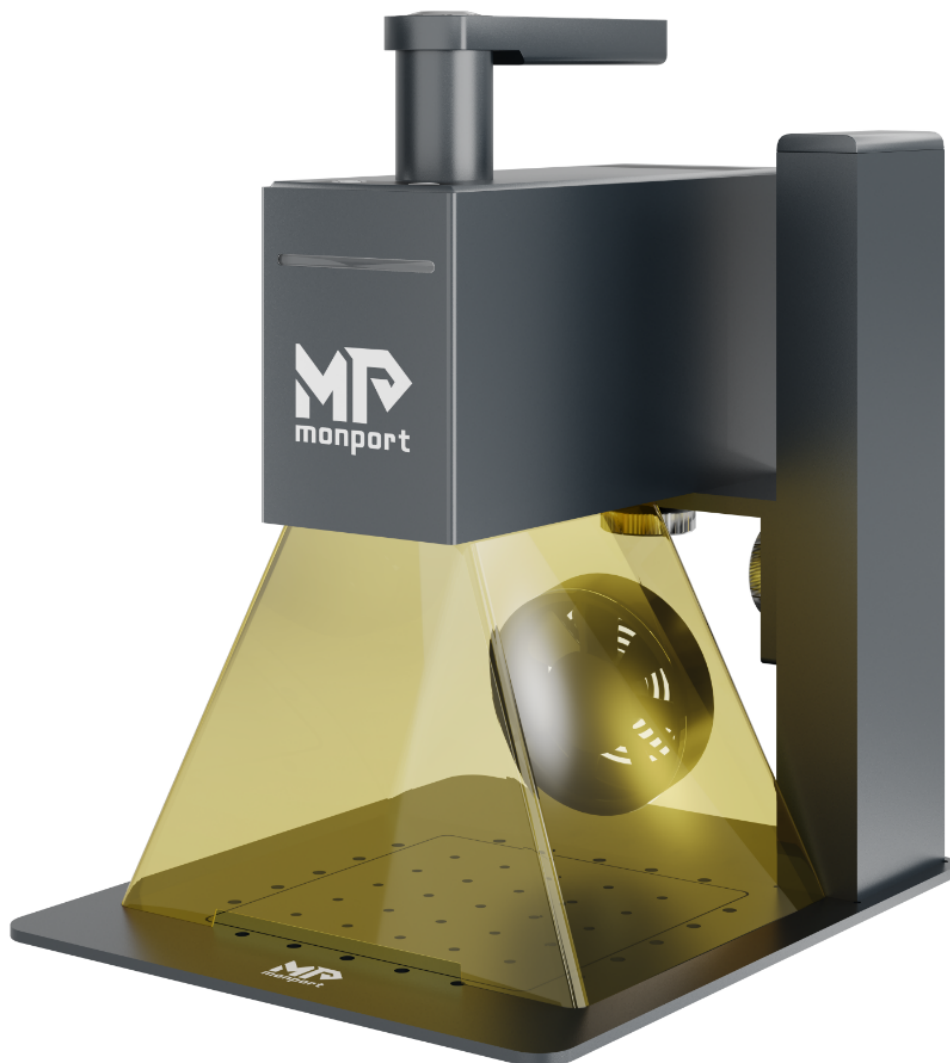




Module Laser Engraver User Manual



Dear customer:

Thank you for choosing Monport products **Module 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@monportlaser.com
2. Facebook ID : Monport Laser Official Group
3. YouTube channel: Monport Laser
4. Help Desk: <https://monportlaser.com/pages/after-sale-support>

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A. Safety Precautions

(1) The **Module** 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 **Module** 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 1×10^3 seconds but is considered a chronic viewing hazard for any period of time greater than 1×10^3 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 **Module** Safety Glasses provided are specific for Monport 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 **Module**.
- DO NOT allow unsupervised access to the **Module** to children.
- DO NOT allow access near the **Module** 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.

(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 **Module**. 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 **Module**.

- 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 Module operating unattended.**

-
- ALWAYS clean up clutter, debris, and flammable materials in the laser **Module** bed after use.

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

(7) Environmental requirements:

Temperature requirement: 10°C~30°C, humidity requirement: 20%~50%, this **Module** 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.
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(9) The **Module** has built in technology and algorithms to keep its users and the surrounding environment safe. This said it is important to understand the **Module** is not a toy and should be operated with care and respect.

B. Product Information

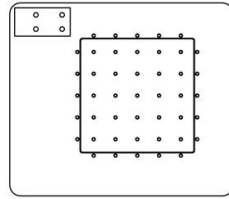
1. Product Specification

Features		Features	
Model	Module	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 Size	205mm*179mm*249mm
Gross Weight	3.9kg	Net Weight	2.55kg
Continuous Working Hours	Not 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		

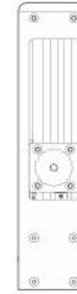
2. Product Accessories List



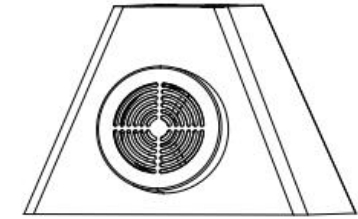
Laser unit



Base plate



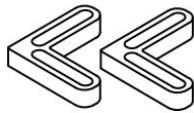
Electric lifting bracket



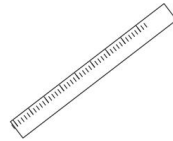
Protective cover



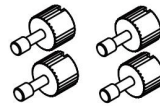
Goggles



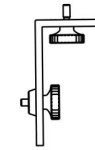
L-shaped Positioning piece



Ruler



Thumb screws



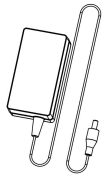
Mounting bracket



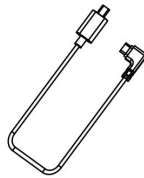
M4x8 Screws



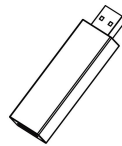
H2.5 Allen wrench



Power adapter



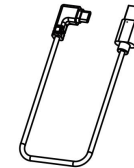
Double type-c cable



Card reader



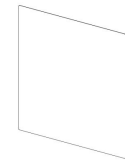
TF card



Data cable

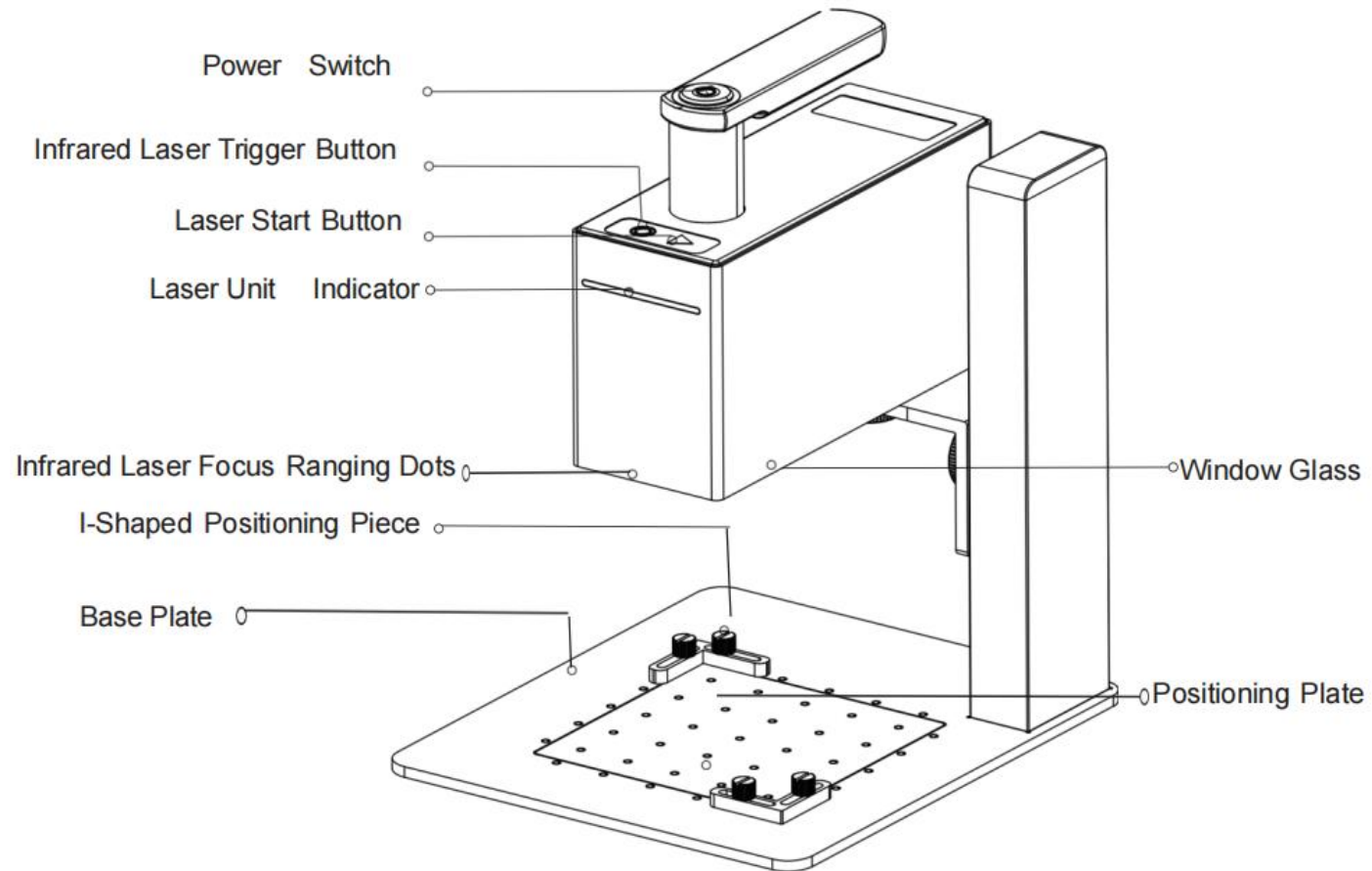


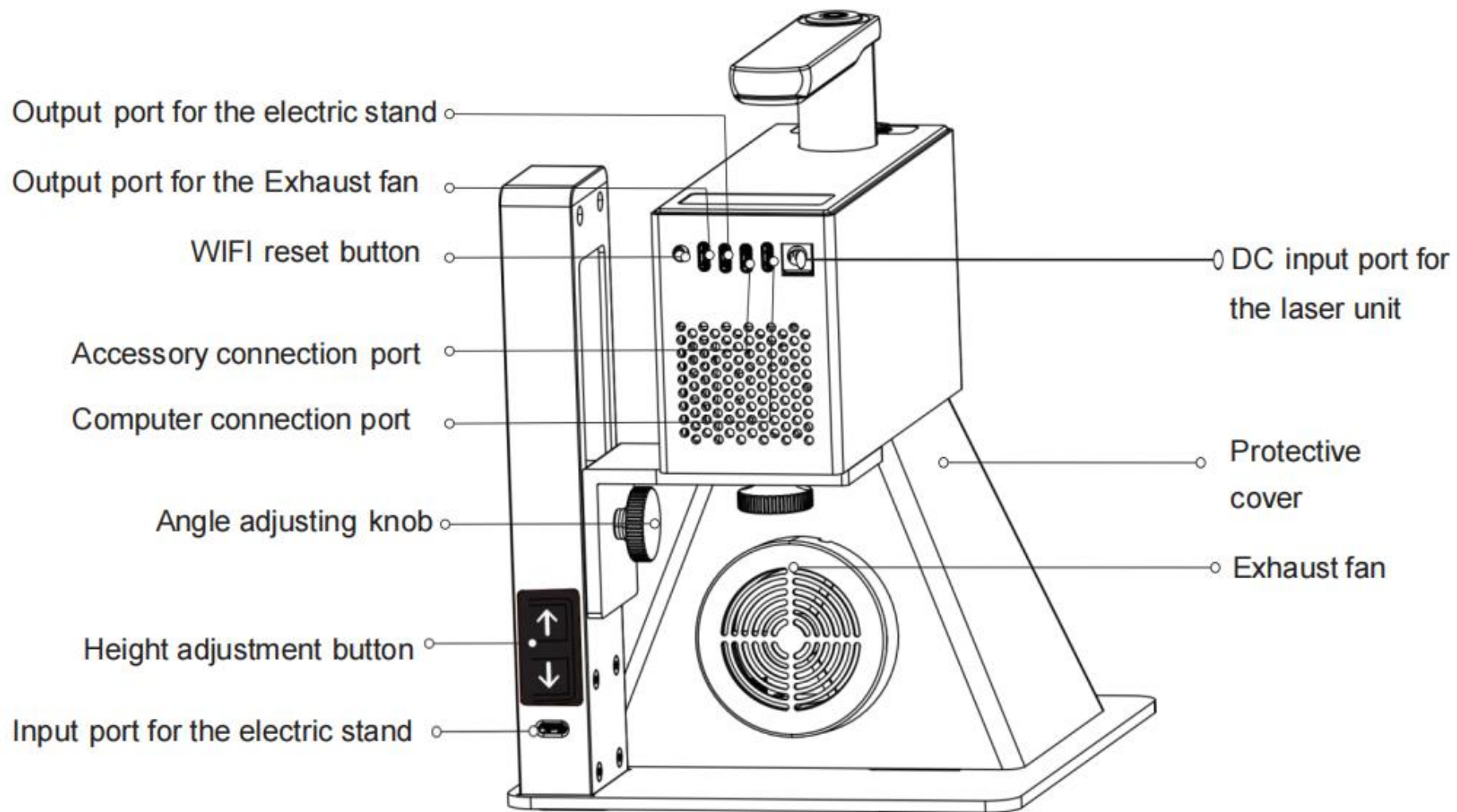
Consumables



Glasses cloth

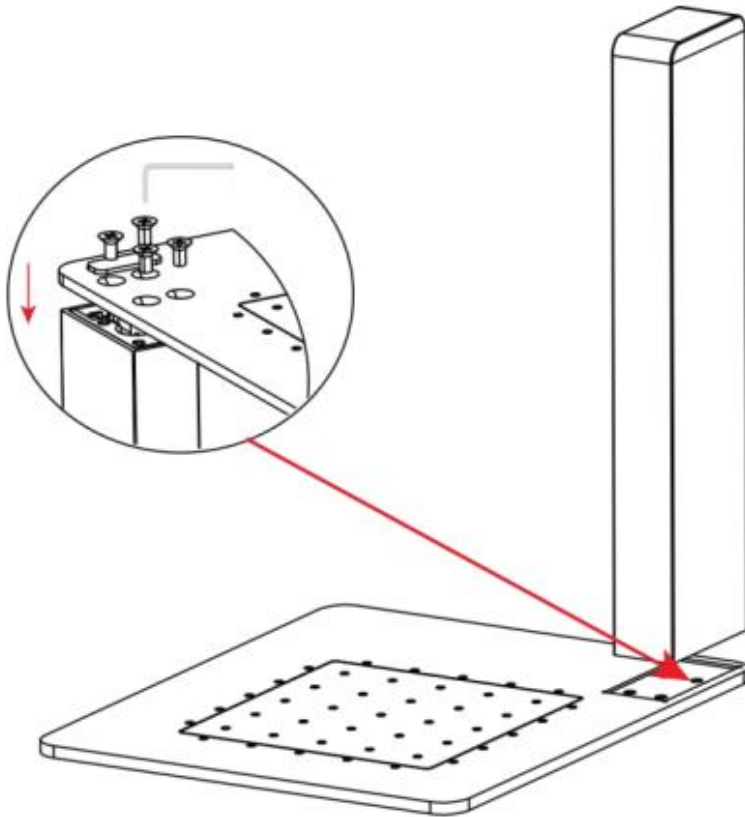
3. Product Instruction





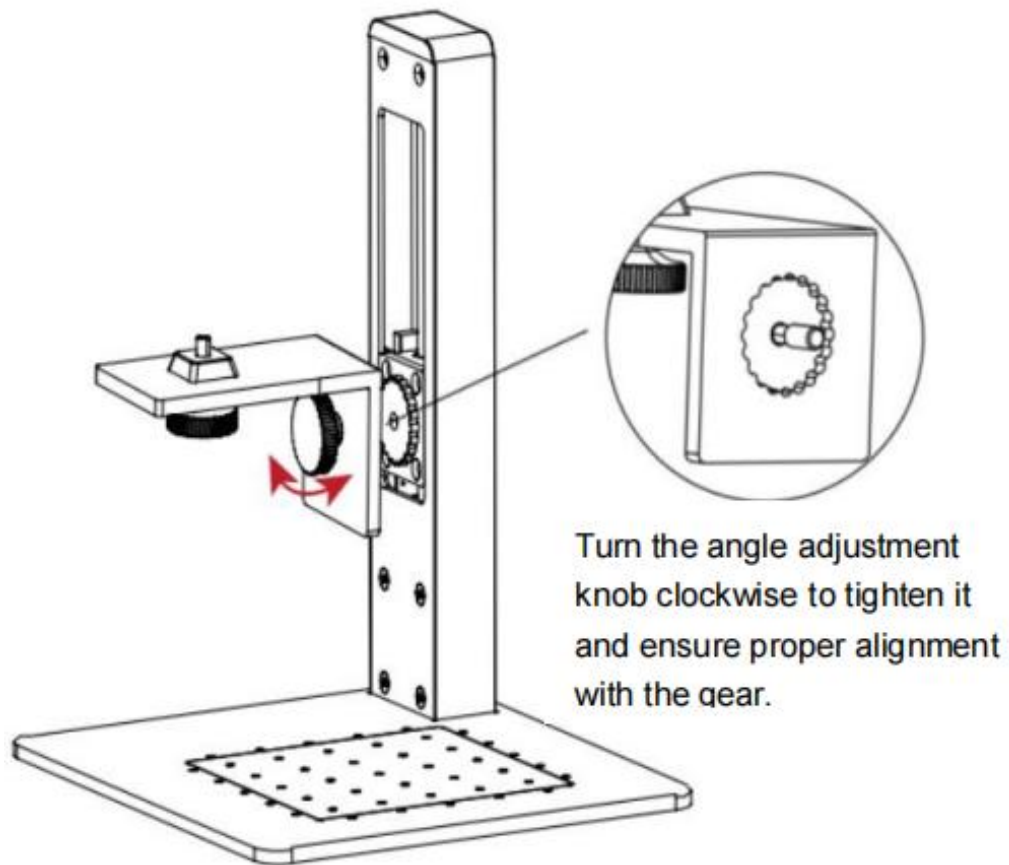
C. Quick installation

1. Electric lifting bracket assembly



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

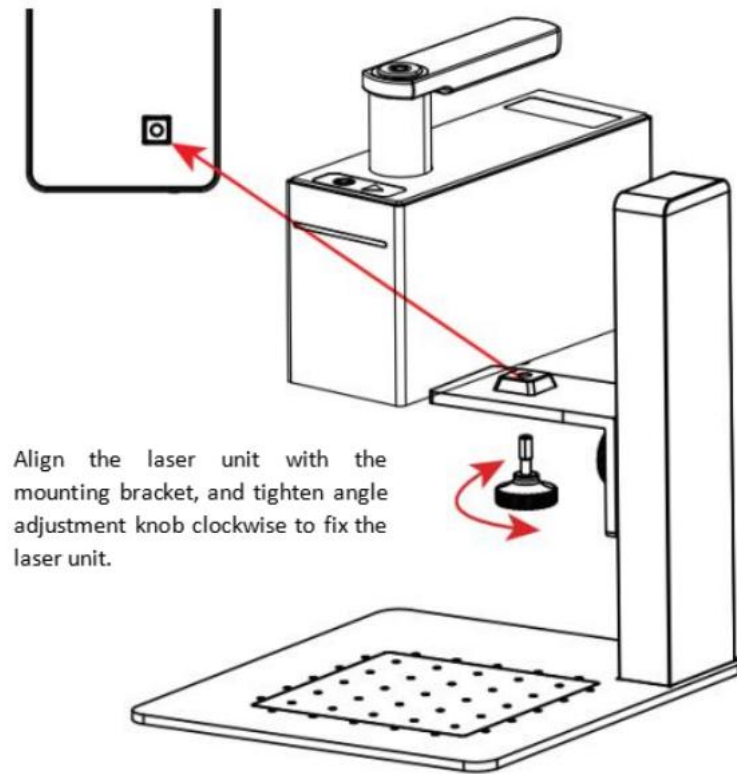
When taking out the bracket, be careful that the movable base plate is not fixed on the base. The movable base may fall off the bracket.



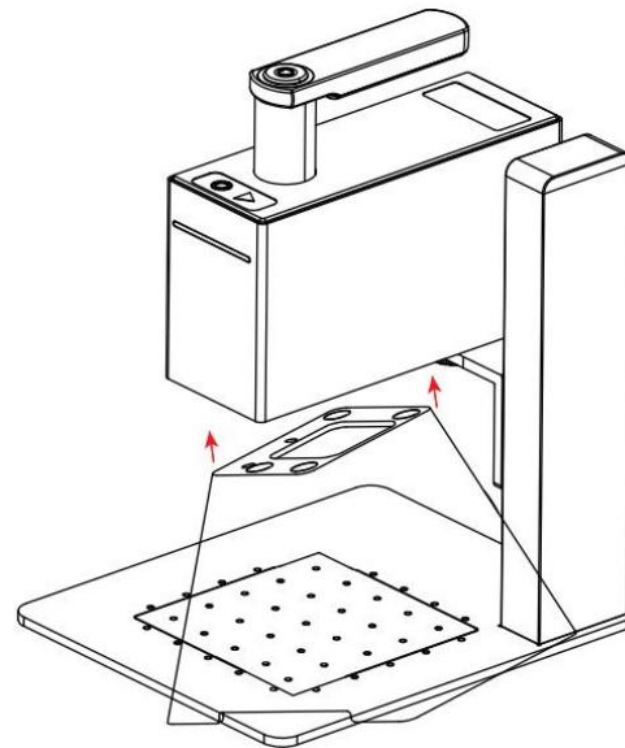
- 2) Attach the mounting bracket to the electric lifting bracket using the angle adjusting knob.

2. Install the laser unit and protective cover

1) Fix the laser unit on electric lifting bracket.

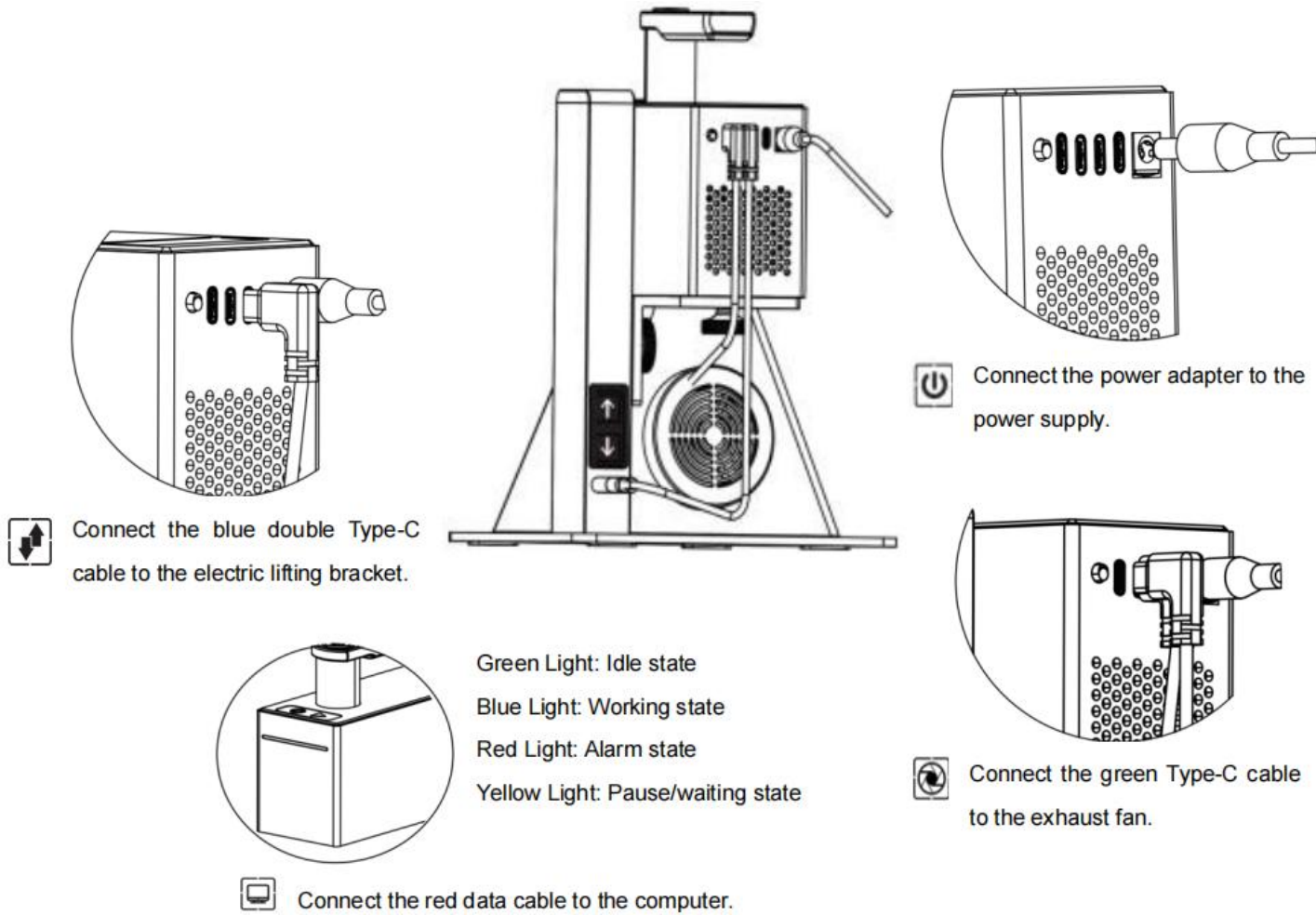


2) Mount protective cover.



❖ Note: Ensure that the exhaust fan is facing the rear.

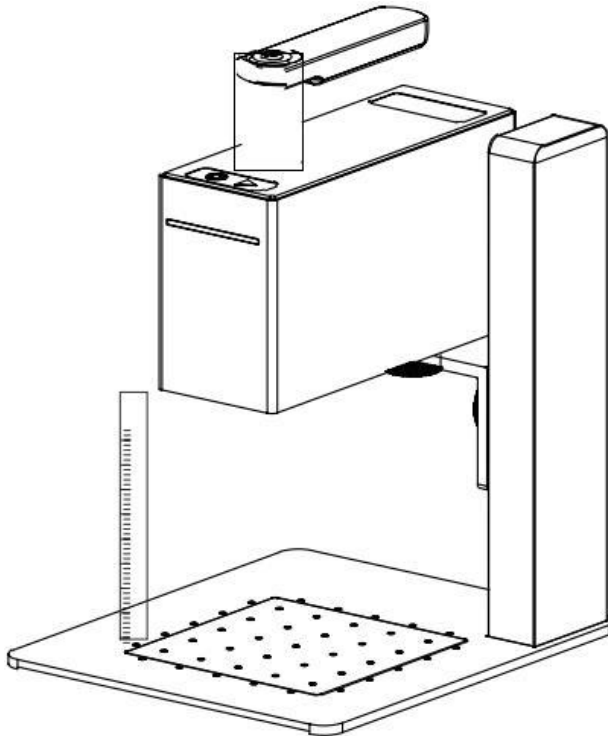
3. Connect the cable



4. Adjust the focus

1) Focus by ruler

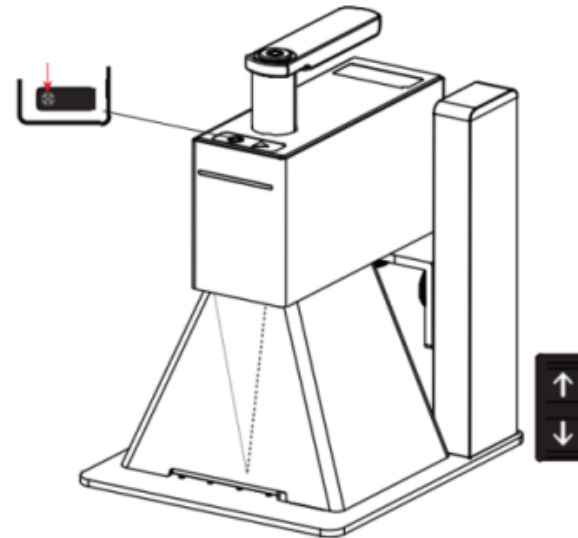
Adjust the height of the laser unit by touching the button of lifting bracket until the bottom of the laser unit is 110mm away from the surface of engraved object



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.

Click to turn on the infrared laser



Adjust the height

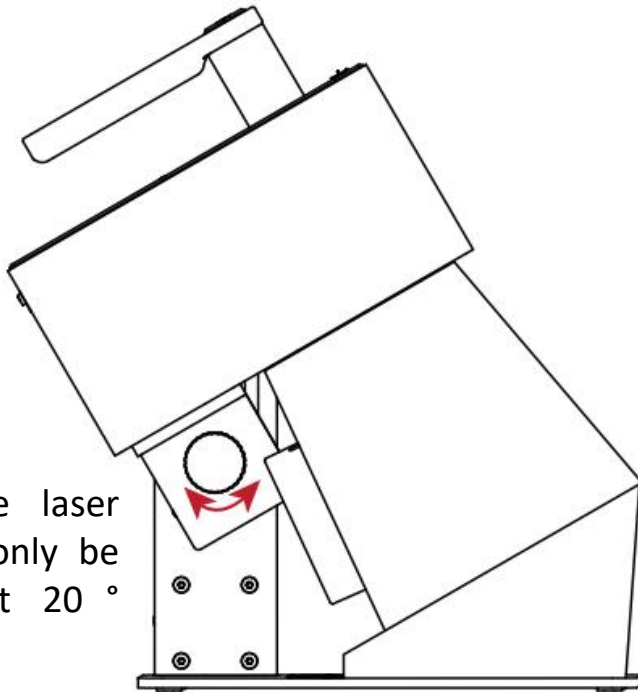
Note: The red dot is not the engraving center point, it is only used for focus reference.

5. Oblique engraving

1) Oblique engraving

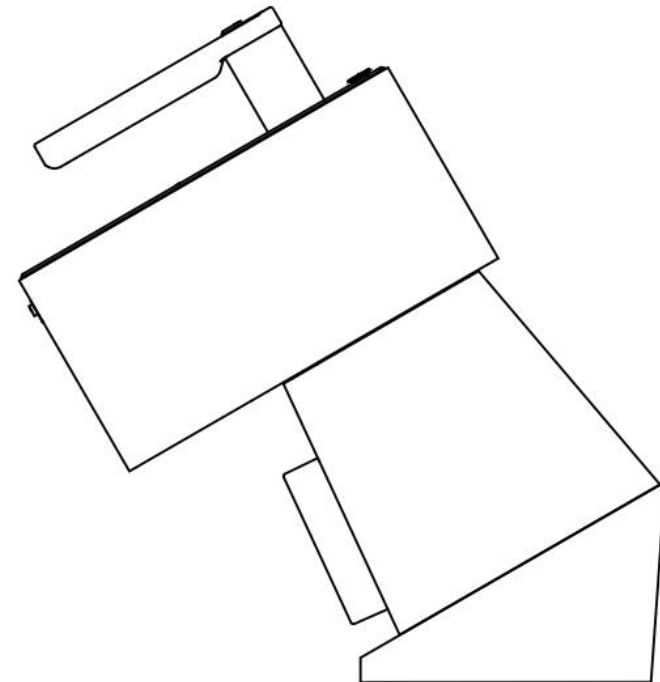
Turn the angle adjustment knob counterclockwise to loosen it, adjust the angle of the mounting bracket, and after the adjustment is completed, it will mesh with the gear, then turn the angle adjustment knob clockwise to lock it and adjust focus.

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



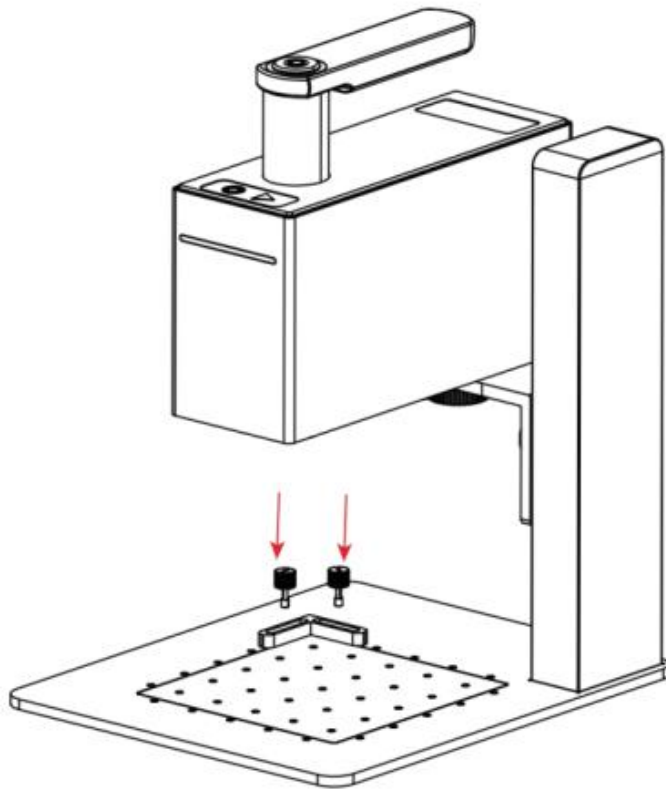
2) Handheld engraving

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

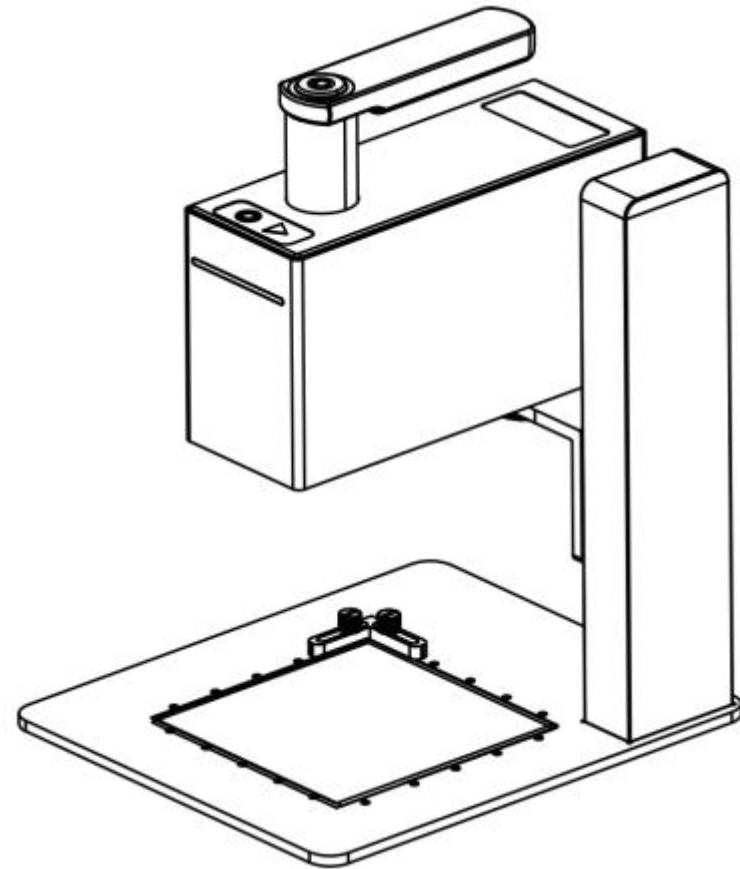


6. Batch engraving

- 1) Place the base plate and tighten the two M3X8 thumb screw.
- 2) Place carving materials.



Tighten the screws clockwise.

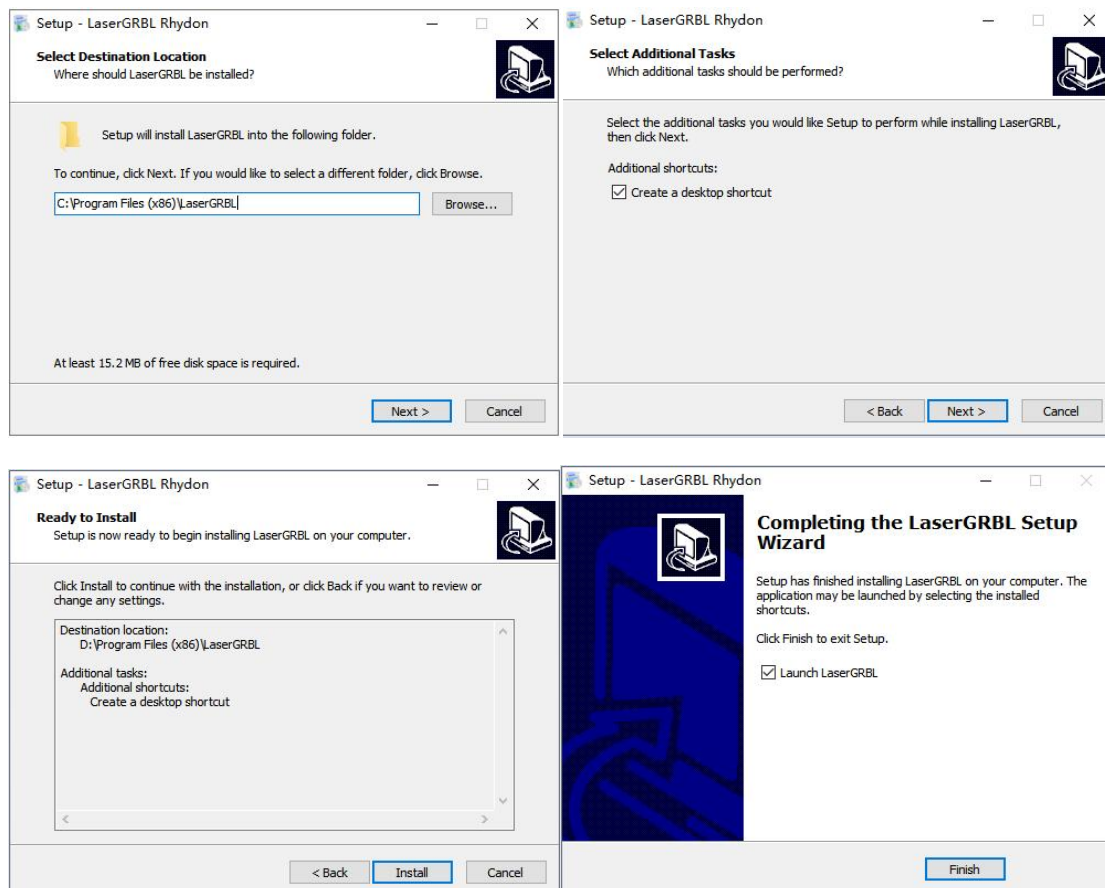


D. LaserGRBL Software Operation

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 Monport is not responsible for any data loss caused by third-party software.

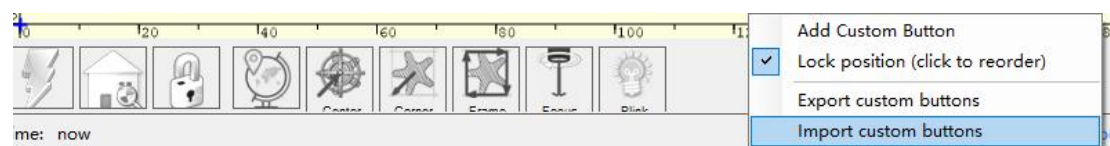
1. Software Download and Installation

Double-click the LaserGRBL 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.



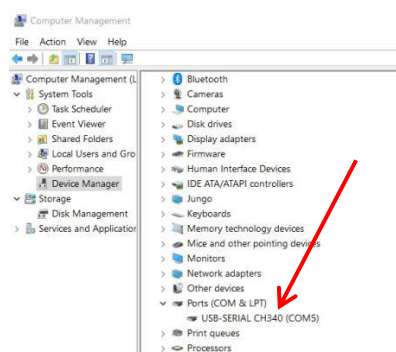
2. Import configuration file

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



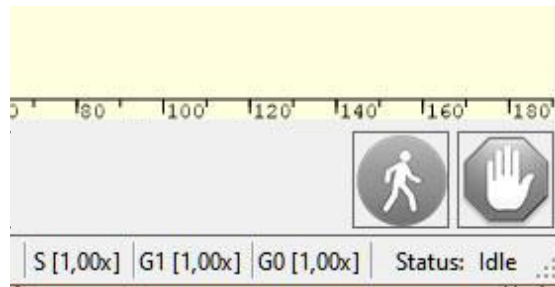
3. Connect Module to LaserGRBL

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.

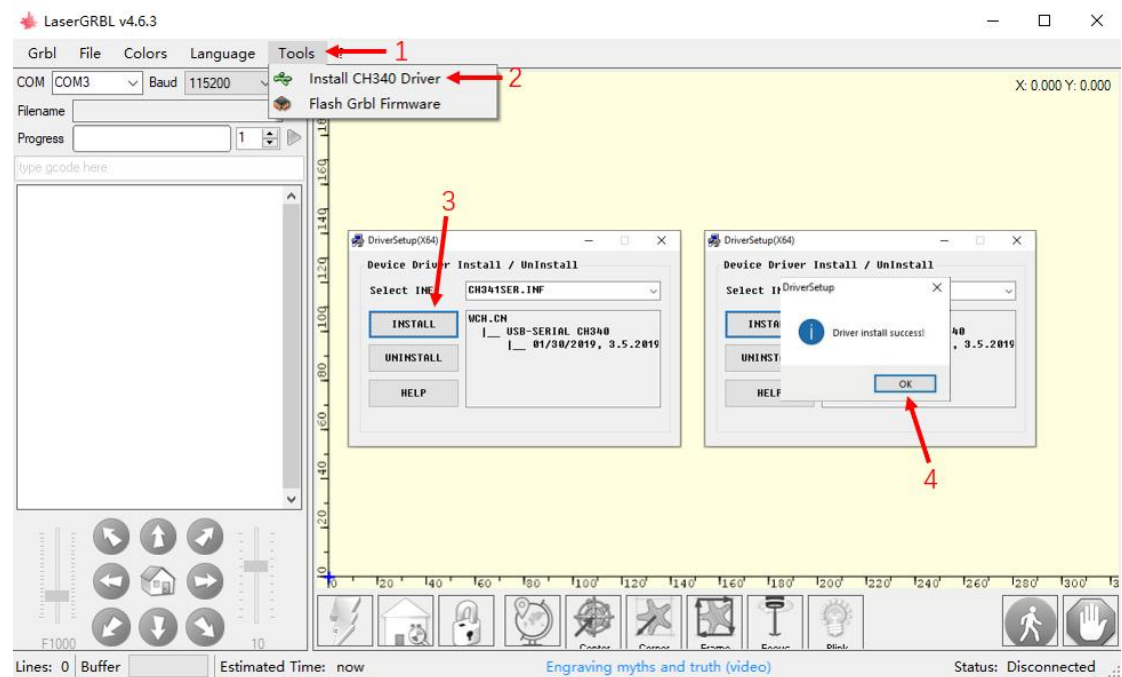


When connected to proper port grbl reply with “welcome message” showing Grbl firmware version. On the bottom-right of the

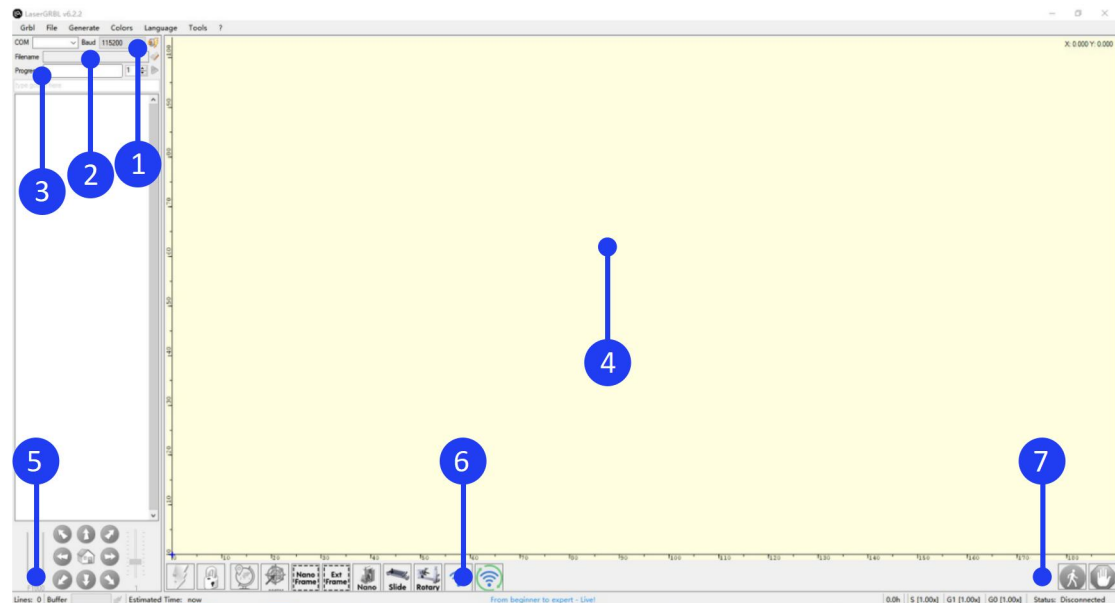
LaserGRBL interface it shows “Status: Idle”



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.

⑥ Grbl 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.

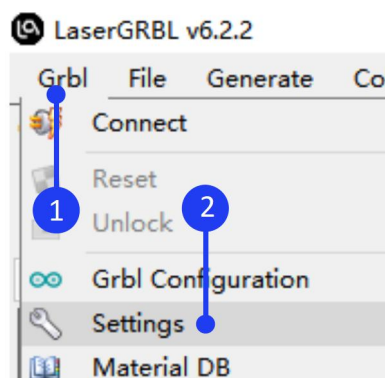
⑦ Pause and resume: this buttons can suspend and resume program progress.

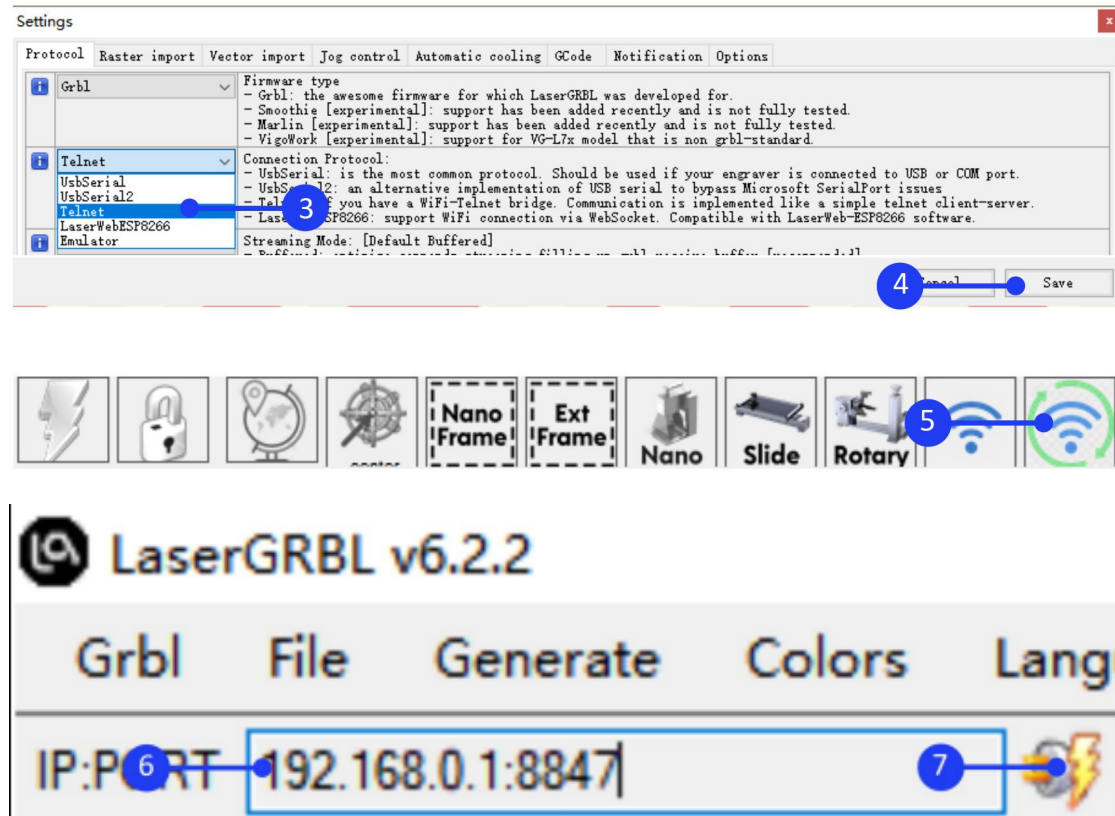
5. Connect Module to LaserGRBL by WIFI

There are two modes: STA or AP to connect Module 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 Module to LaserGRBL by WIFI in AP mode

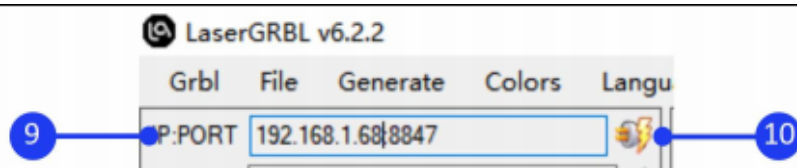
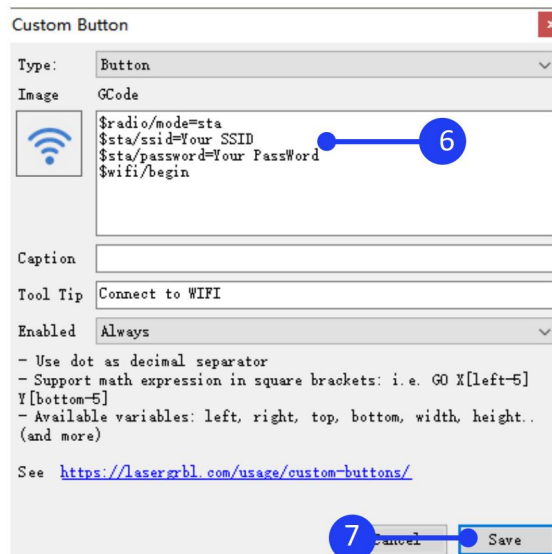
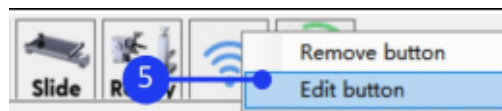
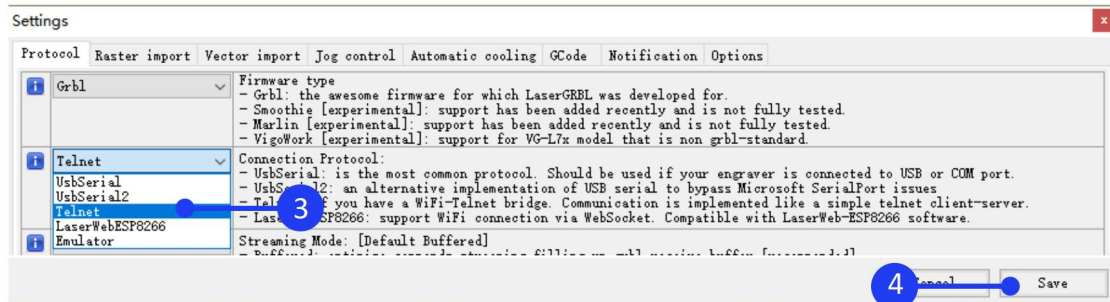
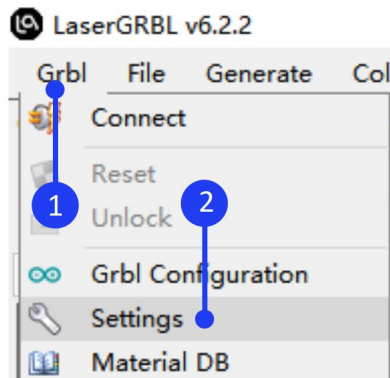
Run the LaserGRBL, click [Grbl > Settings](#), select [Telnet](#) in the [Connection Protocol](#) and [Save](#), click 'WiFi reset'  in the bottom of the window to set WiFi to AP mode, connect the computer to the WiFi that starts with [MonportLaser_Module](#), input password [12345678](#), input [192.168.0.1:8847](#)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





2) Connect Module 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



6. How to make a project in the LaserGRBL

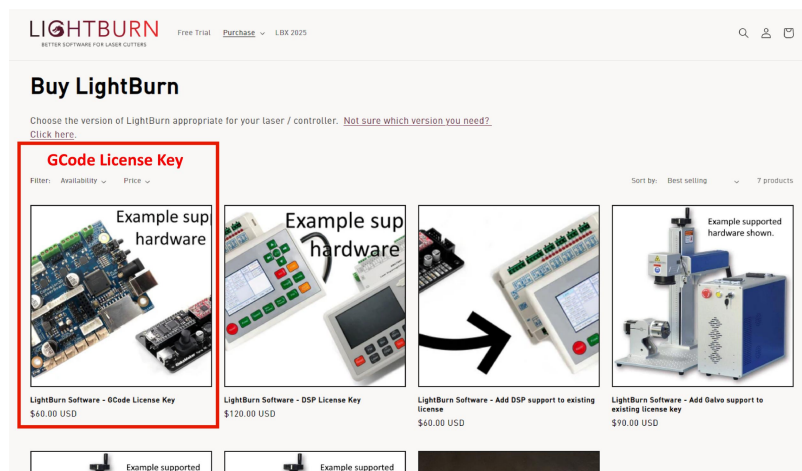
Click **File** > **Open** File to add the design to be engraved, set the **Quality** to 16.67Lines/mm (quality has only two values options, 11.11Lines/mm or 16.67Lines/mm. For those who require high precision, it can choose 16.67Lines/mm. For those who require high efficiency, it can choose 11.11Lines/mm), 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 Module, click **Module 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/>.

E. LightBurn Software Operation

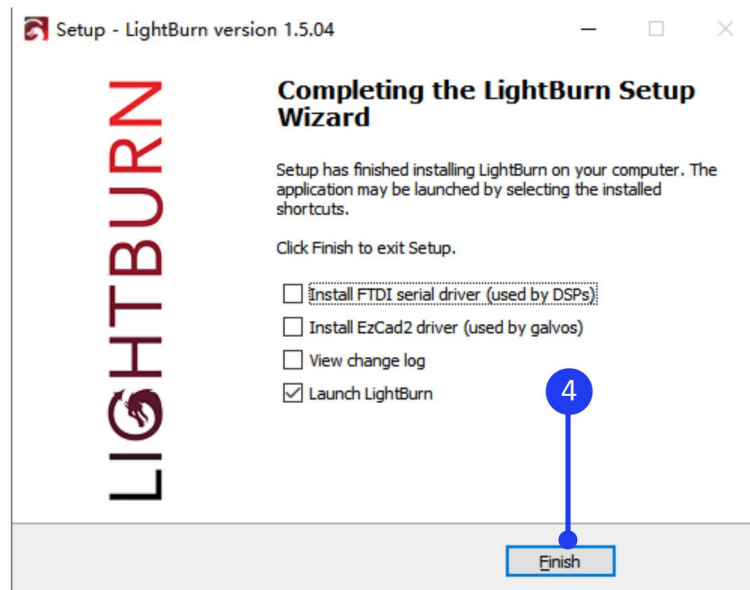
LightBurn is professional layout, editing, control and paid software for engraver, running on Windows, MacOS, and Linux. It provides a 30 days trial period. Please save or back up data in time during use to avoid data loss, but Monport is not responsible for any data loss caused by third-party software. 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





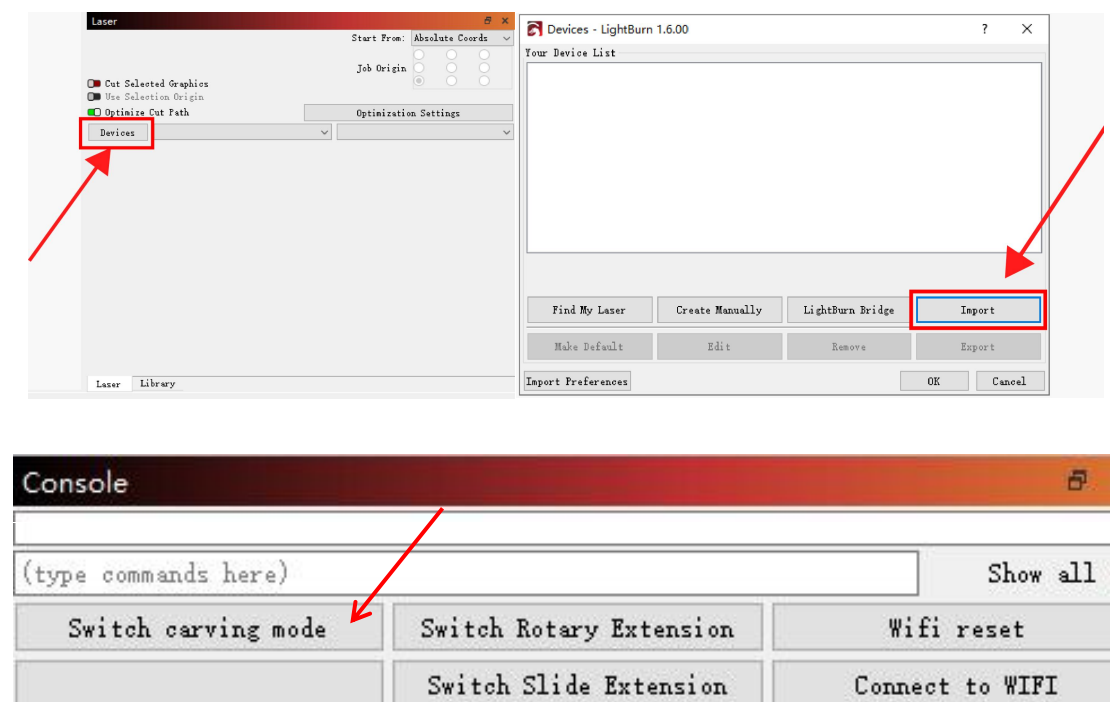
To install LightBurn on [Mac](#), double-clicking the .DMG file after downloading it and drag LightBurn into Applications folder. When launching LightBurn for the first time, open a [Finder](#) window, browse to the '[Applications](#)' folder, hold the Control key and click the LightBurn icon, choose '[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.



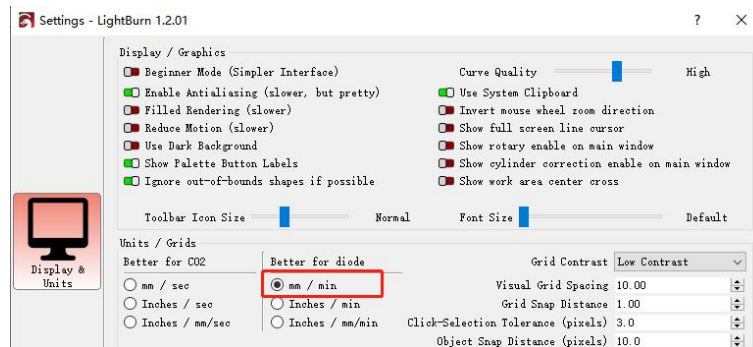
2. Import configuration file

Before using LightBurn with Module for the first time, it needs to import the LaserModule.Ibdev 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 [Module.Ibdev](#) file, and click OK to add the Module configuration to LightBurn. The macro commands will be successfully added in the Console window and Module 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.

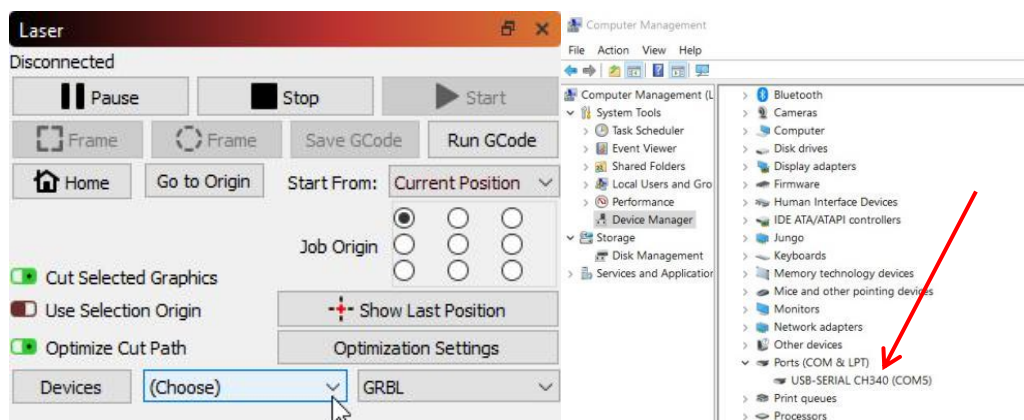


After adding the device, it is recommended to set the speed unit to mm/min. That is select 'Edit' on the task bar, select 'Settings', select mm/min as the unit, and click the 'OK' button.



3. Connect the Module 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](#).



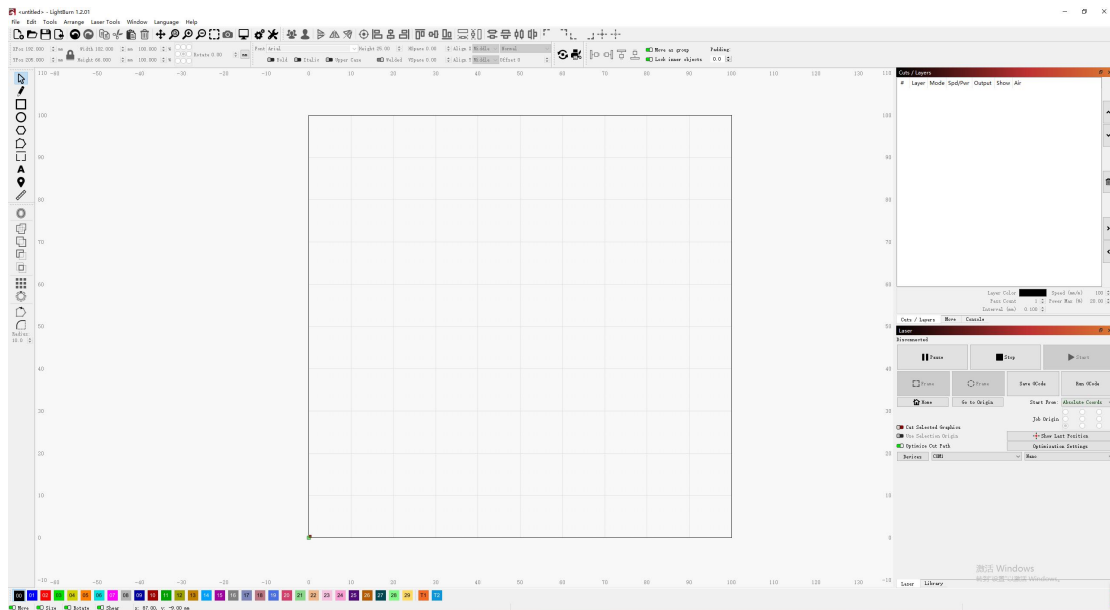
For MacOS, please go to About this Mac > Overview > System Report, select USB under Hardware, there will be USB Serial if the driver is installed automatically, and select cu.wchusbserial14230 port in the LightBurn by clicking where you see '(Choose)' in the [Laser Window](#).

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:

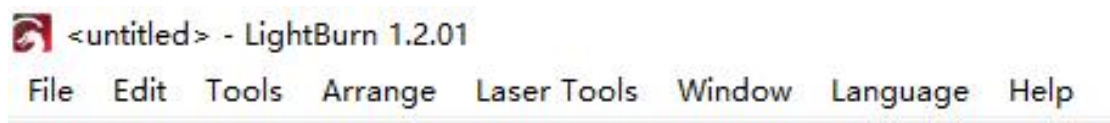
<https://drive.google.com/drive/folders/1Sc-TKuez-mz--38Vp6DeL-pGmQcQdHW4>.

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.



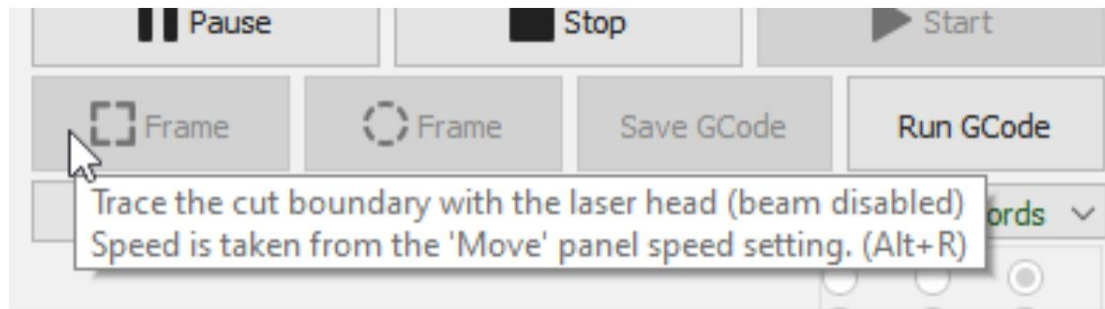
Menus: The menu bar at the top of the main window provides the access to almost every feature available in LightBurn, like File, Edit, Tools etc.



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.



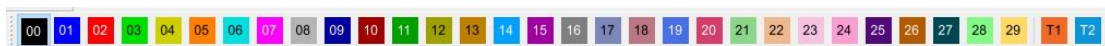
Tool tips: If hover the mouse over a control, then a small bit of text pop up that describes that button or feature, like this:



Creation & Modifier Tools,

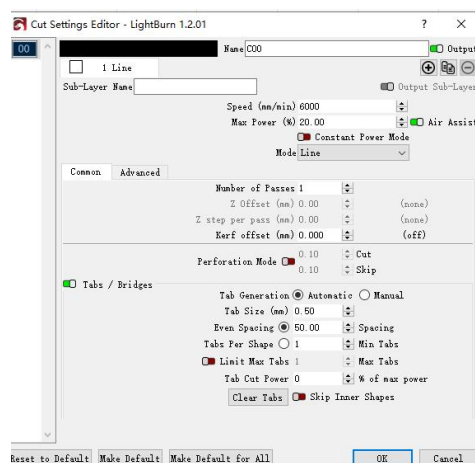
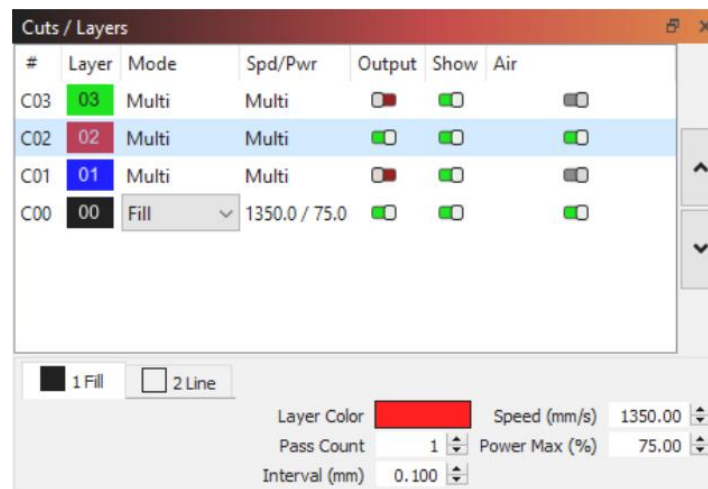


Color Palette, these colors are used to assign different kinds of parameters to the shapes in the design. If a design is selected, click a color entry will apply that color to the shapes in your selection. The colors currently in use in your design will also appear as entries in the Cuts / Layers window,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

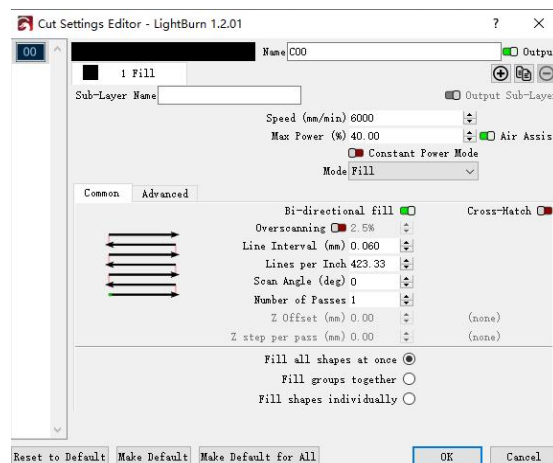


Cuts / Layers: The first column shows the name you've assigned to this layer, followed by the color, then the Mode (Line, Fill, both, or Image). Then the speed and power are displayed, followed by the options to enable or disable sending this layer to the laser, or displaying it in the workspace. Underneath 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

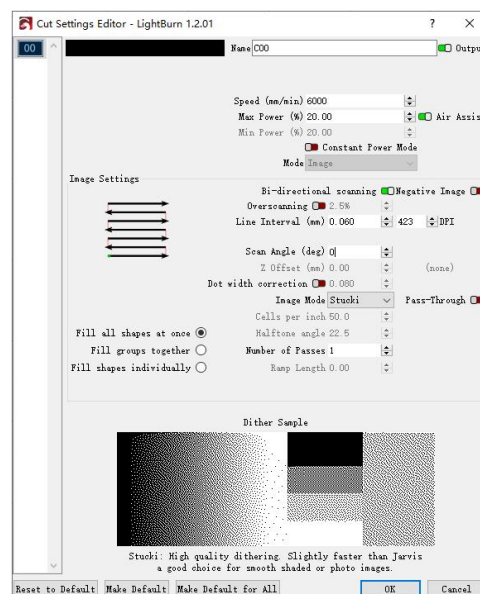


Fill mode

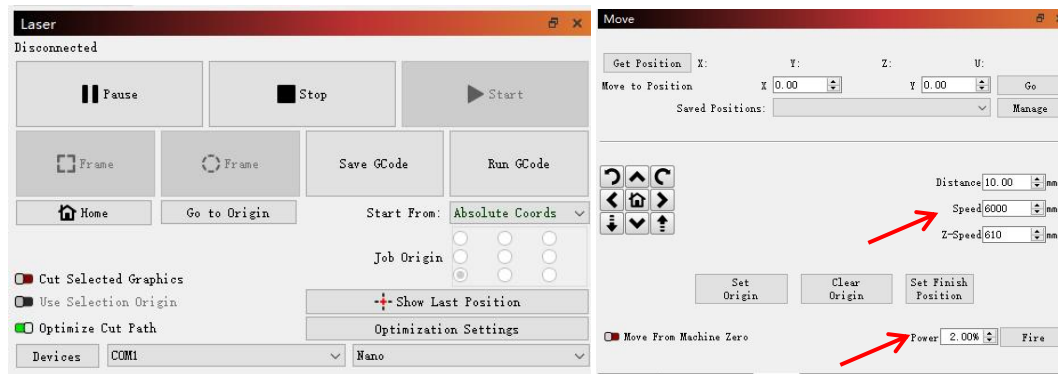
Double-clicking an entry in the layer list will bring up the full Cut Settings Window, allowing you to edit to all the settings. There are three modes that are often used, namely Line, Fill and Image.

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

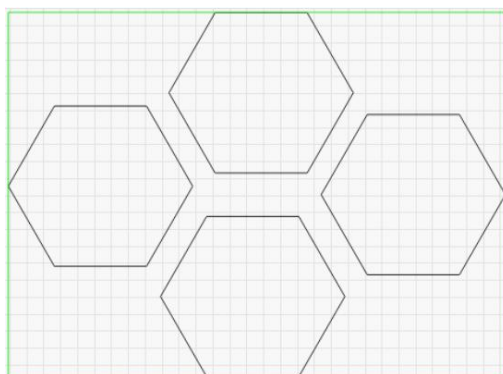
cut through the material. The only difference between surface marking and cutting is the power and speed. **Fill mode** permits the laser to scan line by line and fill in the selected shape, which will fill in closed shapes but not open shapes. **Image mode** is only available for images, and can control how LightBurn renders the image data on the laser. There are three image modes that are often chosen, which are Atkinson, Stucki, Jarvis.



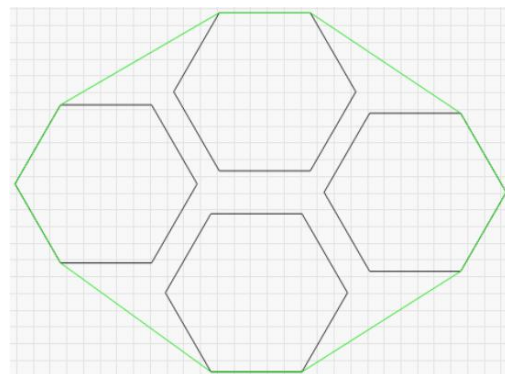
Laser Window: The Laser Window is used to select the active machine, test the framing (the artwork's outer bounds), run and stop the machine, and choose the file processing, order, and artwork positioning within the workspace.



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:



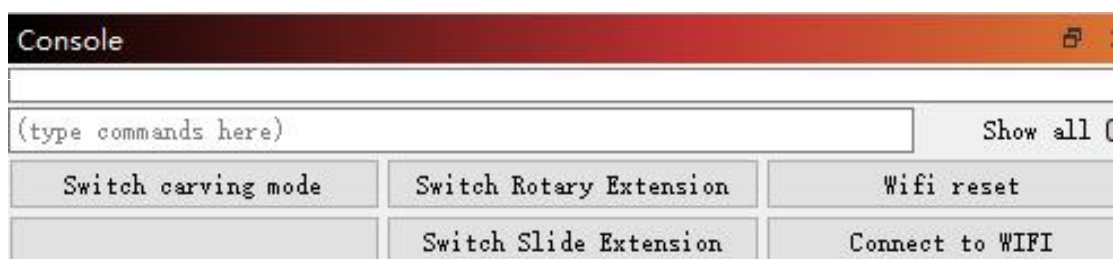
 Rectangular frame



 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 Module 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 Monport 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 Module and click the **Frame** button  , confirm the placement of the engraving, then click **Start**

 **Start** .

10. Warranty

- To the extent permitted by law, this warranty is exclusive and replaces all other warranties, express or implied, including but not limited to fitness for a particular purpose or statutory provisions. Monport is not responsible for any incidental, special, indirect, or consequential damages arising from use, misuse, incompetence, or product defects.
- When applying for warranty service, ensure all important personal data is backed up. During maintenance, such as part replacement or software updates, data may be lost. Monport does not provide data backup or guarantee data integrity.
- Monport offers different warranty periods for the laser unit, consumables, and wear parts. However, the warranty does not cover:
 - 1) Failures or damages resulting from incorrect or improper use, maintenance, or storage, such as mishandling, using the product for unintended purposes, improper connection of external devices, impacts, exposure to extreme conditions (temperatures, solvents, acids, alkalis, water), or infestation by insects or rodents.
 - 2) Failures or damages caused by installation, repair, modification, or disassembly by unauthorized personnel.
 - 3) Modifications or removal of original product identification information.

Processing quality related to user operation, materials, and environment is not covered by the warranty.

11. Contact Us

Thank you again for choosing our laser equipment for your needs!

If you're satisfied with the machine's performance, please consider leaving a positive review on the website where you made your purchase. If you encounter any problems with this engraver, please contact us with your order ID.

Monport Laser Customer Support email:
support@monportlaser.com.

Amazon/eBay Customer Support email:
support@monportlaser.com.

Our customer service team will respond within 24 hours.

Thank you, and we hope you will choose us again for your next purchase!

