AtomStack Studio Software User Manual
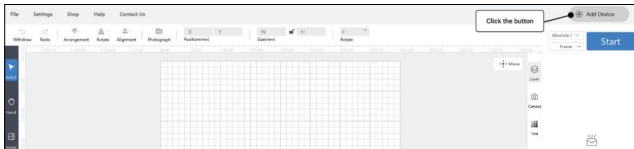
Table of contents

1.AtomStack Studio download and installation

(1)You can download the AtomStack Studio software for your PC operating system from www.atomstack.com(Operating system support: macOS 10.14 or later, Win7 or later).

(2)Locate the downloaded file in the Software Downloads folder. In Windows or Mac OS, you can simply double-click the downloaded file to complete the installation.
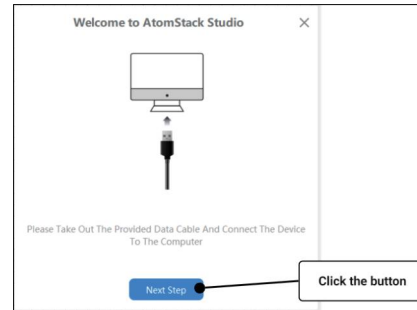

2.Connect and control devices via USB

(1)Open AtomStack Studio software and click the "Add Device" button.

(2)Connect engraver to the computer through equipped USB cable and click "Next".Please check followings in case of connection failure:

- Please check whether the device and computer serial port are working properly. You can try other serial ports.
- If you simultaneously connect to other software (e.g., Lightburn) while using the current device, please close other similar software.
- The computer USB driver version is out of date, please update it:
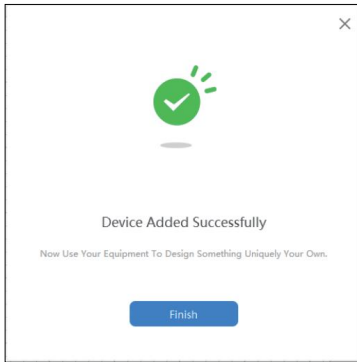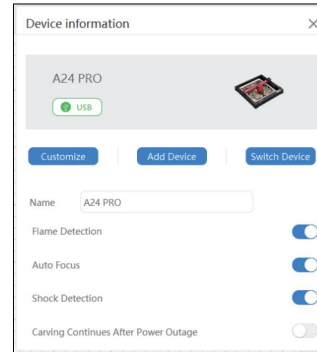 **Windows driver:** https://asa.atomstack.com/downloadWindows-Drivers.do3
  Mac driver: https://asa.atomstack.com/downloadMacDrivers.do3

(3)Select correct model and click "Next Step".

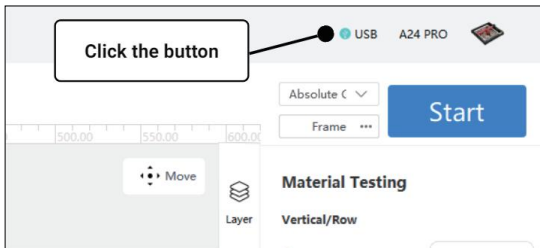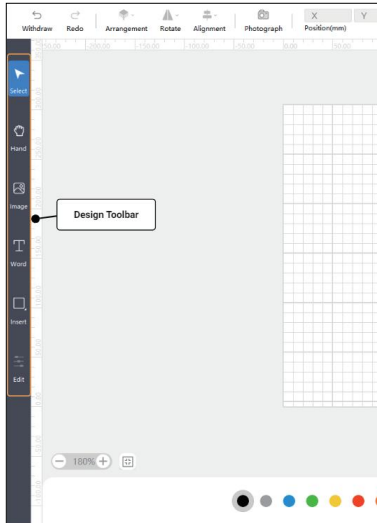(4)The device is added successfully, now start your creation.

3.Device settings

(1)Get device connected, click the device connection icon in the upper right corner of homepage to open the device settings window.
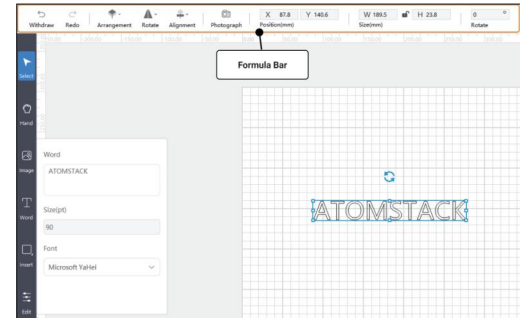

(2)Set the device as you need.

- **Name:** You can rename the device.
- **Flame Detection :** When enabled, it triggers when a fire occurs directly below the laser. Laser module automatically returns to the origin, and buzzer sounds. Machine resumes to work after restarting. (If supported)
- **Auto Focus:** After enabling, the machine will automatically focus before engraving, and then engrave after focusing. (If supported)
- **Tilt detection:** When enabled, it triggers when the angle between the machine and the horizontal plane is between 15° and 20°. Machine automatically stops working, and buzzer sounds. Click "confirm" on display screen to dismiss the alert. (If supported)
- **Resume Engraving:** When enabled, if machine stops due to a power outage during engraving, the unfinished engraving work can be continued after reconnecting the machine. (If supported)
- **Customize:** The laser and extension kit of the device can be customized. The recommended engraving settings and workspace size will be refreshed along with device hardware updates.
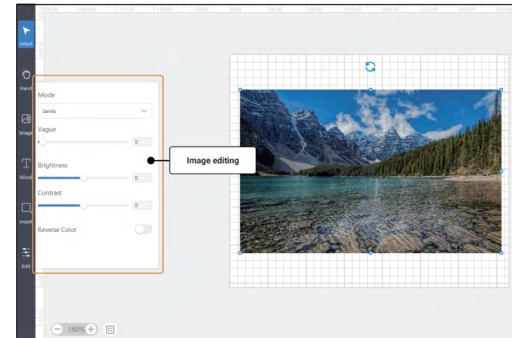
4.Project Design

(1)You can use the toolbar on the left side of workspace to create objects, includes inserting pictures , vectors , shapes, and text .
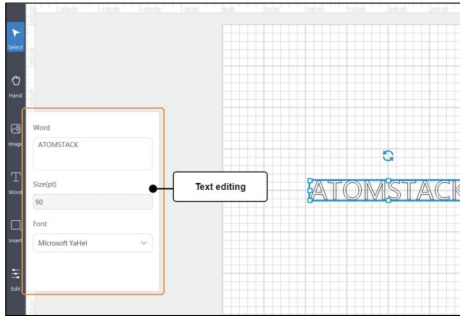

Design Toolbar

(2)Create and select the object in workspace, you can edit position , size , rotation angle , alignment , and flip of the object with the top editing bar.

Formula Bar

(3)Select the image, you can adjust mode, blur, brightness, contrast, and inverse color of the image with the pop-up editing bar on the left.
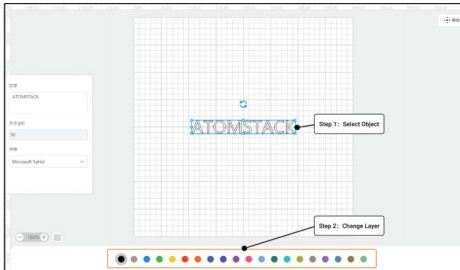

Image editing

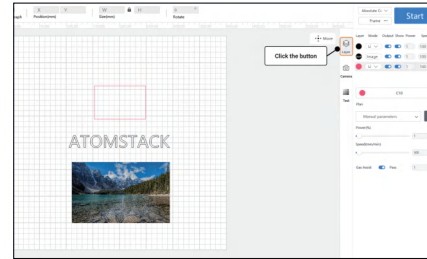(4)Select the text, you can adjust content , size , and font of the text with the pop-up editing bar on the left.

5.Engraving parameter settings

(1)Each object in workspace corresponds to a "layer", select the object, you can change its "layer" in the bottom layer list. Double-click the circular pattern at the bottom of the layer to select all objects in workspace within that 'layer'.
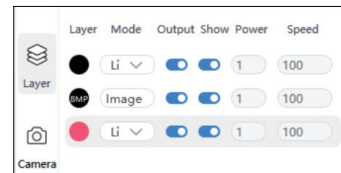

(2)Click "Layer" button in menu on the right side of workspace to set engraving parameters for all "layers" in workspace.

(3)The "Layer" list displays information about all "layers " in workspace .

- **Layer:** Since the engraving parameter settings for Image object differs from vector object in the object's layer, they are displayed separately in the list, image layer displays "BMP".
- **Mode:** The engraving type of the layer. Image has single model without other options, vector has options of "Line " , "Fill" and "Cut". Line-follows vector lines to engrave , Fill-fill vector objects before engraving , Cut-follows vector lines to cut.
- **Output:** Enable/disable engraving of this layer.
- **Show:** Enable/disable showing this layer in workspace.
- **Power:** Set the power for this layer.
- **Speed:** Set the speed for this layer.

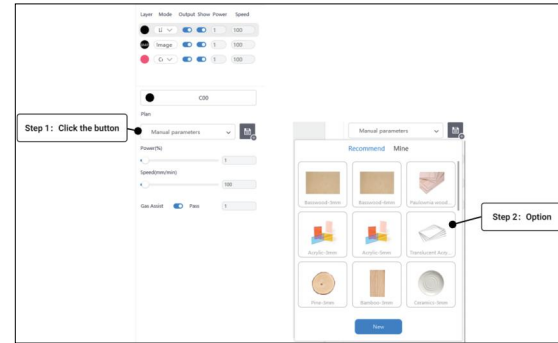(4)Click "Layer" in the list, and other engraving parameter settings for this layer are displayed below. Engraving parameters set for image object differs from vector object.

- **Plan:** Use official or user-created engraving parameter settings
- **Gas Assist:** Enable gas assist (if supported)
- **Pass:** Number of times this layer is repeated for engraving.
- **Start cutting Z step:** Engraver 's Z-axis descent distance before cutting begins.
- **Z step per pass :** Engraver's Z-axis descend distance after each pass (if
- supported).
- **Line Spacing:** The spacing between consecutive engraved lines.
  Engraving Direction : Set the bitmap engraving direction, "Horizontal" and
- "Vertical".
  Engraving Mode : Set the bitmap engraving mode, Bidirectional Engraving - higher engraving efficiency, One-Way Engraving - lower engraving efficiency, better result.
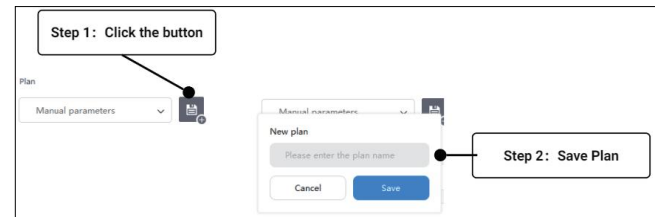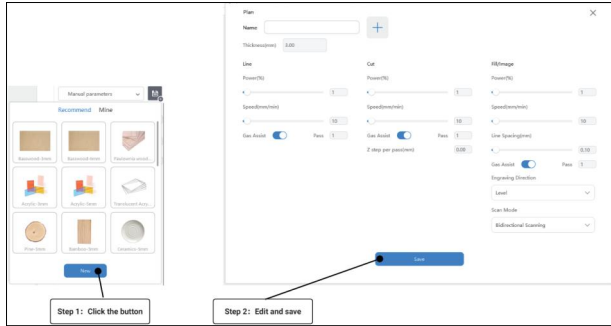

6.Material plan

(1)When you set the "Layer" engraving parameters, you can select the corresponding material plan in "Plan" to automatically load the engraving parameters.
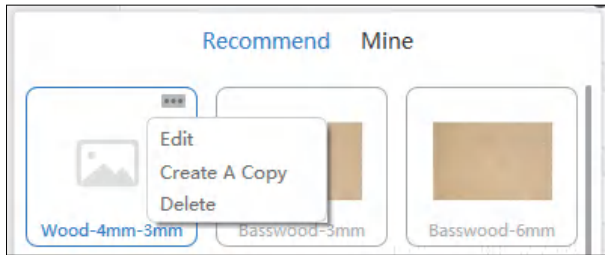

(2)When you want to save the current engraving parameter values, you can click "Save" button, name the plan and save the values of the current engraving mode.

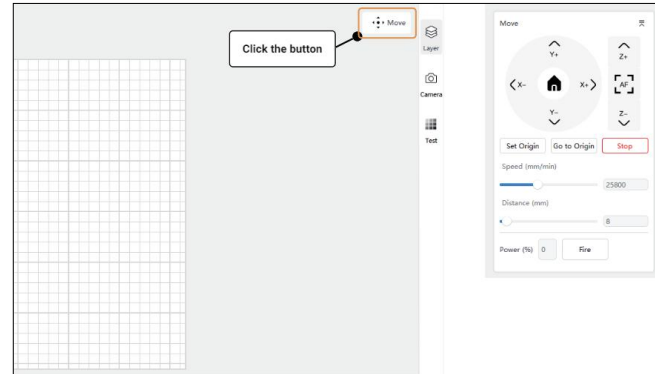(3)You can also create a plan in the pop-up window by clicking "Create Plan" in plan list.

(4)After the plan is successfully created, you can check it in plan list, and click "... " in the upper right corner of the plan to edit , create a copy and delete it.

7.Laser movement

(1)Click the "Move " button in the upper right corner of workspace to open the laser move page.

On move page, you can control XYZ axis movement of the laser, set the origin, frame, and fire.

- **Set Origin:** Set the origin with the current position coordinates of the laser. When engraving starts from "User Origin" and use the origin coordinates set by the user as the starting position for engraving.
- **Frame:** The laser moves to outline the current engraving position in workspace.
- **Stop:** Force stop any movement and emission of the laser.
- **Go to Origin:** move laser to the origin set by the user.
- **Speed:** Laser movement speed on XYZ axis.
- **Distance:** Laser movement distance on XYZ axis.
- **Fire:** Laser emission test (power adjustable from 0-20%).

8.Engraving area preview

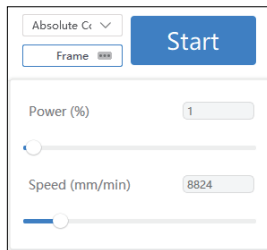(1)After you complete the object creation on workspace, you can click the "Frame" button on the upper right side of the page, laser will move along the boundary of the pattern on material so that you can preview the engraving area.

(2)You can also click the "..." on the right side of "Frame" button to set the blue light output power and moving speed of the laser when framing.

9.Start engraving

(1)Click the "Start Position" button in the upper right corner of main window to select where to starts from.

- **Absolute Coords :** Carve on material according to the coordinate position of the object in workspace.
- **Current Position :** Use the current coordinate position of laser as the starting position for engraving.
- **User Origin :** Use the origin coordinate position set by the user as the starting position for engraving.

(2)After start position is selected, click "Star" button on the right, and the laser immediately performs the engraving work.

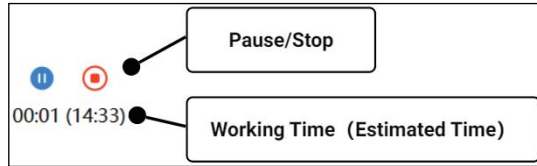(3)The page displays buttons for "Pause" and "Stop," as well as the "Working Time (Estimated Time)" when engraving starts.

- **Pause:** Pause the engraving, click it again to resume the unfinished work.
- **Stop:** Stop the engraving, the device returns to standby mode.
- **Working Time:** Displays the current accumulated engraving duration.
- **Estimated Time:** Indicates the expected duration for the current project.

(4)There will be a pop-up prompt when the engraving is completed .

10.Complete a project

1.Let's try to make a piece of carving project. Firstly, we can import an image by clicking "Image" button on the left.

2.Set parameters, position, and size after the image is imported.

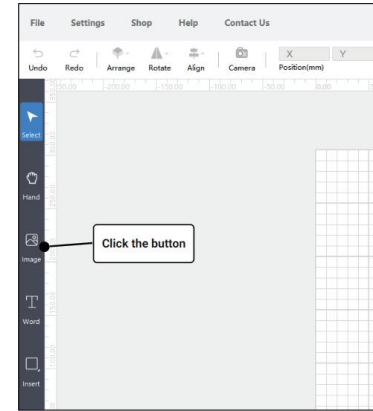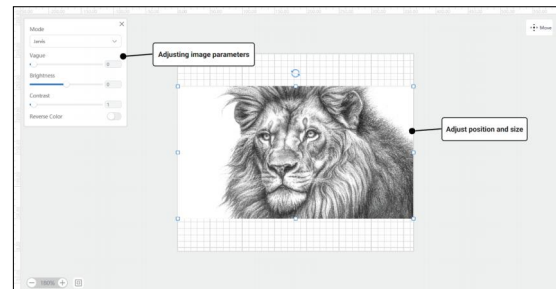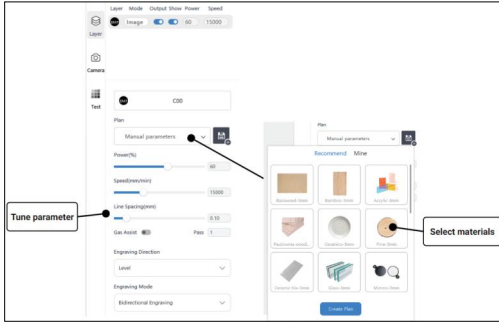3.You can go to the corresponding layer on the right to set parameters. If you are a beginner, we recommend to use the officially provided material plan to set parameters. You can also manual set every item directly. For this project, we use 3mm thick MDF, set as Power-60%, Speed 15000mm/min, Line Spacing -0.1mm.

4.When parameter is set, position the laser on "Move" page. Click "Frame" button to target the engraving area, click "Start" button to start engraving when all set.

5.Laser module stops working when project is completed, you can take out your piece from device.

11.Camera calibration

(1)Before using the camera to update workspace background function, you need to calibrate this camera. Please complete the engraver addition first and connect camera to computer.

(2)Click "Camera" button on the right side of workspace, select the connected camera in the pop-up camera settings, and click "Calibrate Lens" to enter camera calibration.

(3)Steps in calibration
- **Step 1:** You need to download the picture "chessboard" to your computer and print the it on a paper, ensure the side length of square between 1mm and 1.2mm
- **Step 2:** According to the diagram at top, place the "chessboard" paper to the same position as diagram.
- **Step 3:** Click "Capture" button below to detect the pattern when it is clearly visible.

If capture fails, please check and readjust the "chessboard" paper position to see if the pattern is clearly visible/obstructed by obstacles. Click "Capture" button to try again when well checked.

(4)After first position is captured successfully, you need to calibrate the next "chessboard" position shown in diagram. Repeat the capture until all 9 position calibrations are completed, page moves to "Camera Alignment".

Lens Calibration Wizard(2/9) ✕

Download chessboard

Place The "chessboard" Card As Shown In The Picture At The Location Of The Engraving Area Captured By The Camera, And Then Click The "Capture" Button. Please Try To Place The chessboard Within The Drawn Line Area And Ensure That The Pattern Is Not Obscured.

Camera Image

Capture

(5)Steps in alignment
- **Step 1:** You need to set the engraving area to be photographed first.
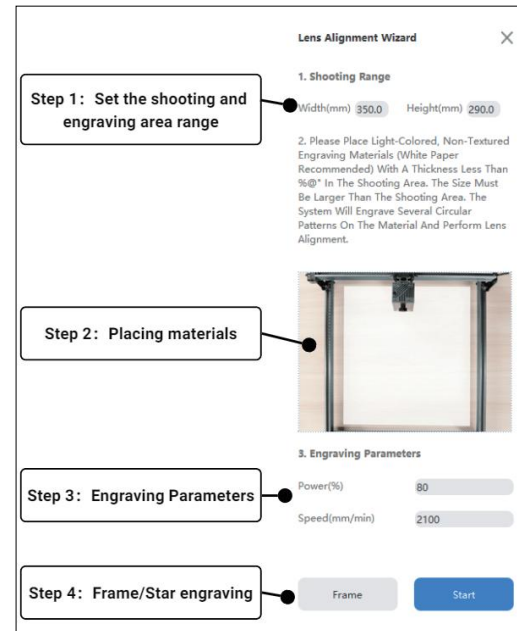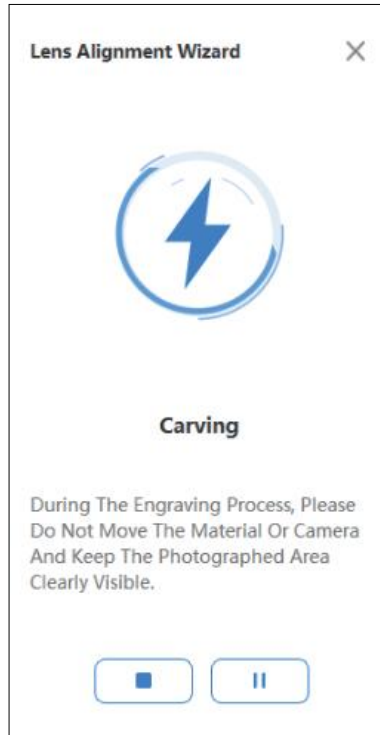- **Step 2:** Place light-colored, non-textured materials in the engraving area (it is recommended to use a paper). The size of the materials needs to be larger than the range of the engraving area you set to shoot.
- **Step 3:** The laser will engrave 49 circular patterns on the material, so you need to set the laser engraving parameters.
- **Step 4:** Frame to check whether the engraving area is proper, and click "Start" button to start engraving.

Lens Alignment Wizard ✕

1. Shooting Range

Step 1: Set the shooting and engraving area range

Width(mm) 350.0   Height(mm) 290.0

2. Please Place Light-Colored, Non-Textured Engraving Materials (White Paper Recommended) With A Thickness Less Than %@* In The Shooting Area. The Size Must Be Larger Than The Shooting Area. The System Will Engrave Several Circular Patterns On The Material And Perform Lens Alignment.

Step 2: Placing materials

3. Engraving Parameters

Step 3: Engraving Parameters

Power(%)   80

Speed(mm/min)   2100

Step 4: Frame/Star engraving

Frame   Start

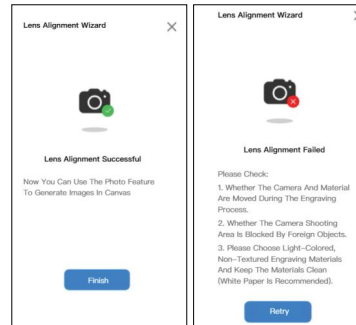(6)Please do not move the material or camera in when moves to engraving page, and keep the photographing area clearly visible. Realignment is needed if you stop engraving/exit the process during engraving.
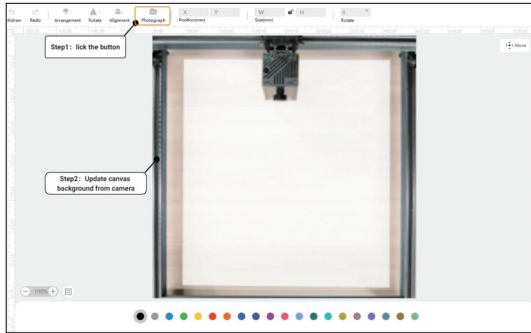

Lens Alignment Wizard   ✕

Carving

During The Engraving Process, Please Do Not Move The Material Or Camera And Keep The Photographed Area Clearly Visible.

(7)A pop-up window comes to the page after the engraving is completed. Please check that each circular pattern engraved on the material is clearly visible. If there is any residue on the material, please clean it without moving the material and click "OK".

Please check that each circular pattern engraved on the material is clearly visible. If there is any residue on the material, please clean it without moving the material before proceeding to the next step.

Cancel   OK

(8)After alignment is successfully completed, you can refresh workspace background through "Photo" function. If alignment fails, you need to follow the prompts to check the steps, and click "Retry" below to realign the camera.

Lens Alignment Wizard   ✕

Lens Alignment Successful

Now You Can Use The Photo Feature To Generate Images In Canvas

Finish

Lens Alignment Wizard   ✕

Lens Alignment Failed

Please Check:
1. Whether The Camera And Material Are Moved During The Engraving Process.
2. Whether The Camera Shooting Area Is Blocked By Foreign Objects.
3. Please Choose Light-Colored, Non-Textured Engraving Materials And Keep The Materials Clean (White Paper Is Recommended).
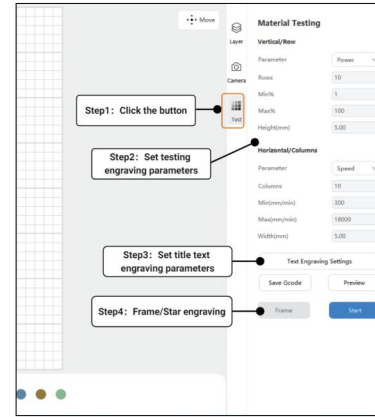
Retry

(9)After calibration, you can click "Photograph" button at the top of workspace to take a photo with the camera to update workspace background, and use the background picture to accurately align the image. If the accuracy of background photograph is not ideal, you can recalibrate the camera by clicking "Calibrate Camera Lens" on the camera homepage.

12.Material testing

(1)If you need to test the engraving result of the material, you can quickly test the material through the material test function.
- **Step 1:** Click "Test" button on the menu on the right side of workspace.
- **Step 2:** Set the required test parameters in the list.
- **Step 3:** Set the title text engraving parameters in the material testing matrix.
- **Step 4:** Frame to check whether the engraving area is proper, and click "Start" button to start engraving.

- **Parameter:** Set the engraving parameters that need to be tested.
- **Rows:** Set the number of "rows" in the test array.
- **Columns:** Set the number of "columns" in the test array.
- **Min:** test the minimum value of engraving parameters.
- **Max:** Test the maximum value of the engraving parameters.
- **Height:** Set the height of each engraved rectangular object in the test array.
- **Width:** Set the width of each engraved rectangular object in the test array.

AtomStack PC软件说明书

目录

1.AtomStack下载与安装

(1)你可以在www.atomstack.com下载适用于您 PC 操作系统的AtomStack软件(系统支持：macOS 10.14或更高版本，Windows7或更高版本）。

(2)完成下载后，在"软件下载"文件夹中找到该文件。在 Windows 和 Mac 上，您只需双击下载的文件即可完成安装。
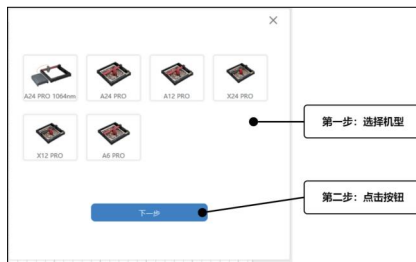

2.通过 USB 连接和控制设备

(1)打开AtomStack软件，单击"添加设备"按钮。
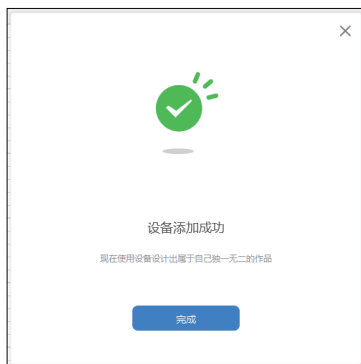

(2)使用随附的 USB 电缆将设备连接至计算机，点击"下一步"。

如无法连接，请检查以下情况：
a. 请检查设备与计算机串口是否运作正常，可尝试更换计算机连接串口后重试。
b. 正在使用其他软件(例：Lightburn)与当前设备进行连接，请关闭其他同类软件。
c. 计算机USB驱动程序版本过旧，请进行更新：
- **Windows驱动下载地址**：https://asa.atomstack.com/downloadWindowsDrivers.do3
- **Mac驱动下载地址：** https://asa.atomstack.com/downloadMacDrivers.do3

(3)请在界面中选择对应机型，点击"下一步"按钮。

(4)设备添加完成，现在开始您的设计创作。

3.设备设置

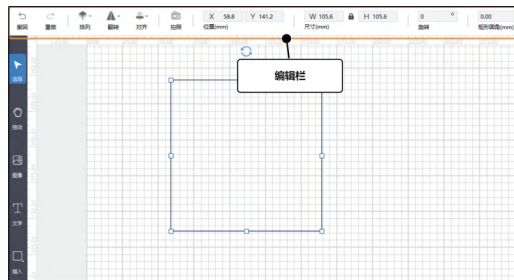(1)连接设备后，在软件主页的右上角，单击设备连接信息即可打开设备设置窗口。

(2)在界面中，您可以根据需要设置设备。

- **名称：** 给设备设定一个新的名称。
- **火焰检测：** 启用后，当激光器正下方发生火灾时触发该功能，激光模块自动返回原点，蜂鸣器鸣响。重启机器后即可正常使用。（如果支持）
- **自动对焦：** 启用后，进行雕刻前机器会自动进行对焦，对焦完毕后再进行雕刻。（如果支持）
- **倾斜检测：** 启用后，当机器与水平平面之间的角度在15°-20°时，该功能被触发机器自动停止工作，蜂鸣器鸣响。点击设备屏幕上的"确定"解除警报。（如果支持）
- **断电续雕：** 启用后，当机器雕刻过程中断电停止，重新连接机器后可继续未完成雕刻工作。（如果支持）
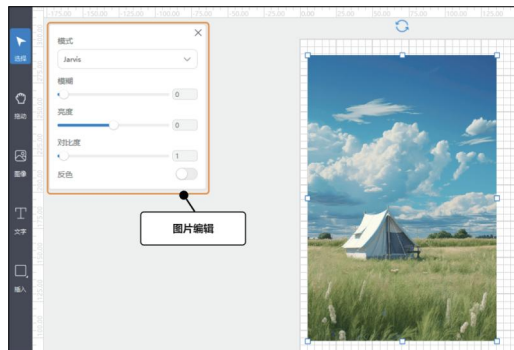- **自定义：** 可自定义设备的激光器与延长轴，雕刻推荐参数与画布尺寸跟随更改后设备硬件进行刷新。
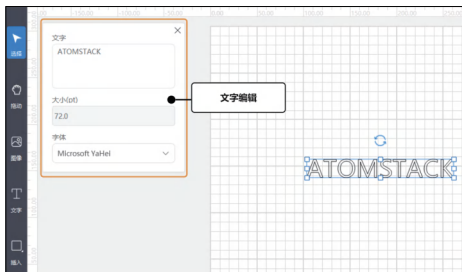
4.项目设计

(1) 您可以使用画布左侧的设计工具栏进行创作设计，创作内容包括插入图片、矢量图、形状、文字。

设计工具栏

(2)插入内容并在画布中激活对象后，您可以通过顶部编辑栏对对象进行位置、尺寸、旋转角度、对齐、翻转、矩形圆角进行编辑。

编辑栏
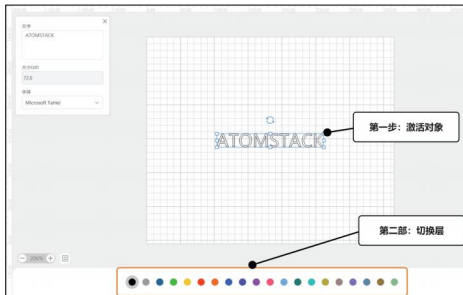
(3)如您激活图片，您还可通过左侧弹出辑栏，对图片进行模式、模糊、亮度、对比度、反色调整。

图片编辑

(4)如您激活文字，您可通过左侧弹出编辑栏，对文字进行内容、大小、字体调整。

5.设置雕刻参数

(1)画布中每一个对象对应一个"层"，激活对象后您可以通过底部层列表更换对象所在"层"。双击层底部圆形图案，可激活该"层"内所有画布对象。
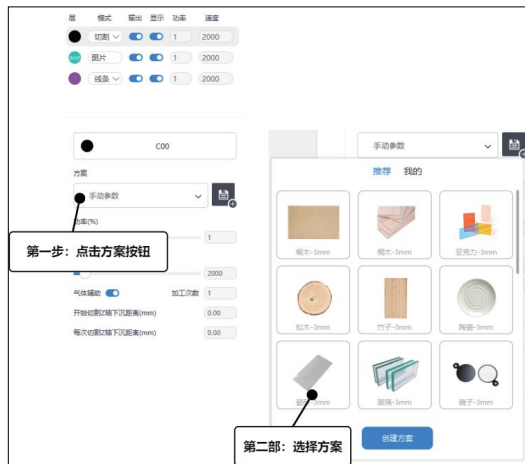

(2)在画布右侧菜单栏中点击"层"按钮，可以为画布中所有"层"设定雕刻参数。

(3)层列表中显示画布中所有"层"信息。

· **层：** 对象所在层，图像与矢量对象需设置雕刻参数不一样，因此在列表中会区分显示，图像层显示"BMP"。
· **类型：** 层的雕刻类型，图像固定只有一种雕刻类型，矢量对象可设定"线条""填充""切割"。线条–以矢量线条进行雕刻、填充–对矢量对象进行填 充后再进行雕刻、切割–对矢量线条进行切割。
· **输出：** 启用/禁用激光器雕刻此层。
· **显示：** 启用/禁用在画布中显示此层。
· **功率：** 该层使用雕刻功率。
· **速度：** 该层使用雕刻速度。

(4)点击列表中"层"，下方显示该层其他雕刻参数设置，图像与矢量对象需设置雕刻参数不一样。

· **方案：** 使用官方或用户创建的雕刻参数方案。
· **气体辅助：** 启用气体辅助（如果支持）。
· **加工次数：** 此层重复雕刻次数。
· **每次切割Z轴下沉距离：** 每遍切割后，激光器Z轴下降距离（如果支持）。
· **开始切割Z轴下沉距离：** 切割开始前，激光器Z轴下沉距离（如果支持）。
· **线条间隔：** 激光器雕刻连续线之间的间距。
· **雕刻方向：** 设定位图雕刻方向，分为"水平""垂直"两种。
· **雕刻模式：** 定位图雕刻模式，双向雕刻–雕刻效率高，单向雕刻–雕刻效率低但效果更好。

(2)当您希望保存当前雕刻参数，可以通过点击"保存"按钮，输入方案名称后保存当前雕刻模式的参数。

6.材料方案

(1)当您设定"层"雕刻参数时，您可以在"方案"功能中，选择对应材料方案自动载入雕刻参数。

(3)您也可以通过在方案列表中点击"创建方案"，在弹窗界面进行方案创建。

(4)方案创建成功后，您可在方案列表中进行查看，并可以点击方案右上角"..."进行编辑、创建副本、删除。

7.激光器移动

(1)点击画布右上角"移动"按钮，可打开激光器移动操作界面。界面中您可以操作激光器XYZ轴移动、设定原点、巡边、点火。

- **巡边：** 激光器通过移动在雕刻区域中显示当前项目雕刻位置。
- **紧急停止：** 强制停止激光器任何运动及出光。
- **设置原点：** 以激光器当前位置坐标设定原点，当雕刻开始位置采用"用户原点"，以用户设定原点坐标位置作为雕刻开始位置进行雕刻。
- **移动到原点：** 将激光器移动至用户设定原点位置。
- **速度：** 激光器XYZ轴移动速度。
- **距离：** 激光器XYZ轴移动距离。
- **点火：** 激光器出光测试（功率可设置0–20%）。

8.预览雕刻区域

(1)当您完成画布中对象设计后，可以点击界面右上方"巡边"按钮，激光器将沿着材料上加工图案的边界进行移动，以便您可以预览雕刻区域。

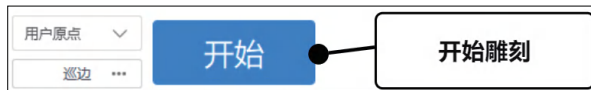(2)您还可以通过点击"巡边"按钮右侧"...", 设定巡边时激光器蓝光出光功率以及移动速度。

(1)在主界面右上方点击"开始位置"按钮, 可选择雕刻对象在材料中雕刻开始位置。

· **绝对坐标:** 按照对象在画布中坐标位置, 在材料上对应坐标进行雕刻。
· **当前位置:** 以激光器当前坐标位置作为雕刻开始位置进行雕刻。
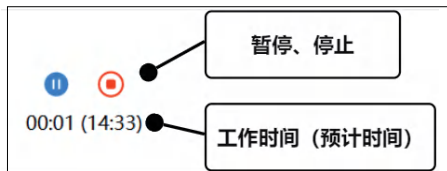· **用户原点:** 以用户设定原点坐标位置作为雕刻开始位置进行雕刻。

(2)选择开始位置后, 点击右侧"开始"按钮, 激光器立即执行雕刻工作。

(3)进入雕刻过程后，界面显示"暂停""停止"按钮以及"工作时间（预计时间）"。

- **暂停：** 暂停雕刻工作，可再次点击按钮继续未完成工作。
- **停止：** 停止雕刻工作，设备返回待机状态。
- **工作时长**：当前工作雕刻累计时长。
- **预计时长：** 当前工作预计需要时长。
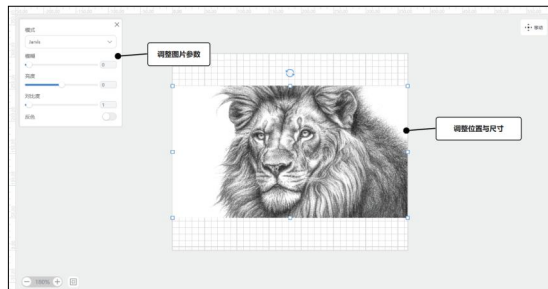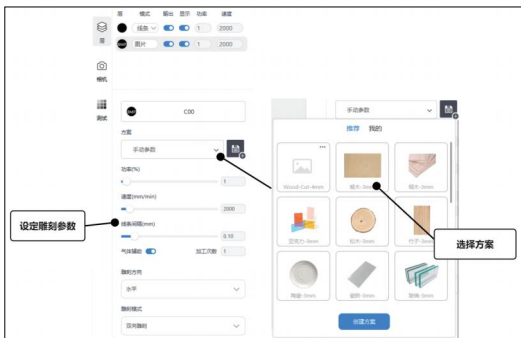

(4)雕刻完成后，界面有弹窗提示。

10.制作一个作品

1.让我们尝试完成一个雕刻作品，首先我们可以通过点击左侧"图像"按钮，载入一张图片。

2.导入图片后，您可以对图片参数、位置、尺寸进行调整。

3.您可以通过右侧"层管理"界面中，对雕刻参数进行设置。如果您是初学者，我们推荐您根据项目的材料，使用官方提供方案设定雕刻参数。你也可以直接通过对每项雕刻参数调节进行设置，本次我们使用材料为MDF-3mm，功率-60%、速度-15000mm/min、线条间隔-0.1mm。

4.完成雕刻参数设定后，通过"移动"界面可对激光模组进行定位。使用"巡边"在雕刻区域中定位雕刻目标范围与位置，准备就绪后点击"开始"进行雕刻。

5.雕刻完毕，待激光模组停止运作后，即可从设备中取出您的雕刻作品。

11.相机标定

(1)在使用相机更新画布背景功能前，您需要先对接入相机进行"校准相机镜头"操作。首先完成激光雕刻设备添加，将相机与计算机进行连接。

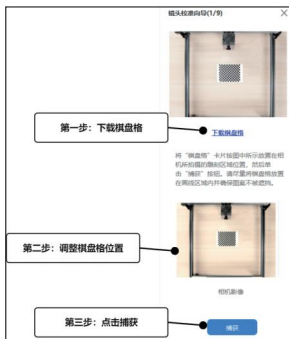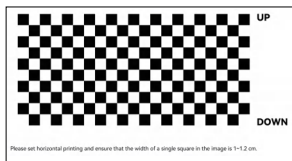(2)点击画布右侧菜单"相机"按钮，在弹出的相机设置中选择已连接相机，点击"校准相机镜头"进入相机标定流程。

(3)进入相机标定流程后，您需要进行以下步骤

第一步：需下载图片"棋盘格"至计算机，并用纸张打印"棋盘格"。棋盘格的方格需要确保在1–1.2mm。

第二步：按照界面上方示意图，将"棋盘格"摆放在相机拍摄区域相同位置。

第三步：确保图案清晰可见后，点击下方"捕获"按钮进行检测。

如检测失败，请检查并重新调整"棋盘格"位置，图案是否清晰可见/是否被障碍物遮挡。完成检查后再次点击"捕获"按钮进行重试。

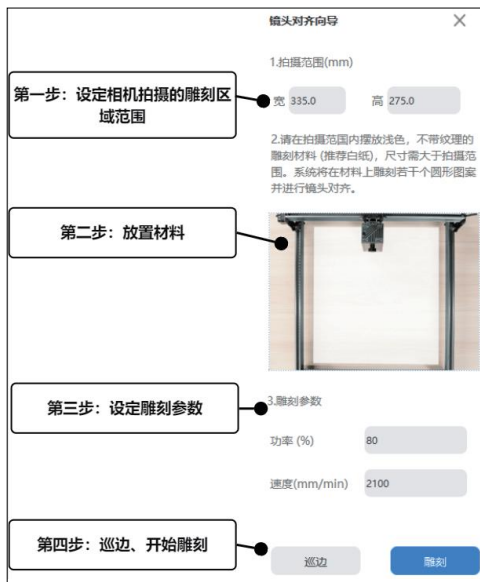(4)检测通过后，您需要对示意图显示的下一个位置进行棋盘格重新摆放并进行"捕获"，重复捕获直至完成9个位置校准后，界面进入"校准相机对齐"。

(5)在"校准相机对齐"流程中，您需要进行以下步骤：

第一步：您需要先设定拍摄雕刻区域范围。

第二步：在雕刻区域摆放浅色，不带纹理材料（建议使用白纸），材料尺寸需要大于您所设定拍摄雕刻区域范围。

第三步：激光器将会在材料上雕刻49个圆形图案，因此您需要设定激光器雕刻参数。

第四步：执行巡边检查雕刻区域是否合适，然后点击"开始"按钮开始雕刻。

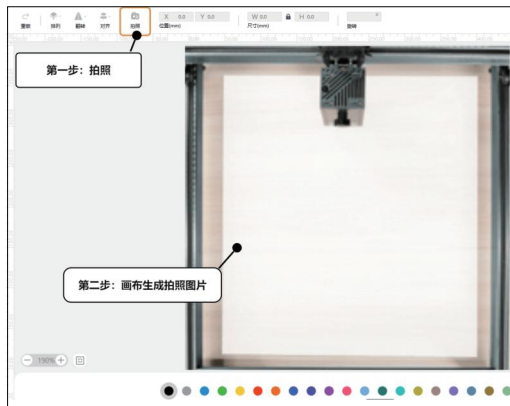(6)进入雕刻过程页面后，请不要移动材料或相机，并保持拍摄区域清晰可见。如雕刻过程中停止雕刻/退出流程，则需要重新进行"校准相机对齐"流程。

(7)雕刻完成后，界面弹出弹窗提示。请检查材料上雕刻每个圆型图案清晰可见，如材料上有残渣，请在不移动材料前提下完成清洁后，点击"确定"按钮。

请检查材料上雕刻每个圆型图案清晰可见，如材料上有残渣，请在不移动材料前提下完成清洁，再进行下一步操作。

取消　　　确认

(8)校准成功后，您可以通过"拍照"功能进行画布背景刷新。如校准失败，您需要按照界面提示，对校准步骤进行检查，并点击下方"重试"按钮重新进行校准相机对齐。

镜头对齐向导　　　×

镜头对齐完成

现在您可以使用拍照功能在画布中生成图片

完成

镜头对齐向导　　　×

镜头对齐失败

请检查：
1.雕刻过程中，相机与材料是否被移动。
2.相机拍摄区域是否被外物遮挡。
3.请选用浅色、不带纹理雕刻材料，并保持材料整洁（推荐白纸）。

重试

(9)完成校准后，您可以通过点击画布顶部"拍照"按钮，由相机拍照更新画布背景，通过背景图片进行雕刻图像精准对位。如发现画布背景图片精准度不够理想，您可以通过在相机主页点击"点击"校准相机镜头""重新进行相机标定。

第一步：拍照

第二步：画布生成拍照图片

12.材料测试

(1)如果你需要对材料进行雕刻效果测试，你可以通过材料测试功能对材料进行快速测试。
第一步：点击画布右侧菜单"测试"按钮。
第二步：在列表中设定需要测试参数。
第三步：设定材料测试阵列中，标题文字雕刻参数。
第四步：执行巡边检查雕刻区域是否合适，然后点击"雕刻"按钮开始雕刻。

- **参数：** 设定需要测试雕刻参数。
- **行数：** 设定测试阵列中，"行"的数量。
- **列数：** 设定测试阵列中，"列"的数量。
- **最小值：** 测试雕刻参数的最小值。
- **最大值：** 测试雕刻参数的最大值。
- **高度：** 设定测试阵列中，每个雕刻矩形对象高度。
- **宽度：** 设定测试阵列中，每个雕刻矩形对象宽度。