# TOOCA Laser 1 User Manual
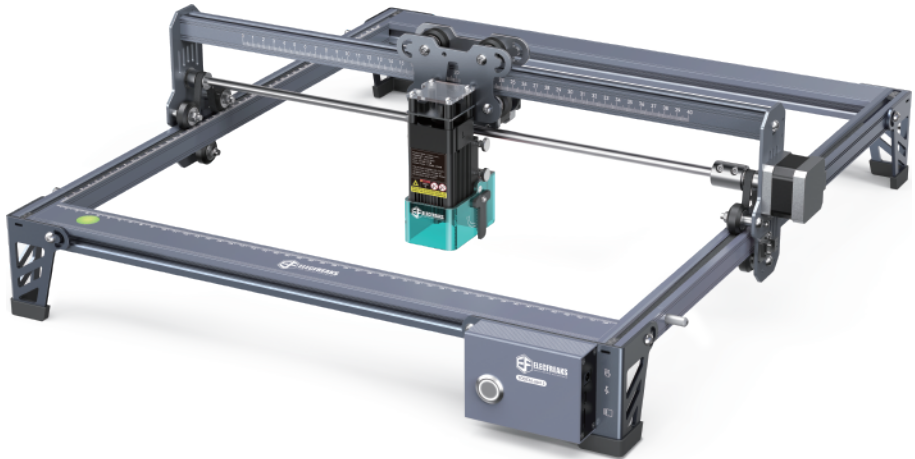## TOOCA Laser 1 快速使用指南

V1.0
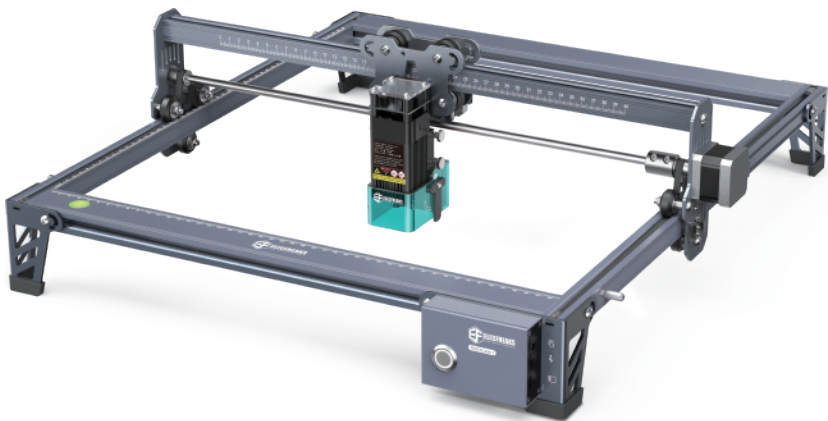
# Rendering Picture



Dear Consumers:

Thank you for choosing our products. For the best experience, please read the instructions before operating the machine. Our teams are always ready to render you the best services. Please contact us via the phone number or e-mail address provided at the end when you have any problem.

For a better experience in using our products, you can also learn how to use the engraving machine in the following ways:

View the accompanied instructions and videos in the TF card.

Visit the wiki of TOOCA Laser 1 via https://www.elecfreaks.com/learn-en/tooca-laser-1 to find relevant software/hardware information, contact details, operation and maintenance instructions.

## Firmware Upgrade

Please go to the wiki page via https://www.elecfreaks.com/learn-en/tooca-laser-1, select the updating methods to download the latest firmware. Save it to TF card and it can be automatically updated after powering on.
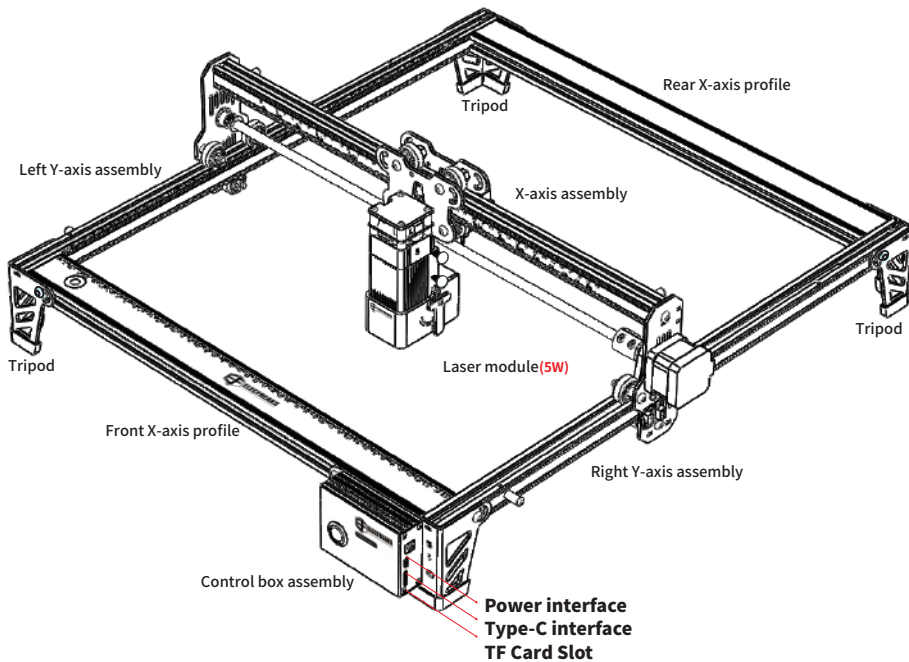
## User Notice

For the purpose of engraving or cutting with a laser engraving machine, allow the workpiece to be exposed to the high-density laser beam emitted by the laser engraving machine. The workpiece may be subject to gasification without combustion as it is pretty hot on the surface. On the other hand, most workpieces are essentially combustible, which may be ignited, leading to an open flames and consequently to the machine breakdown and environmental contamination.

1. It is prohibited to store the machine in areas close to combustible and explosive substances, volatile solvents or source of heat. Instead, store it in a well-ventilated, cool and dust-free place;

2. Make sure that only the specific attached power cord rather than other similar power cords are used during installation;

3. Clean the tripod and laser module with a dry cloth regularly when the power is off;

4. Ensure to run the laser at 0℃-35℃. Operation at sub-zero temperature is prohibited; it is prohibited to run the machine under wet environment or in thunderstorm weather;

5. Switch off the machine if it is offline for an extended period of time, and unplug the power cord;

6. It is prohibited to come in contact with electronic areas with hands or other tools when the machine is connected to power supply;

7. Touching any moving parts and laser module while the machine is running is prohibited;

8. Before engraving, place a flat object that cannot be penetrated by the laser, such as an aluminum alloy or stainless steel plate on the workbench, and then place processing material;

9. Wear goggles to prevent vision damage arising from exposure to the laser spot during laser engraving operation;

10. It is advisable to run the machine under well ventilated condition as laser engraving may generate small amount of fume or gas;

11. Children under 10 years old are not allowed to run the machine without adult presence, which otherwise may lead to personal injury;

12. Put in place fire extinguishers in case of use, which shall be regularly checked. It is prohibited to keep the machine unattended while it is running;

13. Users should comply with the laws and regulations of the corresponding countries and regions where the equipment is located (used), abide by professional ethics, pay attention to safety obligations, and strictly prohibit the use of our products or equipment for any illegal purposes. ELECFREAKS will not be responsible for any violators' legal liability under any circumstances.
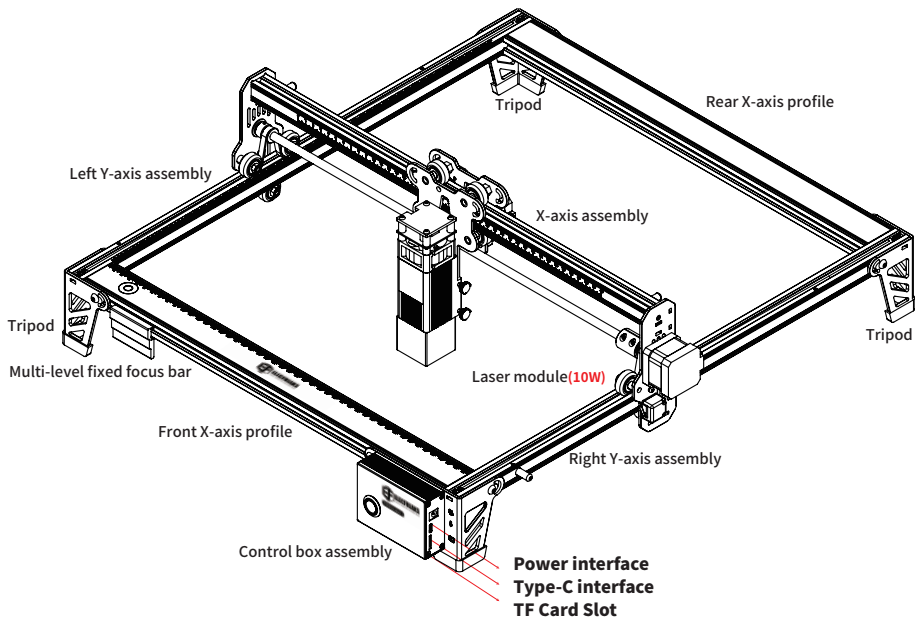
# Parameters

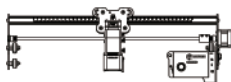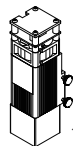| | |
|---|---|
| Model | TOOCA Laser 1 |
| Machine size | 568*632*198mm |
| Net weight | 3.2kg |
| Operation system | Windows /MacOS |
| Input | 100-240V~ 50-60Hz |
| Output | DC 24.0V 3.0A |
| Range of operating temperature | 0℃-35℃ |
| Safety certification | IEC60825, FDA, CE, RoHS, FCC, UKCA, UL and PSE |
| Engraving size | 400mm*415mm |
| Laser source | Semiconductor laser unit |
| Laser wave length | 455±5nm |
| Laser power | 5W/10W |
| Safety class | Class IV (FDA classification standard) |
| Laser engraving software | LaserGRBL, LightBurn |
| Format files | jpeg, jpg, png, bmp, svg and dxf |
| Type of supporting materials | Cardboard, wood, bamboo, rubber, leather, fabric, acrylic, plastic, etc |

# Equipment Intro（5W）

Rear X-axis profile

Tripod

Left Y-axis assembly

X-axis assembly

Tripod

Tripod

Laser module(5W)

Front X-axis profile

Right Y-axis assembly

Control box assembly

**Power interface**
**Type-C interface**
**TF Card Slot**

# Equipment Intro（10W）



Left Y-axis assembly

Tripod

Rear X-axis profile

Tripod

X-axis assembly

Tripod

Multi-level fixed focus bar

Laser module(10W)

Front X-axis profile

Right Y-axis assembly

Control box assembly

**Power interface**
**Type-C interface**
**TF Card Slot**

# Parts List



1. X-axis assembly & Control box assembly



or

5W    10W

7. Laser module*1



2. Front X-axis profile*1



8. Power adaptor*1



3. Rear X-axis profile*1



9. Power cord*1



4. Left Y-axis assembly*1



10. Linden plywoods*2



5. Right Y-axis assembly*1

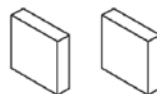

11. M5*20 screws*18



6. Tripods*3



12. T-shaped nuts*6

13. M1.5/M2/M2.5/M3 Allen keys

**Only for 5W laser module**
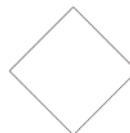
17. Activated carbon smoke absorption cottons*2

14. Open wrench*1

18. Black cable ties*3

15. TF card & card reader *1

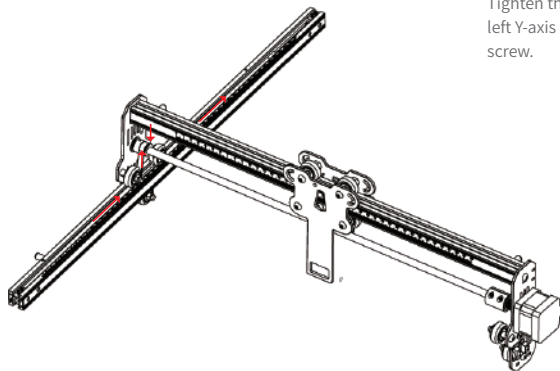19. Dustless cloth*1

16. Goggle*1

20. Instruction manual*1

**Only for 10W laser module**

21. Multi-level fixed focus bars

# Assemble Directions

1. Assemble the left Y-axis assembly: Pass the left Y-axis assembly (with the belt up) through the X-axis assembly and put on the belt in the direction shown in the figure:

Tighten the belt, and insert two T-shaped nuts into the left Y-axis assembly. Then lock the belt with hexagon screw.
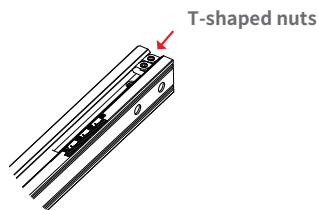
**T-shaped nuts**

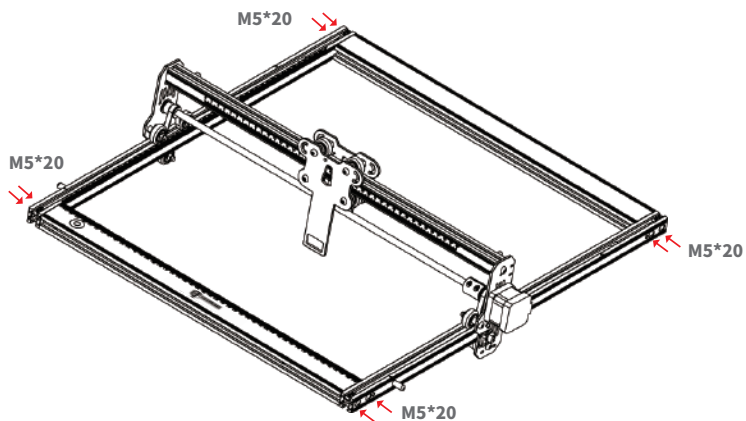2. Assemble the right Y-axis assembly and it is the same as above.
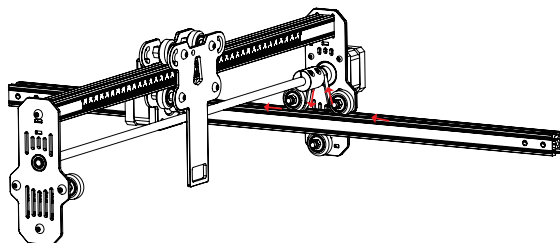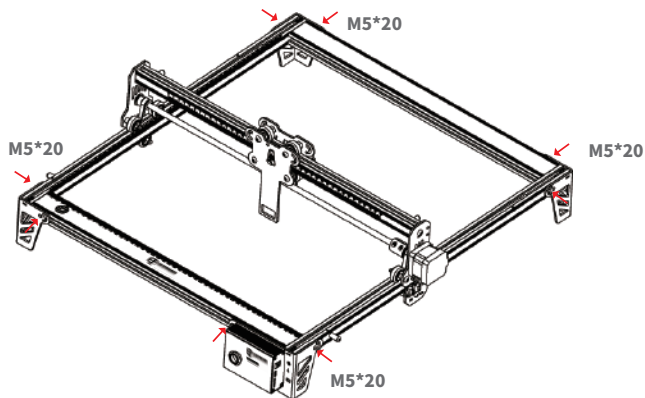
**T-shaped nuts**

**Not to lock too tightly to prevent the belt from perforating.**

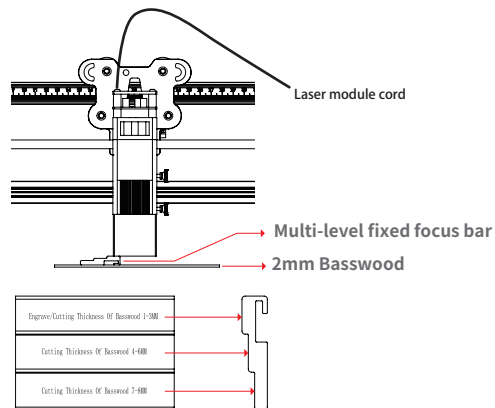3. Assemble rear X-axis profile and front X-axis profile: Lock with eight M5*20 screws.

**M5*20**

**M5*20**

**M5*20**

**M5*20**

4. Assemble three tripods and control box assembly: Lock with eight screws.

**M5*20**

**M5*20**

**M5*20**

**M5*20**

5.1. Assemble 5W laser module: Assemble it into the fixing plate and the fixed focus bar should contact with the surface of the processed material when it is naturally vertical downward. Then lock it with two hand screws on the right and turn the fixed focus bar clockwise until it is attracted by the magnet. Finally plug in the laser module cord.
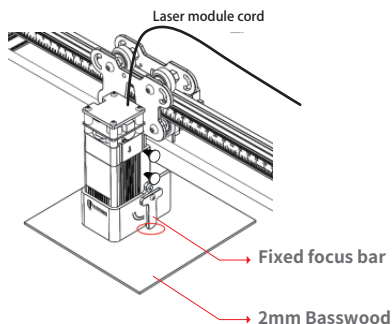
5.2. Assemble 10W laser module: Please place the multi-level fixed focus bar between the laser module and the processed material. Follow the tips and make the bottom of the laser module contact with the corresponding surface of the multi-level fixed focus bar. Finally lock it with two hand screws on the right. For example, if you engrave or cut a 2mm basswood:



Laser module cord

Fixed focus bar

2mm Basswood



Laser module cord

Multi-level fixed focus bar

2mm Basswood

Engrave/Cutting Thickness Of Basswood 1-3MM

Cutting Thickness Of Basswood 4-6MM

Cutting Thickness Of Basswood 7-8MM

**The laser module must be installed and removed only when the power is off.**

# Software Installation and Usage Guide

The TF card that comes with the machine contains the tutorials of LightBurn and LaserGRBL. You can get the relevant information from the TF card.

# Start Engraving

The machine supports real-time working by Type-C or offline working by TF card. Please follow the assembly directions to focus correctly and wipe the protective lens of the laser module with dustless cloth and alcohol to ensure the best engraving effect.

5W

10W

Protective lens

Offline Working
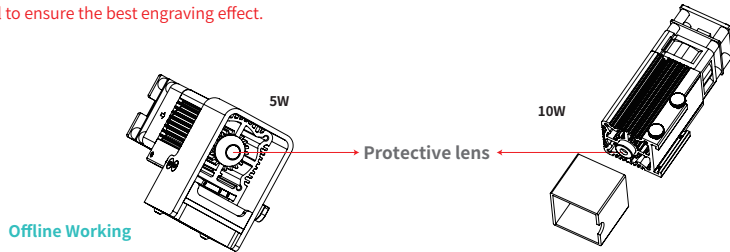
1. Insert the TF card with .gcode file(The machine reads the latest .gcode file in TF card by default. It is recommended to delete other .gcode files before engraving) into the machine before powering on, insert one side of the power adapter into the power socket that can be remotely switched on, and the other side into the power connector on the right side of the control box. Lastly, turn on the red switch on the left side of the control box.

Power supply interface

TF card socket
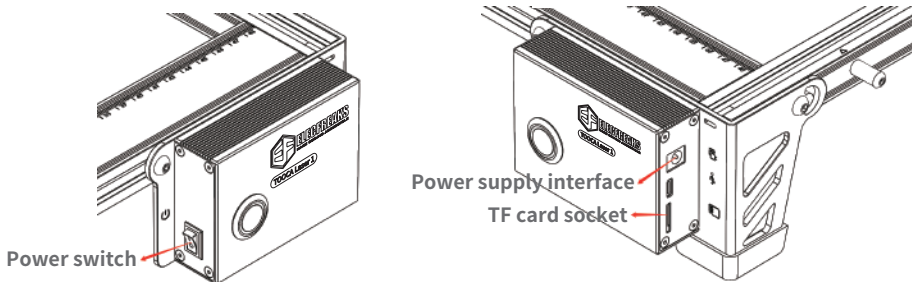
Power switch

After powering on, it will "beep" once and reset. After the reset is completed, it will "beep" twice and enter standby mode.

2. Press the microswitch, it enters preview mode from standby mode, the laser head will emit weak light, and repeat movement around the largest X, Y edge of the processed picture with indicator lighting on. At this time, adjust the material to a suitable position.

In preview mode, press microswitch again, it enters engraving mode. At this time, the laser head will emit strong light, the machine will start engraving with indicator light on.

Pause engraving: press the microswitch (or click "Pause" button in the software). At this time, the indicator light turns into breathing light. Press the microswitch again to continue engraving.

Cancel engraving: Please press and hold the microswitch for 3 seconds (or click "Cancel" button in the software), it will "beep" once, start to reset, and "beep" twice after reset is completed. Enter standby mode, the indicator light turns into breathing light.

**Microswitch**
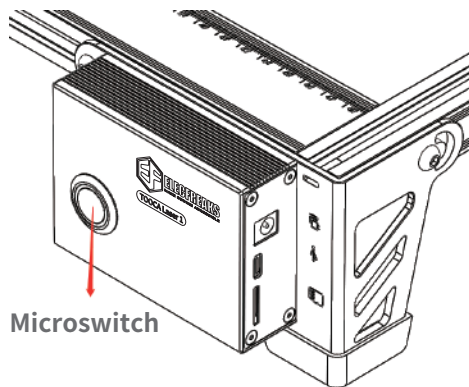
3. After engraving is completed, it will "beep" three times and reset. After reset is completed, it will "beep" twice and enter standby mode, and the indicator light turns into breathing light.

# Real-time Working

For real-time working by Type-C, please refer to the tutorial in the TF card.
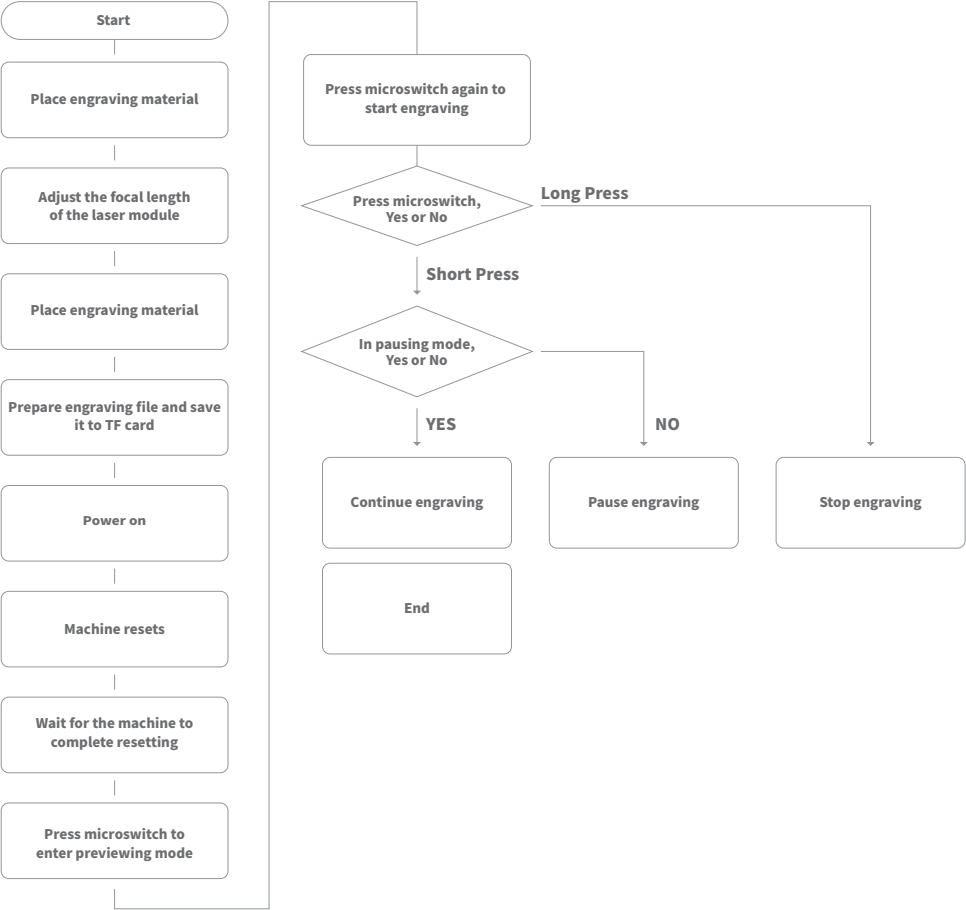
# Indicator Status

1. Light off: The machine is in a power-off state, or the power is abnormal.

2. Breathing light: The machine is in standby mode, you can press the microswitch to enter preview mode or engraving mode.

3. Light flashes: the machine is in upgrade mode or abnormal mode, and the buzzer beeps rapidly, and it will automatically enter standby mode after the upgrade is completed or the abnormality is cleared.

4. Light always on: the machine is in preview mode or engraving mode. The laser head is working, please pay attention to safety.
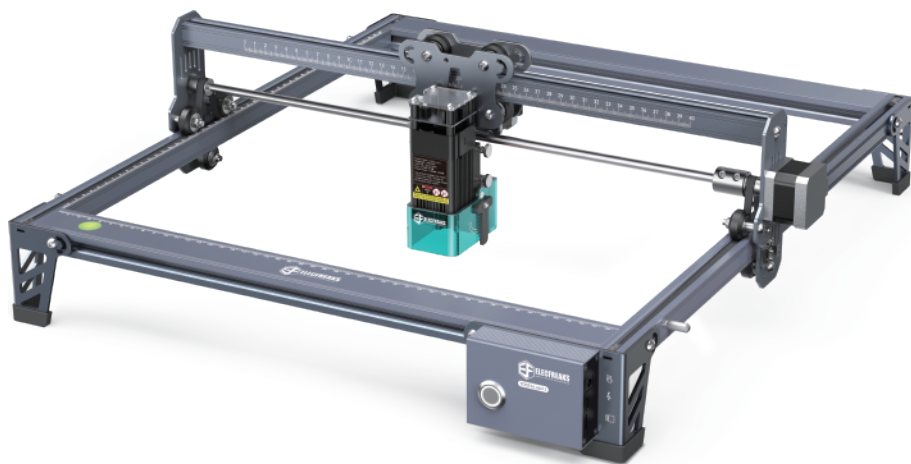
# Exception Handling

In preview mode and engraving mode, if the machine turns on its side or moves, it will turn off the laser. Motor stops moving, indicator light starts flashing, and buzzer emits alarm.

Solution: Please move the machine to its original position and press microswitch on the machine control box to continue previewing or engraving after clearing abnormality.

# User Operation Guide

```
┌─────────────────────┐
│        Start        │
└─────────────────────┘
           │
┌─────────────────────┐
│ Place engraving     │
│ material            │
└─────────────────────┘
           │
┌─────────────────────┐
│ Adjust the focal    │
│ length of the laser │
│ module              │
└─────────────────────┘
           │
┌─────────────────────┐
│ Place engraving     │
│ material            │
└─────────────────────┘
           │
┌─────────────────────┐
│ Prepare engraving   │
│ file and save it to │
│ TF card             │
└─────────────────────┘
           │
┌─────────────────────┐
│      Power on       │
└─────────────────────┘
           │
┌─────────────────────┐
│   Machine resets    │
└─────────────────────┘
           │
┌─────────────────────┐
│ Wait for the machine│
│ to complete         │
│ resetting           │
└─────────────────────┘
           │
┌─────────────────────┐
│ Press microswitch to│
│ enter previewing    │
│ mode                │
└─────────────────────┘
```

Press microswitch again to start engraving

Press microswitch, Yes or No

Long Press

Short Press

In pausing mode, Yes or No

YES

NO

Continue engraving

Pause engraving

Stop engraving

End

渲染图

尊敬的用户：

感谢您选择恩孚科技的产品。为了您使用方便，请您在使用之前仔细阅读本快速使用指南，并严格按照快速使用指南的指示进行操作。

恩孚科技团队时刻准备为您提供优质的服务。在使用过程中无论遇到什么问题，请按照快速使用指南结尾所提供的电话、邮箱与我们进行联系。为了您能够更好地体验我们的产品，您还可以从以下方式获取设备操作知识：

随机使用说明：您可以在 TF 卡内找到相关使用说明及视频。

您还可以登陆 TOOCA Laser 1 的 wiki 页面 (https://www.elecfreaks.com/learn-en/tooca-laser-1) 寻找相关软硬件、联系方式、设备操作、案例及素材等信息。

## 固件升级

登录 wiki 页面 (https://www.elecfreaks.com/learn-en/tooca-laser-1)，点击"固件更新方式"下载最新固件，保存至 TF 卡并插入机器，上电可自动更新。

## 使用须知

激光雕刻机在雕刻或切割材料时使用高密度激光束照射材料，使材料表面产生高温，目的是在不燃烧的情况下使材料气化。但大多数材料本质上是易燃的，可能被点燃并形成明火，明火可能烧毁机器及其周围环境。

请遵循以下操作原则：

1. 请勿将本产品放置在易燃易爆物品、挥发性溶剂或高热源附近，请将本产品放置在通风、阴凉、少尘的环境内。

2. 请勿在安装过程中使用其他产品电源线代替，请使用本产品附带的电源线。

3. 定期在断电的情况下，用干布清洁机身及激光模组。

4. 激光工作环境温度在 0℃-35℃，严禁在零下温度运行，避免在潮湿环境下使用本产品，切勿在雷雨天气下使用本产品。

5. 如长时间不使用本产品，请关闭本产品，并断开电源线。

6. 本产品已连接电源时，请勿用手或其他工具触碰电子相关区域。

7. 本产品运行时，请勿触碰正在运动的机械机构及激光模组。

8. 雕刻前在工作平面上放置激光无法穿透的平面物体如铝合金或不锈钢板，然后再放置加工材料。

9. 激光雕刻过程中，请务必佩戴护目镜，避免直视激光光斑带来的视力损伤。

10. 激光雕刻过程中可能会产生少许烟雾或气味，建议在通风良好的环境下操作。

11. 年龄在 10 岁以下的儿童，请勿在没有成人监督的情况下使用本产品，以免造成人身伤害。

## 产品参数

| | |
|---|---|
| 产品型号 | TOOCA Laser 1 |
| 产品尺寸 | 568*632*198mm |
| 产品净量 | 3.2kg |
| 操作系统 | Windows /MacOS |
| 输入电压 | 100-240V  50-60Hz |
| 输出电压 | DC 24.0V 3.0A |
| 工作温度范围 | 0℃-35℃ |
| 安规认证 | IEC60825，FDA，CE，ROHS，FCC，UKCA，UL，PSE |
| 雕刻尺寸 | 400mm*415mm |
| 激光源 | 半导体激光器 |
| 激光波长 | 455±5nm |
| 光功率 | 5W/10W |
| 安全等级 | Class IV（FDA 分类标准） |
| 激光雕刻软件 | LaserGRBL，LightBurn |
| 文件格式 | jpeg，jpg，png，bmp，svg，dxf |
| 支持材料类型 | 纸板、木板、竹板、橡胶板、皮革、织物、亚克力、漆面金属、塑料等 |

# 设备简介(5W)



后X轴型材

脚架

左Y轴组件

X轴组件

脚架

脚架

激光模组(5W)

前X轴型材

右Y轴组件

控制盒组件

电源接口

Type-C 接口

TF 卡槽

# 设备简介(10W)



脚架

后X轴型材

左Y轴组件

X轴组件

脚架

脚架

多级定焦条

激光模组(10W)

前X轴型材

右Y轴组件

控制盒组件

电源接口

Type-C 接口

TF 卡槽
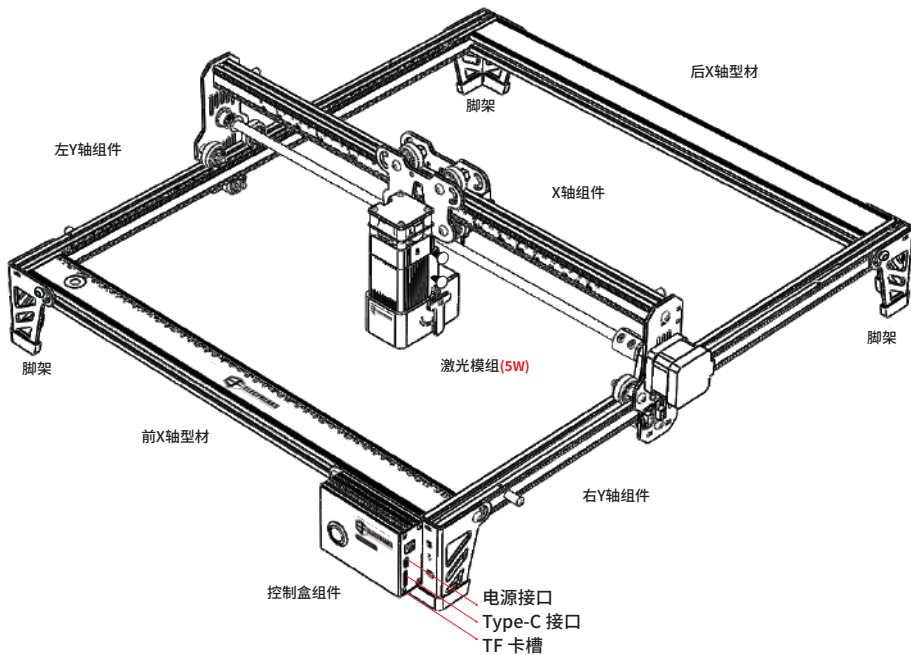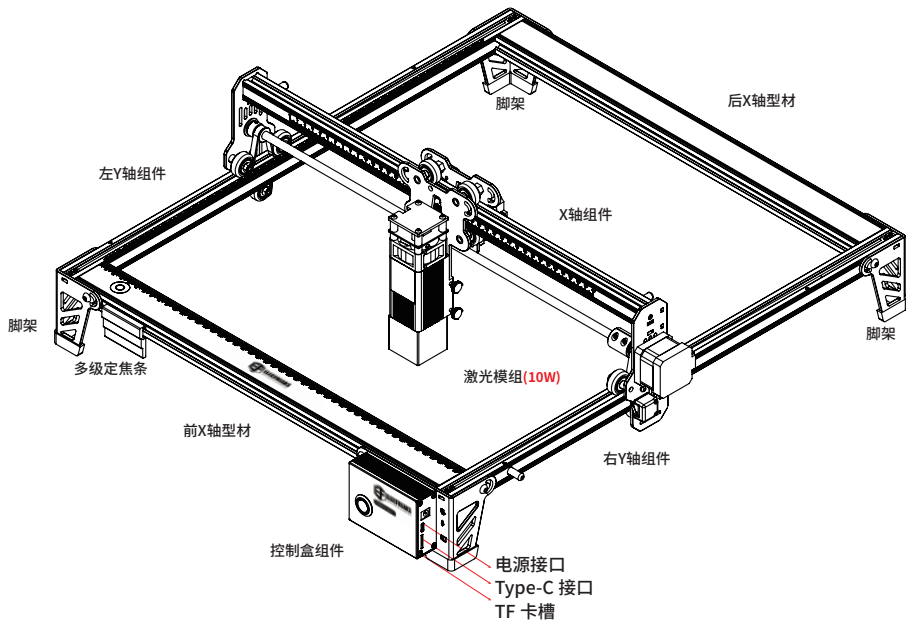
# 零部件清单
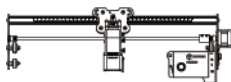
1.X轴组件+控制盒组件

7.激光模组*1   5W   or   10W

2.前X轴型材*1

8.电源适配器*1

3.后X轴型材*1

9.电源线

4.左Y轴组件*1

10.木板*2

5.右Y轴组件*1

11.M5*20内六角平圆头螺丝*18

6.脚架*3

12.T型船型螺母*6

13.M1.5/M2/M2.5/M3 内六角扳手

**仅限5W激光模组**
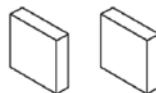
17.活性炭吸烟棉*2

14.开口扳手*1

18.黑色尼龙扎带*3

15.TF卡&读卡器*1
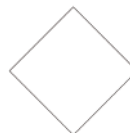
19.无尘布*1

16.防护眼镜*1

20.快速使用指南*1

**仅限10W激光模组**

21.多级定焦条

# 组装说明

1. 安装左 Y 轴组件：将左 Y 轴组件(同步带朝上)穿过 X 轴组件，按图示方向穿好同步带：

拉紧同步带，同时将两颗 T 型船型螺母嵌入左 Y 轴组件中，再使用内六角紧定螺钉锁紧同步带。
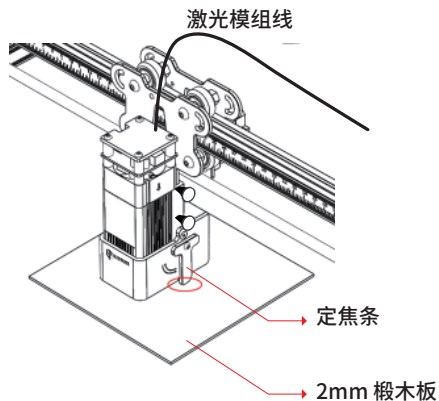


**T 型船型螺母**

2. 安装右 Y 轴组件：方法同上。



**T 型船型螺母**
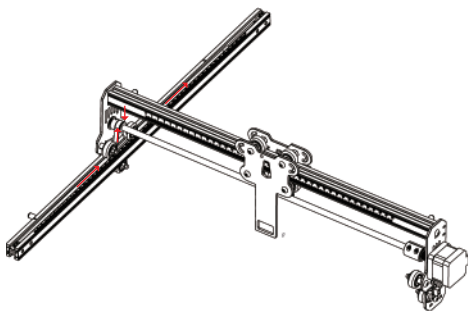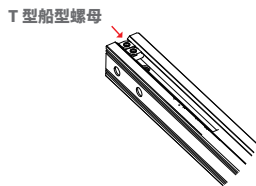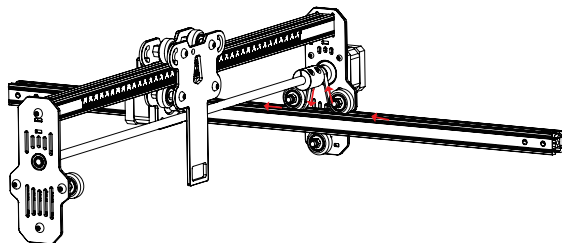
**注意不能锁得太紧，防止皮带穿孔。**

3. 安装前 X 轴型材与后 X 轴型材 , 一共使用 8 颗 M5*20 内六角平圆头螺丝锁紧。
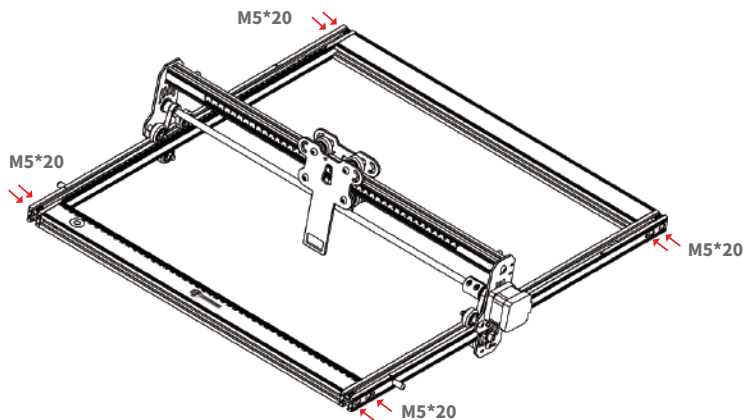
**M5*20**

**M5*20**

**M5*20**

**M5*20**

4. 安装三个脚架以及控制盒组件：一共使用 8 颗 M5*20 内六角平圆头螺丝锁紧。

**M5*20**

**M5*20**

**M5*20**

**M5*20**
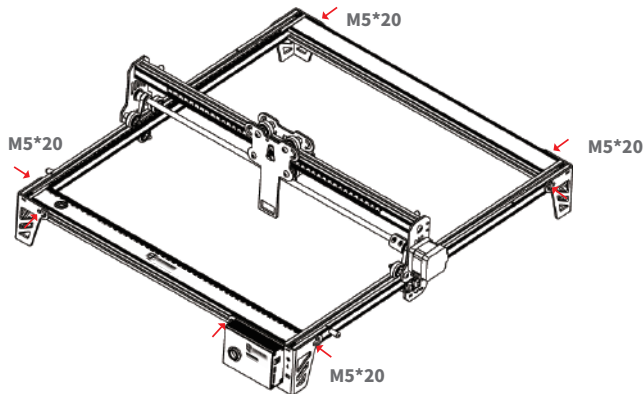
5.1 安装 5W 激光模组：请将它安装至固定板中,定焦条自然垂直向下时应与雕刻材料表面互相接触,最后使用右侧的手拧螺丝将其锁紧，并顺时针拨动定焦条直至被磁铁吸住。最后插上激光模组线。

5.2 安装 10W 激光模组：请将多级定焦条放置在模组与加工材料之间,按照定焦条表面的镭雕提示,使激光模组护目罩底部与多级定焦条对应位置相接触,最后使用右侧的手拧螺丝将其锁紧。例如雕刻或者切割 2mm 厚的椴木板：



**激光模组线**

**定焦条**

**2mm 椴木板**



**激光模组线**

**多级定焦条**

**2mm 椴木板**

| Engrave/Cutting Thickness Of Basswood 1-3MM |
| Cutting Thickness Of Basswood 4-6MM |
| Cutting Thickness Of Basswood 7-8MM |
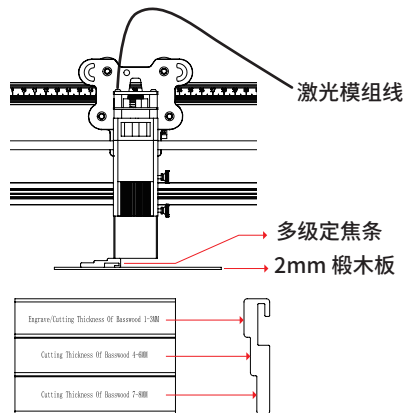
**注意激光模组必须在断电状态下才能安装与拆卸。**

## 软件安装及使用

随机器附赠的 TF 卡中包含了 LightBurn 以及 LaserGRBL 的使用教程,您可以通过电脑从 TF 卡中获取相关信息。

# 开始雕刻

机器支持 Type-C 实时工作和通过 TF 卡离线工作。无论您采用何种方式,**雕刻前请按照组装说明部分正确调焦,并使用无尘布搭配酒精擦拭激光模组的保护镜片,保证最佳雕刻效果。**



**5W**　**10W**　保护镜片
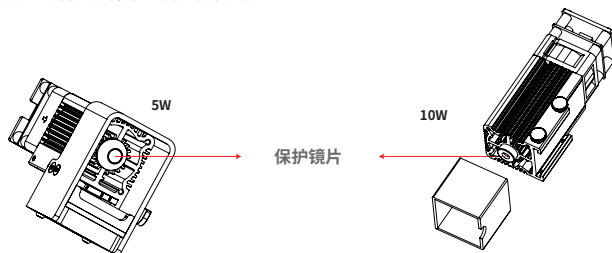
# 离线工作

1. 上电前先将存有 .gcode 文件(机器默认读取 TF 卡中最新的 .gcode 文件,建议雕刻前把其它 .gcode 文件删除)的 TF 卡插入机器中,然后将配套的电源适配器一侧插入可远程开关的电源插座中,另一侧插入控制盒右侧电源接口。最后打开控制盒左侧的红色电源开关。
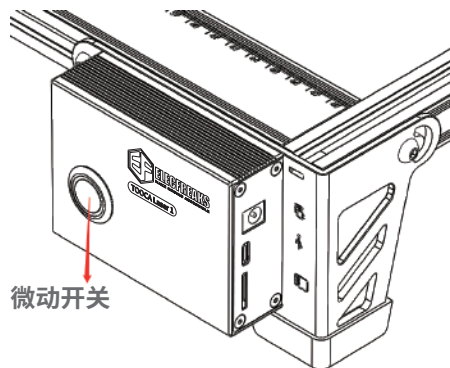


电源开关

电源接口

TF卡槽
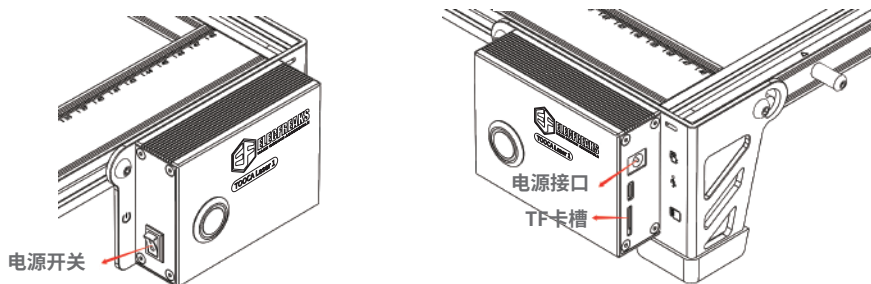
电源接通后,机器发出"滴"一声,随后机器复位,复位完成机器发出"滴 ... 滴 ..."两声,初始化完成后进入待机模式。

2. 按下微动开关,机器从待机模式进入预览模式,激光头会发出弱光,并围绕所加工图片的最大 X、Y 边缘重复运动,指示灯常亮。此时可以调整材料至合适位置。

预览模式下,再次按下微动开关,机器进入雕刻模式,此时激光头会发出强光,机器开始雕刻,指示灯常亮。

如果需要暂停雕刻,请按下微动开关,此时指示灯变成呼吸灯效果,再次按下微动开关可以继续雕刻。

如果需要取消雕刻,请长按微动开关 3 秒,机器会发出"滴"一声,随后机器复位,复位完成机器发出"滴 ... 滴"两声,进入待机模式,指示灯变成呼吸灯效果。



**微动开关**

3. 雕刻完成后,机器会长"滴"三声,随后机器复位,复位完成机器发出"滴 ... 滴"两声,进入待机模式,指示灯变成呼吸灯效果。

# 在线工作

关于 Type-C 实时工作,请参考 TF 卡中的随机资料。

## 指示灯状态说明

1. 指示灯灭：机器处于断电状态，或上电异常。

2. 呼吸灯效果：机器处于待机模式，可按下微动开关进入预览模式或雕刻模式。

3. 指示灯闪烁：机器处于升级模式或异常模式，同时蜂鸣器发出急促的响声，等待升级完成或清除异常后自动进入待机模式。

4. 指示灯常亮：机器处于预览模式或雕刻模式，此时激光头处于出光状态，需格外注意安全。

## 异常处理

1. 在预览模式以及雕刻模式中，如果机器发生侧翻异常或移动，机器会关闭激光，电机停止运动，指示灯闪烁，同时蜂鸣器发出急促响声进行报警。

处理办法：请将机器恢复至原来位置，清除异常后按下机器控制盒上的微动开关继续预览或雕刻。

# 用户操作流程图

开始

放置雕刻材料

调整激光模组焦距

准备雕刻文件并存入TF卡

将TF卡插入机器

接通电源并打开开关

机器进行初始化

等待初始化完成

按下微动开关进入预览模式

再次按下微动开关开始雕刻

是否按下微动开关 — 长按

短按

是否处于暂停模式 — 否

是

继续雕刻

暂停雕刻

停止雕刻

结束

# WARRANTY

Before returning the product and filling in a warranty, please contact after-sale person for going through after-sale formality. And attach this warranty card along with the returned machine.

Repair ☐        Change ☐        Return ☐

Name:_____Telephone:_____

Address:_____

_____

_____

Serial Number:_____Order Number:_____

Channel: Platform ☐      Offline ☐

Date of purchase Day_____Mon._____Year_____

Malfuction And Damage Depiction Or Return And Change Reasons/Suggestions:

_____

_____

_____

Repair Records:

_____

_____

_____

Note: Clients have to fill in basic infor. and return reasons. Repair records shall retain for technicians.

# 产品保修卡

产品寄回前请先联系售后专员,为正常进行售后处理,请务必填写此卡,并随机器寄回。

返修 ☐        换货 ☐        退货 ☐

客户名称:_____联系电话:_____

收件地址:_____

_____

_____

机器制造编码:_____订单编号:_____

购买渠道:电商平台 ☐      线下 ☐

购买日期:_____年_____月_____日

故障描述或退、换货原因和建议:

_____

_____

_____

维修情况记录:

_____

_____

_____

温馨提示:基本信息及返厂原因为客户必填项,维修情况记录部分为维修人员填写项。