Nano Laser Engraver User Manual V1.0

Shenzhen Longer Technology Co., Ltd.

Dear customer:

Thank you for choosing LONGER products **Nano laser engraver**.

Maybe you are familiar with the engraving machine or have bought a similar engraving machine before, we still highly recommend that you read this manual carefully. The installation techniques and precautions in this manual can help you avoid any unnecessary damage or frustration.

More information please refer to:

1. Please contact us via email: support@longer.net
2. Technical support: (+1)888-575-9099
3. Facebook ID : Longer Global
4. Facebook ID : Longer Nano Official Group
5. YouTube channel: Longer Official

Content

A. Safety Precautions

(1) The **Nano** engraves and cuts materials by the means of a high-energy diode laser beam.

The hazards associated with a high-energy diode laser beam include the possibility of fires, generation of hazardous and/or irritating toxic fumes, but more importantly damage to eyes and skin.

(2) Laser engravers are divided into several internationally valid classes based on their performance and the risk of injury. The **Nano** falls into the Class IV (Class 4 IEC standard focus on the American 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 any period of time less than or equal to $1x10^3$ seconds but is considered a chronic viewing hazard for any period of time greater than $1x10^3$ seconds.
Class II	Class II laser radiation is considered a chronic viewing hazard.
Class IIIa	Class IIIa laser radiation is, depending upon the irradiance, either an acute intrabeam viewing hazard or chronic viewing hazard. If viewed directly with optical instruments, Class IIIa laser radiation is classified as an acute viewing hazard.

Class IIIb	Direct Class IIIb laser radiation is considered an acute hazard to the skin and eyes.
Class IV	Class IV laser radiation is considered an acute hazard to the skin and eyes from both direct and scattered radiation.

The high energy laser beam can cause severe eye damage, including blindness and serious skin burns.

Improper use of the controls and modification of the safety features may cause serious eye injury and burns.

Please wear Personal Protective Equipment (PPE, Safety Glasses are designed to filter specific ranges of laser wavelength. The **Nano** Safety Glasses provided are specific for LONGER Laser Module;) when using the machine.

- DO NOT look directly into the laser beam.
- DO NOT aim the laser beam at reflective surfaces.
- DO NOT operate the laser without PPE protection for all persons nearby in the proximity of the **Nano**.
- DO NOT allow unsupervised access to the **Nano** to children.
- DO NOT allow access near the **Nano** to pets.

- 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, and at the same time, the door of the room has a sealing effect, and the windows have curtains, to effectively avoid looking directly at the laser beam and some smoke and steam , Particles, and other highly toxic substances. At the same time, you can pay attention to the LONGER products (cover) in the follow-up.

(4) The high-energy diode laser beam can produce extremely high temperatures and significant amounts of heat as the substrate material is burned away while engraving and cutting. Some materials are prone to catch fire during cutting operations creating flame, fumes, and smoke.

(5) It is strongly recommended that a Fire Extinguisher should be located within proximity to the **Nano**. Extinguishers should be halogen or multi-purpose dry chemical. Alternatively, or in conjunction with the Fire Extinguisher it is recommended a “Fire Extinguisher Ball” is positioned beside the **Nano**.

- DO NOT use materials that are highly flammable, explosive or produce toxic by-products.
- DO NOT remove material from the cutting bed before it has cooled.
- **DO NOT leave the Nano operating unattended.**
- ALWAYS clean up clutter, debris, and flammable materials in the laser **Nano** bed after use.

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

(7) Environmental requirements

Temperature requirement: 10°C~30°C, humidity requirement: 20%~50%, this **Nano** laser engravers can work normally within this range; beyond this range, this laser engravers will be unable to achieve the best engraving results.

(8) Below a list of some of the most known hazardous materials that the user SHOULD NOT attempt to engrave or cut on. If a material is not in this list, do not consider it to be safe to use. Obtain the

Safety Data Sheet (SDS) from the material's manufacturer when handling unknown materials.

Material	Reason to avoid engraving / cutting it
PVC (Poly Vinyl Chloride)	PVC will emit Chlorine gas when laser cut, or laser engraved. This toxic gas can ruin the optics and motion control system of the laser engraver, in fact, engraving or cutting PVC is a sure way of voiding the warranty of your laser engraver
Lexan / Thick Poly-carbonate	Lexan not only cuts poorly but it also catches on fire very easily. The window of the laser engraving machine is usually made from polycarbonate because it does a very good job of attracting infrared radiation., which is the frequency of light the engraver uses when cutting and engraving materials. This makes the laser cutter quite ineffective in cutting polycarbonate materials
ABS	ABS melts upon exposure to a laser beam as opposed to vaporizing which would be the ideal reaction needed for laser engraving. Instead of leaving a crisp image, ABS will melt and leave a gooey deposit on the surface.
HDPE	HDPE melts and catches on fire easily upon exposure to a laser beam.
Polystyrene Foam	Only very thin pieces can be laser cut but for the most part, polystyrene catches on fire and melts when exposed to a laser beam

Fiberglass	Fiberglass is made from two materials: glass and epoxy resin. The best method of marking glass is etching while epoxy resin can emit toxic fumes upon laser engraving. These two reasons make fiberglass a bad choice for a laser engraving material
Polypropylene	polypropylene melts and catches on fire easily and then the melted material continues to burn thereby forming pebble-like drips that harden on the surface
Coated Carbon Fiber	Coated carbon fiber emits noxious fumes. Additionally, carbon fiber can be cut albeit with some fraying but this is not the case when it is coated.

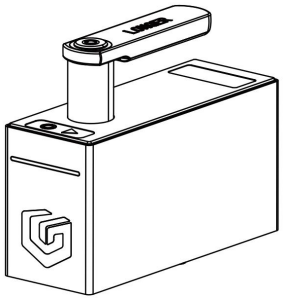
(9) The **Nano** has built in technology and algorithms to keep its users and the surrounding environment safe. This said it is important to understand the **Nano** is not a toy and should be operated with care and respect.

B. Product Information

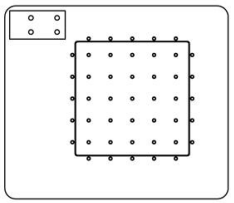
1. Product Specification

Features		Features	
Model	Nano	Laser Power	6W
Laser Source	One diode laser with FAC	Laser Wavelength	450nm
Working Area	100*100mm	Cutting Depth	6mm
Resolution	3.3K	Engraving Precision	0.05mm
Engraving Speed	2200mm/s	Preview Speed	17000mm/s
Support Format	jpg, bmp, png, dxf, svg, ai, tiff, etc	Lifespan	10000+H
Warranty Period	One year	Preview Mode	Outline preview
Engraving Angle	0~360°	Material of Machine	Aluminum alloy
Connection	WIFI, USB, APP	Safety Certifications	CE; FCC; FDA; RoHS
Support Systems	Windows; MAC; Linux	Product Volume	205mm*179mm*249mm
Gross Weight	3.9kg	Net Weight	2.55kg
Continuous Working Hours	More than 7 hours		
Power Adapter	AC Input 100-240V 50/60Hz 1.7A DC Output 12V-4A 48W		
Applicable Materials	engraving or cutting on wood, acrylic, leather, cloth, metal, ceramics, etc		
Support Languages	German; Portuguese; French; English; Italian; Spanish; Japanese		

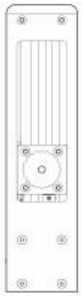
2. Product Accessories List



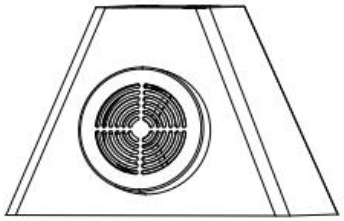
Laser unit



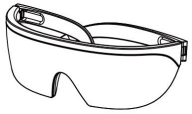
Base plate



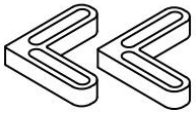
Electric lifting bracket



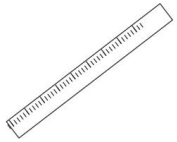
Protective cover



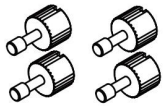
Goggles



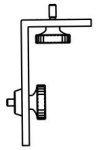
L-shaped Positioning piece



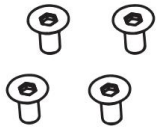
Ruler



Thumb screws

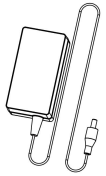


Mounting bracket

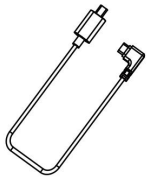


M4x8 Screws

H2.5 Allen wrench



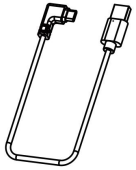
Power adapter



Double type-c cable

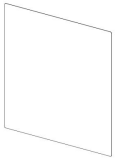
Card reader

TF card



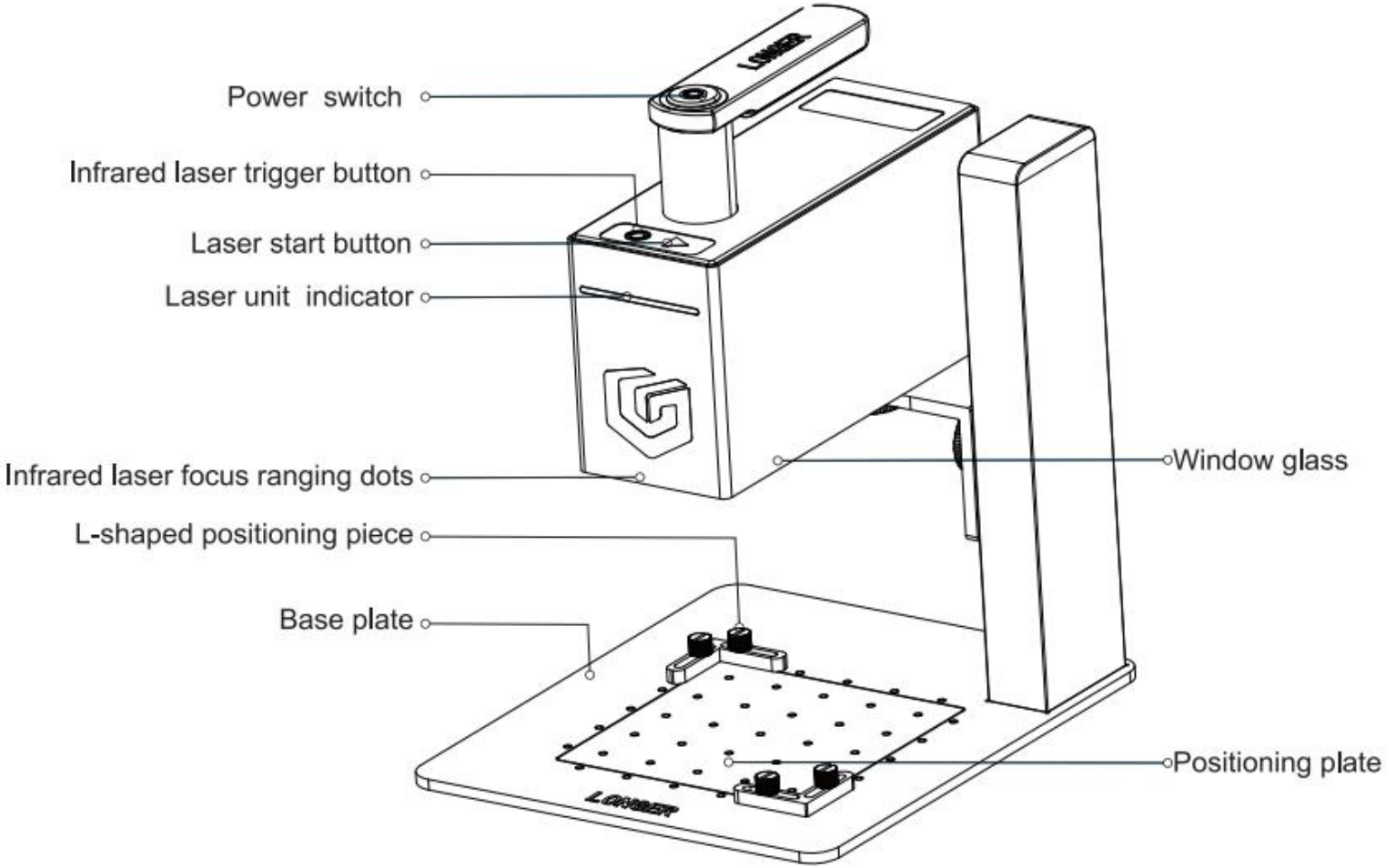
Data cable

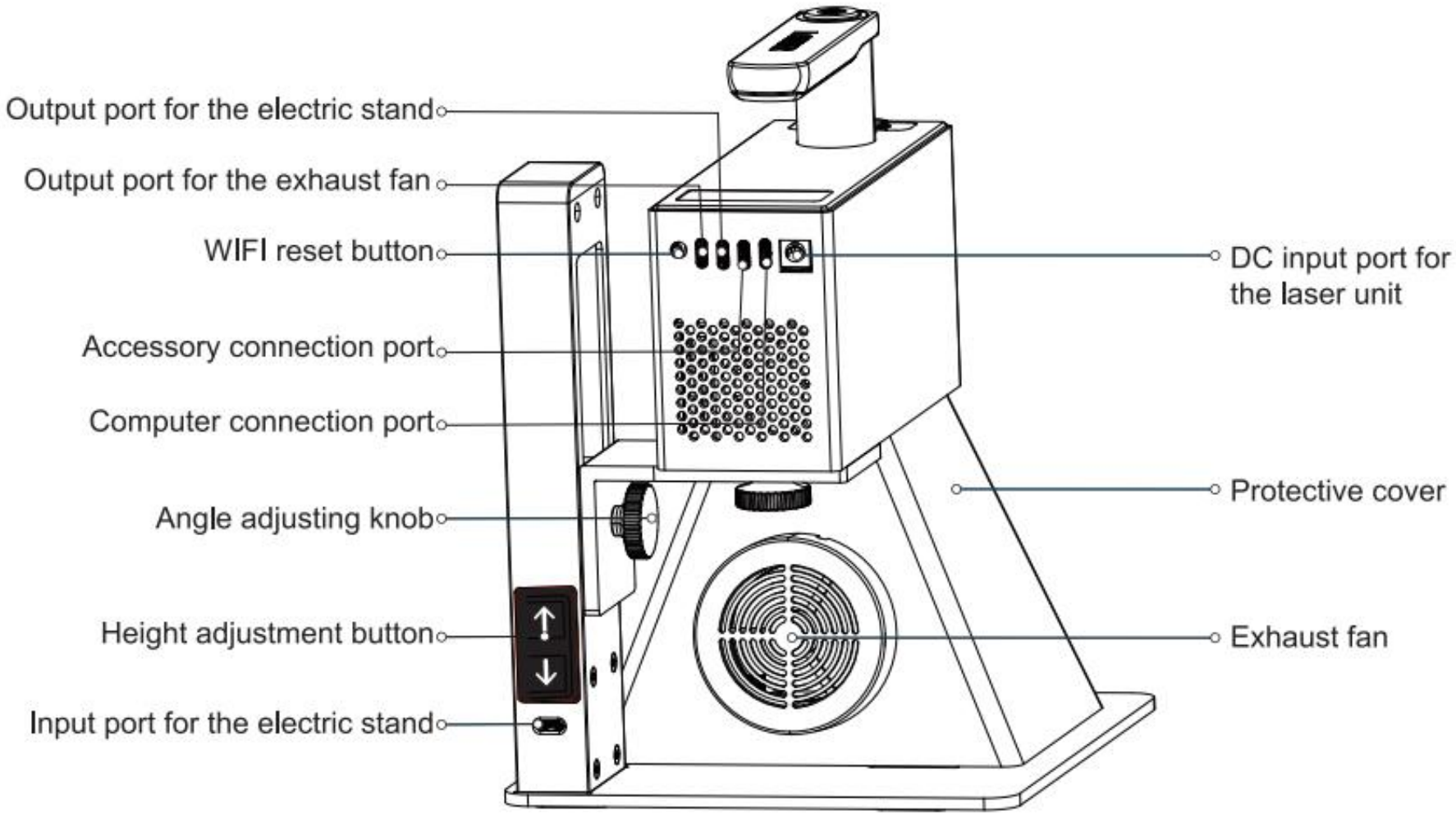
Consumables



Glasses cloth

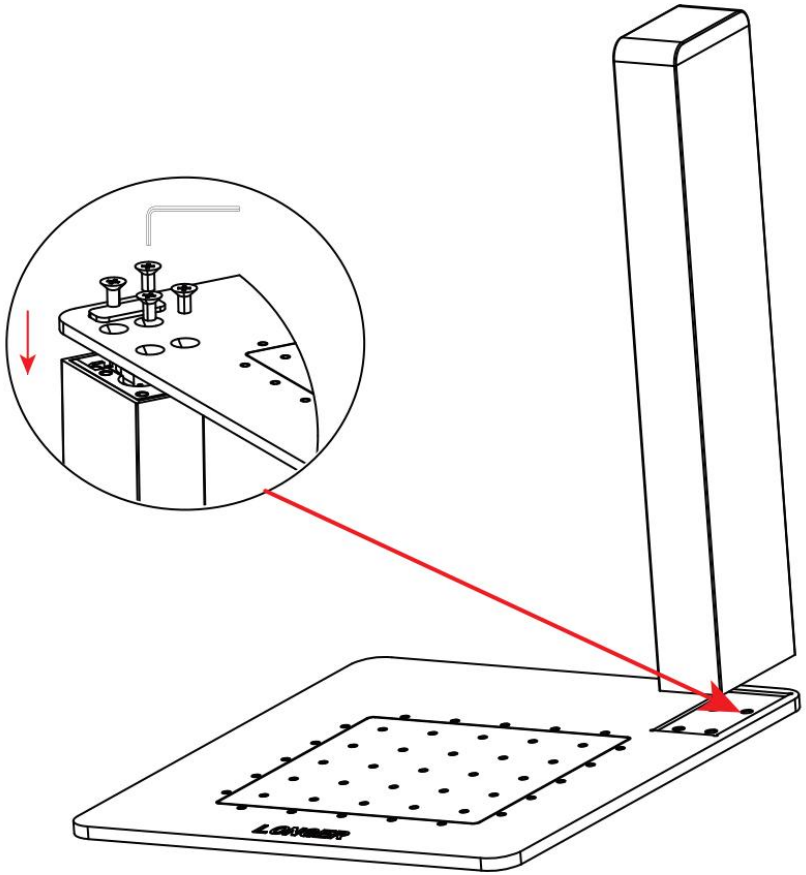
3. Product Instruction




Output port for the electric stand
Output port for the exhaust fan
WIFI reset button
Accessory connection port
Computer connection port
Angle adjusting knob
Height adjustment button
Input port for the electric stand
DC input port for the laser unit
Protective cover
Exhaust fan

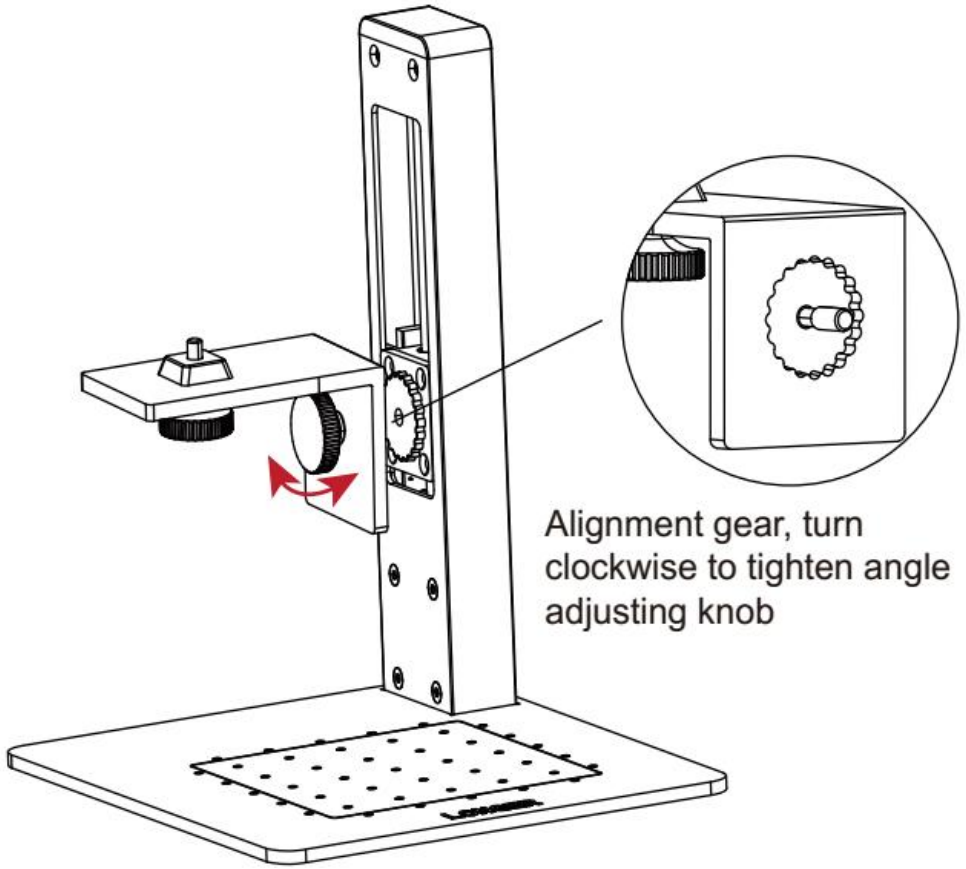
C. Quick installation

1. Electric lifting bracket assembly



1) Attach the electric lifting bracket to the base plate using the wrench and 4 M4x8 screws.

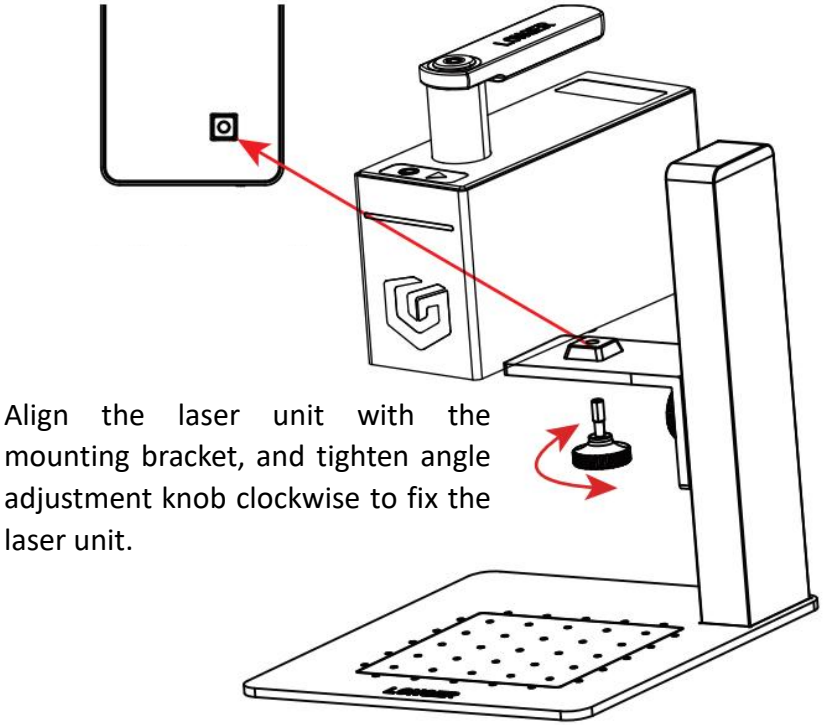
When taking out the bracket, be careful that the movable base plate is not fixed on the base. The movable base may fall off the bracket.



2) Attach the mounting bracket to the electric lifting bracket using the angle adjusting knob.

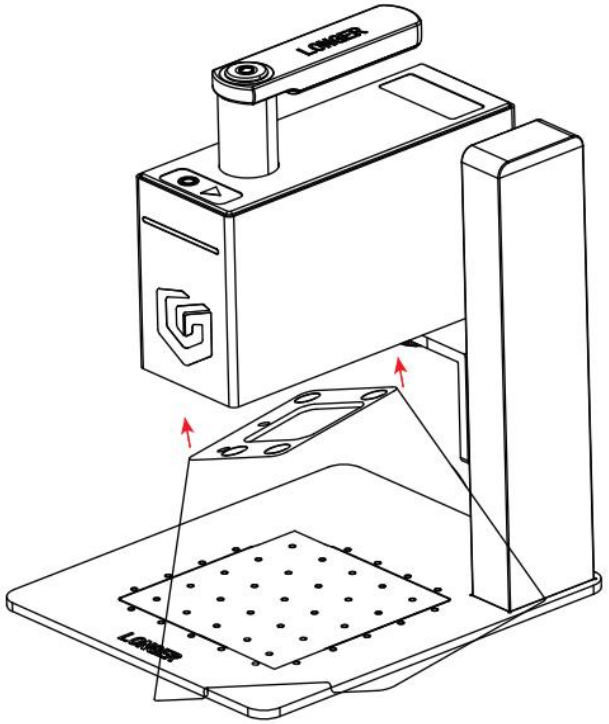
2. Install the laser unit and protective cover

1) Fix the laser unit on electric electric lifting bracket.



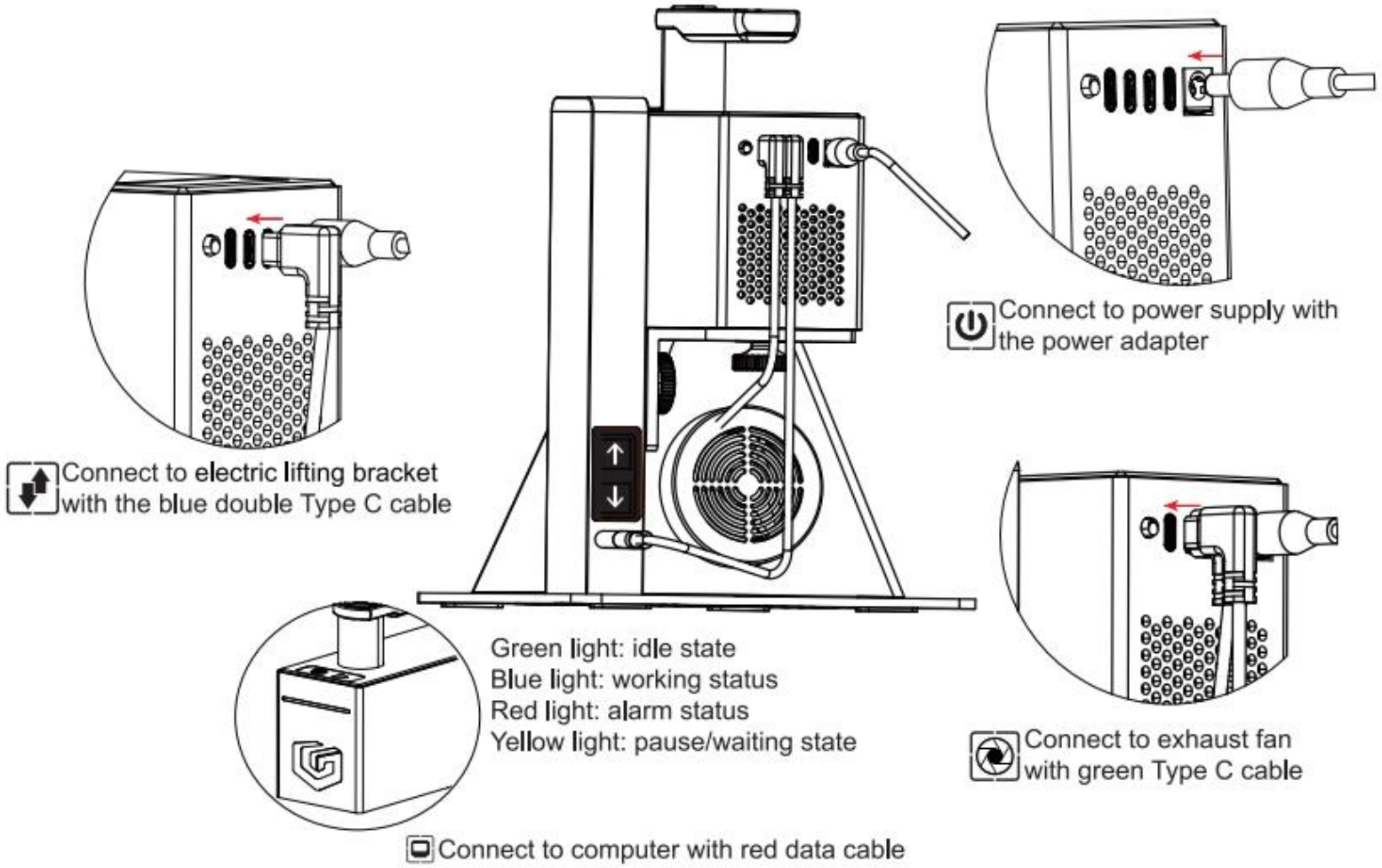
Align the laser unit with the mounting bracket, and tighten angle adjustment knob clockwise to fix the laser unit.

2) Mount protective cover.



Note: Make sure of exhaust fan is toward rear.

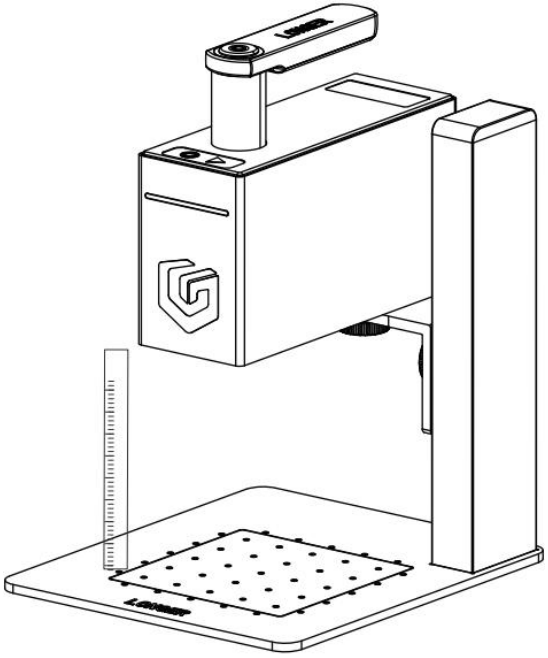
3. Connect the cable



4. Adjust the focus

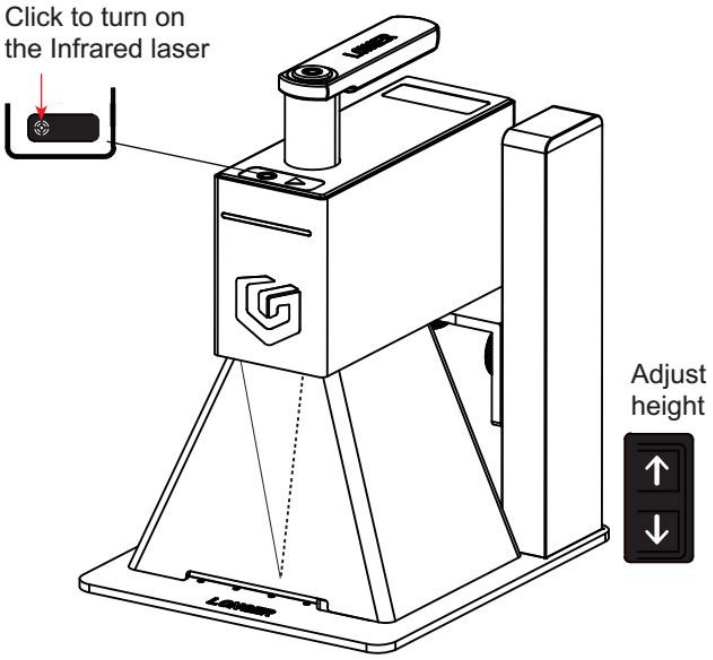
1) Focus by ruler

Adjust the height of the laser unit by touching the button of lifting bracket until the bottom of the laser unit is 110mm away from the surface of engraved object



2) Focus assist by infrared laser

Press the infrared laser button and adjust the height of the bracket. When the two laser points overlap into one point, the focus is completed.

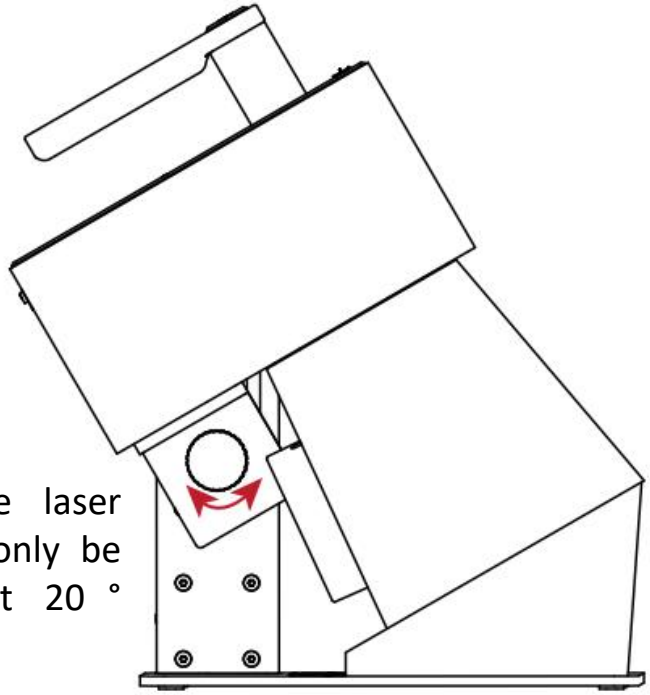


Note:The red dot is not the engraving center point, it is only used for focus reference.

5. Oblique engraving

1) Oblique engraving

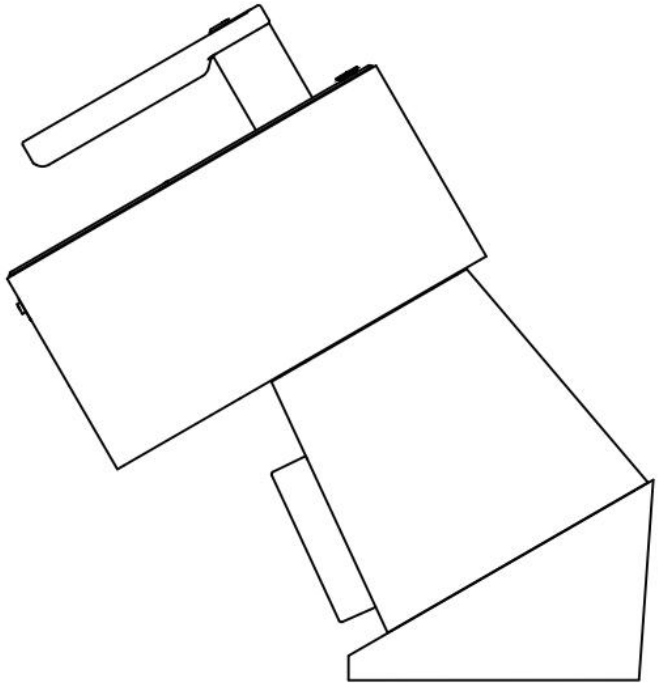
Turn the angle adjustment knob counterclockwise to loosen it, adjust the angle of the mounting bracket, and after the adjustment is completed, it will mesh with the gear, then turn the angle adjustment knob clockwise to lock it and adjust focus.



Note: The laser unit can only be rotated at 20 ° intervals.

2) Handheld engraving

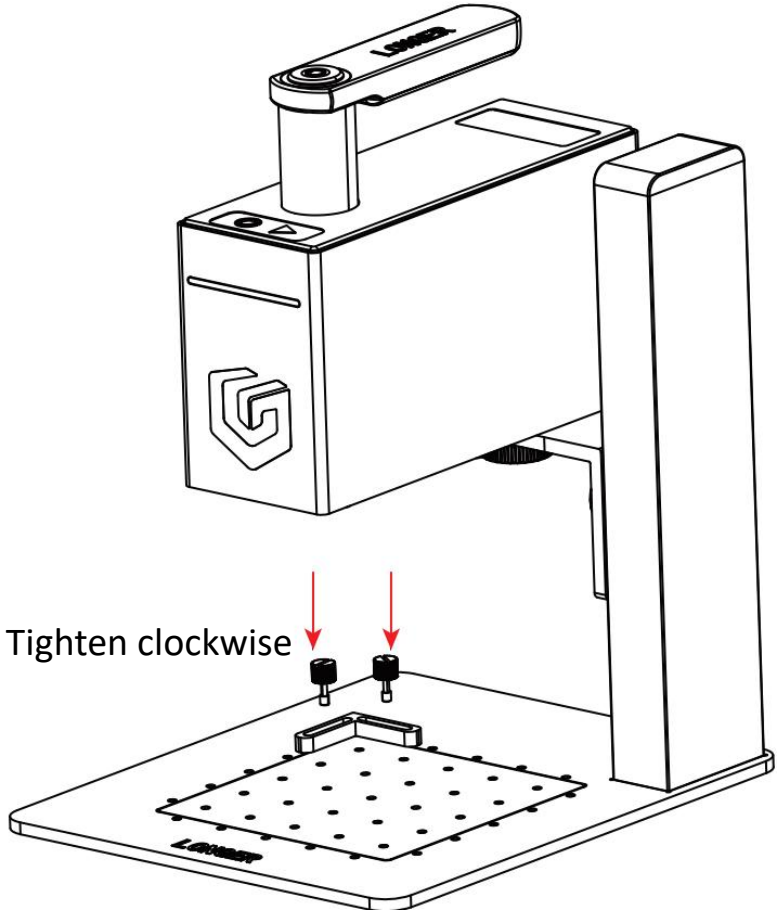
Hold the handle and place the protective cover against the surface of the object to be engraved, and you can engrave.

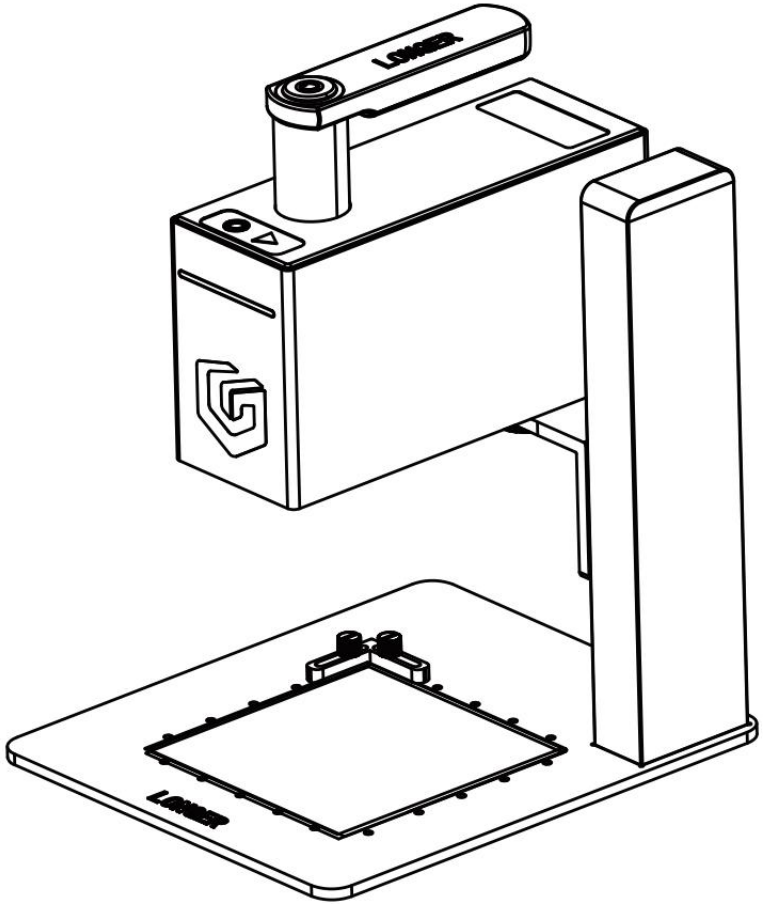


6. Batch engraving

1) Place the base plate and tighten the two M3X8 thumb screw.

2) Place carving materials.



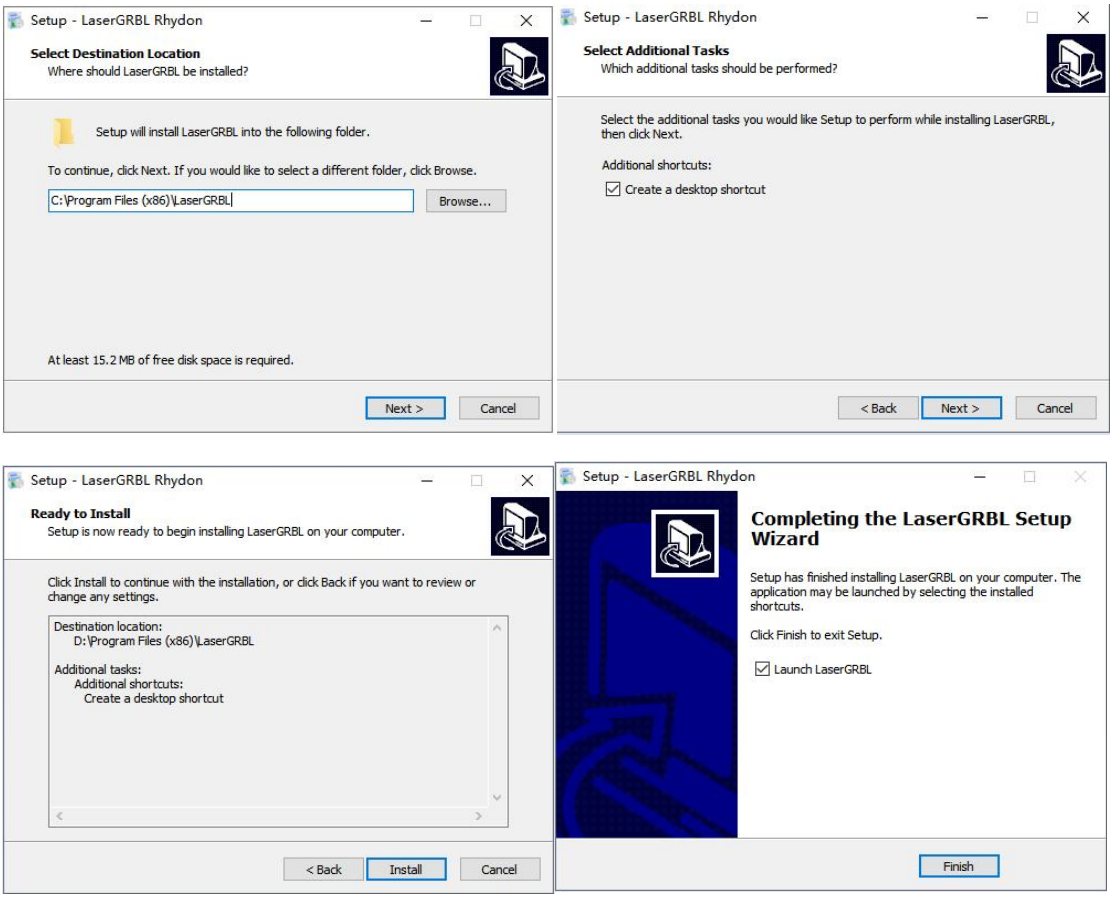


D. LaserGRBL Software Operation

LaserGRBL is an easy-to-use and fully free software for laser engraver only running on Windows. Please save or back up data in time during use to avoid data loss, but LONGER is not responsible for any data loss caused by third-party software.

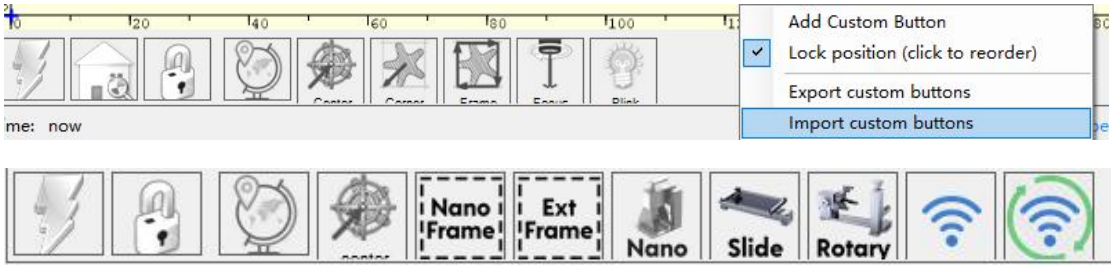
1. Software Download and Installation

Double-click the LightBurn installation file in the software folder in the SD card or download it from the following link to install LaserGRBL,: https://lasergrbl.com/download/, click Next > Next > Install > Finish.



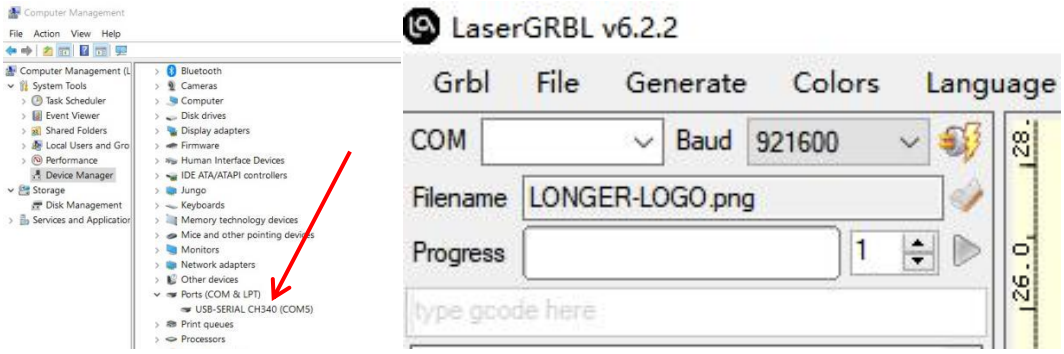
2. Import configuration file

In order to meet the use of NANO in LaserGRBL, it must to import custom buttons. Right-click in the blank area at the bottom and select Import custom buttons, open nano.zbn file to import, click YES to confirm, then there are three new Nano, Slide, Rotary icons.



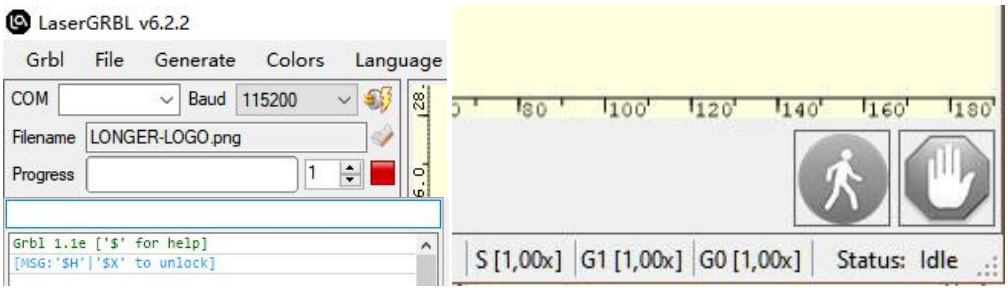
3. Connect Nano to LaserGRBL

It needs connect the engraver to LaserGRBL software first. For Windows, it needs to right-click the computer and select Manage, click Device Manager, click to expand Ports (COM & LPT), find the port corresponding to the CH340 driver, and then select this port from the COM port list, set 961200 baud rate, click  to connect.

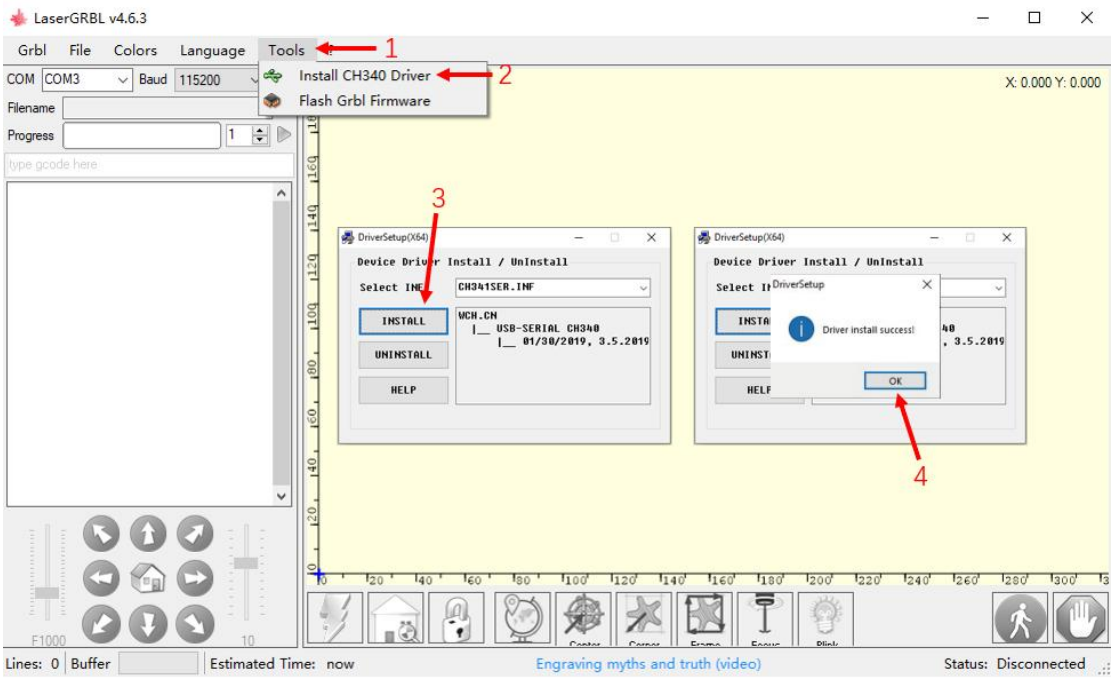


When connected to proper port grbl reply with “welcome message”

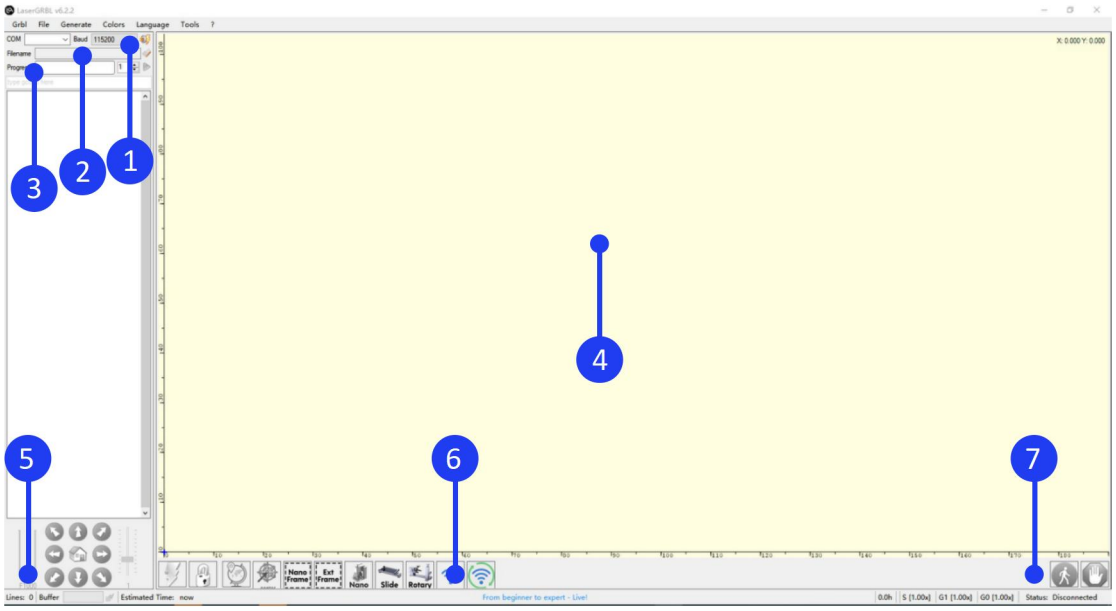
showing Grbl firmware version. On the bottom-right of the LaserGRBL interface it shows “Status: Idle”



If no ports are listed in the drop-down, it means that no engravers were found, which could mean that it is not plugged in correctly, isn't powered, or the PC is missing a driver. Please click Tools menu to Install CH340 Driver from LaserGRBL software.



4. The main window of LaserGRBL



① Connection control: here you can select serial port and proper baud rate for connection.

② File control: this shows loaded filename and engraving process progress. The green “Play” button will start program execution.

③ Manual commands: it can type any G-Code line here and press “enter”. Commands will be enqueued to command queue.

④ Engraving preview: this area show final work preview. During engraving a small blue cross will show current laser position at runtime.

⑤ Jogging control: allow manual positioning of the laser. The left vertical slider control movement speed, right slider control step size.

⑥Grbl reset/homing/unlock: this buttons submit soft-reset, homing and unlock command to grbl board. On the right of unlock button you can add some user defined buttons.

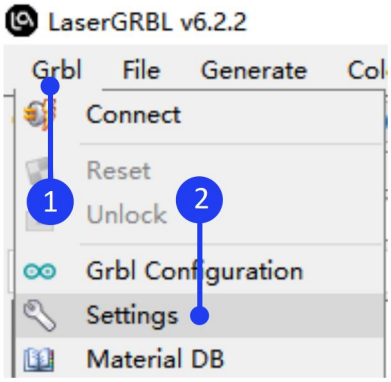
⑦ Pause and resume: this buttons can suspend and resume program progress.

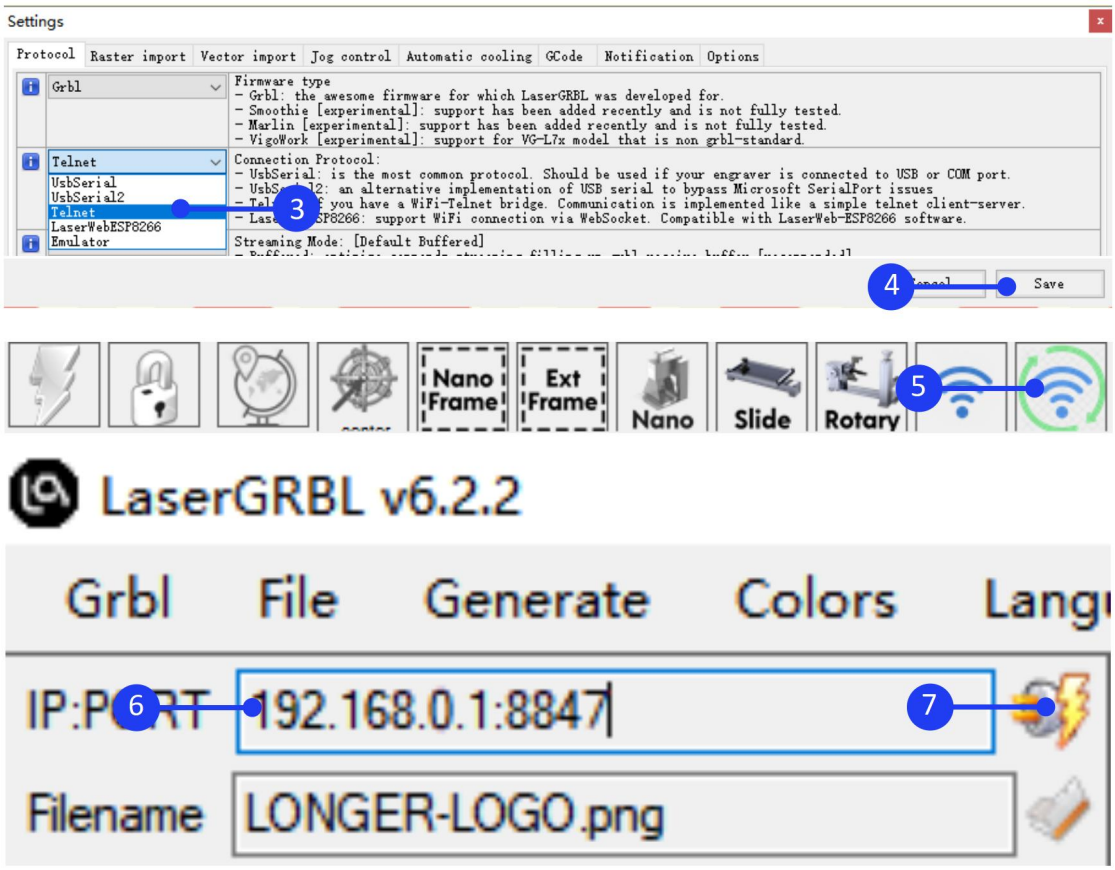
5. Connect Nano to LaserGRBL by WIFI

There are two modes: STA or AP to connect Nano to the LaserGRBL via wifi. The difference is that in AP mode, the computer has no network, while in STA mode, computer can maintain network.

1) Connect Nano to LaserGRBL by WIFI in AP mode

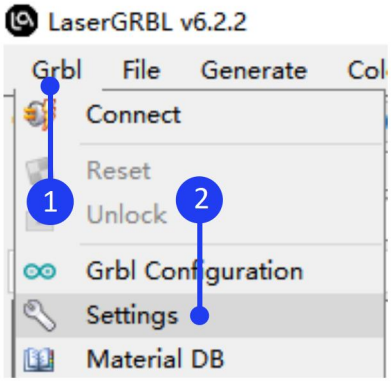
Run the LaserGRBL, click Grbl > Settings, select Telnet in the Connection Protocol and Save, click 'WiFi reset'  in the bottom of the window to set WiFi to AP mode, connect the computer to the WiFi that starts with LongerLaser_Nano, input password 12345678, input 192.168.0.1:8847 in IP:PORT, click  to connect.

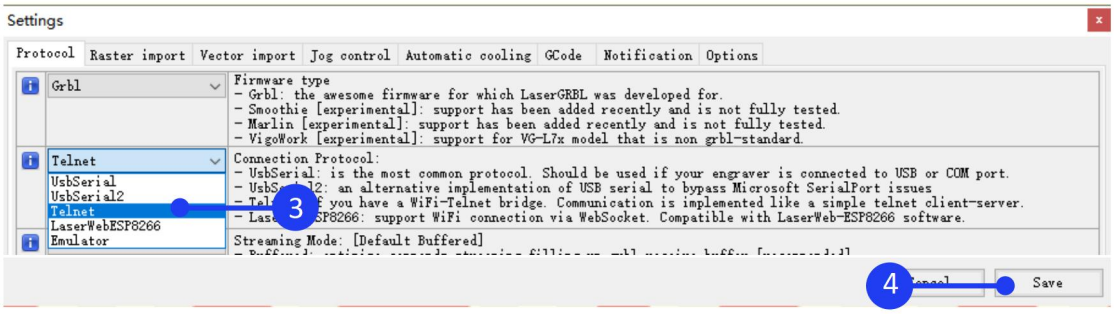


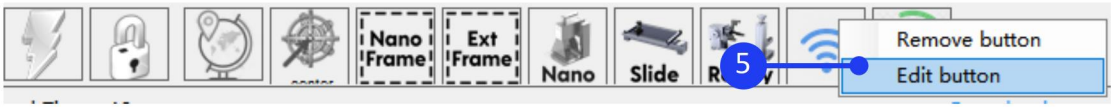


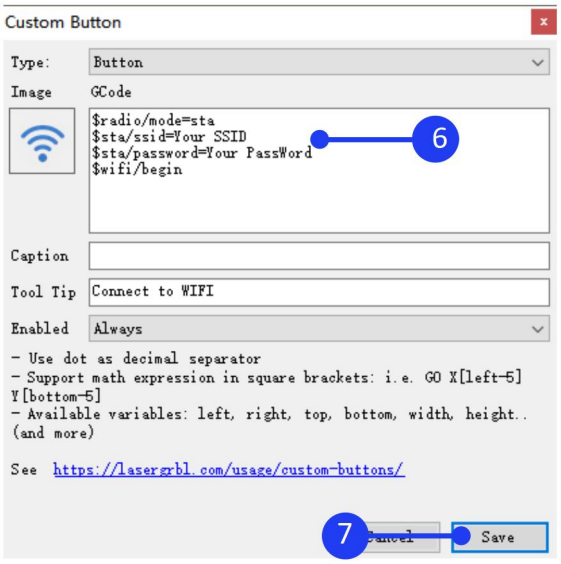
2) Connect Nano to LaserGRBL by WIFI in STA mode

Run the LaserGRBL, click Grbl > Settings, select Telnet in the Connection Protocol and Save, right click 'Connect to WiFi' in the bottom of the window to change Your_SSID and Your_PassWord to your WIFI account and password in $sta/ssid and $sta/password command, click Save, left click 'Connect to WIFI' to change it 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 192.168.1.68:8847 in IP:PORT, click to connect

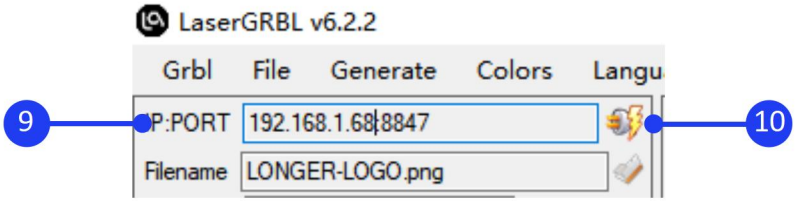

LaserGRBL v6.2.2
Grbl
File
Generate
Col
Connect
Reset
Unlock
Grbl Configuration
Settings
Material DB
1
2


Settings
Protocol
Raster import
Vector import
Jog control
Automatic cooling
GCode
Notification
Options
Grbl
Firmware type
- Grbl: the awesome firmware for which LaserGRBL was developed for.
- Smoothie [experimental]: support has been added recently and is not fully tested.
- Marlin [experimental]: support has been added recently and is not fully tested.
- VigoWork [experimental]: support for VG-L7x model that is non grbl-standard.
Telnet
UsbSerial
UsbSerial2
Telnet
LaserWebESP8266
Emulator
Connection Protocol:
- UsbSerial: is the most common protocol. Should be used if your engraver is connected to USB or COM port.
- you have a WiFi-Telnet bridge. Communication is implemented like a simple telnet client-server.
- 8266: support WiFi connection via WebSocket. Compatible with LaserWeb-ESP8266 software.
Streaming Mode: [Default Buffered]
3
4
Save

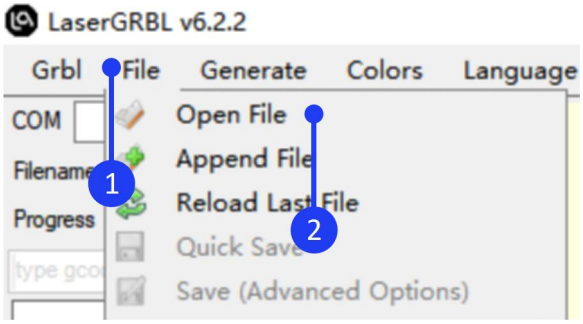

Nano Frame
Ext Frame
Nano
Slide
Remove button
Edit button
5


Custom Button
Type:
Button
Image
GCode
$radio/mode=sta
$sta/ssid=Your SSID
$sta/password=Your PassWord
$wifi/begin
6
Caption
Tool Tip
Connect to WIFI
Enabled
Always
- Use dot as decimal separator
- Support math expression in square brackets: i.e. GO X[left-5] Y[bottom-5]
- Available variables: left, right, top, bottom, width, height.. (and more)
See https://lasergrbl.com/usage/custom-buttons/
7
Save


Nano Frame
Ext Frame
Nano
Slide
Rotary
8


LaserGRBL v6.2.2
Grbl
File
Generate
Colors
Langu
P:PORT
192.168.1.68:8847
Filename
LONGER-LOGO.png
9
10

6. How to make a project in the LaserGRBL



Click File > Open File to add the design to be engraved, set the Quality to 16.67Lines/mm (quality has only two values options, 11.11Lines/mm or 16.67Lines/mm. For those who require high precision, it can choose 11.11Lines/mm. For those who require high efficiency, it can choose 16.67Lines/mm), click Next, 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 **M3-Constant Power**, and the value of S-MAX is 10 times the target laser power, such as when the laser power is 100%, S-MAX needs to be set to 1000%, if the laser power is 60%, it needs to be set to 600%. Then set the size of the image to scale the design. If the design position is outside the working range, it should set the XY axis offset to adjust the graphics position.

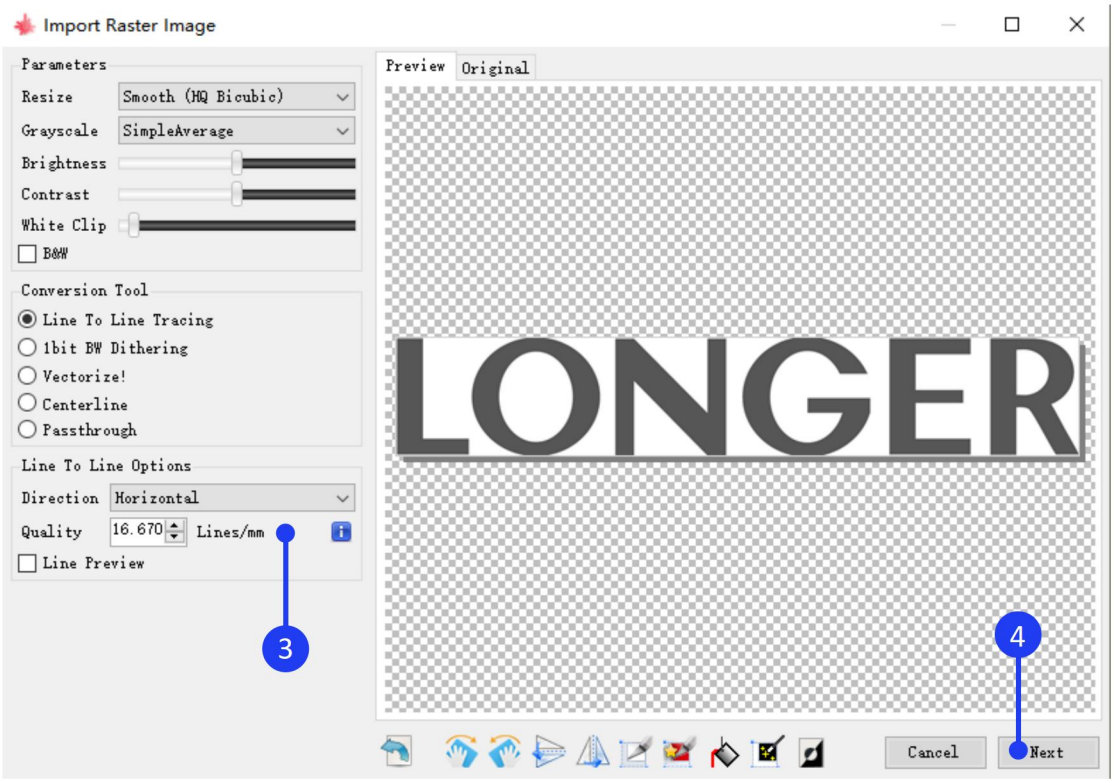
After successfully importing the graphics and setting the parameters, it needs to set the focus of Nano, click 

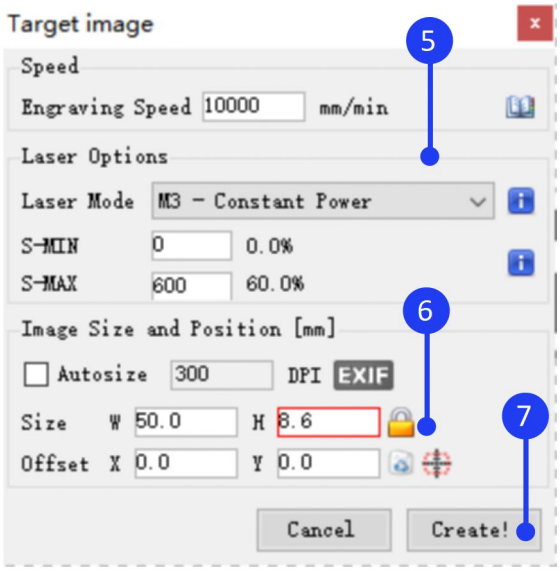
Nano button, then click 

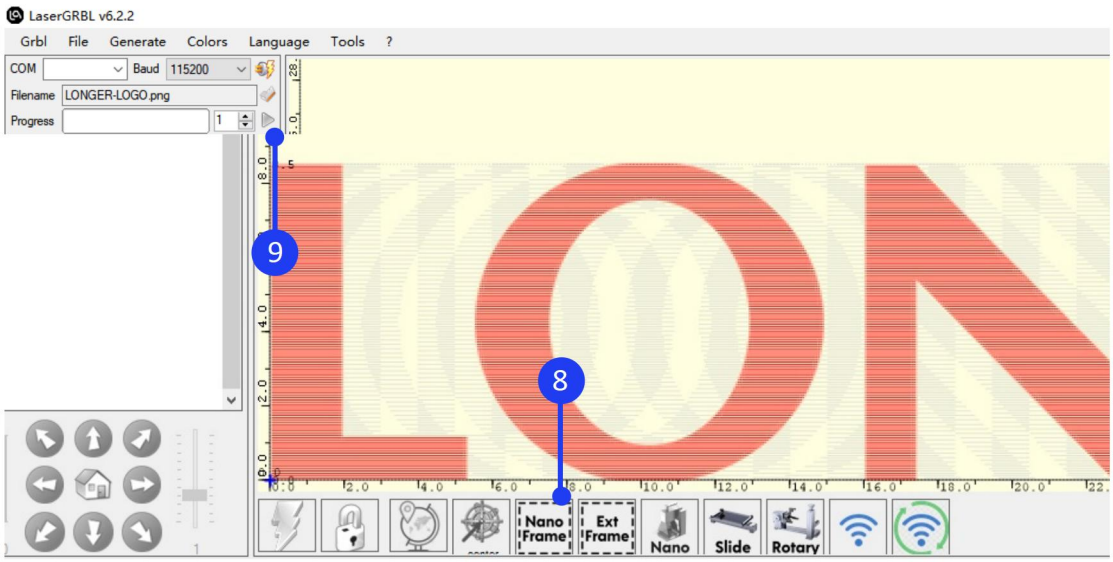
Frame button to determine the material placement, and finally

click  Start button to start engraving.

For detailed LaserGRBL software operation, please refer to https://lasergrbl.com/usage/.

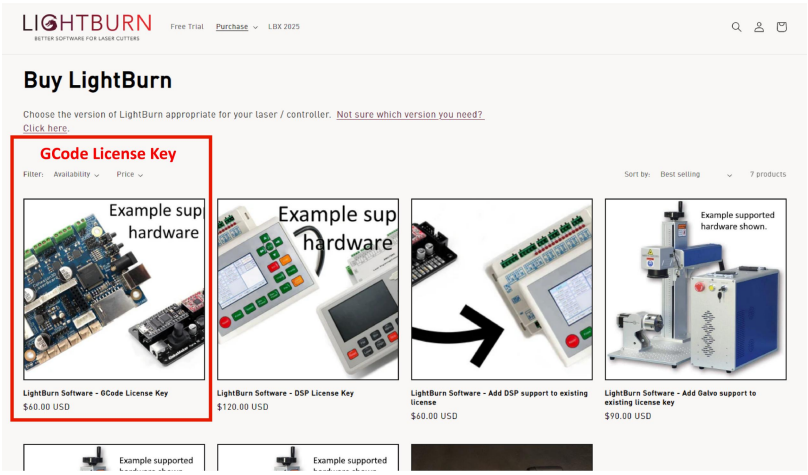





LaserGRBL v6.2.2
Grbl
File
Generate
Colors
Language
Tools
?
COM
Baud
115200
Filename
LONGER-LOGO.png
Progress
9
8
Nano Frame
Ext Frame
Nano
Slide
Rotary

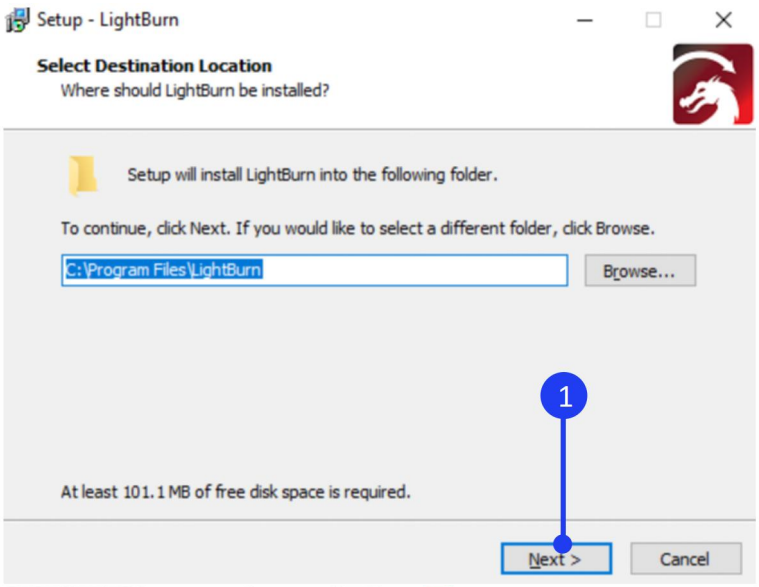
E. LightBurn Software Operation

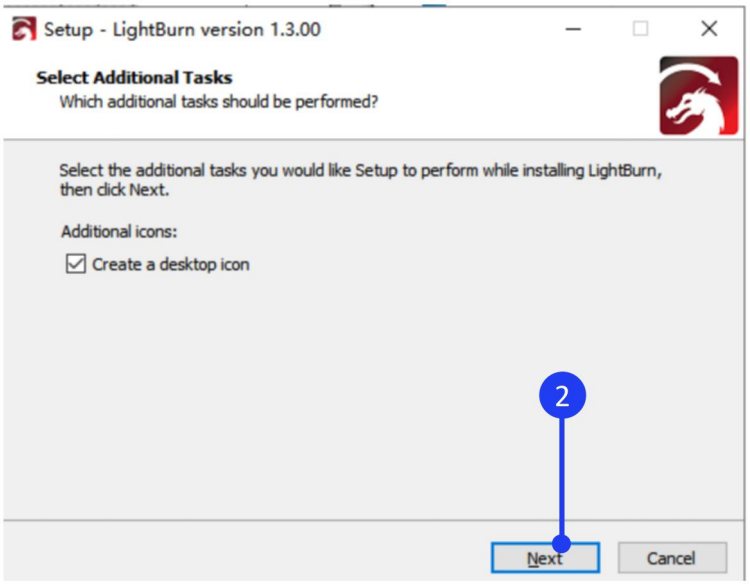
LightBurn is professional layout, editing, control and paid software for engraver, running on Windows, MacOS, and Linux. It provides a 30 days trial period. Please save or back up data in time during use to avoid data loss, but LONGER is not responsible for any data loss caused by third-party software. If the computer has previously installed the software or after 30-day free trial period, according to LightBurn's trial rules, it needs to purchase a license key to continue using it. To purchase a license and obtain a key code, please go to the LightBurn online store and select "GCode License Key".

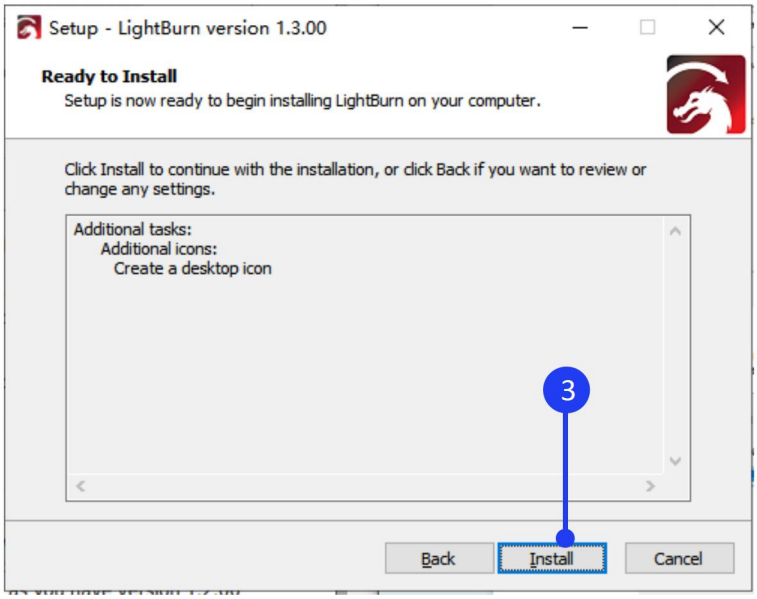


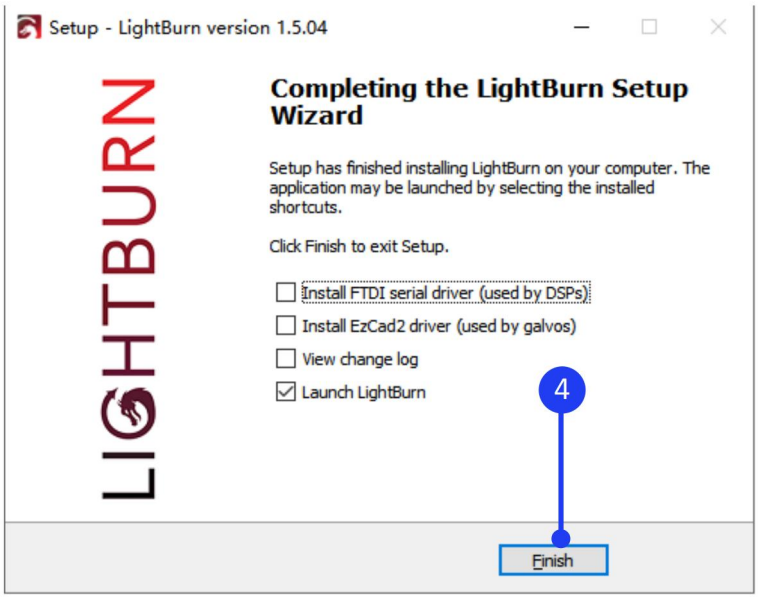
1. Software Download and Installation

Double-click the LightBurn installation file in the software folder on the SD card or download it from the following link: https://LightBurnsoftware.com/pages/download-trial to install the trial version of LightBurn


Setup - LightBurn
Select Destination Location
Where should LightBurn be installed?
Setup will install LightBurn into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\LightBurn
Browse...
1
At least 101.1 MB of free disk space is required.
Next >
Cancel


Setup - LightBurn version 1.3.00
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing LightBurn, then click Next.
Additional icons:
Create a desktop icon
2
Next
Cancel


Setup - LightBurn version 1.3.00
Ready to Install
Setup is now ready to begin installing LightBurn on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Additional tasks:
Additional icons:
Create a desktop icon
3
Back
Install
Cancel

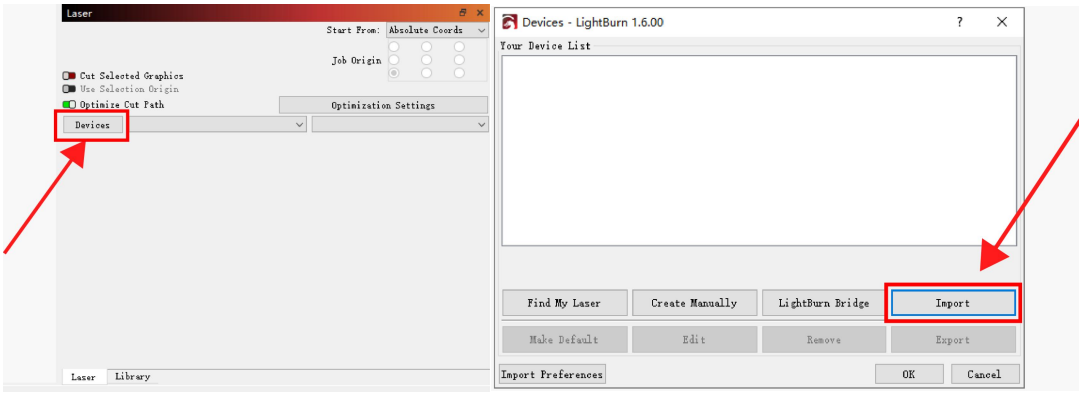


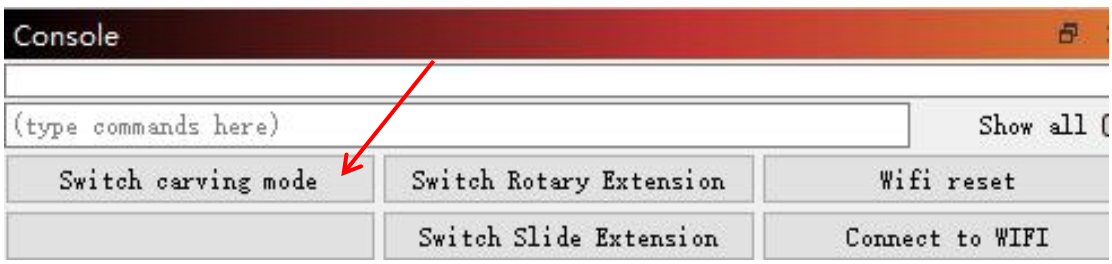
To install LightBurn on Mac, double-clicking the .DMG file after downloading it and drag LightBurn into Applications folder. When launching LightBurn for the frst time, open a Finder window, browse to the 'Applications' folder, hold the Control key and click the LightBurn icon, choose 'Open' from the menu. When MacOS asks if it should open the program, click yes, and it will be listed as an exception in your launcher. From then on you can just launch the application normally.

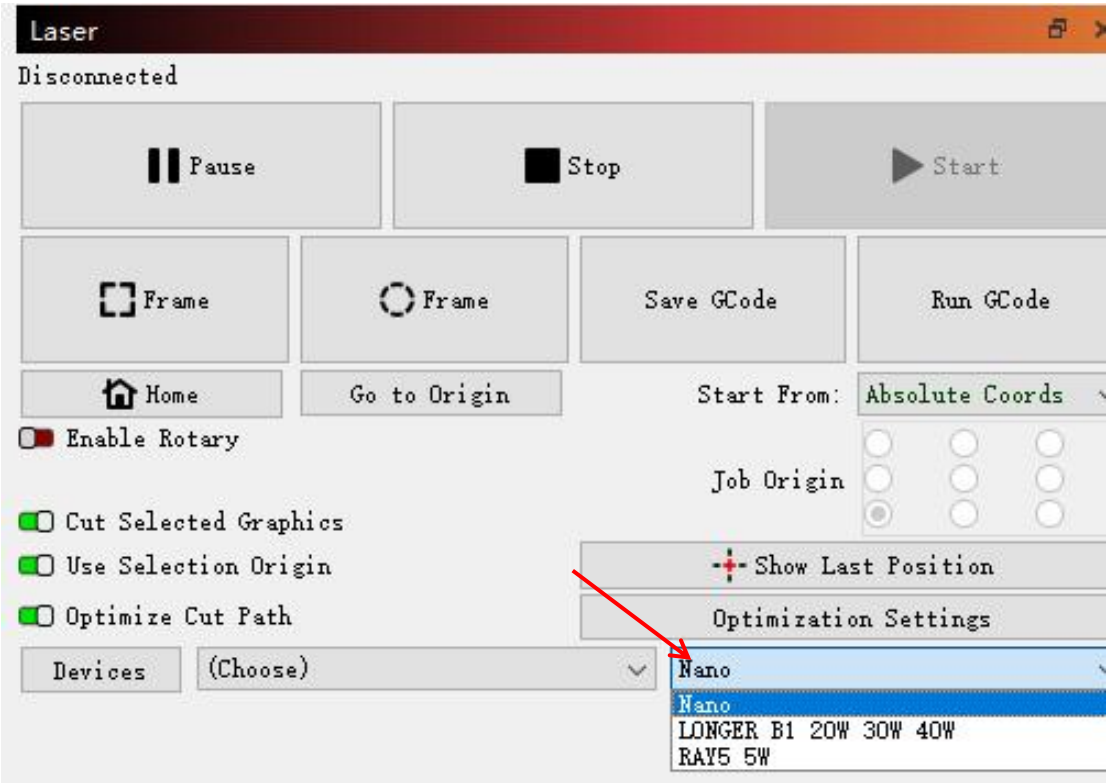
2. Import configuration file

Before using LightBurn with Nano for the first time, it needs to import the LaserNano.lbdev configuration file, which is in the software folder of the SD card.

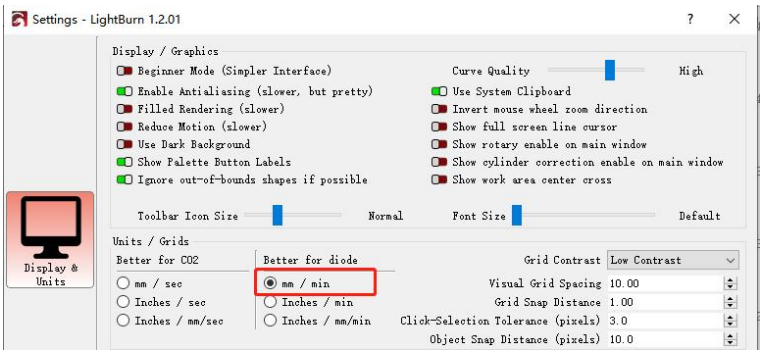
For the first time launching LightBurn, it will prompt a 'New Device Wizard' or click "Devices" in the laser control module to import the engraver. Click ‘Import’, select the Nano.lbdev file, and click OK to add the Nano configuration to LightBurn. The macro commands will be successfully added in the Console window and Nano device would appear in the list of devices to the right of the 'Devices' button in the Laser window when the configuration file is imported successfully.







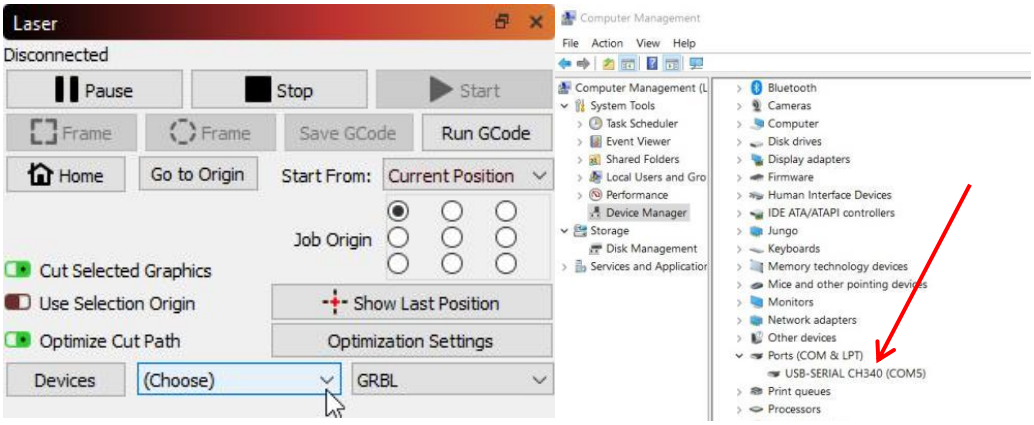
After adding the device, it is recommended to set the speed unit to mm/min. That is select 'Edit' on the task bar, select 'Settings', select mm/min as the unit, and click the 'OK' button.



3. Connect the Nano to LightBurn

It needs connect the engraver to LightBurn software before use. For Windows system, it needs to right-click the computer and select Manage, click Device Manager, click to expand Ports (COM & LPT),

find the port corresponding to the CH340 driver, and then select this port in the LightBurn, that is to manually choose the right port that the engraver is connected to, by clicking where you see '(Choose)' in the Laser Window.



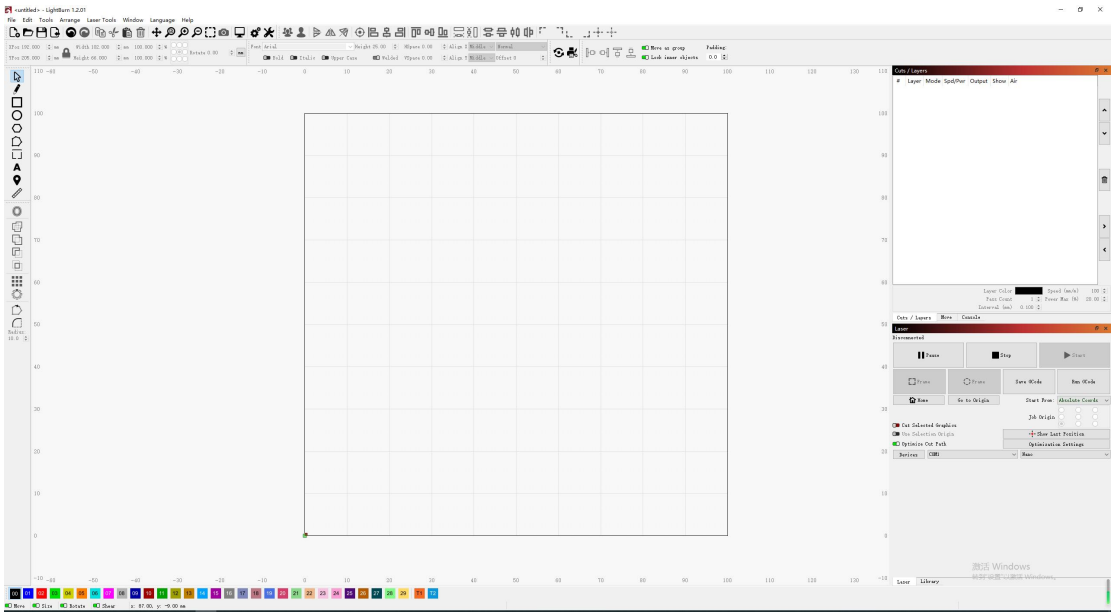
For MacOS, please go to About this Mac > Overview > System Report, select USB under Hardware, there will be USB Serial if the driver is installed automatically, and select cu.wchusbserial14230 port in the LightBurn by clicking where you see '(Choose)' in the Laser Window.

If no ports are listed in the drop-down, it means that no engravers were found, which could mean that it is not plugged in correctly, isn't powered, or the PC is missing a driver. It needs to download CH340 driver from the link and double click it to install:

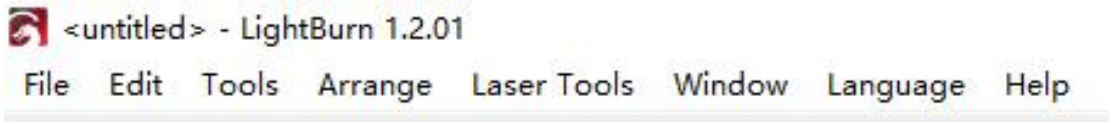
https://drive.google.com/drive/folders/1Sc-TKuez-mz--38Vp6DeL-pGmQcQdHW4.

4. The main window of LightBurn

This is the default layout for the main LightBurn window, which includes Menus, Main Toolbar, Creation & Modifier Tools, Color Palette, Cuts / Layers, Laser Window, Move Window etc.



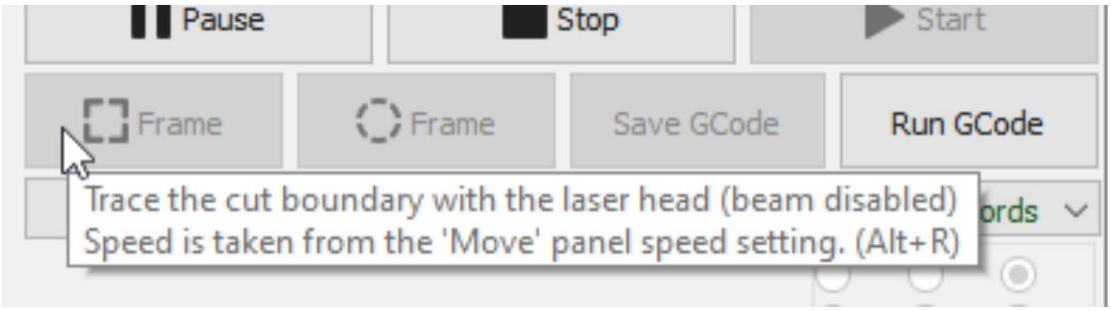
Menus: The menu bar at the top of the main window provides the access to almost every feature available in LightBurn, like File, Edit, Tools etc.



Main Toolbar: The main toolbar in LightBurn provides quick access to commonly functions for opening or importing files, saving, using the clipboard (copy & paste), moving or zooming the view. Right beside it is the Arrangement toolbar, containing some commonly

used arrangement tools for arranging and aligning shapes.

Tool tips: If hover the mouse over a control, then a small bit of text pop up that describes that button or feature, like this:

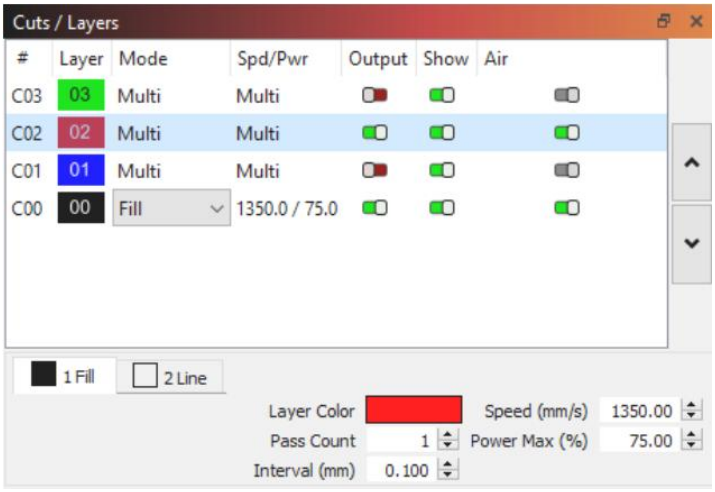


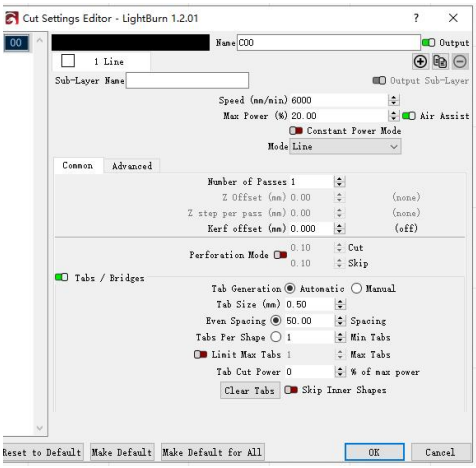
Creation & Modifier Tools,

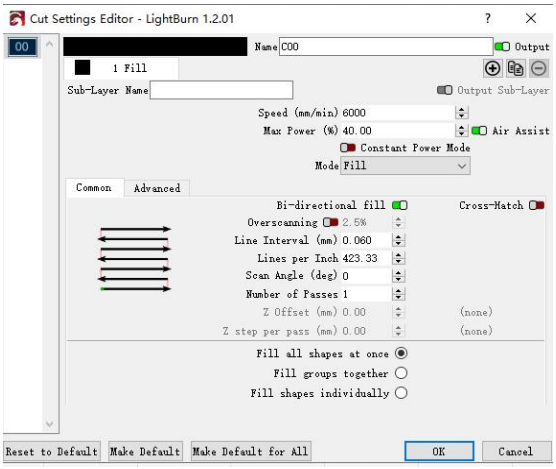
Color Palette, these colors are used to assign different kinds of parameters to the shapes in the design.If a design is selected, click a color entry will apply that color to the shapes in your selection. The colors currently in use in your design will also appear as entries in the Cuts / Layers window,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

Cuts / Layers: The first column shows the name you've assigned to this layer, followed by the color, then the Mode (Line, Fill, both, or Image). Then the speed and power are displayed, followed by the

options to enable or disable sending this layer to the laser, or displaying it in the workspace. Underneath the layer list you can see and change the basic settings for the currently selected layer. Double-clicking an entry in the layer list, it will bring up a larger Cut Settings Editor with a more complete set of options.



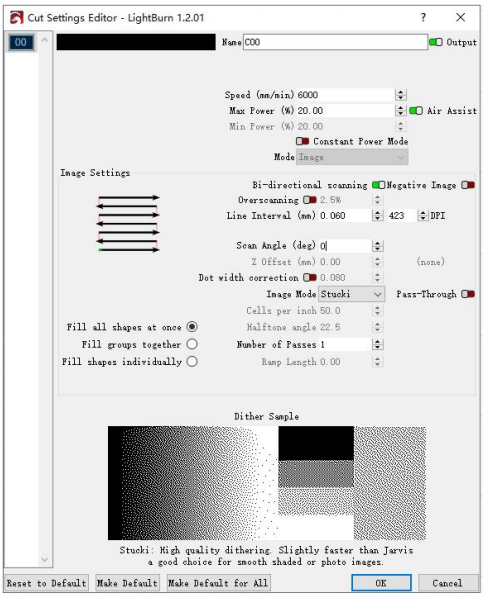




Line mode Fill mode

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

In Line mode, the laser follows the exact path of selected design, tracing the lines with the beam enabled at the setting power and speed. If laser moves quickly, or with low power, it will likely just etch the surface. If laser moves slowly and with high power, it will cut through the material. The only difference between surface marking and cutting is the power and speed. Fill mode permits the laser to scan line by line and fill in the selected shape, which will fill in closed shapes but not open shapes. Image mode is only available for images, and can control how LightBurn renders the image data on the laser. There are three iamge modes that are often chosen, which are Atkinson, Stucki, Jarvis.



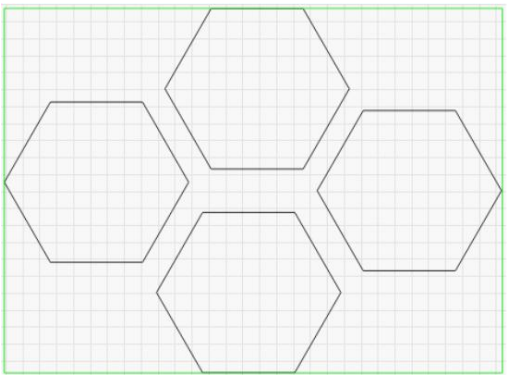
Laser Window: The Laser Window is used to select the active machine, test the framing (the artwork's outer bounds), run and stop the machine, and choose the file processing, order, and

artwork positioning within the workspace.

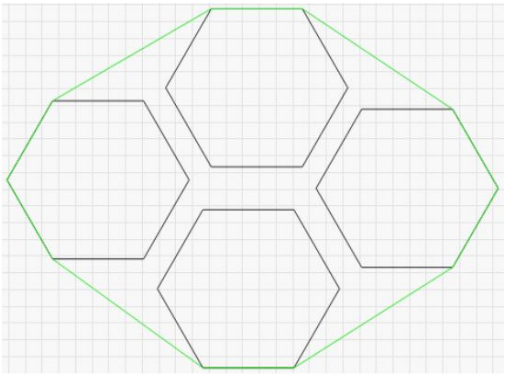
There are two Frame buttons are used to preview the position of the job on the laser. 

The first is a standard rectangular frame, also called a 'Bounding Box'. This is the smallest rectangle that will fully contain the shapes selected. 

The O-Frame button, called the 'Rubber Band Frame', traces a path around selected design that is the shape of a rubber band stretched around it. The speed and laser power during frame are adjusted in the MOVE window. Due to software limitations, the maximum speed during frame can be 10,000 mm/min.These two different frame effects can be shown in the following figure:

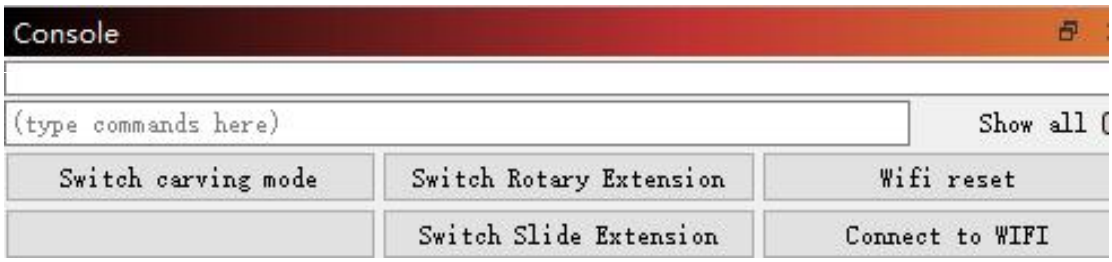


Rectangular frame



O-Frame

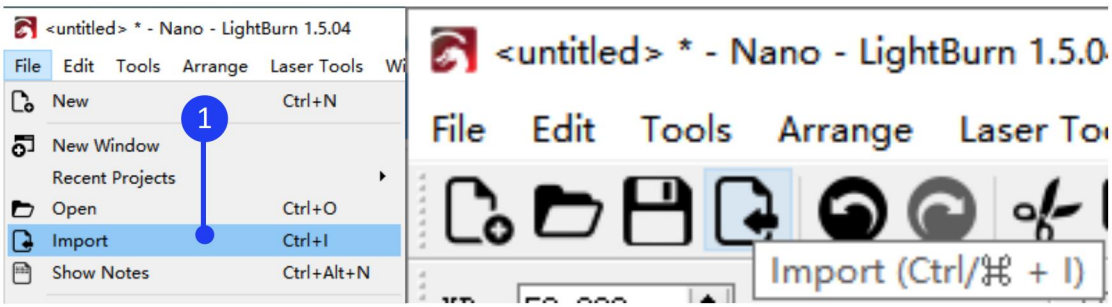
Console Window: The Console window displays messages from the controller and commands sent to it by LightBurn, and some macro commands designed of Nano engraver. It can also input direct commands to engraver through this window, such as $$ to display GRBL settings, $X is to unlock machine if it has been locked due to an alarm or error. The Console window will also display alarm or error messages sent to LightBurn by the laser's controller, indicating that there was a problem with the machine's operation.

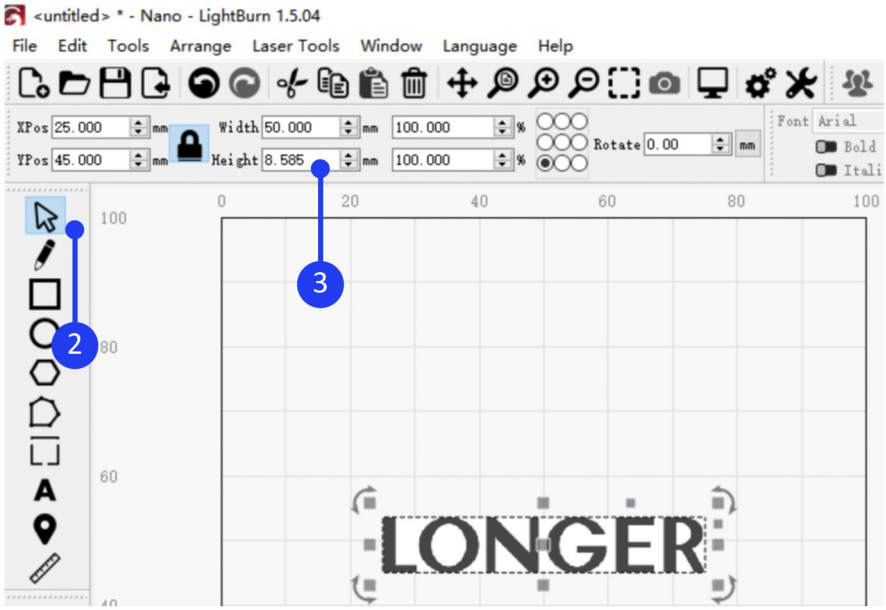


5. How to make a project

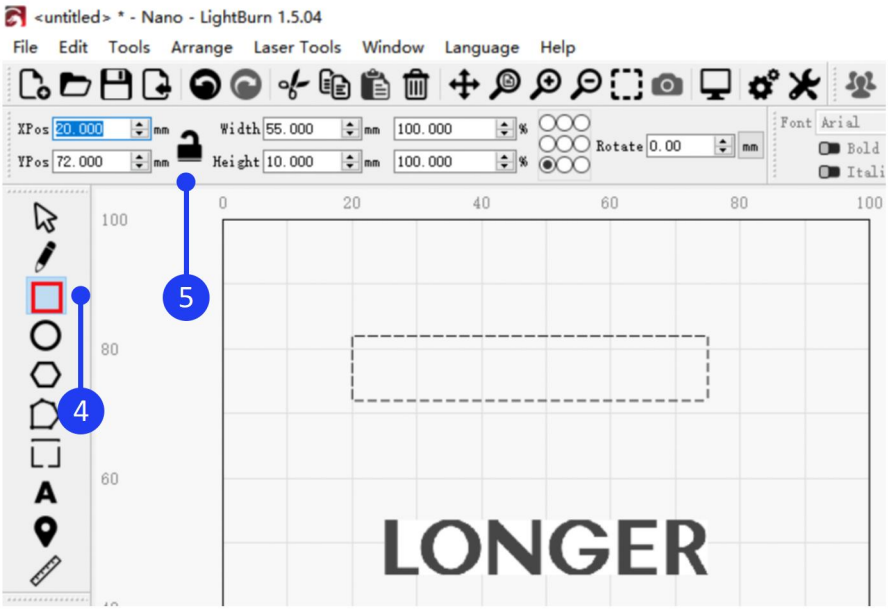
Generally speaking, creating a engraving task includes importing graphics, editing graphics, setting parameters, preview, framing and engraving. Taking engraving the LONGER LOGO and cutting after engraving as an example：.

Click File > Import or click  import icon in Toolbar to add image to LightBurn, click  select icon to choose the image, change the width of image to 50.00mm, the height of image will change in proportion to the width.

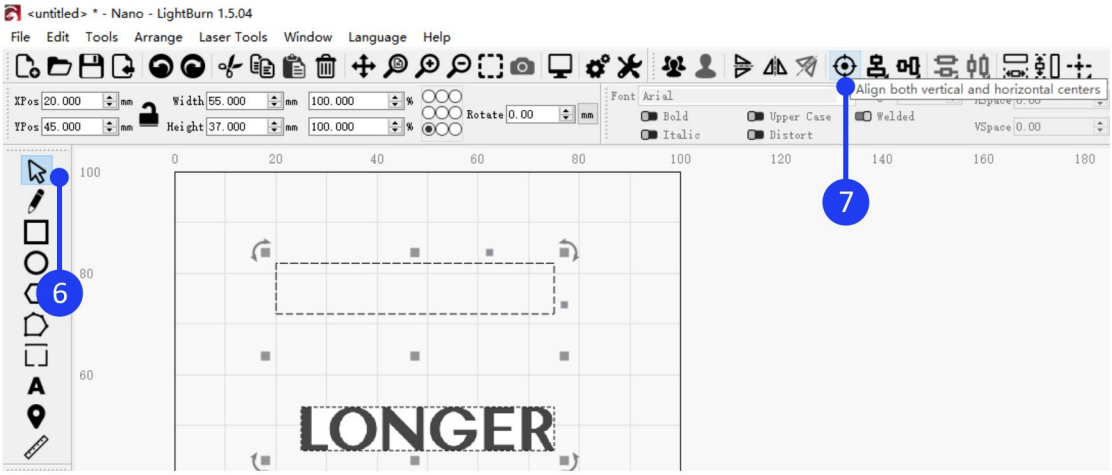




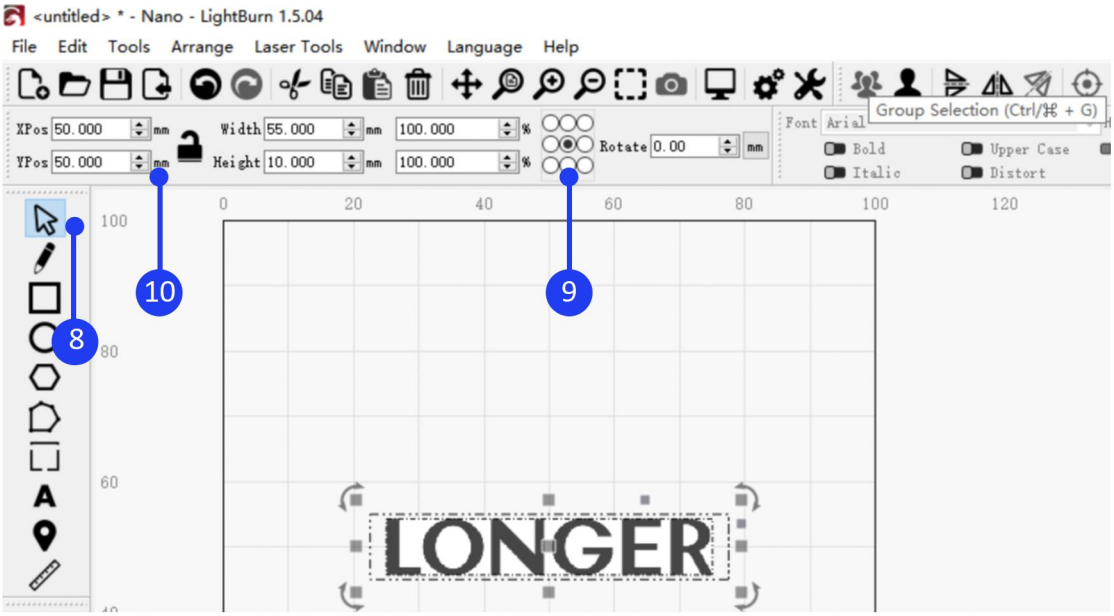
Click  Create Rectangle icon to draw a rectangle, click  to unlock, set the width and height of rectangle to 55.00 and 10.00.



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



Set the coordinate point at the center of the image and enter the XY position coordinates as 50, 50 respectively, so the design is moved to the center of working size.



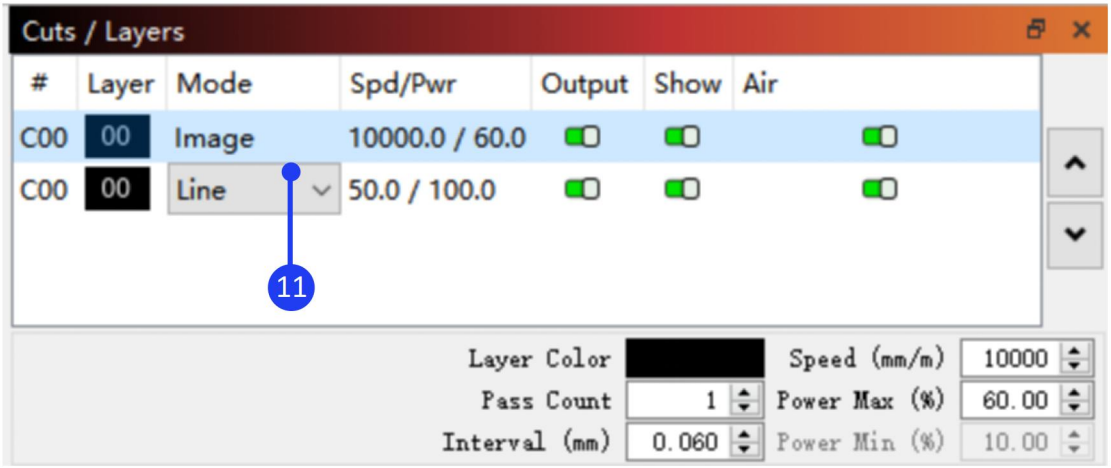
Click on different layers in Cuts and Layers Window to set the

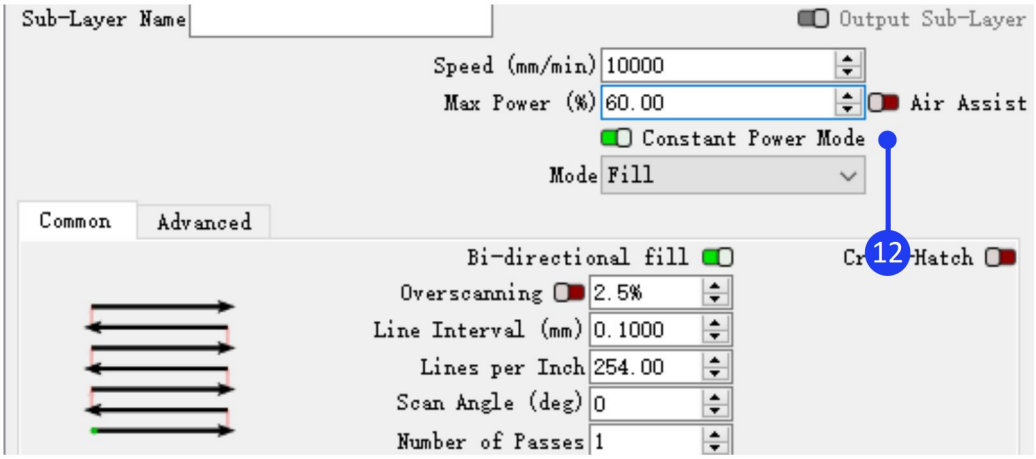
corresponding parameters, **enable Constant Power Mode** (Please note that for image or fill engraving, the Y interval is 0.06mm (Y interval has only two values options, 0.06mm or 0.09mm. For those who require high precision, it can choose 0.06mm. For those who require high efficiency, it can choose 0.09mm), and adjust the specific parameters according to the actual materials and parameter table). Click Switch carving mode 

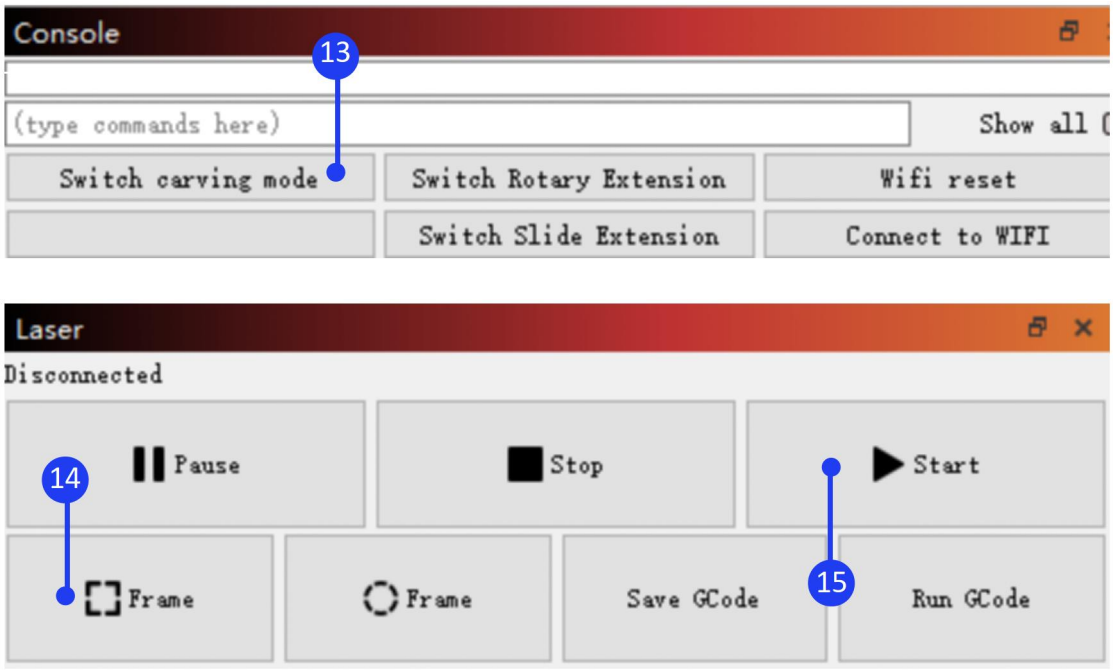
in the console window, adjust the focus of Nano and click the Frame button 

, confirm the placement of the engraving, then click Start 

.





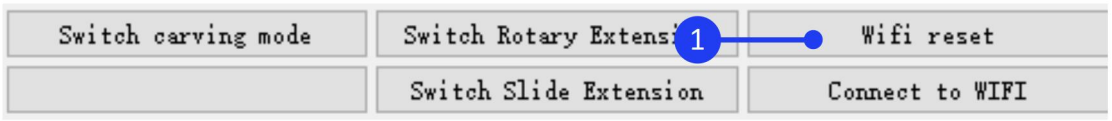


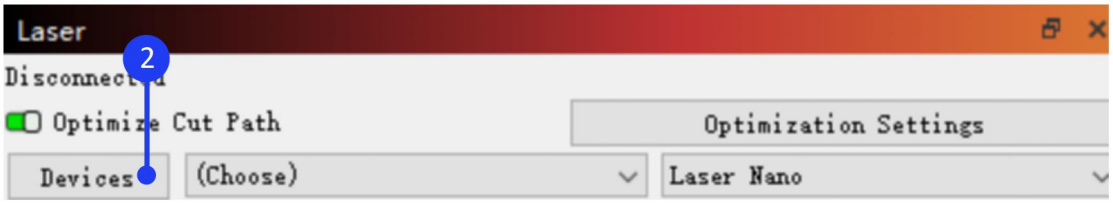
6. Connect Nano to LightBurn by WIFI

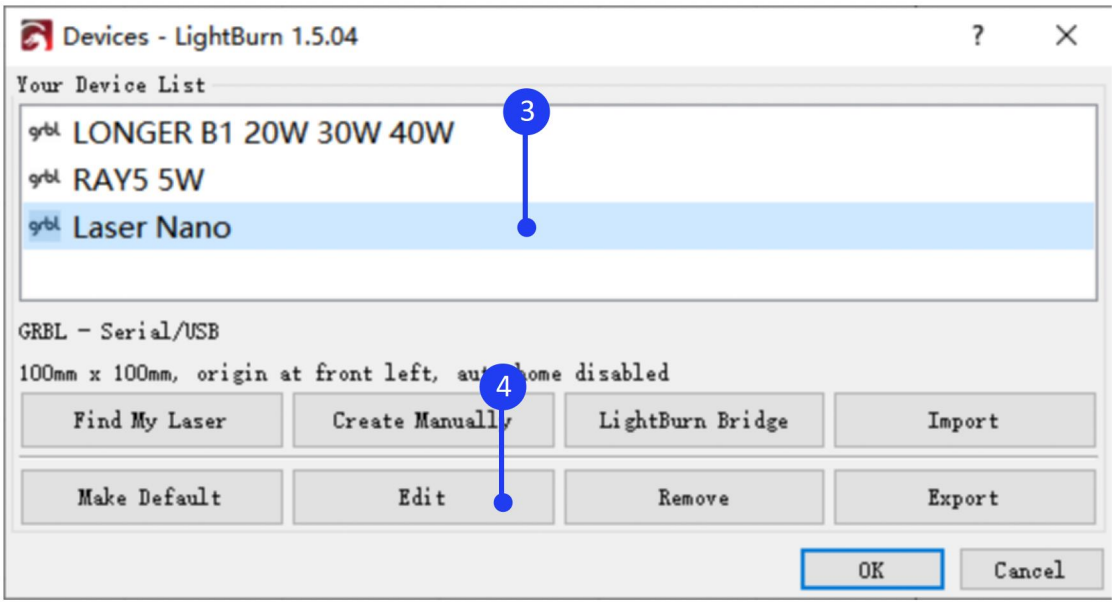
There are two modes: STA or AP to connect Nano to the LightBurn via wifi. The difference is that in AP mode, the computer has no network, while in STA mode, computer can maintain network.

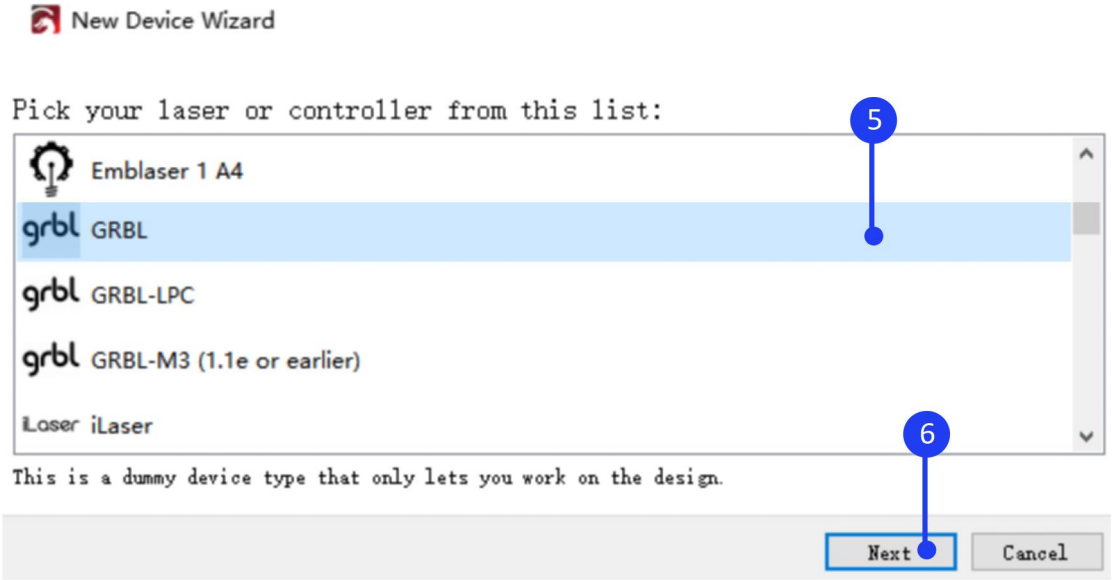
1) Connect Nano to LightBurn by WIFI in AP mode

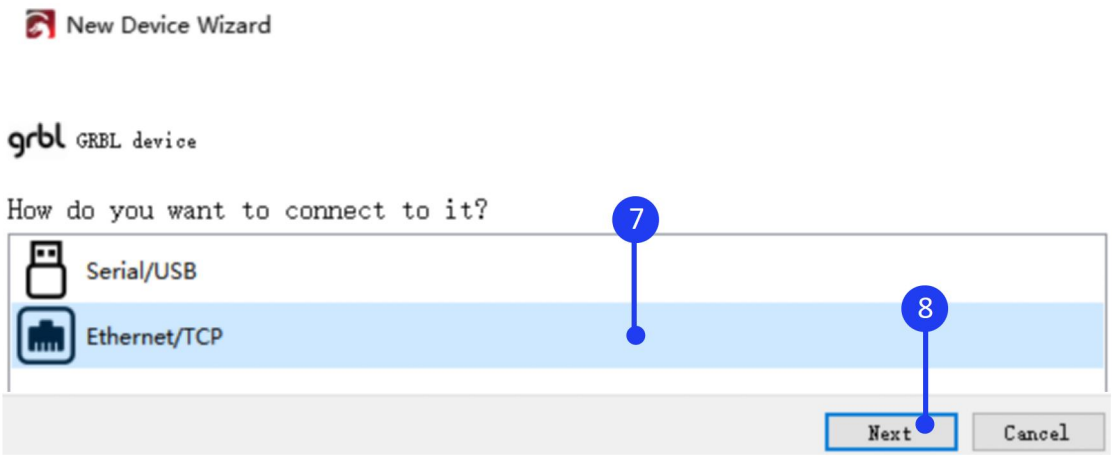
Run the LightBurn, connect PC to Nano, click 'WiFi reset' in console window to set WiFi to AP mode, connect the computer to the WiFi that starts with LongerLaser_Nano, input password 12345678, click Devices in Laser window, select Laser Nano > Edit > GRBL > Next > Ethernet/TCP > Next > input 192.168.0.1 > Next > Next > Next > Finish > OK, click Device Settings > input 8847 in Network Port > OK.

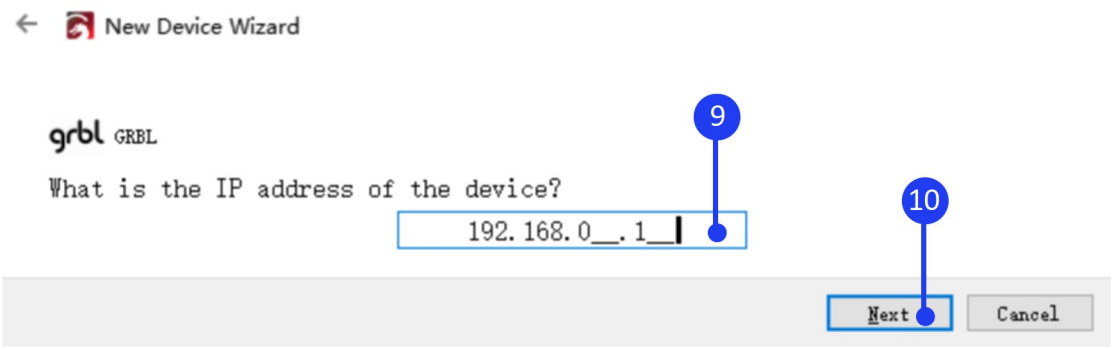

Switch carving mode
Switch Rotary Extensi
Wifi reset
Switch Slide Extension
Connect to WIFI
1

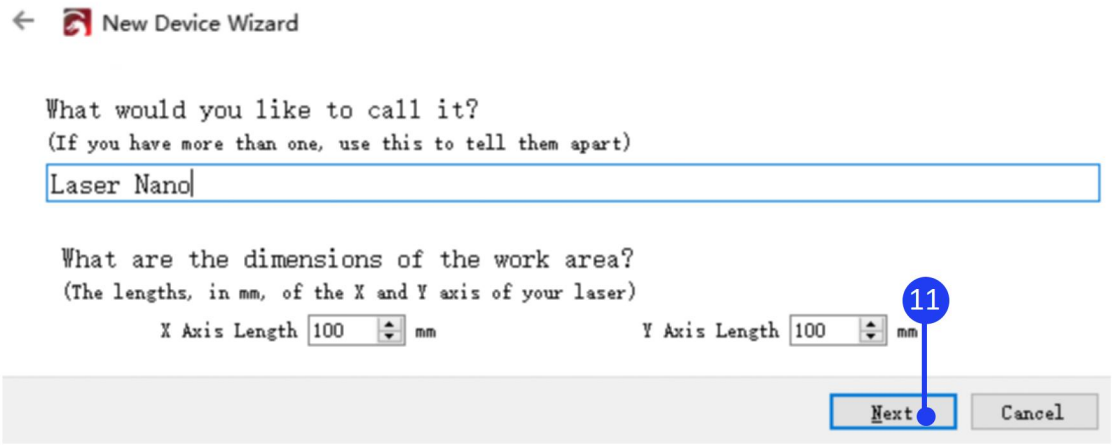

Laser
Disconnected
Optimize Cut Path
Optimization Settings
Devices
(Choose)
Laser Nano
2

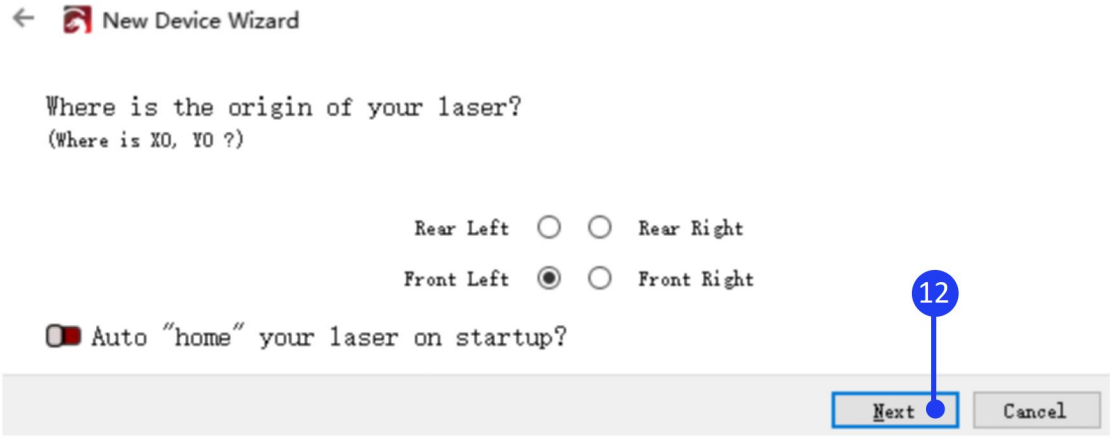

Devices - LightBurn 1.5.04
Your Device List
LONGER B1 20W 30W 40W
RAY5 5W
Laser Nano
3
GRBL - Serial/USB
100mm x 100mm, origin at front left, auto home disabled
Find My Laser
Create Manually
LightBurn Bridge
Import
Make Default
Edit
Remove
Export
4
OK
Cancel

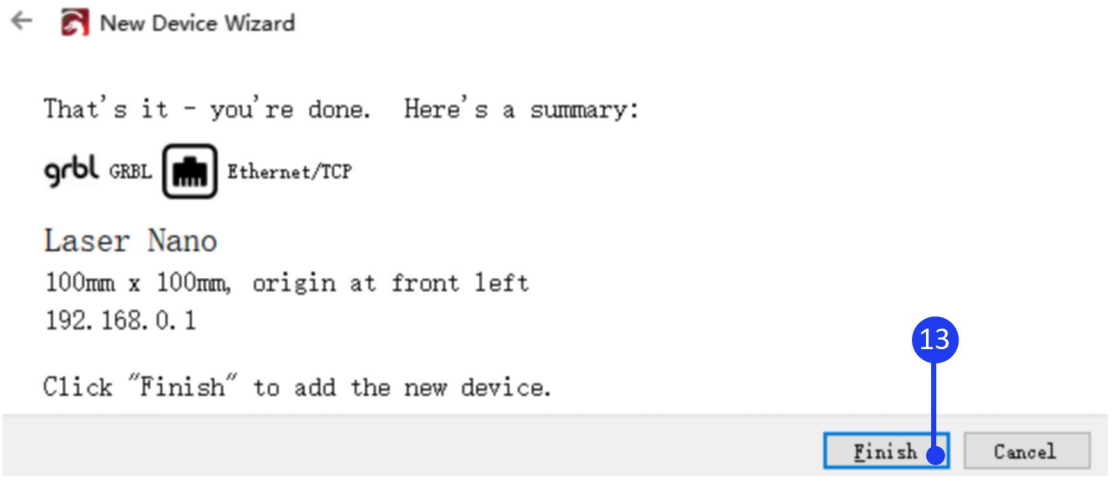

New Device Wizard
Pick your laser or controller from this list:
Emblaser 1 A4
GRBL
GRBL-LPC
GRBL-M3 (1.1e or earlier)
iLaser
5
This is a dummy device type that only lets you work on the design.
6
Next
Cancel

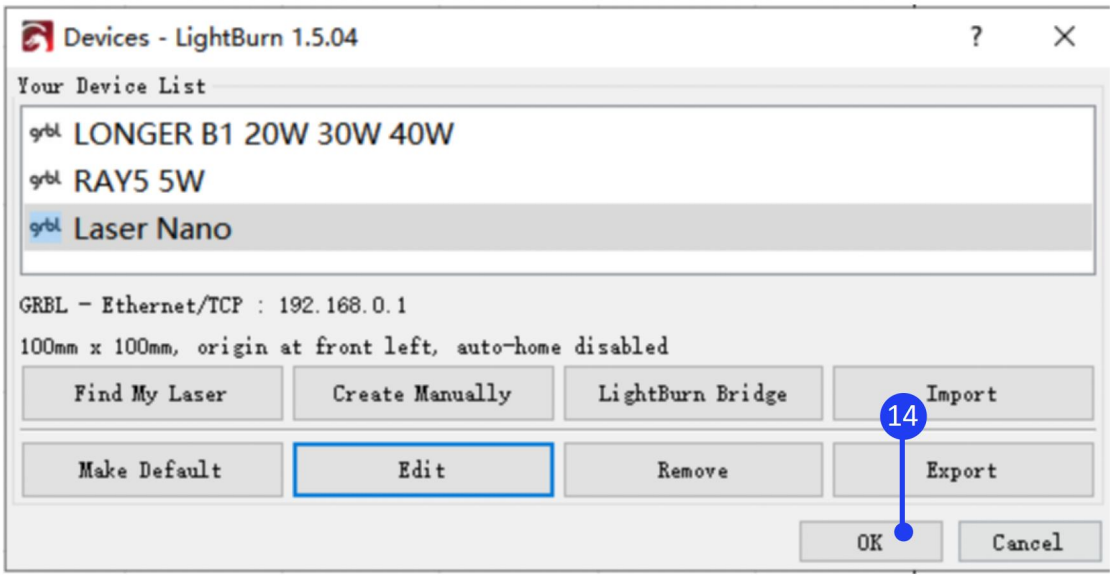

New Device Wizard
grbl GRBL device
How do you want to connect to it?
Serial/USB
Ethernet/TCP
7
8
Next
Cancel

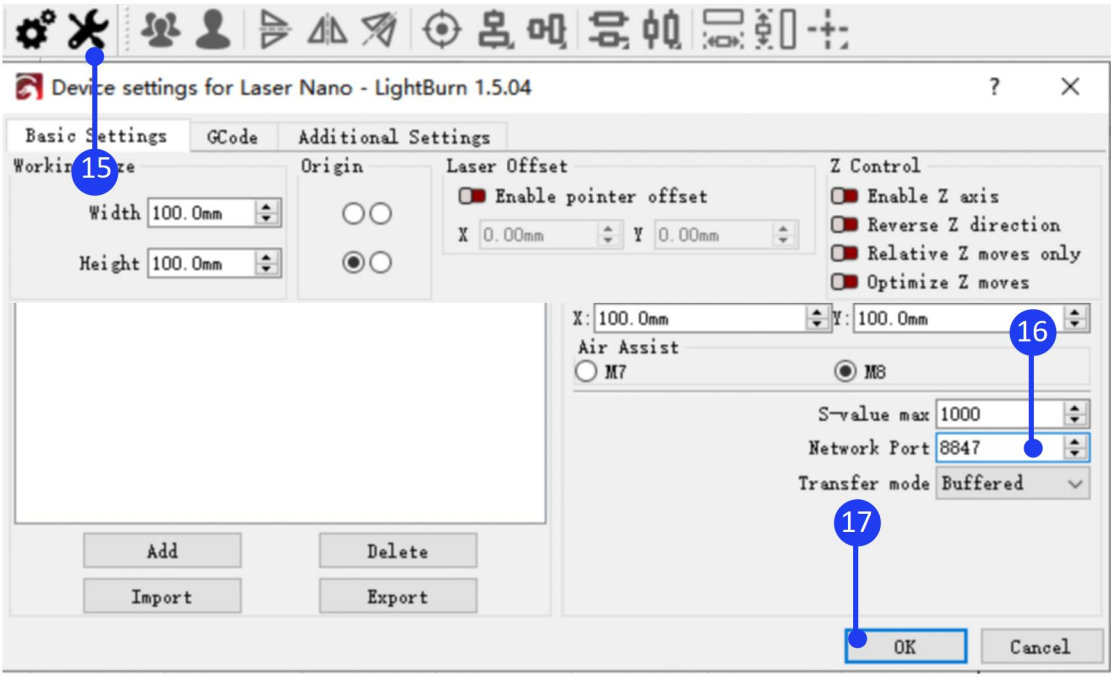

New Device Wizard
grbl GRBL
What is the IP address of the device?
192. 168. 0__. 1__
9
10
Next
Cancel


New Device Wizard
What would you like to call it?
(If you have more than one, use this to tell them apart)
Laser Nano
What are the dimensions of the work area?
(The lengths, in mm, of the X and Y axis of your laser)
X Axis Length 100 mm
Y Axis Length 100 mm
11
Next
Cancel


New Device Wizard
Where is the origin of your laser?
(Where is XO, YO ?)
Rear Left
Rear Right
Front Left
Front Right
Auto "home" your laser on startup?
12
Next
Cancel

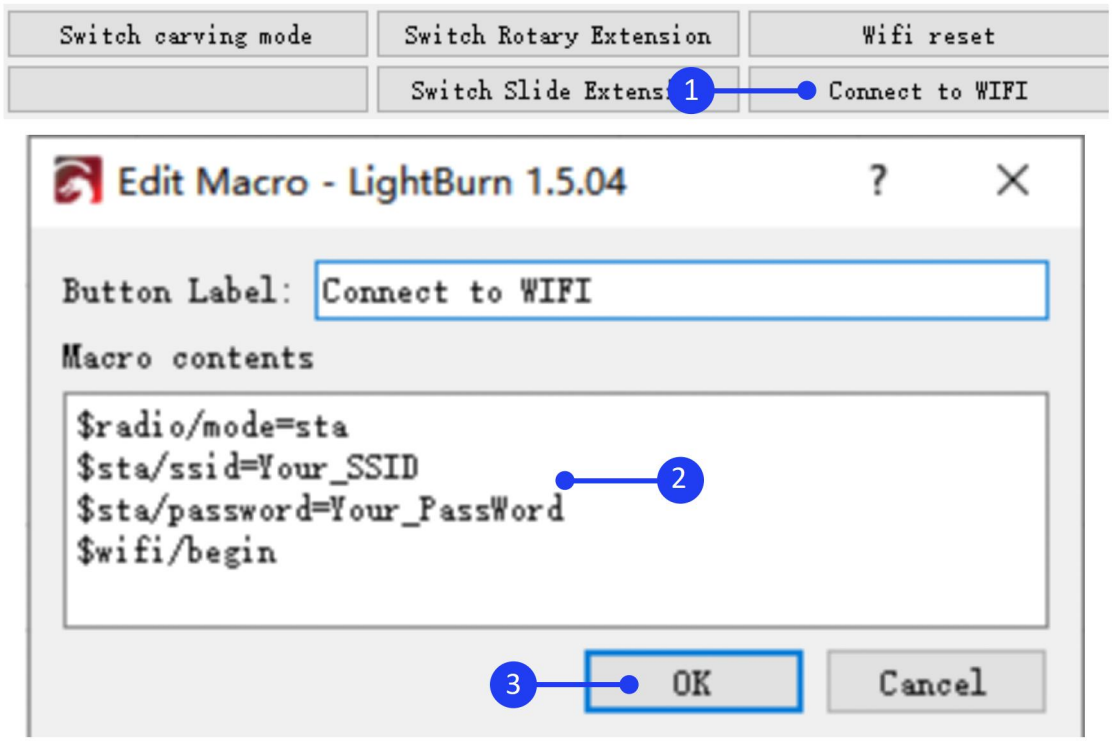

New Device Wizard
That's it - you're done. Here's a summary:
GRBL
Ethernet/TCP
Laser Nano
100mm x 100mm, origin at front left
192.168.0.1
Click "Finish" to add the new device.
13
Finish
Cancel

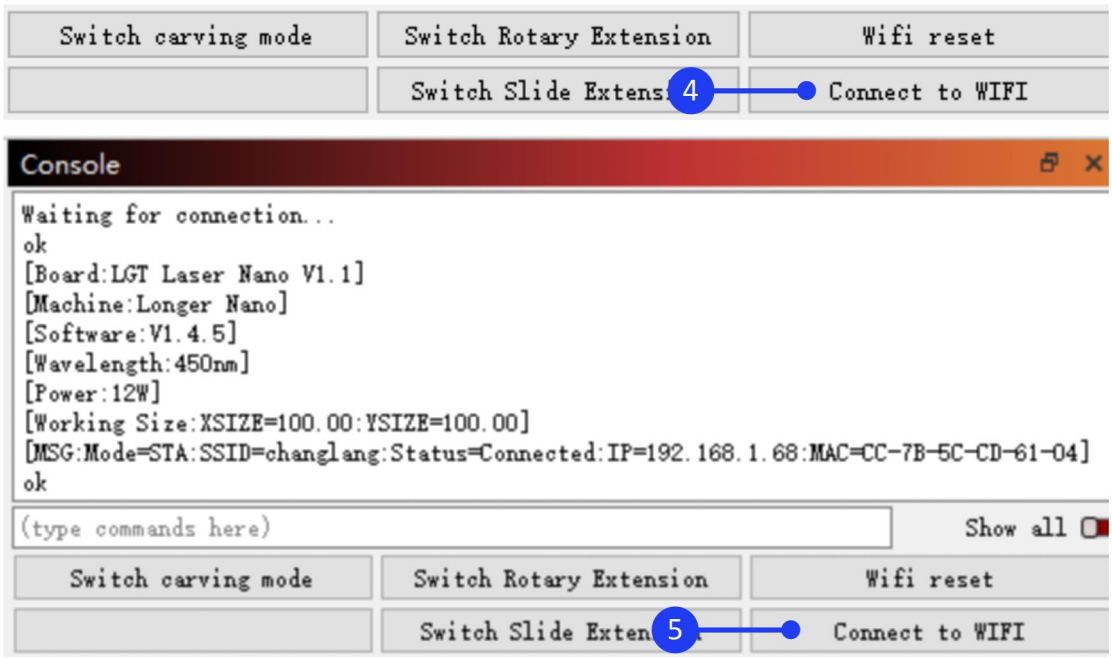

Devices - LightBurn 1.5.04
Your Device List
LONGER B1 20W 30W 40W
RAY5 5W
Laser Nano
GRBL - Ethernet/TCP : 192.168.0.1
100mm x 100mm, origin at front left, auto-home disabled
Find My Laser
Create Manually
LightBurn Bridge
Import
Make Default
Edit
Remove
Export
14
OK
Cancel

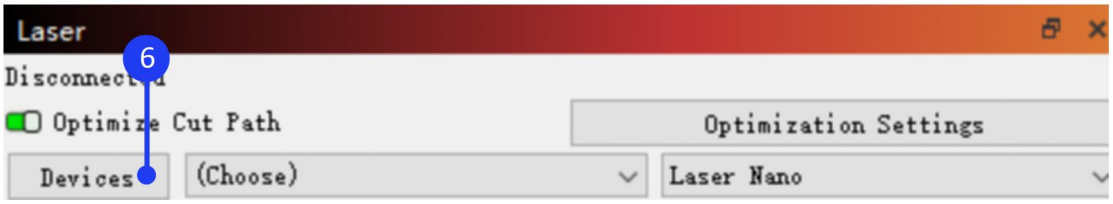

Device settings for Laser Nano - LightBurn 1.5.04
Basic Settings
GCode
Additional Settings
15
Origin
Laser Offset
Enable pointer offset
Z Control
Enable Z axis
Reverse Z direction
Relative Z moves only
Optimize Z moves
Width 100.0mm
Height 100.0mm
X 0.00mm
Y 0.00mm
X: 100.0mm
Y: 100.0mm
Air Assist
M7
M8
16
S-value max 1000
Network Port 8847
Transfer mode Buffered
17
Add
Delete
Import
Export
OK
Cancel

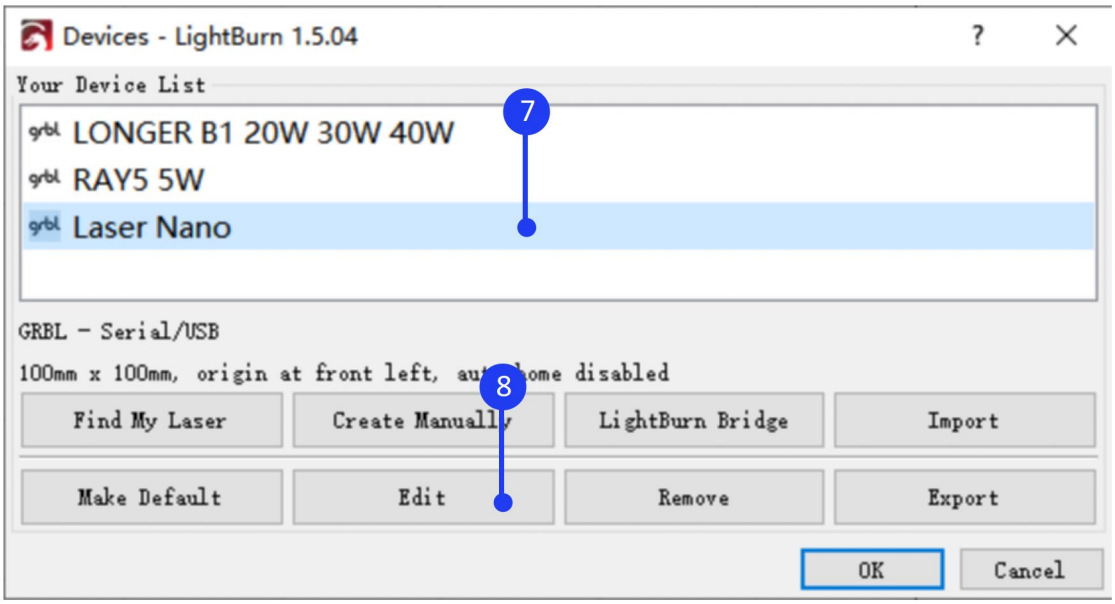
2) Connect Nano to LightBurn by WIFI in STA mode

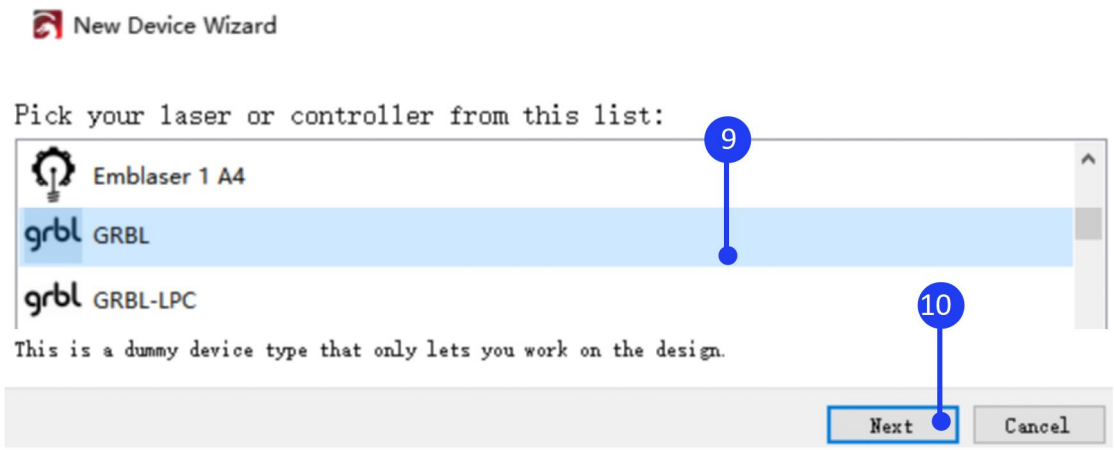
Run the LightBurn, connect PC to Nano, right click 'Connect to WIFI' in console window to set WiFi information, change Your_SSID and Your_PassWord to your WIFI account and password in $sta/ssid and $sta/password command, click OK, left click 'Connect to WIFI' to change it to STA mode. After the connection is successful, the console prompts the 'status = connected' and the IP address. Please note that the computer network and WIFI must be in the same LAN (local area network). Click Devices in Laser window, select Laser Nano > Edit > GRBL > Next > Ethernet/TCP > Next > input IP address > Next > Next > Next > Finish > OK, click Device Settings > input 8847 in Network Port > OK.

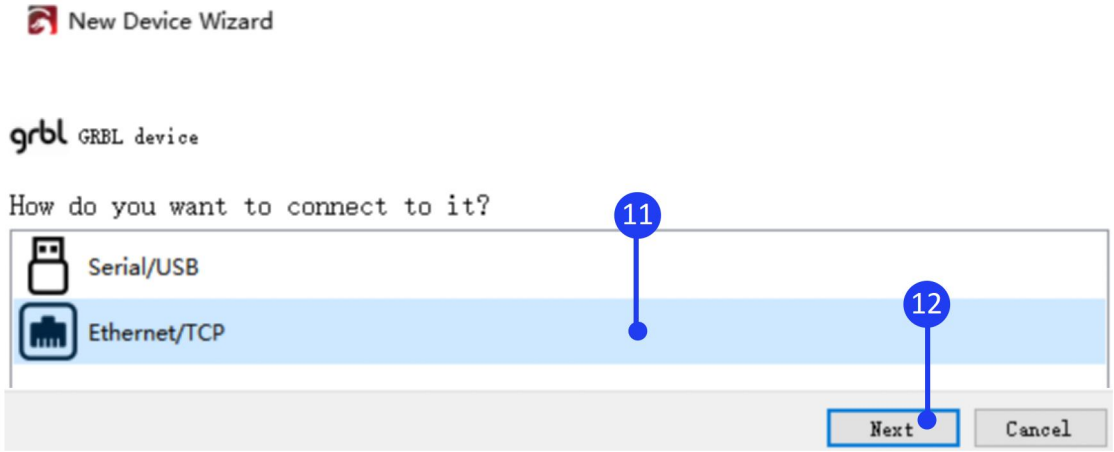


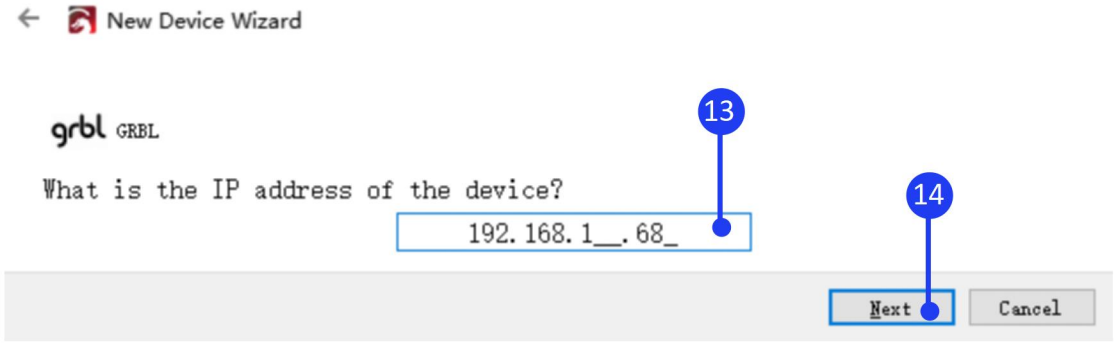

Switch carving mode
Switch Rotary Extension
Wifi reset
Switch Slide Extens
4
Connect to WIFI
Console
Waiting for connection...
ok
[Board:LGT Laser Nano V1.1]
[Machine:Longer Nano]
[Software:V1.4.5]
[Wavelength:450nm]
[Power:12W]
[Working Size:XSIZE=100.00:YSIZE=100.00]
[MSG:Mode=STA:SSID=changlang:Status=Connected:IP=192.168.1.68:MAC=CC-7B-5C-CD-61-04]
ok
(type commands here)
Show all
Switch carving mode
Switch Rotary Extension
Wifi reset
Switch Slide Exten
5
Connect to WIFI

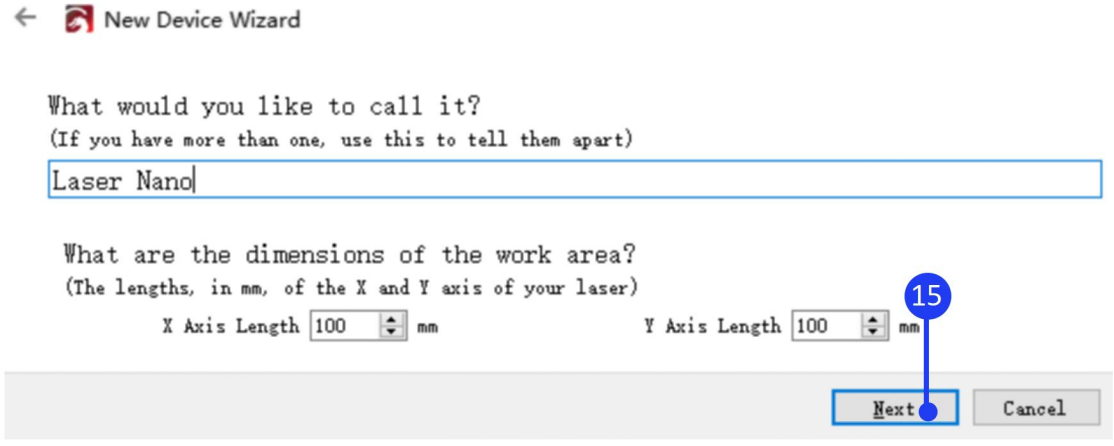

Laser
6
Optimize Cut Path
Optimization Settings
Devices
(Choose)
Laser Nano

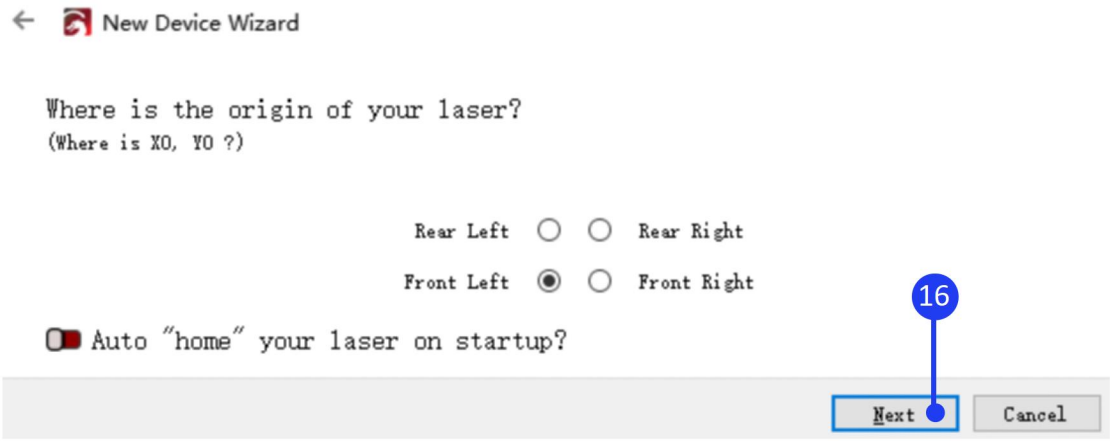

Devices - LightBurn 1.5.04
Your Device List
7
LONGER B1 20W 30W 40W
RAY5 5W
Laser Nano
GRBL - Serial/USB
100mm x 100mm, origin at front left, auto home disabled
8
Find My Laser
Create Manually
LightBurn Bridge
Import
Make Default
Edit
Remove
Export
OK
Cancel

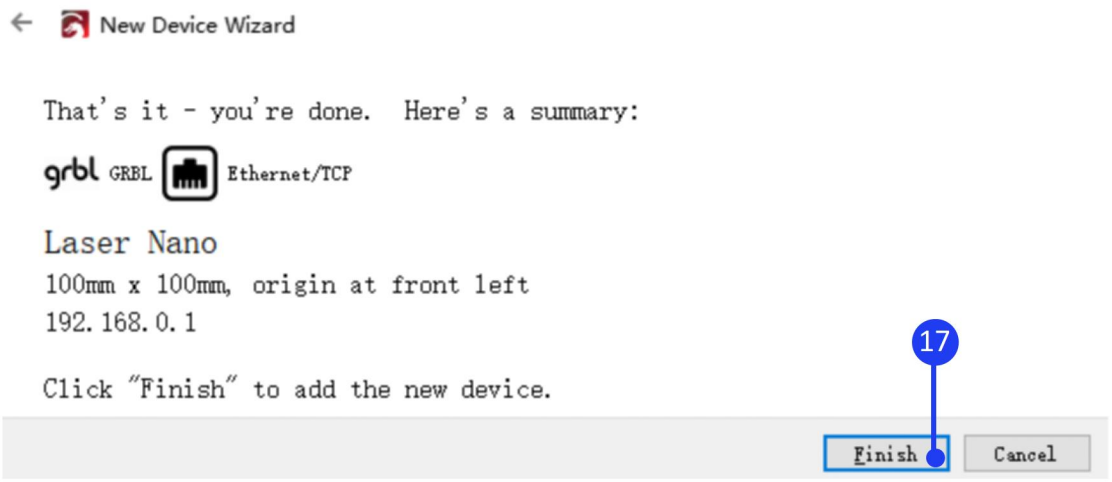

New Device Wizard
Pick your laser or controller from this list:
Emblaser 1 A4
GRBL
GRBL-LPC
This is a dummy device type that only lets you work on the design.
9
10
Next
Cancel

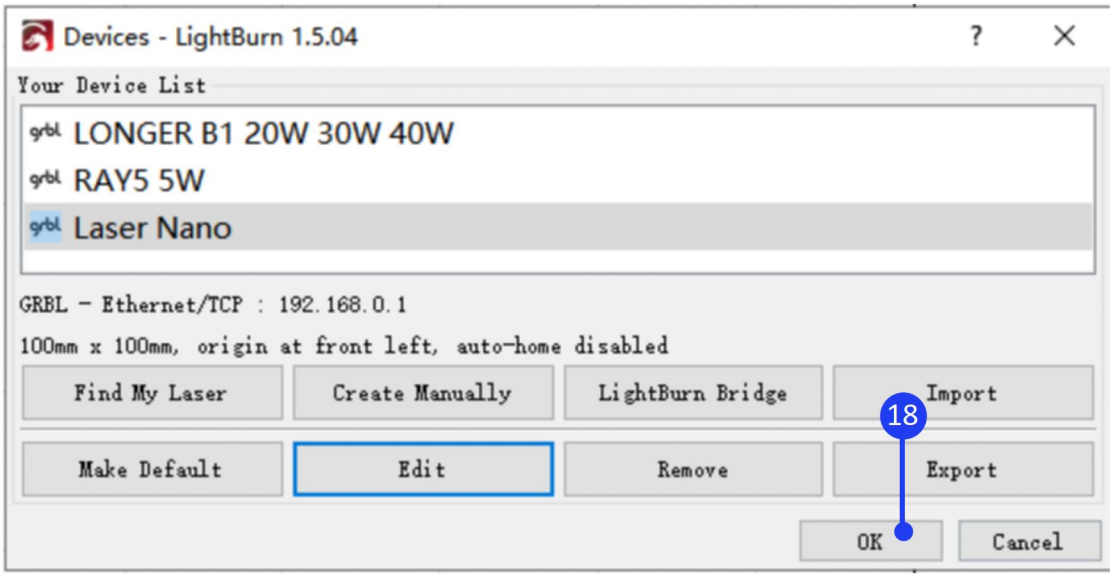

New Device Wizard
GRBL device
How do you want to connect to it?
Serial/USB
Ethernet/TCP
11
12
Next
Cancel

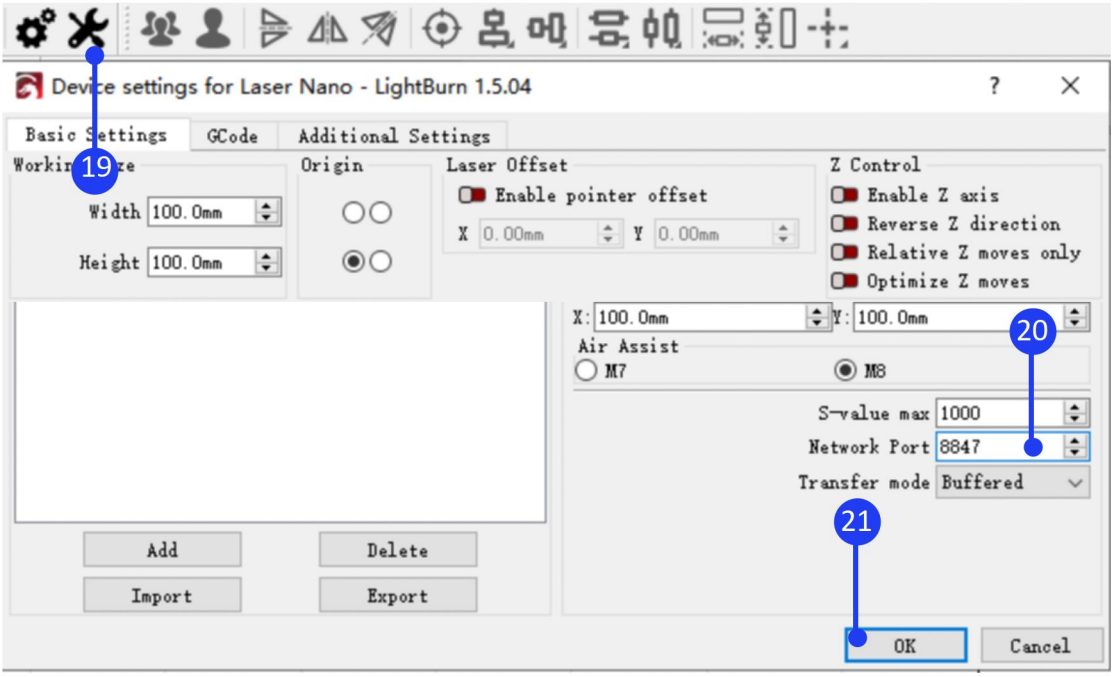

New Device Wizard
GRBL
What is the IP address of the device?
192. 168. 1__. 68_
13
14
Next
Cancel


New Device Wizard
What would you like to call it?
(If you have more than one, use this to tell them apart)
Laser Nano
What are the dimensions of the work area?
(The lengths, in mm, of the X and Y axis of your laser)
X Axis Length 100 mm
Y Axis Length 100 mm
15
Next
Cancel


New Device Wizard
Where is the origin of your laser?
(Where is XO, YO ?)
Rear Left
Rear Right
Front Left
Front Right
Auto "home" your laser on startup?
16
Next
Cancel


New Device Wizard
That's it - you're done. Here's a summary:
GRBL
Ethernet/TCP
Laser Nano
100mm x 100mm, origin at front left
192.168.0.1
Click "Finish" to add the new device.
17
Finish
Cancel


Devices - LightBurn 1.5.04
Your Device List
LONGER B1 20W 30W 40W
RAY5 5W
Laser Nano
GRBL - Ethernet/TCP : 192.168.0.1
100mm x 100mm, origin at front left, auto-home disabled
Find My Laser
Create Manually
LightBurn Bridge
Import
Make Default
Edit
Remove
Export
18
OK
Cancel


Device settings for Laser Nano - LightBurn 1.5.04
Basic Settings
GCode
Additional Settings
Origin
Laser Offset
Enable pointer offset
Z Control
Enable Z axis
Reverse Z direction
Relative Z moves only
Optimize Z moves
Width 100.0mm
Height 100.0mm
X 0.00mm
Y 0.00mm
X: 100.0mm
Y: 100.0mm
Air Assist
M7
M8
S-value max 1000
Network Port 8847
Transfer mode Buffered
Add
Delete
Import
Export
OK
Cancel
19
20
21

F. APP operation

1. Download and install

Please search for "LaserBurn" in Google play or visit the address below to download for Android system

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

Please search for "LaserBurn" in the Apple store or visit the address below to download for IOS system:

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

Or download from LONGER's offical website:

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

Or scan the code to download the APP:

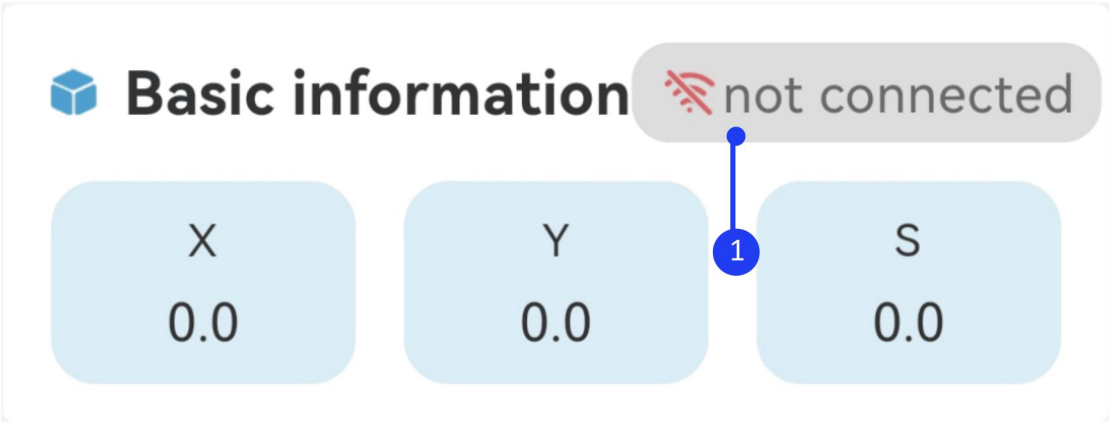
For complex grayscale engraving, it is recommended to transfer the image to the mobile phone album and import it into the APP for engraving, which will have a better effect.

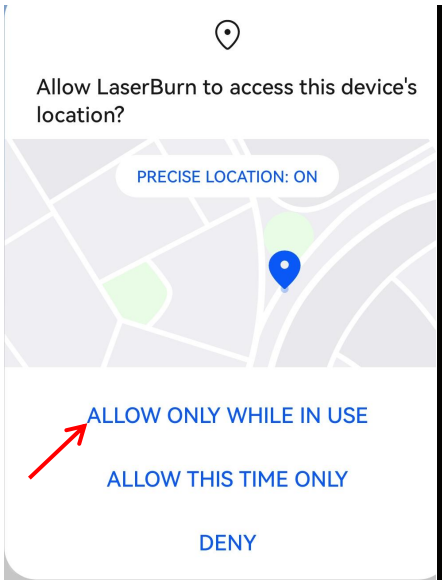
2. Connect to WIFI in AP mode

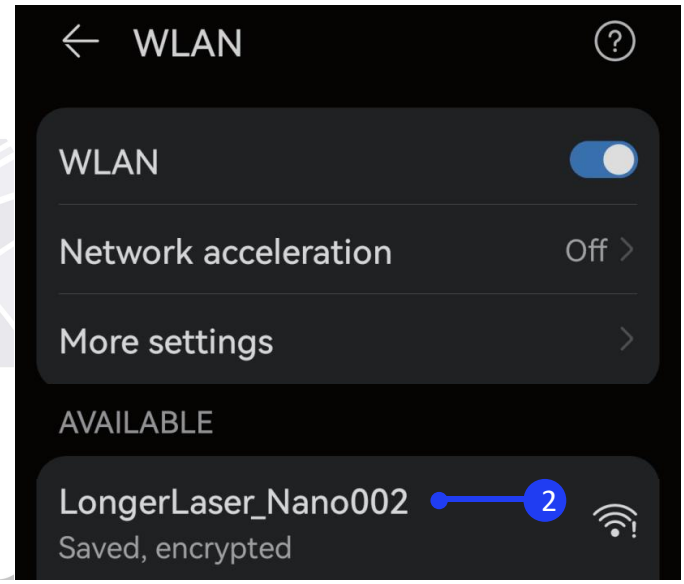
Note: There are two modes, AP and STA, to connect NANO via WIFI. The difference is that in AP mode the phone will have no network, but in STA mode the phone can maintain network.

1) Run the LaserBurn APP and enter the Home page, click not connected icon 

. when there is a 'Allow LaserBurn to access this device' prompt, you need to click 'Allow only while in use', otherwise you may not be able to search for WIFI of Nano.

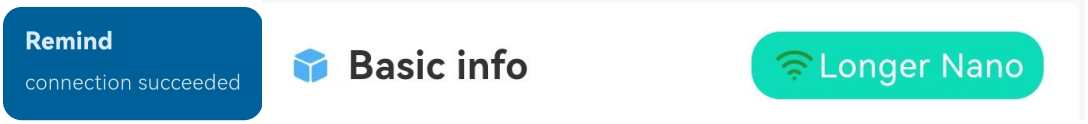






2) Open the WLAN settings on your phone, search for the WIFI starting with LongerLaser_Nano and input password 12345678 to connect the wifi of Nano Pro. If WIFI of LongerLaser_Nano can not be found, please long press the WIFI reset button on the back of the Nano Pro until you can hear three buzzers to reset the WIFI, then search the WIFI list again.

3) Enter the IP address 192.168.0.1 below, click Connect. There will be a remind 'connection succeeded' when connect successful

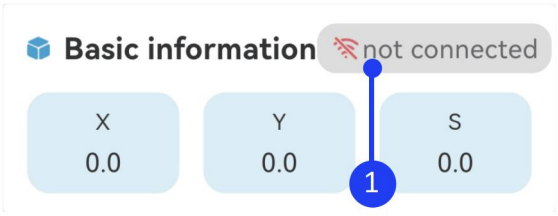


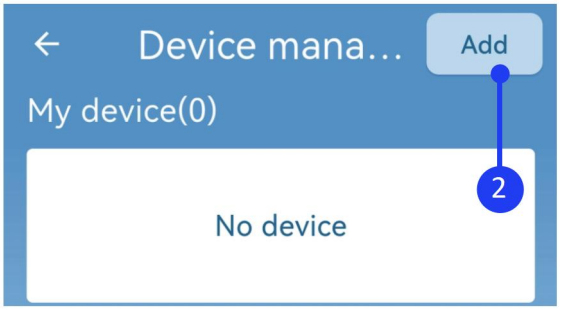
3. Connect to WIFI in STA mode

1) Open the WLAN settings on your phone. Run LaserBurn and enter the Home page, click not connected icon 

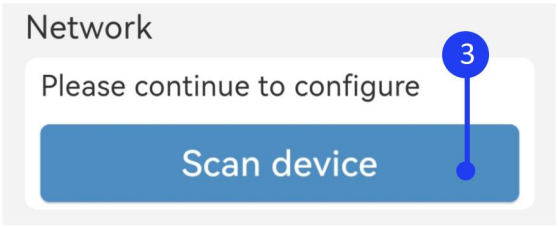
, enter the network configuration page, click Add 

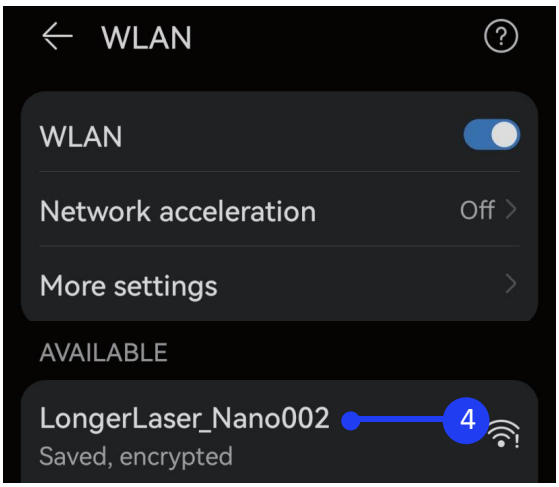
in the upper right corner.





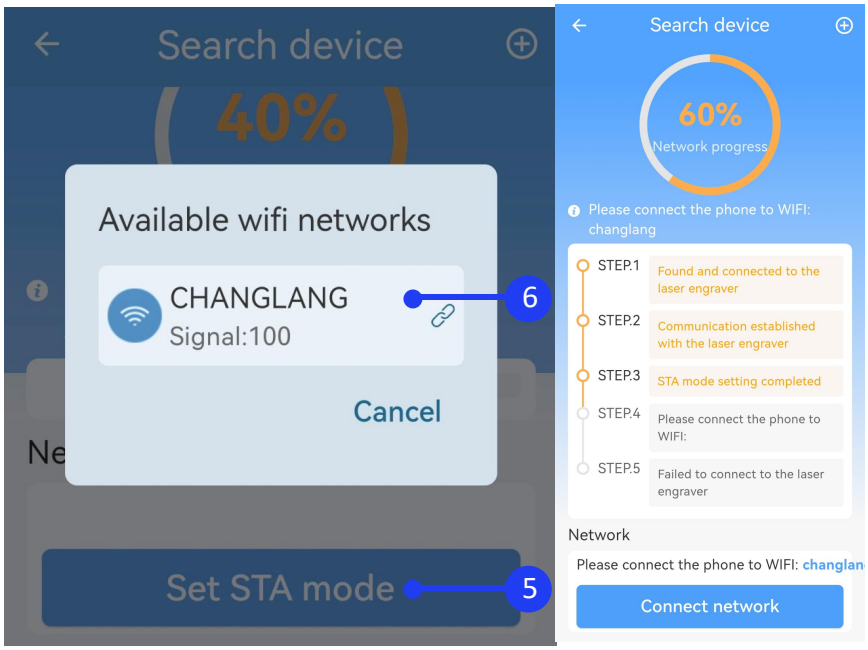
2) Click Scan device, search for the WIFI starting with LongerLaser_Nano and input password 12345678 to connect the wifi of Nano.





3) After the connection is successful, return to LaserBurn, select Set STA mode to connect WIFI of router (only supports 2.4G), and

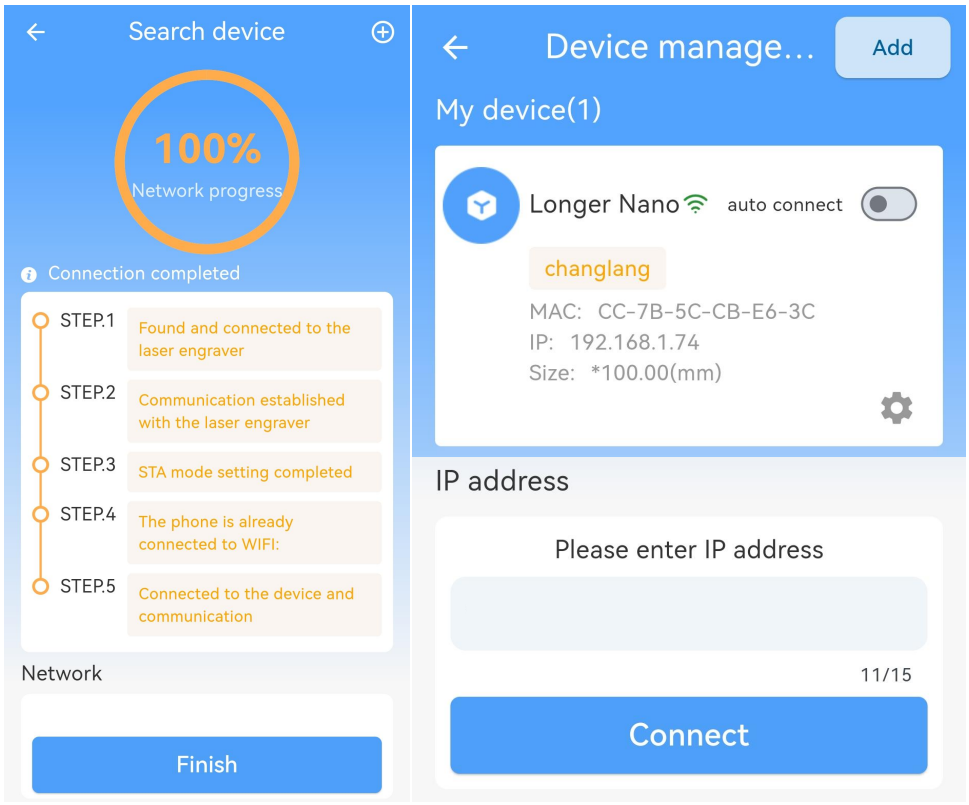
enter the password. The indicator light in front of Nano will switch to orange breathing light during connecting, then will turn green if the connection is successful, then click the app to enter the next step, the network progress will reaches 60% . And the indicator light will remain orange if the connection fails, click the app to return to the first step and start again.



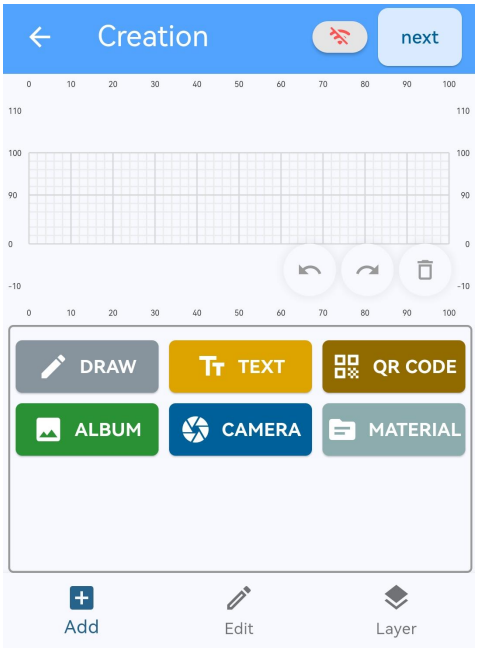
4) Back to LaserBurn, click Connect network at the bottom of the page, connect the phone to the same WIFI as the STA mode in the previous step, wait for network configuration. When the connection is successful and the network process reaches 100%, click FINISH at the bottom to return to the device list interface.

Note: After the device is connected, when click anywhere on the device list label, the machine will disconnect; conversely, if click

when the device is disconnected, the phone will automatically connect to the device.



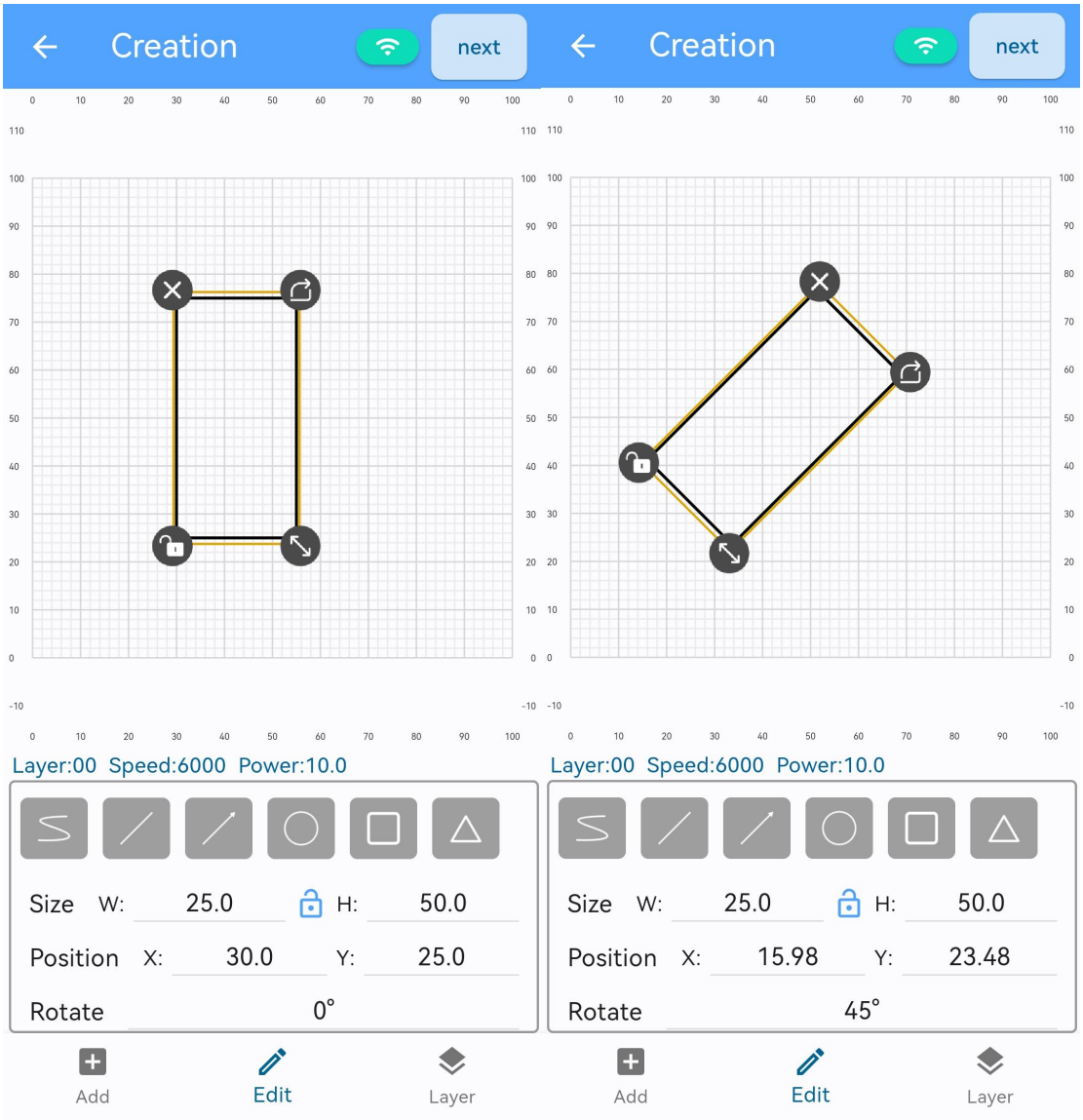
4. Creation



In the creation interface, graphics can be imported through drawing, text, QR code, photo album, camera, material library, etc.

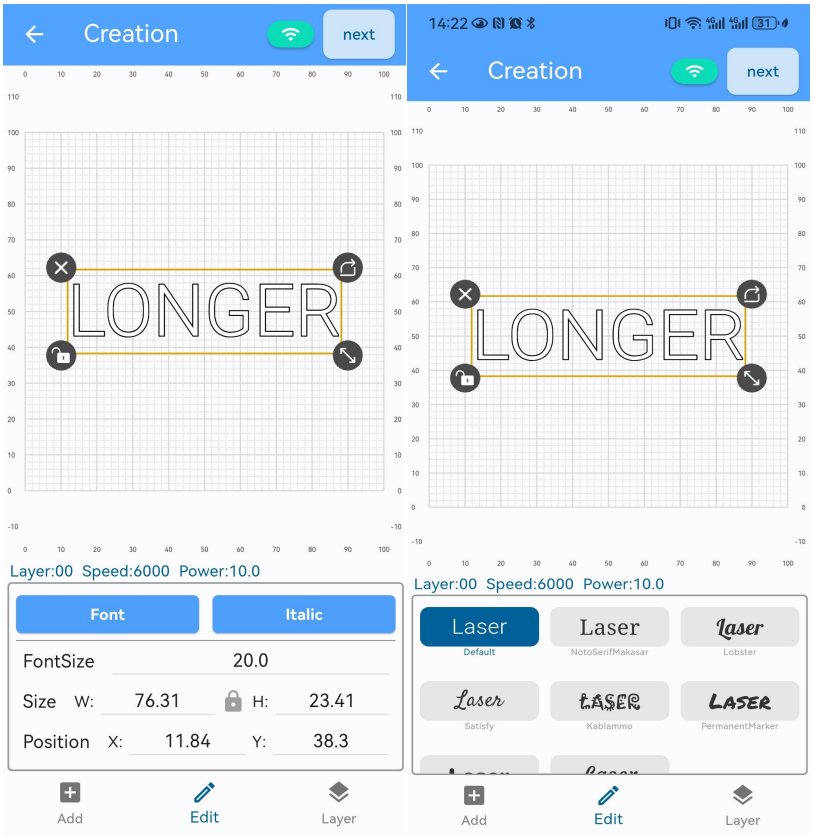
1) Draw:

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

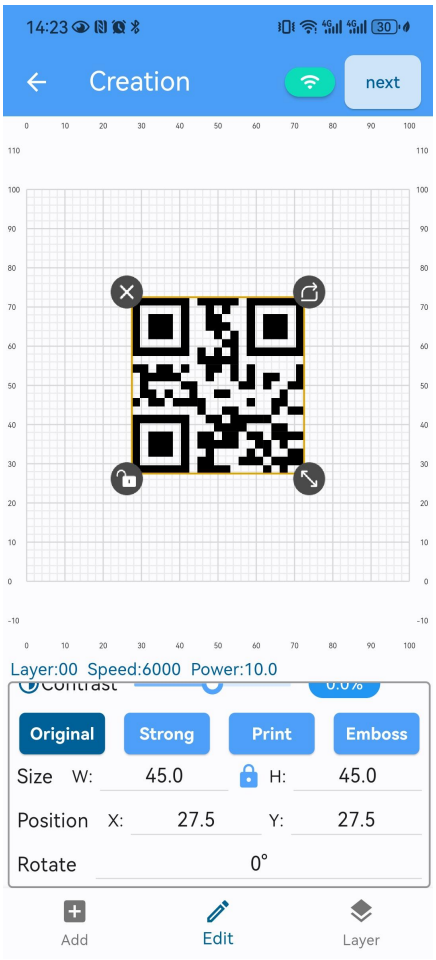


Enter the value in Size to scale the graphic proportionally or hold down the button to drag. If you need to change the length and width of the graphic separately, you can click the button to unlock the proportional lock; enter a value in Position to change the position of the graphic, or select the graphic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

2) Text



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



3) QR code

Generate QR code based on the input content, and change the size, position or angle of the QR code.

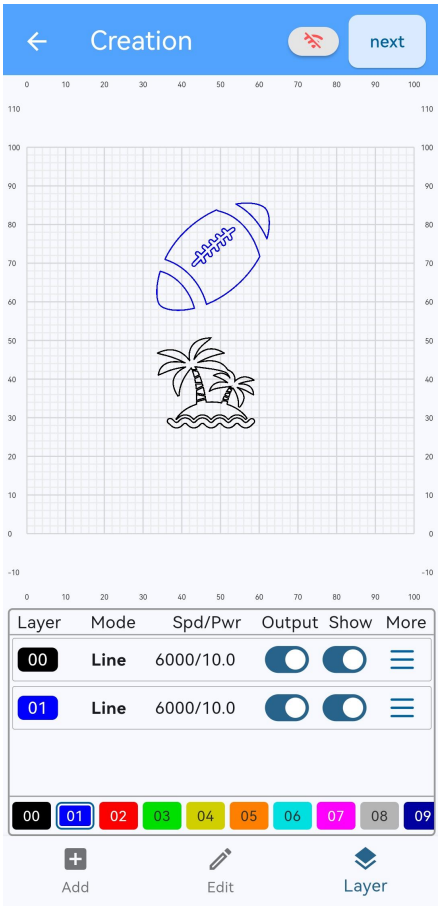
4) Layer

Layer mode: set line or fill

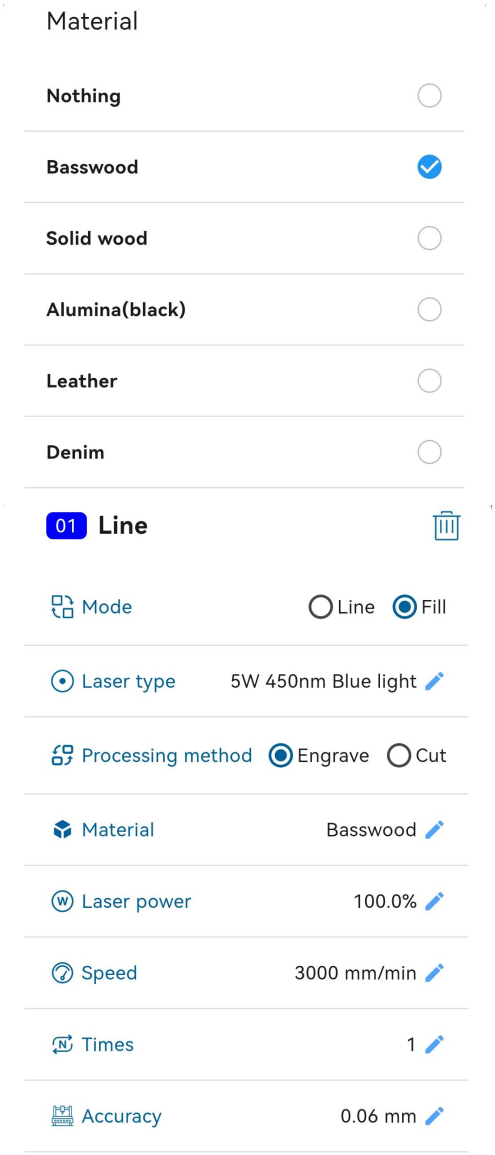
Laser type: choose 6W for Nano, 12W for Nano Pro pro

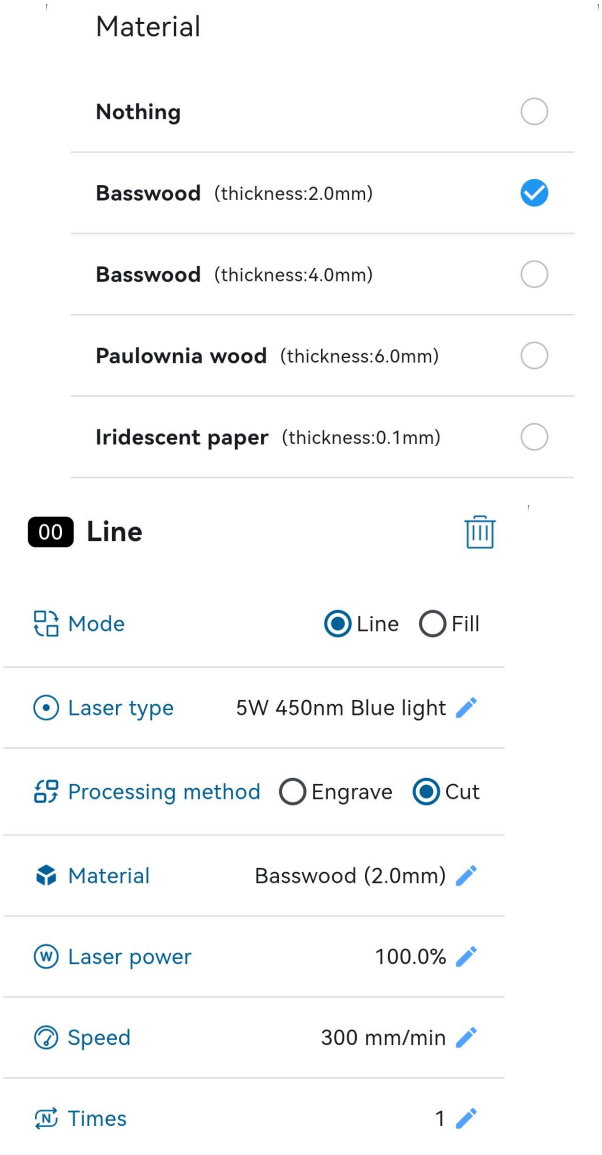
Processing method: engrave or cut

Material: select the corresponding material from the material library, and the APP will automatically set the appropriate parameters according to the processing method and laser power selection. If the parameters need to be modified, click the edit button to adjust.



Different colored layers can set different parameters for designs to meet the needs of engraving or cutting multiple files at the same time. Such as layer mode, laser type, processing method, material, laser power, speed, times and accuracy. Up to 11 parameters can be set in the APP, first select the design to set parameters, click Layer, and select different colored layers.





5) Album

Import pictures from the mobile phone album.

6) Camera

Use the phone camera to shoot pictures and import to APP.

7) Undo

Undo the last operation, up to 20 steps can be supported.

8) Redo

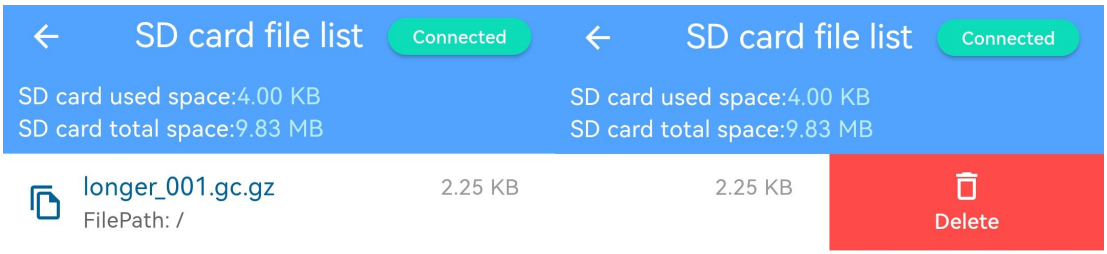

Redo the last operation, up to 20 steps can be supported.

9) Clear


Clear all graphics in the canvas.

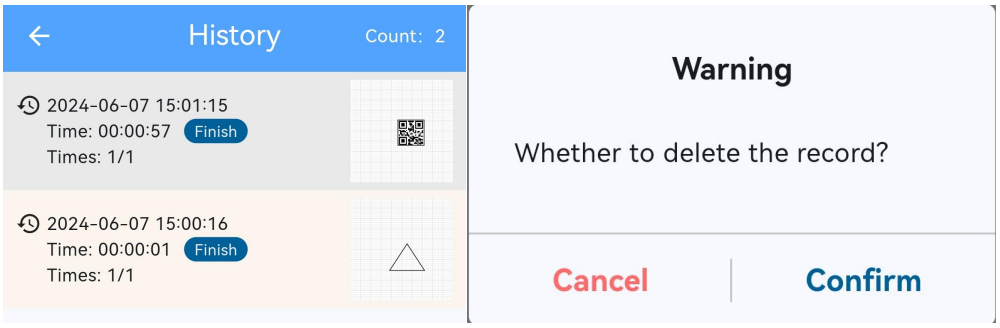
5. Files

When connected to the engraving machine, you can preview the file data uploaded to the Nano. Select a file from the list and slide it to the left can delete it. When the reserved memory is almost used up, please clean up unnecessary files in time, otherwise new files can not be uploaded.

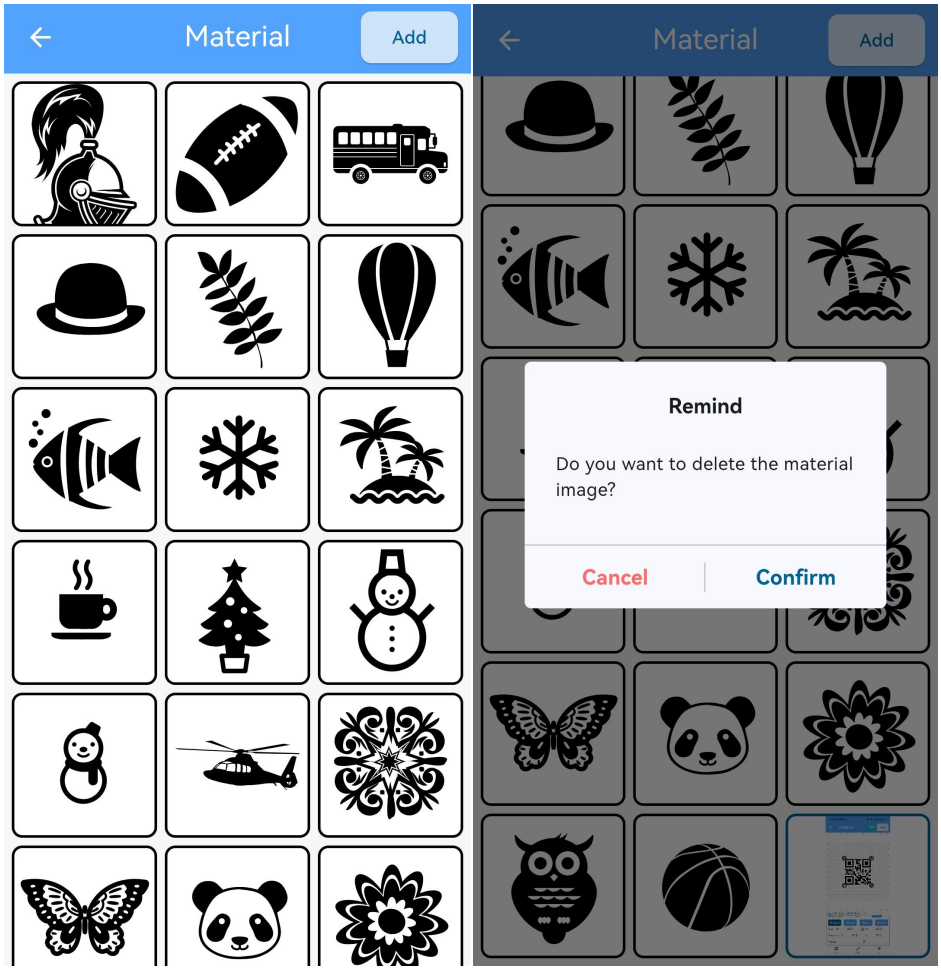


6. History

History displays a graphic history list of operations on the APP. You can long press a file in the list to delete unwanted images.



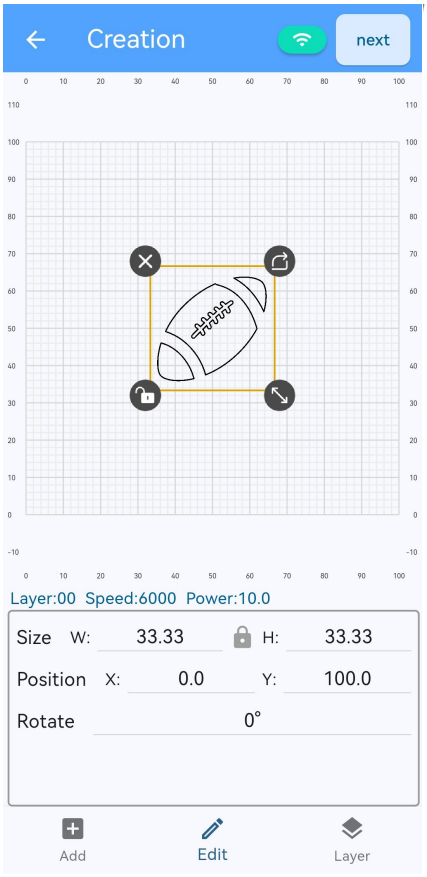
7. Material

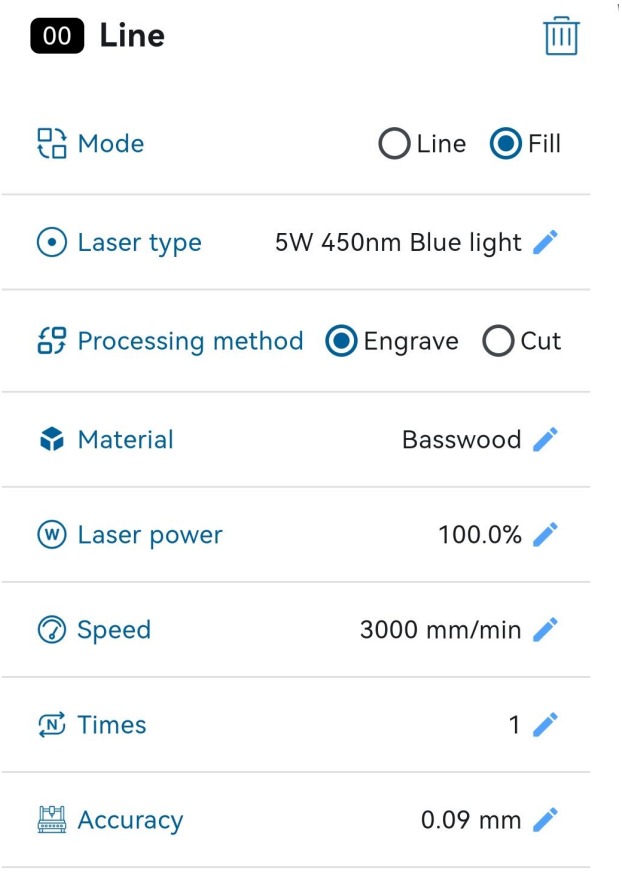


Material: Graphic library in the APP. Click the ADD button in the upper right corner can add graphics from the phone album or phone memory. Long press on the self imported image can delete it, but the built-in image cannot be deleted.

8. How to make a project on LaserBurn APP

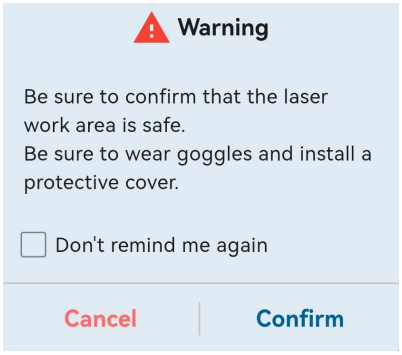
1) Run LaserBurn app and connect the APP to Nano, add a graphic, click Edit to set size and position, click Layer to set the parameter of the graphic, then click next in the upper right corner.



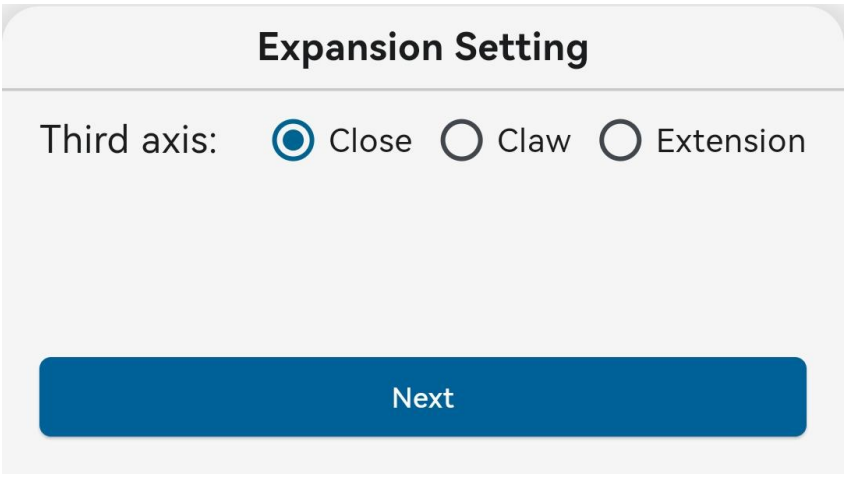


Accuracy has only two values options, 0.09mm or 0.06mm. For those who require high precision, it can edit it to 0.06mm. For those who require high efficiency, it can choose 0.09mm.

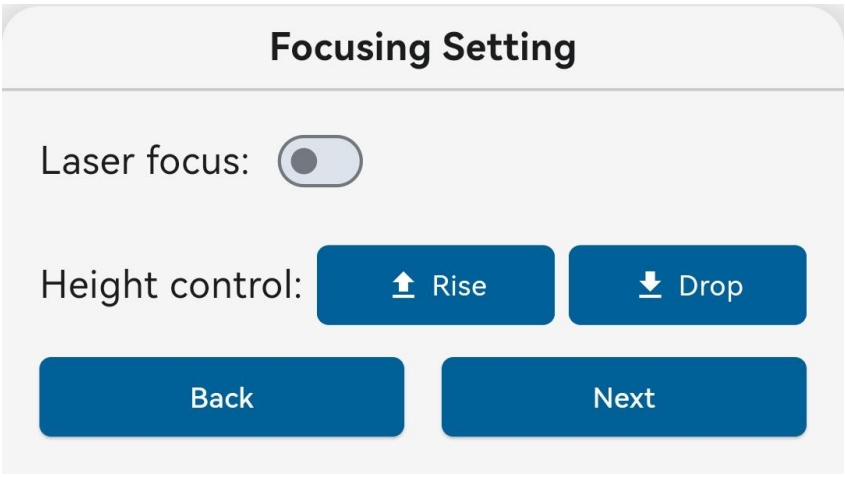
2) There will be a warning window, make sure the work area is safe, wear googles and protective cover is installed , click Confirm.



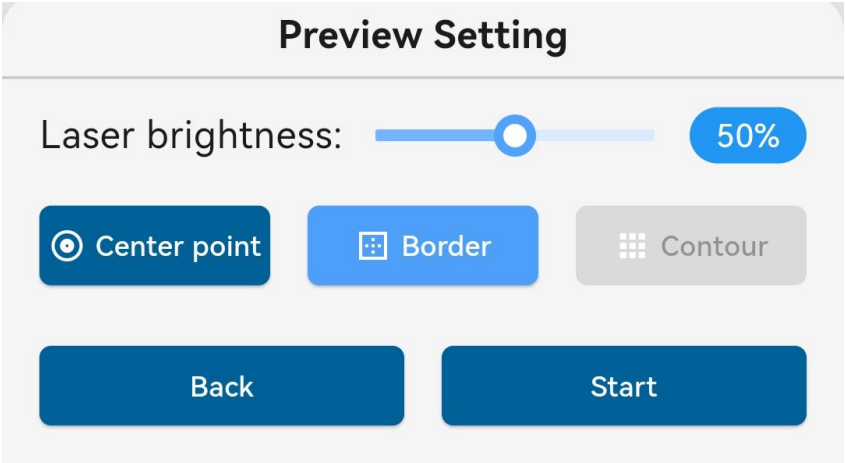
3) Set the third axis option, select None for the Nano, click Next.



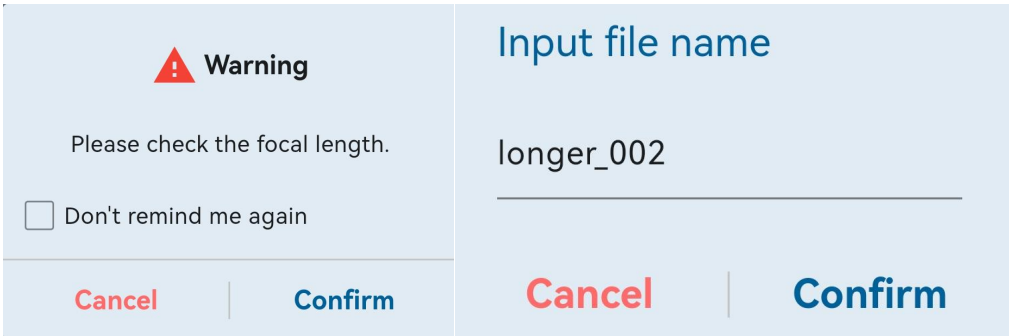
4) Set the focus, enable the Laser focus, the infrared laser will be turn on, click Rise or Drop to adjust the height until two infrared dots coincide with each other, click Next.

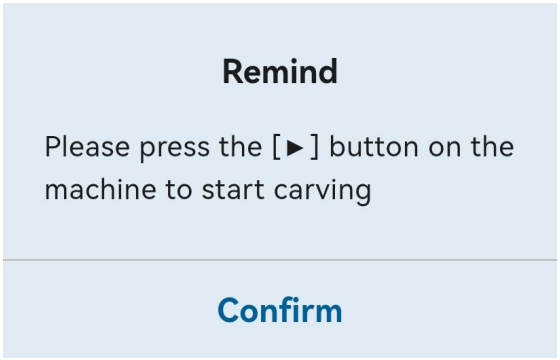


5) Click Border to preview the work position of the graphic to confirm the position of material is correct. If you cannot see the blue light clearly during preview, you can increase the blue light power appropriately, but be careful to avoid burning the engraving material, click Start.



6) After confirming that the focus is adjusted normally and the goggles are worn, click Confirm to make sure the file name, and then the file starts to upload to the Nano. After the upload is completed, click Confirm and press the start button on the laser module to start the engraving task.





7) The APP will display the task progress. You can click Pause to pause the task, click Restart to resume the task, or click Stop to cancel the task. When the task is completed, there will be a 'Work completed' prompt. Click confirm to return to the Home page.