MECPOW

X1

User Manual

CATALOGUE

CONTENTS

1. Preface

Dear Customer,

Thank you for purchasing our laser engraving machine. This device is a high-tech product that integrates light, machinery, and electricity. In order for you to use and maintain the equipment better, please read the user manual carefully and follow the steps in the manual.

Disclaimer

Any losses caused by improper use or failure to follow the steps in the user manual will be borne by the individual. The final interpretation of the user manual belongs to our company, and we reserve the right to modify any information, data, technical details, etc. in the manual.

2. Security Statement

Safety Precautions

* Laser processing can be risky, and users should carefully consider whether the object to be processed is suitable for laser work.
* The object being processed and emissions must comply with local laws and regulations.
* This machine uses a Class IV laser (high-power laser radiation), which may cause the following situations:
(1) Ignition of surrounding flammable materials;
(2) During laser processing, other radiation and toxic and harmful gases may be produced, depending on the object being processed;
(3) Direct exposure to laser radiation can cause harm to the human body. There must be fire-fighting equipment in the workplace, and flammable and explosive materials must not be stacked around the workbench or machine. Good ventilation must also be maintained.
* The environment in which the machine is located should be dry, free from pollution, vibration, strong electricity, strong magnetism and other interference. The working ambient temperature should be 5-30℃, and the working ambient humidity should be 35-65%RH.
* The working voltage of the machine is AC100-240V.
* During the operation of the machine, it must be monitored throughout. Before leaving, all power must be cut off to prevent any unforeseen issues. If an abnormal situation occurs, please immediately cut off the power and deal with it!
* It is strictly prohibited to place any reflective or diffuse objects in the machine that are not relevant to its operation to prevent laser reflection on the human body or flammable materials.
* The machine should be kept away from electrical equipment sensitive to electromagnetic interference, which may cause electromagnetic interference to it.
* It is strictly forbidden for non-professionals to disassemble the laser engraver as there may be dangers such as high voltage inside the machine.

⚠️ Warning

1. The laser engraving machine can produce laser light. It is strictly prohibited to place any living organisms under the laser emission (the port is marked with a yellow warning sign).
2. Photosensitive patients are prohibited from using or getting close to the laser engraver.
3. When using the laser engraving machine, the operator and anyone near the machine must wear laser safety glasses. Do not operate the laser machine without laser goggles. Our machine comes with a pair of laser safety glasses. If you want to purchase additional goggles, the goggles should offer wavelength protection between 400-445nm (+-5nm), have an outer diameter of +5, and meet a minimum L5 level.
4. When the laser engraving machine is in operation, the user must pay close attention and not leave it unattended to avoid ignition of the engraved material. Place the machine in a fireproof area and ensure good ventilation. It is recommended to have a fire extinguisher nearby in case of emergencies.
5. Make sure there are no flammable materials near the laser engraving machine. We recommend placing a honeycomb working table under the machine.
6. When operating the laser engraver, ensure that there is enough space around it. Engraving certain materials may produce smoke, which should be vented out using a specialized exhaust system.
7.Do not touch the laser beam or the object being processed while the machine is in operation, as this could

cause serious injury or beam reflection. Additionally, avoid touching the radiator as it may be hot due to the laser engraving machine working or just recently stopping.

8. Children or teenagers (especially those under 14 years old) are not allowed to use the laser engraving machine alone and should be supervised by an adult at all times.

9. The operating temperature of the machine is 5°F-86°F (-15°C-30°C).

10. When laser engraving, there is a risk of fire. When the laser engraving machine is in use, it must be supervised by a skilled operator who can use a fire extinguisher to handle any accidents that may occur.

11. Our laser engraving machine is equipped with a built-in flame sensor to maximize the safety of our equipment. But please note that no written or implied warranty is made regarding the availability or functionality of the flame sensor.
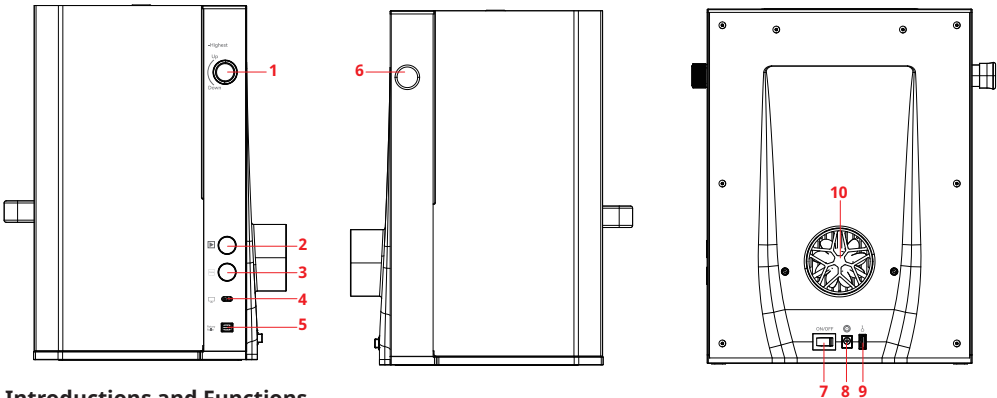
Safety Instructions

1. Before using the Mecpow X1, please ensure that the emergency stop switch is off, the key is inserted, and the laser reflector is clean.

2. The X1 complies with Class 1 laser safety standards. Before starting laser engraving, check that the protective cover is intact and not damaged. If any damage is found, stop using the device.

3. During operation, ensure that the laser remains within the protective cover. When processing objects with the Mecpow X1, always cover the work area with the protective cover and wear eye protection for safety.

4. It is important to avoid moving the device while laser engraving to prevent any self-protection measures from causing the device to stop working. This can also affect the final result of the engraving work by disrupting the engraving process. If you need to move the device or the object being engraved, it is recommended to do so before or after the engraving process. It is crucial to avoid moving the device or objects during laser operation.

5. Minors should always be supervised and assisted by an adult when operating this product.

6. When cutting or engraving flammable materials at low speed and high power, there is a risk of flames occurring. If flames are detected, it is important to stop the processing immediately.

7. When the device is powered on, it is essential to avoid disassembling any parts of the machine body to prevent accidental contact with the power supply. Additionally, do not touch any electronic components with your hands or tools.

8. If you encounter any of the following situations, please stop using the product immediately and turn off the power:
- A burnt smell coming from the machine
- An open flame generated from the engraving material
- Damage to the internal components of the product
- Unexpected stoppage of the product
- Abnormal noise or light that has never occurred before

9. Please use caution when using controls or making adjustments, as performing procedures not specified may result in hazardous radiation exposure.

Maintenance

1. To maintain optimal performance, regularly clean the lens of the machine with a dust-free cloth or paper dampened with alcohol.

2. Be cautious when using or storing the machine to prevent foreign objects from entering the top vents and interfering with its operation.

3. Diagram

Introductions and Functions

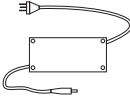| Parts		Names	Functions
1		Z-Axis Adjustment Knob	(1) Turn it clockwise, and the laser head will move up. (2) Turn it counterclockwise, and the laser head will move down. Note: The red and blue light spots are observed to coincide during adjustment, indicating that focusing is complete.
2		Start Button	Short press to start engraving.
3		Frame Button	Short press to start/stop framing the working area of the laser.
4		USB-C Port	For connection to a computer
5		8-Pin Port	For connection to a rotary roller
6		Emergency Stop Button	(1)Short press to stop the machine from working and disconnect it from the computer or mobile phone. (2)Rotate the button clockwise to reconnect with the computer or mobile phone. Note: ・If a fault or danger occurs during operation, press the emergency button to stop the machine from working immediately. ・Parameters need to be reset after reconnecting.
7		Power Switch	Switch it on/off to turn the power on/off.
8		DC Input Port	Plug in the power adapter for power.
9		USB Key Port	Insert the USB key to reset the machine before switching on the machine. Note: The machine will fail to reset if the USB key is not inserted before powering up the machine.
10		Exhaust Fan	For removal of fumes, smoke, and other debris during engraving or cutting
11		Auxiliary Red Light	(1) It is used to help determine the focus by coinciding with the blue light spot when manually focusing. Note: ・The red and blue light spots are observed to coincide during adjustment, indicating that focusing is complete. ・It is always on when powering up and only off when framing or engraving.
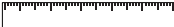
Indicator

Knob Indicator	Indicator Status	Machine Status
⬭	Solid White	The machine starts up.
	Solid Red	It is in infrared laser mode.
	Solid Blue	It is in blue laser mode.

4. Specifications

Model		X1
Basic Specifications	Product Size	284x259x331mm
	Package Size	350x350x420mm
	Weight	6.6kg (N.W.), 8.9kg (G.W.)
	Input Voltage	DC 12V, 6A
	Rated Power	84W
	Max. Engraving Area	105x105mm
	Max. Engraving Speed	5000mm/s
	Laser Spot Size	0.03x0.03mm (Infrared Laser), 0.06x0.08mm (Blue Laser)
	Connection Methods	WiFi, USB
	Software Support	LightBurn, Mecpow Laser (PC), Mecpow Laser (App)
	System Support	Windows, macOS, Android, iOS
	File Format Support	JPG, BMP, PEG, PNG
Laser Module	Rated Power	72W
	Input Power	36W
	Laser Power	2W (Infrared Laser), 10W (Blue Laser)
	Wavelength	1064±1nm (2W), 445±5nm (10W)
	Positioning Accuracy	0.0001
	Focusing Methods	Auto Focusing, Manual Focusing
Power Adapter	Input Voltage	100V-240V
	Output Voltage	12V
	Output Current	6A

5. Package List

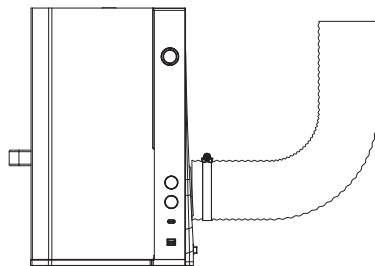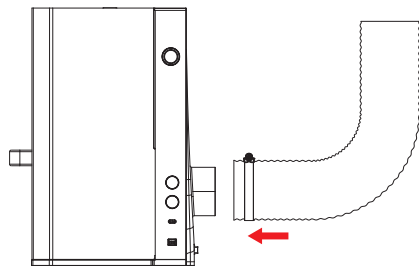|				
Power Adapter *1	Type-C Cable *1	USB (2GB) *1	USB Key *2	Exhaust Pipe *1
Throat Hoop *1	Metal Plate *6	Engraved Card *6	Wood Board *2	Googles *1
Allen Key *2	Screwdriver *1	Ruler *1	Cutting Panel *1	Positioning Fixture *1

Pet Tag *2   User Manual *1

6. Instructions for Use

Installation of Exhaust Pipe

Attach the exhaust pipe to the air guide and secure it with the throat hoop.
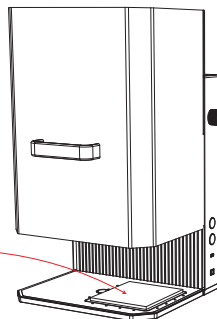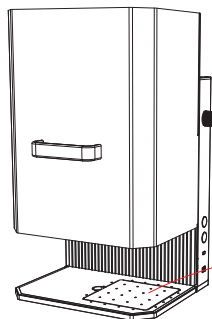
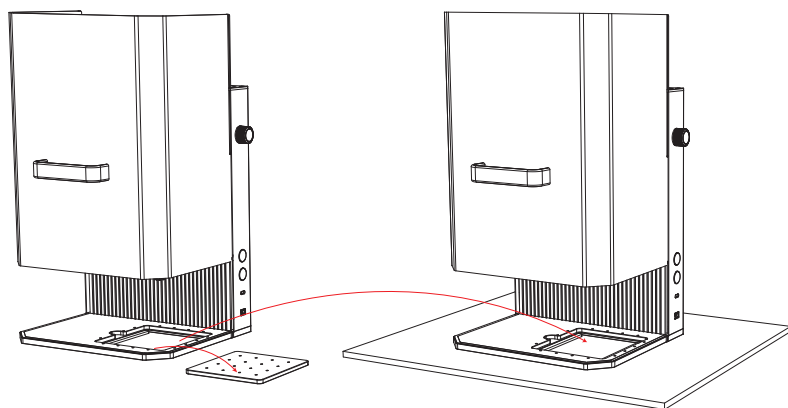### Use of Positioning Fixtures
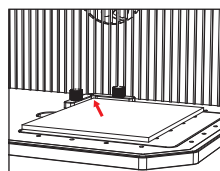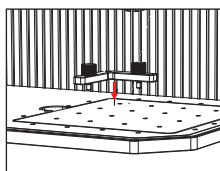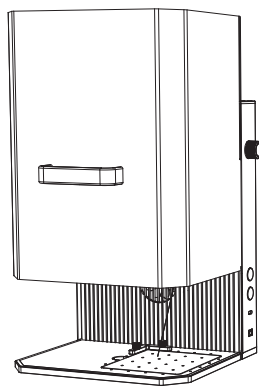
Engraving Materials with Different Sizes
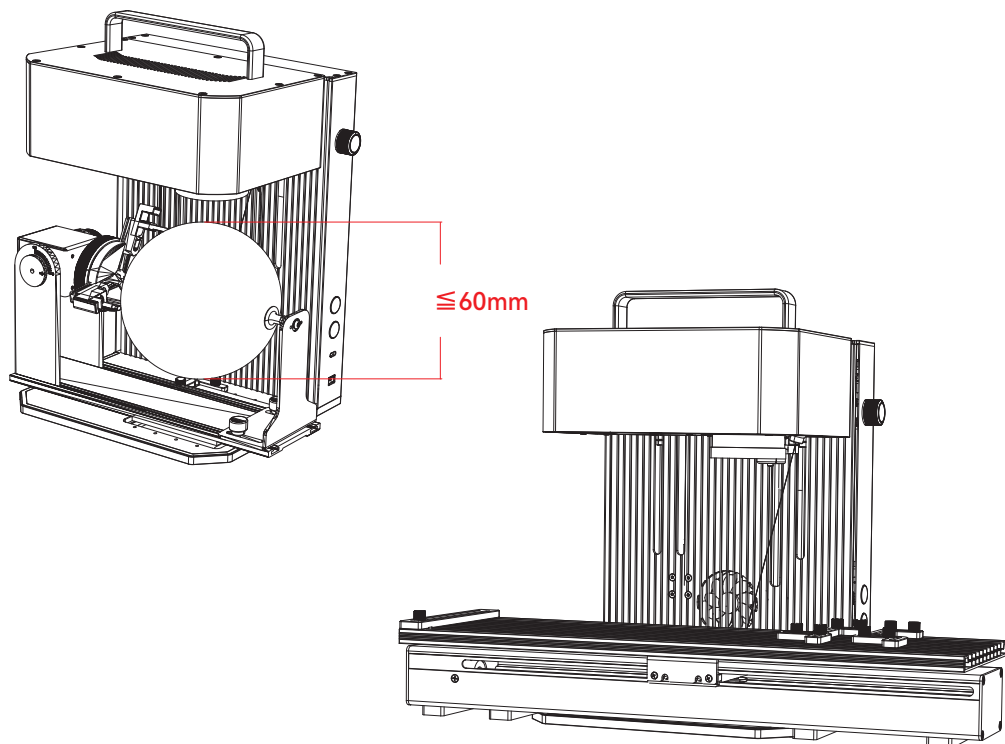
For small objects

For large objects

Use with Rotary Roller

Connect the rotary roller with the machine via a 6-pin to 8-pin cable. Plug the 6-pin connector into the rotary roller and the 8-pin connector into the machine.
Note: The rotary roller needs to be purchased separately.

≦60mm

7. Control via Computer Software

For detailed tutorials on how to operate this engraving machine using the computer software, please check the steps below or scan the QR code to check the instruction.

1. For Windows users, install the driver on your computer first. Open the attached USB and find "Cypress Driver installer.exe". Double-click the file to install the driver.
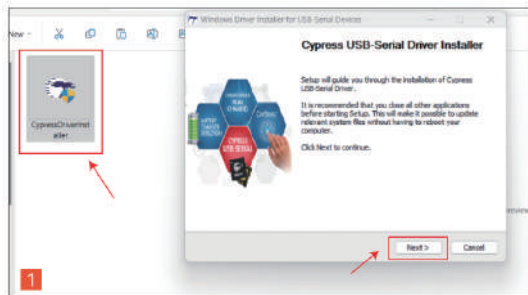
2. Find the "Mecpow Laser" software and install it.

3. Insert the USB key.

4. Connect the computer and the machine with the Type-C cable.
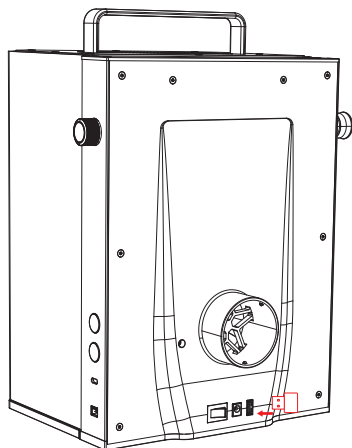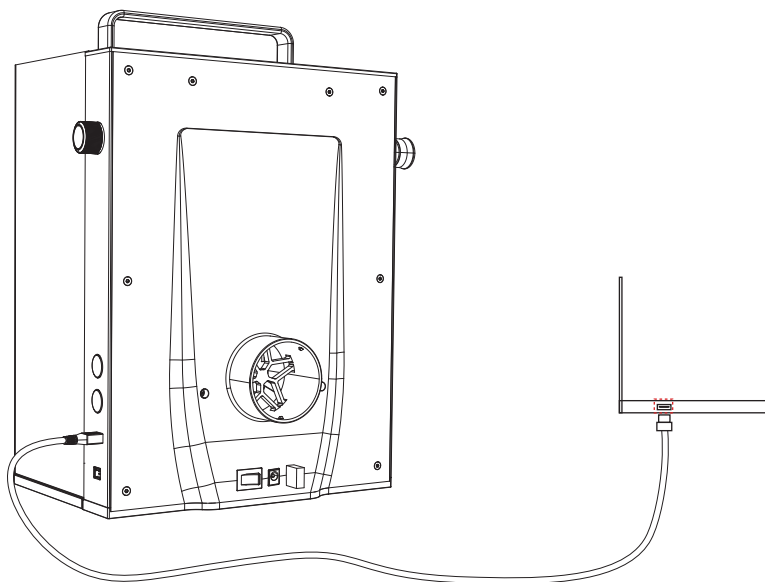

5. Plug in the power adapter, switch the power on, and wait for the machine initialization to be completed.
Note:
· The laser head moves to a focal length of 150 mm and the software shows the connected state, indicating that the initialization is complete.
· The USB key must be inserted before switching on the machine, otherwise it will not initialize to a 150mm focal length and will not perform engraving.
· Make sure the emergency stop button is not pressed down.
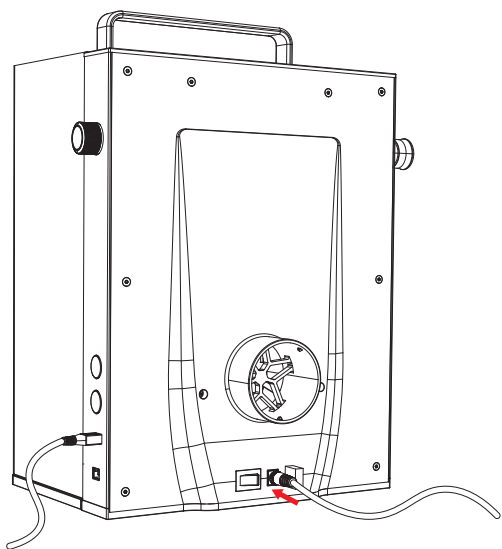
6.Open the "Mecpow Laser" software and click "New" to create a new canvas.
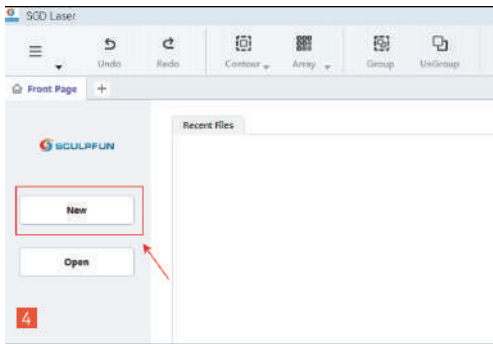
Interface Overview
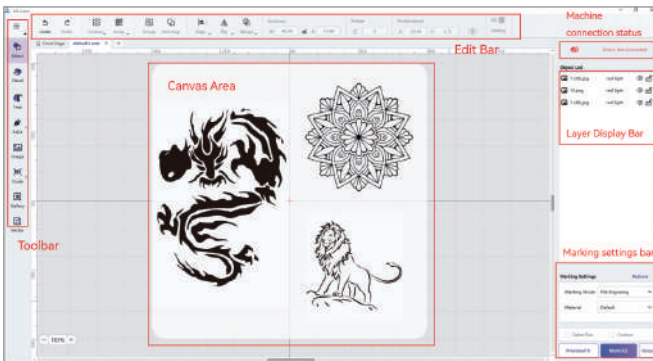
7. Select the file to be engraved, adjust the image size and properties according to your needs. (Note: Vector images do not have an image property adjustment bar.)
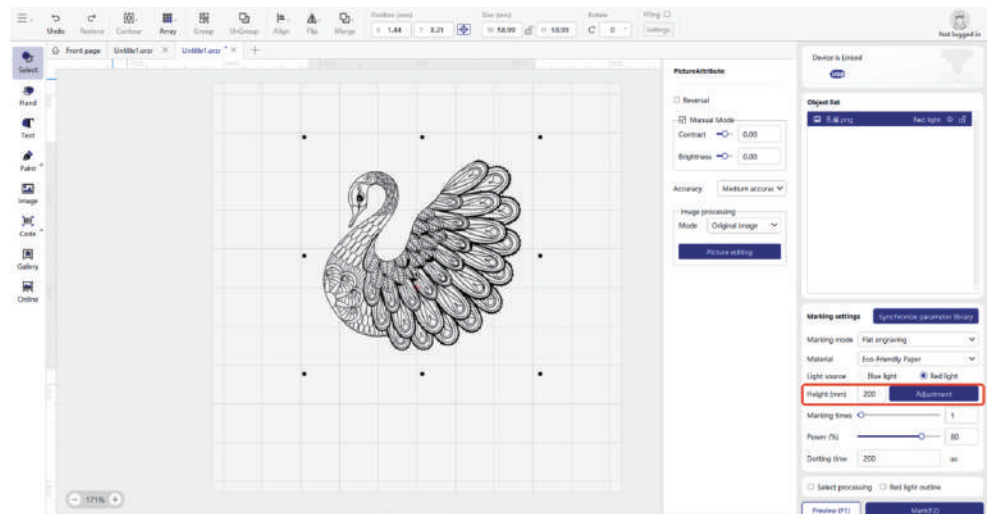
8. Set the operating parameters, including the light source, marking times, power and speed according to different materials. (Note: For bitmaps, you can only set the dotting time, while for vector images, you can set the speed. Recommended operating parameters for different materials are listed in Section 9.)
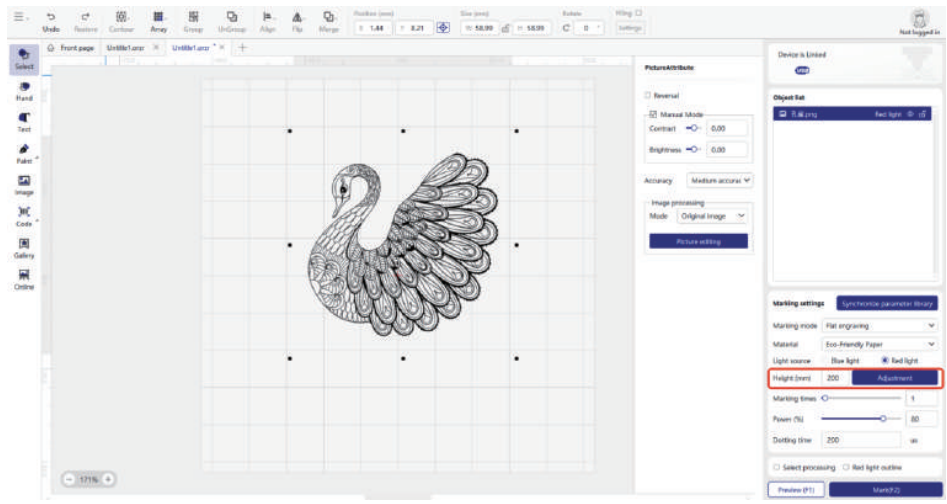
9. Focus the laser.

Automatic Focusing: Enter the height value of the engraved object and click "Adjustment", and the machine will perform focusing automatically.

Manual Focusing: Rotate the Z-axis adjustment knob to move the laser head up and down until the red and blue light spots are observed to coincide, indicating that focusing is complete.
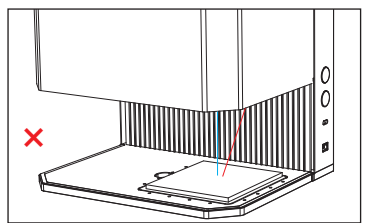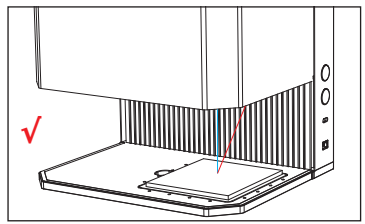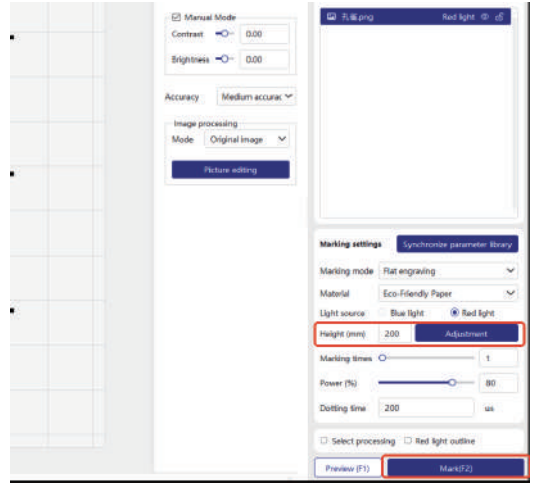
10. Click "Preview" in the software or press the "Frame" button on the machine to preview the engraving area. Adjust the position of the engraved object or resize the image if needed. After previewing and adjustment, lower the protective cover and click "Mark" in the software or press the "Start" button on the machine to start engraving or cutting.
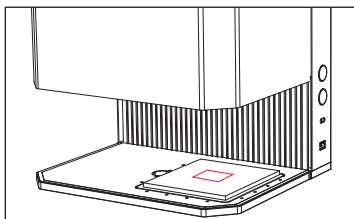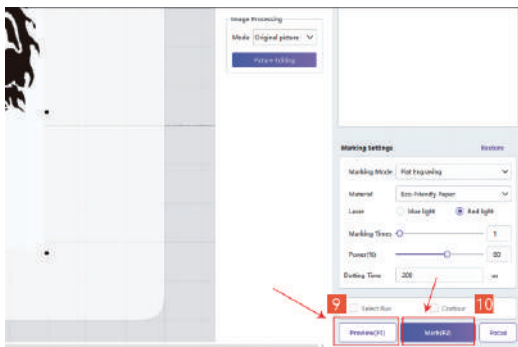
8. Control via Mobile App

Note: Ensure that the machine is disconnected from the computer via the Type-C cable before attempting to connect to the mobile phone via Wi-Fi. The machine will fail to connect to the mobile phone through Wi-Fi if it is still connected to the computer via the Type-C cable.

1. Insert the USB key.
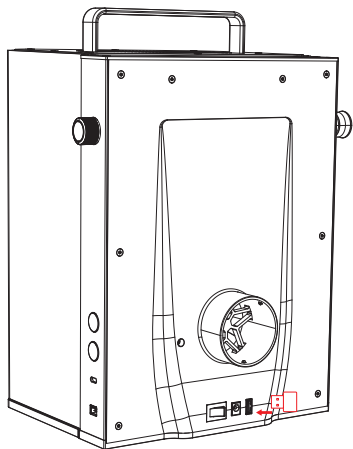
5. Plug in the power adapter, switch the power on, and wait for the machine initialization to be completed.
Note:
· The laser head moves to a focal length of 150 mm and the software shows the connected state,
indicating that the initialization is complete.
· The USB key must be inserted before switching on the machine, otherwise it will not initialize to a
150mm focal length and will not perform engraving.
*· Make sure the emergency stop button is not pressed down.*
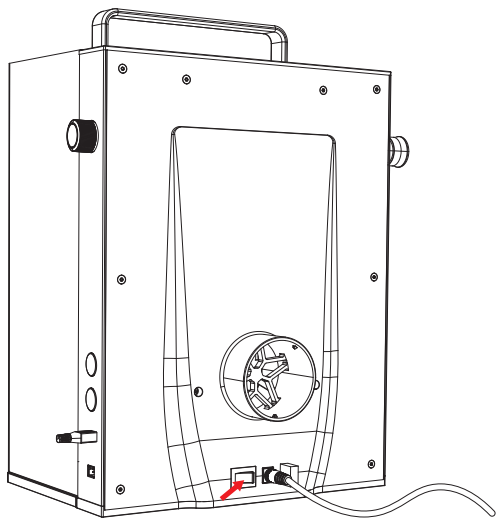
3. Scan the QR code to download the "Mecpow" app and turn on the app.

iOS

Android

4. Enable the Wi-Fi function of your phone and connect the Wi-Fi "Mecpow". Select "Always connect".
Wi-Fi Name: Mecpow
Wi-Fi Password: 12345678
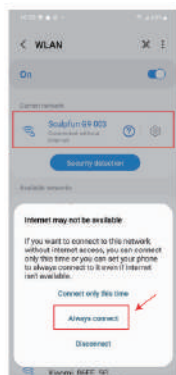
5. Open the app. Select "Device Connection" in the settings.
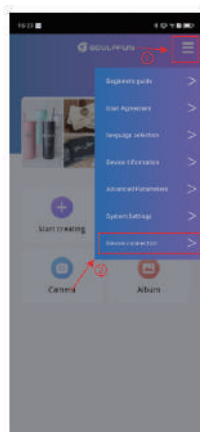
6. Click "Start creating" to create a new file.
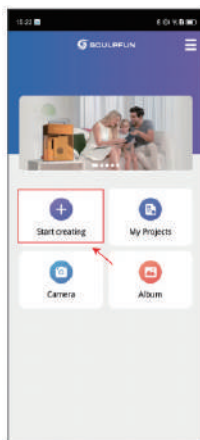
7.Edit the image size and properties as needed.

8. Set the operating parameters, including the light source, marking times, power and speed according to different materials. Click "Next" after setting. (Note: For bitmaps, you can only set the dotting time, while for vector images, you can set the speed. Recommended operating parameters for different materials are listed in Section 9.)
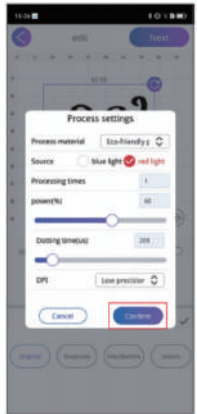

9. Focus the laser.
Click "Focus". Rotate the Z-axis adjustment knob to move the laser head up and down until the red and blue light spots are observed to coincide, indicating that focusing is complete. (Note: For engraving materials of different heights, you will need to readjust the focus.)

-14-
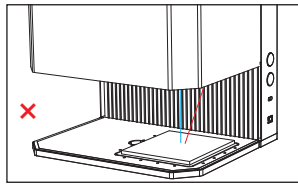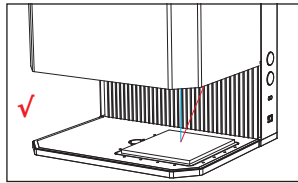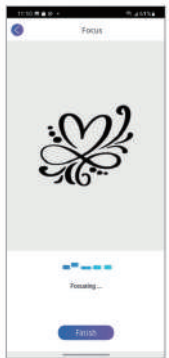
10. Click "Preview" to preview the engraving area on the object. Adjust the position of the engraved object or resize the image if needed.
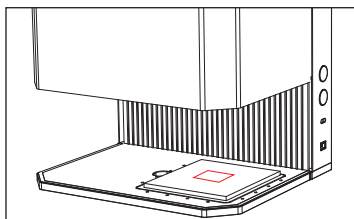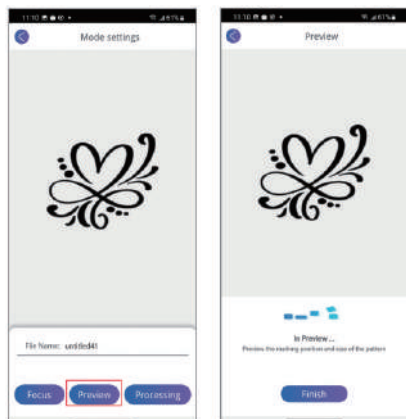
11. After previewing and adjustment, lower the protective cover and click "Processing" to start engraving or cutting.
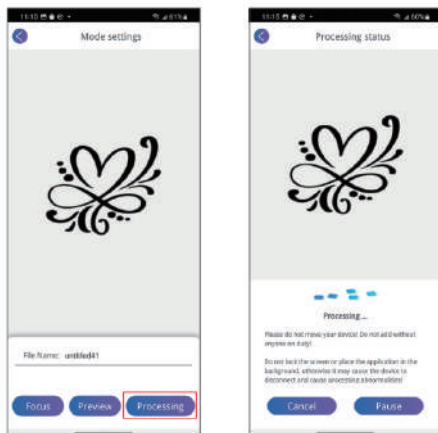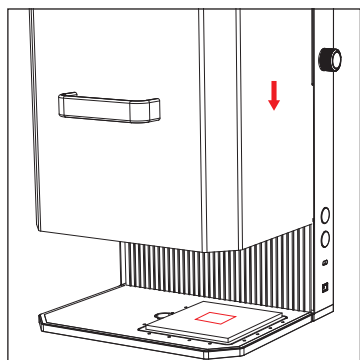
9. Recommended Operating Parameters

Materials	Laser Modes	Types	Power (%)	Speed (mm/s)	Line Spacing (mm)	Accuracy	Dotting Time (μs)	Number of Cuts
ABS	Infrared Laser	Vector Lines	100	50	0.03	/	/	/
		Vector Fills	100	100	0.03	/	/	/
		Bitmap	100	/	/	High	2000	/
3mm Black Acrylic	Blue Laser	Vector Lines	100	100	0.03	/	/	/
		Vector Fills	100	600	0.03	/	/	/
		Cutting	100	1	0.03	/	/	1
	Infrared Laser	Bitmap	100	/	/	High	500	/
Carton	Blue Laser	Vector Lines	100	150	0.03	/	/	/
		Vector Fills	100	800	0.03	/	/	/
		Bitmap	60	/	/	High	100	/
Kraft Paper	Blue Laser	Vector Lines	100	300	0.03	/	/	/
		Vector Fills	100	1500	0.03	/	/	/
		Bitmap	45	/	/	High	100	/
Rock	Infrared Laser	Vector Fills	100	100	0.03	/	/	/
		Bitmap	100	/	/	High	1000	/
	Blue Laser	Vector Fills	100	500	0.03	/	/	/
		Bitmap	100	/	/	High	150	/
Glass (blackened)	Blue Laser	Vector Fills	100	100	0.03	/	/	/
		Bitmap	100	/	/	High	500	/
PCB Board	Blue Laser	Vector Lines	100	300	0.03	/	/	/
		Vector Fills	100	400	0.03	/	/	/
Leather	Blue Laser	Vector Lines	100	300	0.03	/	/	/
		Vector Fills	100	1000	0.03	/	/	/
		Bitmap	60	/	/	High	100	/
Paulownia	Blue Laser	Vector Lines	100	80	0.03	/	/	/
		Vector Fills	100	500	0.03	/	/	/
		Bitmap	100	/	/	High	80	/
Density Board	Blue Laser	Vector Lines	100	150	0.03	/	/	/
		Vector Fills	100	500	0.03	/	/	/
		Bitmap	50	/	/	High	100	/
3mm Plywood	Blue Laser	Vector Lines	100	100	0.03	/	/	/
		Vector Fills	100	400	0.03	/	/	/
		Bitmap	100	/	/	High	100	/
		Cutting	100	10	/	/	/	4
Black Aluminum Oxide	Infrared Laser	Vector Lines	100	60	0.03	/	/	/
		Vector Fills	100	100	0.03	/	/	/
		Bitmap	100	/	/	Medium	600	/
Stainless Steel/ Brass	Infrared Laser	Vector Lines	100	10	0.03	/	/	/
		Vector Fills	100	30	0.03	/	/	/
		Bitmap	100	/	/	High	3000	/
Iron Sheet	Infrared Laser	Vector Lines	100	20	0.03	/	/	/
		Vector Fills	100	50	0.03	/	/	/
		Bitmap	100	/	/	High	3000	/
Black Metal Business Card	Infrared Laser	Vector Lines	100	100	0.03	/	/	/
		Vector Fills	100	300	0.03	/	/	/
		Bitmap	100	/	/	/	500	/
	Blue Laser	Vector Lines	100	400	0.03	/	/	/
		Vector Fills	100	1000	0.03	/	/	/

Note:
1. "/" means that this parameter does not need to be set.
2. Bitmap dot parameter setting: 128.

10. Troubleshooting

1. What materials can it operate on?
Wood, leather, acrylic, paper, fabric, some metals (e.g. anodized aluminium), etc.
Note: Different power settings affect the engraving effect. Please refer to the recommended operating parameters before use.

2. What should I be aware of when using this machine?
When using this product, proper ventilation must be ensured as laser engraving can produce smoke. It is recommended to operate in a well-ventilated area or use exhaust equipment. Additionally, always wear protective goggles while operating to avoid direct exposure to the laser. If there are children or pets around, it is best to keep them away from the equipment and consider using the safety lock feature for added security.

3. How to connect the machine?
Wireless connection: Enable the Wi-Fi function of your phone and connect the Wi-Fi "Mecpow" to match the "Mecpow" app.
Wired connection: Connect your computer to the machine via the attached USB-C cable.

4. What's the engraving speed and accuracy?
The engraving speed can reach up to 5000mm/s, varying based on the intricacy of the image being engraved.
The engraving accuracy reaches up to 0.01mm, depending on materials and settings.

5. Does the X1 support the LightBurn software?
The X1 supports the LightBurn software. However, some functions may not work perfectly yet. It is recommended to prioritize using the "Mecpow Laser" software and the "Mecpow" app for optimal performance.

6. Can it be used with engraver accessories?
It supports use with some of Mecpow accessories, including the G3 and G5 rotary rollers, the G1 conveyor and the P150 fume extractor.

7. What are the advantages of dual lasers?
Dual-laser engravers can handle a wider range of materials and thicknesses, providing greater versatility and flexibility in engraving projects. The infrared laser is ideal for cutting and engraving materials such as metal and plastic, while the blue laser is better suited for engraving on materials like wood, leather, glass, acrylic and stone.

For more questions and answers, please refer to the link below or scan the QR code below.
https://mecpow.com/pages/faq

11. Compliance Statement

This product is in compliance with the standards of the European Community.

This product complies with the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) EU rules restricting the use of hazardous substances in electrical and electronic equipment to protect the environment and public health.

The laser warning sign is used to alert users and visitors if there is a risk of being exposed to a naked laser beam. Exposure to certain lasers can cause eye or optic damage and skin burns.

This symbol indicates that the product is capable of being recycled.

This symbol indicates that the product should not be disposed of as household waste. The product must be sent to separate collection facilities for recovery and recycling of electrical and electronic equipment.

FCC Caution:
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.
To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.