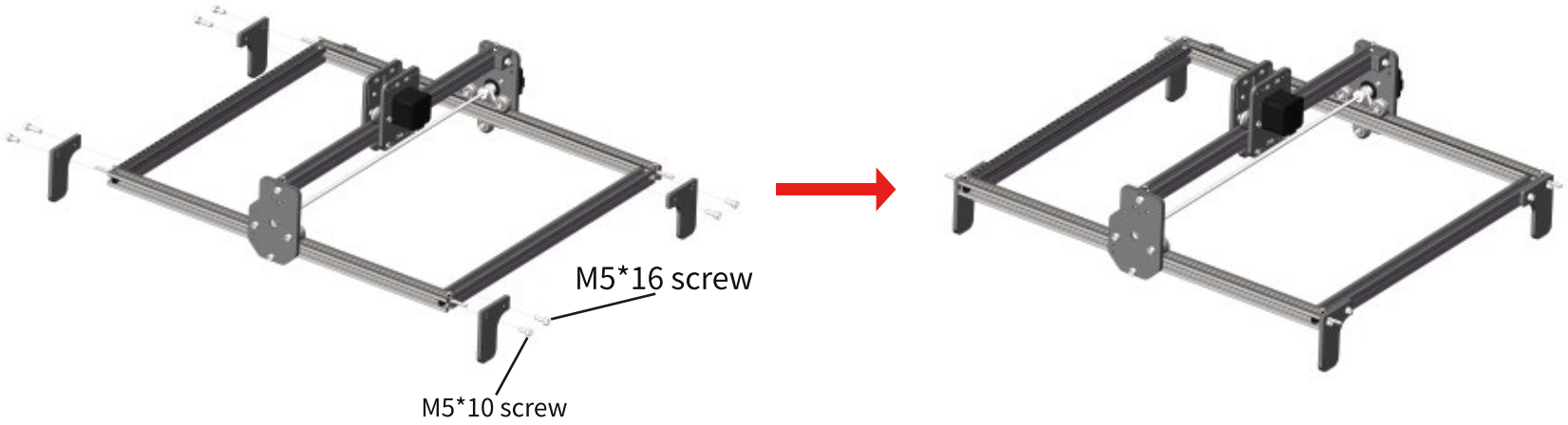
What you will need

❹ 4 x Footstand

⓫ 4 x M5*10 screw

⓮ 4 x M5*16 screw

Install the 4 footstands as shown in the figure below with M5 screws and spanner.



Laser Module

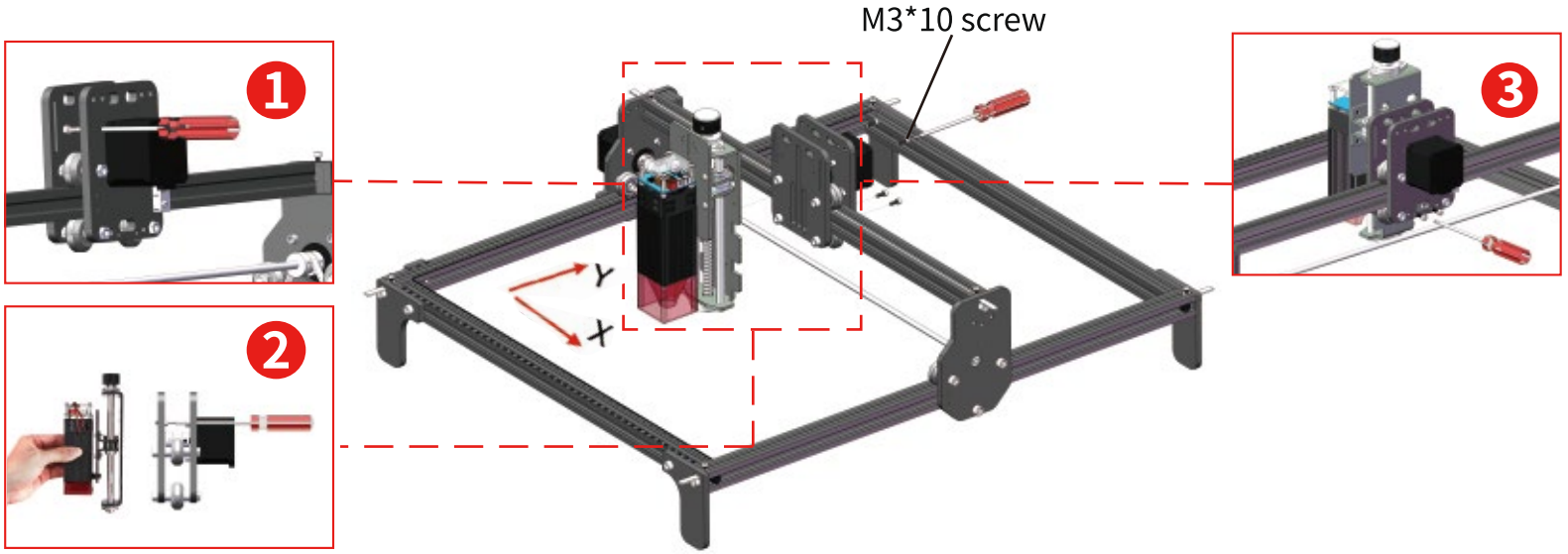
What you will need

❺ Laser module

⓲ 4 x M3*10 screw

㉖ M2.5 Screwdriver

Secure the laser module to the X-axis gantry with M3*10 screws as shown below.



4.6 Control Board & Limit Switch

What you will need

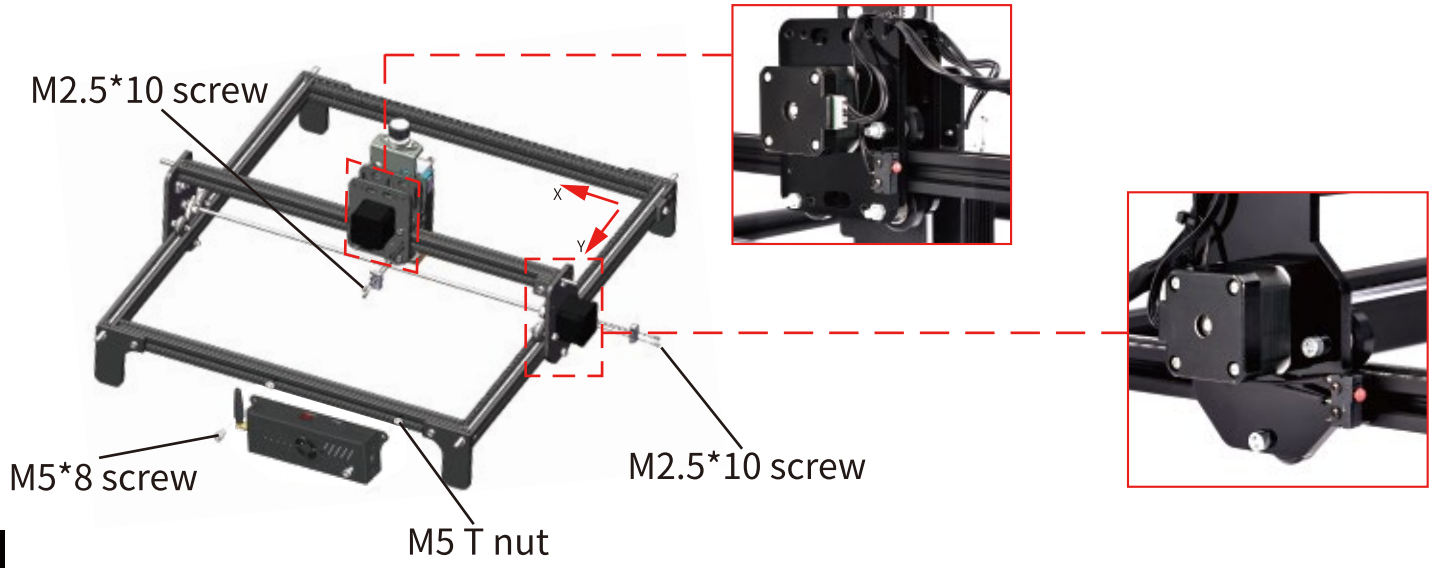
❼ Control board

❿ 2 x M5*8 screw

⓰ 2 x M5 T nut

⓱ 4 x M2.5*10 screw

1. Fix the control panel with M5 T nuts and M5*8 screws.
2. Secure the limit switch respectively to the fixed holes on X-axis and Y-axis with M2.5*10 screws as shown in the figure below.

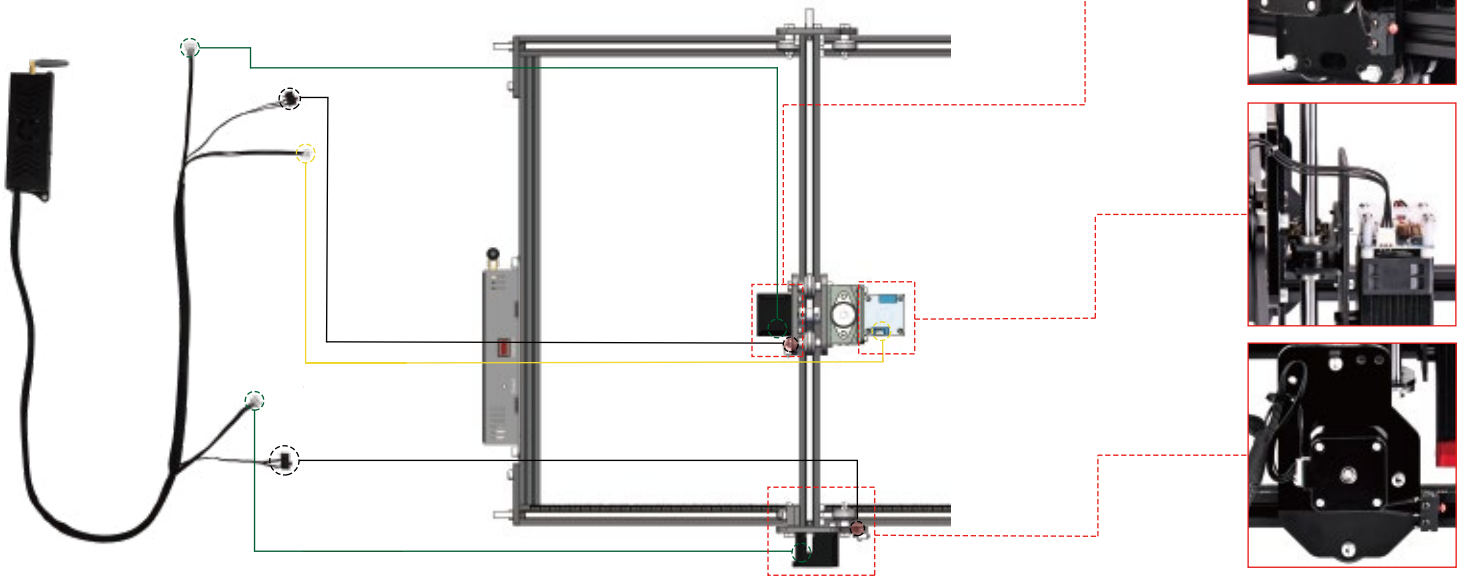


4.7 Connecting Wires

What you will need

20 6 x Cable tie

1. Connect well the motor wire and laser wire as shown in the figure below.
2. You can put all the wires straight with cable ties.



Engraving Reference Parameters

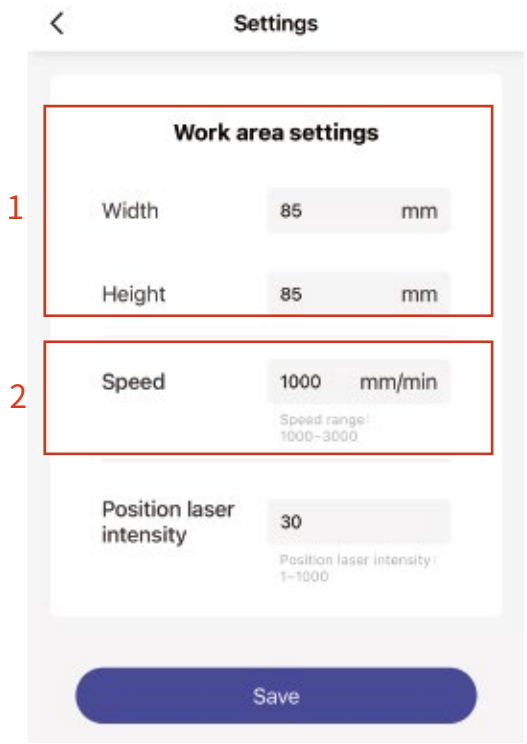
	APP		Lasergrbl	
Material	Engraving speed	Engraving depth	Engraving speed (mm/min)	Engraving power
Cardboard	100%	15~30%	1000	150~300
Plywood	100%	30~50%	1000	300~500
Plastic	100%	40~60%	1000	400~600
Acrylic	30~35%	80%	300~350	800
MDF board	100%	30~40%	1000	300~400
Leather	100%	20~40%	1000	200~400
Metallic lacquer	10~30%	100%	100~300	1000

Cutting Reference Parameters

	APP		Lasergrbl	
Material	Engraving speed	Engraving depth	Engraving speed(mm/min)	Engraving power
Cardboard	25~30%	80~100%	250~300	800~1000
Plywood	15~30%	100%	150~300	1000
Plastic	15~20%	100%	150~200	1000
Acrylic	15~20%	100%	150~200	1000
Leather	25~30%	100%	250~300	1000

Note:

1. The working area can also be set up accordingly to your needs.
2. In the table above, the default engraving speed of APP is 1000mm/min, and the maximum speed can be set to 3000mm/min, and then the engraving depth can be adjusted accordingly.
3. The maximum thickness of the materials cut above shall be controlled within 3mm.
4. When using laser cutting, it is recommended to put a piece of waste wood at the bottom to avoid scratching the base plate or table top.



6. APP Installation & Usage Instruction

6.1 Download and Installation APP

Scan the following QR code to download and install the "IKLESTAR" APP.

Google play

Android

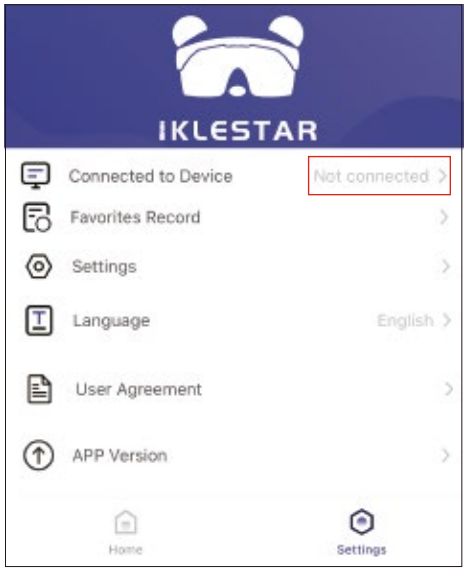
IOS

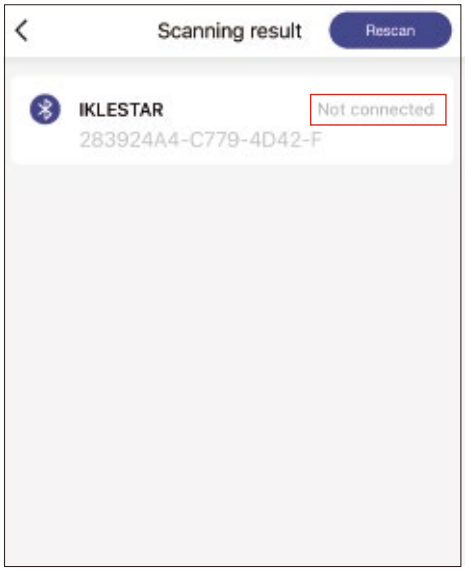
Note:

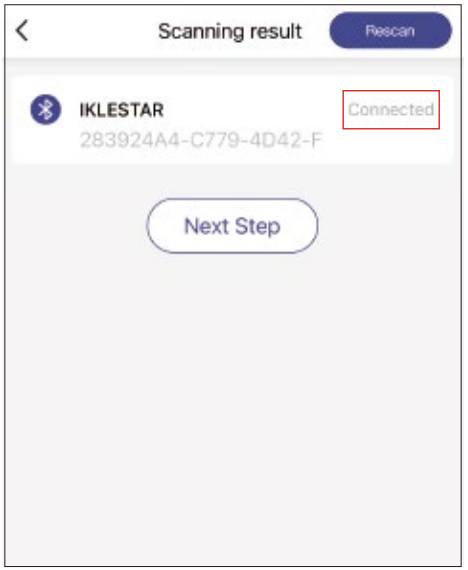
1. Android requires a browser to scan the QR code to download;
2. After successful installation, you need to open the relevant access rights of the software to ensure that the software can be connected and used normally.

6.2 APP Connection

1. Connect the device to the power supply, and press the power switch to start the engraving machine.
2. Enabling the Bluetooth function of the cell phone.
3. Open the "IKLESATR" APP, click "Settings" in the lower right corner, select "Connect Device", and start to automatically search for nearby device signals.
4. Click on "IKLESTAR-XXX" .
5. Wait 1~2 seconds, it will show "Connected", which means the APP has been successfully connected to the machine and can be used normally.





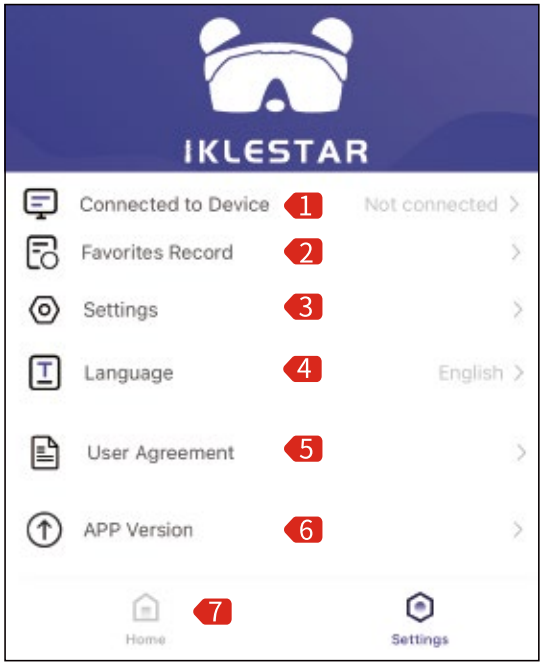


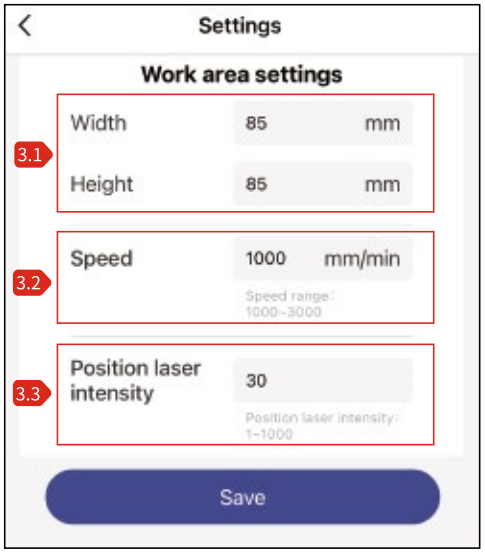
Note:

1. As long as the Bluetooth connection is completed between the mobile APP and the machine, the software on the PC side cannot be used, unless you disconnect the Bluetooth again.
2. Every time you log in to the mobile APP, you need to make a manual connection. The APP does not support automatic Bluetooth connection for the time being.

6.3 Software Introduction

1.Software interface introduction (setting content)





❶ Connected to Device

❷ Favorites Record
Add favorites after each carving, you can view the parameters here, or you can re-carve the history.

❸ Settings

3.1 Scale size setting
Panel travel size
3.2 Engraving speed
Total engraving speed size, speed range from 1000~3000mm/min, in the use of contour cutting function, it is recommended to retain the default speed of 1000mm/min.
3.3 Positioning laser intensity
Intensity range 1~1000, it is recomm -ended to keep the default parameters.

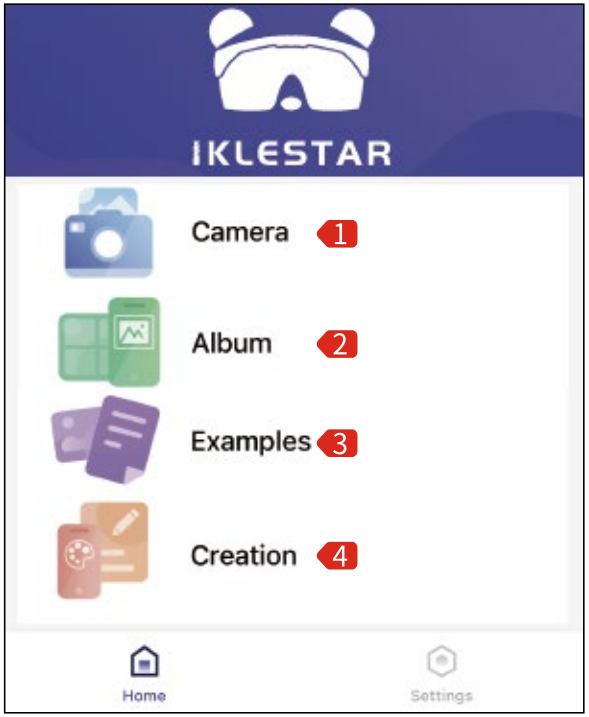
❹ Language
Available in Chinese, Japanese, English, Russian, Spanish, German.

❺ User Agreement

❻ APP Version
View the current version

❼ Home
Click on the bottom left corner to go back to the home .

2.Software interface introduction (home page content)



❶ Camera

Take pictures by your camera

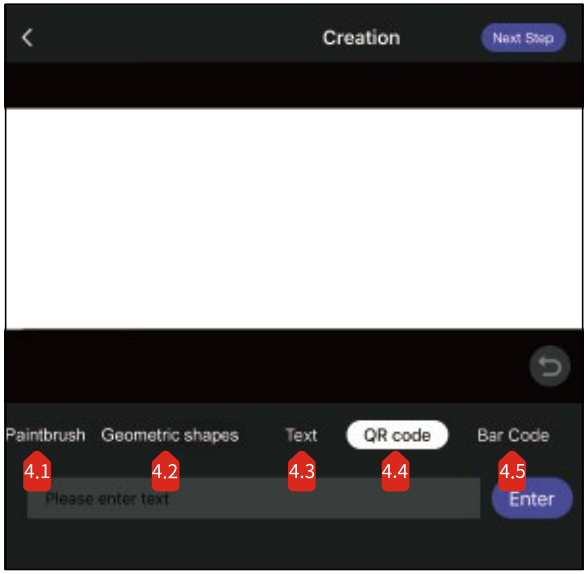
❷ Album

Load pictures from albums

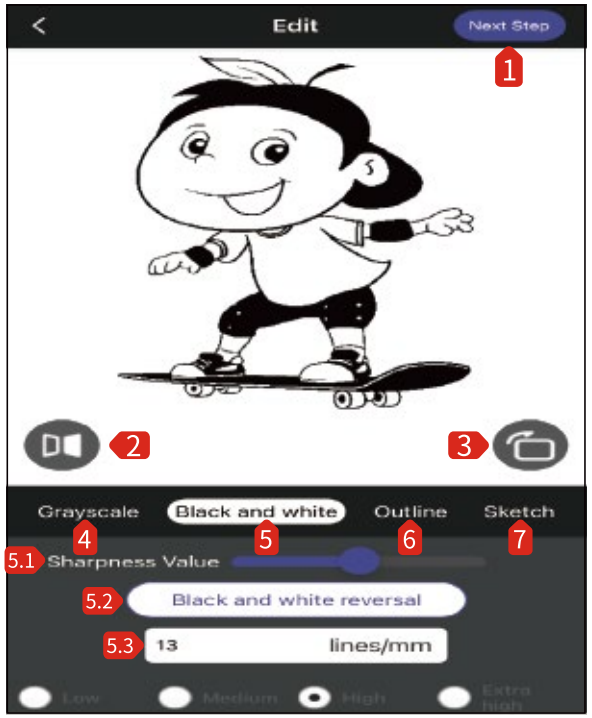
❸ Example

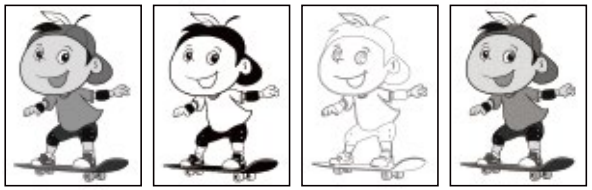
❹ Creation

4.1 Paintbrush
4.2 Geometric shapes
4.3 Text
4.4 QR code
4.5 Bar code



3.Software interface introduction (edit content)
Path: Album -> Edit





Grayscale Black and White Outline Sketch

❶Next Step
Click "Next Step" to enter the engraving Settings interface.

❷Mirroring
Left and right mirror image

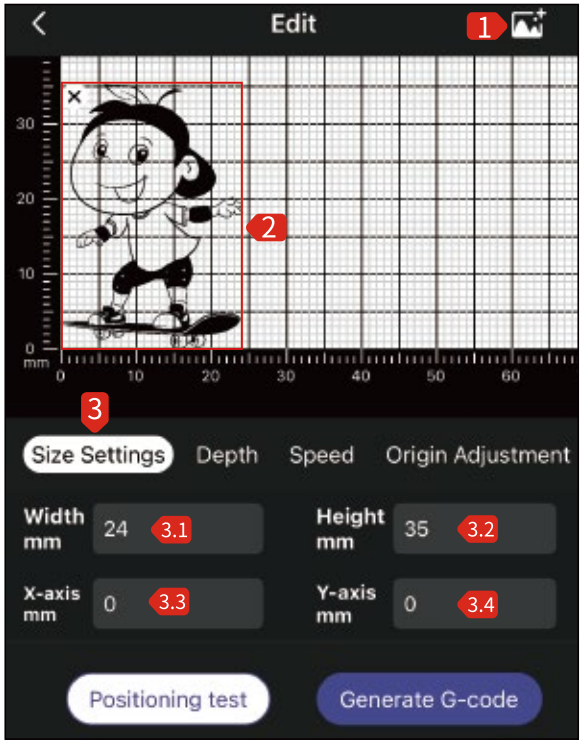
❸Rotation
Can be rotated 90 degrees, 180 degrees or 360 degrees at will.

❹Grayscale map
Grayscale mode, engraving photos with this function, you can adjust the resolution of the picture gray tone processing.

❺Black and white drawing s
Image black and white processing
5.1 Sharp value
Display image edge sharpness
5.2 Black and white reversal
Invert the black and white color of the image
5.3 Resolution
The resolution of the engraving image

❻Outline
In cutting mode, wireframes are used for cutting.

❼Sketch
Sketch mode, enhance the picture line outline three-dimensional sense.



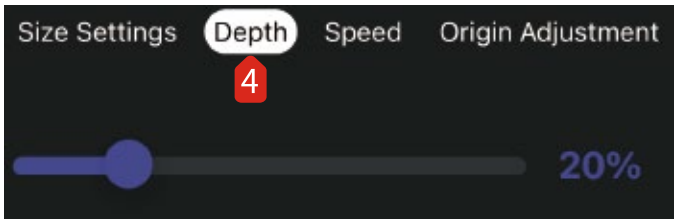
❶Overlay function
Multiple image engraving can be achieved

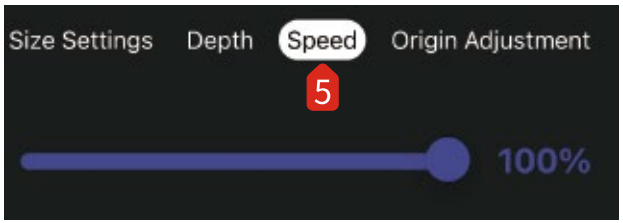
❷Drag and drop images
Moving engraving position

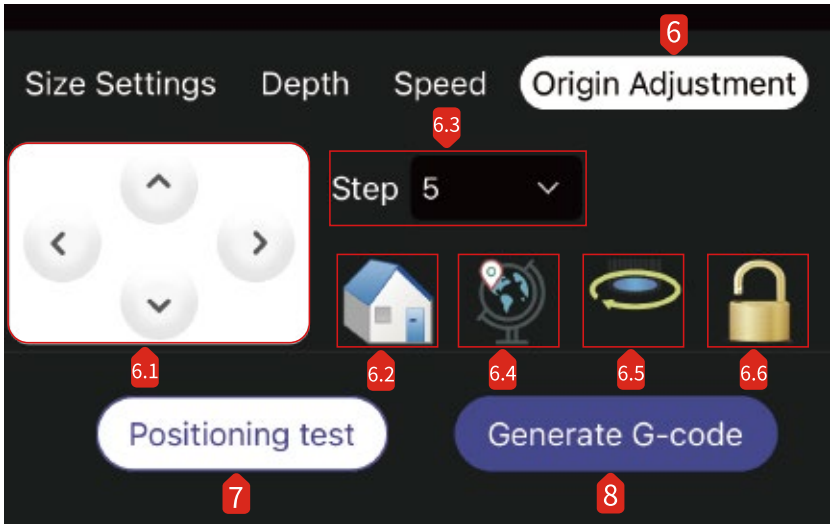
❸Set Size
3.1 Set engraving width
3.2 Set engraving height
3.3 Setting the X-axis
3.4 Setting the Y-axis

❹Engraving depth
Set the power (0~100%)

❺Engraving speed
Set the engraving speed (0~100%)







❻Home point adjustment

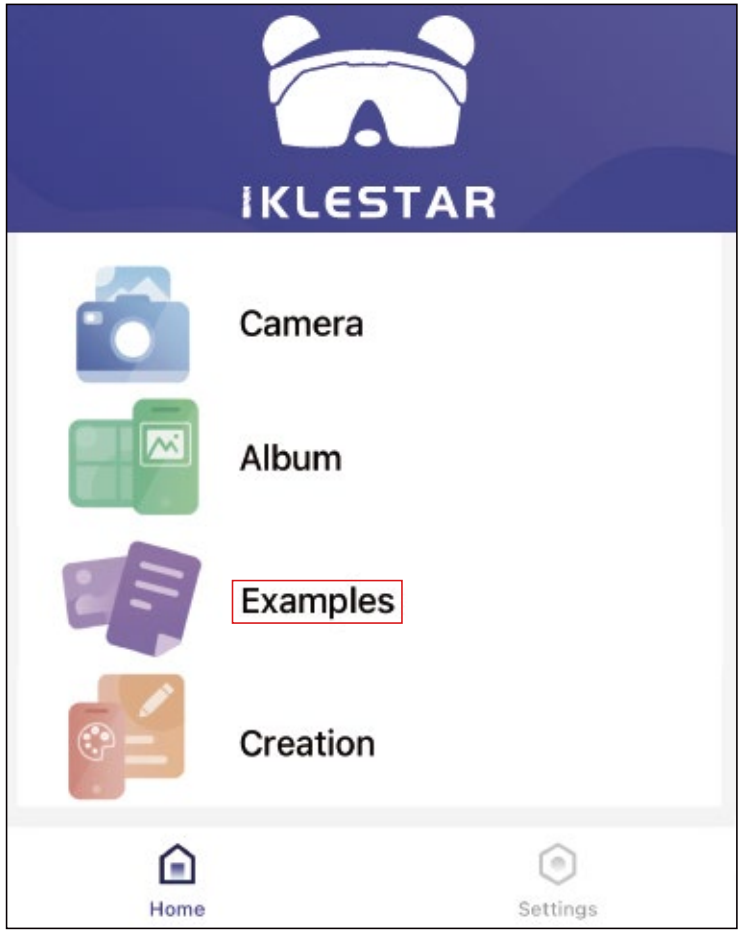
6.1 Can control XY axis direction
6.2 Return to machine origin
6.3 Setting the number of steps
Distance per step of machine movement, in mm (0.1~50)
6.4 Zeroing
6.5 Turn on the laser
6.6 Unlocking

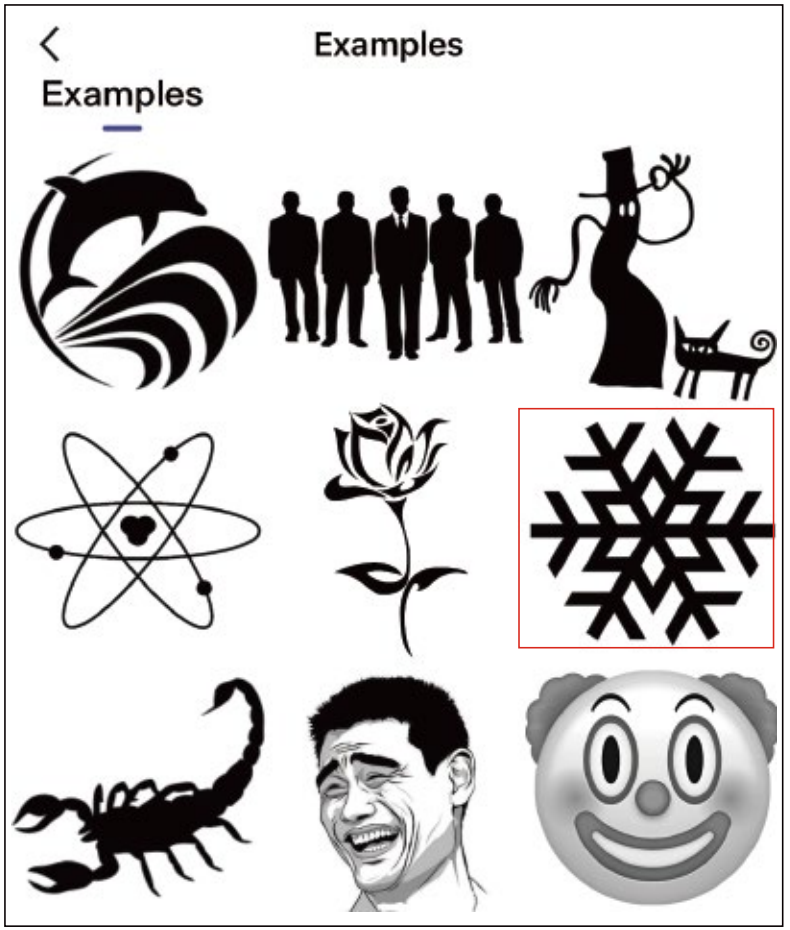
❼Positioning test
Preview engraving position

❽Generate G-code
Convert images to gcode format format

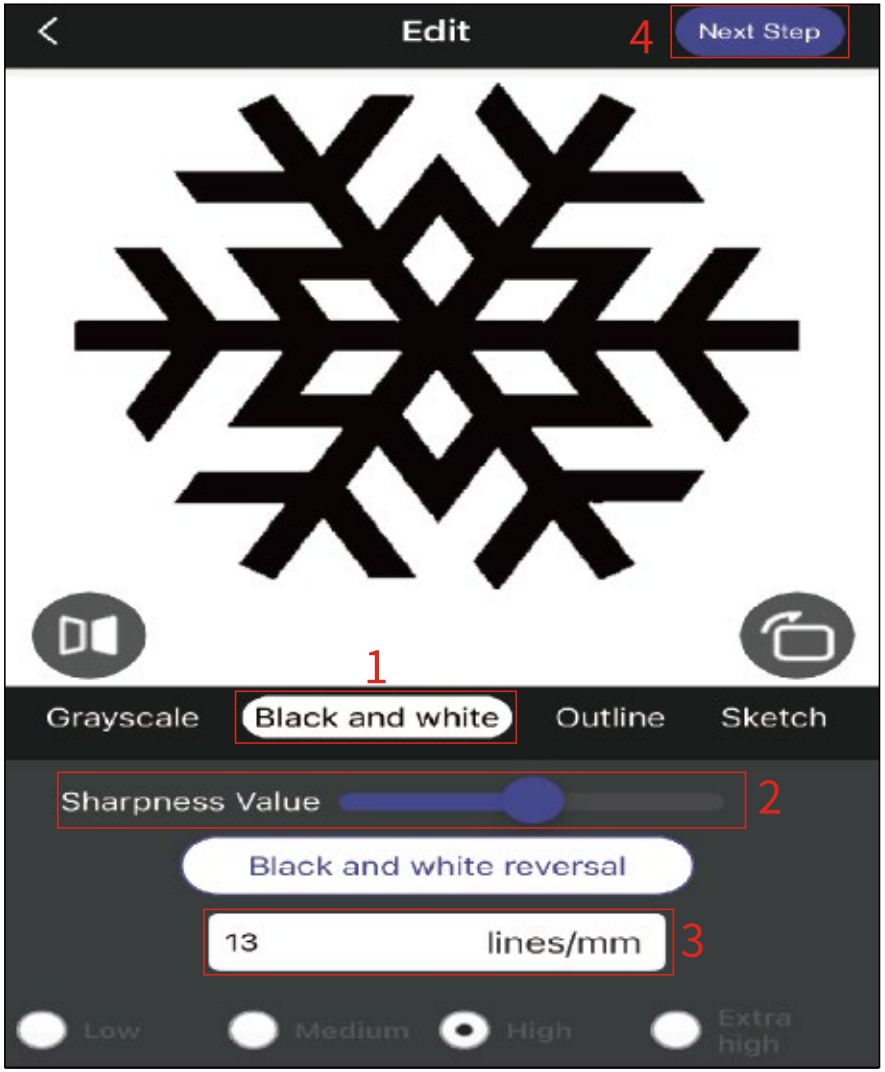
6.4 Test Items

Take engraving black and white mode as an example.
1.Select "Home", click "Material", and select a picture at will.

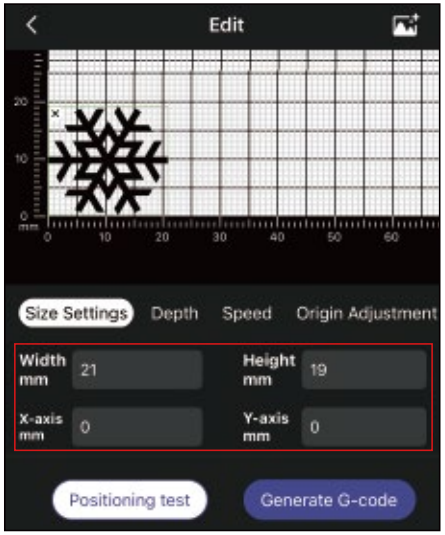


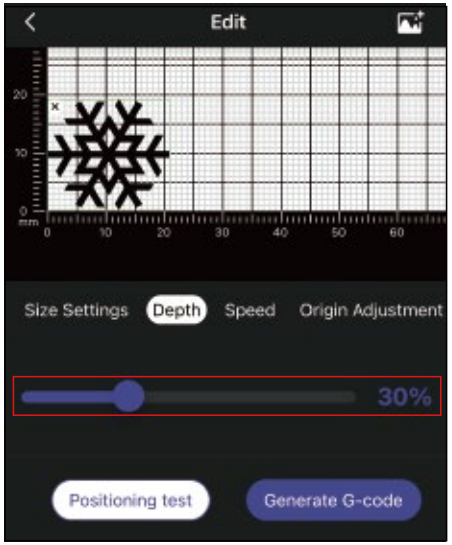


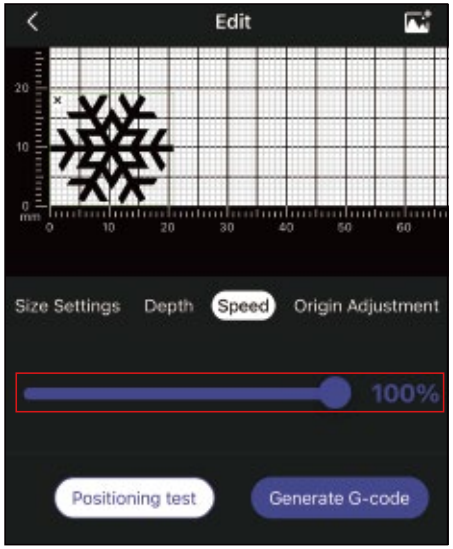
2. Select "Black and White", then click "Sharpness", pull to the appropriate value, followed by clicking "Resolution", select 13, and finally click "Next Next".



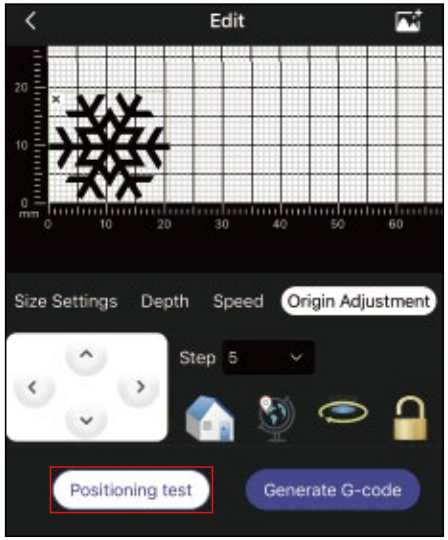
3.Set the picture size "21*20mm", the engraving depth "30%" and the engraving speed "100%".





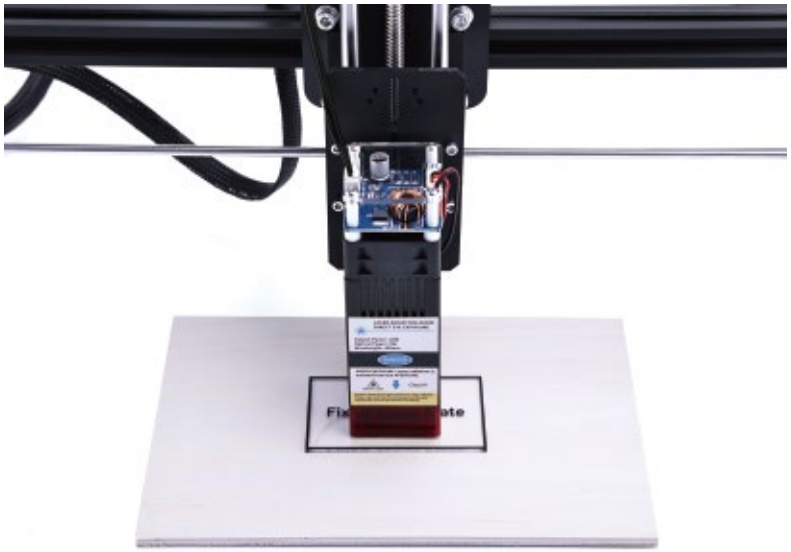


4.Click the "Position Test" button to preview the location.

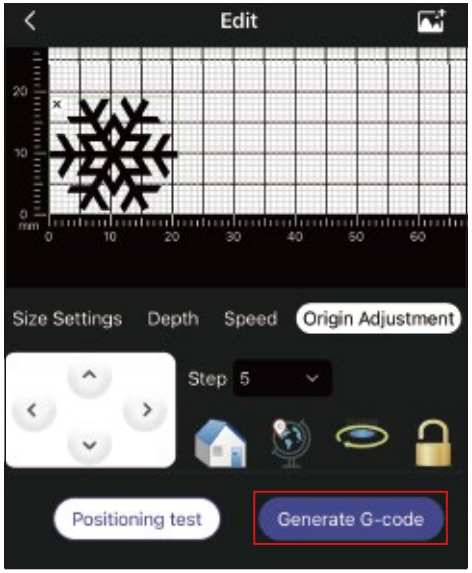


5. Adjust the laser module focus

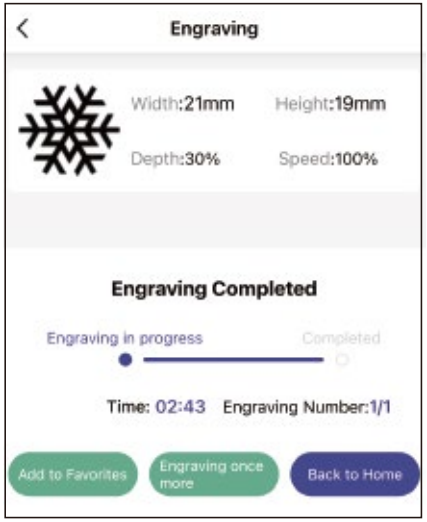
Use a 2mm focus plate to assist in focusing (as shown below), when the laser module just touches the focus plate, remove the focus plate to complete focusing.



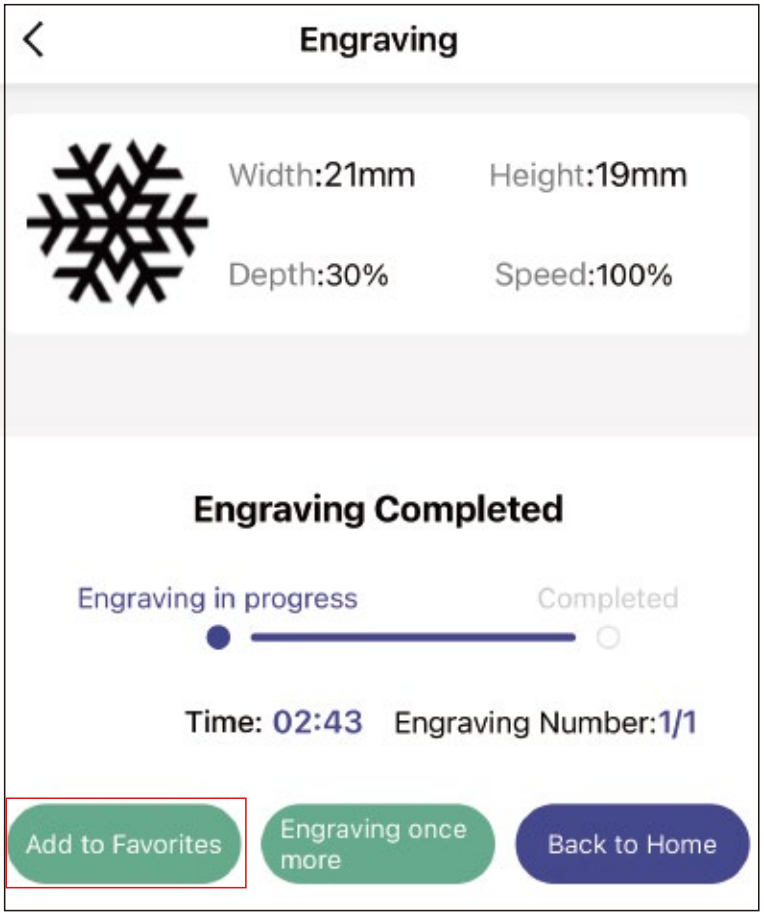
6. Click on "Generate G-Code".

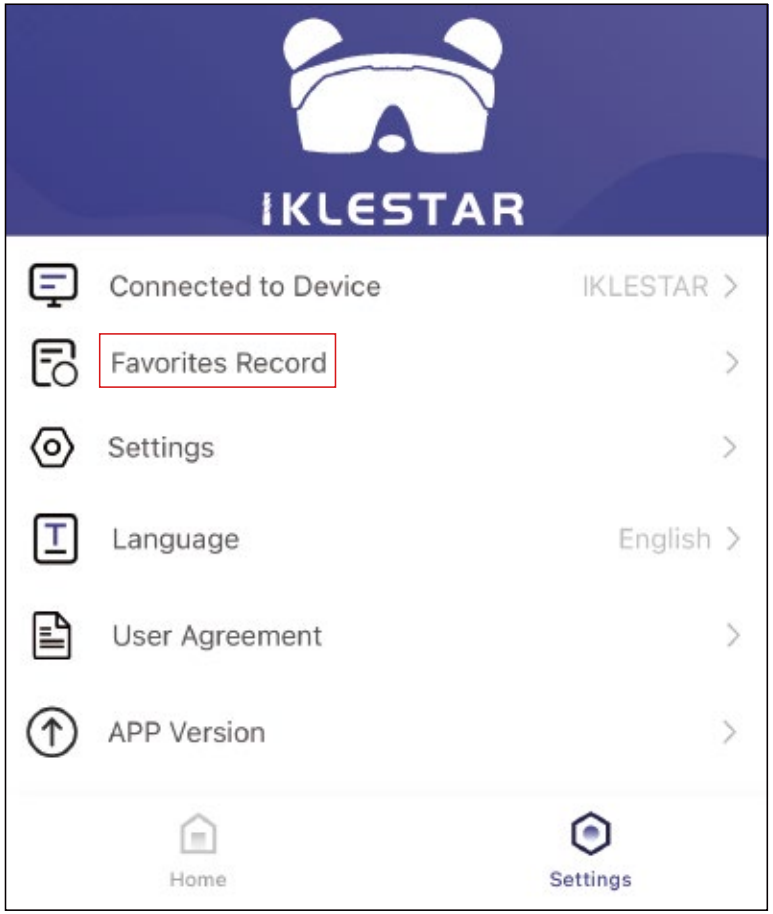


7. Finally, click "Start Engraving", as shown in the figure below.



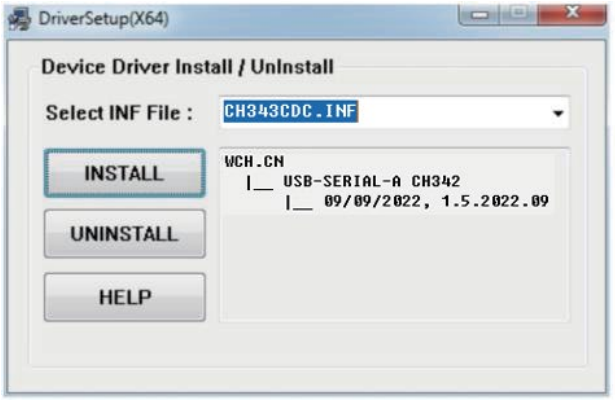
Note: After the engraving is finished, you can click the "Add to Favorites" button, which can be viewed in the "Favorites Record" next time, as shown in the picture below:

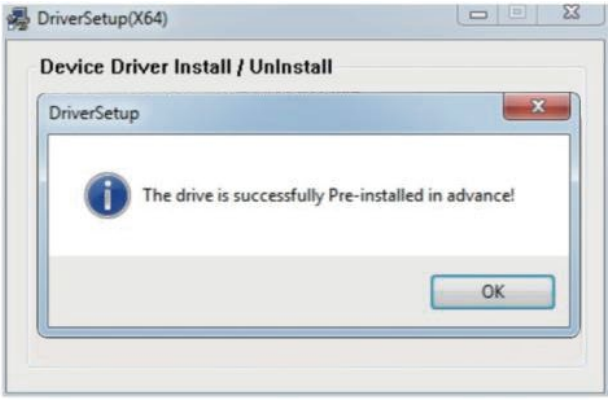




7.1 Installing the driver

You can find the CH34 driver on the U disk and install it.
Windows version path: Software→Driver→Windows→CH343CDC.exe
MAC version path: Software→Driver→Mac→Ch34xVCPDriver.pkg



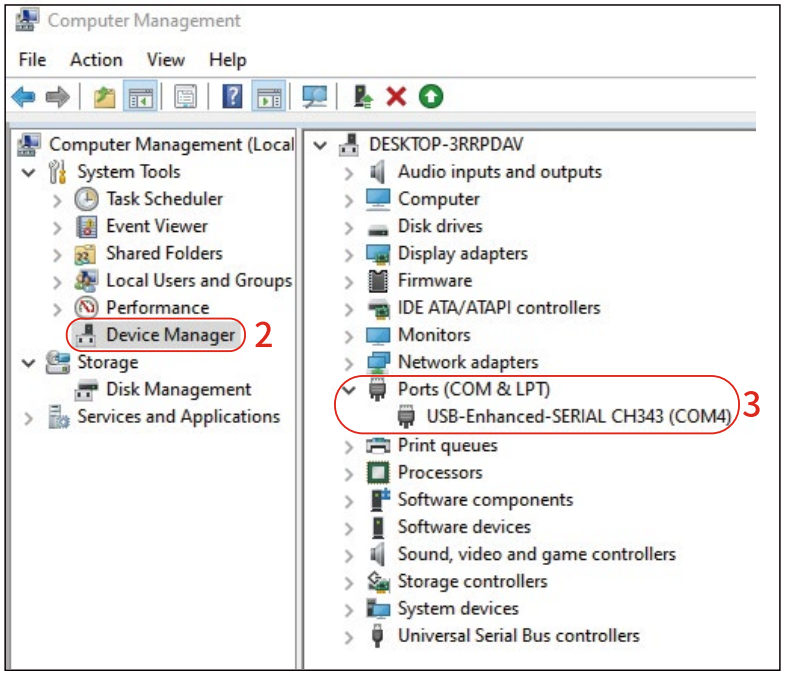


7.2 Find the Machine COM Port

Windows XP: Right click "My Computer", select "Manage", and click "Device Manager".

Wind7/8/10/11: Click "Start" → right click "Computer" → select "Manage", and select "Device Manager" from the left pane. Select "Device Manager" from the left pane. In the tree, expand "Ports" (COM & LPT).

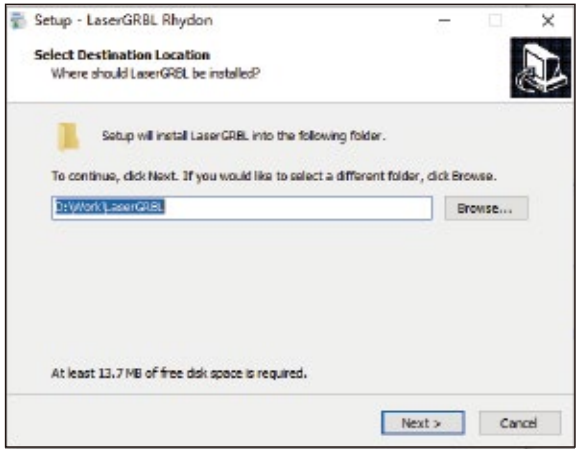
Your machine will be a USB serial port (COMX), where "X" indicates the COM number, e.g. COM12.
If there are multiple USB serial ports, right click on each one and check the manufacturer, the machine will be "CH340".

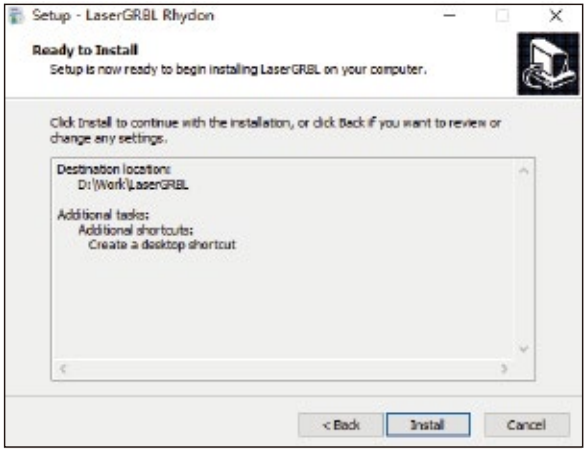


Note: A USB cable is required to connect the control board to the computer in order to see the port number.

7.3 Installing Lasergrbl

Open the U disk (Software → Lasergrbl.exe), click Lasergrbl.exe to Install, select the installation path, and follow the instructions to complete the installation.





Note: Depending on your needs, you can also upgrade Lightburn software for a fee, which is also a good option.

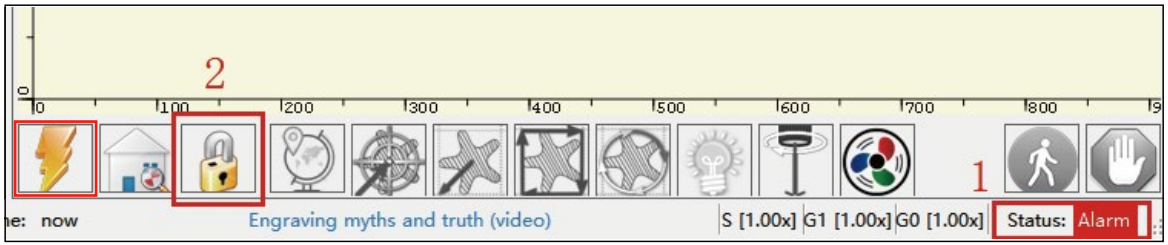
7.4 Connection Software

Double-click to open the Lasergrbl software, then select the correct COM and Baud(115200) and click the "3" Connect button. As shown in the picture below:

- If the connection is successful, the control window prints "Grbl 1.1f['$'for help]".
- If the port is selected incorrectly, no message will be returned.

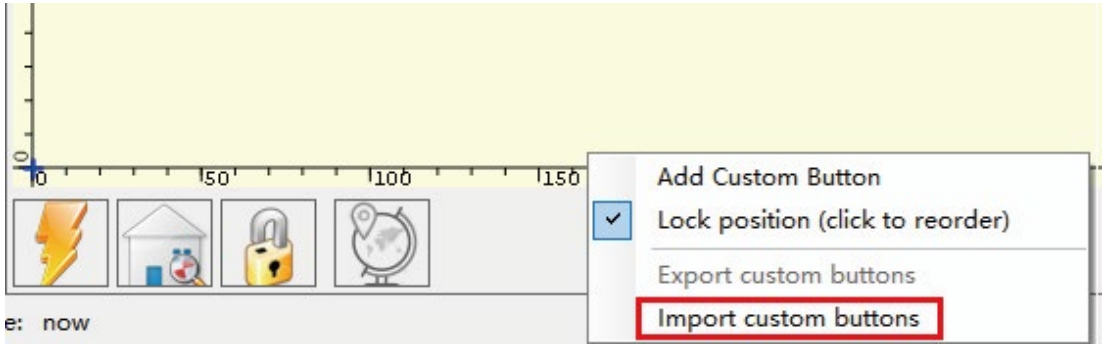
Note:

1. If you successfully connect to the software, a red "Alarm" will appear in the Status at the bottom right corner of the software interface, you need to click the "Grbl Unlock" button or the reset button on the control panel.
2. If the machine encounters a limit switch and a red "Alarm" appears in the Status in the bottom right corner of the software interface, you need to click the reset button on the software first, and then click the "Grbl Unlock" buttonOr the reset button on the control board.



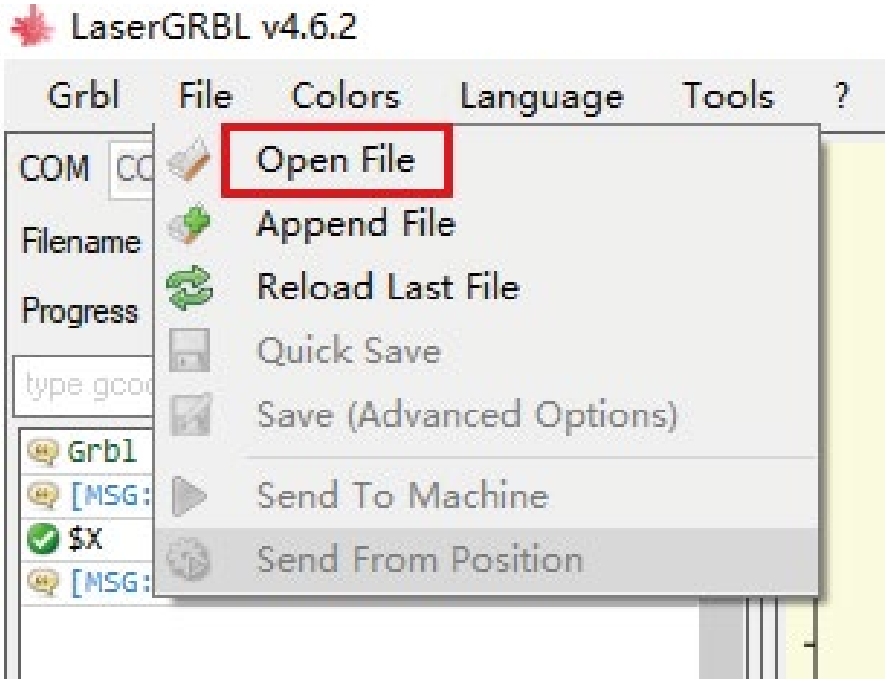
7.5 Add Custom Button

As shown in the figure, right-click in the blank area of the toolbar and choose "Import Custom buttons". Find the Custombuttons. gz" file in the USB drive and click "Ok" to complete the addition.

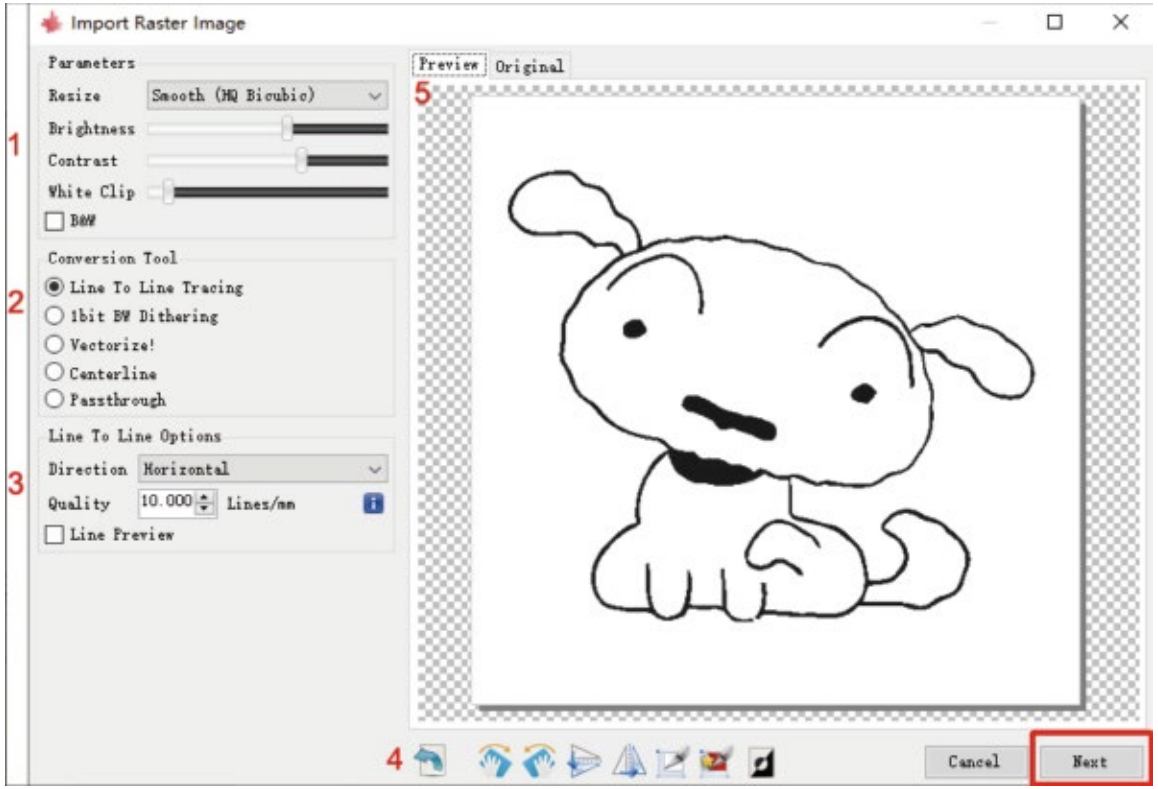


7.6 Image Import

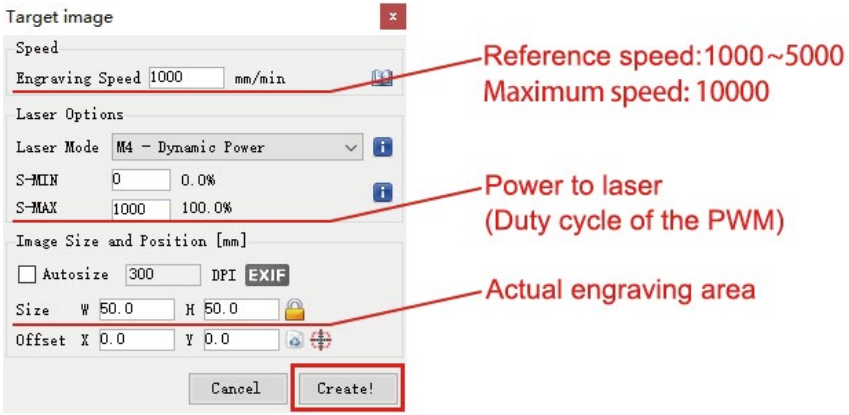
Select File on the menu bar and click Open File in the drop-down list box to import images in PG,PNG, or BMP and laserGRBL willautomatically convert the images into the corresponding Gcode instructions without using other software.

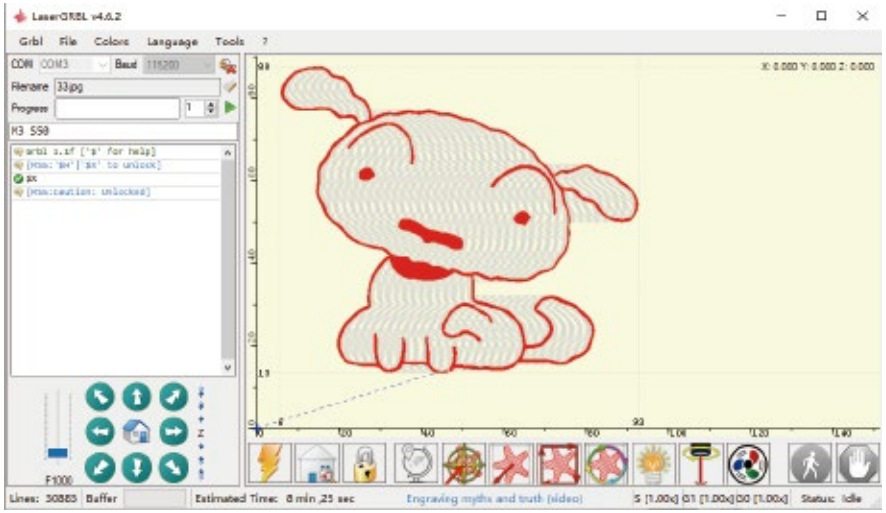


1. Parameters: Transform the original image in grayscale or black and white.
2. Conversion tool: Choose between tools suitable to various types of images.
3. Line To Line: For grayscale PWM pictures.
4. Dithering: For grayscale dithering technique.
5. Vectorize: Produce the best result with logo and hand-drawn images.
6. Tool options: Contain a specific set of parameters for each different import tool.
7. Rotate, crop, and flip tools.
8. Image preview and original image tab.



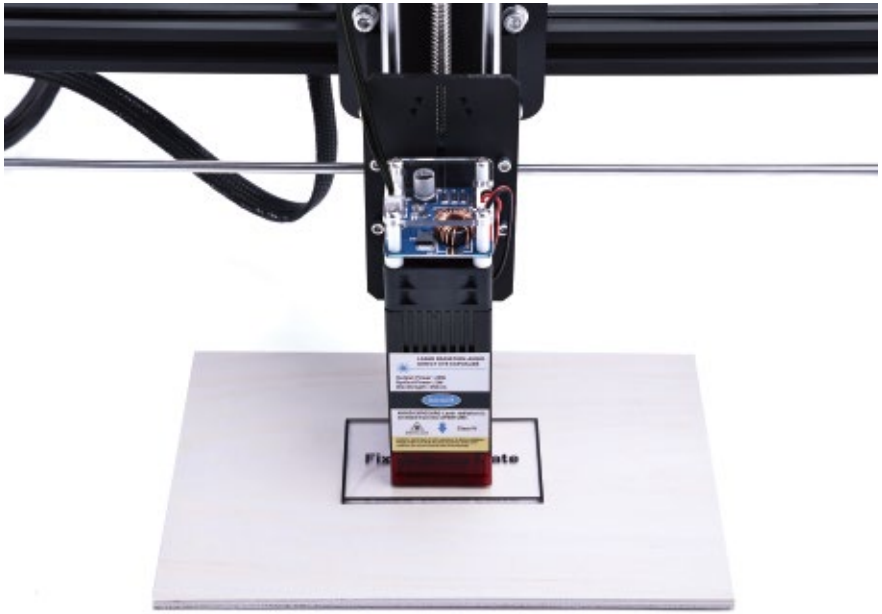
Speed (Max 10000) andmower (Max 1000) are set depending on the mode and carving material.
In engraving mode, the speed between 300 and 3000, power between 500 and 800.
In cutting mode, the speed between 50 and 300, power between 900 and 1000 are recommended.





7.7 Adjust the Laser Module Focus

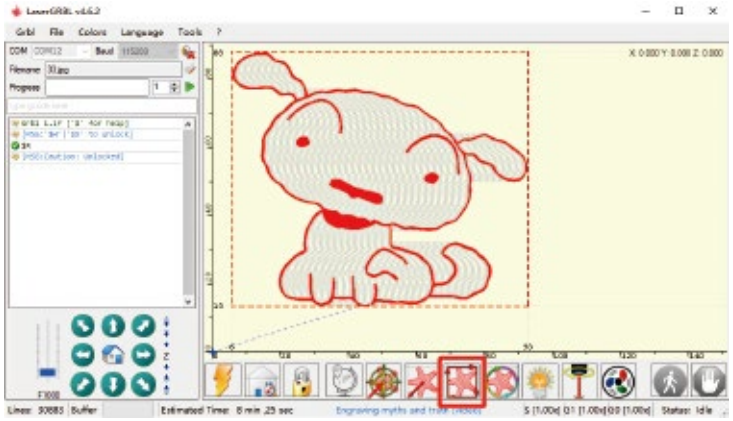
Use a 2mm focus plate to assist in focusing (as shown below), when the laser module just touches the focus plate, remove the focus plate to complete focusing.



7.8 Open Laser Module and Preview

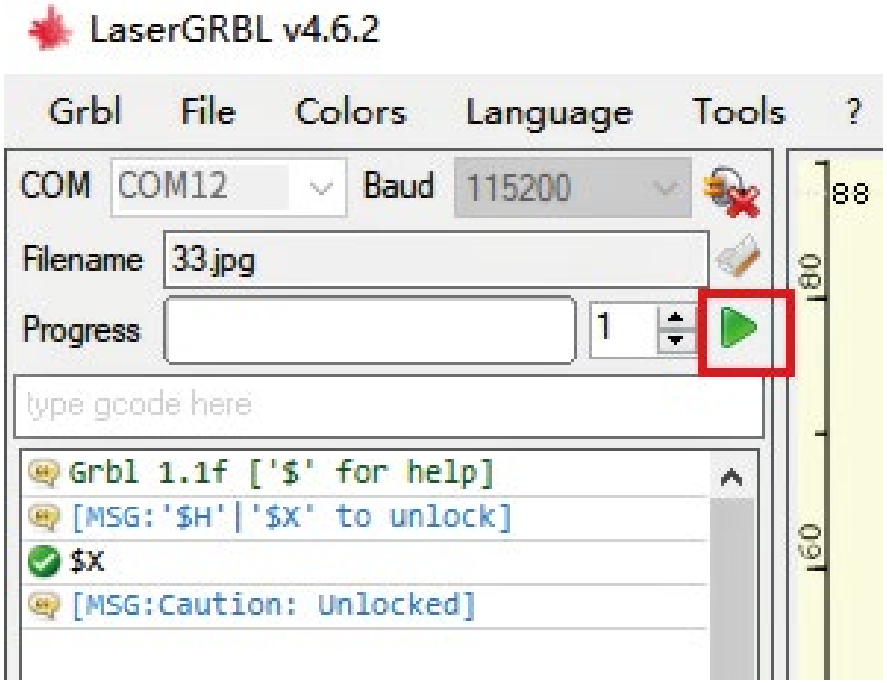
1. Click the "Turn on laser for Focusing" icon in the toolbar (as shown in the figure below) to turn on the laser.

2. Preview the workspace by clicking the "Framing" icon in the toolbar, as shown below.



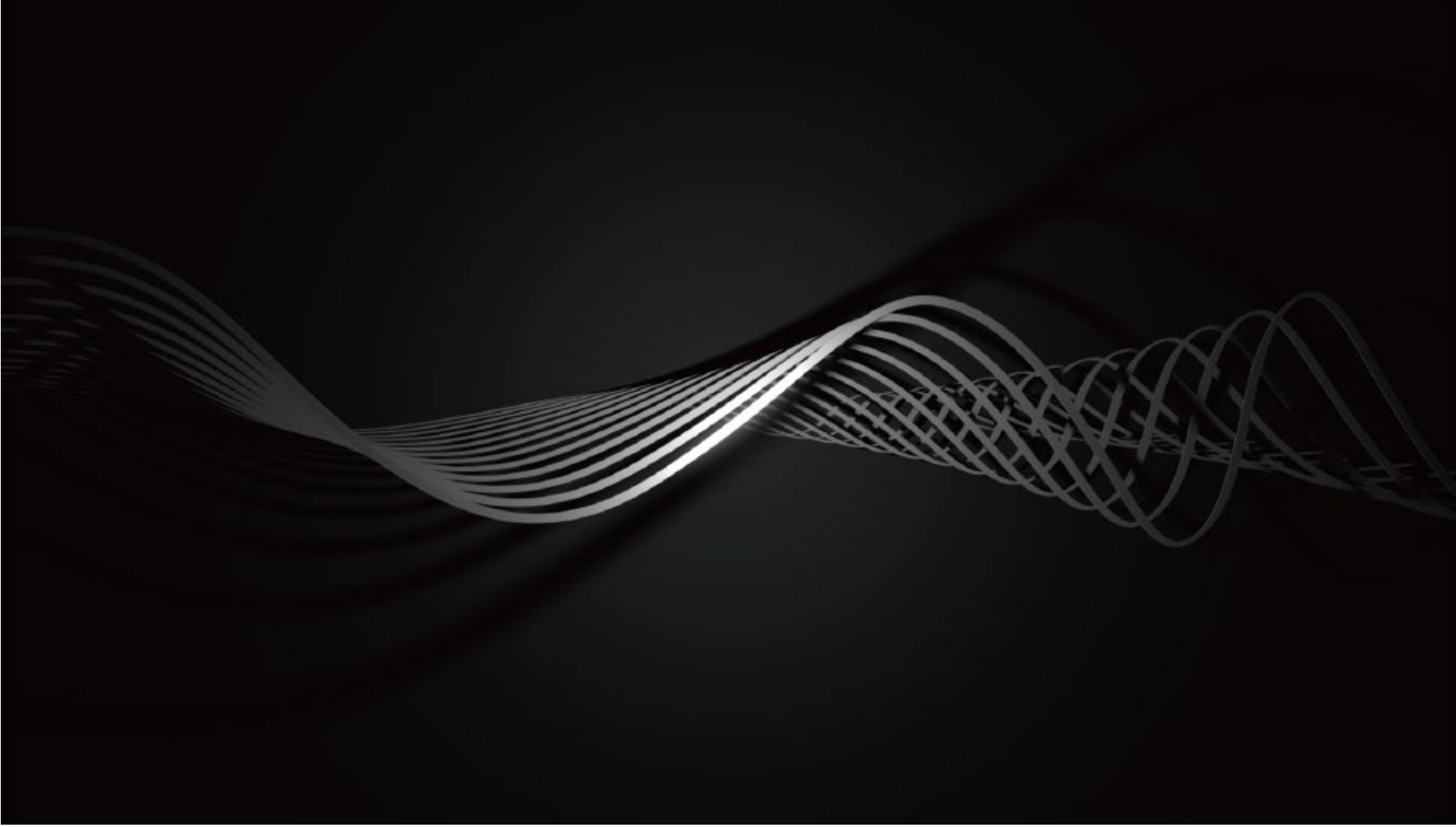
7.9 Start

Click on the green "Play" icon in the upper left corner of LaserGRBL to start the Program.



Tips

LaserGRBL is an open-source, easy-to-use, and powerful software, but only supports Windows (Win XP / Win 7 / Win 8 / XP / Win 10).

For Mac users, of course, you can choose LightBurn, which is also an excellent engraver software and also supports Windows, but you have to pay $40 for it.

For more information about laser software, please visit:
Official website of LaserGRBL: https://lasergrbl.com/
Official website of LightBurn: https://lightburnsoftware.com/