CutLabX Software

User Manual

Dongguan xinjia laser technology co.，limited

一、General overview

Introduction to CutLabX software

CutLabX is a layout, editing and control software for laser cutting machines. CutLabX talks directly to your laser without the need for additional software. In addition, CutLabX provides a large number of materials for you to use. You can also sell materials to obtain points to purchase paid materials. You can even exchange these points for actual money in reality.

With CutLabX you can:

- Import various common vector graphics and image format artwork (including DXF, PNG, JPG, BMP, SVG) and other formats. You can also run NC format and CutLabX proprietary files and use purchased materials in CutLabX.
- Edit and even create new vector shapes in graphics
- Apply settings such as power, speed, engraving times, grayscale mode, etc
- Send results directly to your laser cutting machine.

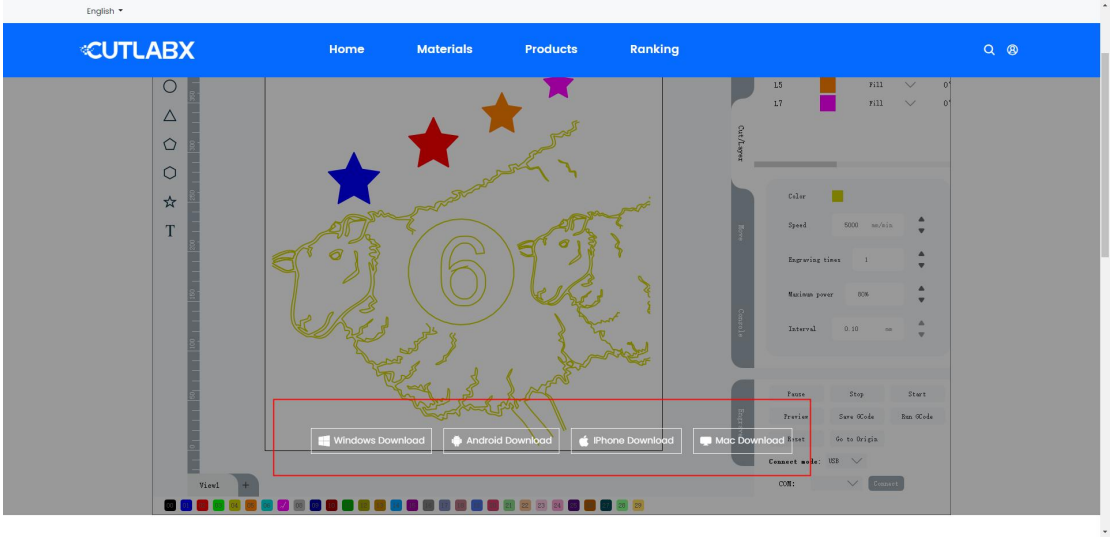
CutLabX is a native application written for Windows, macOS, with light versions on Android and ios.

二、Software Use

1.1. CutLabX Software Download And Installation

1.1.1. Download CutLabX

Visit https://www.cutlabx.com to enter the homepage of the software official website, and select the corresponding download content according to your system.



- Windows： After clicking Windows Download, a zip file will be downloaded, which contains the latest installation package.
- Android：After clicking Android download, two QR codes will pop up, you can use your Android phone to scan the QR code, the first QR code is to enter the Google Store to download, the second QR code is to download an apk file format installation package.
- IOS： After clicking on iPhone to download, a QR code will pop up. Use your iPhone to scan the QR code and enter the Apple Store to download the software.
- Mac OS： After clicking Mac download, it will jump to the Apple Store, where you can download it.

1.1.2. System Requirements

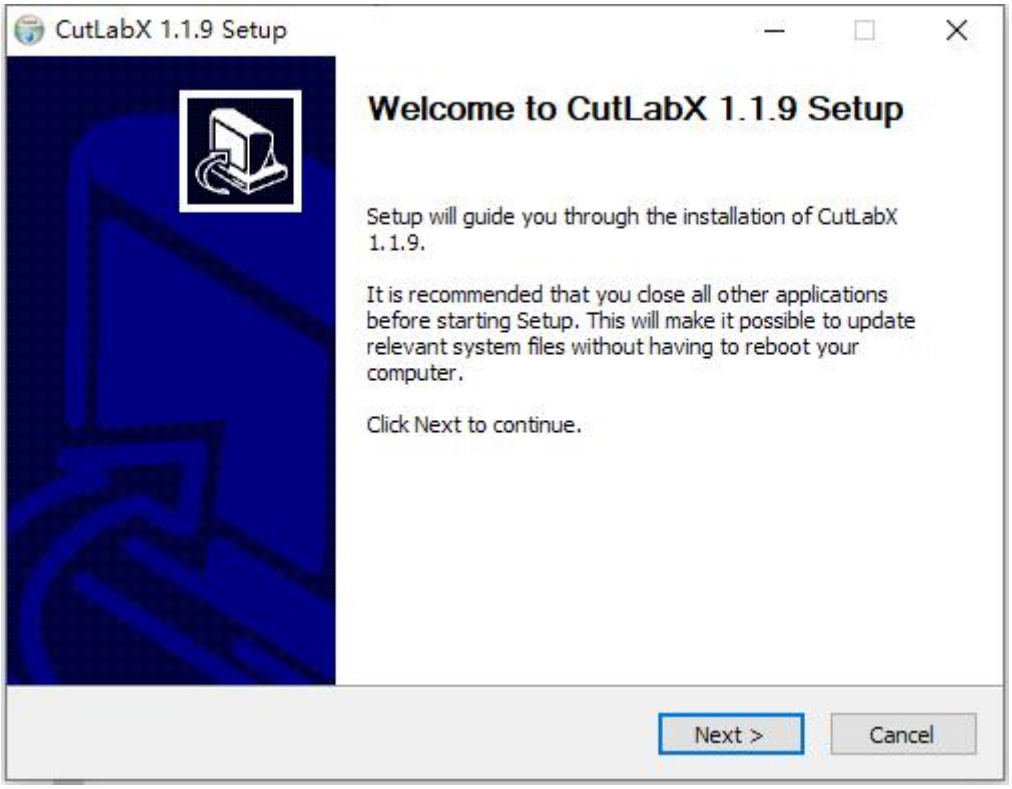
- Windows：Windows 7.0 or higher, 64-bit system
- Android：Android 6 and above
- IOS：ios 13.0 and above
- Mac OS：MacOS 11.0 and above

CutLabX does not have high requirements for computer performance, but if your design contains a large number of images or some complex vector graphics, a computer with better performance will be able to handle the content more easily.

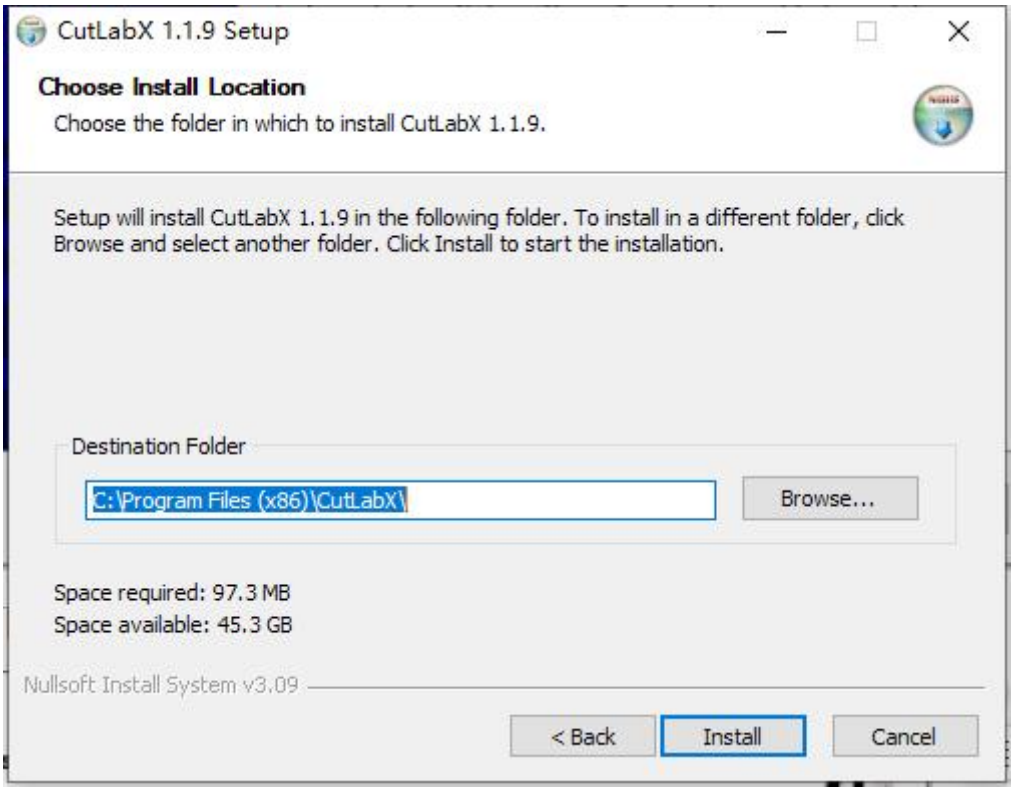
1.1.3. CutLabX Installation

Windows:

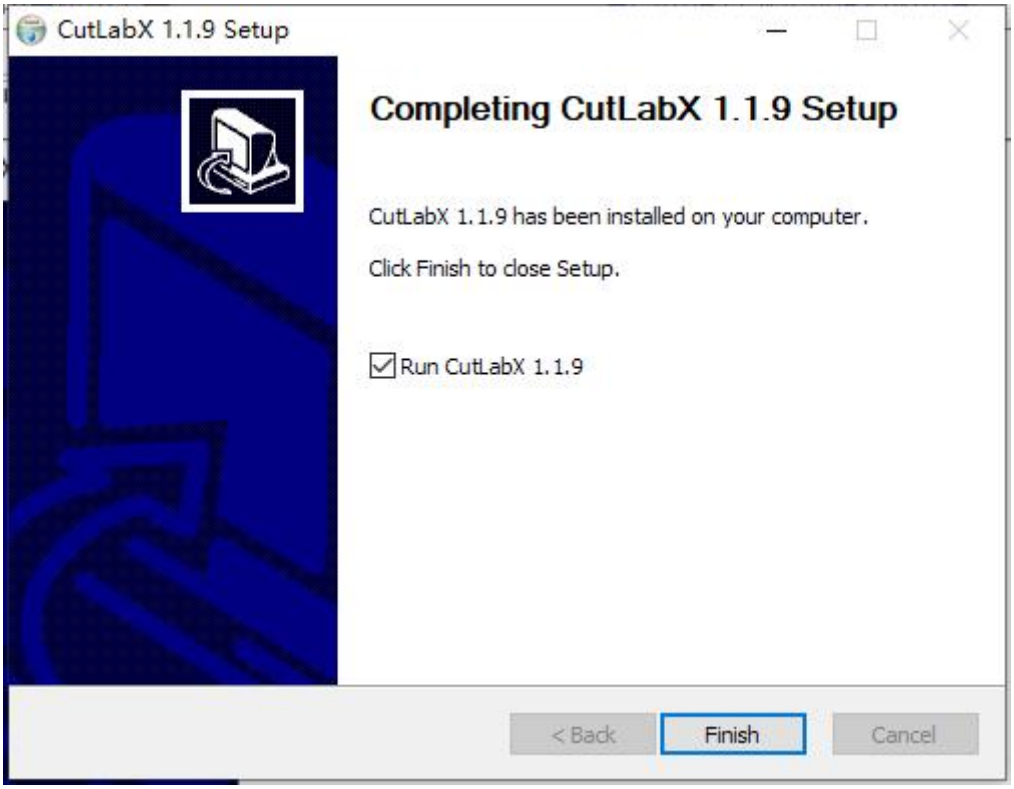
Double-click to start the installer. Windows may first ask you if you trust us



Then click Next, select the path you want to install, and click Install

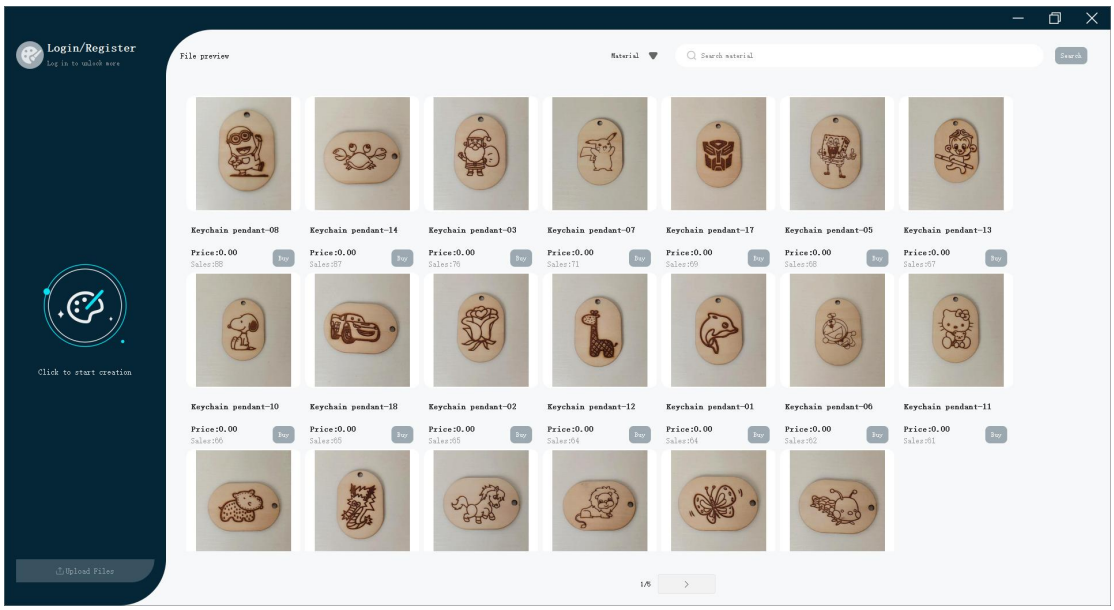


Once the installation is complete, you will see the following:



The installation is now complete. Find the software icon on the desktop and start the program.

1.2. Software Main Window And Buttons



1.2.1. Material

CutLabX provides a large number of free materials that you can log in to purchase and then use. CutLabX also supports users to create some exquisite materials by themselves and then upload them. Here they can also set different prices for other users to purchase and use; when your materials are paid materials and other users purchase them, you can Earn some points that can be redeemed for real money.

1.2.1.1. Material Search

（1）Search for material by author name

Click the filter drop-down box in the search area of the main interface, select "Author", enter the full name or part of the author's name in the right input box, click the "Search" button, and all author materials containing the author's name will be searched.

（2）Search for materials by material name

Click the filter drop-down box in the search area of the main interface, select "Material", enter the full name or part of the material name in the input box on the right, click the "Search" button, and all materials containing the material name will be searched.

1.2.1.2. Material Content And Details

（1）Material display content

The searched materials or the materials opened and refreshed for the first time will be displayed in pages, with 20 materials displayed per page. Each material will display a main picture, material name, price, sales volume and current status

①Price: The price is in the virtual currency of the software.

②Current status: When you are not logged in, the status of the materials is displayed as "Purchased", and you cannot use the materials at this time; after logging in, the status of purchased materials is displayed as "Used", and you can use the materials, and the status of unpurchased materials is displayed as "Purchased".

（2）Material details

When logged in, click the main image of the material to enter the material details interface, which will display relevant information about the material, such as the main image, material name, label, material type, machine model, price, material, laser power, detailed text description, detailed image, and price. Users are also allowed to purchase or use the material on this interface.

1.2.1.3. Material Purchase and Use

（1）Material purchase

When logged in, click the "Buy" button of the material on the material page. If the currency balance is sufficient, a pop-up message will pop up after clicking the button to indicate that the purchase is successful, and the button status will change to "Use". If the balance is insufficient, a pop-up message will pop up to indicate that the balance is insufficient.

（2）Use of Materials

When the status of the material is "Use", click the "Use" button to jump to the creation interface, and the files in the material will be imported, and the relevant

parameters and views will also be imported

1.2.1.4. Material upload

Click the "Upload File" button in the main interface to enter the material upload page. Fill in the corresponding material information and click the "Upload" button to upload. After the upload is successful, the background will review it. After the review is successful, the material will appear on the material page.

Main picture: a picture used to display the material. Multiple main pictures are supported. The first main picture will be displayed on the material homepage. The file format is jpg or png.

- Material name: The name of the material, allowing text in various languages
- Material file: The file format is fixed to .cutlabx, which can be exported by CutLabX software
- Material: The material used to make the material, such as wood, paper, etc. This attribute does not support customization at present. If necessary, you can customize the material in the tag
- Model: The machine and model used to make the material. This attribute does not support customization at present. If necessary, you can customize the model in the tag
- Price: The selling price of the material, in the currency that comes with the CutLabX software, which can be exchanged for real money
- Power: The laser power of the machine used to make the material. Customization is not supported yet. If necessary, you can customize the power in the label
- Material type: The type of material sold, such as animals, buildings, etc. Customization is not currently supported. If necessary, you can customize the material type in the tag
- Material description: Fill in some introduction about the material or some steps to make the material
- Tags: Support customization, you can fill in the content you want, such as model, festival, animation, etc. Multiple tags can be separated by English commas
- Material details pictures: You can upload some pictures of assembly materials or pictures introducing materials, etc. It supports uploading multiple pictures and supports pictures in jpg and png formats.

1.2.2. Personal Center

1.2.2.1. User Management

Note: When logging in, registering, and changing passwords, make sure your device network is normal.

（1）Register

Click the "Login and Register" button on the main interface, then click the "Register" button in the login window, enter the corresponding user information, and click "Register" to successfully register.

- Username: cannot exceed 15 characters. Please do not enter inappropriate words, otherwise CutLabX may block your account.
- Email: Email is your only identifier. Please make sure that the email you enter exists and can receive emails, otherwise you will not receive the registration code and will not be able to register successfully.
- Password and confirmation password: The password and confirmation password must be consistent, cannot be less than 8 characters and cannot exceed 20 characters.
- Verification code: After clicking "Send", your email will receive a verification code and enter it in the corresponding area.
- Privacy and Policy: Please read the corresponding terms and click to agree, otherwise you will not be able to register.

（2）Log in

Click the "Login and Register" button on the main interface, enter your email and password on the login interface, make sure your account can be used normally, read the corresponding privacy terms, and click the "Login" button.

After logging in, you will automatically log in every time you enter the software.

（3）Change password

Click the "Login and Register" button on the interface, then click "Forgot Password", fill in the corresponding information on the password modification interface, and click "Change Password".

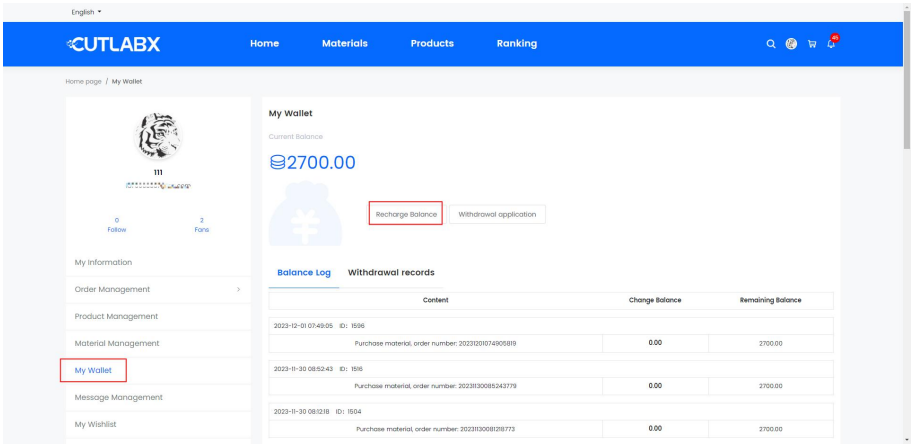
- Email: Make sure your email exists and can receive emails, and the email has been registered
- Password and Confirm Password: The password and confirmation password must be consistent, not less than 8 digits and not more than 20 digits.
- Verification Code: After clicking "Send", your email will receive a verification code and enter it in the corresponding area.
- Privacy and Policy: Please read the corresponding terms and click to agree, otherwise you will not be able to change your password.

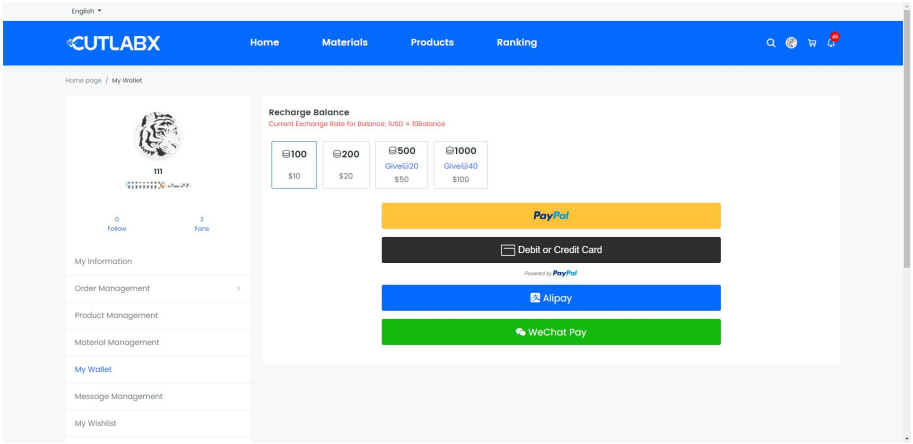
1.2.2.2. Personal Center

(1) User information: After successful login, the Personal Center window will pop up and display the user's name. After successful login, you can also click the "Personal Center" button on the main interface to enter the window

(2) Currency management: After successful login, the Personal Center window will pop up and display the corresponding information. After successful login, you can also click the "Personal Center" button on the main interface to enter the window.

- Currency balance: The personal center window will display the user's currency balance. The currency can be used to purchase materials, or withdrawn and converted into real currency.
- Recharge: The personal center will display a "Recharge" button. Clicking the "Recharge" button will jump to the official website of the software. After logging in, click "Wallet" in the personal center and click the "Recharge" button in the wallet. Currently, four recharge methods are supported: Paypal, credit card, WeChat, and Alipay. The amount is fixed, and the actual currency conversion ratio is subject to the web page.





- Withdrawal: The "Recharge" button will be displayed in the personal center. Clicking the "Recharge" button will jump to the official website of the software. After logging in, click "Wallet" in the personal center and click the "Withdraw" button in the wallet. Currently, withdrawals to PayPal, Alipay, and bank cards are supported. The minimum withdrawal amount is 500 currencies. Please ensure that the information entered during withdrawal is accurate, otherwise the withdrawal will fail.

(4) Model acquisition: When logged in, if the machine is connected, the model information will be saved in your account.

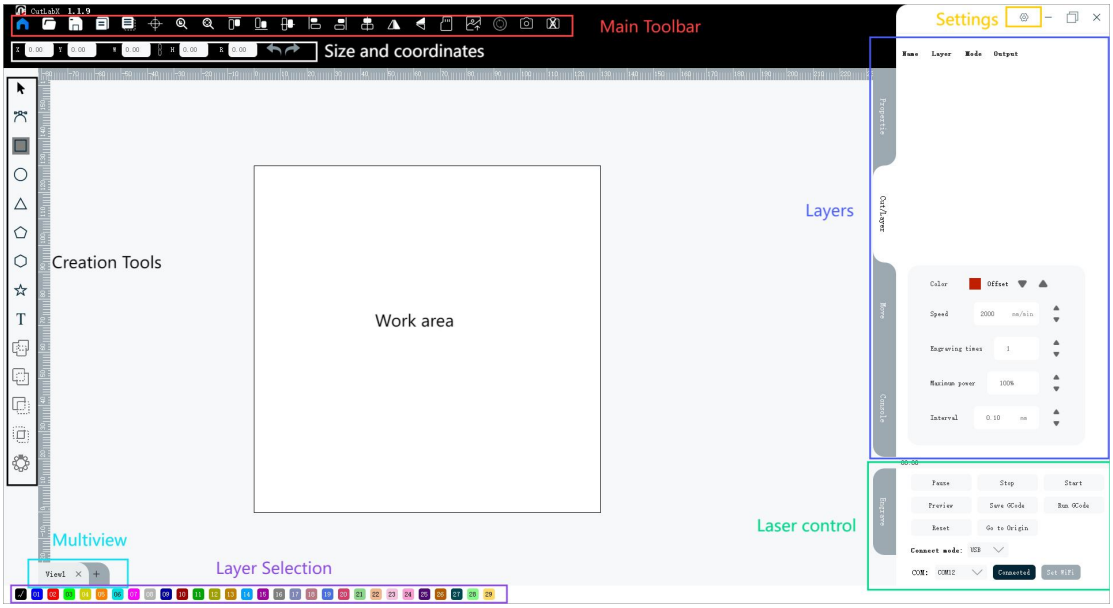
(5) Log out: Click "Log out" on the personal center interface to log out of the account and return to the main interface, and all materials will become purchased.

1.3. Creation interface and buttons

CutLabX software is compatible with many types of laser cutters and engravers. As long as your machine is a GCode-based system, CutLabX supports almost all of them.

1.3.1. Main interface of creation

Click the "Click to Start Creating" button on the main interface to enter the main creation interface.



The main creation interface consists of the following contents:

- Main toolbar area
- Creation tool area
- Multi-layer selection area
- Multi-view management area
- Device Settings Area
- Properties Window
- Cut/Layer Window
- Move Window
- Console window
- Laser control window
- Coordinate size area

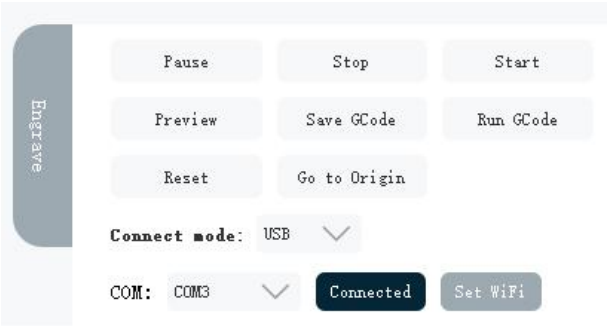
1.3.2. Laser control window (engraving window)

The Laser Control window allows you to select how the machine is connected, view and manipulate its connection status, control some operations on the laser, and set machine settings (if your laser machine has this function)

1.3.2.1. USB Connection

Select the "USB" connection mode in the engraving window of the creation interface, select the appropriate port in the COM port, and click the "Connect" button.

After the connection is successful, the "Connect" button will change to "Connected" and the "Set Wi-Fi" button will appear.



If the COM port is not displayed, follow the steps below to confirm:

（1）Make sure your laser is turned on and use a normal USB data cable to connect the laser to the computer.

（2）Make sure you have installed the appropriate driver on your computer and that the driver is compatible with your computer system version. You can ask the merchant who sells the laser and ask them to provide the corresponding driver.

（3）Make sure your computer interface is not loose, has poor contact, or other abnormalities. It is recommended to try a different computer interface.

If the COM port is displayed but the connection fails after clicking the Connect button, please follow the steps to confirm:

（1）Make sure your laser supports this software.

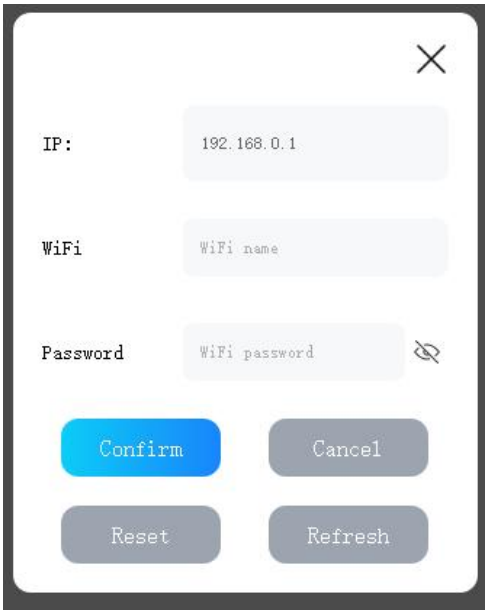
（2）Make sure your laser is in normal state. If the laser is not initialized or is in an abnormal state such as an alarm state, the connection will fail. Some lasers have a status indicator light. Under normal conditions, the indicator light is always white. Please ask the merchant who sells the laser for specific details.

（3）Make sure your COM port is not occupied by other software. It is recommended to close other laser-related software before connecting.

1.3.2.2. Setting up Wi-Fi

If the laser does not have wifi function, the "set wifi" function will be invalid.

After successfully connecting via USB mode, click the "Set Wi-Fi" button to enter the Wi-Fi settings interface.



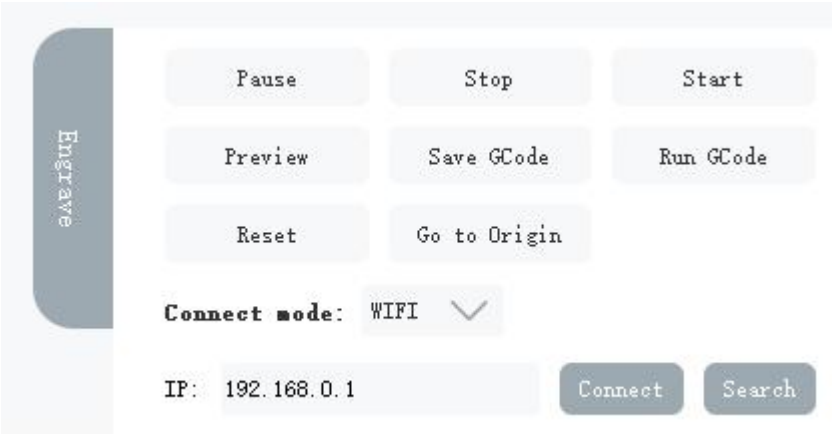
- IP: The current IP of the laser will be displayed, which can be used for subsequent wifi connections. The default IP of the laser is 192.168.0.1, and the laser acts as a router device to send wifi at this time
- WiFi: The name of the WiFi to which the laser machine will connect. The format of the WiFi name currently only supports Arabic numerals, English, and English characters except !, ?, ~, and $. The connected wifi can be either a home wifi or a mobile phone hotspot
- Password: The wifi password of the wifi to which the laser is connected. Currently only Arabic numerals, English, and English characters except !, ?, ~, and $ are supported. The password length cannot exceed 64 bits
- Confirm: After entering the wifi name and password, click the "Confirm" button. You need to restart the software and the laser, otherwise the settings will be invalid and other errors will occur
- Refresh: Click the "Refresh" button to re-acquire the current laser's IP
- Reset: Click the "Reset" button to reset the laser to the initial wifi mode, that is, the IP is 192.168.0.1, and the laser sends wifi for other devices to connect

Note: Some lasers cannot connect to 5Gwifi. When connecting to 5Gwifi, please make sure your laser supports 5Gwifi connection, otherwise the setup will fail.

1.3.2.3. Wifi connection

If the laser does not have wifi function, the "set wifi" function will be invalid.

Select the "WiFi" connection mode in the engraving window of the creation interface and switch to the WiFi connection interface



IP: Enter the IP of the laser. The IP of the laser can be viewed in the "Set Wi-Fi" interface after connecting in USB mode, or you can obtain the IP by searching.

Search: After clicking the "Search" button, the IP of the laser connected to the network under the current computer will be searched, and the IP will be displayed in the IP input box. If there is no laser connected to the network or the network is poor, it will be displayed as empty at the IP, and the IP cannot be searched when the laser is in the initial state, that is, the IP is 192.168.0.1.

Connect: After clicking the "Connect Button", if connected, the button will become connected, and the communication status indicator area will appear. Green means smooth communication, yellow means communication delay, and red means communication abnormality. After the connection is successful, the search button will disappear

Disconnect:

（1）When the communication anomaly lasts for 5 minutes or more, the connection will be automatically disconnected. If the communication anomaly occurs for a long time, please restart the laser and software and try to reconnect.

（2）When connected via wifi mode, the connection will be automatically disconnected after switching the computer network. At this time, when connecting via wifi mode for the first time, it will prompt to restart the laser machine. Please restart the machine according to the prompts, otherwise other abnormal problems will occur.

Note:

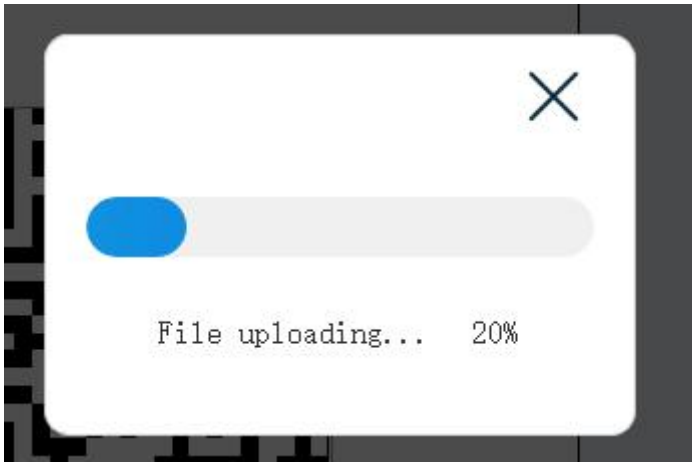
① Before connecting, please make sure that your computer is not using other tools such as proxy servers. These tools will change your computer IP, resulting in the WiFi mode being unable to connect successfully.

② Some lasers cannot connect to 5Gwifi. When connecting to 5Gwifi, please make sure that your laser supports 5Gwifi connection.

1.3.2.4. Start, Stop, Pause, Preview

- Start: Run the file of the selected graphics in the current view on the laser.

（1）After clicking the start button in wifi mode, a transfer progress bar will appear. When the progress bar reaches 100%, the laser starts engraving.



（2）In USB mode and WIFI mode, if the graphics are too complex, a rotating dynamic box will appear after clicking Start. After the dynamic box disappears, engraving will start directly in USB mode, and file transfer will start in wifi mode.

（3）When engraving starts, the running time and running progress bar will appear above the laser window.

Running time: The timing starts from clicking the start button and stops when the engraving ends. Pausing the engraving will not pause the timing.

Running progress bar: The progress bar starts from 0% and the machine is engraving; after the machine stops engraving, the progress bar reaches 100%.

- Pause: Pause the running job. After pausing, the Pause button will change to Continue state. Click Continue to continue engraving.
- Stop: Immediately terminate the running job.
- Preview: After selecting the graphics in the current view, there will be a rectangular box, and the laser will preview according to the size and position of the rectangle.

Note: If no graphics are selected, all graphics in the current view will be selected by default.

1.3.2.5. Save Gcode, run Gcode

- Save GCode: This function will save all contents in the current view as an executable engraving file, including all parameters such as power and speed. The file format can be saved as .nc or .gcode.
- Run GCode: Load and run a local executable engraving file in .nc or .gcode format.

Note: When the machine starts engraving, you cannot save or run GCode files.

1.3.2.6. Reset, return to origin

- Reset: Click the "Reset" button and the laser will perform a homing cycle. During this process, the laser moves to the starting position, touches the travel switch on the boundary and rebounds to stop. The position of the laser is (0,0)
- Origin: The origin is the starting position of the laser operation. The default origin of the laser is (0,0). If the origin is not set, the coordinates of the lower left corner of the graphic in the canvas are (30,30), then the preview and engraving position of this point is also (30,30); if the origin is set to (20,20), then the preview and engraving position of this point is (50,50). The origin can be cleared in CutLabX or restarted to clear it.

1.3.3. Main toolbar area

Hover over an icon in the software to see its name.

1.3.3.1. Main interface 

Clicking this icon will jump to the main interface of the software.

1.3.3.2. Open file 

Supported file formats are .png, .bmp, .jpg, .jpeg, .cutlabx, .dxf, .svg.

- png, bmp, jpg, jpeg: These four file formats are image files. The larger the pixel value of the image, the longer the import time will be, and the edges will be jagged after zooming in. After the above file formats are imported, they will be displayed in the current view of the canvas.
- dxf: The file format is a vector file

（1）The imported content will be displayed in the current view.

（2）The file is imported at a 1:1 ratio, and the imported position coordinates are consistent with the actual position coordinates.

（3）If the actual coordinates exceed the maximum coordinates that CutLabX can display, the import is invalid.

（4）After the file is imported, the file content will be treated as a whole and cannot be split or layered.

（5）If the original dxf file has multiple layers, it will be imported as a whole and cannot be split or layered.

（6）After the dxf file is imported, the text content in the file is not supported for display.

- svg: the file format is a vector file

（1）The imported content will be displayed in the current view. .

（2）SVG files are mainly generated by Inkscape and Adobe Illustrator. Both SVG files can be imported, but 1:1 import is not supported yet.

（3）If the original SVG file has multiple layers, it will be imported as a whole and cannot be split or layered.

（4）After the SVG file is imported, the text content in the file cannot be displayed yet.

- cutlabx: The file format is cutlabx file

（1）There are views in the cutlabx file. After the file is imported, the file content will be displayed in the new view. If there are multiple views in the file, the corresponding multiple views will appear in the software after importing.

（2）If there are blank views in the software, that is, there is no content in the

view, these blank views will be cleared after importing the cutlabx file.

（3）After the cutlabx file is imported, the file content will be imported at a 1:1 ratio, and related parameters such as position coordinates, power speed, etc. will also be imported.

（4）The text in the cutlabx file does not support editing.

1.3.3.3. File Saving

All view contents and their corresponding parameters in the software will be saved as files in the .cutlabx format.

1.3.3.4. Copy and Paste

- Copy: Select the graphic or text content in the software, click the copy icon or press Ctrl+C to save the graphic or text in the clipboard inside the software.
- Paste: If you have copied the relevant content, click the paste icon or press Ctrl+V to insert the content of the clipboard in the software into the canvas.

Note: Pasting the generated text does not currently support modifying the text content.

1.3.3.5. Centered

The Center button will move the selected graphic to the center of the canvas, so that the center point of the selected area coincides with the center point of the canvas.

1.3.3.6. Enlarge the canvas

The Zoom Canvas button will zoom the current canvas to the maximum canvas size displayed on the interface and display the canvas in the center of the page.

1.3.3.7. Zoom in on the selected graphic

The Zoom in Graphics button will zoom in on the selected graphics to the maximum size that the interface can display and will display the selected graphics in the center of the page.

1.3.3.8. Top, bottom and horizontal center alignment

These buttons will move all the graphics in the current selection to align the top, bottom, or horizontal center of the selected shapes with the rectangular area formed by the selected shapes.

1.3.3.9. Left-aligned, right-aligned, and vertical center-aligned

These icon buttons will move all currently selected shapes to align the left side, right side, or vertical center of the selected shapes with the rectangular area formed by the selected shapes.

1.3.3.10. Mirror horizontally and vertically

Horizontal mirroring flips all currently selected graphics vertically; vertical mirroring flips all currently selected graphics horizontally.

1.3.3.11. Read TF card

Note:

(1) The laser must have a TF card.

(2) The TF card must be used in WiFi mode.

Click the TF card icon to display the TF card interface window, which displays all files in the root directory of the TF card by default.

- Open: Open other folders in the root directory of the TF card.
- Delete: Delete files in the TF card.
- Upload: Only files in nc format are allowed to be uploaded to the TF card. If the file size is too large, the upload time will be extended due to the hardware and network limitations of the laser.
- Run: Only files in nc format are allowed to run. Please make sure that the engraving range of the file does not exceed the movement range of the laser. After starting to run, the three buttons of Pause, Continue, and Stop will appear.
- Preview: The engraving area of the selected file will be previewed in a rectangular frame. Only files in nc and Gcode formats are supported for the time being.

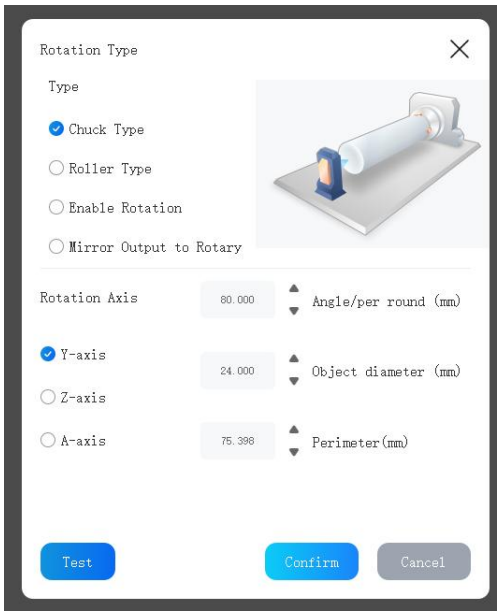
Note: If the nc or Gcode file in the TF card is too large, please do not preview the file, as it may cause network connection abnormality.

1.3.3.12. Upload Materials

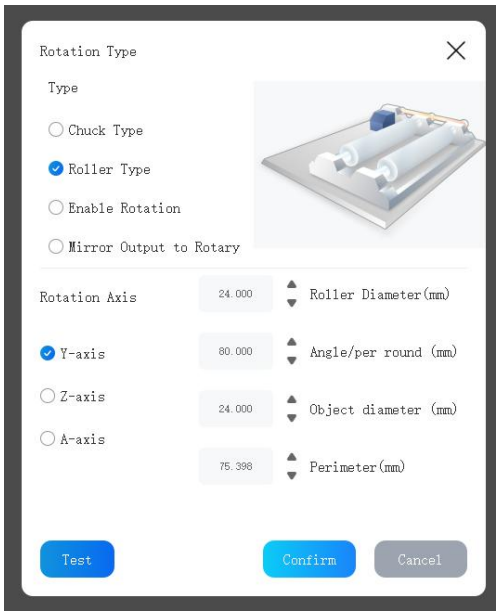
Click the upload material icon to enter the main interface, and then click the "Upload File" button on the main interface to upload the material.

1.3.3.13. Roller settings

Click the roller setting icon to open the roller setting window. There are two types of rollers in the roller setting interface, chuck type and wheel type, as shown below:



Chuck Roller



Roller Type Roller

Roller General Steps:

- Determine the type of roller you have, chuck or wheel.
- Make sure your laser supports rollers.

- Enable the roller. The roller icon will turn from gray to white when the roller is enabled.
- Determine which axis of the laser you want the roller to replace.

（1）Selecting the Y axis will replace the original laser's Y axis, that is, when the laser is running, it will only move in the X axis direction.

（2）Selecting the Z axis will replace the original laser's X axis, that is, when the laser is running, it will only move in the Y axis direction.

（3）Selecting the A axis is not supported yet.

- In the Steps per Revolution box, enter the number of steps the attachment takes to complete one full revolution. For chuck rotation, this will be one revolution of the chuck, for rollers, this will be one full revolution of the roller, not the object. For GCode devices with dedicated rotary axes, this number should simply be "360 degrees". If you are not using a dedicated rotary axis, you will have to do this by trial and error.
- Click the "Test" button to verify that the roller or chuck is perpendicular to the direction of the laser's motion, otherwise the engraving will be a straight line.
- Enter the diameter or circumference of the object you want to engrave and the system will automatically calculate the other value.
- Align the object under the laser head to where the X or Y axis will start, then rotate the object in the rotary attachment to the point where you want the engraving to begin.
- When using rotation, it is usually a good idea to preview first so you can confirm where the laser will engrave.
- Remember to uncheck the "Use Rotation" checkbox when you are done to avoid messing up your next regular project

Note:

（1）Mirror Output to Rotary and A-axis functions are not yet implemented, and selection is invalid

（2）The roller parameters of some lasers are fixed in the software and cannot be modified.

（3）After using the roller, when the graphics in the software are previewed for engraving, the engraved graphics are 1:1 in size and have the same position and direction; when the CutLabX version is lower than 1.1.9, the actual engraved graphics are the graphics in the software rotated 90° counterclockwise.

（4）The roller mode is not suitable for using the camera function.

（5）In roller mode, engraving will start with the current position of the laser.

（6）In roller mode, the preview will be fixed in the direction of the X-axis or Y-axis. The value of the X-axis or Y-axis is determined by the maximum stroke of the

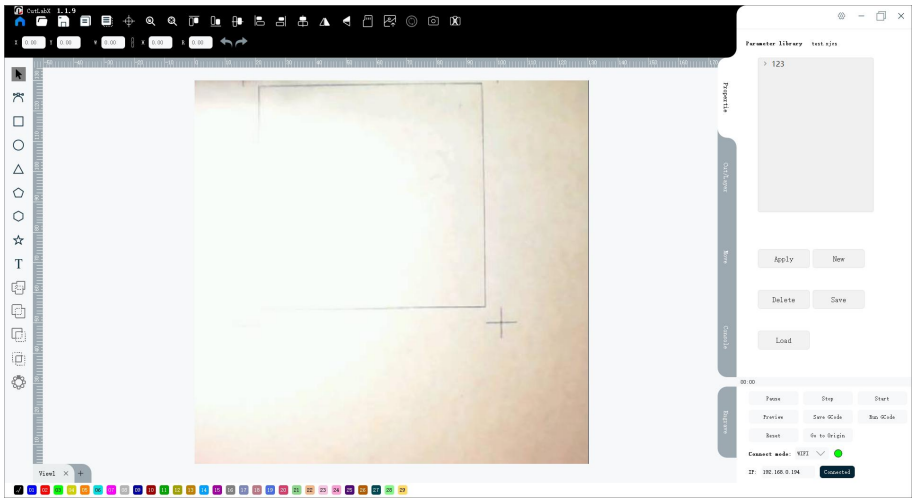
laser, which is half of the maximum stroke. If the laser stroke is 130mm*130mm, the roller uses the Z-axis, and the laser will move in the Y-axis direction of X=75 during preview.

（7）To modify the roller parameters and start the roller, you need to click "Confirm" to take effect.

1.3.3.14. Take pictures

After clicking the photo icon, the laser will move to the upper left corner, and the image will appear in the canvas area within a few seconds. It takes a few seconds to refresh the image each time you click the photo icon. This is related to the strength of the network connected to the laser. When the network is poor, it takes longer to appear or refresh the image.

After taking a photo, place the content you want to engrave on the acquired image and start engraving. You will see the 1:1 engraving content on the actual object, and the position will remain consistent.



Note:

（1）Make sure your laser has a camera function and supports CutLabX software.

（2）To use the camera function, use it in wifi mode.

（3）The camera icon is hidden by default when the laser is not connected to the software.

（4）If the camera icon does not appear after the software and laser are connected in wifi mode, please check the corresponding information in the console window, wait a few seconds to refresh, and make sure that "camIP" has an IP address. If there is still no icon after the IP address appears, please contact the seller of the laser; if there is no IP address or no camIP, please try to restart the laser and software, or contact the seller of the laser.

（5）If no image is displayed when you click on the camera, please make sure

that the CutLabX software version is 1.1.5 and above, and then calibrate the camera in the settings; if after calibrating the camera, there is still no image displayed when you click on the camera, please contact the seller of the laser. For camera calibration, please refer to the camera calibration instructions in the settings.

（6）If the camera positioning is not accurate:

① Make sure your object focal length is accurate .

② Try to recalibrate the camera.

（7）The camera function is not suitable for use in roller mode.

（8）The image obtained by taking a photo will not be updated in real time. Clicking the camera icon once will refresh the image once.

1.3.4. Coordinates and dimensions

1.3.4.1. Position and scale

This area is used to adjust the size, position and direction of the selected graphic. Note: A rectangular box will appear after selecting a graphic. The size, position and direction all refer to the size, position and direction of the rectangular box.

- X and Y: represent the coordinate position of the lower left corner of the currently selected graphic. The X coordinate increases from left to right, and the Y coordinate increases from bottom to top. After modifying the corresponding X and Y coordinates, the selected graphic will also move to the corresponding X and Y coordinate positions.
- Width and height: represent the size of the currently selected graphic. After modifying the width and height, the size of the selected graphic will also become the modified size. The software starts proportional changes in width and height by default, that is, when the icon on the right side of width and height is , after changing the length or width, the parameter of the other value will change in a certain proportion.
- Rotate R: You can enter the corresponding value in the input box to rotate the selected graphic, and the center of rotation is the center point of the graphic

1.3.4.2. Undo and Redo

- Undo: If the changes you made do not meet your requirements, you can click the Undo button or use the shortcut keys Ctrl + Z to undo.
- Redo: If you want to keep your changes or undo an accidental operation, you can click the Redo button or use the shortcut keys Ctrl + Y to redo.

Note: Undo and redo can only go back to the changes made 10 times ago. Subsequent changes cannot be undone or redoed.

1.3.5. Creation Tools

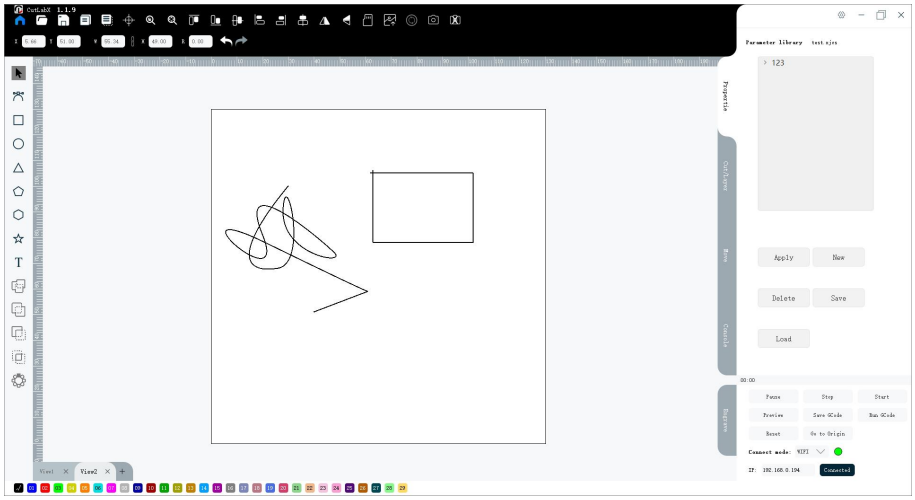
1.3.5.1. Graphics Selection

The graphic selection icon allows you to select a single graphic to perform other operations.

1.3.5.2. Line drawing

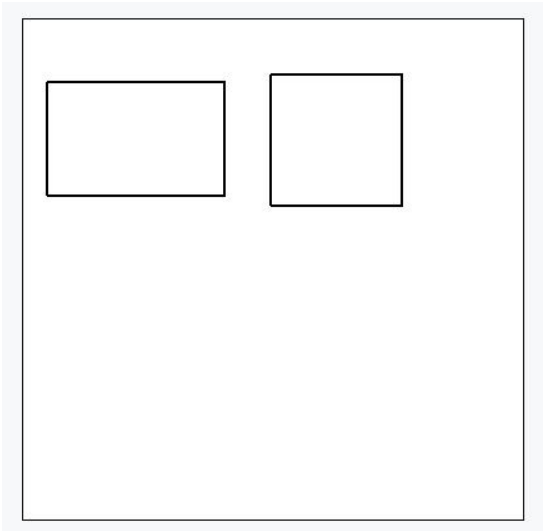
Click the Line Tool icon to use the Line Tool. Left-click anywhere on the page to start drawing the line, then click elsewhere to place the endpoints of the line.

To create a curve, click and drag while placing points. When using the Line Tool, you can combine curved and straight segments. The length or width of your drawing cannot be less than 1 mm.



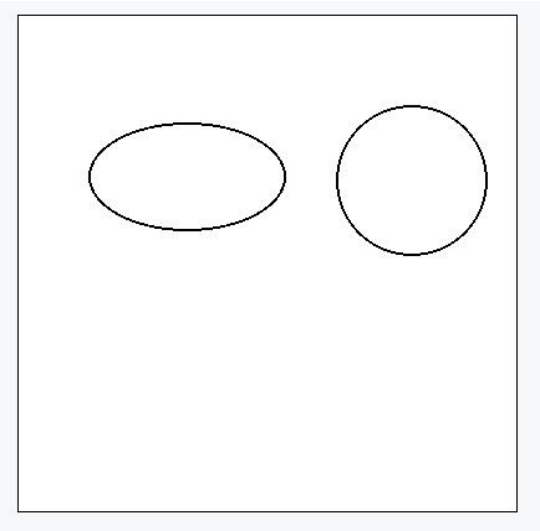
1.3.5.3. Rectangle

The Rectangle Tool is used to draw squares and rectangles. Dragging along the diagonal will produce a shape with fixed proportions. The length or width of the drawing cannot be less than 1mm. Using shift+dragging with the left mouse button will draw a square.



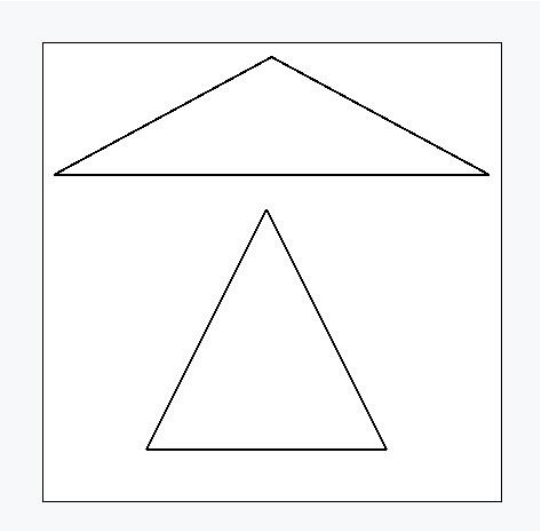
1.3.5.4. Ellipse

The Ellipse Tool is used to draw ellipses and circles. Clicking the icon with the left mouse button will exit the Ellipse Tool. The length or width of the drawing cannot be less than 1mm. Using Shift+left mouse button to drag will draw a circle.



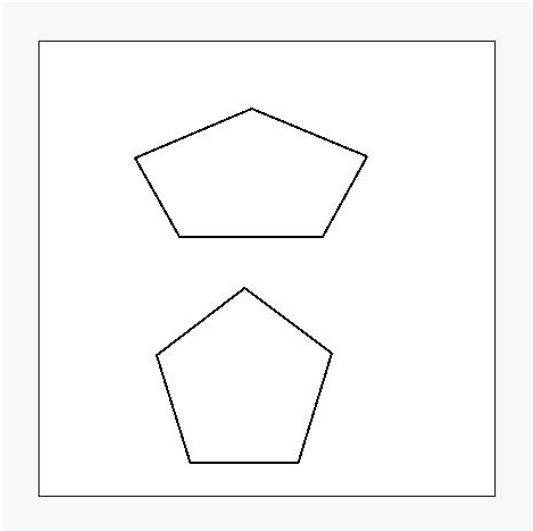
1.3.5.5. Triangle

The Triangle Tool is used to draw triangles. Clicking the icon with the left mouse button will exit the Triangle Tool. The drawing size cannot be less than 1mm in length or width.



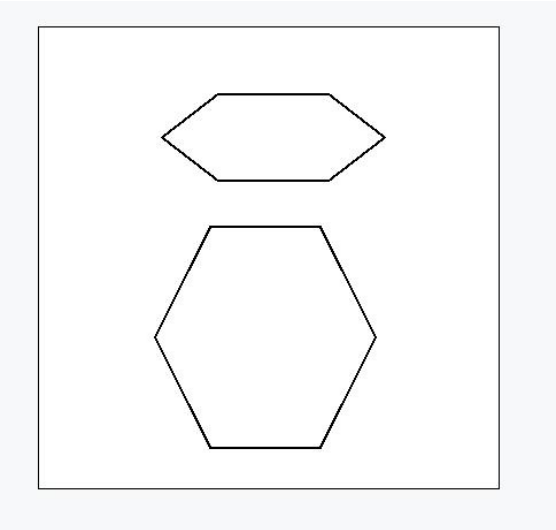
1.3.5.6. Pentagon

The pentagon tool is used to draw triangles. Clicking the selection icon with the left mouse button will exit the pentagon tool. The drawing size cannot be less than 1mm in length or width.



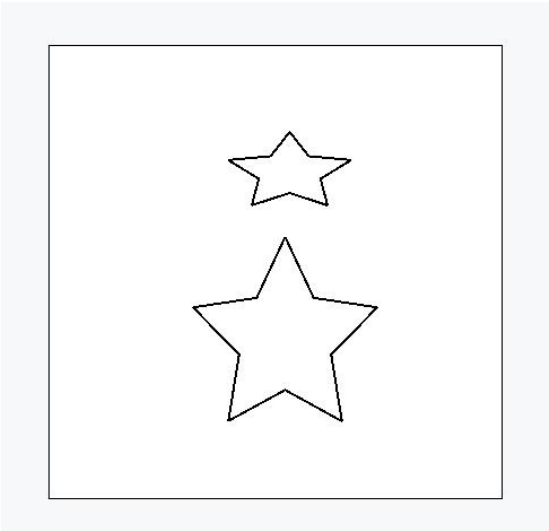
1.3.5.7. Hexagon

The Hexagon Tool is used to draw triangles. Clicking the icon with the left mouse button will exit the Hexagon Tool. The drawing size cannot be less than 1mm in length or width.



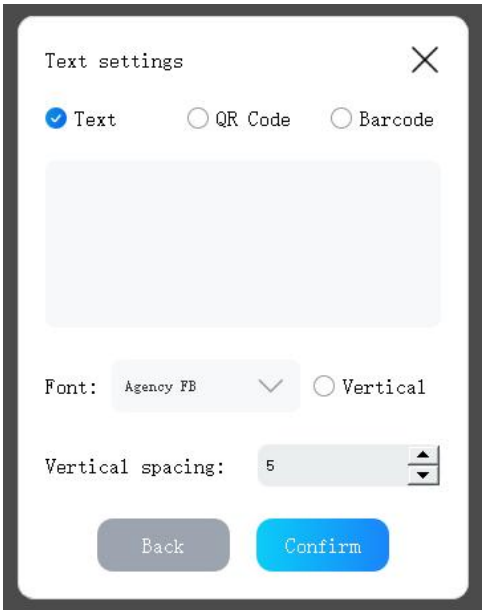
1.3.5.8. Pentagram

The Pentagram Tool is used to draw triangles. Clicking the icon with the left mouse button will exit the Pentagram Tool. The drawing size cannot be less than 1mm in length or width.



1.3.5.9. Text T

The Text Tool can be used to generate text, QR code and barcode. Click the Text Tool icon with the left mouse button to display the Text Setting window.



- Text: After selecting the text radio button, enter the corresponding content in the text editing area, select the font, and click the "Confirm" button. The corresponding text content will be generated in the working area.

  （1）Text content: You can enter the corresponding content in the text editing area. It supports text in multiple languages and supports line breaks.

  （2）Font: The font list depends on the fonts your computer system has. If you need other fonts, please use the tools provided by the operating system to install the font and restart CutLabX software.

  （3）Vertical: Display the text content vertically.

  （4）Vertical spacing: When the text is displayed in multiple lines or

vertically, you can adjust the vertical spacing value to change the line spacing between the texts. The minimum vertical spacing value is 0.

Note: The text content supports secondary editing. Double-click the generated text with the left mouse button to edit it again.

- QR code: After selecting the QR code radio button, enter the corresponding content in the text editing area and click the "Confirm" button. The corresponding QR code will be generated in the work area. It can be scanned by a mobile device with a camera.

  （1）Supports input of simple text, URL, etc.

  （2）Supports WiFi information, but requires a specific format, such as WIFI:S:Name;P:Password;T:WPA;;

  （3）Support contact address, etc

  MECARD:N:1,1;ADR:1;TEL:1;EMAIL:1;NOTE:1;URL:1;;

- Barcode: After selecting the barcode radio button, enter the corresponding content in the text editing area, click the "Confirm" button, and the corresponding barcode will be generated in the work area. It can be scanned by a mobile device with a camera. The input content only supports Arabic numerals and English letters. The barcode generated by entering other content cannot scan the corresponding content.

1.3.5.10. Boolean Graphics Combinations

（1）Multi-Graphic Union Combination : This function can combine multiple closed vector graphics, take the union of the selected graphics, and turn the graphics after the union into a whole. The default color of the icon is gray, and it cannot be selected. When there are two or more selected graphics, the icon color turns black.

（2）Double-Graphic Union Combination : This function can combine two closed vector graphics, take the union of the selected graphics, and turn the graphics after the union into a whole. The default color of the icon is gray, and it cannot be selected. When there are two or more selected graphics, the icon color turns black.

（3）Double-Graphic Difference Combination : This function can combine two closed vector graphics, so that the graphics obtained by subtracting the intersection of the two graphics from one of the graphics is the difference of the two graphics. Different two graphics will have two difference results. When combining the difference of two graphics, a result will be randomly generated. After cancellation, another result will appear when combining

（4）Double-Graphic Intersection Combination : The intersection of two graphics will obtain the overlapping parts of the two graphics. If there is no overlapping part, it will not be combined

1.3.5.11. Circular array

The Circular Array tool can create one or more copies around a center point. This function is suitable for watchmaking, pattern design, etc.

Start: represents the position where the first copy starts to be calculated. When the start value is modified, the step value will change accordingly. Step value = (end-start)/copy, and except for the position of the last copy, the positions of other copies will change.

End: represents the position of the last copy. When the end value is modified, the step value will change accordingly. Step value = (end-start)/copy, and the positions of all copies will change.

Step: The angle of each copy about the rotation center. When this value is modified, the end value will change accordingly. End value = start + copy * step, and except for the last copy, the position of other copies will change.

Copy: The copy value represents the number of copies generated, ranging from 0 to 99. The step value will be modified as the copy value is modified. Step = (end-start) / copy, and except for the last copy, the position of other copies will change.

Center: Represents the center of rotation when generating copies. The default initial value is the center point coordinates of the original image.

Use the last selected object position as the center: When there are two or more selected graphics, after checking this option, the rotation center will become the center point of the last selected graphic as the rotation center, and the generated copy does not include this graphic.

Rotate object copy: This function will rotate the generated copy. The rotation center point is the center point of the copy itself, and the rotation angle is the start value + step * the number of copies.

1.3.6. Layer Selection

Color Palette: The color palette is located at the bottom of the main creation window, and the black layer is selected by default.

Lasers don't print in color, so these colors are used to assign different types of operations to the shapes in your design. A common convention is to use bright red for cutouts, but how you use the colors is up to you.

With nothing selected in the workspace, click on a color entry and new shapes will be created in that color. If you have something selected, clicking on a color entry will apply that color to the shapes you have selected. The colors currently used in your design also appear as entries in the Cuts/Layers window, where you can select what operation each color represents.

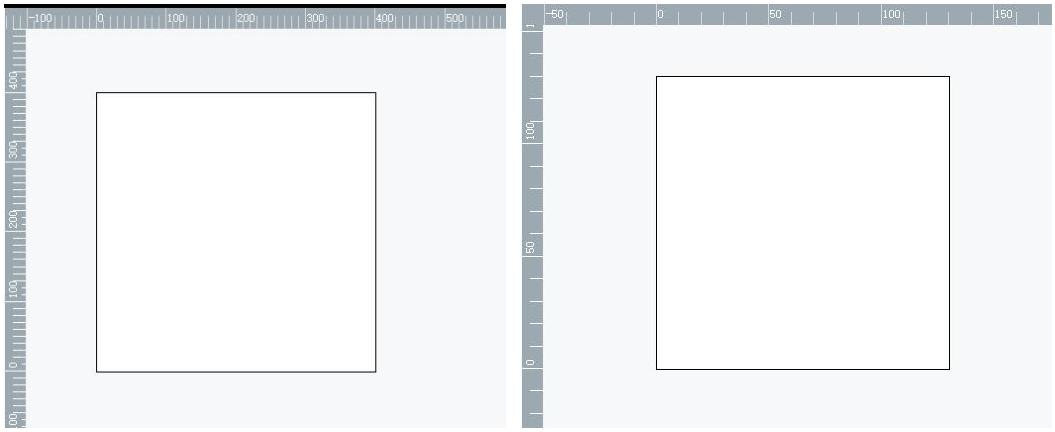
1.3.7. Work area

1.3.7.1. Work area display

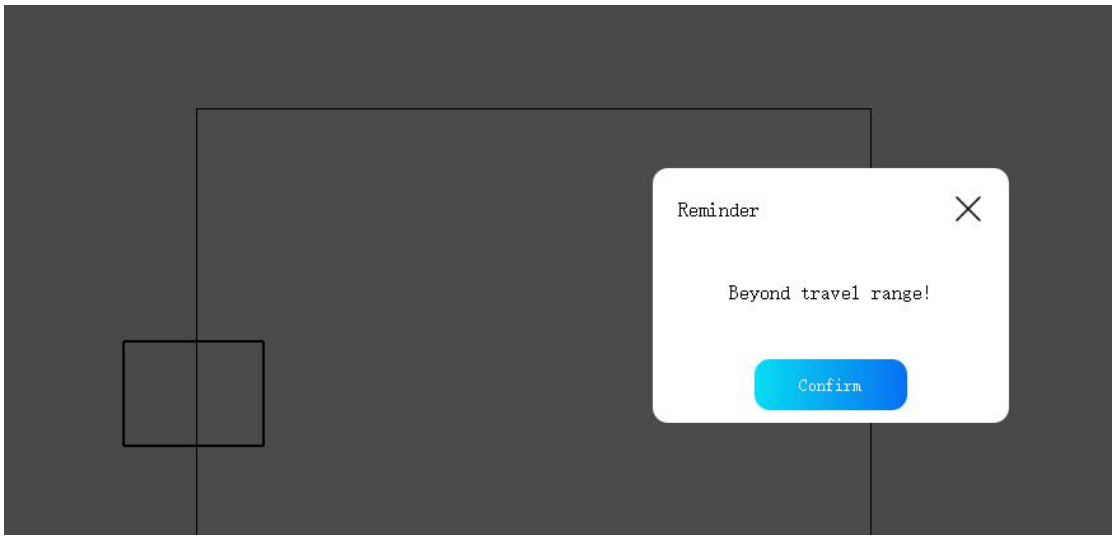
The middle area of the main interface of the software creation is the image display area, and the maximum display area range is:

X：-900~1300　　Y：-700~1100

The working area, i.e. the canvas area, is located in the middle of the display area and consists of a black border and a white area. When the laser is not connected, the default size is 400mm*400mm. After the laser is connected, it is refreshed to the corresponding area according to the relevant parameters inside the laser.



When the image exceeds the working area, a corresponding prompt will be displayed during preview or operation to prevent the operation.



1.3.7.2. Pan and zoom the working area

- an: To pan the work area, hold down the right mouse button and drag to move the work area. When the displayed area range is -400~800 in the X coordinate range, it can be panned left and right; but when the Y coordinate range is -400~750, it can be panned up and down.

- Zoom: Slide the mouse wheel to zoom in or out the mouse position.

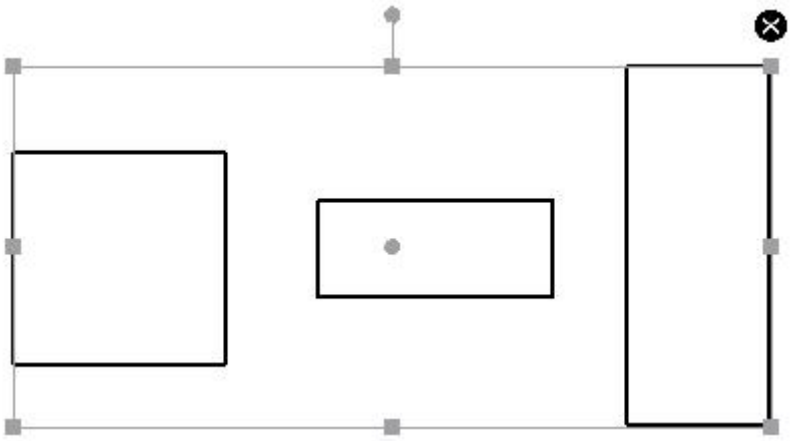
1.3.7.3. Select, resize, move and delete graphics

- Selection: Graphic selection

① Click the Select icon to exit the authoring tool.

② Bitmap: Click the graphic area with the left mouse button to select a single graphic, or double-click the graphic with the left mouse button to force the selection of the graphic; Vector: Click the graphic line with the left mouse button to select a single graphic.

③ To select multiple graphics, you can select a collection of shapes by holding down the left mouse button and dragging a rectangle around the content you want to select. If you drag the rectangle from bottom to top, the graphics you want to select will be selected even if the rectangle does not completely cover them; if you drag the rectangle from top to bottom, you need to select all areas of the graphic to select it. After selecting the graphic, a rectangular box will be drawn at the boundary.

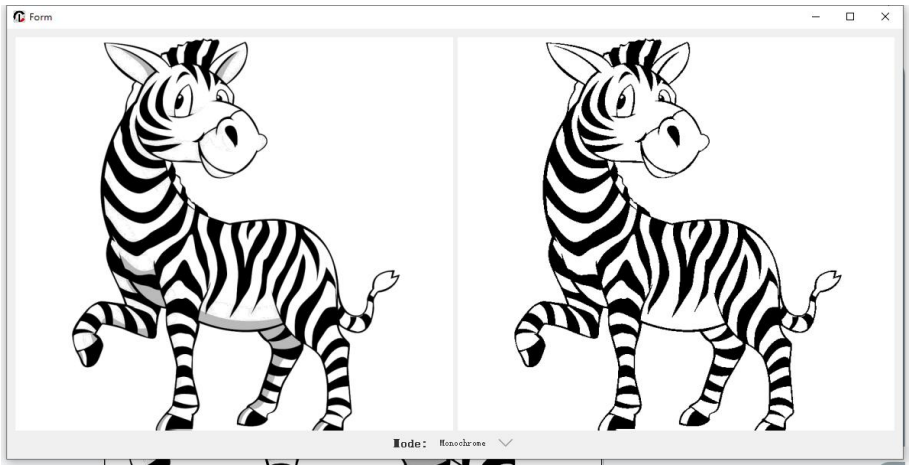


④ You can use the left mouse button to click in a blank area to deselect the graphic.

- Zoom: After selecting the graphic, place the mouse on the border of the rectangular box and the corresponding icon will be displayed. Drag the border with the left mouse button to zoom in and out, and drag diagonally to zoom in and out in proportion.
- Move: After selecting a graphic, place the mouse in the rectangular box and the corresponding icon will be displayed. You can move it by dragging the left mouse button. You can use the shortcut keys "↑↓←→" to move the graphic, and the moving distance will change with the minimum scale displayed on the current interface.
- Delete: After selecting a graphic, click the close icon in the upper right corner of the rectangular box to delete the graphic, or use the del key to delete it.

1.3.7.4. Mode Preview

In Mode Preview, you can see how the image will look in different modes. Place the mouse on the bitmap, right-click, and select Mode Preview.



Note:

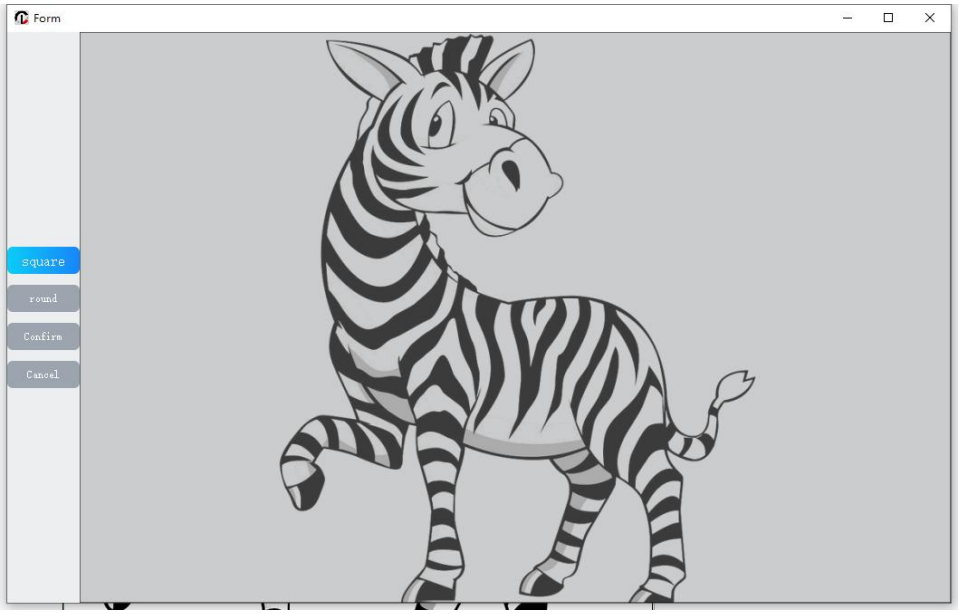
① There are 7 modes: black and white mode, dithering mode, outline mode, grayscale mode, and negative mode. For details, please refer to the mode introduction in "Cut/Layer".

② When switching modes, only the display effect of the image will be changed, and the actual mode of the image will not be modified

③ Different mode effects can only be displayed in this window, and the default image display effect imported will be displayed in the creation interface

1.3.7.5. Cropping

If you want to engrave only a portion of the imported image, you can use the crop function. Place your mouse over the bitmap, right-click, and select Crop.



Square: The original image will be cropped with a rectangular box. Hold down the left mouse button and drag, a rectangular box will appear, and you can determine the part you want to crop by moving and scaling the box.

Circle: The original image will be cropped with an elliptical area. Consistent with the square, hold down the left mouse button and drag to generate an elliptical area, which is the engraving area.

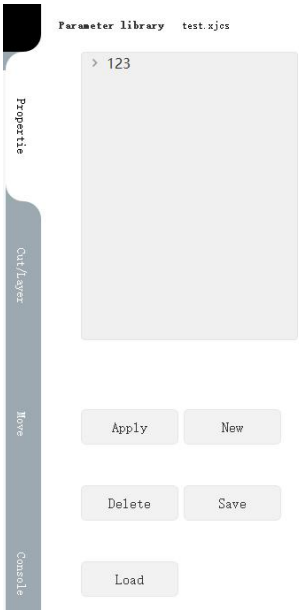
1.3.8. Multiple Views

The software allows multiple views, each of which is independent. The layers and related parameters in different views do not affect each other and are unrelated.

When there is too much content in a view or too many layers are displayed, you can create other views and place some content in other views to make the interface neater.

Layers of the same color may have different parameters in different views.

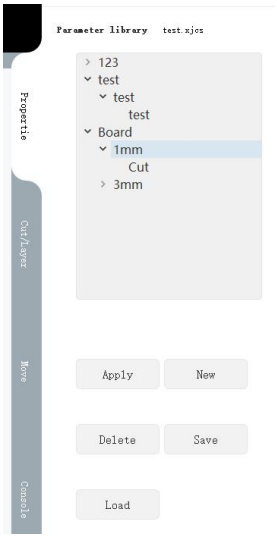
1.3.9. Properties Window

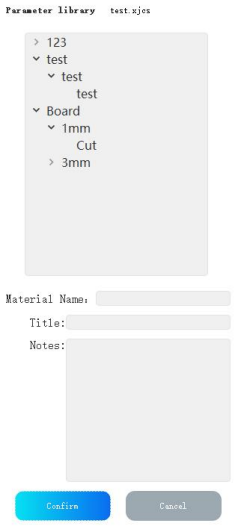


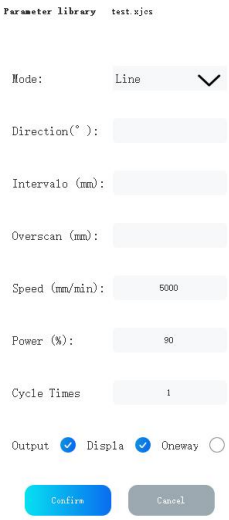
1.3.9.1. Parameter Library

The parameter library is mainly used to store common preset parameters for different operations on different materials, and there is a way to quickly apply these parameters.

To add parameter values, you can directly create a new parameter file in the parameter library, set the material type, title (you can also enter material thickness, etc.) and a brief description, and then set the corresponding parameters. The parameter library data can also be saved as a file on your computer, so that you can use these parameters on other computers.







Create new parameter file　　Fill in parameters

- Create a new parameter file:

（1）After clicking the "New" button in the parameter library with the left mouse button, an information filling window will appear.

（2）Fill in the information in the information filling window, including the material name, title and brief description.

（3）Click the "Confirm" button to complete the parameter file creation.

- Fill in the parameters:

（1）Double-click the brief information item of the parameter file, i.e. "Cutting" or "Bitmap Engraving" in the above figure, to enter the parameter information filling window.

（2）Fill in the corresponding parameters, such as mode, power speed, etc. This parameter is consistent with the parameters in "Cutting/Layer".

（3）Click the "Confirm" button.

- Modify parameters:

（1）Double-click the brief information item of the parameter file, i.e. "Cutting" or "Bitmap Engraving" in the above picture, to enter the parameter information filling window.

（2）Modify the corresponding parameters.

（3）Click the "Confirm" button.

- Save parameters: Click the "Save" button in the parameter library with the left mouse button to save the data in the parameter library as a file to your computer, so that you can automatically load the parameter library the next time you restart the software, or use the parameter file in other computers. The file format is fixed to .xjcs.
- Apply: After selecting a graphic in the work area, select the corresponding

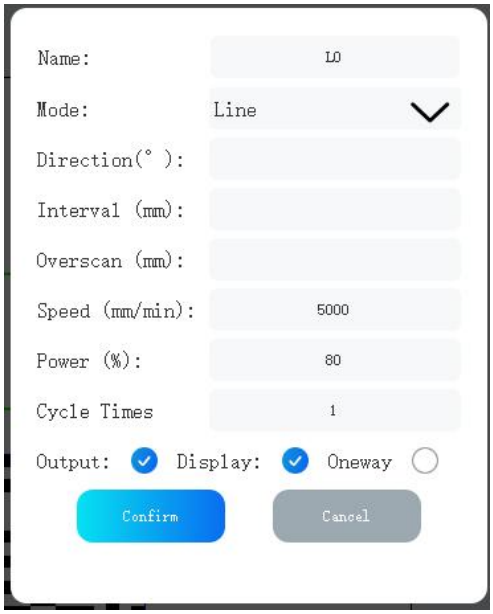
parameter file (click the brief information of the parameter file with the left mouse button), and then click the "Apply" button. Note: Some graphics cannot apply some parameters, such as vector graphics and text cannot apply grayscale mode parameters, and clicking Apply will be invalid.

- Delete parameters: After selecting the brief information of the corresponding parameter file, click the "Delete" button, the parameter file will be deleted, and then click the "Delete" button to synchronize the parameter file in the computer.
- Load parameter library: Click the "Load" button and select the parameter file in your computer. The file format is .xjsc. The relevant data in the parameter library will be replaced with the newly loaded parameters.

1.3.10. Cutting/Layer

The "Cutting/Layer" window mainly displays the relevant information and parameters of the layer. It mainly contains three parts of information. One part is the relevant information and some parameters of the layer, which are displayed in the form of a table. Another part is the commonly used parameters for layer engraving. The last part is to double-click the layer with the left mouse button to display the parameter window, which displays all the parameters of the layer.

The multi-layer window supports multiple layers. Multi-layers are used to engrave different graphics with different parameters during the engraving process.



1.3.10.1. Layer Information

- Name: The name of the layer, which can be edited and customized.
- Layer: The color of the layer. Different layers have different colors. The content of the work area belongs to a certain layer, and its border color is also consistent with the layer color.
- Mode: The mode is divided into two parts, one is the vector graphics mode, and the other is the bitmap graphics mode.

Vector graphics: There are three modes: line, fill, and cross fill.

（1）Line: In this mode, the laser will move along the path you designed at the power speed you selected. If you use a higher speed or lower power, you may only leave a shallow mark on the surface of the object; if you use a lower speed and higher power, you will cut the object or even penetrate the material, depending on the material of your object.

（2）Fill: After selecting this mode, the laser will scan and fill the shape you want line by line, and the content in the working area will also be filled and displayed with the color of the layer.

（3）Cross Fill: After selecting this mode, the laser will scan and fill the shape you want line by line, and run it again in a line manner after the scanning and filling is completed.

Bitmap graphics: There are five modes: black and white, dither, outline, grayscale, and negative.

（1）Black and White: Bitmap mode is selected by default. This mode is useful for images where black and white are distinct in certain places, and is more suitable for images that are originally in black and white.

（2）Dither: Dithering, also known as error diffusion dithering, is best for smoothing shaded images such as photographs. This also approximates shading with simple dots, but does so without obvious patterns and tends to produce more subtle shading.

（3）Outline: When this mode is selected, the outline of your image is extracted during engraving, and the engraving is done as a line trace.

（4）Grayscale: Grayscale mode allows for variable depth (3D) engraving instead of shading. Images usually need to be created specifically for this purpose. With a diode laser, this can give very good shading, but is more difficult to achieve than normal dithering. This mode is more useful for images with more detail.

（5）Negative: When this mode is selected, your image is inverted during engraving. Black becomes white, and white becomes black. This is useful for engraving stone or glass, as the burned areas will appear lighter.

- Output: Enabled by default. When it is turned off, no information will be output to the laser during engraving, so after it is turned off, the laser will not respond when engraving.
- Display: Display by default. When the display is turned off, the content of this layer will not be displayed in the work area.
- Delete: After clicking the delete icon, the layer and the content of this layer in the work area will be deleted.

1.3.10.2. Common layer parameters

- Offset: When the laser engraves multiple layers, it will engrave the contents of

each layer from top to bottom in the order of the layers. After clicking the layer with the left mouse button, you can click the offset button to move the layer and change the engraving order of the layer.

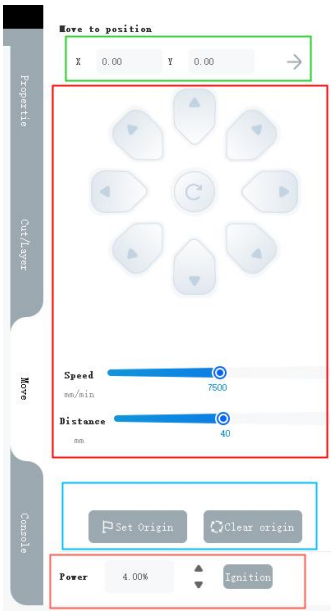
- Speed: This parameter is the movement speed of the laser during engraving, in mm/min. The larger the value, the shallower the engraving. The default speed is 5000mm/min.
- Power: This parameter is the laser power during laser engraving, calculated as a percentage. At 0%, the laser does not emit light, and at 100%, the laser moves at the maximum laser power. The default laser power is 80%.
- Engraving times: The laser will repeat the engraving at the currently set engraving times.
- Fill spacing: Controls the spacing between scan lines. The smaller the value, the smaller the spacing between scan lines.

1.3.10.3. All parameters of the layer

- Name: See the layer name in the layer information
- Direction: Normally 0, meaning the laser will scan horizontally back and forth across the image, from the bottom to the top of the image. If you set this value to 180, the laser will scan the image from top to bottom. Setting it to 90 will make the laser scan vertically across the image, from left to right. Not available in Line Mode and Outline Mode.
- Overscan: When enabled, extra movement is added to the beginning and end of each line to give the laser time to speed up before firing and slow down after firing. If your machine has low acceleration or you see darker burns on the sides of your infill, you may need to increase the amount of overscan. If the image is placed at the edge of the work area, there is a chance that the extra movement will hit the edge. Not available in Line Mode and Outline Mode.
- Unidirectional: The default Bidirectional mode is not enabled, and the laser will engrave in a side-to-side scanning motion, engraving in one direction and then engraving again in the return direction. When enabled, the laser will engrave in one direction and then return to the beginning of the next line instead of engraving a return pass. Not available in Line Mode and Outline Mode.
- Output: See output in layer information
- Display: See display in layer information
- Speed: See speed in common parameters
- Power: See power in common parameters
- Engraving times: See engraving times in common parameters
- Filling spacing: See filling spacing in common parameters

1.3.11. Moving Window

The moving window is mainly used to control the movement and positioning of the laser.



1.3.11.1. Position movement

- Coordinate position movement: Enter the X and Y values and click the move arrow to move the laser to the X and Y coordinate positions.
- Button control movement: Click the move button to move the laser according to the set speed and power. Click different movement direction buttons to move the laser in different directions. Click the middle button to return the laser to the origin.

  （1）Speed: You can drag the pulley to set the speed of movement. The maximum speed is the maximum speed of the machine.

  （2）Distance: The distance the laser runs each time the button is clicked. The distance of movement can be set by dragging the pulley.

1.3.11.2. Zero point setting and origin clearing

- Set zero point: that is, set the origin. When the laser is at a certain coordinate, click Set zero point to set the current coordinate as the origin. The origin is the initial position when the laser starts to move. The default origin is (0,0). When the origin is not set, the machine runs to the point (10,10) in the working area, and the actual running position of this point is (10,10). When the zero point is set to (20,20), the actual running position of this point is (30,30).
- Clear origin: Clear the set origin and reset the origin to the initial position (0,0)

1.3.11.3. Preview Laser Power Control

During preview, the laser will run at a certain power. Here you can set the laser

power during laser preview. The default is 4%, the maximum is 20%, and the laser will not emit light at 0%.

Clicking the "Ignition" button with the left mouse button will cause the laser to emit light in a static state, making it easier to determine the current position of the laser spot.

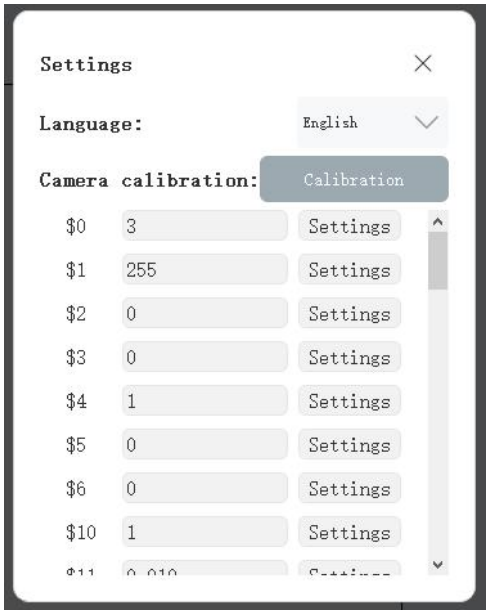
1.3.12. Console Window

When the software is connected to the laser, the console will continue to receive the current information and status of the machine and output it. If the console does not output any information after the connection, it proves that the machine connection is abnormal. At this time, please restart the machine and software and try to reconnect.

You can enter the command in the text box and the console will output the result.

1.3.13. Settings Window

Click the "Settings" icon button in the upper right corner of the creation main interface, and the settings window will appear. The settings window mainly allows you to switch software languages, calibrate the camera, and set laser internal parameters.



1.3.13.1. Language Switching

The default language of the software is English. Click the drop-down box in the settings window to select other languages to switch. After selecting the language, you need to restart the software to take effect. The software currently supports Chinese, English, Korean, Japanese, Italian, Spanish, German, Russian, French, and Portuguese.

1.3.13.2. Camera Calibration

Camera calibration is mainly used to calibrate when there is a deviation in the

camera positioning. From CutLabX1.1.5 version onwards, the camera calibration button will be in the settings window.

Calibration steps:

（1）Place a plane in the engraving machine, and the problem of being able to engrave clear marks at the default power speed, and the size of the object must be greater than 130mm*130mm

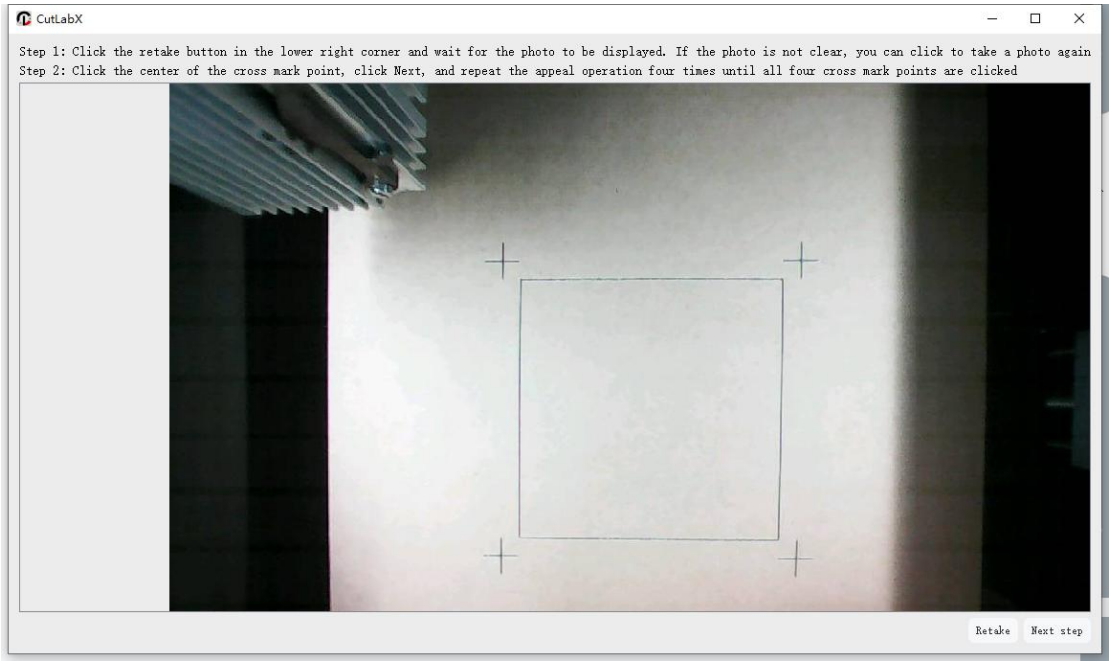
（2）Aim at the focal length of the machine

（3）Use wifi mode to connect the software to the laser

（4）Make sure your current view has no content

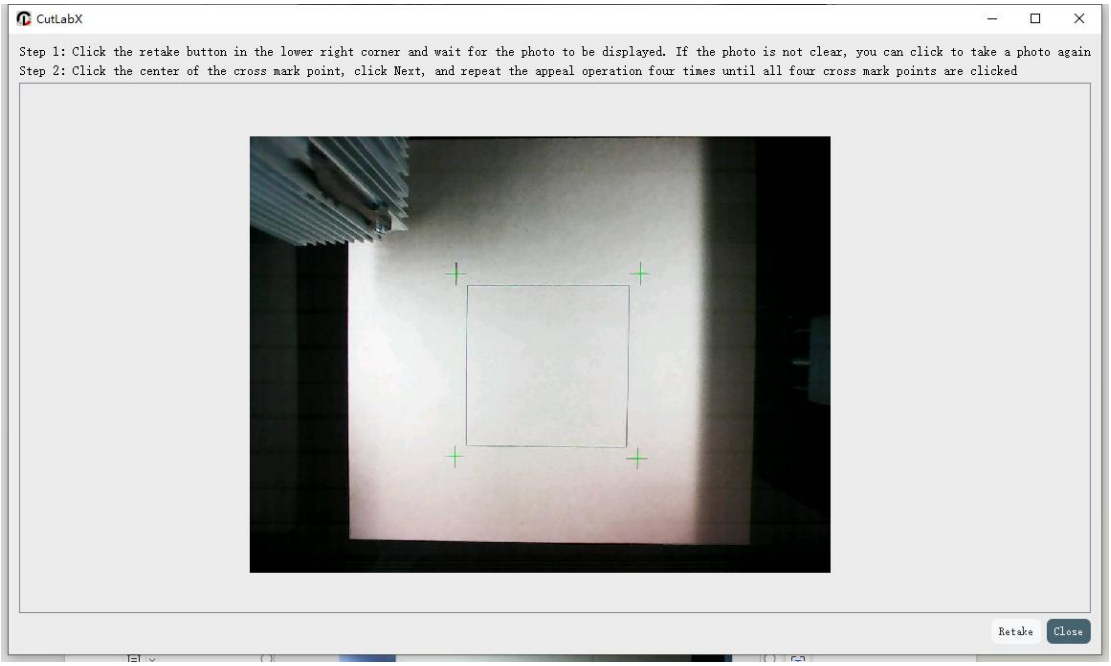
（5）Click the "Calibrate" button in the settings interface, and a prompt "Do you need to calibrate the camera?" will appear, click the "Confirm" button. At this time, a square and four small crosses will be automatically drawn in the working area, and the engraving will be automatically transmitted. The camera calibration window will appear in the software.

（6）Wait for the engraving to be completed, click the "Retake" button in the camera calibration window, the laser will move to the upper left corner, and the image will appear in the calibration window after a few seconds. If it is not clear, click the "Retake" button again to wait for the image to appear. You can use the left mouse button to drag the image to move, and use the mouse wheel to zoom in and out of the mouse position



（7）Click the center of the four crosses in the image in sequence, from upper left to upper right to lower right to lower left. After clicking each cross center, click Next to make the red cross turn green and the center of the green cross coincide with the center of the cross in the image. When the centers of the four green crosses coincide with the center of the cross in the image, click the

Close button or close the window, and the calibration is complete.



（8）Click Take Photo in the creation interface, and you can see that the rectangle and cross engraved on the main interface will overlap with the displayed photo image.

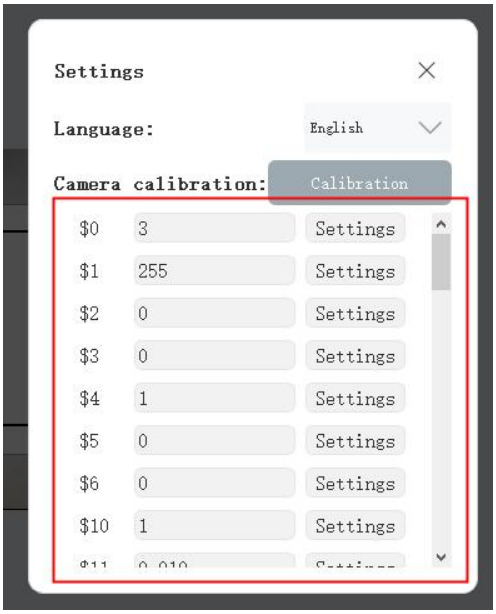
1.3.13.3. Machine parameter settings

When the software is successfully connected to the machine, the settings interface will display the relevant parameters of the machine, such as the movement direction of the X-axis, the acceleration of the Y-axis, the engraving area of the machine, etc. For detailed parameter descriptions, please refer to the website https://github.com/bdring/Grbl_Esp32/wiki/Settings.

Note:

①If you do not understand these machine parameters, please try not to modify them. If modifying the machine parameters causes the machine to operate abnormally, please change to the original parameters or contact the merchant who sold you the machine to reset the machine.

②After entering the modified value in the input box, you need to click the Set button, otherwise the modification will not be successful.


Settings
Language:
English
Camera calibration:
Calibration
$0
3
Settings
$1
255
Settings
$2
0
Settings
$3
0
Settings
$4
1
Settings
$5
0
Settings
$6
0
Settings
$10
1
Settings