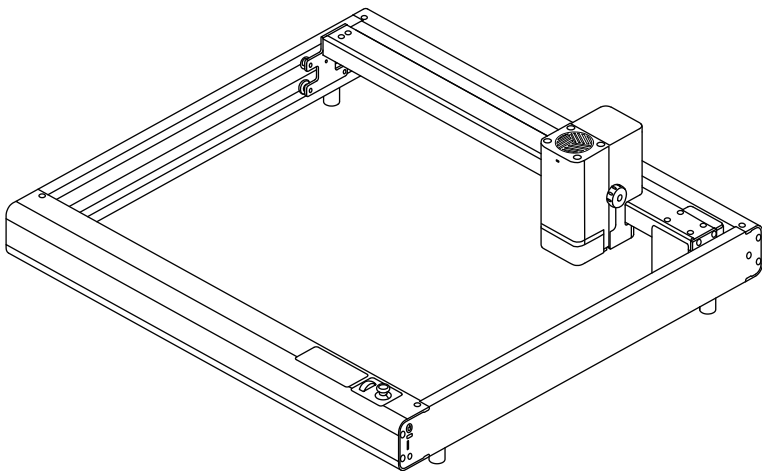


DAVCARVE L1

Product Instruction Manual



Preamble

Dear users:

Hello! Thank you for choosing DavcarveL1, we hope that in designing and creating new works, the master engraver can be your capable inventive assistant, so that you can feel the infinite joy brought by the laser technology, let's start the journey of invention and creation together!

FCC rules

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception,

which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction

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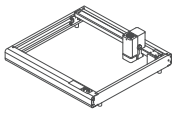
I. Meet the DavcarveL1

Welcome to the DavcarveL1 User Manual, for a better user experience, please read this manual carefully and follow the specifications before operating the device for the first time.

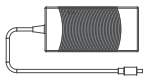
Based on the product concept of people-oriented and continuous improvement, our company may revise and upgrade the user manual without prior notice to the user. We sincerely ask for the understanding of our valued users.

II. Product list

The standard product includes the following accessories.



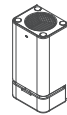
Davcarve × 1



Adapter and Power Cord × 1



Fine Goggles × 1



Machining head × n



USB cable × 1



Material package × 1



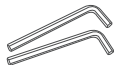
Aluminum panel × 1



User manual × 1



screws × random



Allen wrench × 3



Slotted Screwdriver × 1



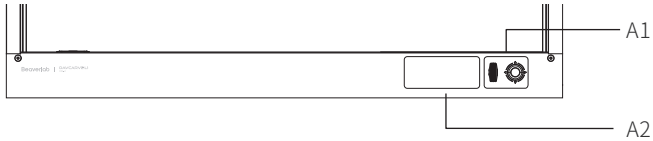
Lubrication oil pack × 1



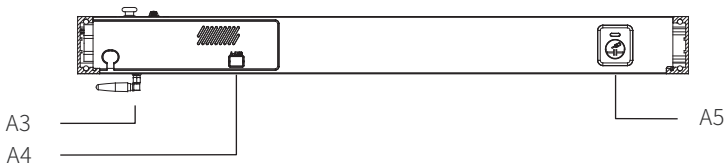
TF card × 1

III. Product introduction

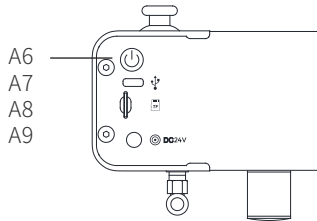
Appearance of the machine



Top view of front frame



Rear view of front frame

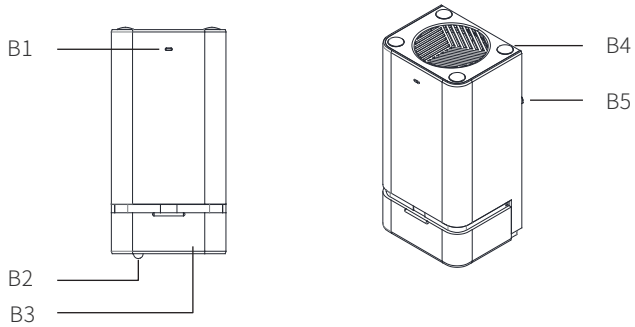


Side view of the right frame

- A1: Wheel and joystick kit
- A2: Screen, touch buttons
- A3: External antenna
- A4: A-axis interface
- A5: Coupling Port

- A6: Boot button
- A7: TypeC interface
- A8: TF card holder
- A9: Power connector (DC24V)

Blue Laser Module



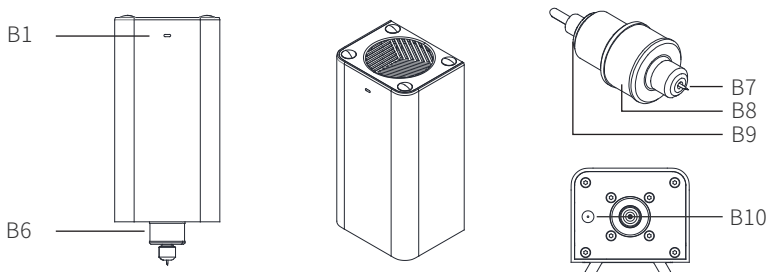
10W, 20W Blue Laser Module Diagrams

B1:LED status light
B2:Tool setting rod
B3:Yellow Shield

B4:Cooling Fan
B5:Air tube connector

Note: The laser module can be mounted directly on the equipment.

Find Point Blade Module



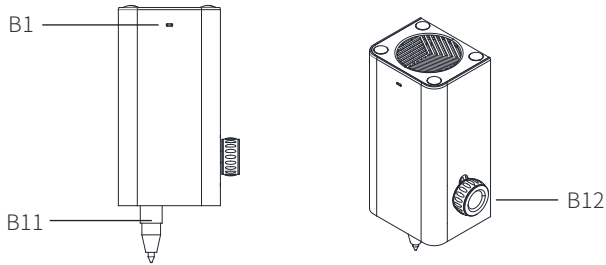
B6:Cutter head
B7:Blade

B8:Silicone Rubber Ring
B9: Magnets

B10:Red dot laser

Use note: Insert the blade into the circular hole at the bottom of the cutting head, and magnetically attach it to the blade module as a whole. Then, install it onto the device.

Artistic Drawing Module



Artistic Drawing Module

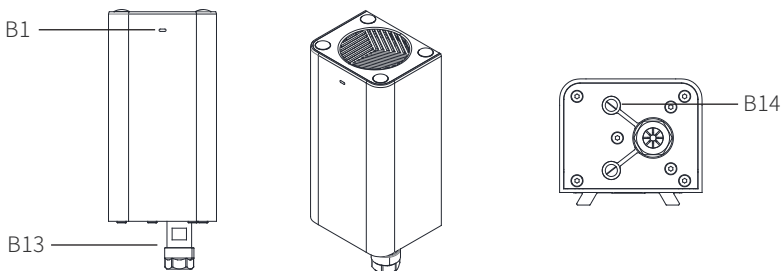
B11:Brushes

B12:Rotating handle

Use note: Insert the brush into the pen clip unit, ensuring that the brush is 20-30mm away from the bottom plate. Rotate the handle to tighten the brush, then secure the drawing module in place.

Note: The handle wheel should not be over-tightened to avoid deformation of the pen.

CNC Router Module



CNC Router Module

B13:ER11 Collet

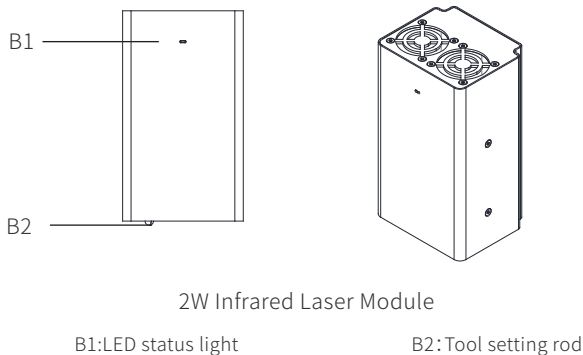
B14:Red Dot Laser

4.Use Note: Install the tool into the ER11 collet and tighten the collet with a wrench to clamp the tool in place; then secure the CNC module to the machine.

Note: The aluminum panel needs to be securely installed on the equipment before attaching the CNC module.

Note: CNC module operation requires the use of independent software. For detailed guidelines, refer to the CNC module usage document

2W Infrared Laser Module

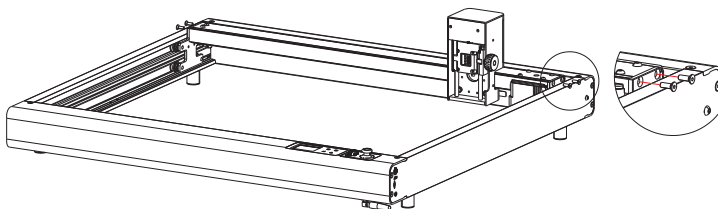


Note: The laser unit can be mounted directly on the equipment.

IV. First-time use

4.1 Equipment installation

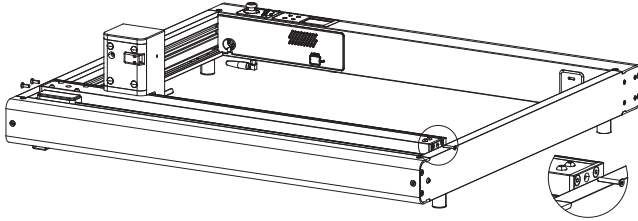
Remove the X-axis crossbar assembly from the package and secure the assembly to the left and right side crossbar with screws;



Accessories used

Countersunk hexagon socket bolt 4xM4-12

Allen wrench M2.5



Check the tightness of the X-axis head movement and tighten the screws accordingly, ensure the X-axis timing belt is properly tensioned.

Accessories used

Countersunk hexagon socket screws M3*20 x1

Allen wrench M2.0

4.2 Connecting power

Insert the power terminal into the DC24V port on the device.

4.3 Inserting a TF card

Insert the TF card, the power-on button light turns on; the screen lights up and enters the power-on interface.

4.4 Installation of antennas

Screw the antenna into the antenna holder under the front frame to complete the antenna installation.

V. Security guidelines

Read and familiarize yourself with all safety instructions before operating this product.

- Observe the procedures for the use of the equipment.
- Ensure that the product has been properly installed in place and is in proper working condition;
- Children younger than 10 years of age should be accompanied by an adult throughout the use of this equipment;.

Electricity safety

In order to minimize electricity problems in using the equipment, pay attention to the following:

- Do not repair or modify the product without professional guidance.
- The device is powered by DC24V, do not connect to other power sources.

Fire prevention and safety

The laser module generates high temperatures on the surface of the material during processing, and the processed material may ignite.

- Ensure that personnel are present when using the laser, especially when cutting new materials or when using it for the first time.
- Cleaning up process debris regularly to prevent burning caused by debris residue.
- Cut at low speeds (at speeds below 3mm/s) and try to use fast, multiple cuts rather than slow, single cuts.
- Keep the surrounding area clean and free from flammable materials, explosives or volatile solvents.

Fume and dust safety

The laser module generates fumes and dust during processing.

- Ensure that the workspace is well ventilated, and it is recommended that the fumes are vented externally.

-
- Toxic gases can be generated during the laser processing of some materials (avoid materials containing chlorine or chlorides).

Laser Safety

Attention to materials

- When processing unknown materials, start with low settings and gradually increase while testing to avoid material burning or extensive engraving failures.
- If the material has been bent, twisted, it is recommended to flatten them for use or replace them with new materials for processing.
- Do not fold or stack materials for processing.
- Material cutting and engraving parameters are detailed in the software material cutting and engraving parameters table.

Laser attention

- Do not observe the laser for a long period of time. Goggles are recommended for observation;
- The laser can burn the skin; avoid direct exposure of the skin to the laser.


Labels and Warnings

The following labels are on the side of the machine body

Beaverlab

Model: 10W Blue Laser
 Wavelength: 450nm
 Light Path: Focused Beam
 Input Voltage/Current: 24V ~1.5A
 Total Power: 36W

This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated (Insert date of this guidance.)




AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

Beaverlab

Model: 20W Blue Laser
 Wavelength: 450nm
 Light Path: Focused Beam
 Input Voltage/Current: 24V ~3.5A
 Total Power: 84W


This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated (Insert date of this guidance.)



AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

Beaverlab


Model: Find Point Blade Module
 Blade Dia: 2mm
 Max Cutting Thickness: 1.5mm
 Input Voltage/Current: 24V ~0.2A
 Total Power: 4.8W



Avoid hurting your hand with the tip of the Blade

Beaverlab

Model: Artistic Drawing Module
 Hold Dia: 5-20mm
 Hold Length: 80-190mm
 Input Voltage/Current: 24V ~0.2A
 Total Power: 4.8W




Avoid hurting your hand with the tip of the Pen

Beaverlab

Model: 2W Infrared Laser
 Wavelength: 1064nm
 Frequency: 20000HZ
 Input Voltage/Current: 24V ~4.0A
 Total Power: 96W


This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated (Insert date of this guidance.)



AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

Beaverlab

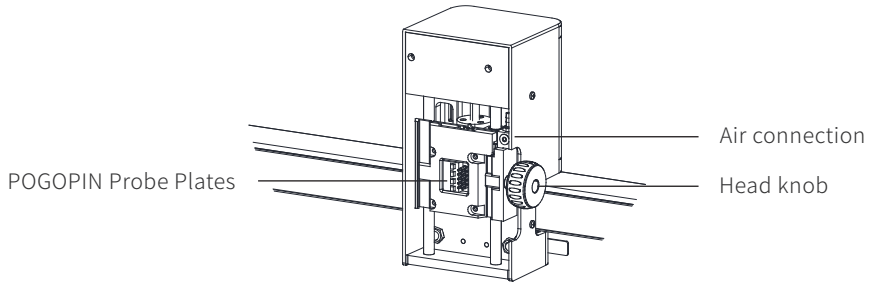
Model: CNC Module
 Hold Dia: 3.175mm
 Spindle speed: 10000rpm
 Input Voltage/Current: 24V ~2.5A
 Total Power :60W



Avoid hurting your hand with the tip of the Pen

VI. Functionality

Quick release head



The head slider is equipped with POGOPIN probes, and support the quick-release, wireless replacement of the processing module after loosening the knob on the right side.

Safety protection

Blue laser protection: the transparent yellow shield on the laser unit protects against blue light.

Combustion detection: The laser head's flame sensor intelligently detects the combustion status of items, preventing fire hazards;

Tipping Detection: The device's three-axis acceleration sensor can intelligently detect collisions;

Emergency stop: During the machining process, it supports instantaneous stop by touching the button and joystick;

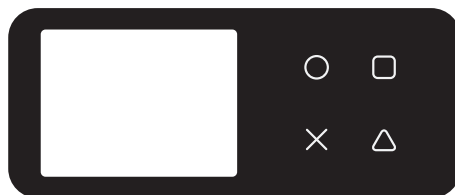
Quick Air Circuit

Below the front of the machine, there are air interfaces arranged for easy insertion and removal of outer diameter 4 PU air tube, facilitating the quick introduction of the laser unit's air circuit.

VII. Introduction to Interaction

On the front side of the machine, the LCD display, touch buttons, and wheel joystick system can complete the multi-control processing.

Buttons



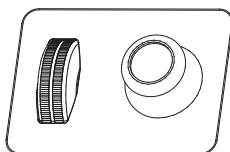
Key ○: Confirmation key (OK);

Key ×: Back;

Button □: Try to go to the frame;

Button △: switch Fine/Fast (Step);

Wheel and joystick



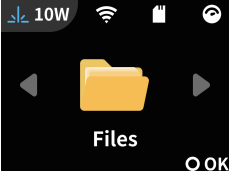
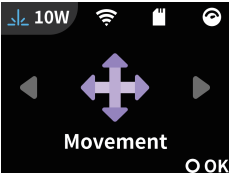
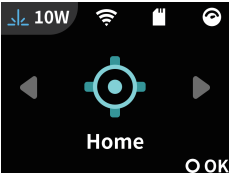
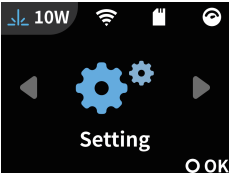
Wheel rolling: Vertical movement of the Z-axis;

Wheel Press: Z-axis auto-focus during centrifugal machining process;

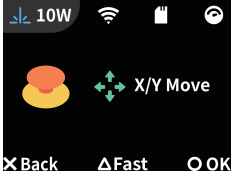

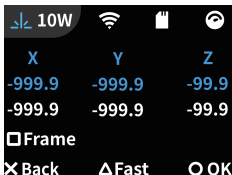
Joystick left/right: Movement along the X-axis, switch main interface;

Joystick up/down: Movement along the Y-axis, up/down selection.

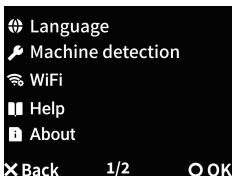
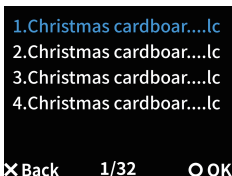
Control Panel Main Interface

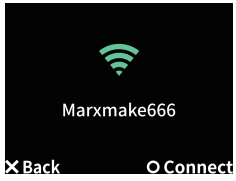
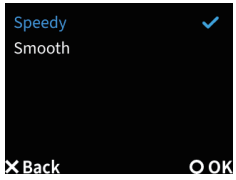

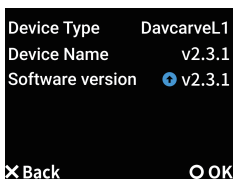
Interfaces	Introduction of Interface
 <p>The screenshot shows a black interface with a yellow folder icon in the center. At the top left, there is a '10W' indicator and icons for signal strength, Wi-Fi, and battery. At the bottom, there are left and right navigation arrows, the word 'Files' in the center, and an 'OK' button at the bottom right.</p>	<p>File Selection Page</p> <p>After the device is inserted into the TF card and confirmed in this screen, you can select the processing file</p>
 <p>The screenshot shows a black interface with a purple crosshair icon in the center. At the top left, there is a '10W' indicator and icons for signal strength, Wi-Fi, and battery. At the bottom, there are left and right navigation arrows, the word 'Movement' in the center, and an 'OK' button at the bottom right.</p>	<p>Mobile Control Interface</p> <p>Confirmation in this screen allows you to move the control device according to the on-screen prompts</p>
 <p>The screenshot shows a black interface with a teal target icon in the center. At the top left, there is a '10W' indicator and icons for signal strength, Wi-Fi, and battery. At the bottom, there are left and right navigation arrows, the word 'Home' in the center, and an 'OK' button at the bottom right.</p>	<p>Reset Interface</p> <p>Confirm in this screen to perform a device reset</p>
 <p>The screenshot shows a black interface with a blue gear icon in the center. At the top left, there is a '10W' indicator and icons for signal strength, Wi-Fi, and battery. At the bottom, there are left and right navigation arrows, the word 'Setting' in the center, and an 'OK' button at the bottom right.</p>	<p>Setting interface</p> <p>After confirming in this screen, you can access the setting menu</p>

Mobile Control Interface


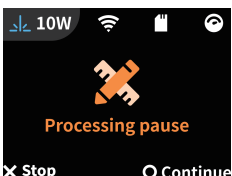
Interfaces	Introduction of Interface
	<p>Joystick control guidance interface</p> <p>Toggle the joystick up/down/right/left/right to control the X/Y axis movement, use the <input type="checkbox"/> key to start the test frame movement</p>
	<p>Roller Control Guidance Interface</p> <p>The roller scrolls up and down to control Z-axis movement.</p>
	<p>Movement Process Interface</p> <p>The wheel and joystick control the movement of the processing head, and the device data changes accordingly.</p>

Setting Interface

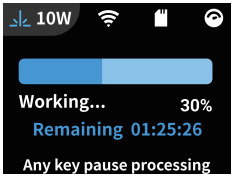
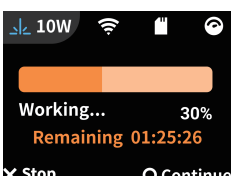
Interfaces	Introduction of Interface
	<p>Setting List Interface</p> <p>Selecting from the list of settings takes you to the submenu of the corresponding settings.</p>
	<p>Language Settings Interface</p> <p>Languages can be switched via the language settings</p>

Interfaces	Introduction of Interface
	<p>WiFi Configuration Interface</p> <p>Languages can be switched via the language settings</p>
	<p>Motor Mode Interface</p> <p>Motor mode can be switched by motor mode selection</p>
	<p>Operation Guide Interface</p> <p>During initial use, an operation guide appears in the movement control process. The operation guide can also be accessed in the settings</p>
	<p>Version info Interface</p> <p>This interface provides information about the current version. Press <input type="radio"/> to initiate a version upgrade.</p>

Online machining interface

Interfaces	Introduction of Interface
	<p>Processing in Progress Interface</p> <p>The device can be paused during processing by performing any action on the device</p>
	<p>Pause Processing Interface</p> <p>After a pause in machining, you can continue machining with the O key or stop machining with the X key.</p>

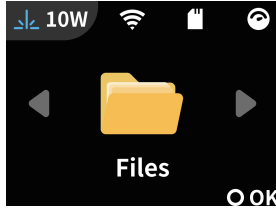
Offline Processing Interface

Interfaces	Introduction of Interface
	<p>Processing in progress Interface</p> <p>After starting machining, the interface will be displayed in blue color, and the interface will provide real-time feedback on the machining progress and machining time. Any operation on the equipment can pause the processing.</p>
	<p>Pause Processing Interface</p> <p>After processing is paused, the interface is displayed in orange, and you can continue processing with the O key or stop processing with the X key.</p>

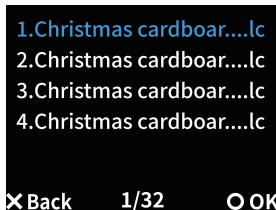
Offline Processing Flow

01 File Selection

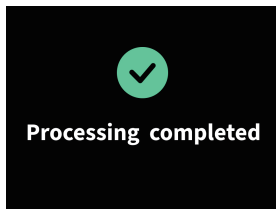
When you turn on the device, the screen will show "File", and the interface is as follows:



After the device TF card is memorized, switch to the file selection page in the menu and press to confirm the selection to enter the file selection process.

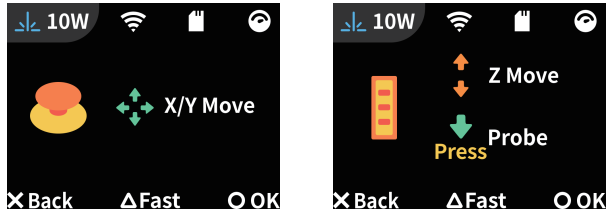


Toggle the joystick up and down to control the file list selection, press to confirm the selection of machining files, and start loading machining files.



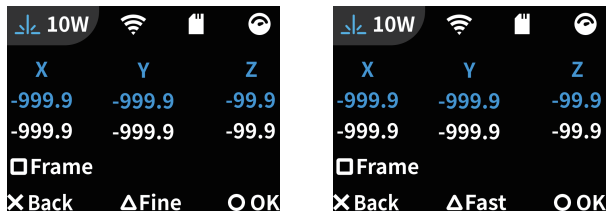
Once the file has been successfully loaded, the processing process begins.

02 Offline machining setup



Press down the center wheel for focusing operation.

If the joystick and wheel are operated, the screen will automatically switch to the dynamic data display interface. Use the Δ key to toggle between standard/rapid modes, the spindle XYZ direction movement is controlled by joystick and wheel operation.

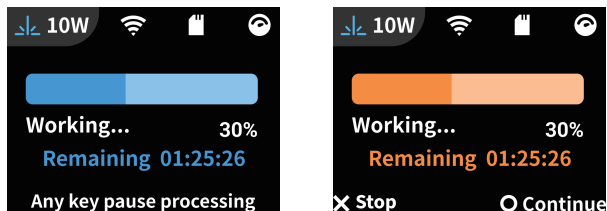


Press \bigcirc to confirm the start of machining and enter the machining process.

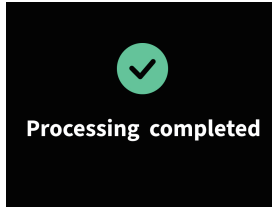
03 Start processing

Once the machine starts offline machining, you can see the progress of machining and the remaining machining time on the screen.

The machine is suspended when any button, joystick or wheel is operated.



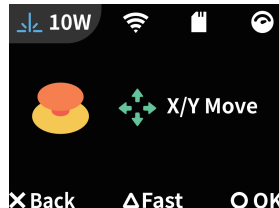
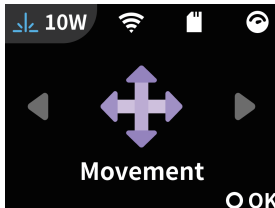
When machining is finished, press to confirm the end of machining and return to the first level menu.



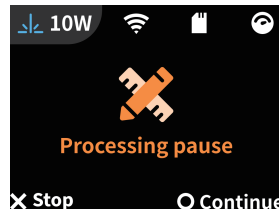
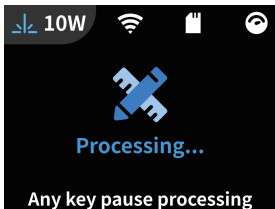
Online Processing Flow

Use the data cable to connect the computer to the device, and press the power on button, the device is in the waiting to connect state

Note: The computer connected to the device needs to install the serial port driver CH340.



After configuring the processing file in the software and clicking 'Start processing' the device begins processing immediately, with the screen displaying the processing progress. When you click 'Pause,' the screen shows the pause interface.




When machining is finished, press to confirm the end of machining and return to the first level menu.

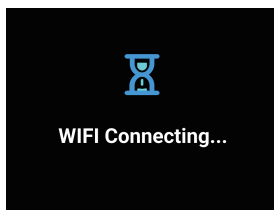
PC-based software

Recommended supporting software for this device: Lightburn, Lasercreate, software tutorials can refer to the software manual or related video tutorials.

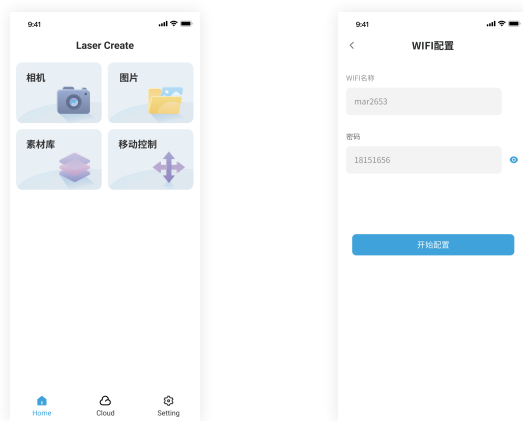
Wifi Processing Flow

Wifi Configuration

Enter the settings interface—WiFi configuration interface, press the  button to initiate WiFi configuration.



Open the Lasercreate software on your phone and click on Settings, click on Wifi Configuration, enter the password for the Wifi and click on Start Configuration



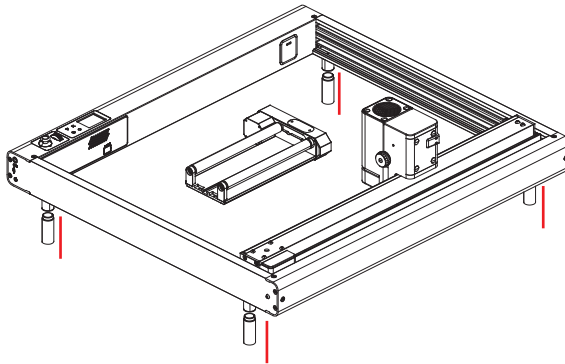
Note: Wifi used requires 2.4GHz band (5GHz band is not supported)

Wifi processing

You can refer to the software manual or related video tutorials for specific Wifi processing procedures.

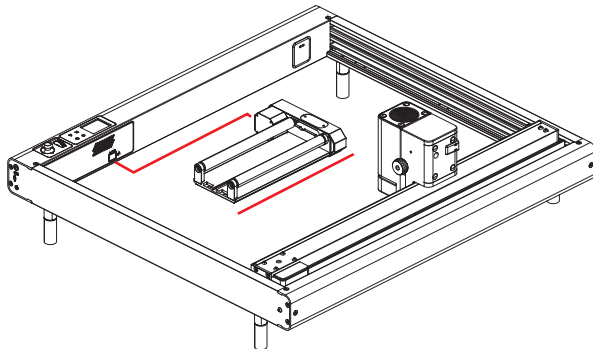
Roller Rotary machining

For details of the rotary axis machining process, please refer to the instruction manual or related video tutorials.



The roller rotary accessory requires installation and wire connection.

1. Raise the entire device (using the risers). Remove the silicone pad from the original feet, exposing the threaded rod, and then screw in the risers



2. Place the roller rotary in the center of the machining area (ensure it's placed flat and keep the rotary axis Z and X-axis directions horizontal)

3. Use a 4IN connecting cable to connect the roller rotary unit to the main machine's A-axis interface

Note: The plastic board can be removed for easier cable routing after removing the buckle at the A-axis interface.

4. Different objects with various diameters require different gear positions. Adjustment of the chuck on the rotating shaft is necessary. Please refer to the instruction manual for detailed adjustment procedures.

Operation of the rotary axis requires independent configuration in the software. For detailed information, please refer to the Rotary Axis User Manual.

VIII. Maintenance and upgrade

About maintenance

Running stuck: The equipment is operated with the combination of steel wheel and optical axis, prolonged use may result in dirt hindering smooth sliding. Grease can be applied to make the machine run more smoothly.

Running asynchronously: Y-axis motor drives the left and right synchronous belt through the coupling; The movement can be synchronized by the following equipment operating: open the coupling cover, release the coupling, push the X-axis to one side, and tighten the coupling again;

No laser light: When the equipment is hit or tilted, the laser light will be stopped and the processing will be suspended.

External air blowing: There is a port below the device screen, which can be directly inserted into the 4mm diameter air tube.

Rotation axis cannot rotate: The rotation axis mode needs to be turned on in the software, and ensure that the cable is securely connected.

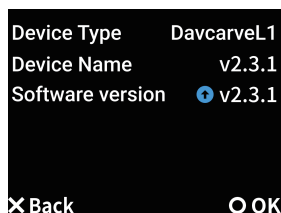
Wifi connection failure: The Wifi connection only supports 2.4Ghz, and the smart configuration takes about 25 seconds. Please wait patiently.

Firmware Upgrade

The product is constantly being optimized and upgraded by users with the latest firmware;

Firmware upgrade method:

- Get the latest firmware and download it to your computer (file name is Firmware)
- Place the firmware under the path of TF card, the path is /SYSTEM/Firmware.
- Click on the Settings interface - About option - the blue upgrade icon appears next to the firmware version number, click on the ○Upgrade
- The device will self-check the firmware version and upgrade the firmware to the corresponding version.
- Note: If the firmware upgrade fails, power off the device, wait for a moment, and then power it on again. Retry firmware flashing.



IX. Common problems and solutions

Here are some common problems with the product during use .

Q: What is the maximum thickness of plate that can be placed for carving?

A: The performance of different materials is different, generally linden basswood Board, plexiglass and other common materials cutting can support up to 6mm, paulownia wood cutting can support up to 15mm.

For relatively thick materials, engraving processing is recommended.

Q: Can it engrave metal?

A: Blue laser processing of metals requires the metal material to have a certain oxide layer, while infrared laser engraving does not have many limitations;

Q: The material is not cut through according to the application parameters?

A: If the laser module is unable to cut through the material, it may be related to the material itself. Factors such as moisture, warping, or spots on the material can affect cutting effectiveness. If the material is not cut through during use, try reducing processing speed, increasing processing power, and increasing the number of cutting passes.

Q: The material is not flat, can it still be used for cutting?

A: If the material is bent more than 5mm, it is better not to use it directly, and it is recommended to use it after cutting. If the degree of bending is small, it is recommended to use magnets or adhesive tape to fix the materials after processing.

Q: How to set material processing parameters

A: General-purpose materials can refer to the parameters in the material parameter table, and common materials can be tested to determine the specific processing parameters of the material.

Q: How machining parameters affect machining results

A: Slower speed and higher power result in deeper processing (complete cutting); conversely, faster speed and lower power result in shallower processing (incomplete cutting or failure to cut through). The fill line spacing affects the density of engraving, with smaller line spacing leading to denser engraving and larger line spacing resulting in sparser engraving.

Q: The software can't connect to the device?

A1: If the corresponding driver is not installed, reinstall the serial port driver and then reconnect to use it;

A2: The computer USB port is old, you can replace the USB port, and then test the use again;

A3: If there are other software occupying the serial port on the computer, close unrelated software and then reconnect to use it.

Q: Clicking "Start Processing" in the software has no response?

A: When the serial port is occupied by other software, the laser software cannot be controlled;

Q: Software Console Display Error Reporting\Focus Failure Error Reporting\Collision Error Reporting

A: When the console displays an error report, reset the device to the initial state. If the device is stuck and there is a step loss abnormality, you can adjust the motor speed to high speed mode and start processing again;

Q: Abnormal control of buttons, roller, joysticks, etc.

A: Buttons, roller, joysticks, etc. cannot be triggered at the same time, determine if any of the buttons have been long pressed;

Promise

DavcarveL1 Engraving Master is an excellent laser product, but all products can not avoid problems, we will provide each user with the most convenient and fast after-sales way.

All technical issues related to the product, or have to consult the content can contact the local agent or official website to communicate directly with our manufacturers, we will provide detailed service and content resources promptly.

List of common accessories and consumables

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Frequently used accessories and consumables are constantly updated

The actual product functions may not fully match the content of the manual due to technological upgrades or firmware updates.

To obtain the latest information about the function introduction and safety usage guidelines, please visit our company's official website or official forum to engage in discussions with other users.