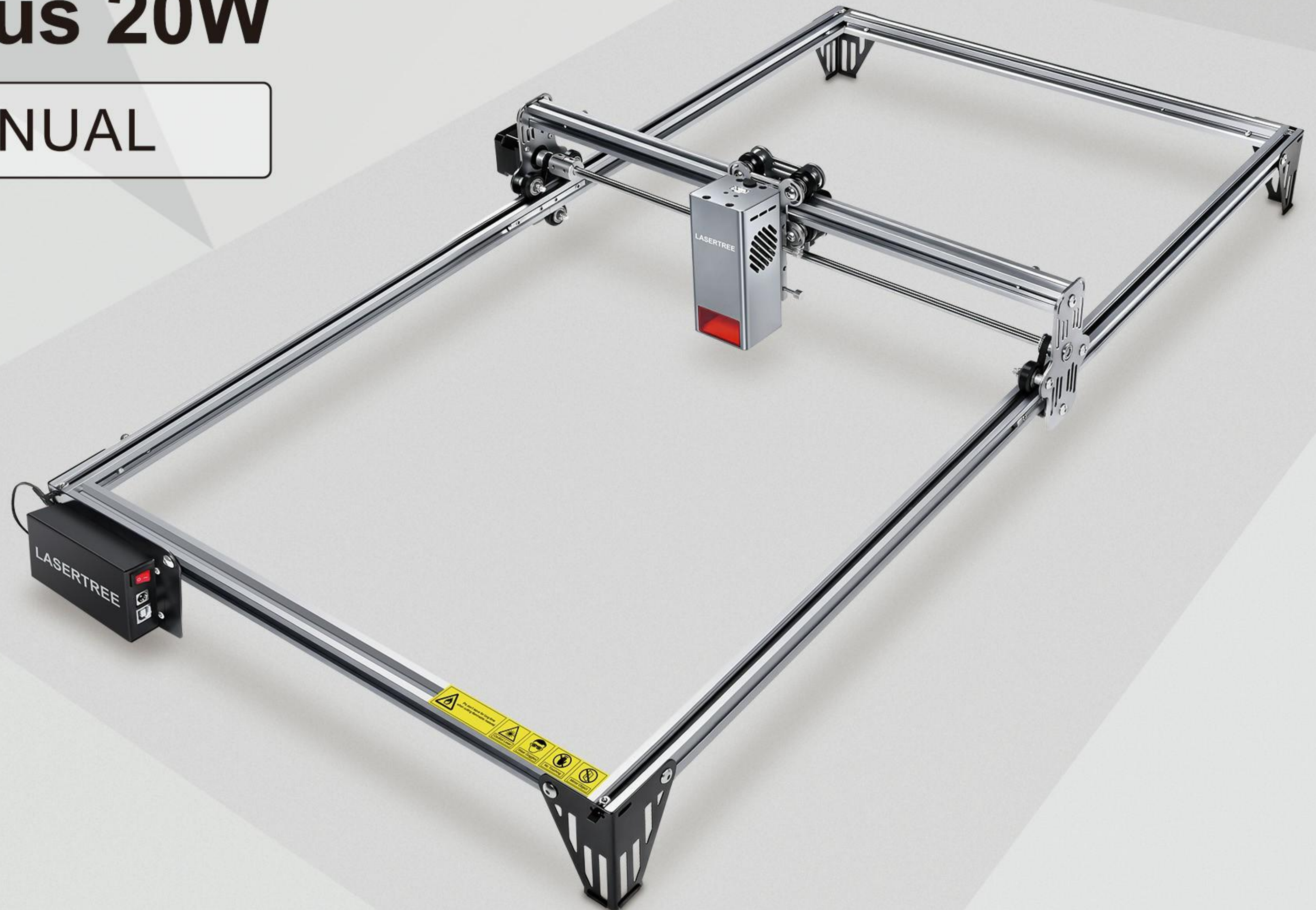


LASERTREE

K1 Mini Plus 20W

USER MANUAL



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1. SAFETY STATEMENT

Before using the laser engraving machine, please peruse this safety manual attentively to comprehend the operating protocols and potential hazards associated with the laser engraving machine.

1. Sharp edges may cut your hands when assembling the stand, gloves are recommended.
2. Laser beam have high energy and heat, direct contact with eyes or skin may cause serious injury. When the laser is working, always pay attention to the position and direction of laser beam movement.
3. Children or teenagers are strictly prohibited from using the laser engraving machine alone.
4. The laser engraver should be placed on a stable table top. Before use the laser, please clean the work area to ensure that the surrounding environment is safe and free of debris, flammable and explosive items, etc. to prevent potential safety hazards.
5. Before using the laser, carefully check the power connection of the laser engraver. Make sure that the power cord is intact and the plug is firmly connected to avoid accidents caused by power problems.
6. When the laser is working, you must wear professional protective glasses to protect your eyes from laser damage. Protective glasses can block the laser light and avoid direct exposure to the eyes.
7. When the laser is working, the engraving area should be paved with metal or non-combustible mats to prevent the laser from burning the workbench or causing fire and other safety hazards.
8. When the laser is working, please do not leave the equipment during operation. Stay focused and pay close attention to the operation of your equipment, to prevent the engraving or cutting material from catching fire.
9. When the laser is working, some materials produce smoke during laser cutting. Please keep the room well ventilated.
10. Residue and debris can accumulate during the cutting and engraving process. Please clean up the work area promptly.
11. Please ensure that a fire extinguisher is located near the laser engraving machine and that regular maintenance and inspections are conducted to promptly respond to any accidents that may occur.

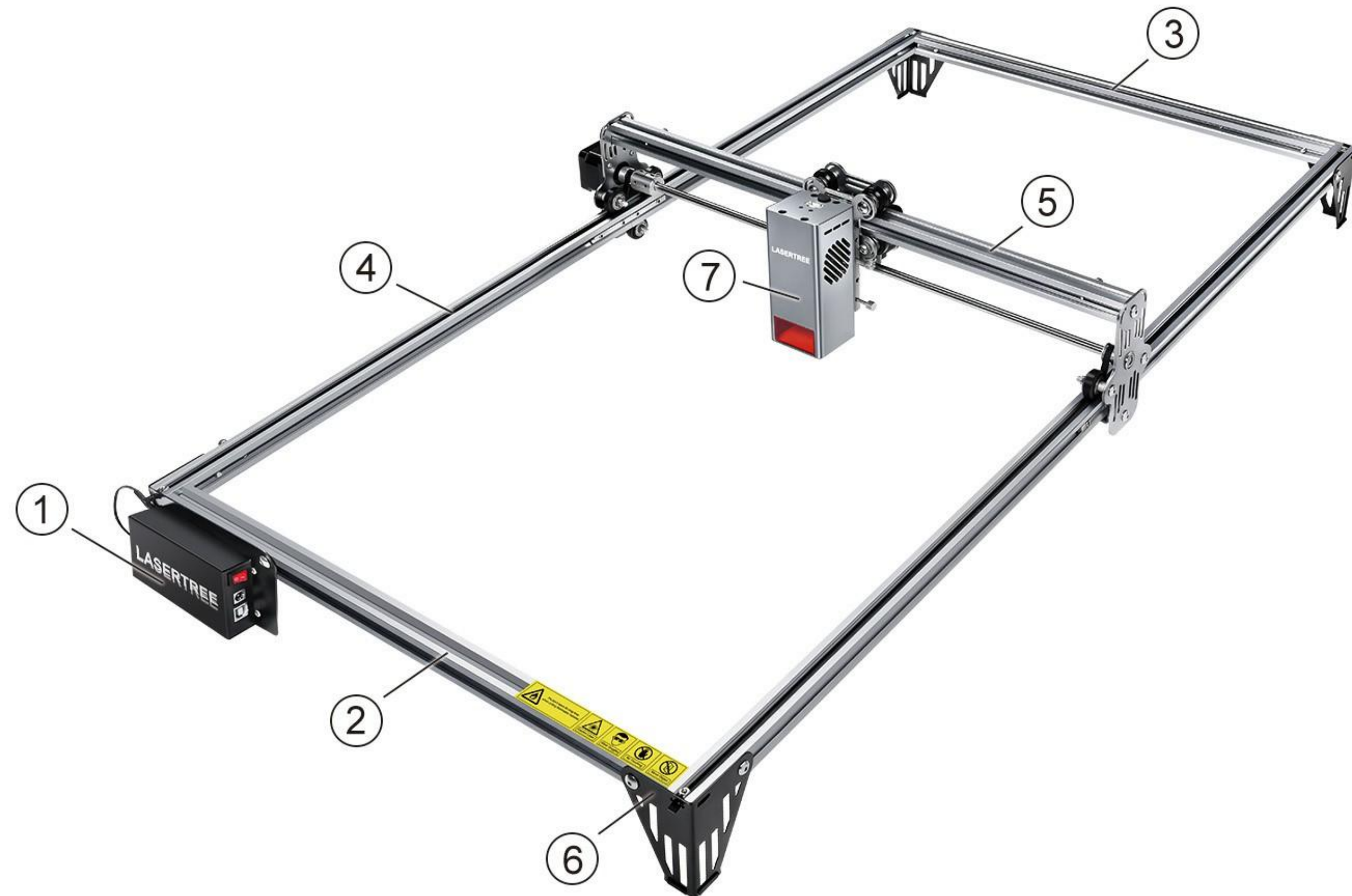
2. SPECIFICATION PARAMETERS

Brand	LASERTREE	Laser Optical Power	20W(±1W)
Model	K1 Mini Plus	Input	DC 24V
Engraving Area	400*800mm	Wavelength	450nm(±10nm)
Net Weight	3.44kg	Working Distance	7mm
Application	Engraving & Cutting	Engraving Speed	10,000mm/min
Support Software	LightBurn & LaserGRBL	Operating Temperature	0-35°C

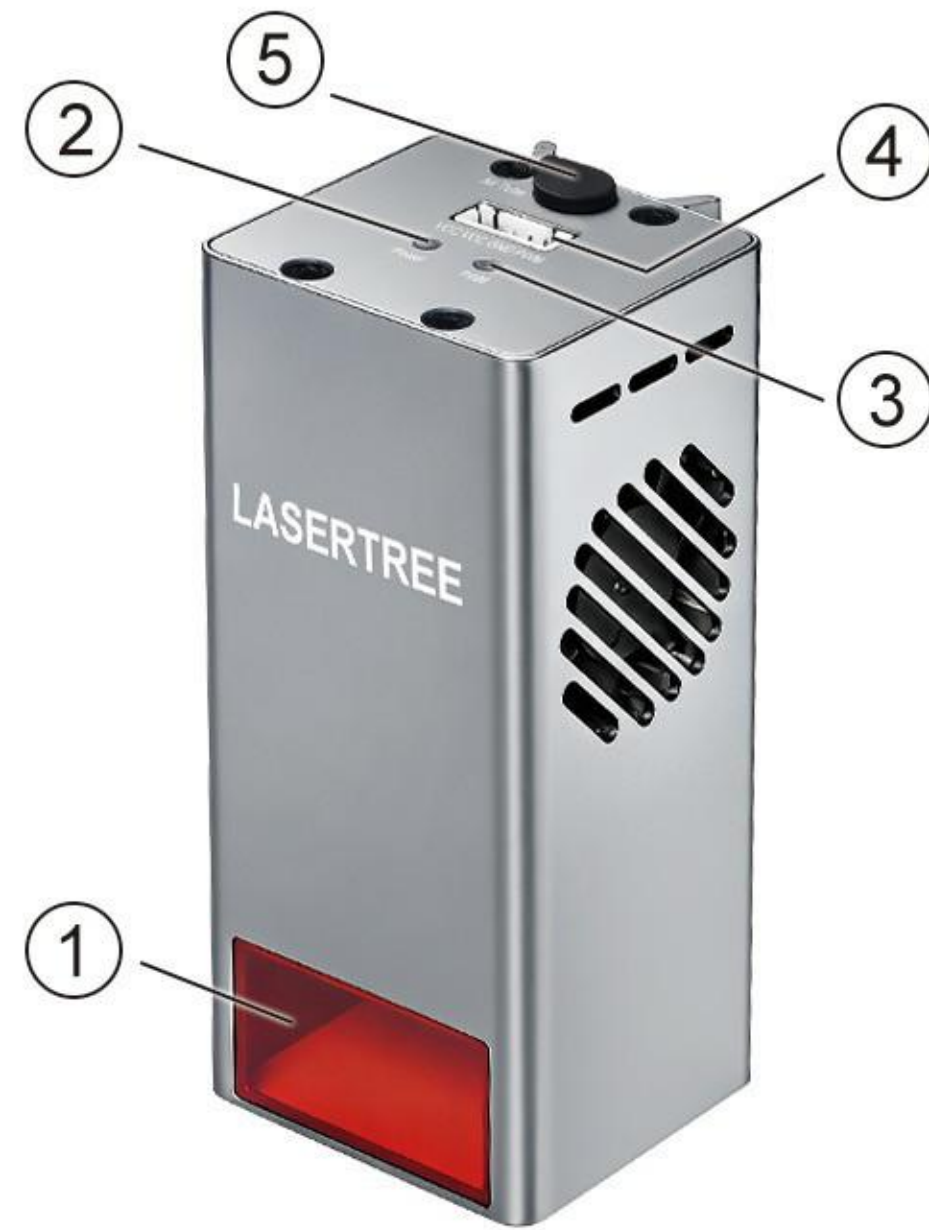
3. ABOUT LASER ENGRAVING MACHINE

3.1 Laser Engraving Machine

- ① Main Control Box
- ② Front Frame
- ③ Rear Frame
- ④ Y-Axis Assembly
- ⑤ X-Axis Assembly
- ⑥ Support Feet
- ⑦ Laser Module



3.2 Laser Module



- ① Laser view window
- ② Power status indicator: it is red when power supply is connected.
- ③ PWM status indicator: it is green when PWM signal is receive.
- ④ Input port: DC 24V, GND, PWM
- ⑤ Air assist port: $\varphi 8$ mm outer diameter, $\varphi 6$ mm inner diameter.
- ⑥ Laser output aperture

4. PACKING LIST



X-Axis Assembly x1



Y-Axis Assembly A x2



Y-Axis Assembly B x2



Front Frame x1



Rear Frame x1



Mainboard Assembly x1



Power Adapter x1



Spare Laser Protective Lens x1



T-Nut x4



Cable Ties x3



Support Feet x3



AC Cable x1



Fixed Focus Plate x2



M5*20 Round Screw x12



Clean Brush x1



Y-Axis Timing Belt x2



Protective Glasses x1



M5*20 Flat Screw x1



M4*5 Fasten Screw x4



Linear Splicing Connector x4



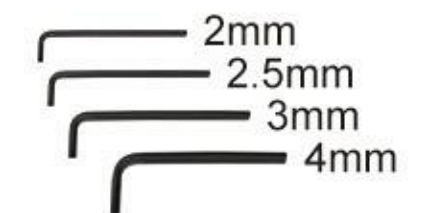
USB Cable x1



20W Laser Module x1



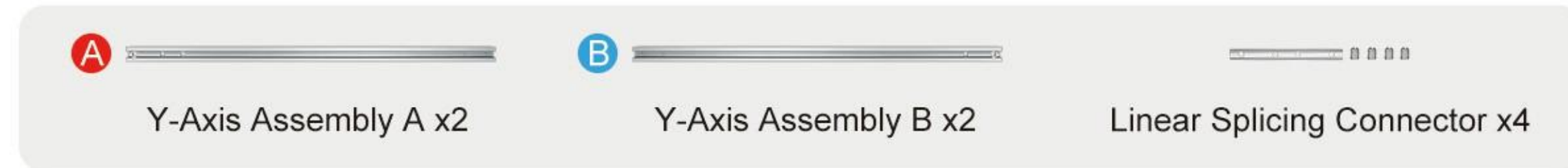
Limiting Column Sleeve x1



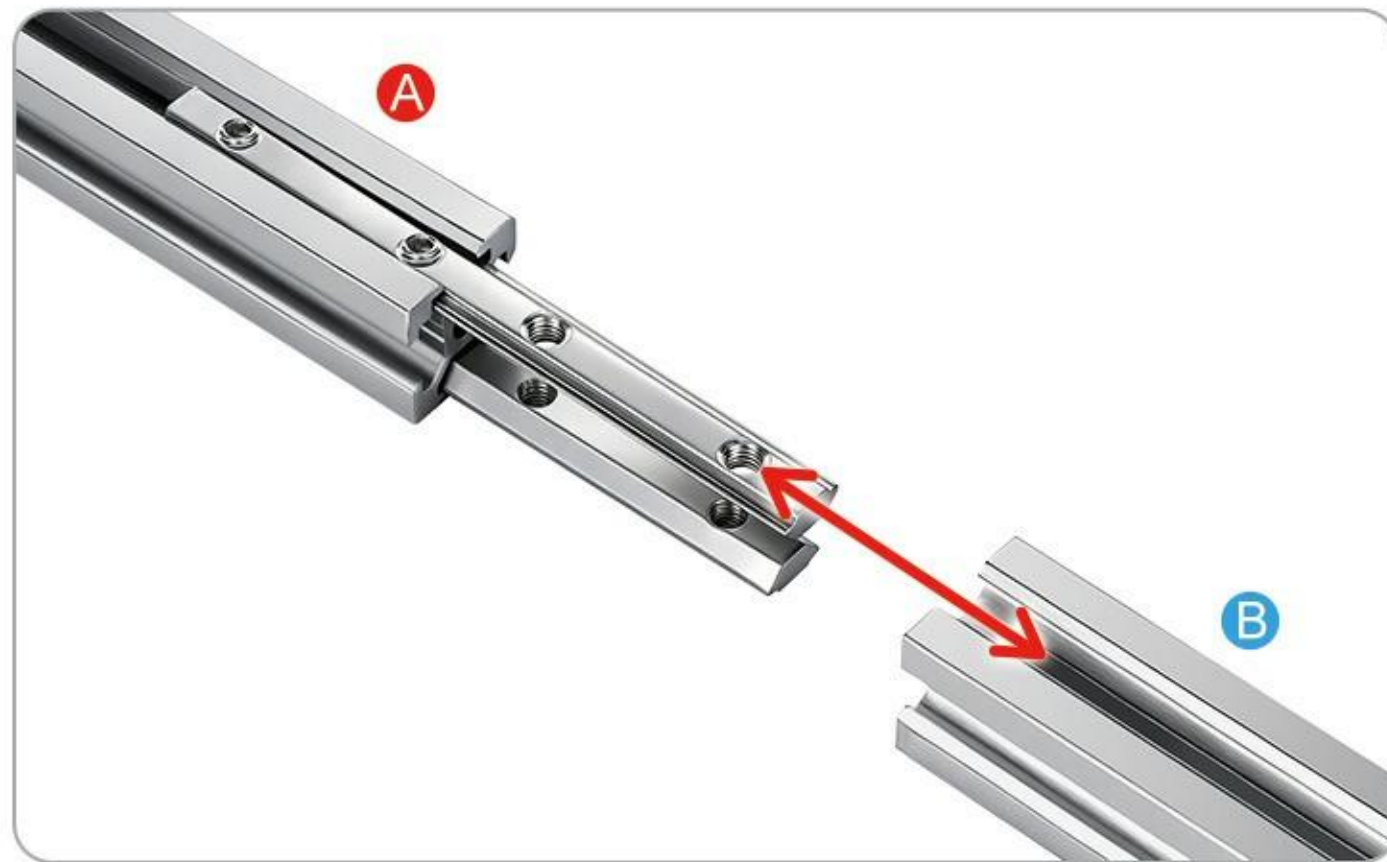
L-Allen Wrench x4

5. INSTALLATION GUIDE

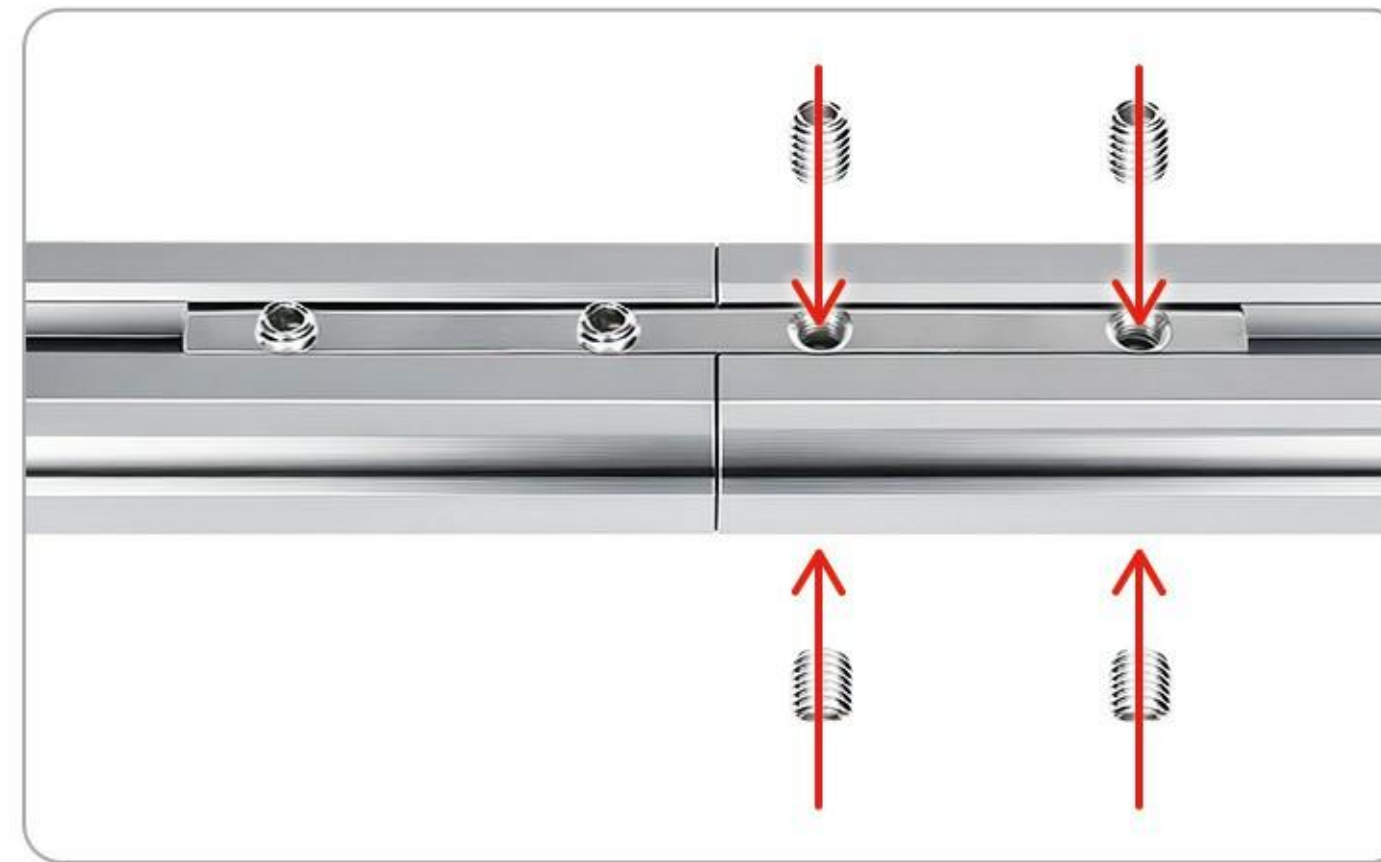
1. Assemble and connect Y-axis A to Y-axis B using a straight connector.



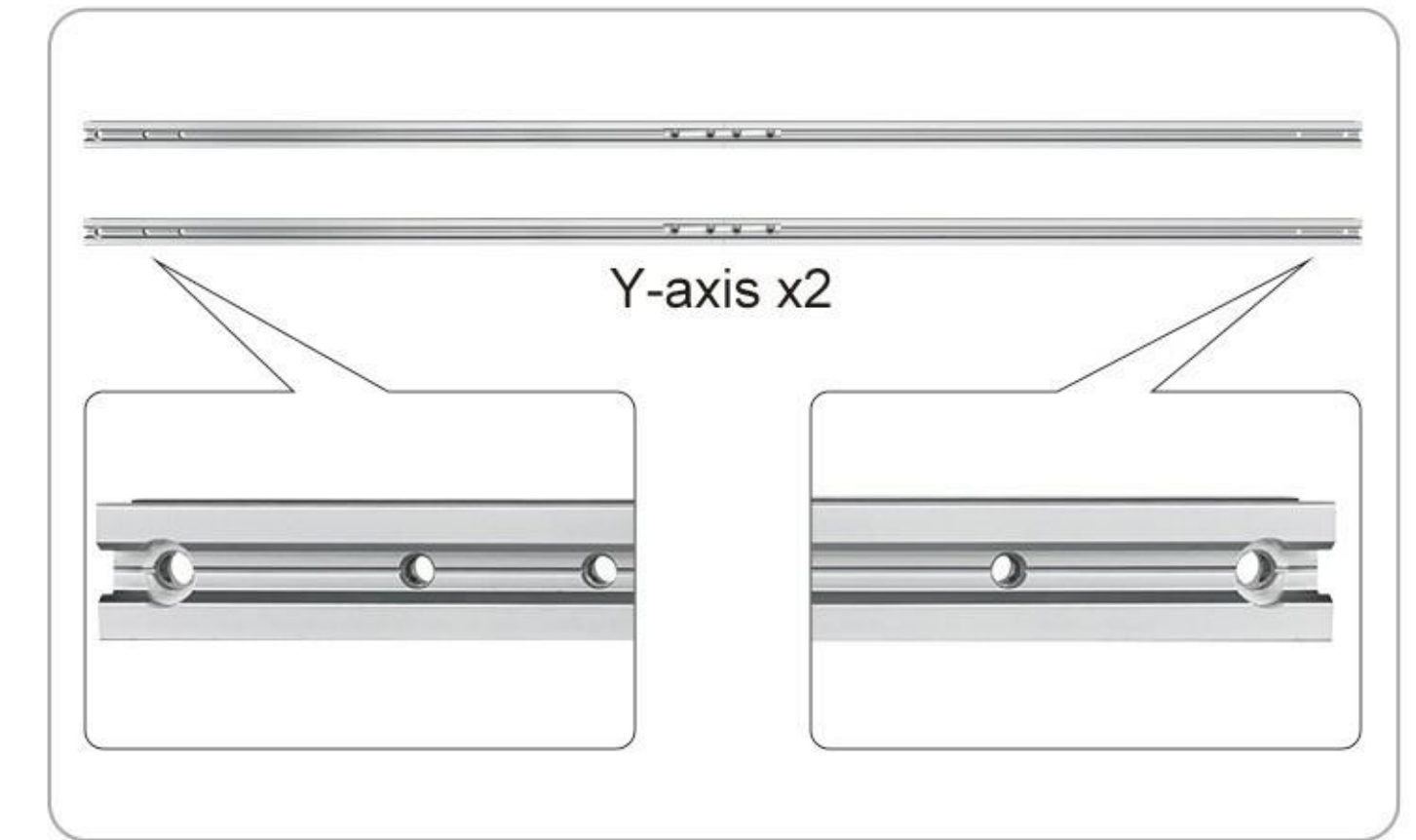
Note: When connecting, the threaded sides on both ends of the Y-axis AB must be aligned on the same plane.



① Align the center point of the straight connector with the Y-axis A and secure it using the center pin screw.

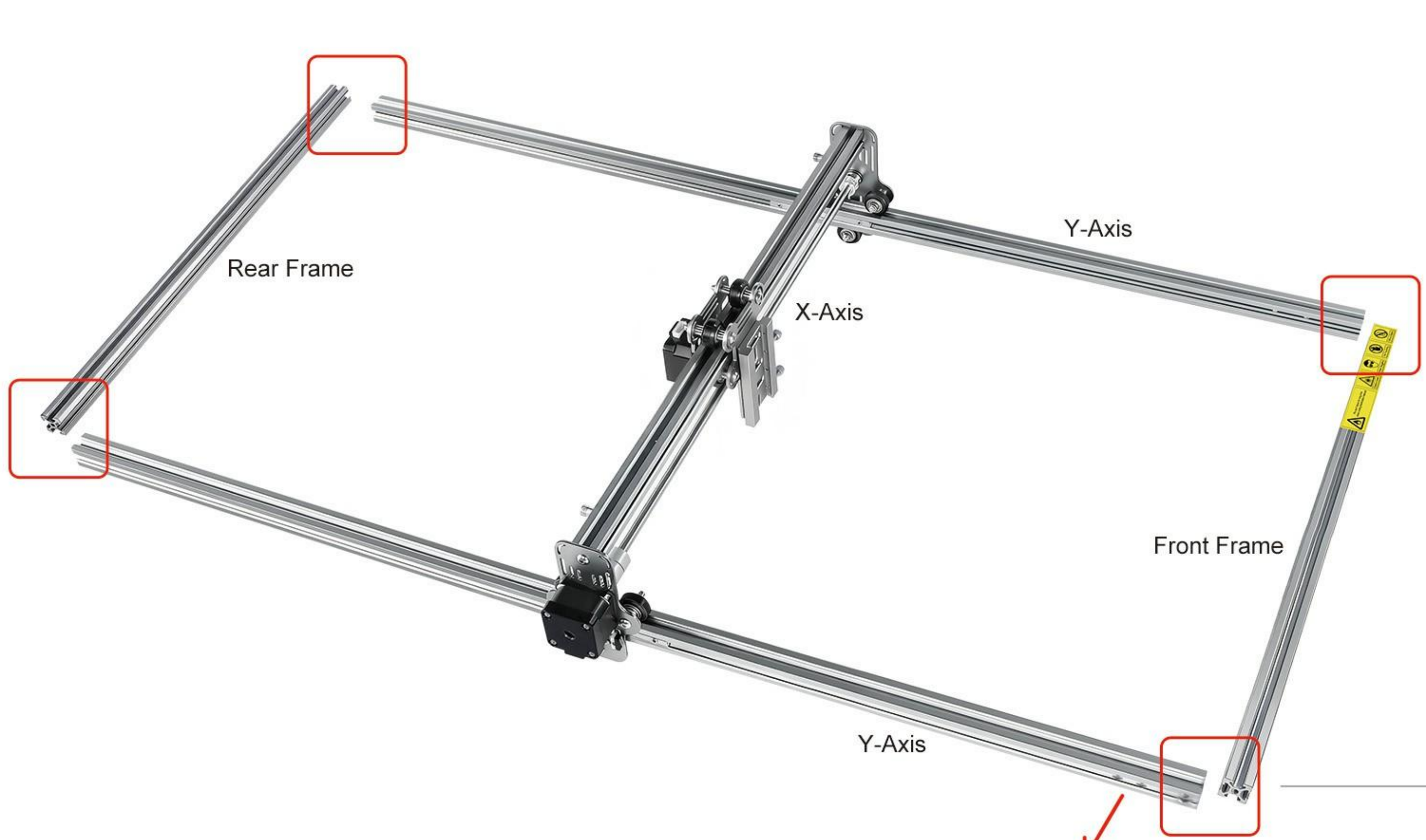


② After balancing Y-axis A with Y-axis B, secure Y-axis B with the set screw.

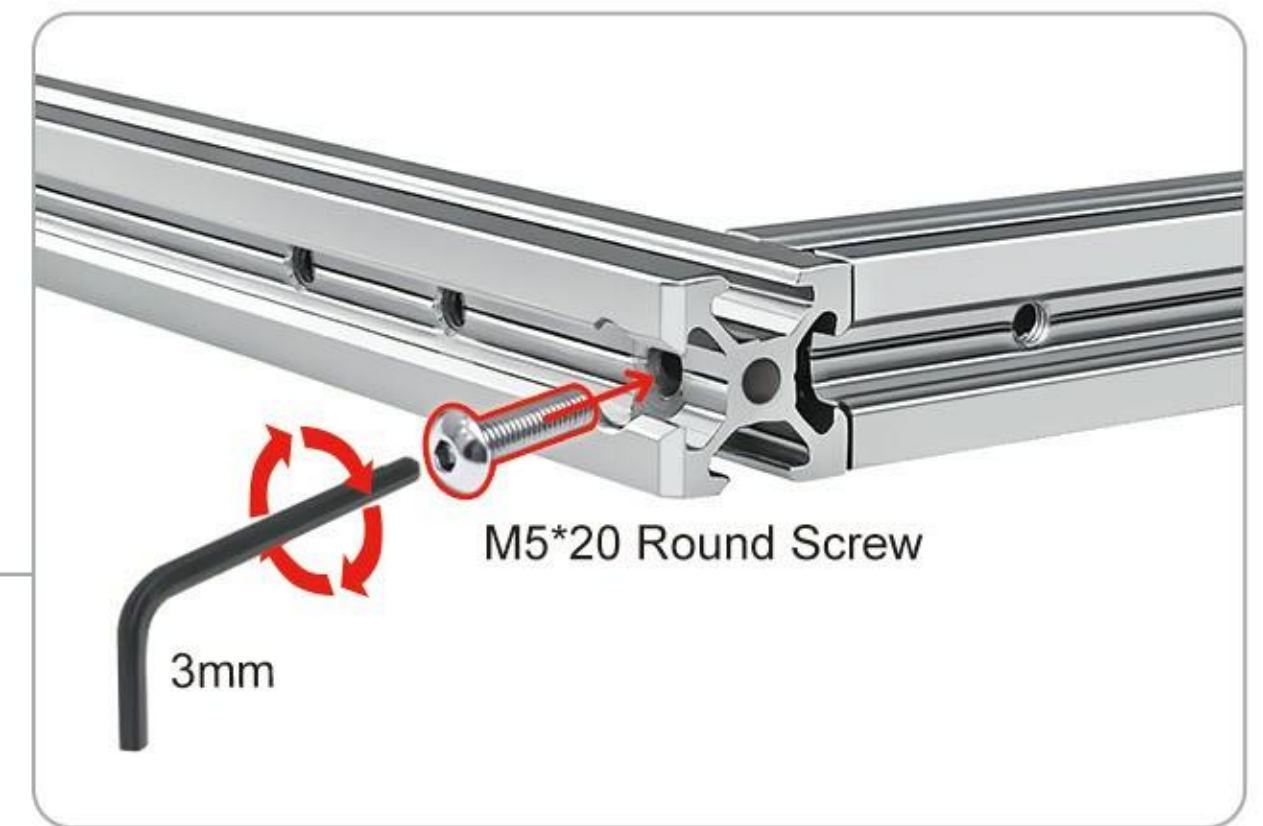
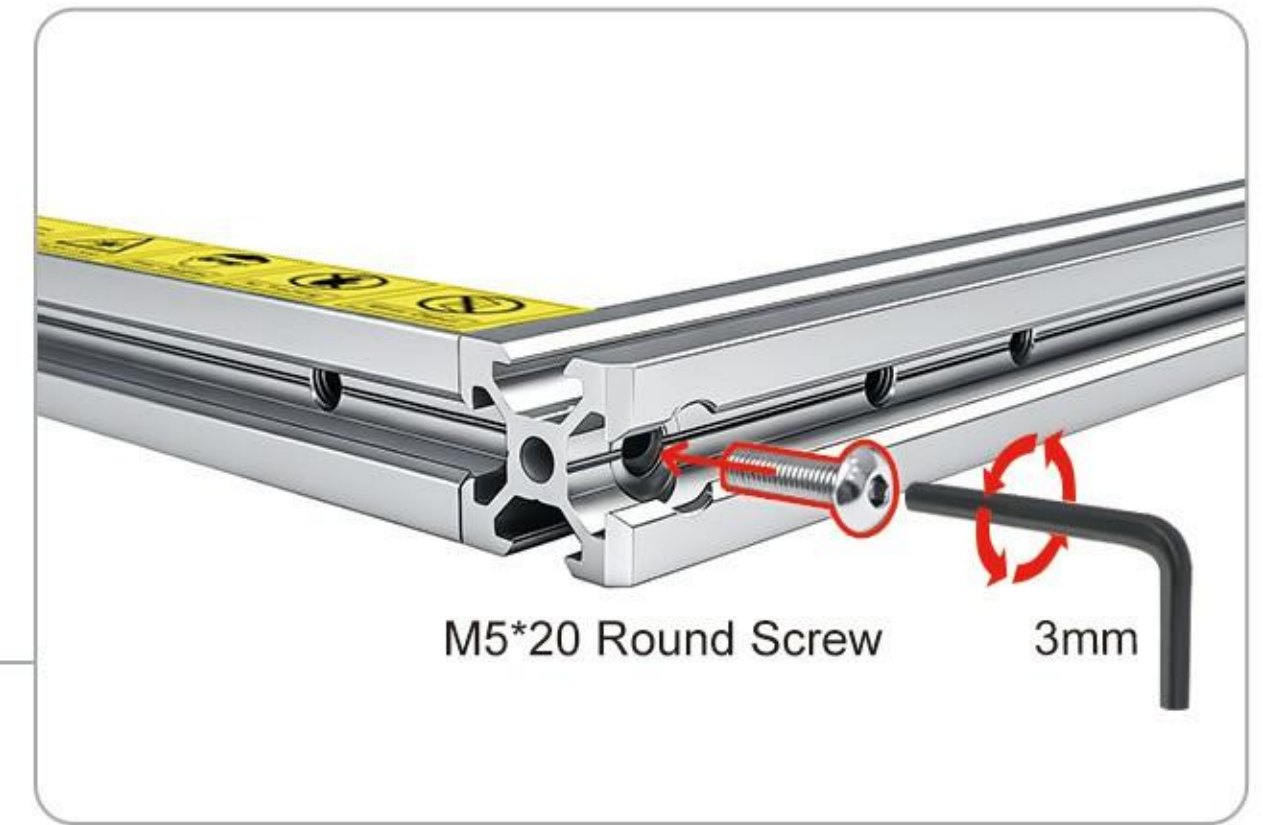


③ Assemble the other Y-axis in the same manner. Both Y-axes are now fully assembled.

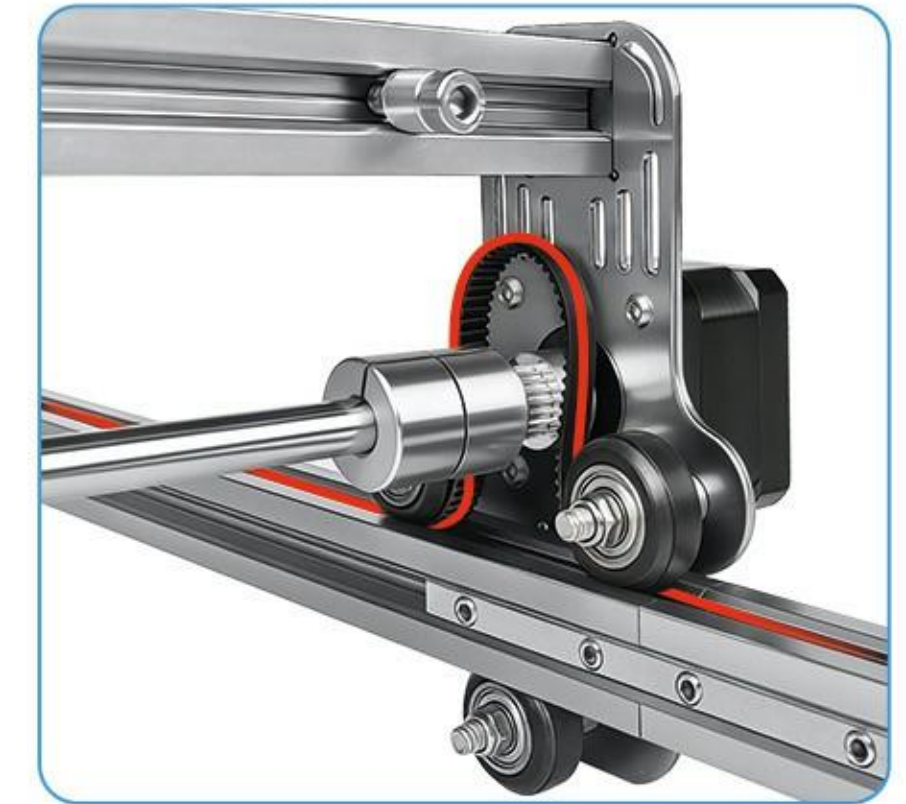
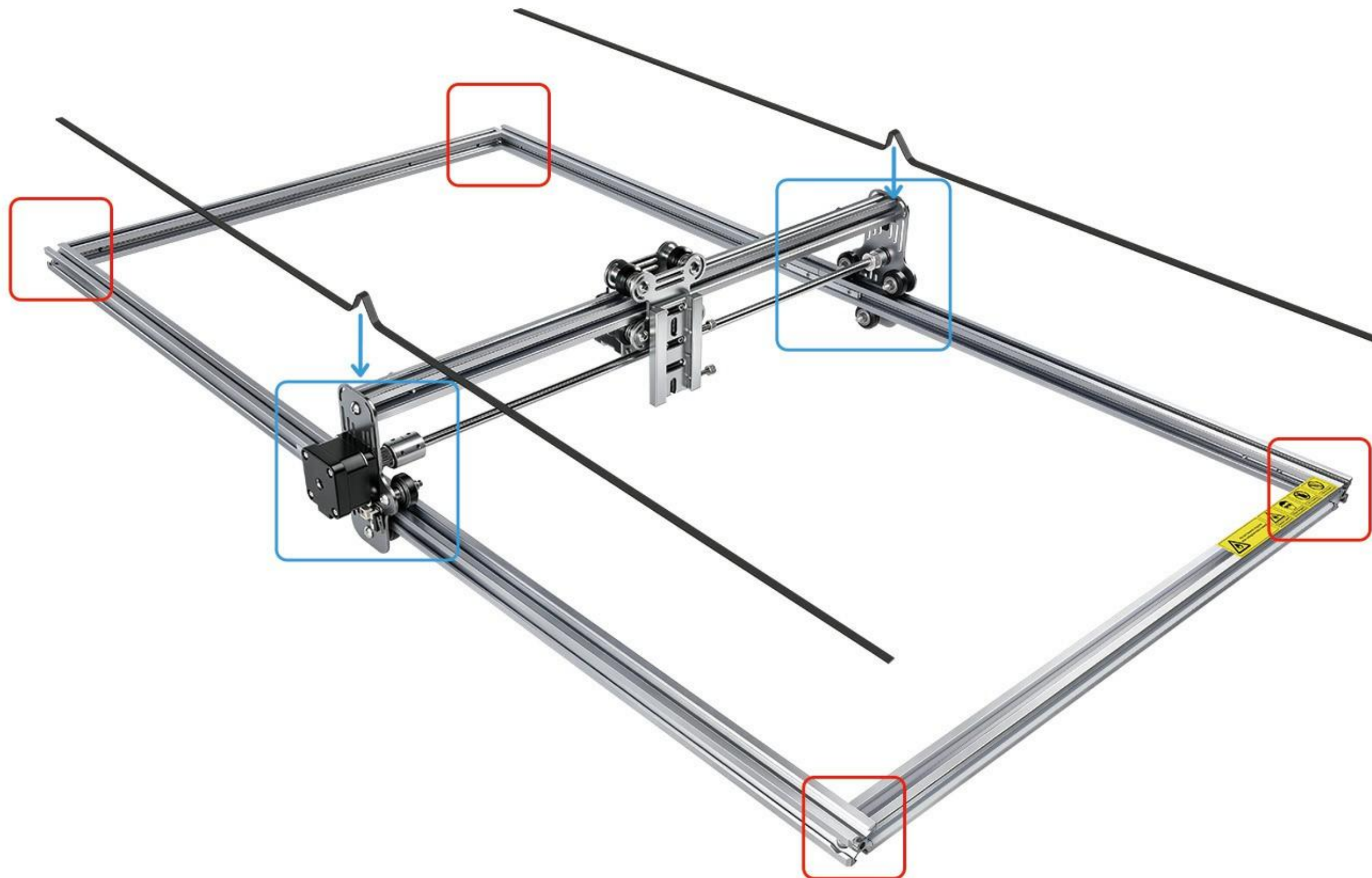
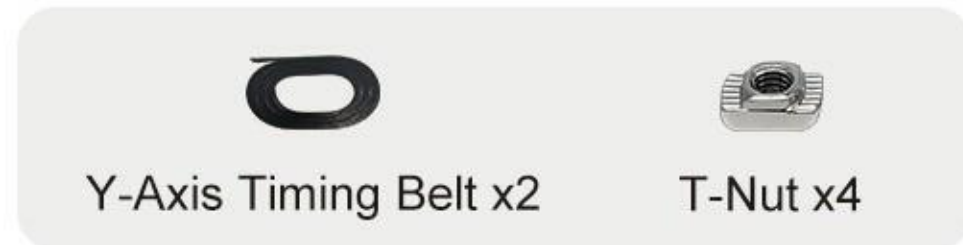
2. Assemble the Main Frame



Note: Ensure that the three holes on the Y-axis are facing the front beam during installation.



3. Install the timing belt and T-nuts



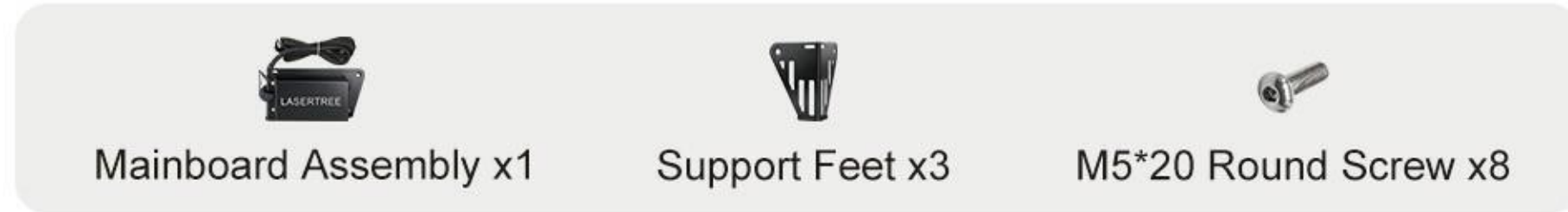
Pass the timing belt through the X-axis pulley manually or using appropriate tools so that it fits snugly and ensures that the timing belt moves smoothly on the pulley.



Caution: DO NOT tighten the T-nut with a screw.

Push the T-nut over the Y-axis belt.

4. Install support feet



5. Belt Tensioning and Securing



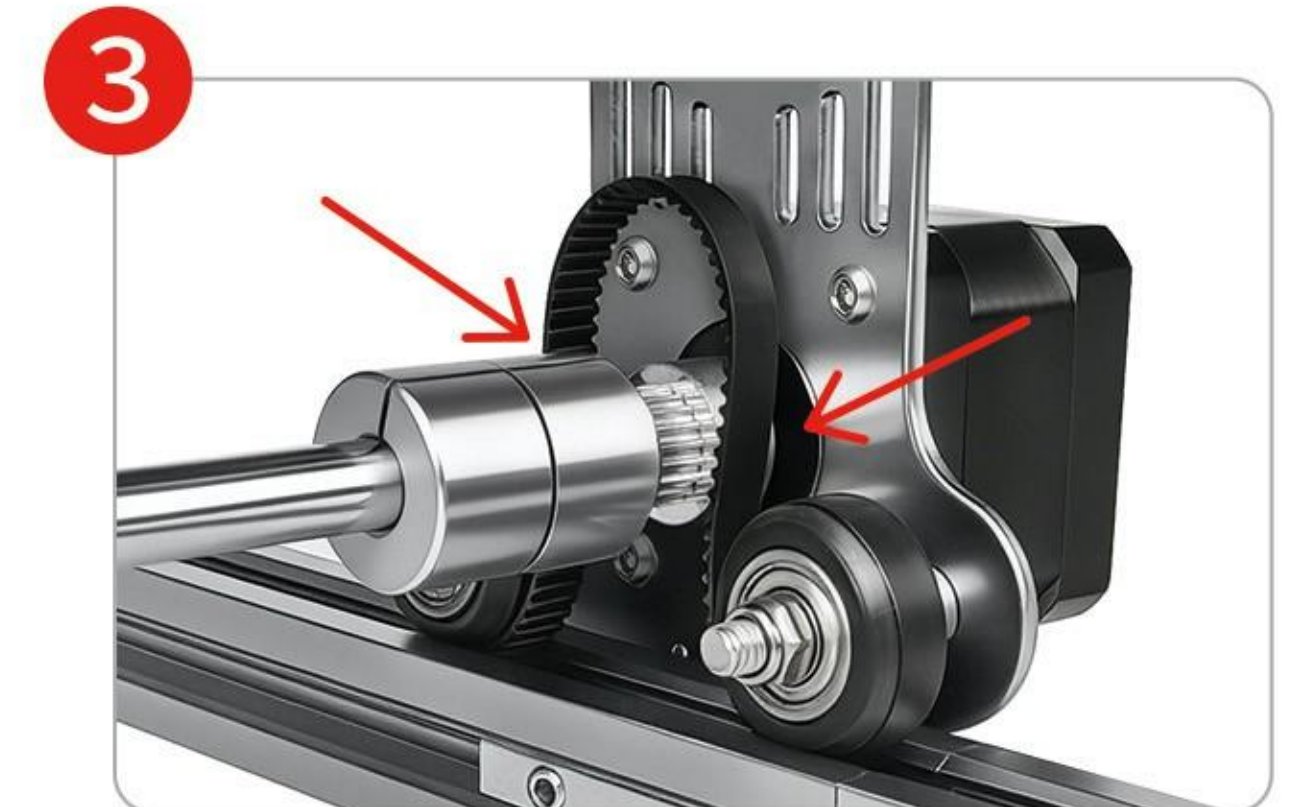
M4*5 Fasten Screw x4



① Secure the rear frame belt using the set screw.

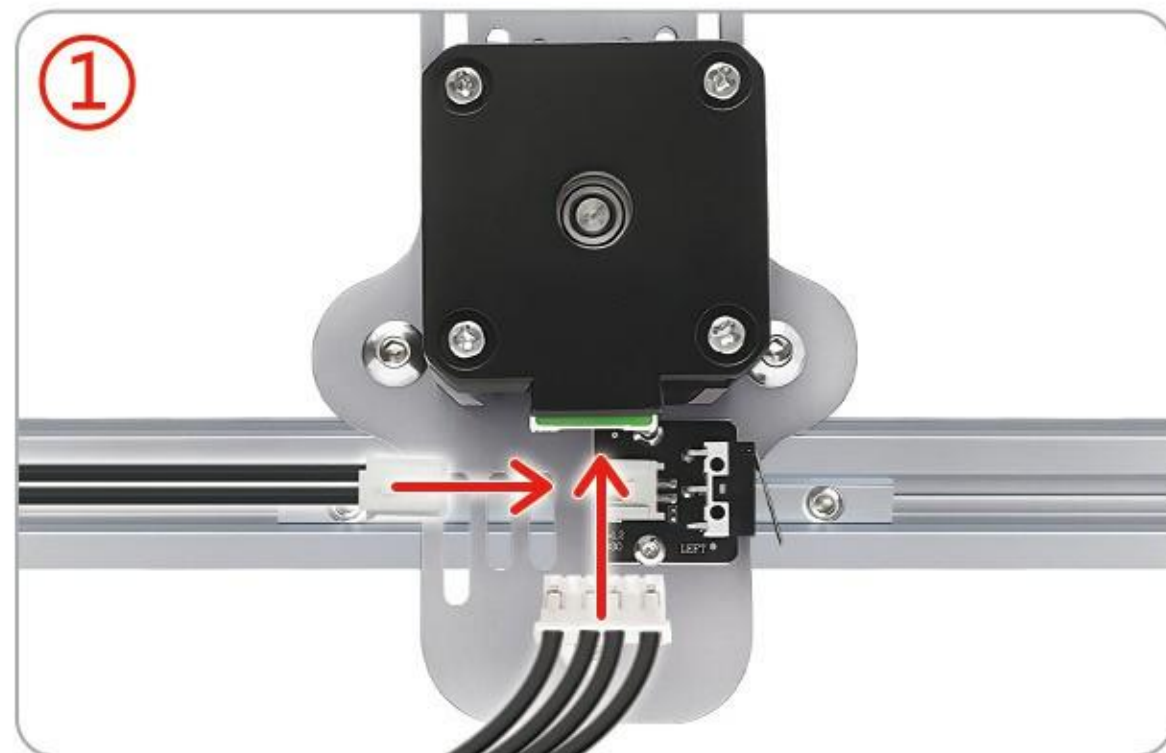
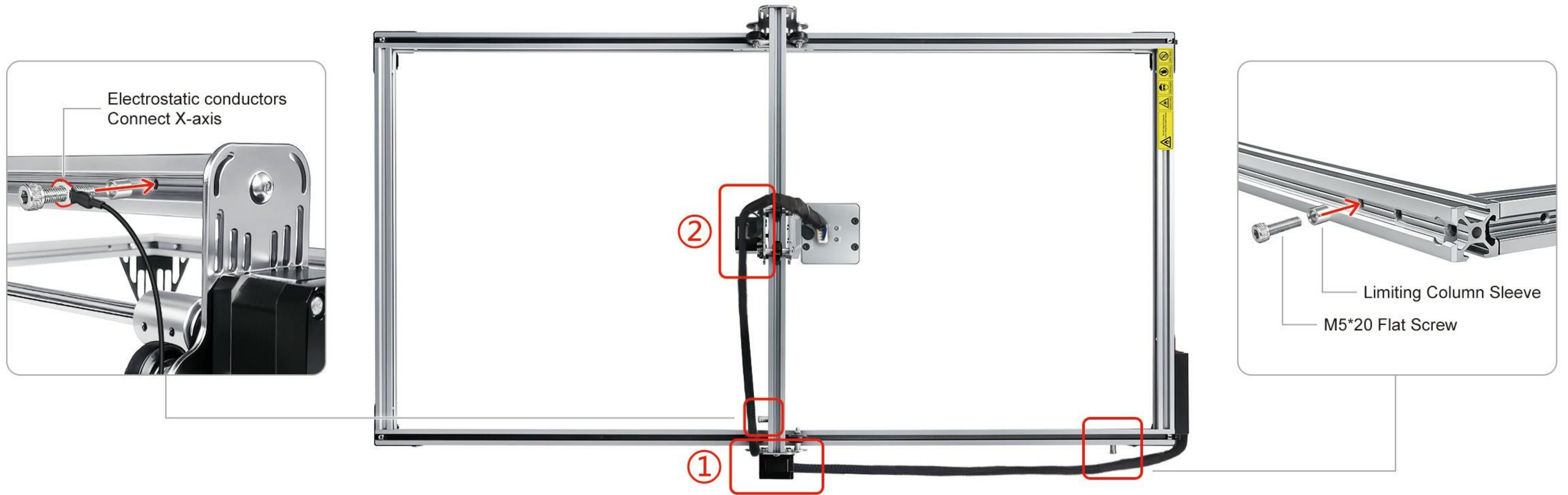


② Push the X-axis backward to ensure it fits snugly against the rear frame. Straighten the belt on the front frame and secure it using the set screw.

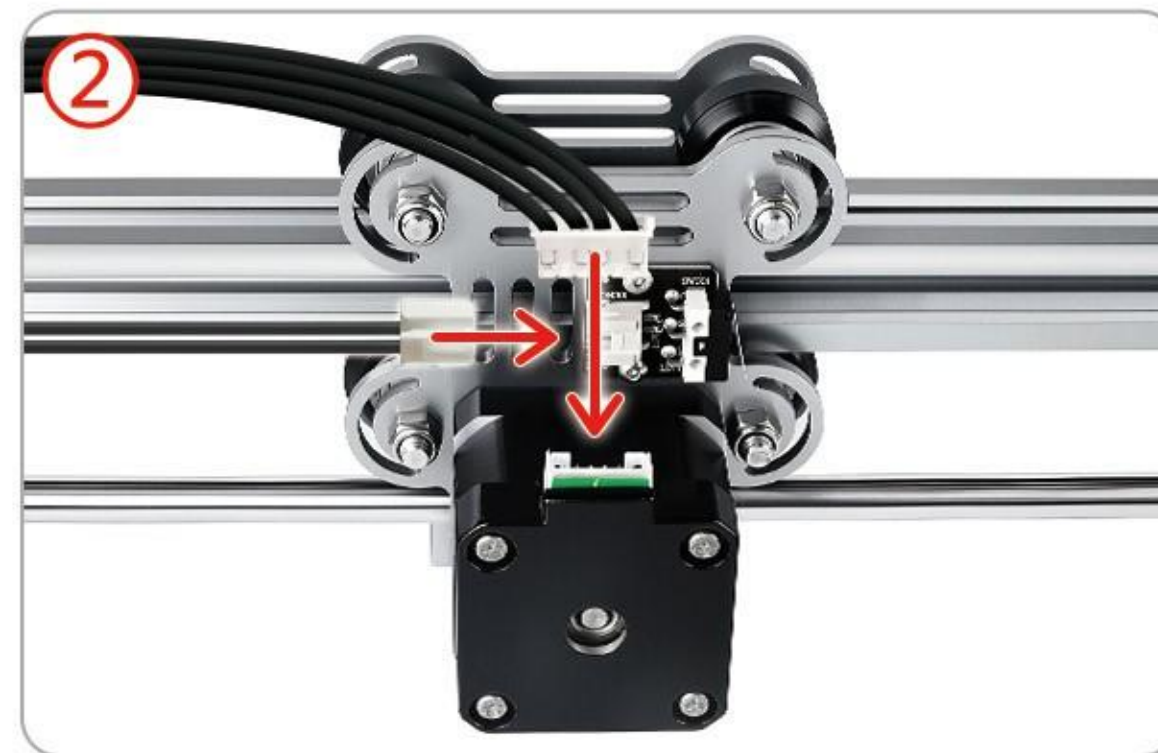


③ For a final check, press your finger on the middle span of the timing belt pulley to make sure the belt is flexible. If the belt is too loose or too tight, it will need to be adjusted.

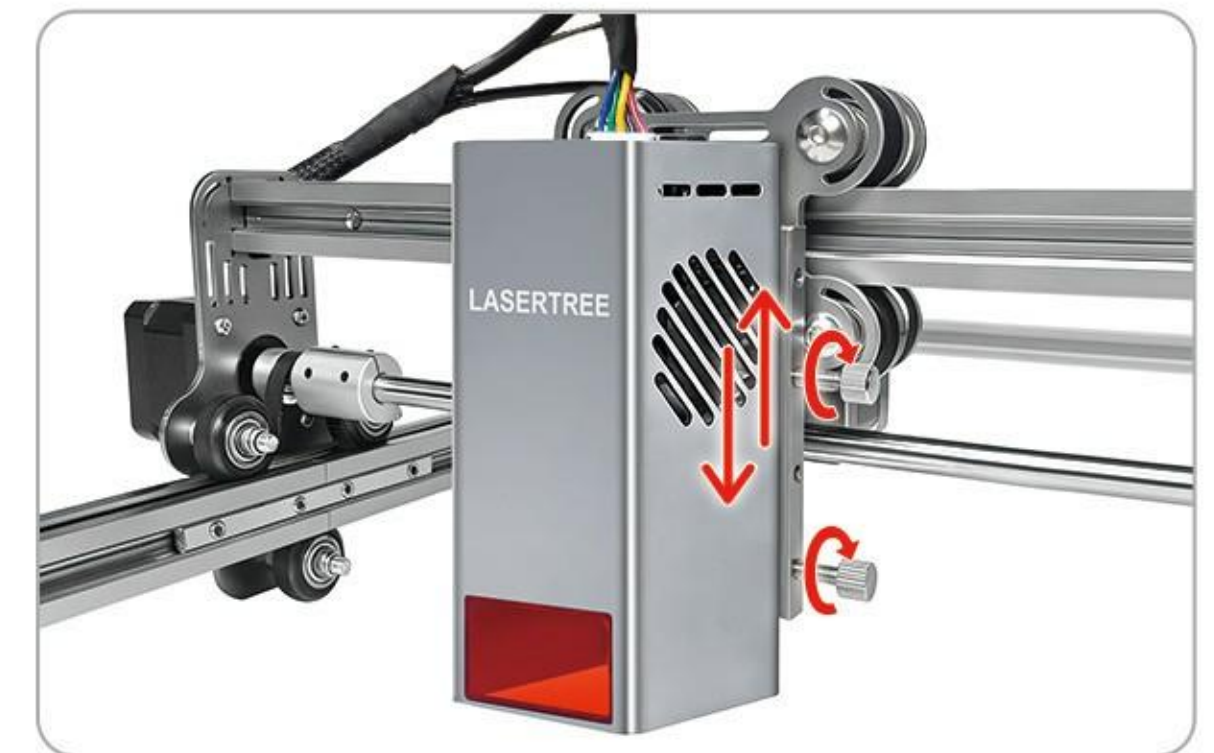
6. Connecting cables



Connect Y-axis motor



Connect X-axis motor



6. SOFTWARE CONNECTION GUIDE

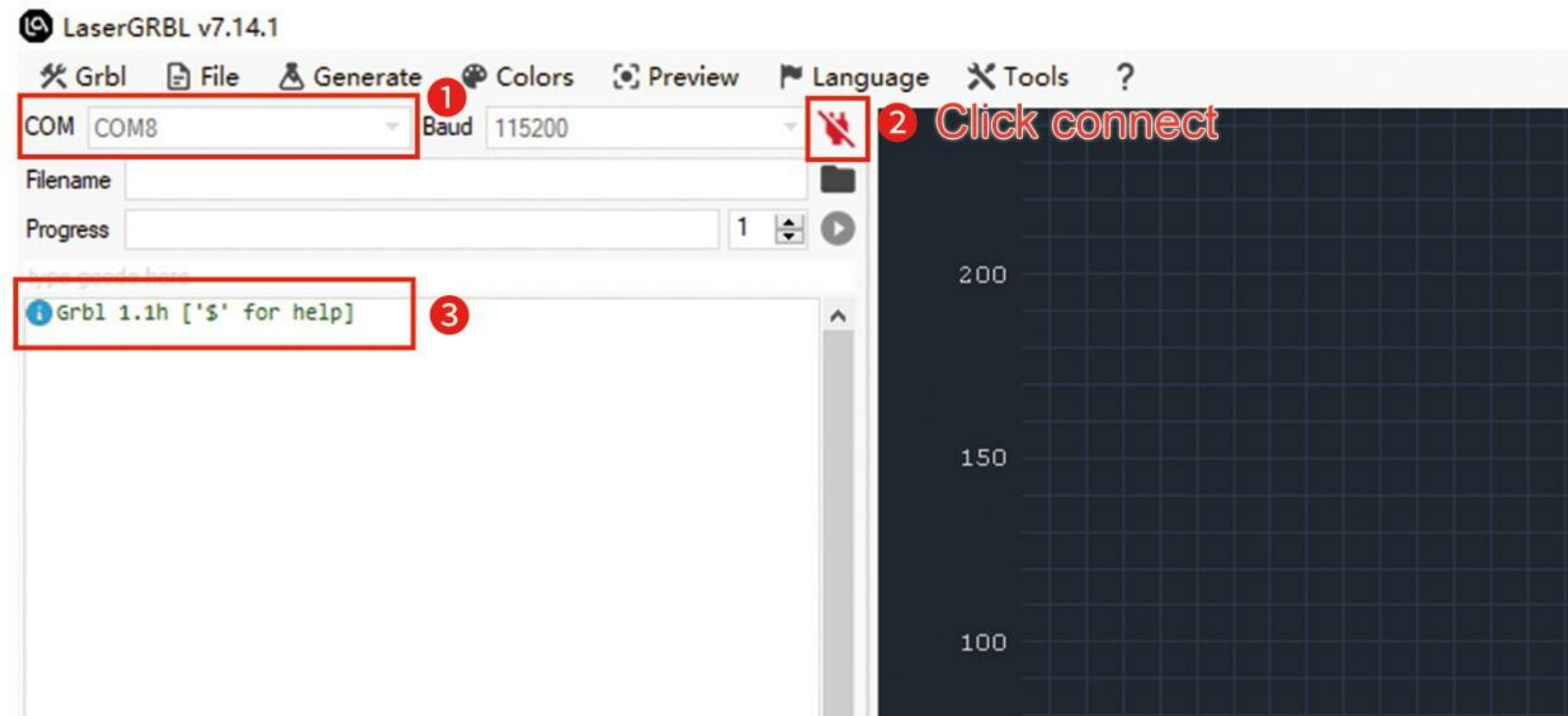
The K1 Mini Plus supports LaserGRBL and LightBurn engraving software.

6.1 LaserGRBL

LaserGRBL download address: <https://lasergrbl.com/download/>

(You can refer to the usage in the <https://lasergrbl.com/>.)

- 1) Connect one end of the USB data cable to the engraving machine and the other end to the USB port of the computer with LaserGRBL software installed.
- 2) Connect the power port of the engraving machine through the DC 24V adapter and turn on the power switch.
- 3) Open the LaserGRBL software on the computer, select the correct COM port and click connect. If the status bar displays "SimpleLaser 1.1h", the connection is successful.



6.2 LightBurn

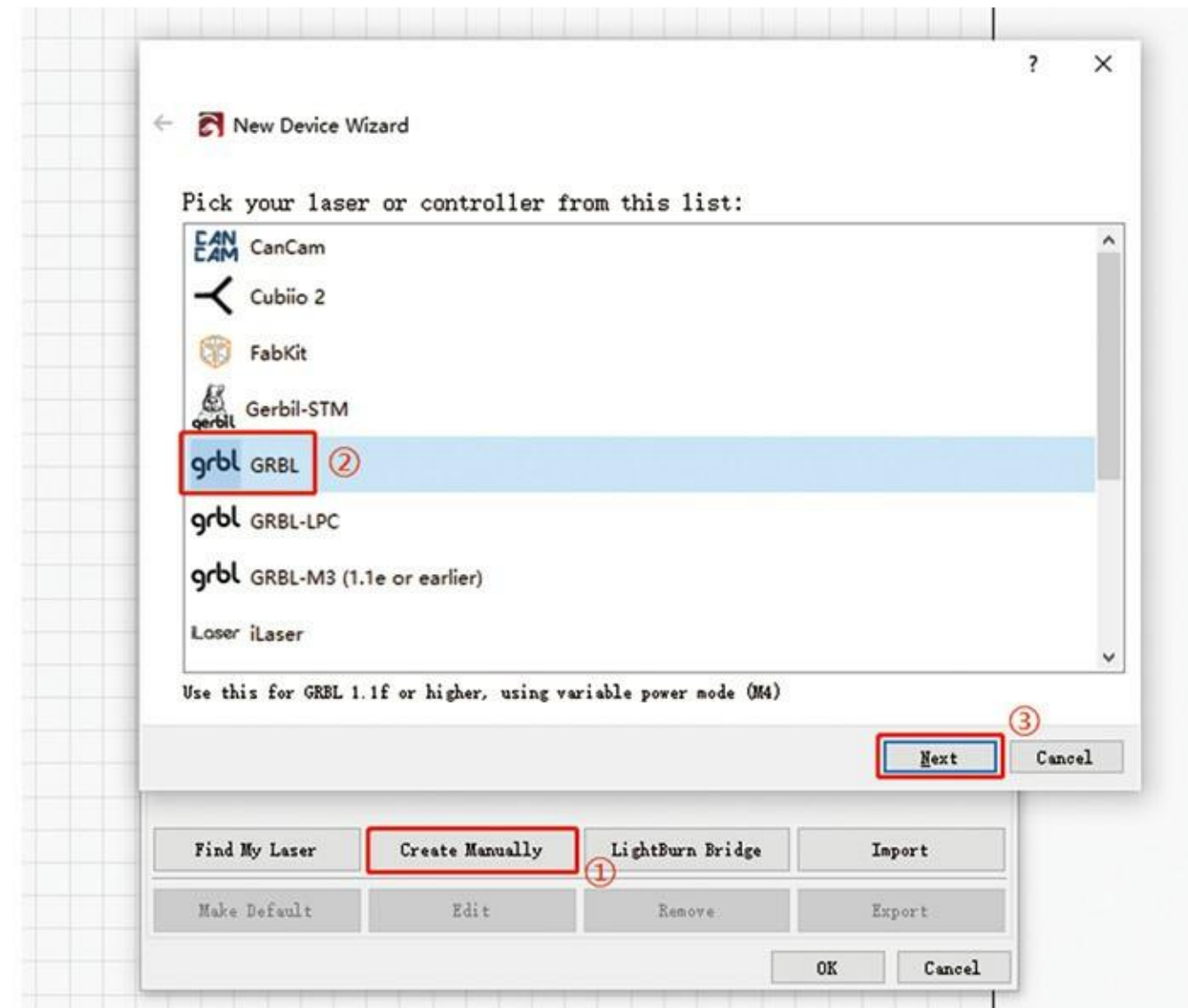
LightBurn download address: <https://lightburnsoftware.com/pages/download-trial>

(Please be aware that you will need to buy lightBurn yourself as it is not available for free. You can refer to the usage in the <https://lightburnsoftware.com/>.)

- 1) Connect one end of the USB data cable to the engraving machine and the other end to the USB port of the computer with LightBurn software installed.
- 2) Connect the power port of the engraving machine through the DC 24V adapter and turn on the power switch.
- 3) Open the LightBurn software, select "Start Your Free Trial" or "Activate License". (Figure 1)
- 4) Create a new device, select "GRBL". (Figure 2)



(Figure 1)



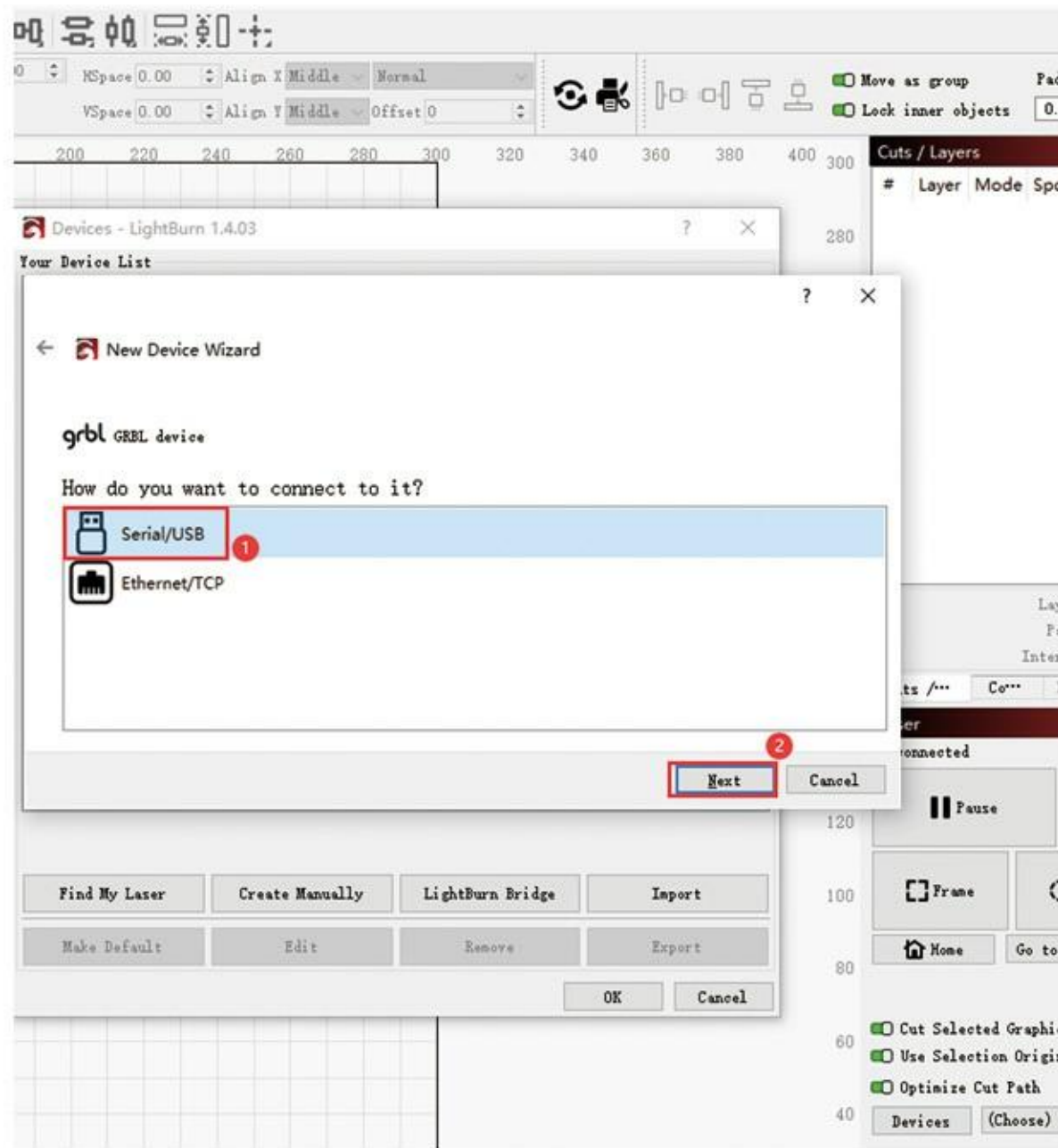
(Figure 2)

5) Select USB connection. (Figure 3)

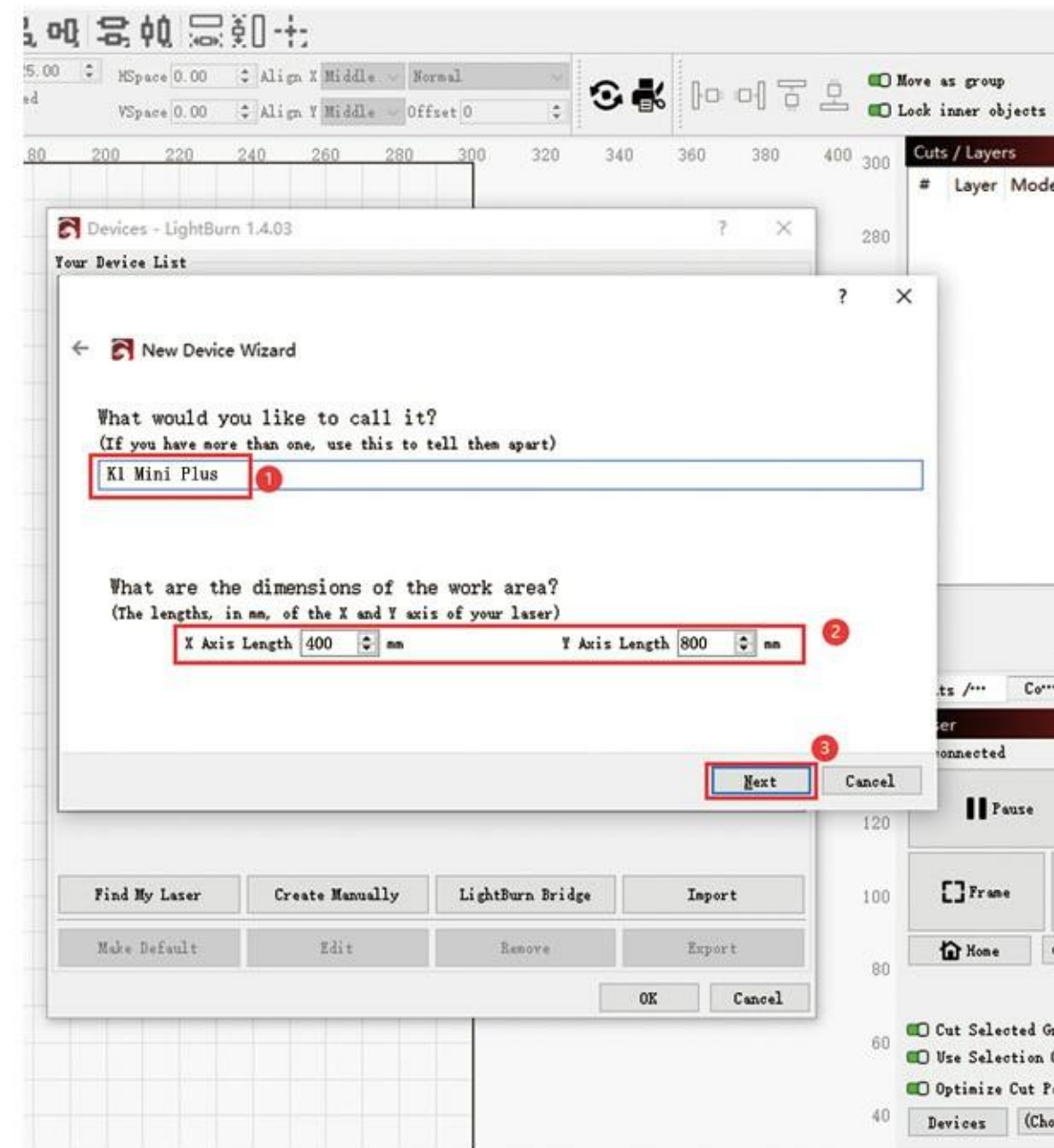
6) Set the engraving area to 400×800mm and modify the device name "K1 Mini Plus". (Figure 4)

7) Set the origin position of the machine and turn off automatic reset on power-on. (Figure 5)

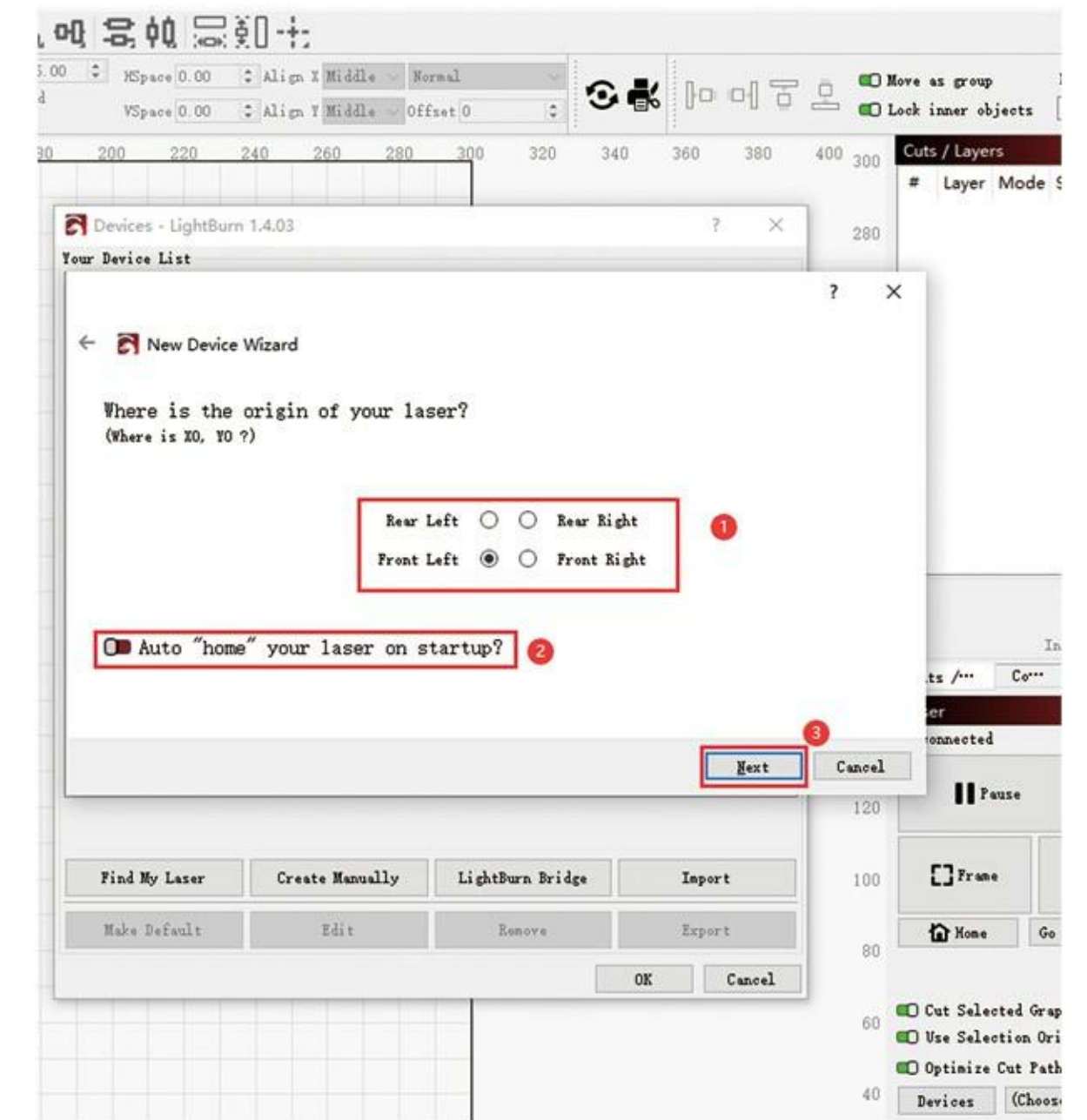
(If you need to automatically reset every time you turn on the computer, please tick step 2 of the attached diagram.)



(Figure 3)



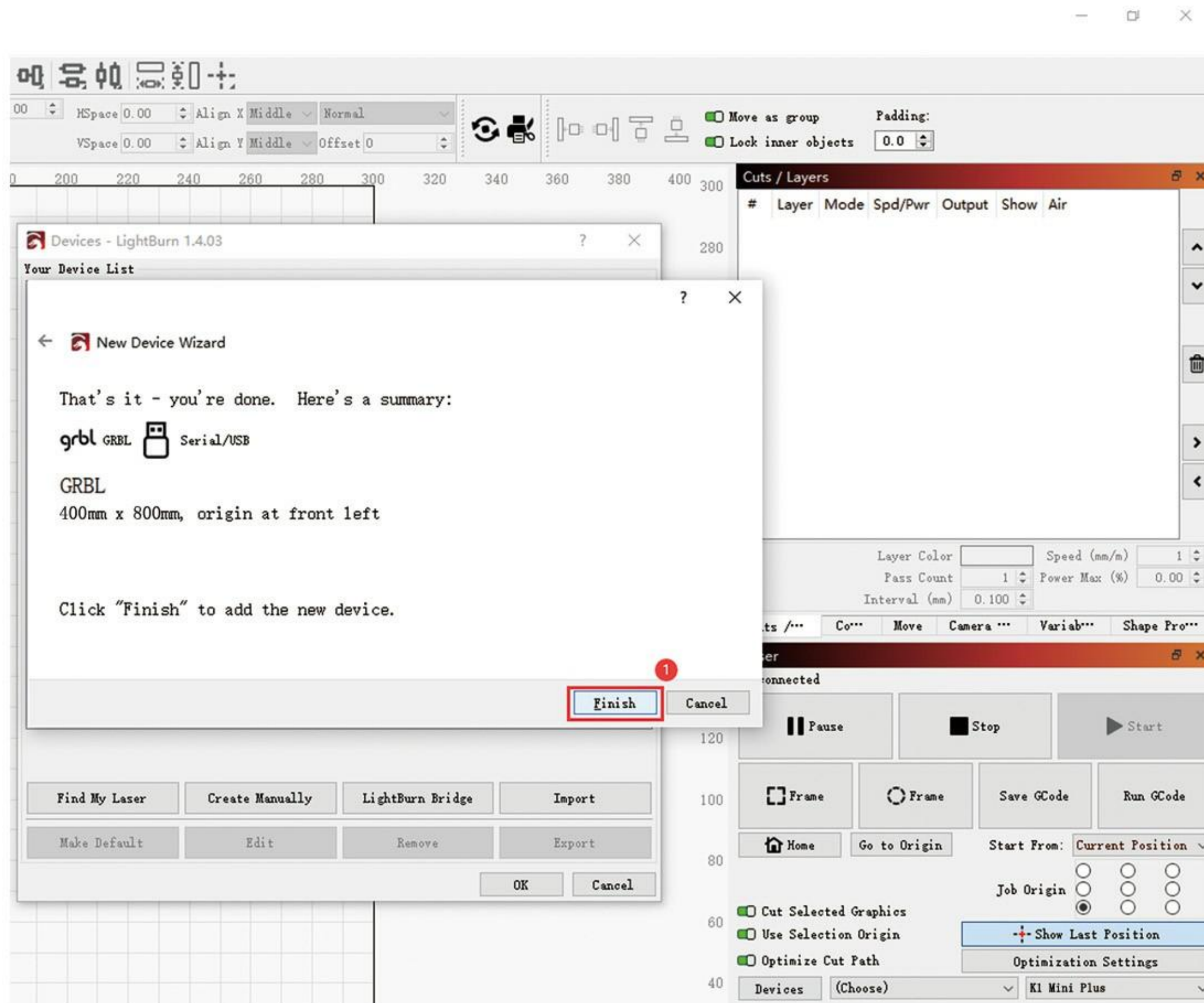
(Figure 4)



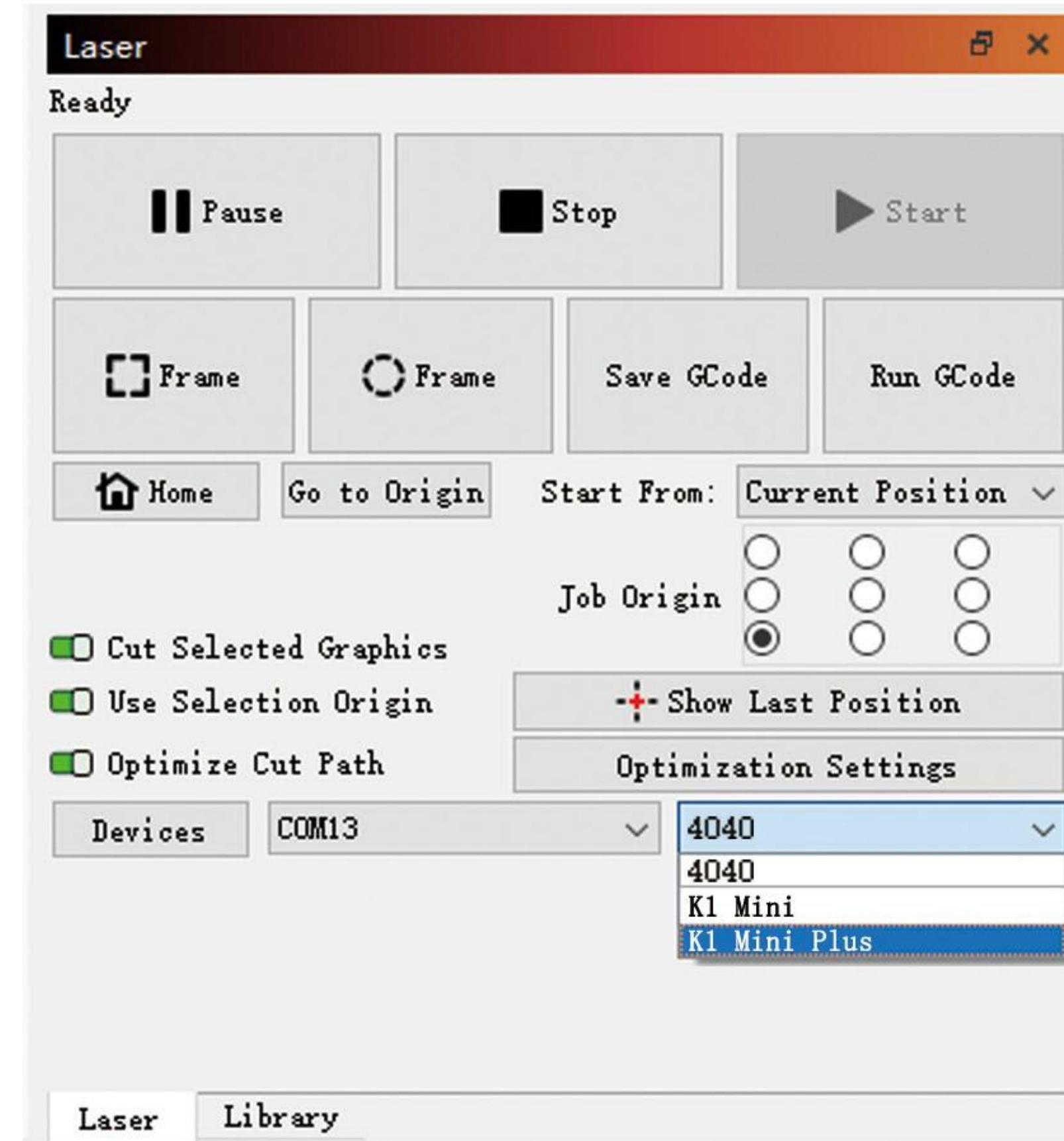
(Figure 5)

8) Complete software setup. (Figure 6)

9) Select the "K1 Mini Plus" device and the correct COM port. When the status bar displays Ready, the device is successfully connected. (Figure 7)



(Figure 6)

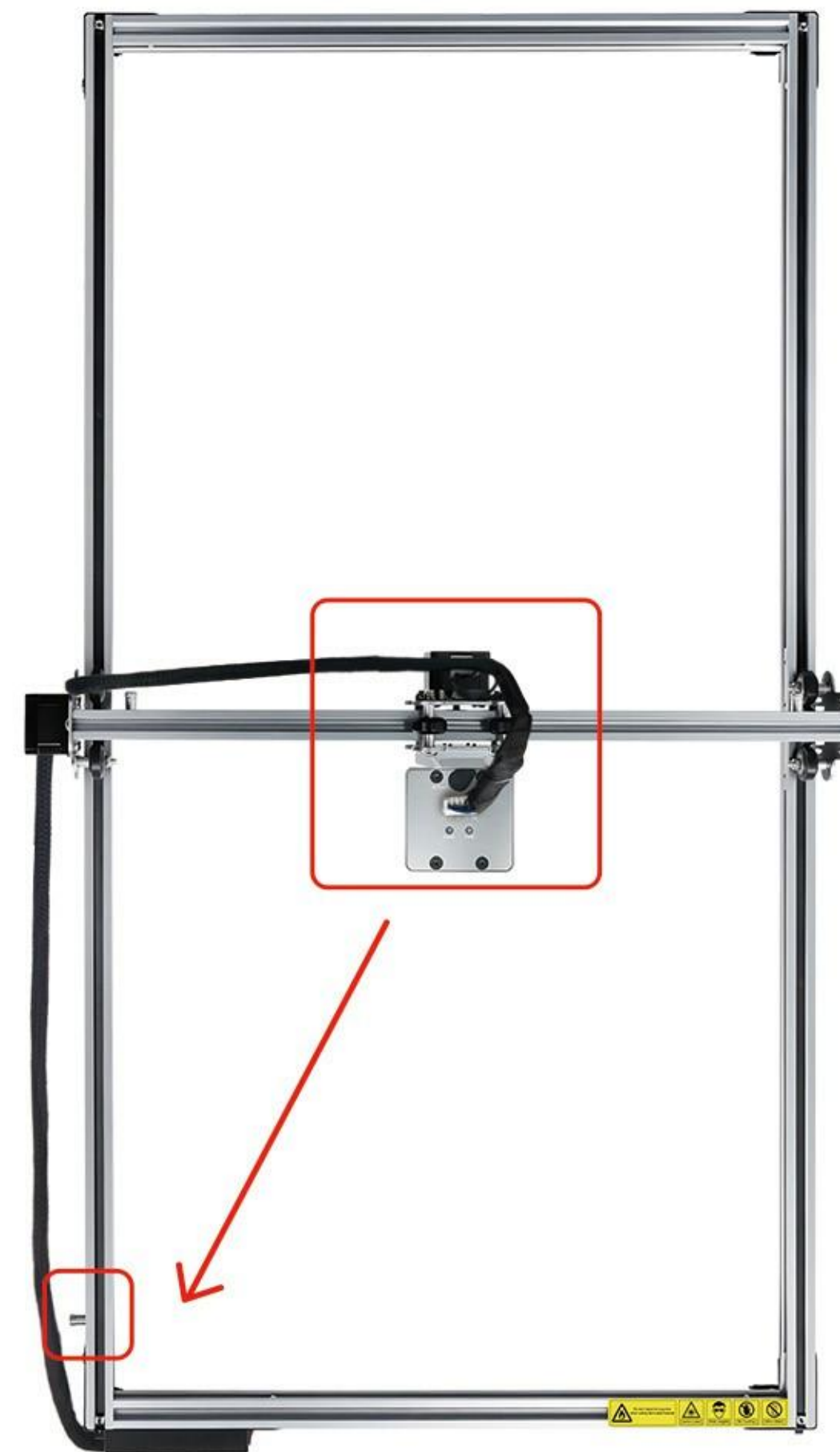
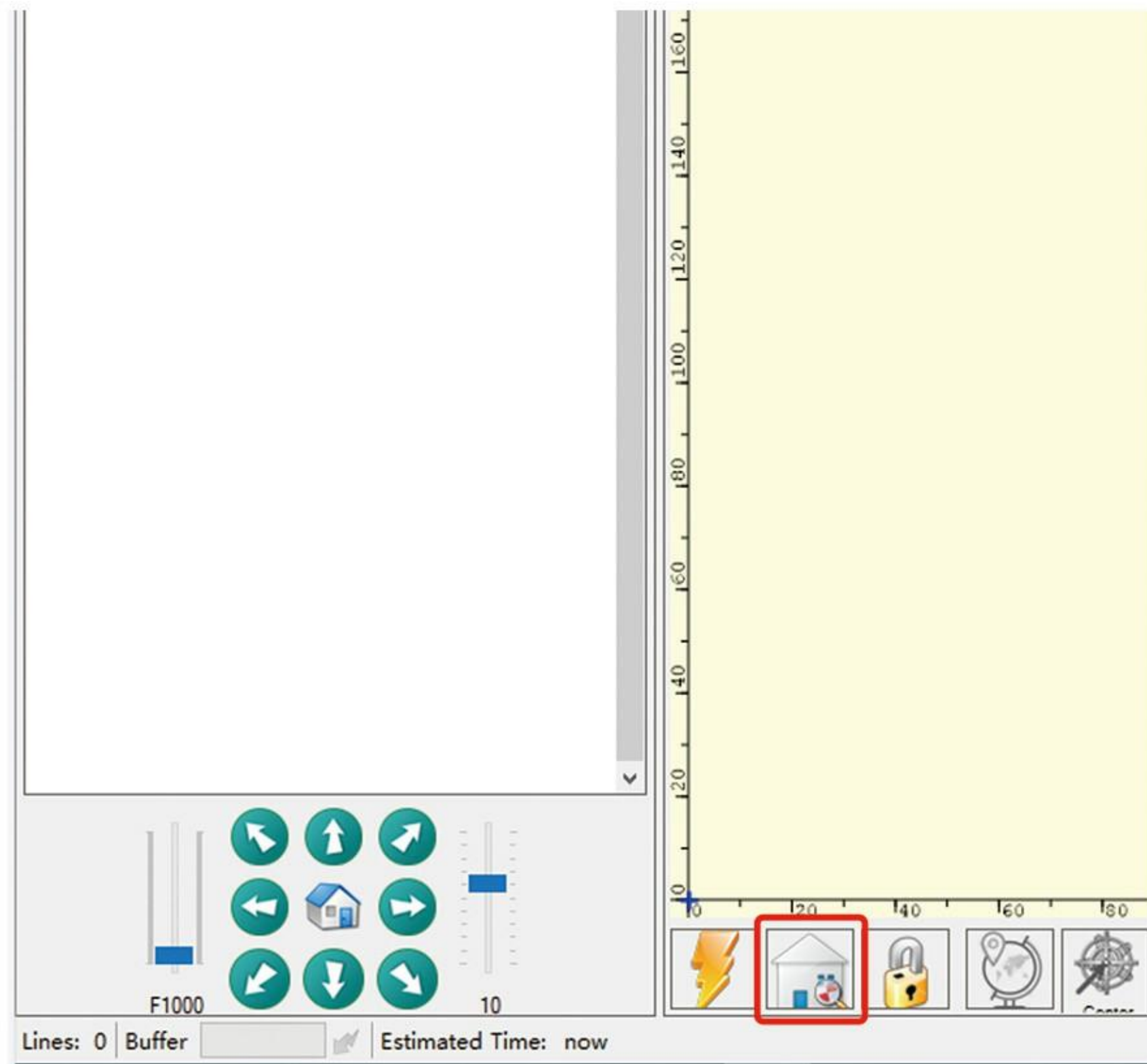


(Figure 7)

7. MACHINE TEST GUIDE

7.1 LaserGRBL

- 1) Engraving machine reset test: Find the reset button on the default interface of LaserGRBL and click it. Under correct operation, Under correct operation, the laser module should be moved to the side of the control box and stopped moving when it hits the limit column.

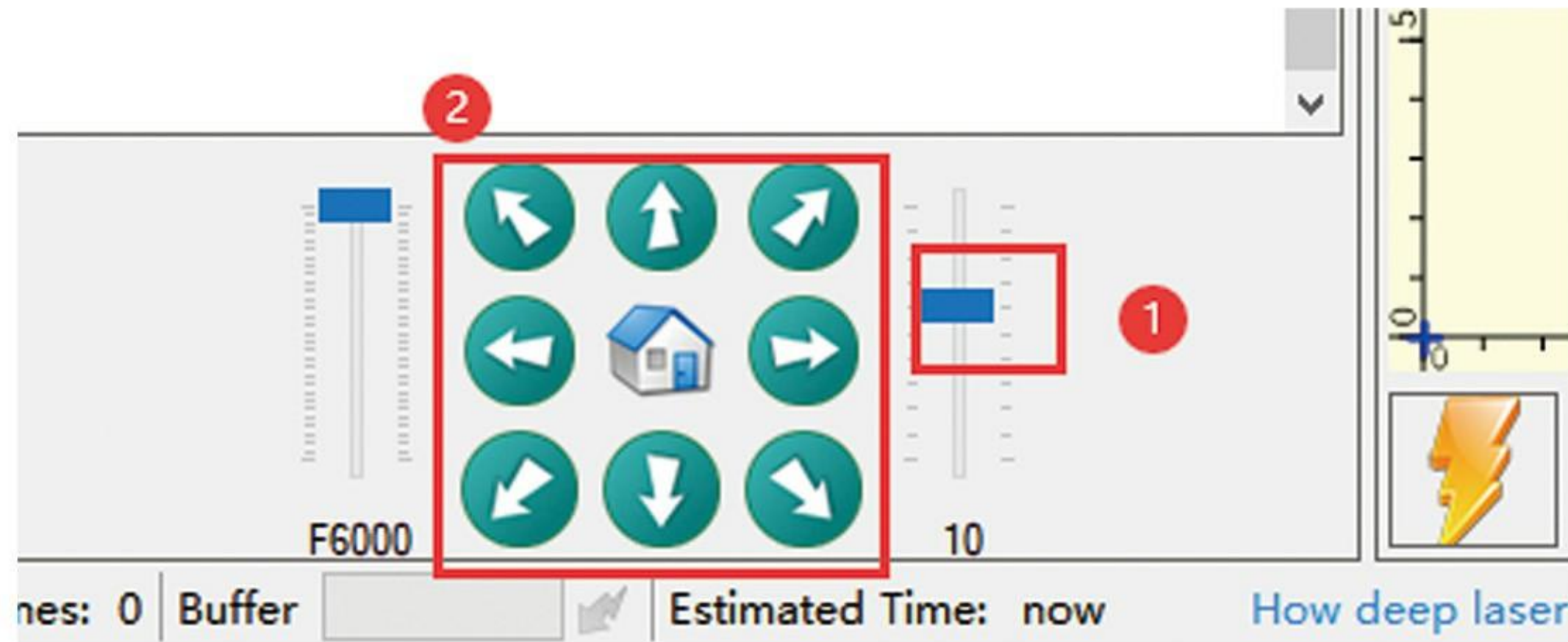


2) Engraving machine movement test:

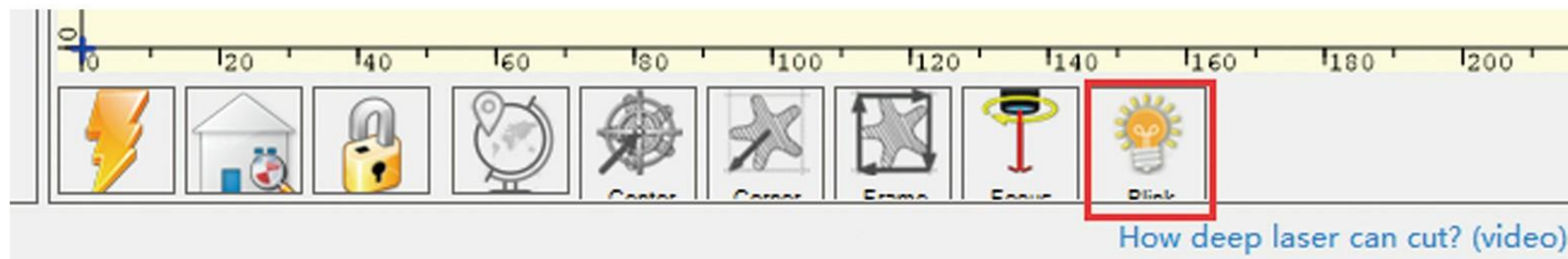
① Find the direction button on the default interface of LaserGRBL and set the moving distance and speed.

(The recommended moving distance is 10mm.)

② Click in any direction. Under correct operation, the laser module should move in the direction shown by the arrow.

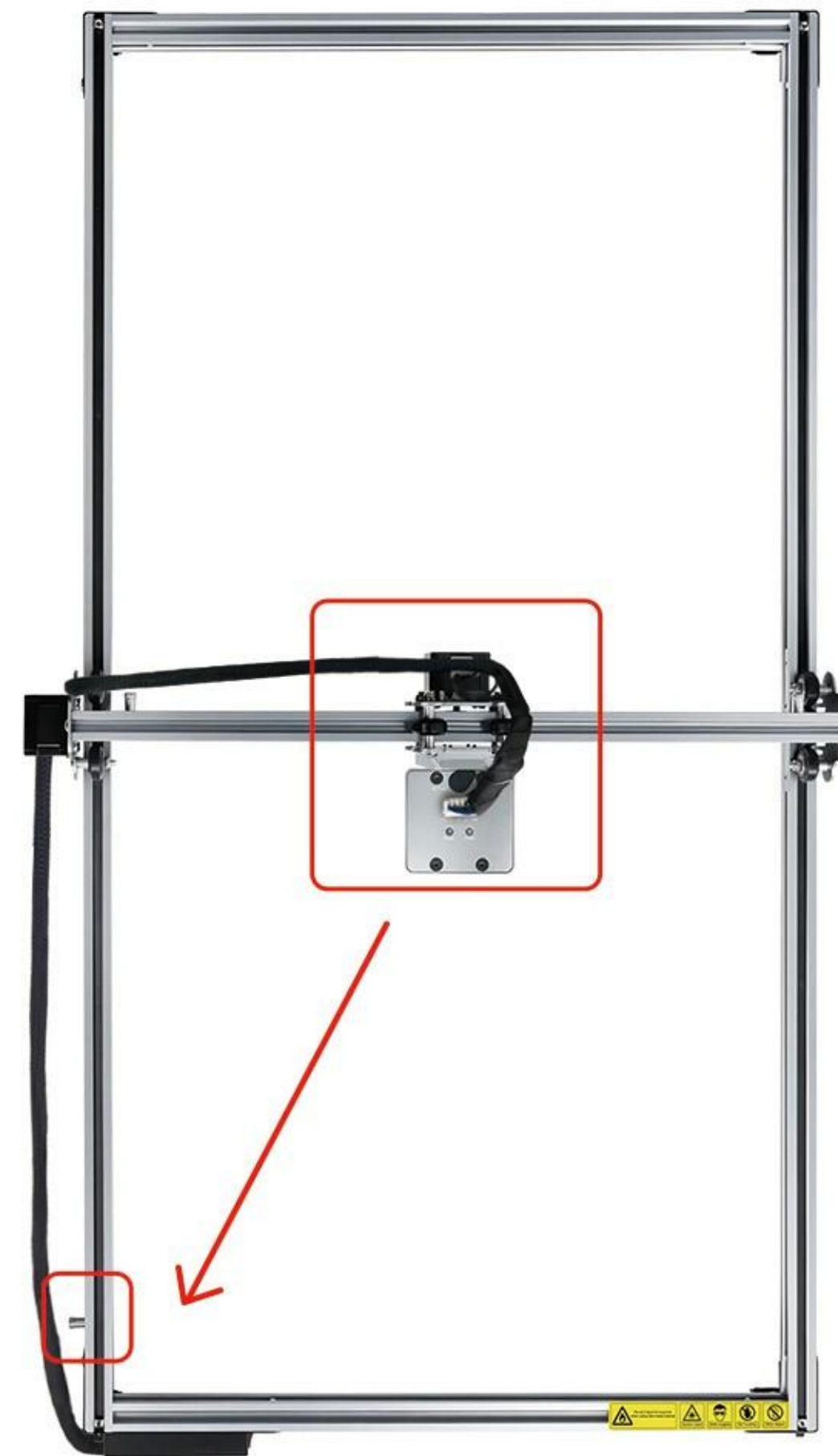
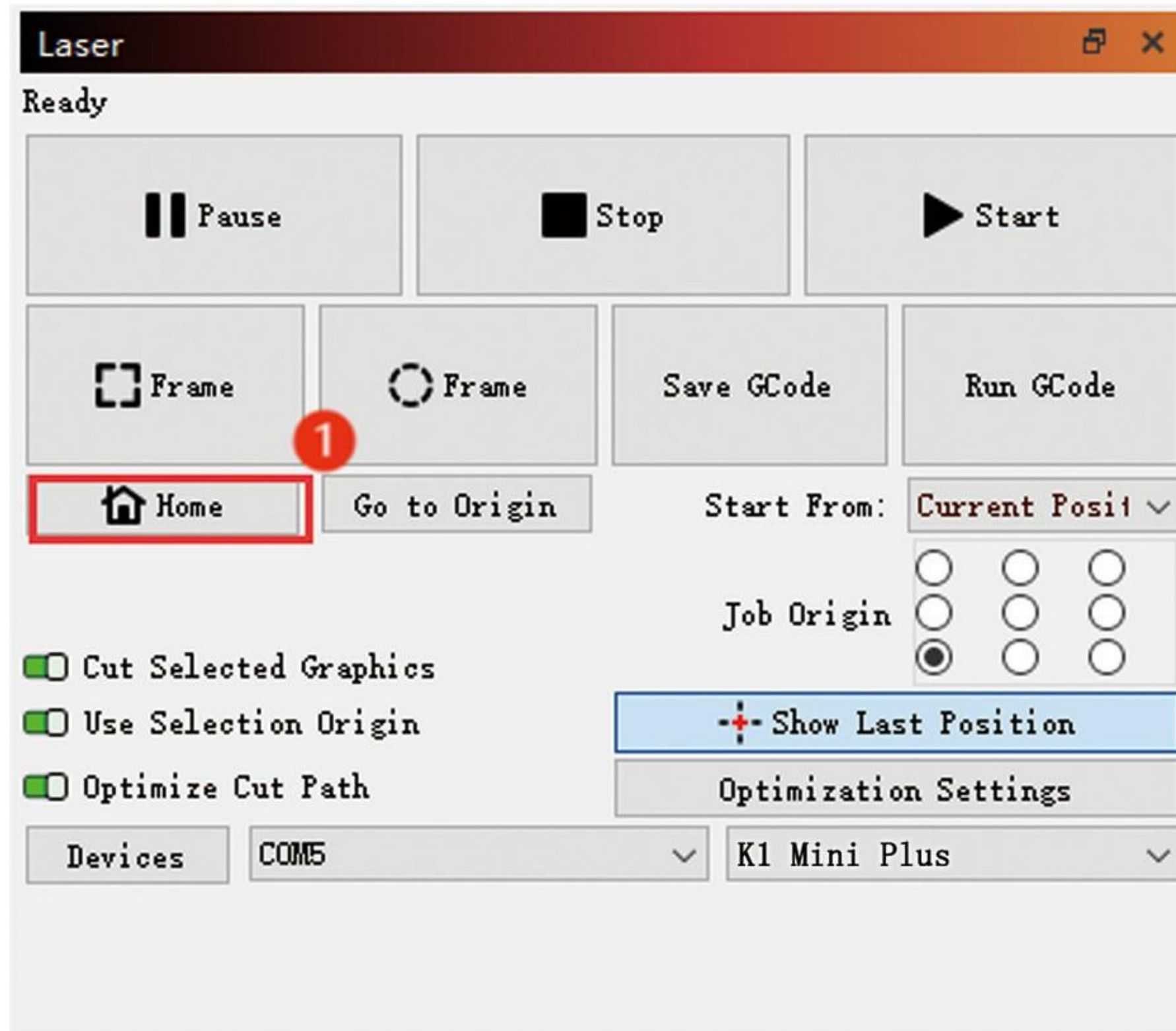


③ Engraving machine laser module light test: Find the light button on the LaserGRBL default interface and press and hold it. Under correct operation, the laser module should emit blue light normally.



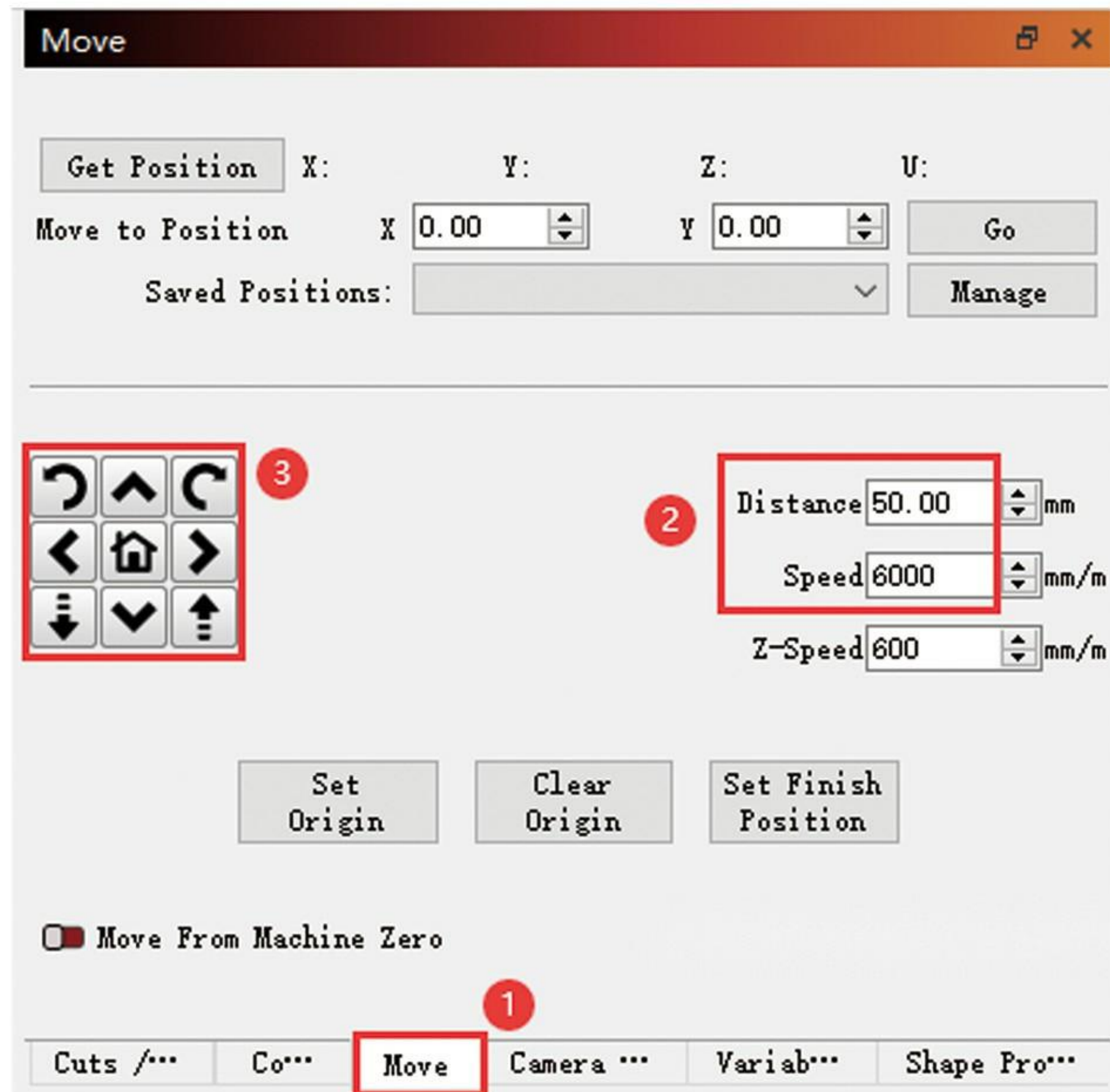
7.2 LightBurn

- 1) Engraving machine reset test: Find "Home" in the lower right corner of LightBurn default interface and click on it. Under correct operation, the laser module should be moved to the side of the control box and stopped moving when it hits the limit column.



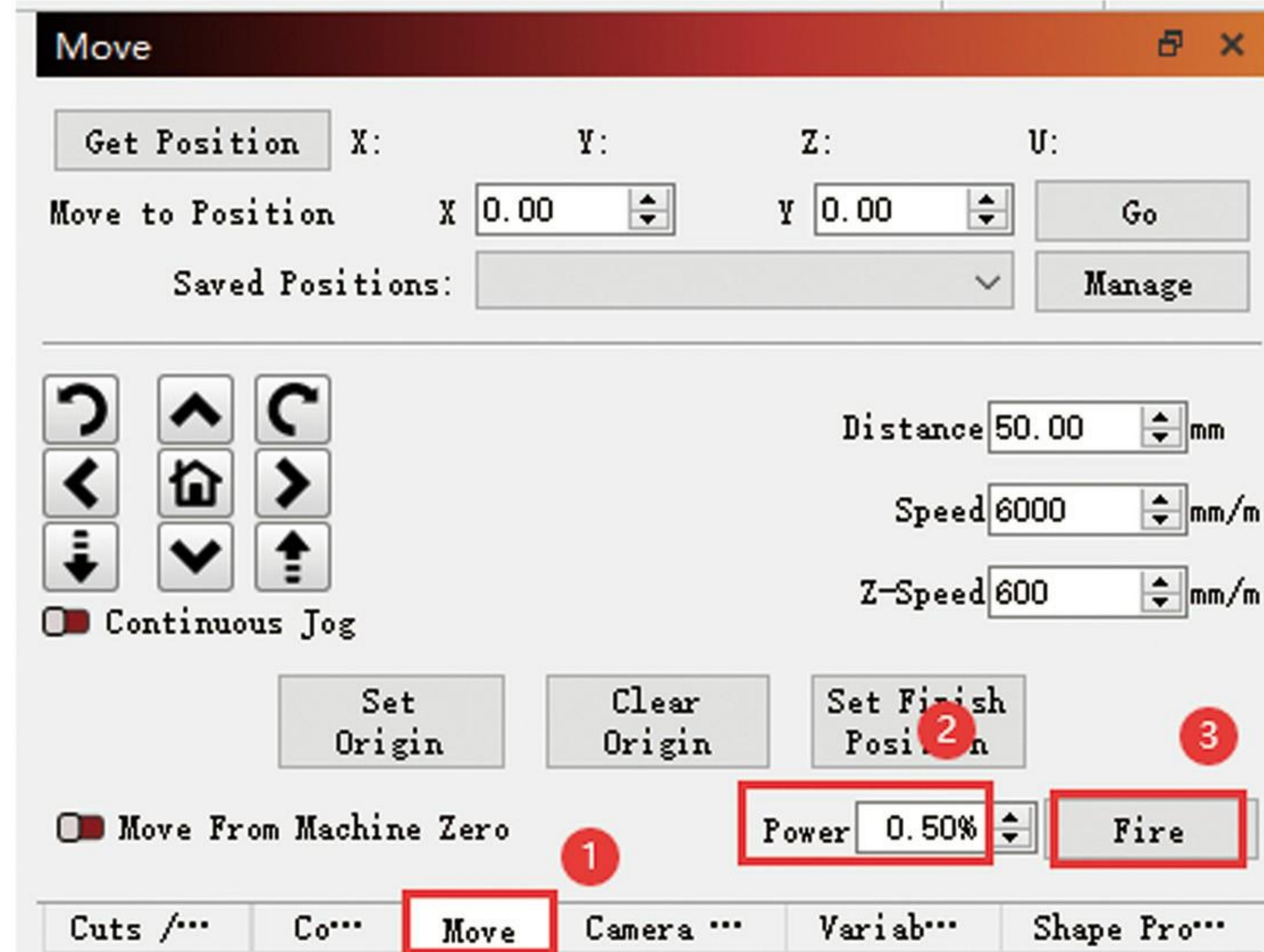
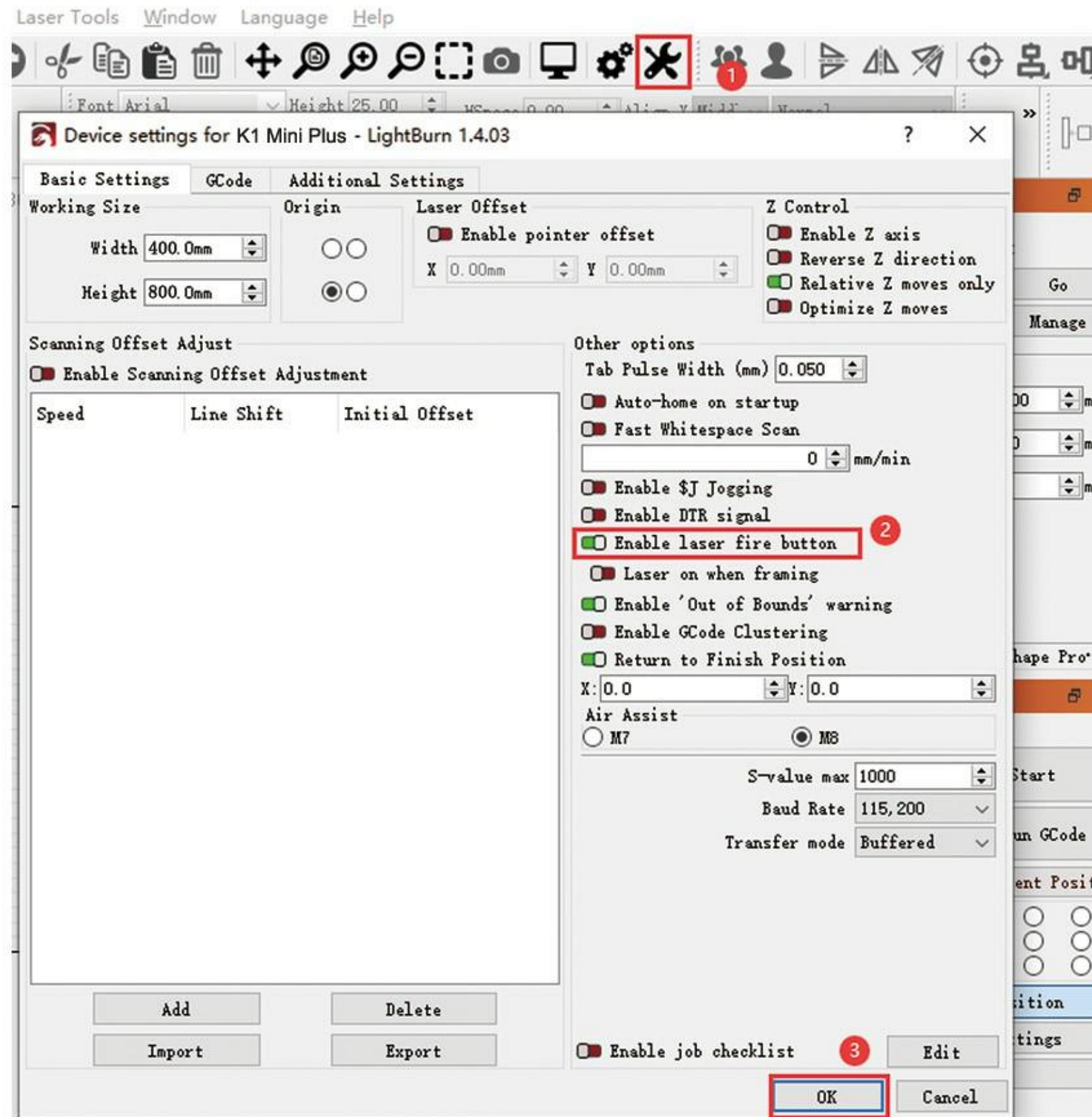
2) Engraving machine movement test:

- ① Find "Move" in the lower right corner of LightBurn default interface and open it.
- ② Set the moving distance and speed. (The recommended moving distance is 50mm.)
- ③ Click in any direction. Under correct operation, the laser module should move in the direction indicated by the arrow.



3) Engraving machine laser module light test:

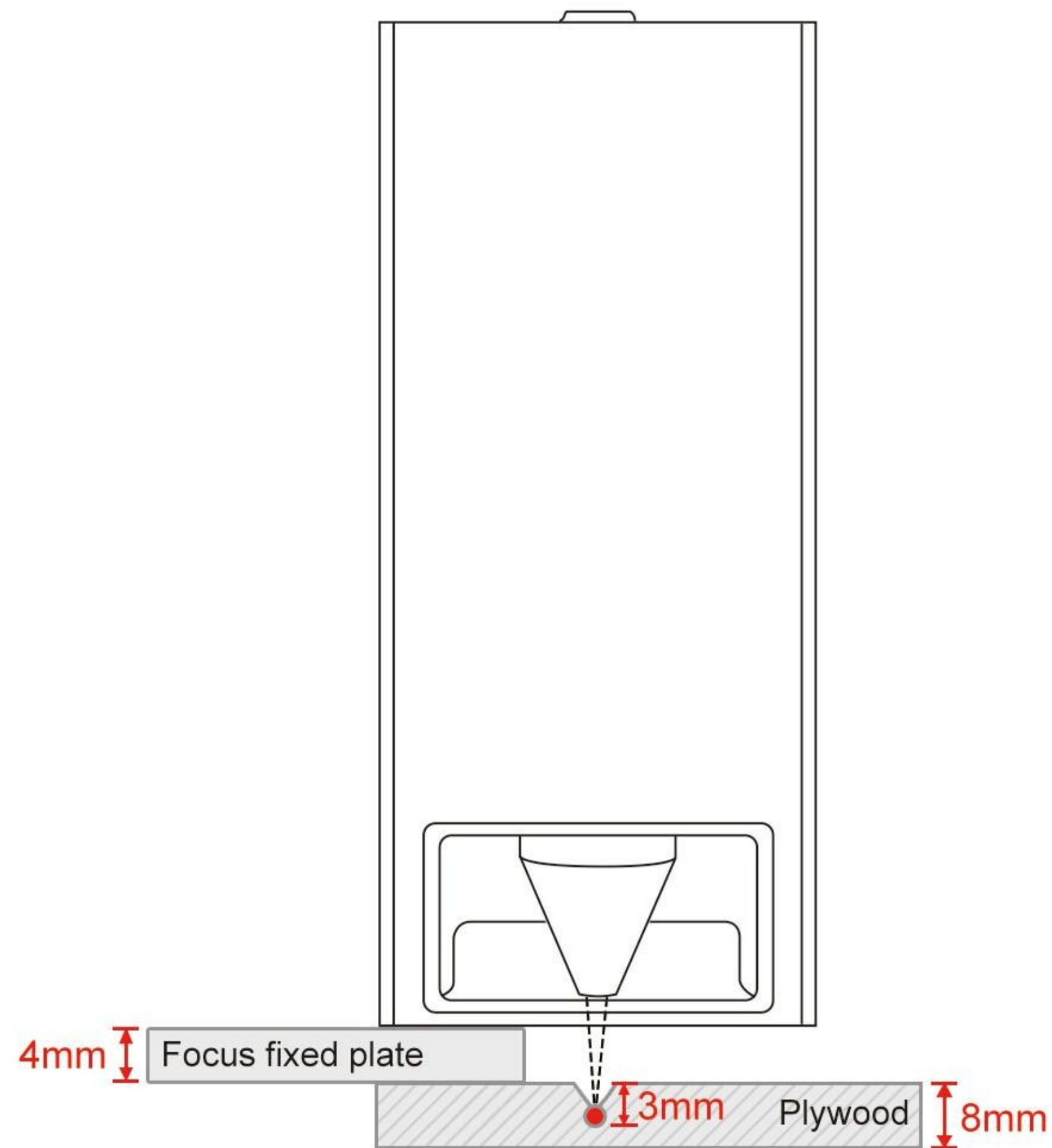
- ① Open the device settings and turn on the laser ignition option.
- ② Find "Move" in the lower right corner of the LightBurn default interface, set the optical power to 0.5% and click "Fire". Under correct operation, the laser module should emit blue light.



8. CUTTING AND ENGRAVING SETTINGS REFERENCE


The K1 Mini Plus 20W laser module has a focal working distance of 7mm.

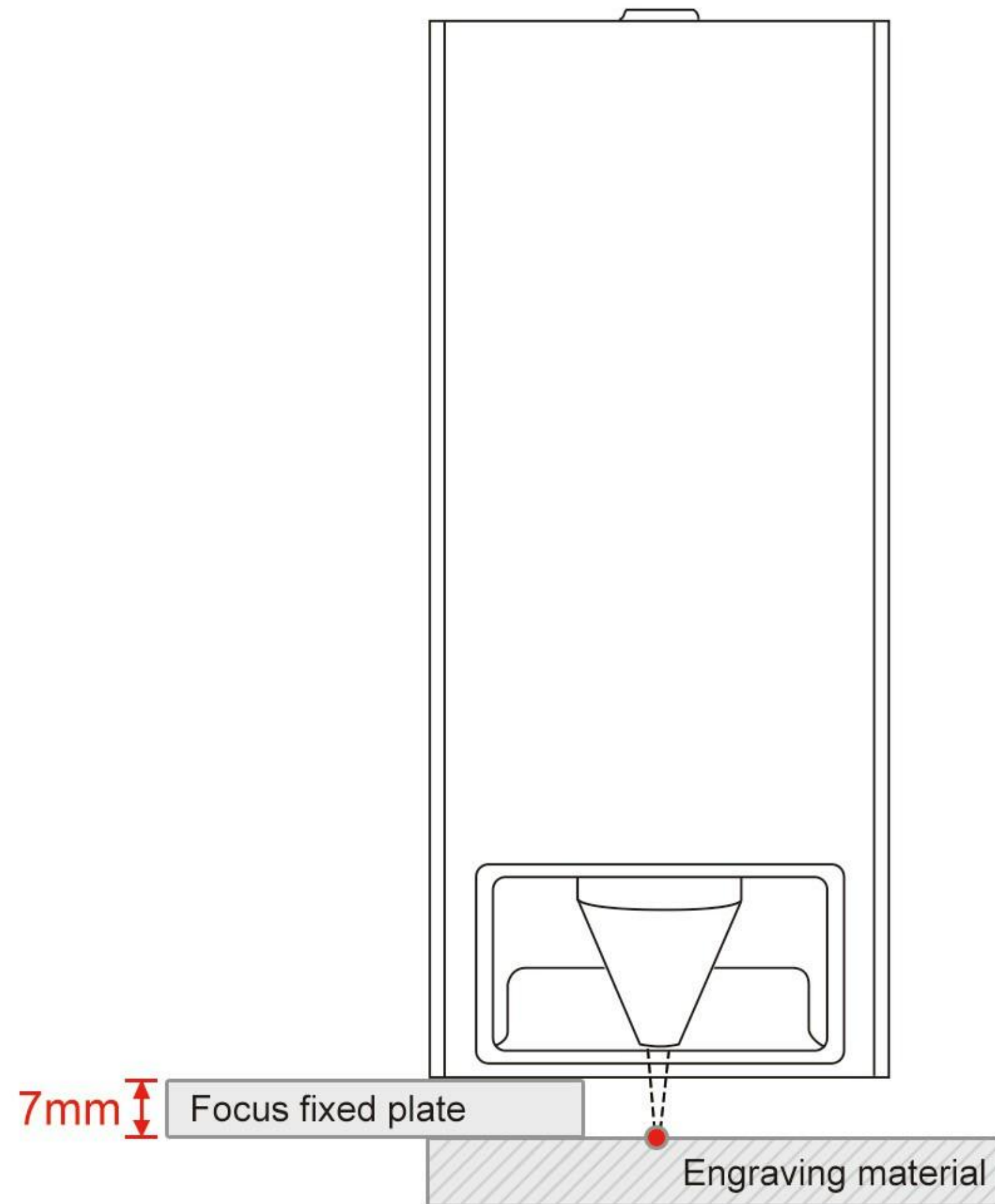
 When cutting, you only need to make the focus locate a bit lower than the surface of materials.



Cutting material	Focus fixed plate(mm)	Recommended speed(mm/min)	power(%)	Interval(mm) / Quality(Lines/mm)
8mm Plywood	4	150	100	1
10mm Plywood	5	100	100	1
3mm MDF	0	350	100	1
5mm MDF	2	200	100	5
8mm Pine Wood	4	150	100	1
10mm Pine Wood	5	100	100	1
15mm Pine Wood	7	70	100	1
3mm Acrylic	7	180	100	1
5mm Acrylic	2	100	100	1
8mm Acrylic	4	20	100	1

For example, if you want to cut 8mm plywood, the focus fixing plate should be 4mm.

 When engraving, please ensure that the focus is located on the material surface.



For example, please use a 7mm focus fixing plate if you want to engrave.

Engraving material	Focus fixed plate(mm)	Recommended speed(mm/min)	power(%)	Interval(mm) / Quality(Lines/mm)
Basswood Plywood	7	11000	35	0.08
Black Acrylic	7	11000	25	0.05
Leather	7	13000	18	0.06
Cork Coaster	7	11000	12	0.08
Rock Slabs	7	8000	20	0.1
Cloth (Suede)	7	15000	14	0.06
Kraft paper	7	13000	50	0.05
Anodized Aluminum	7	5500	50	0.1
Titanium plate	7	4000	90	0.02

Note: When engraving on reflective materials such as mirrors and stainless steel, please paint the surface black to prevent damage to the laser module from reflected light.

9. MAINTENANCE

1. When the laser module is used for a long time, you need to use an alcohol swab to wipe the laser protective lens to ensure the best cutting and engraving performance.

⚠ Caution for lens cleaning:

- Before wiping the lens, make sure the power is turned off and the laser module is disconnected from the engraving machine.
- After wiping, allow the lenses to dry naturally for 3 to 5 minutes before use.

2. When the laser module is not used for a long time, please ensure that the lens is not polluted by dust.



Use the alcohol swab to clean or replace with a spare protective lens.

* For more information about maintenance, please contact us at lasertree@micost-optotech.com.



LASERTREE

Enjoy pleasure of DIY



RoHS



MADE IN CHINA