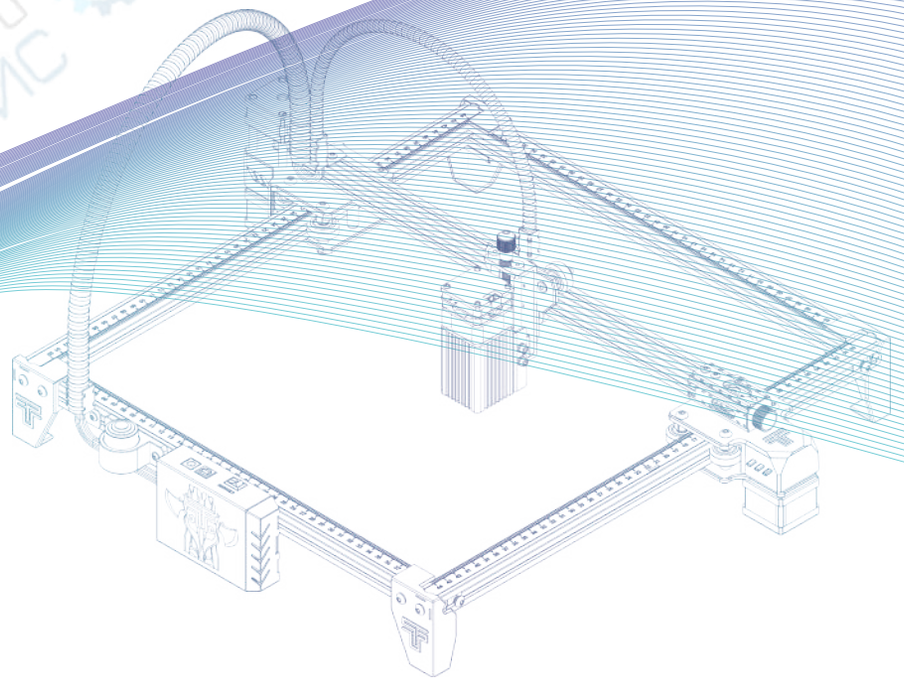
TWO TREES

PRODUCT MANUAL

BURN DOWN ETERNITY

Laser engraver



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Note: The picture is for reference only, the actual product shall prevail

MADE IN CHINA

LETTER FROM TWOTREES 致客户的一封信

Dear Customers,
Thank you for choosing us.
It's customer-oriented idea, continuous innovation and pursuit of excellence that enable everybody to have wonderful experience in using process.
We believe that this manual will be helpful.
Hope you enjoy the good time with TwoTrees.

If you have any problems, please feel free to contact us via:

Website: www.twotrees3d.com
Facebook: https://www.facebook.com/groups/twotrees3Dprinter/
For general inquiry: info@twotrees3dcom For technical support: service@twotrees3d.com
We will contact you within 24 hours.

Sincerely yours,

TwoTrees Team

亲爱的客户：
感谢您选择了我们品牌。
我们一直以客户为导向，不断创新，追求卓越，使每个人都能在使用过程中拥有丰富的体验。
希望您能享受与俩棵树相伴的好时光。

如果您有任何问题，请随时与我们各购买平台的客服联系。
其他联系渠道有：

网站：www.twotrees3d.com
售后邮箱：service@twotrees3d.com
咨询邮箱：info@twotrees3d.com
我们将在24小时内联系上您。

祝您生活愉快！

俩棵树团队

PRECAUTIONS 注意事项

Please follow the instruction, due to misuse will be at your own risk.
请按照说明进行操作，滥用风险自负。

1. Avoid looking steadily at the laser, which may damage your eyes.
   避免长时间直视激光，可能导致视力受损。
2. Avoid touching directly during the machine working.
   避免在运作时用肢体接触机器。
3. You can place a metal plate under the engraved or cut object to prevent your table being burned through.
   雕刻前你可以找一块金属平板放在雕刻或切割的物体下方，防止桌面受损。
4. Avoid combustible object or gas.
   避免可燃物体或气体。
5. Keep it away from children or pregnant women.
   远离儿童或孕妇。
6. Do Not take apart the laser without instructions.
   请勿擅自拆解激光器。
7. Do Not use it on material that reflects the light.
   请勿在会反射光的材料上使用。
8. Wear goggles while taking off the laser cover.
   使用时如取下激光罩需戴上护目镜。
9. Turn off the power when not use.
   不使用时请关闭电源。

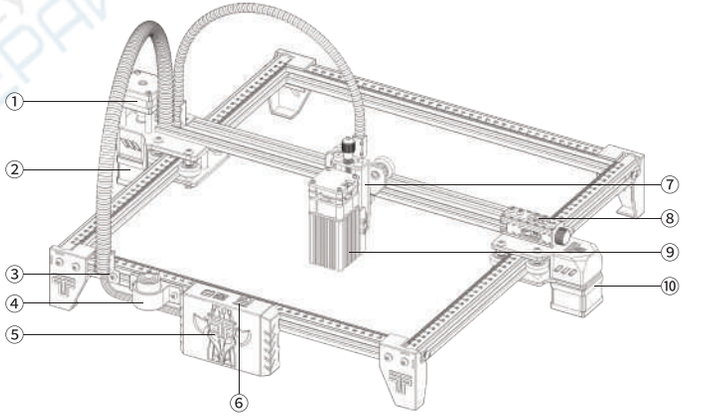
SAFETY GUIDELINES 安全指导

Warning: Laser engraving machine cannot directly carve or cut material that reflects the light; may cause injury.
警告：激光雕刻机不能直接作用于镜面物体，这可能会对操作员造成伤害或激光灼伤。
The product has a high engraving speed and is not recommended for industrial cutting. And the laser head is a consumable.
该产品雕刻速度快，不建议用于工业加工。而且激光头是消耗品。
Do not operate the laser head directly with your hands. Please wear goggles.
在机器上工作时，不建议直接看激光头。请勿直接用手操作激光头。
The laser diode is a sensitive component, please prevent static damage. (This product has an electrostatic protection design, but there is still a possibility of damage).
激光二极管是一个敏感组件，请注意避免静电损坏（本产品有静电保护设计，但有损坏的可能）

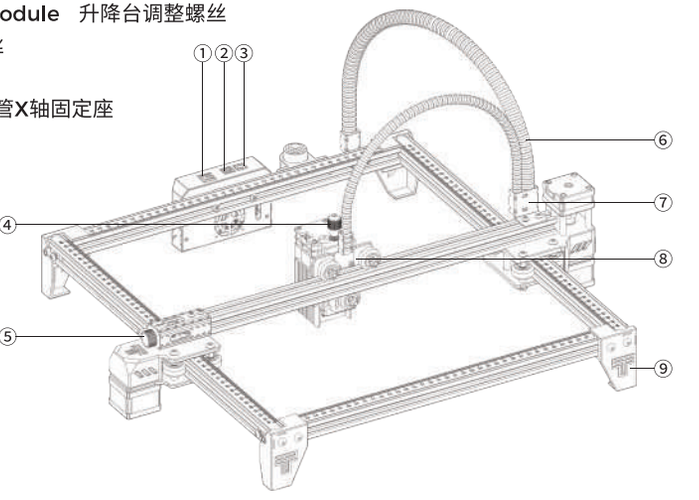
CONTENTS 目录

ABOUT YOUR MACHINE 关于机器

1. X-axis motor X轴电机
2. Y1 motor Y1电机
3. Bellows holder 波纹管固定座
4. Fixed-length column holder（optional） 定焦柱放置架(选配)
5. Motherboard 主板
6. TF card slot TF卡槽
7. Lifting Module 升降模组
8. Tensioner 张紧器
9. Laser head 激光头
10. Y2 motor Y2电机



1. Switch 电源开关
2. USB port USB接口
3. Power jack 电源接口
4. Adjusting screw of lifting module 升降台调整螺丝
5. Thumb screw 张紧器手拧螺丝
6. Bellows 波纹管
7. Bellows X-axis holder 波纹管X轴固定座
8. Carriage 马车
9. Foot pad 垫脚



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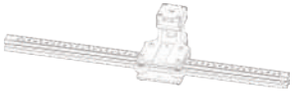
PART LIST 配件表

Y-axis right frame X1
Y轴框架右部件



Y-axis left frame X1
Y轴框架左部件

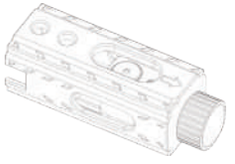
Y-axis front profile X1
Y轴框架前型材

M5*20 X8

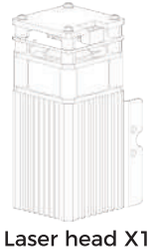
M4*20 X10

M5*10 X4

Y-axis back profile X1
Y轴框架后型材



Tensioner module X1
张紧器工具包

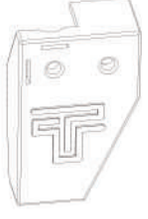


Laser head X1
激光模组

M4*50 X3

M3*8 x4

Laser Goggles X1
激光护目镜



Foot Pad X4
脚垫

Carriage and lifting module X1
马车与升降模组

X-axis beam X1
X轴横梁

Power Supply X1
电源

USB Cable X1
USB数据线

Tool Kit X1
工具包

Motherboard and wires X1
主板与线材

Bellows X axis Holder X1
波纹管X轴固定座

Bellows Holder X1
波纹管固定座

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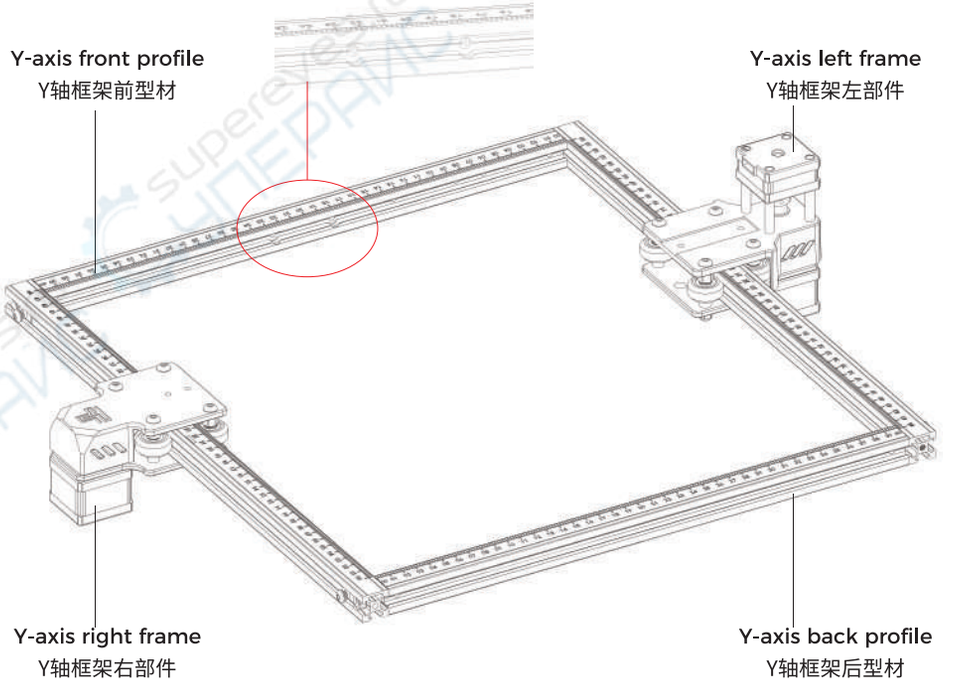
MAIN PARAMETERS 机器参数

Model 型号	TTS
Machine Size 机器尺寸	570*510*150 mm
Machine Weight 机器重量	3 kg
Engraving Size 雕刻范围	300*300 mm
Laser Wavelength 激光波长	445±5 nm
Engraving Method 雕刻方式	USB Connect PC USB联机
Engraving Accuracy 雕刻精度	0.1 mm
Engraving Speed 雕刻速度	10000mm / min
Software Support System 软件支持系统	Mac, Windows
Material 机器材质	Aluminum Profile + Plastic Parts 铝型材+塑料件
Electrical Requirement 电源	12V 4A DC
Motherboard 控制板	LTS ESP32 Motherboard主板 (32bit)
Laser Power 激光功率	DB-5500S / DB-5500 / DB-2500mW (Optional可选)
File Format 软件识别文件格式	NC, DXF, BMP, JPG, PNG, GCODE
Supported Software 支持软件	LaserGRBL (Windows系统), Lightburn (Common通用)
Power Type 电源类型	USA / EU Plug 国标 / 欧标 / 美标 (Optional可选)
Software Support Languages 软件支持语言	Chinese, English, Italian, French, German 中文、英文、意大利语、法文、德语
Working Environment 工作环境	RHTemperature 5-40℃, Humidity 20-60%RH 温度5-40℃，湿度20-60%
Engraving Materials 雕刻材质	Wood, Plastic, Paper, Leather, Sponge Paper, Alumina 木板、塑料、纸质、皮革、海绵纸、氧化铝
Engraving Mode 雕刻模式	Image carving / Text carving / Scanning carving / Contour carving / Pixel carving 图形雕刻、文件雕刻、扫描雕刻、轮廓雕刻、像素雕刻

ASSEMBLY 机器组装

1. Install the frames 组装框架

After assembly of frames 组装框架效果图



Note:

① The position of each frame cannot be changed.

② The countersunk head pore (the enlarged part) of Y-axis front profile faces inside.

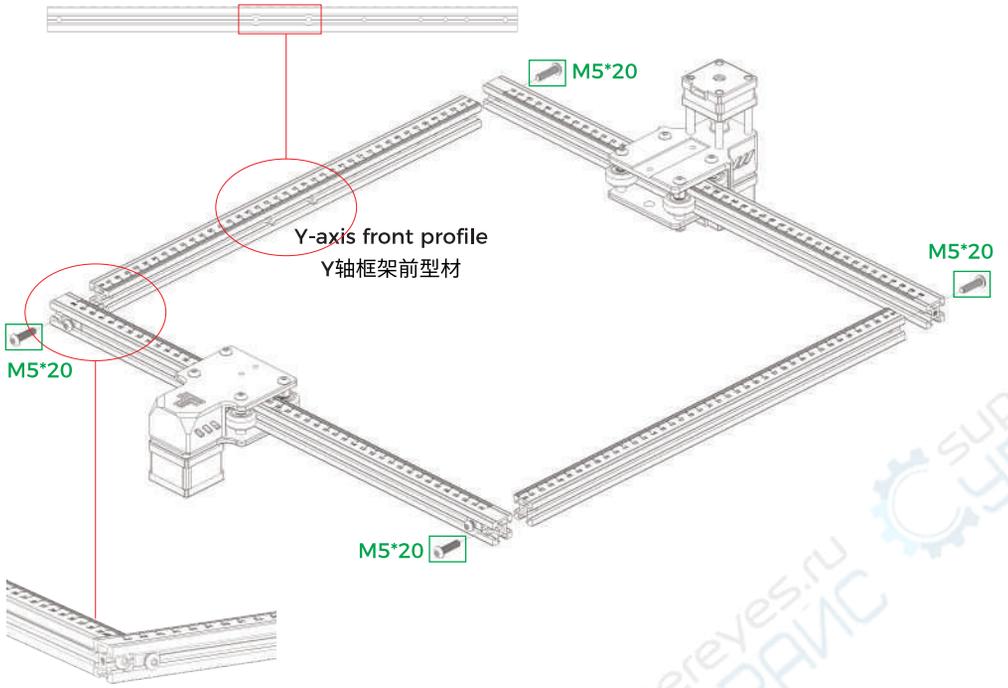
注：①左右部件不能安装错误 ②Y轴框架前型材的沉孔（标识位置）朝内

1.2 Install the frames 组装框架

Screw 螺丝 M5*20 x 4

The countersunk head pore of Y-axis front profile faces inside. And the graduated side faces up. The profile scale is used to measure the size of the engraved object.

注:Y轴框架前型材该孔位朝内,型材刻度朝上。型材刻度作用是测量雕刻物体尺寸。



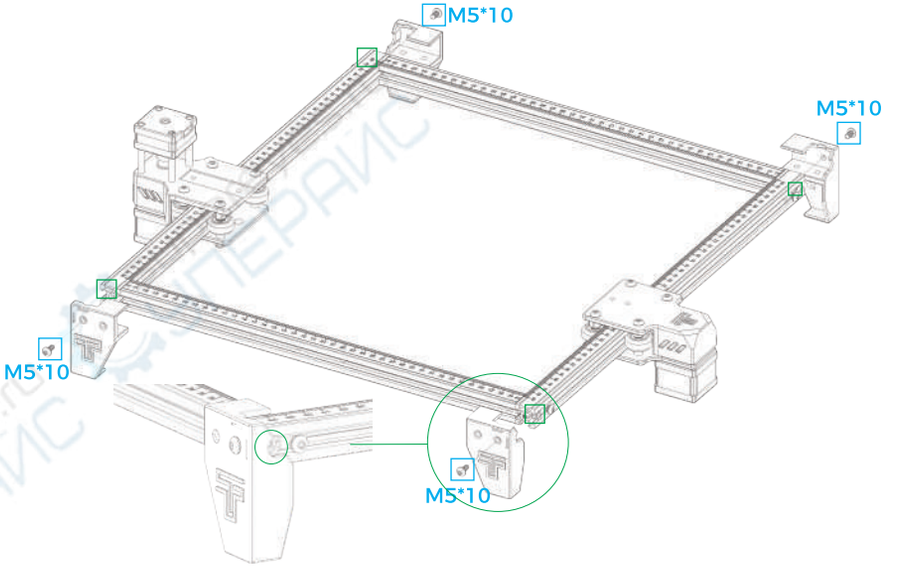
1. First you need to install the frame while you don't need to tighten the screws;
2. Make sure all profiles align.

1. 先将机器框架组装好(螺丝不需要拧紧) 2. 保证型材对齐

2. Install the foot pads 安装脚垫

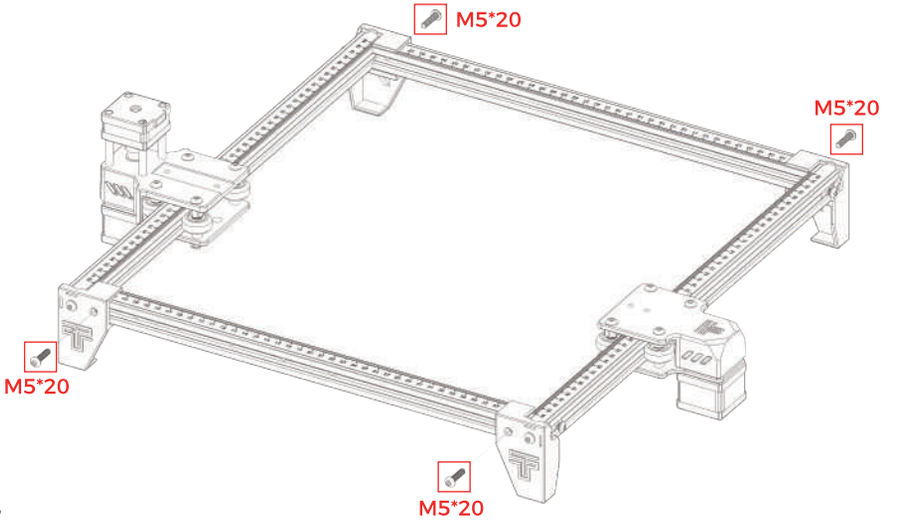
Screw 螺丝 M5*10 x 4

① Push the foot pads in. First tighten the screw M5*10 in blue area, and then tighten the screw M5*20 in green area
脚垫推入,在锁上外侧的蓝框内的M5*10螺丝后,再将绿框对应位置的M5*20螺丝拧紧;



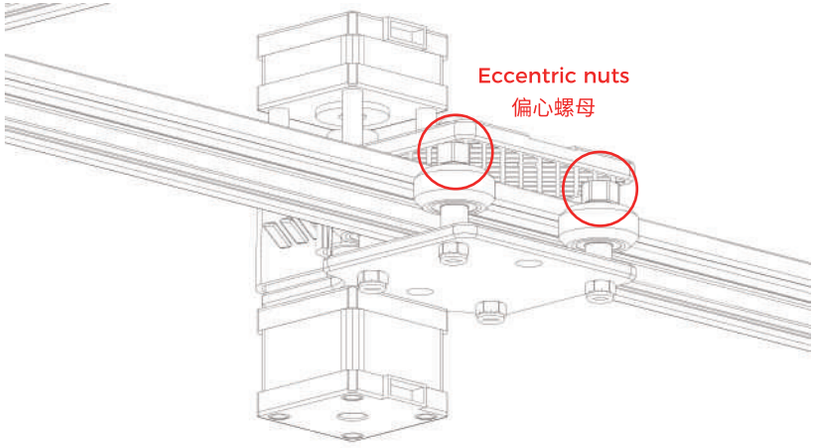
螺丝 Screw M5*20 x 4

② Finally, tighten the M5*20 screws in red area. Note: Please follow the steps above to tighten the M5*20 screws.
最后将红框对应位置的M5*20螺丝锁上。注意:请按照上述步骤顺序拧紧M5*20螺丝。

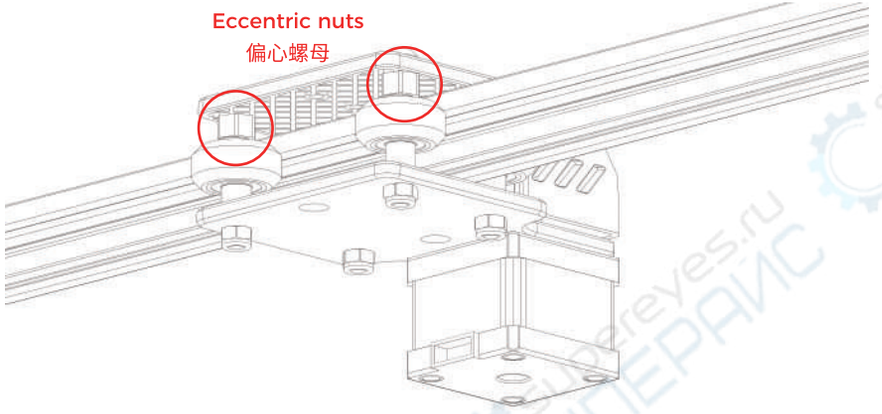


Check that the POM wheels of the left and right units of the Y-axis fit the profiles, ensuring smooth movement without jamming.
检查Y轴左右部件Pom轮贴合型材，移动顺畅没有卡顿

Left unit 左装配体



Right unit 右装配体

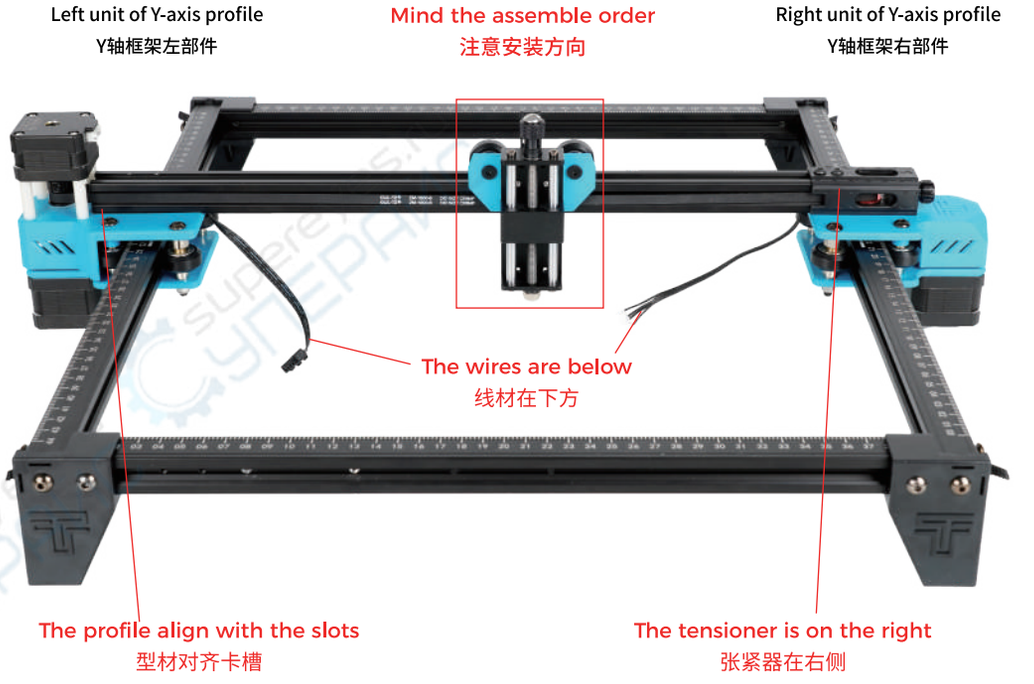


Note: ① It is the most appropriate position to feel a little friction between the POM wheel and the profile when rotating the POM wheel.
② If the wheel is hovering and rotating,it does not fit the profile the eccentric nut can be adjusted clockwise from the screw head with a wrench.

注：①转动Pom轮，感受到Pom轮与型材之间有一点点摩擦力时为最佳。
②如果出现轮子悬空转动没有贴合型材 可以从螺丝头方向顺时针用扳手调节偏心螺母。

3. Install the X-axis 组装X轴

After assembly of X-axis 组装X轴预览图



Note: Synchronous belt to pay attention to the installation of the way and location, to prevent the assembly of the synchronous belt can not be adjusted after the need to disassemble the profile

注：同步带要注意安装的方式和位置，防止出现组装后同步带无法调整需要拆卸型材的情况

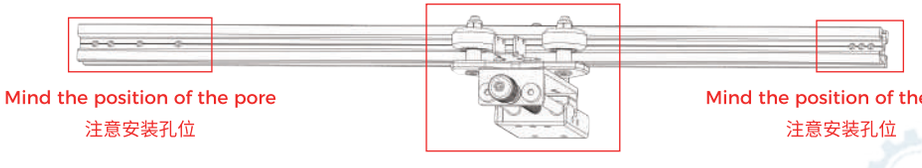
3.1 Install the carriage 安装马车

Push the carriage into the X-axis beam 将马车推入X轴横梁中

The wire passes through the middle of the POM wheel, and then pushes into the alignling groove

线材穿过POM轮中间，然后再推入导向槽

Note 注意 ①



Mind the position of the pore

注意安装孔位

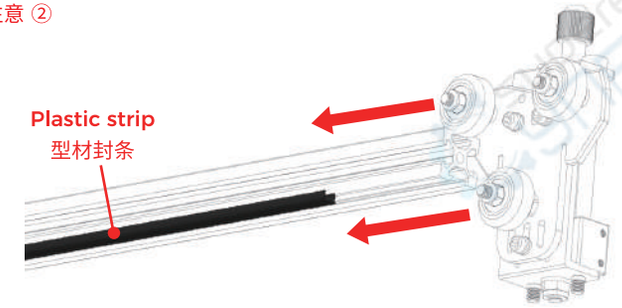
Mind the position of the pore

注意安装孔位

Mind the installation direction

注意安装方向

Note 注意 ②



Plastic strip

型材封条

The plastic strip of the profile faces below. And the wire is pressed inside it.

型材封条在下方，线材是压在封条里面的

3.2 Assemble the tensioner 组装张紧器

Screw 螺丝M4*16

Tensioner internals

张紧器内件

Note: You need to first disassemble the tensioner module before the steps below.

① First slide the synchronous belt into the idler.

② Then insert the idler covered with synchronous belt into the tensioner inner part, and tighten the M4*16 screws.

③ Push the assemble inner part into the outer part.

注意：在进行下面的步骤之前，你需要先拆卸张紧器模块。

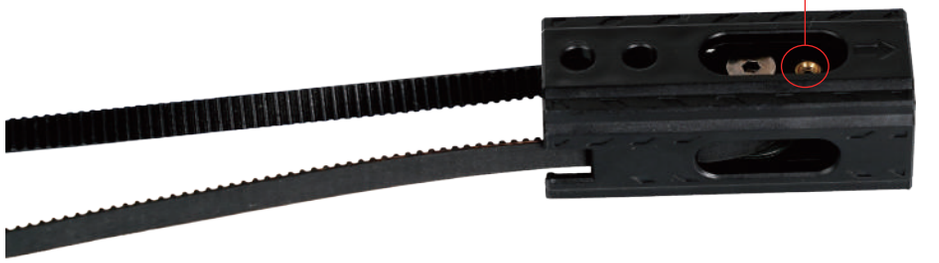
① 先将同步带套进惰轮

② 再将套上同步带的惰轮塞进张紧器内件中，并锁上M4*16螺丝

③ 将组装好的一套内件推入张紧器外件中

Holes face up

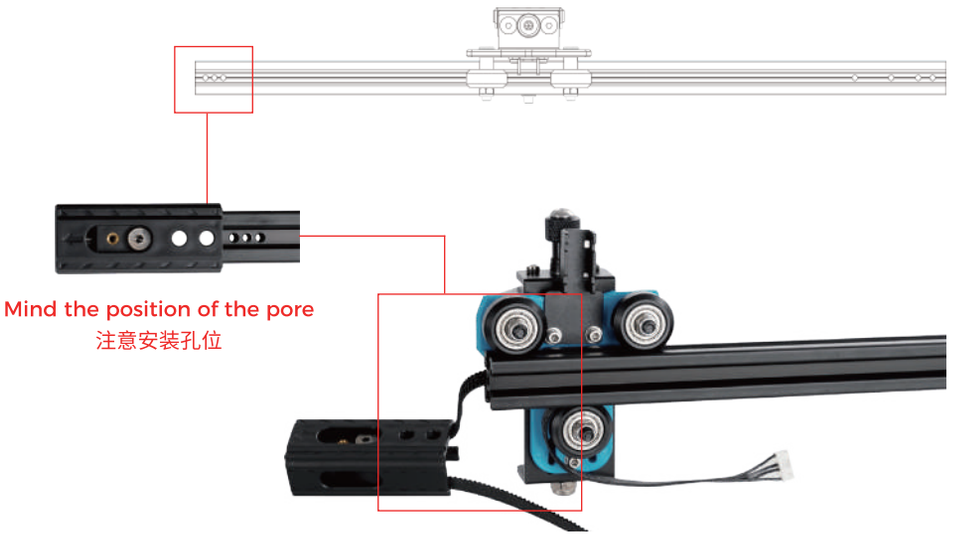
孔位朝上



After assembly

组装后效果图

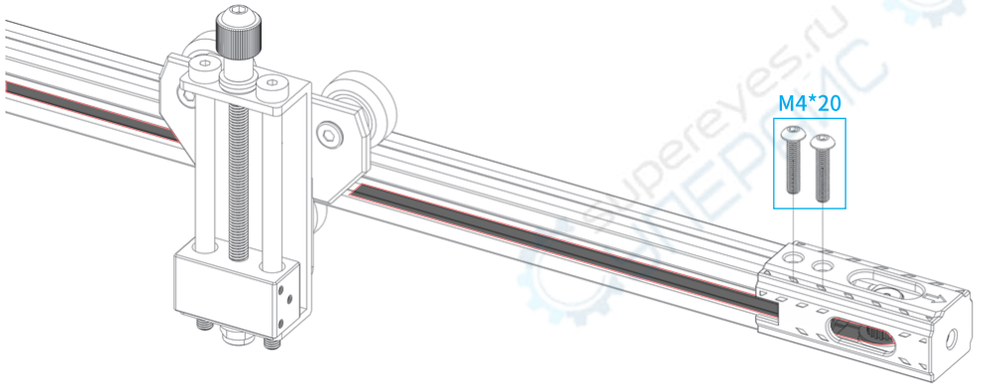
3.2.1 Install the tensioner 安装张紧器



Mind the position of the pore
注意安装孔位

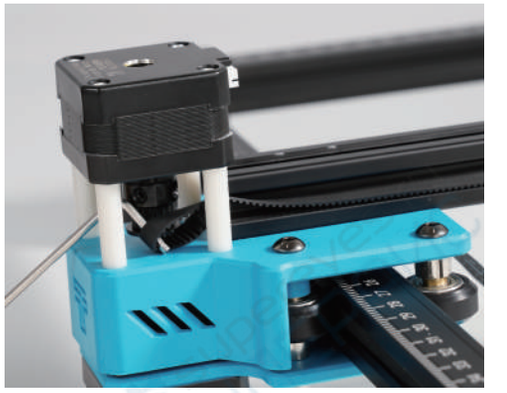
Note: The carriage need to be pushed along the right direction.
注：马车推入方向正确。

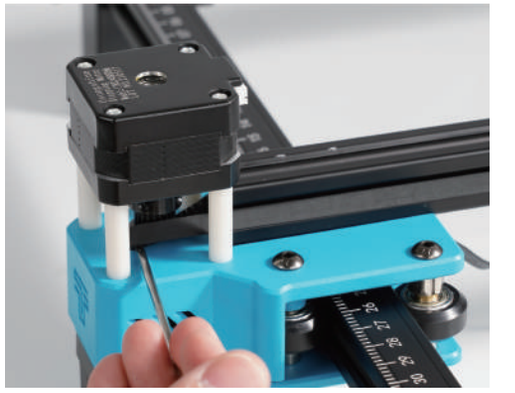
Screw 螺丝 M4*20 x2



The teeth of the synchronous belt face to the aligning groove
同步带的齿应对着导向槽

3.2.2 Insert the X-axis synchronous belt onto the synchronous pulley by the tool.
使用工具将X轴同步带，套进同步轮上

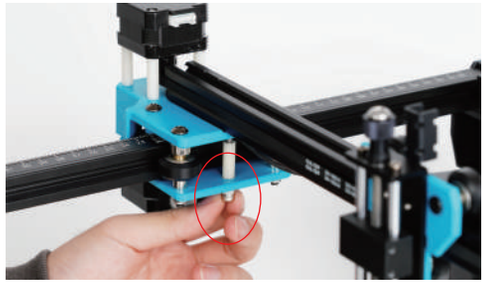


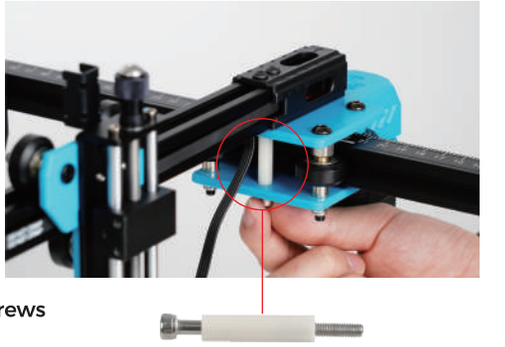


The teeth of the synchronous belt face to the aligning groove
同步带的齿应对着导向槽

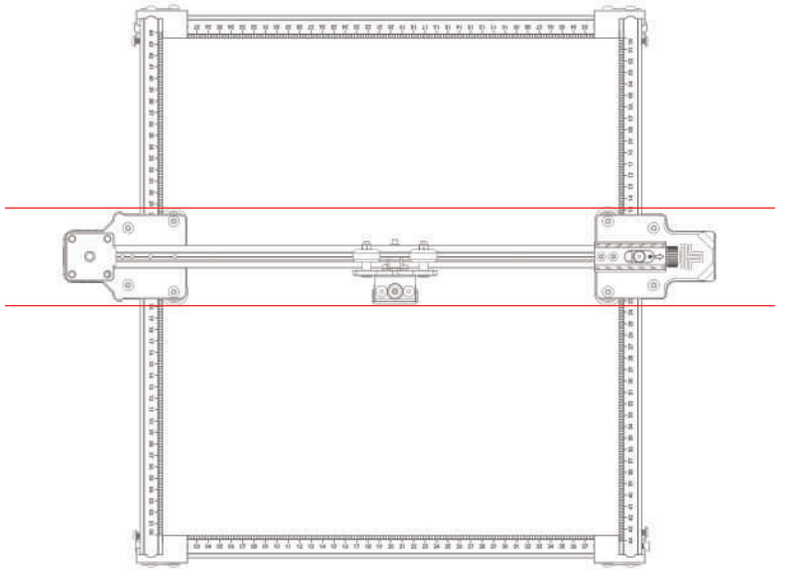
4. Fix the X-axis beam 固定X轴横梁

The X-axis beam aligns the groove. X轴横梁对好槽位





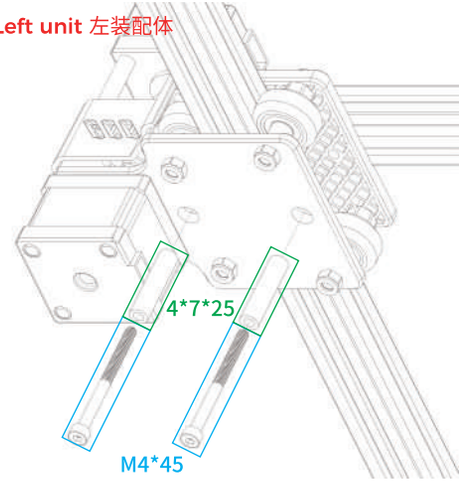
First tighten both sides of the internal M4*45 screws
先固定两侧内部的M4*45螺丝



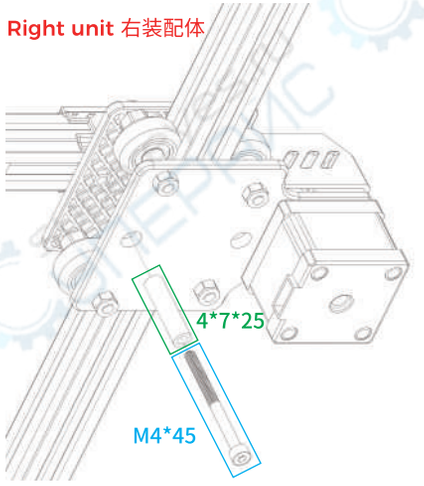
Note: Align the X-axis profiles by the scales on both sides so that they are parallel.
注:利用两侧的刻度,对齐X轴型材,使其在一条直线上

Insulation column 隔离柱 4*7*25 x 3
Screw 螺丝 M4*45 x 3

Left unit 左装配体

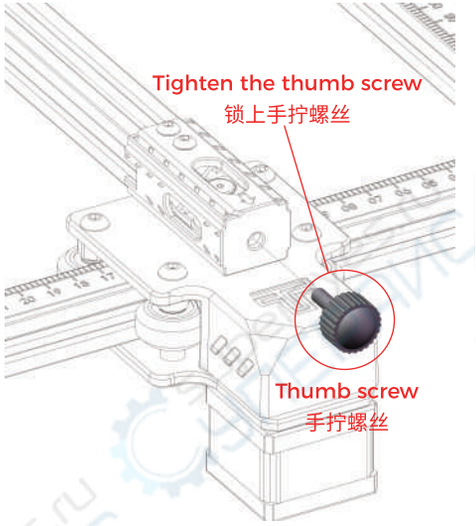


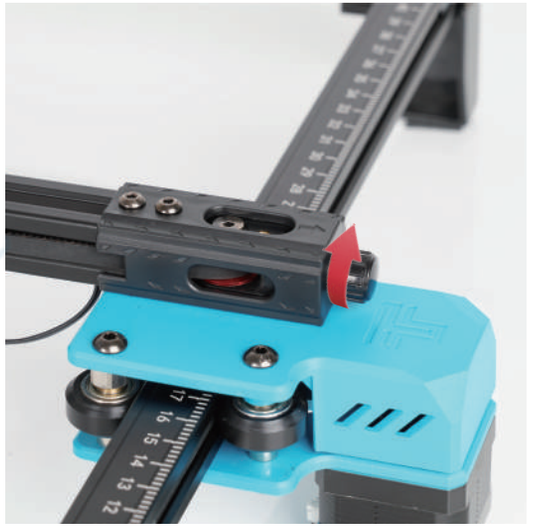
Right unit 右装配体



Then tighten the M4*45 screws.
然后再将M4*45螺丝锁紧

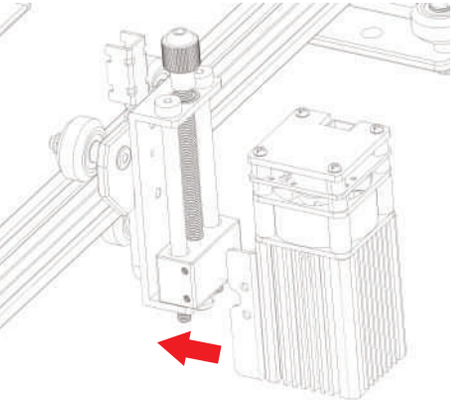
5. Tighten the X-axis synchronous belt. 将X轴同步带扯紧

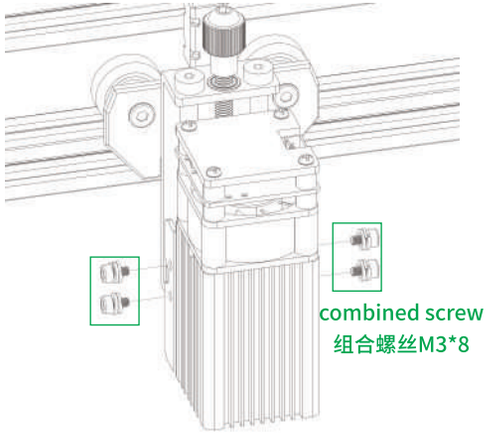




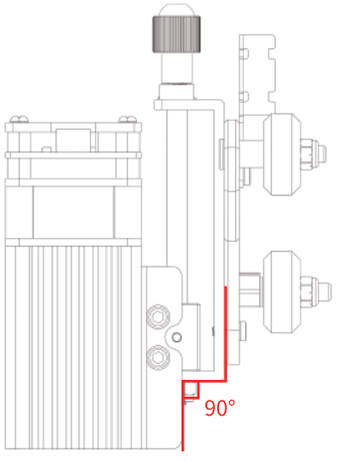
6. Install the laser head 安装激光头

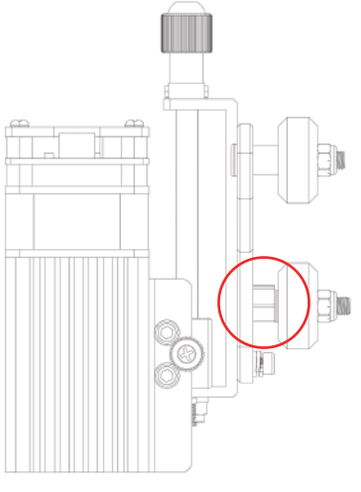
Combined screw 组合螺丝 M3*8 x 4

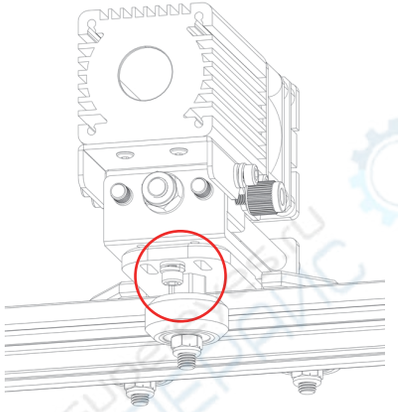




Note: Install the laser head at a vertical angle (90˚).
注意：安装激光头要保证组装角度垂直，呈90度





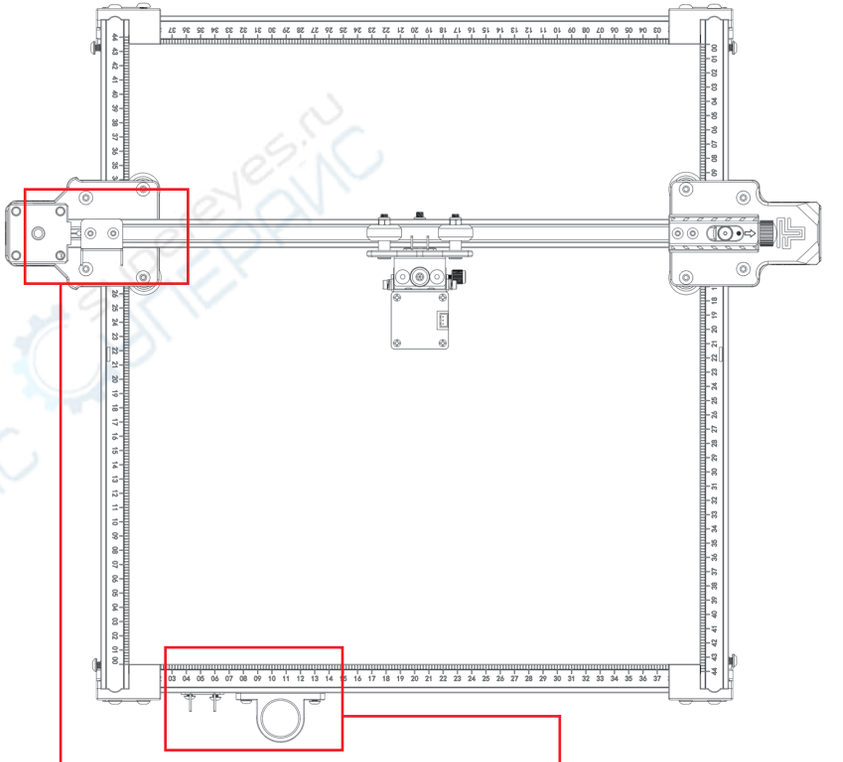


Note: ① It is the most appropriate position to feel a little friction between the POM wheel and the profile when rotating the POM wheel.
② If the wheel is hovering and rotating,it does not fit the profile the eccentric nut can be adjusted clockwise from the screw head with a wrench

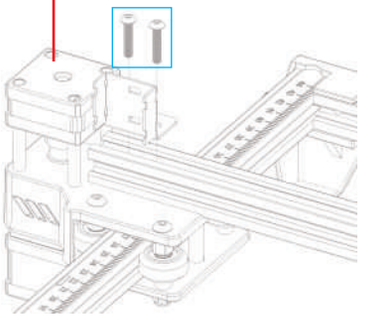
注：①转动Pom轮，感受到Pom轮与型材之间有一点点摩擦力时为最佳。
②如果出现轮子悬空转动没有贴合型材 可以从螺丝头方向顺时针用扳手调节偏心螺母

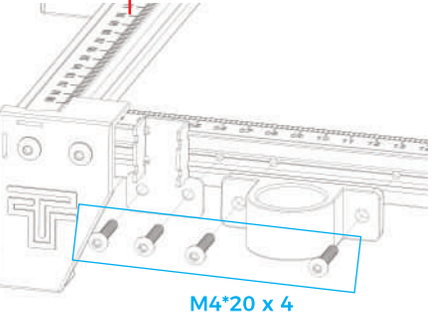
7. Install the bellows holder and Fixed-length column holder
安装波纹管固定座和定焦柱放置架

Screw 螺丝 M4*20 x 6



M4*20 x 2

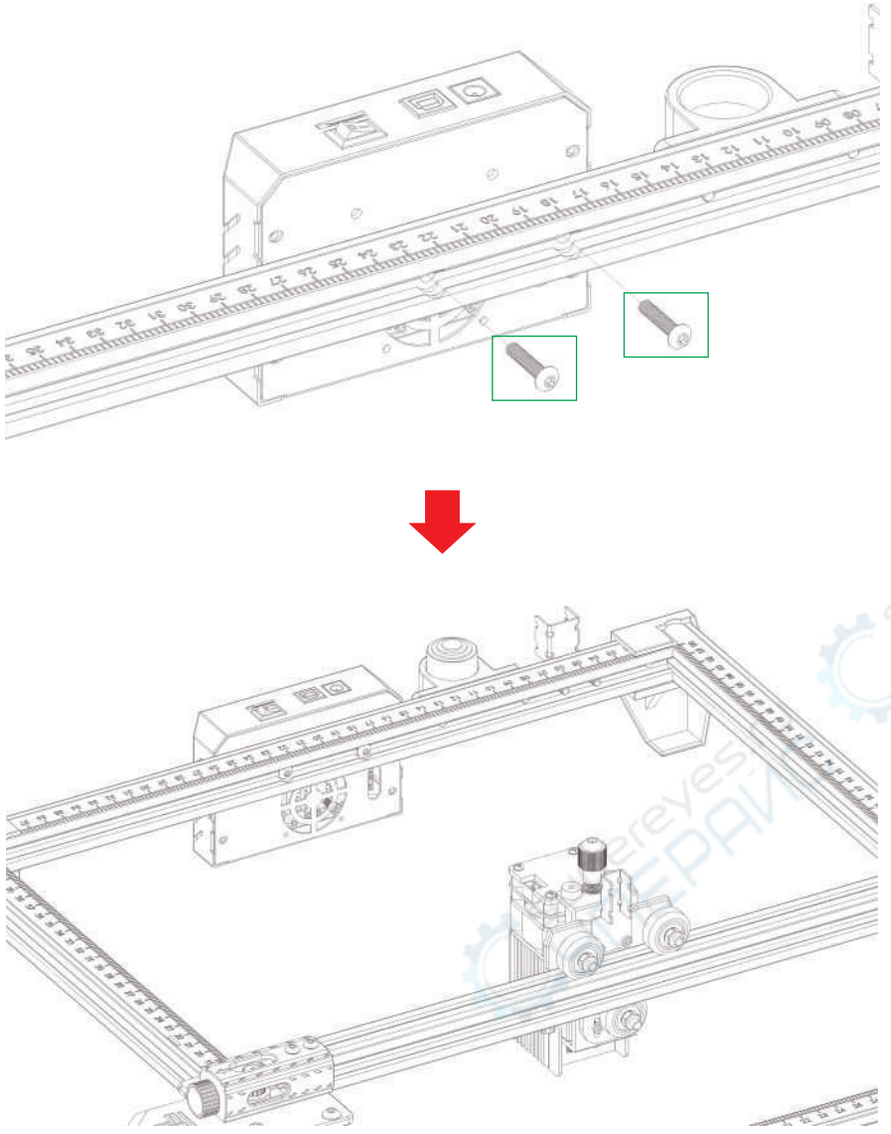




M4*20 x 4

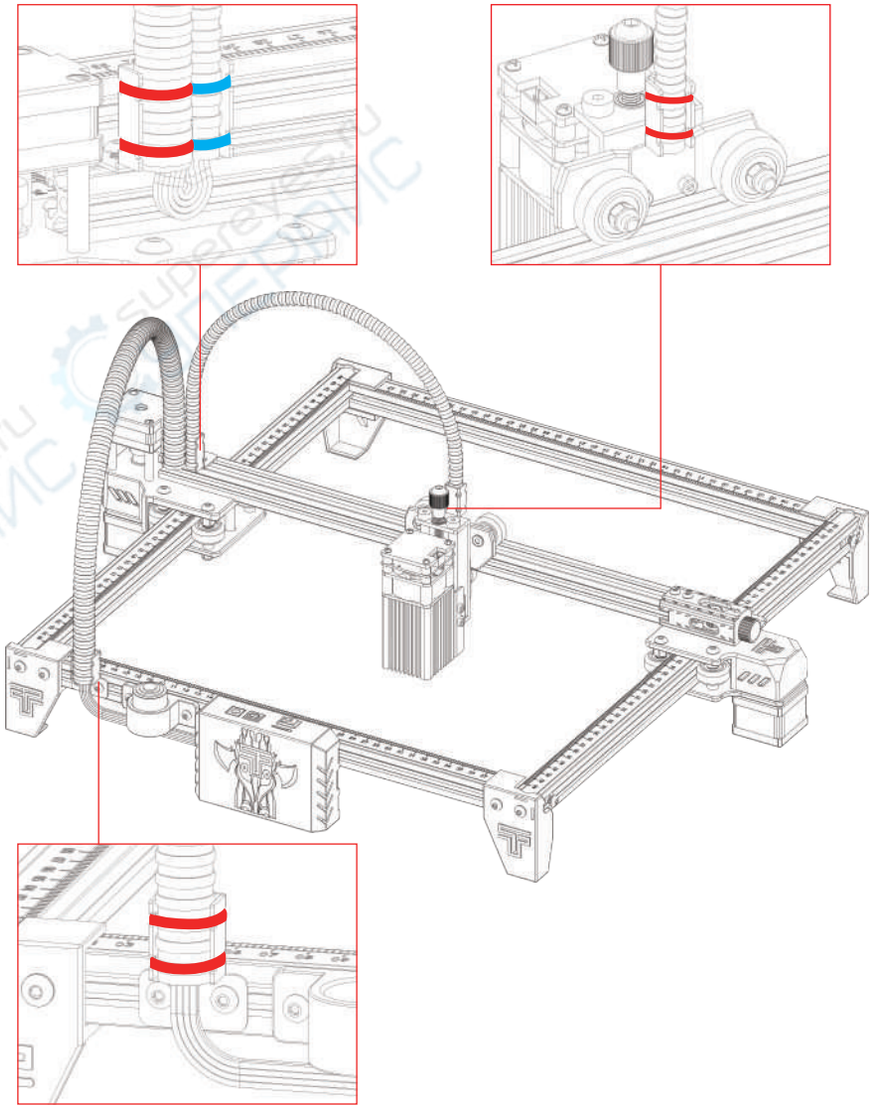
8. Install the motherboard box 组装主板盒

Screw 螺丝 M4*20 x 2



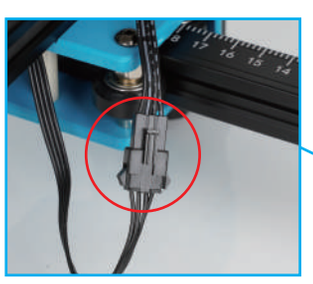
9. Install the bellows 安装波纹管

Note: Fix the bellows with black wire tie.
注：使用扎带固定波纹管



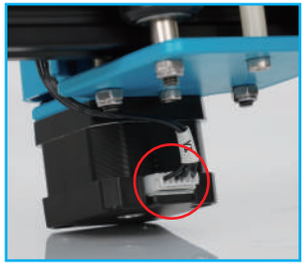
supereyes.ru СУПЕРАЙС

WIRING 接线

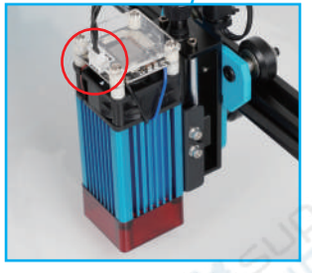


Y2 connector接口

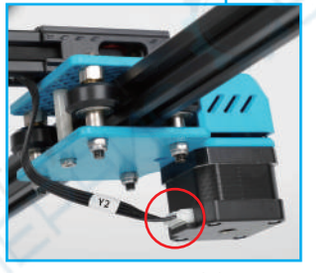
X-axis motor X轴电机



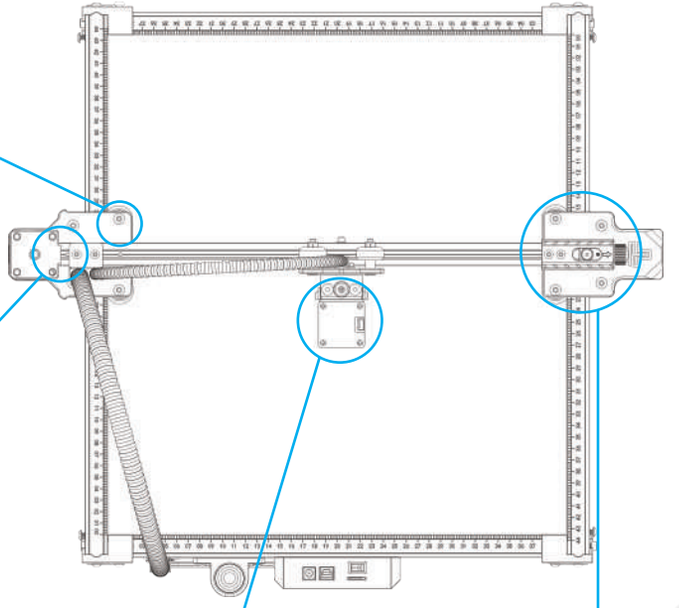
Y1 Motor 电机



Laser head 激光头



Y2 motor电机



Note: Incorrect connection between X-axis and Y1 motor line will lead to abnormal movement.

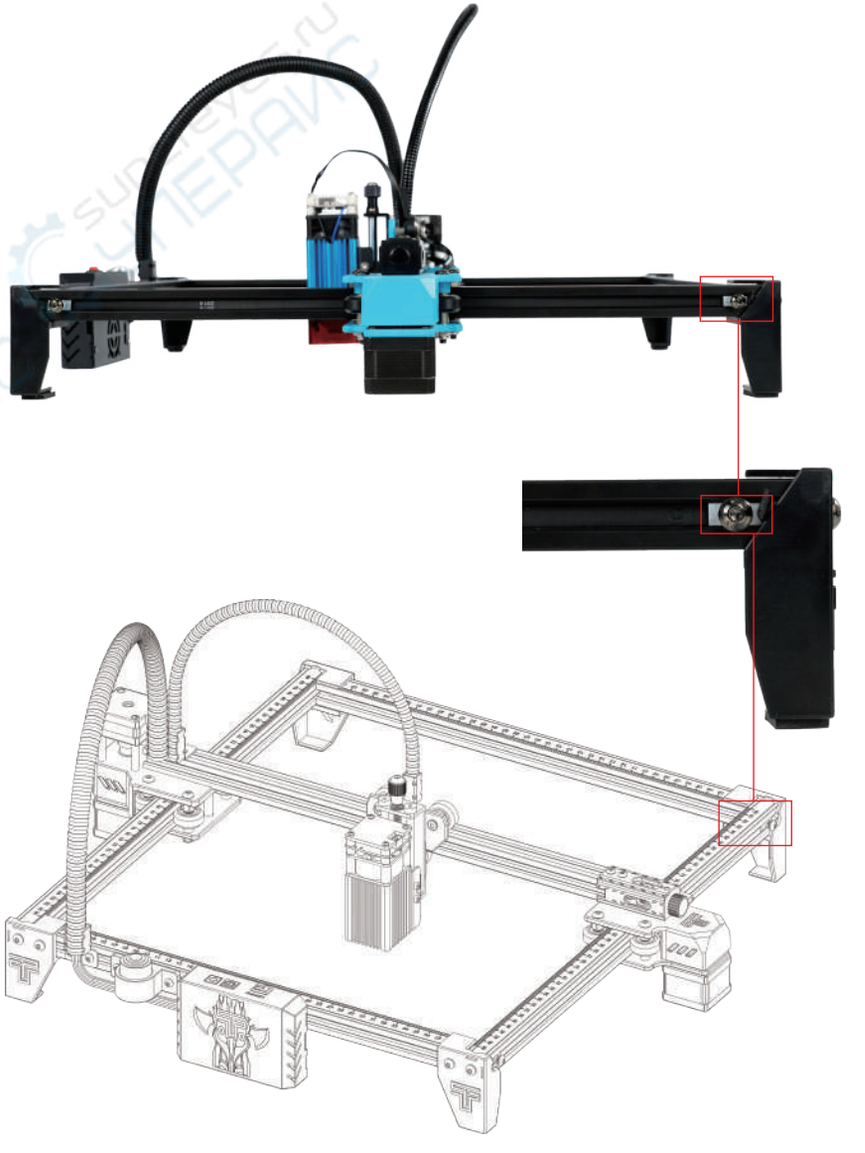
注意：X轴电机线和Y1电机线接线错误会导致移动出现异常。

ADJUSTMENT 机器调整

Method to adjust the synchronous belts on both sides 两侧同步带调整方法

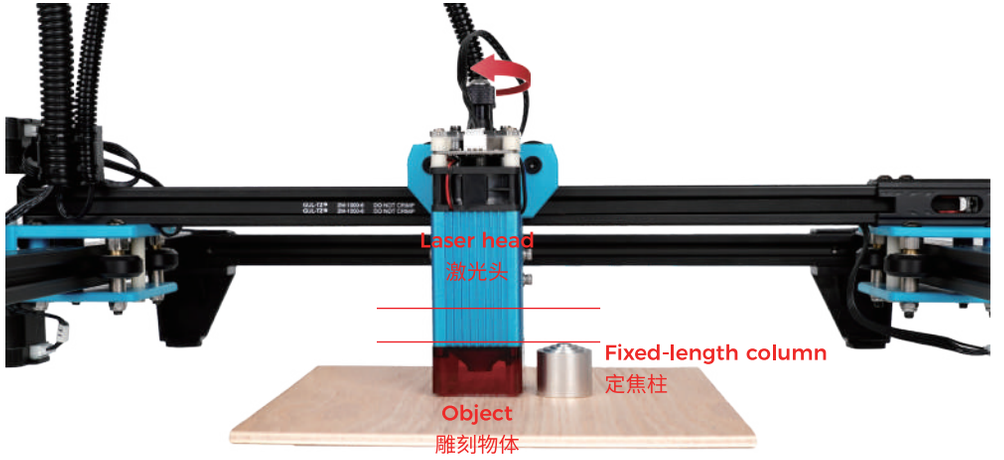
If they loose, first loosen the pressing screws on both sides, then fasten the synchronous belt, and push the pressing screws to the corner and tighten them.

如果松动的情况出现，将两侧的压片螺丝松开，扯紧同步带后将压片螺丝推到角落并锁紧。



ADJUST THE FOCUS 焦点调整

Method 1 调焦方式1



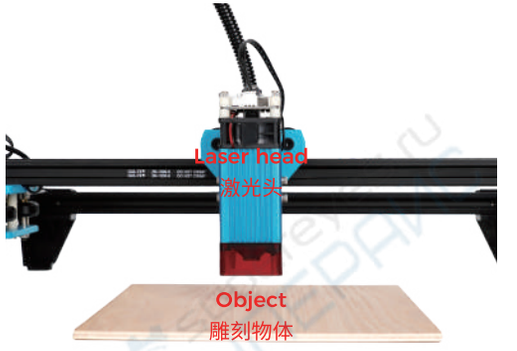
1.1 Focus adjustment before engraving:
Before engraving, the focus needs to be adjusted. The focus needs to be on the surface of the engraved object, and the focusing distance of the laser lens is 23mm.
The fixed-length column can be used for assistance, and the Z-axis lifting module knob can be rotated for more fine adjustment.

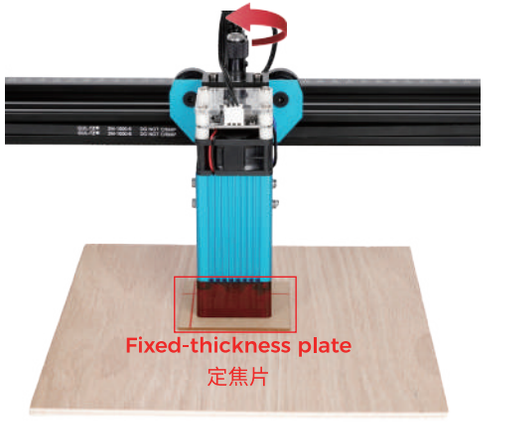
1.2 Focus adjustment before cutting:
Before cutting, the focus needs to be in the middle of the fault of the object. So the focus should be set according to different thickness.
And the z-axis lifting module knob should be rotated for more fine adjustment.
If the object is 2mm thick, use the second level of the fixed-length column;
If the object is 4mm thick, use the third level of the fixed-length.

雕刻前焦点调整：
进行雕刻前，需要进行焦点调整，焦点是需要在被雕刻物体表面，激光镜片定焦距离为23mm.
可以使用定焦柱进行定焦辅助，旋转Z轴升降模组旋钮进行更精细的调整

切割前焦点调整：
进行切割前，焦点是需要在被雕刻物体断层中间，所以应该根据不同板厚，设置相应的焦点，旋转Z轴升降模组旋钮进行更精细的调整。
假设物体为2mm，使用定焦柱的第二台阶；
物体为4mm，使用定焦柱的第三台阶。

Method 2 调焦方式2





2.1 Focus adjustment before engraving:
Before engraving, the focus needs to be adjusted. The focus needs to be on the surface of the engraved object, and the focusing distance of the laser lens is 23mm.
The fixed-thickness plate can be used for assistance, and the Z-axis lifting module knob can be rotated for more fine adjustment.

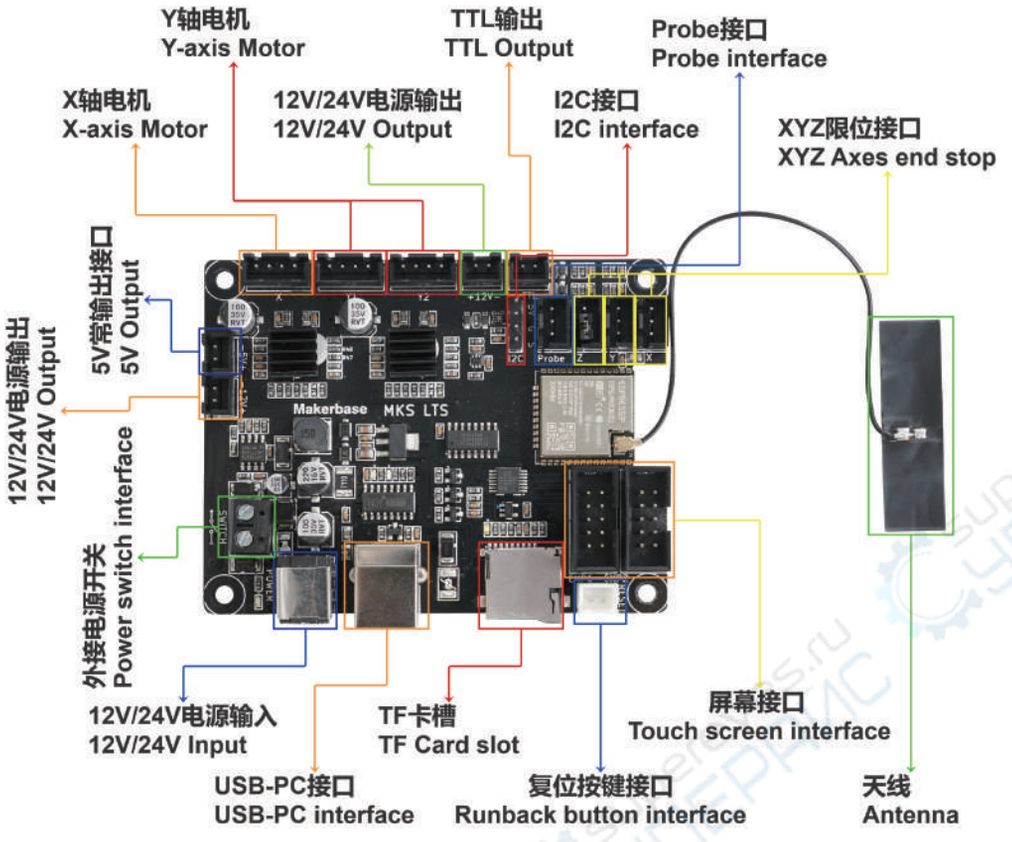
2.2 Focus adjustment before cutting:
Before cutting, the focus needs to be in the middle of the fault of the object. So the focus should be set according to different thickness.
And the z-axis lifting module knob should be rotated for more fine adjustment.

雕刻前焦点调整：
进行雕刻前，需要进行焦点调整，焦点是需要在被雕刻物体表面，激光镜片定焦距离为23mm.
可以使用定焦片进行定焦辅助，旋转Z轴升降模组旋钮进行更精细的调整。

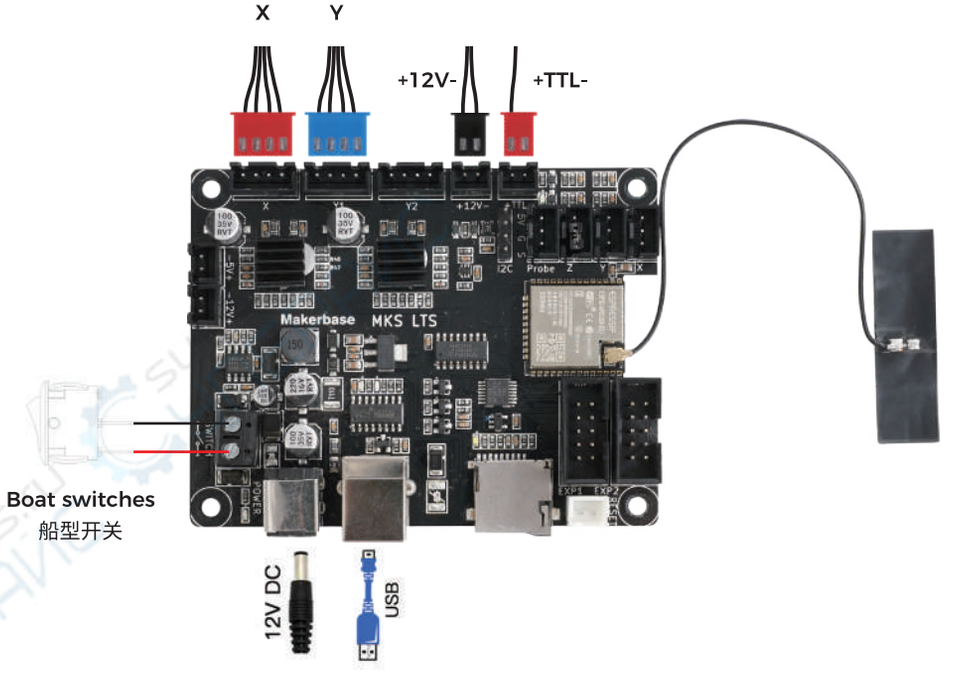
切割前焦点调整：
进行切割前，焦点是需要在被雕刻物体断层中间，所以应该根据不同板厚，设置相应的焦点，旋转Z轴升降模组旋钮进行更精细的调整。

PCB MOTHERBOARD PORT DESCRIPTION

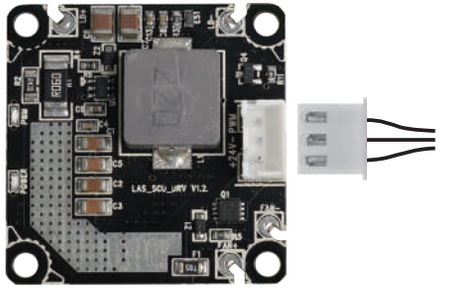
PCB主板端口说明



WIRING DESCRIPTION 接线说明



Y2 connector 接口



Laser wiring 激光头接线

Note: The picture is for reference only, the actual product shall prevail

注：图片仅供参考，以实物为准

GRBL INTRODUCTION 入门使用教程

1. Software Downloading

LaserGRBL is one of the most popular DIY laser engraving software, which can be downloaded in LaserGRBL website http://lasergrbl.com/download/ (The installation package is also available on the TF card from the manufacturer or USB flash disk).

Brief introduction:

LaserGRBL is easy to use. However, LaserGRBL only supports Windows system (Win XP/Win 7 / Win 8 / XP/Win 10).

For Mac users, you can also choose LightBurn, which is also an impressive engraving software, but it's not free. And this software also supports Windows system.

Note: The engraving machine needs to be connected with the computer during engraving, and the software of the engraving machine cannot be turned off.

2. Software Installation

Double click the software installation package to start the software installation and click “Next” until the installation is complete.

1. 软件下载

LaserGRBL是最流行的DIY激光雕刻软件之一，可以在LaserGRBL网站：http://lasergrbl.com/download/下载。(厂家附送的TF卡或U盘中也有安装包)

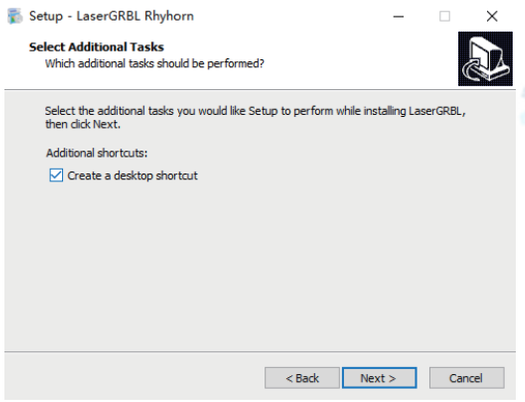
简介：LaserGRBL是一款开源、容易上手且功能强大的软件，不过遗憾的是LaserGRBL软件只支持Windows系统(Win XP / Win 7 / Win 8 / XP / Win 10)

当然对于Mac用户，可以选择LightBurn。LightBurn也是一款非常优秀的雕刻机软件，不过这个软件是付费的。这款软件也支持Windows系统。

注意：雕刻过程中，雕刻机需要和计算机保持连接，且不能关闭软件。

2. 软件安装

双击软件安装包，开始软件安装，一直点击“下一步”直到安装完成。

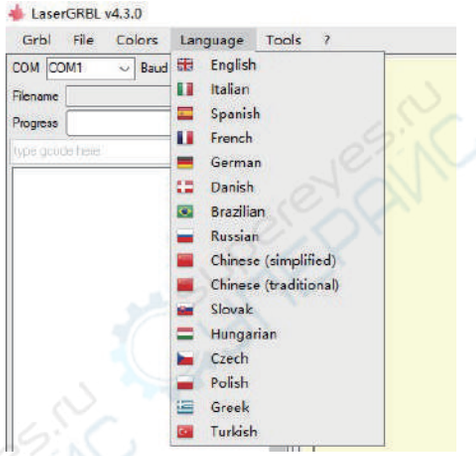


3. Language

Click "Language" on the menu at the top to select the language you need.

3. 语言切换

点击软件界面上方的菜单“language”，进入下拉菜单选择对应的语言。



4. Load Engraving File

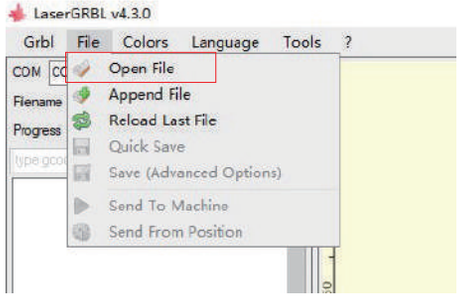
Click "File" and "Open File" in turn, as shown in figure 8.1, and then select the graph you want to engrave.

LaserGRBL supports files in the formats of NC, BMP, JPG, PNG, etc.

4. 生成GCODE文件

点击软件界面上方的菜单“文件”，进入下拉菜单选择“打开文件”。进入图片文件选择界面，选择需要雕刻的文件，并点击“打开”。

(目前LaserGRBL支持NC、BMP、JPG、PNG、等格式的文件)



5. Set picture parameters, engraving mode and engraving quality.

1. LaserGRBL can adjust the sharpness, brightness, contrast, highlight and other properties of the target graph. We can preview window effect during adjustment, and adjust the effect to your satisfaction.

2. In the engraving mode, "Line-to-line Tracking" and "1Bit Shaking" can usually be chosen;"1Bit Shaking" is more suitable for carving grayscale graph. Please Choose "Vector Diagram" or "Center Line" if you need cutting.

3. Engraving quality essentially refers to the line width of laser scanning. This parameter mainly depends on the size of the laser spot of the engraving machine.

Note: The recommended engraving quality range is 12-15. Different materials have different reactions to laser irradiation, so the specific value depends on the specific engraving material.

4. At the bottom of the preview window, the graph can also be rotated, mirrored, cut and so on.

After completing the above settings, click next to enter the settings of engraving speed, engraving energy, and engraving size.

5. 设定图片参数、雕刻模式、雕刻质量

1. LaserGRBL可以调整目标图片的锐度、亮度、对比度、高光等属性。调整时预览窗口效果，调整到自己满意的效果。

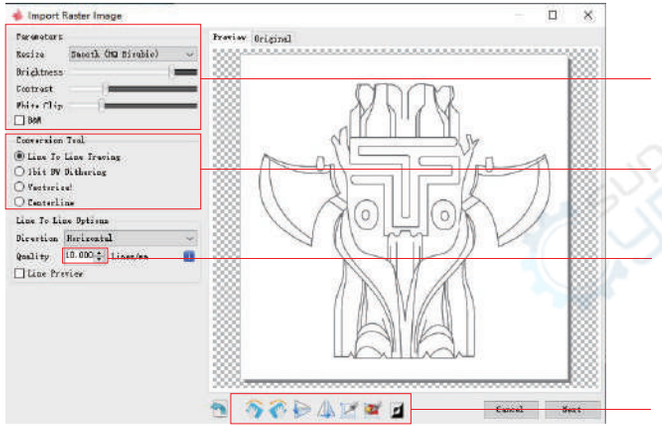
2. 雕刻模式通常选择“线到线跟踪”和“1bit抖动”。“1bit抖动”更适合雕刻灰度图形。如果要进行切割，请选择“矢量图”或者“中心线”的雕刻模式。

3. 雕刻质量本质上是指激光扫描的线宽，这个参数主要依赖于雕刻机激光斑点的大小。

建议使用的雕刻质量范围为12-15，不同的材质对于激光照射的反应不同，因此具体数值还取决于具体的雕刻材质。

4. 在预览窗口的下方还可以对图像进行旋转、镜像、剪切等操作。

在完成以上设置后，点击下一步进入雕刻速度、雕刻能量和雕刻尺寸的设置。



Color adjustment;
intensity adjustment
图片调色；明暗度调整

Choose engraving mode
雕刻模式选择

Quality: 12-15 (recommended)
质量：12-15（建议）

Direction adjustment;
pattern cutting
方向调整；图形裁剪

6. Set engraving speed, engraving energy, and engraving size

1. The recommended engraving speed is 1000, which is considered to be a relative appropriate value after repeated experiments. Of course, you can increase or decrease this speed according to your preference. A faster engraving speed will save time but lead to the decline in the engraving effect. Slower speed is the opposite.

2. In laser mode, there are two instructions: M3 and M4. M4 instruction is recommended for engraving in "1bit jitter" mode, and M3 instruction is recommended for other cases. If you have only M3 instruction on the laser, please check whether the laser mode is used in the GRBL configuration. Please refer to the official instructions of LaserGRBL for GRBL configuration.

3. Choice of engraving energy. Choose it according to different materials.

4. Finally, set the size and click the "Create" button to complete the setting of all engraving parameters.

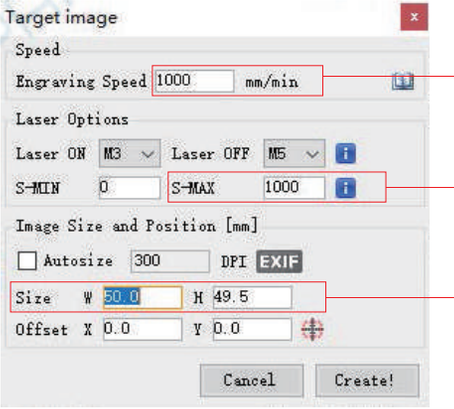
6. 设定雕刻速度、雕刻能量和雕刻尺寸

1. 雕刻速度建议使用1000，这是经过反复实验认为雕刻效果比较合适的一个值。当然您可以根据自己的喜好增大或降低这个速度，更快的速度将节省雕刻时间，但可能会带来雕刻效果的下降，更慢的速度则与之相反。

2. 在激光模式中，打开激光有两个指令，M3和M4；用“1bit抖动”模式雕刻时建议使用M4指令，其他情况建议使用M3指令。如果您的激光只有M3指令能打开，请检查GRBL配置里面是否启用了激光模式，关于GRBL配置的说明请参考LaserGRBL的官方说明。

3. 雕刻能量的选择根据不同的材质选择不同的能量。

4. 最后设置好您想要雕刻的尺寸大小，点击“创建”按钮就完成了所有雕刻参数的设置。



The default engraving speed is 1000 and can be adjusted as required
默认1000雕刻速度，根据需求调整

Set the energy value. Improper energy will affect the engraving effect
能量值设定，能量不合适会影响雕刻效果

Enter the size of the graph you want to engrave
输入自己想要雕刻的图形大小

Save GCODE file

Click "File" in the menu at the top of the software interface, enter the drop-down menu, and select "Save". Copy the saved .nc file to the TF card and insert the TF card into the engraver to use the file to engrave your work.

Use the "MKSLaserTool" software in TF to add preview codes to Gcode files.

保存GCODE文件

点击软件界面上方的菜单“文件”，进入下拉菜单选择“保存”。后缀名为“.nc”,拷贝保存后的.nc文件至TF卡中，放置雕刻机内即可使用该文件雕刻作品。

使用TF卡中的"MKSLaserTool"软件为Gcode文件增加预览代码。

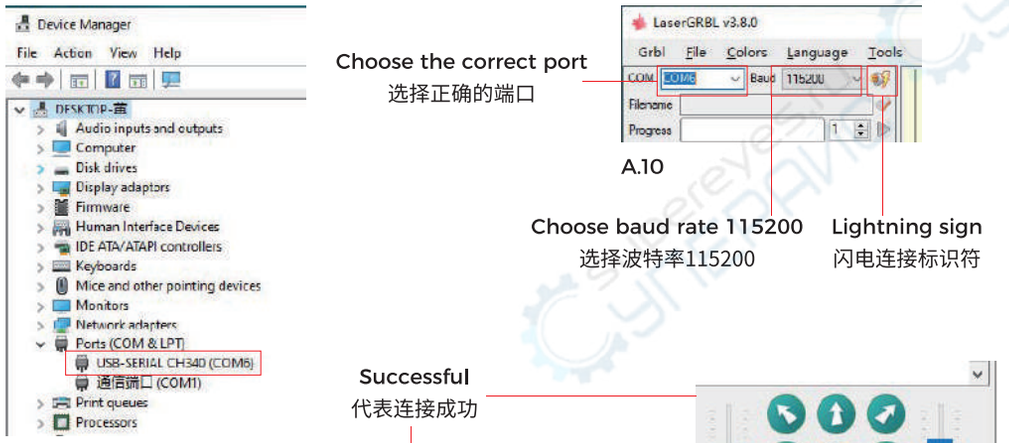
CONNECT PC 机器连接PC端使用

1. Connect the machine with the computer installed with LaserGRBL software with USB data cable.
2. Plug in the power.
3. Open LaserGRBL on the computer.
4. Select the specific port number and baud rate——115200 (Figure A.10)
5. Click the lightning sign. When the lightning sign changes to the red “X” and the direction sign is lit, it indicates that the connection is successful. (Figure A.11)

Generally, the COM port does not need to be selected manually, unless multiple serial port devices are connected to the computer, you can find the port of the machine in the device manager of the windows system (as shown in Figure A.09). A simpler way is to try the displayed port number one by one.

1. 用USB数据线，将激光雕刻机与安装有LaserGRBL软件的电脑连接。
2. 给激光雕刻机插上电源。
3. 在电脑上打开LaserGRBL软件。
4. 在软件中选择正确的端口号及波特率——115200。(图示A.10)
5. 点击软件中的闪电连接标识，当闪电标识变为红色的X标识并且方向标被点亮则表示连接成功。(图示A.11)

一般情况下，COM口不用手动去选择。但是如果你有多个串口设备连接到计算机时需要手动去选择。可在Windows系统中的设备管理器中找到激光雕刻机的端口(图示A.09)，更简单的办法是把显示出来的端口号挨个试一遍。



A.10

A.11

Note:
If you cannot find the correct port in the “Ports”, you may need to
Method 1: Click "Tools" in the menu to install CH340 driver (This function is not available in some software versions);
Method 2: Copy the "CH340ser. Exe" file in the TF Card (USB flash disk) to the computer and install it.

提示：如端口栏没有出现正确的端口：
方法1：点击菜单栏“Tools”安装CH340 驱动（软件部分版本无此功能）；
方法2：拷贝TF卡(U盘)中的“CH340SER.EXE”文件至电脑，并安装。

1. After the laser head has been used for a period of time, it is necessary to clean the lens of the light outlet under the laser head to ensure normal cutting ability
2. Wiping the lens must be done after the machine is powered off, otherwise the laser will hurt people
3. After wiping the lens, please dry it naturally for about 3-5 minutes and wait for the lens to dry before powering it on, otherwise the light will cause the lens to break
4. You can watch the video tutorial by scanning the QR code of the manual

1.激光头使用一段时间后，需清洁激光头下方出光口镜片，保证切割能力正常
2.擦拭镜头必须在机器断电后进行，否则激光伤人
3.擦拭镜头后请自然风干约3-5分钟等待镜头干燥后再通电使用，否则出光会导致镜片破裂
4.可通过扫描说明书二维码观看视频教程

TEST BEFORE USE 机器测试

1. Turn on the machine, and connect it to the computer.

2. Movement test:

Control the machine to move up, down, left and right on the software, to check whether the direction and distance are right.(Fig. A01)

3. Laser emission test:

Software import custom icons, then click to sent out laser(weak laser). Wear goggles and observe whether the laser head emits blue light. (Fig. A02)

4. Test the files in the TF card:

Note: laser will generate heat and glare, which may cause harm. Please follow the instructions to avoid injury.

1.打开电源开关，雕刻机连接电脑，启动机器

2.移动测试：

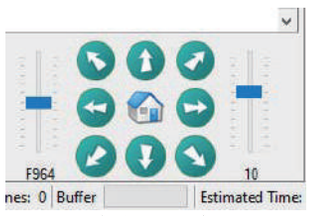
在软件上控制机器上下左右移动，查看移动方向是否正确，检查移动距离是否正确(图A01)

3.出光测试

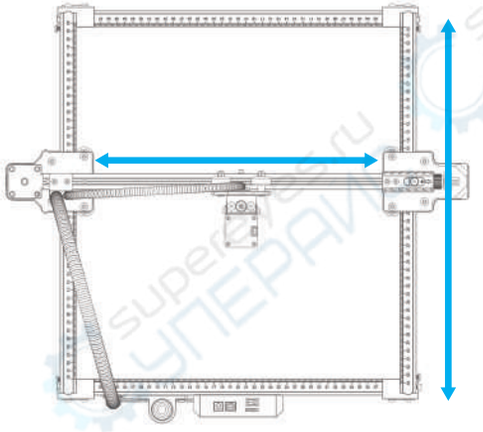
软件导入自定义图标，点击出光（弱光）。佩戴好防护眼镜观察激光模组是否发射蓝光。(图A02)

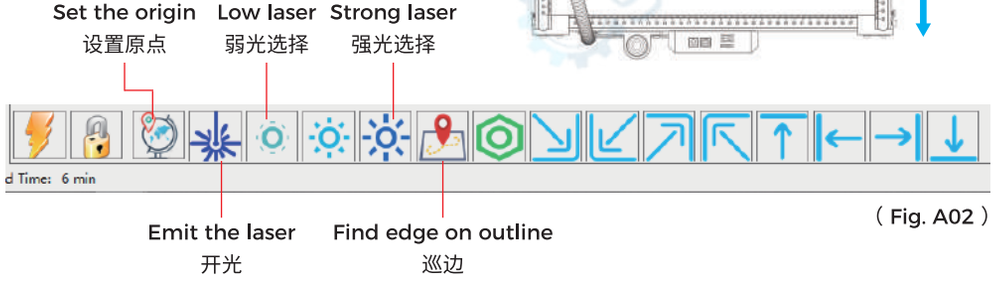
4.调用TF卡中的测试文件进行雕刻测试

注：激光聚焦会产生热量和眩光，这些可能会对人、动物和物体造成伤害。请按照说明进行操作，避免误伤。



（ Fig. A01 ）





（ Fig. A02 ）

AFTER-SALES SERVICE 售后服务

The guarantee period is 12 months from the date of purchase.

1. Missing/Damaged/Defective Parts

Within 7 days of the date of receipt, we will replace any parts for free of charge including shipping fees.

After 7 days of the date of receipt, we will replace any parts for free of charge. But you need to pay the shipping fees.

2. Customer Damaged Parts: You need to pay for the cost of the parts and the shipping fees.

3. Courier company loss, missing, damaged, and defective parts.

a. Lost or damaged shipments must be reported to the carrier within the carrier's claim window, and you need to inform us within 7 days of the date of receipt.

b. For any parts lost or damaged during shipping, you need to take photos or video and send them to us.

c. Once the Carrier dispute is settled, please provide us with all communications with the carrier. It is the customer's responsibility to keep us up to date with ALL communication with the carrier.

d. For Missing Parts, you need to fill out a Service Ticket.

e. For Damaged Parts, you need to fill out a Service Ticket and send us the photos or video.

f. If the part is one of the LCD Panel, Power Supply or Mainboard, you need to ship the part back to us and we will send a new one.

保修期为自购买之日起12个月内。

1. 缺少／损坏／有缺陷的部件：

签收日期后的7天内，我们将免费更换任何部件，包括运费；

签收日期的7天后，我们将免费更换任何部件。但客户需要支付运费。

2. 客户损坏部件：客户应支付部件成本和运输费用。

3. 快递公司责任：丢失、损坏或有缺陷的部件。

a. 对于丢失或损坏的货物的索赔必须在承运人的索赔窗口内向承运人报告，客户需要在签收日期后的7天内通知我们。

b. 对于在运输过程中丢失或损坏的任何部件，客户应拍摄照片或视频并将信息发送给我们。

c. 一旦承运人争议解决，请向我们提供与承运人的所有通讯。客户有责任让我们及时了解与承运人的所有通讯。

d. 对于缺失零件，客户应填写服务单。

e. 对于损坏的部件，客户应填写服务票，并将照片或视频发送给我们。

f. 如果部件是LCD面板，电源或主板，客户应将部件运回给我们，我们将发送新部件。