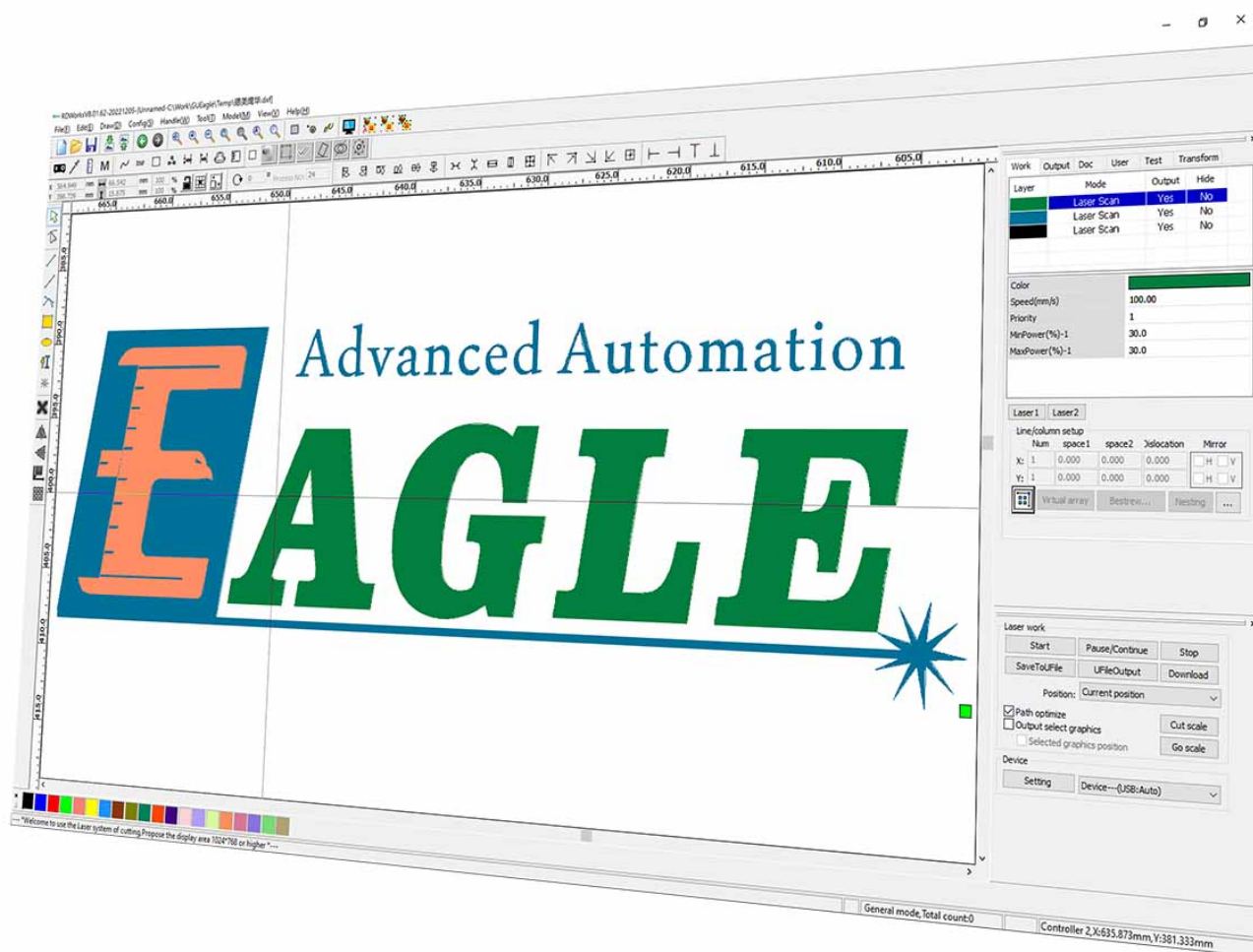# EagleWorks CAD/CAM

User's Manual

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Table of Contents

If any details in this manual is unclear or if you need additional assistance setting up your laser, please feel free to call us at +1 (626) 671-4014 or email at service@gueagle.com.

Introduction

How to Use This User's Manual

Thank you for purchasing a GU Eagle laser system coming with the EagleWorks CAD/CAM software. EagleWorks has been designed to be easy to use, but you will utilize it to its fullest potential by taking some time to read this user's manual prior to use. You will be ready to use the software as soon as you read the first few sections. Then you can refer to topics in the remaining sections, as you work.

Notes Used in This Manual

Look for these kinds of notes to help you find valuable information throughout the text:

> **NOTE**
>
> Helpful notes to keep in mind while running the laser!

> **IMPORTANT**
>
> Important instructions you should always follow.

> **WARNING**
>
> Warnings and cautions to keep in mind while running the laser.

Difference between EagleWorks and RDWorks

The EagleWorks software which comes with the customized EagleCAM laser controllers is almost the same as the original RDWorks software which comes with the original RDCAM laser controllers, except the supported controller models.

You can learn how to use RDWorks by this manual because the functions in RDWorks work the exact same way as in EagleWorks, but you cannot use RDWorks with a laser equipped with an EagleCAM, and vice versa.

Safety

Laser Safety

Lasers use intense beams of light to create heat and fire as a normal part of their operation, and depending on the laser, the light might not be visible to you. If the proper safety measures are ignored, you could burn or blind yourself or someone else, or start a fire that could damage or destroy the building in which the laser system is housed.

> **IMPORTANT**
>
> ***ALWAYS*** wear protecting glasses while doing laser processing.

> **WARNING**
>
> ***DO NOT*** aim and fire laser on anything but the workpieces you want to process.

> **WARNING**
>
> ***DO NOT*** leave a running laser unattended.

> **IMPORTANT**
>
> ***ALWAYS*** follow the laser safety regulations while operating a laser directly in EagleWorks.

The visible output beam of the Laser Diode Pointer (Red Dot Pointer) is accessible to the operator. While this device employs the same technology as the familiar laser pen-pointers, like them it is potentially hazardous if its beam is directed into the eye.

> **WARNING**
>
> ***DO NOT*** view directly into the beam of the Laser Diode Pointer (Red Dot Pointer).

Install EagleWorks

In this chapter, we will guide you to get, install and upgrade the EagleWorks software.

- Get EagleWorks
- Install EagleWorks
- Upgrade EagleWorks

Get EagleWorks

Before diving into the installation, you need to get the EagleWorks software package by the following ways.

1. The EagleWorks installation package comes with your CO_2 lasers.

   Visit our official website to get more information about our CO_2 lasers.


> **NOTE**
>
> The blue license key is for the EaglePrint software, refer to EaglePrint User's Manual for more information.

2. Get the latest EagleWorks installation package from our official website.

Install EagleWorks

Before getting started, plug in the software USB flash or download the EagleWorks installation package from our official website, refer to Get EagleWorks for more details.
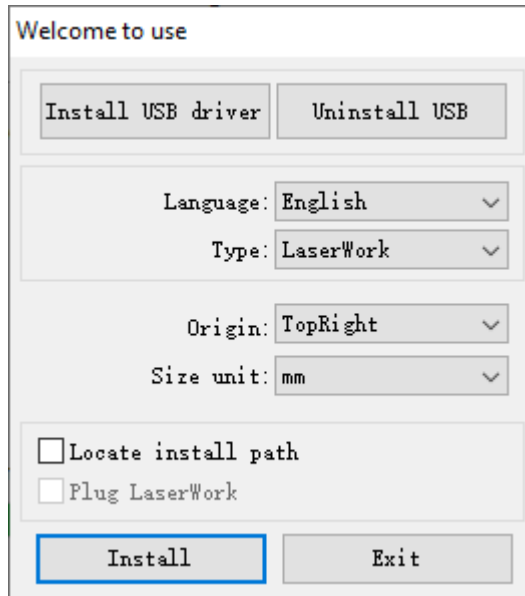
1. Browse to and double click the file *EagleWorksSetup_[version].exe* to launch the installer, a welcome screen appears.
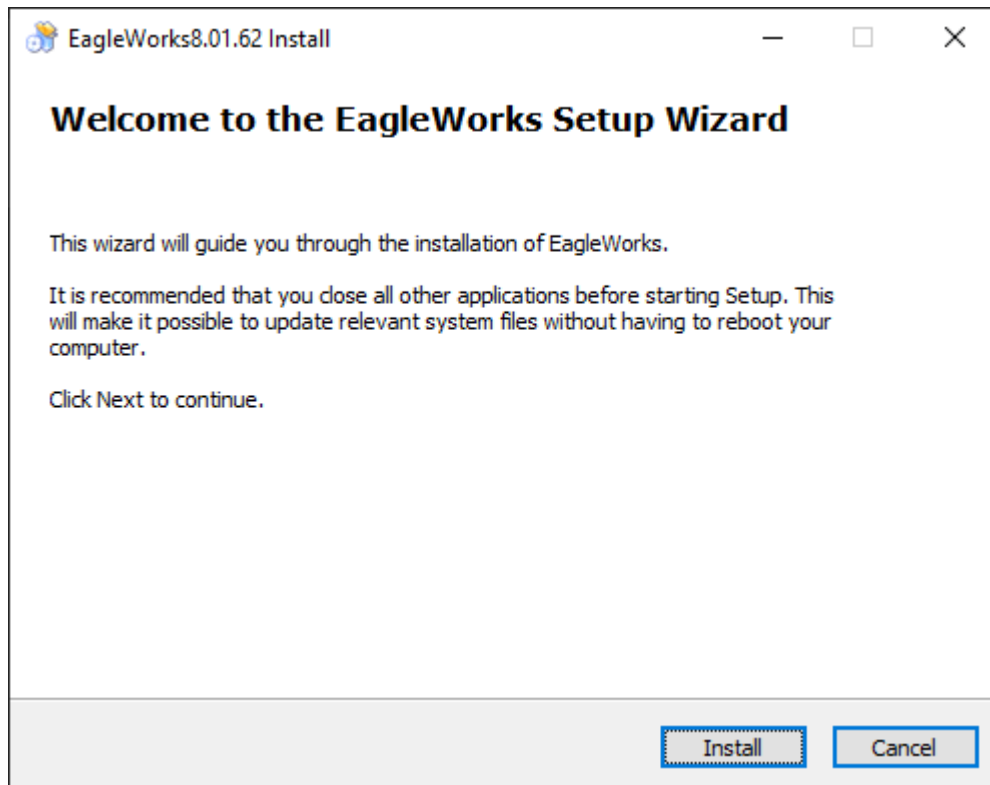
2. Click **Install** to start the installation.
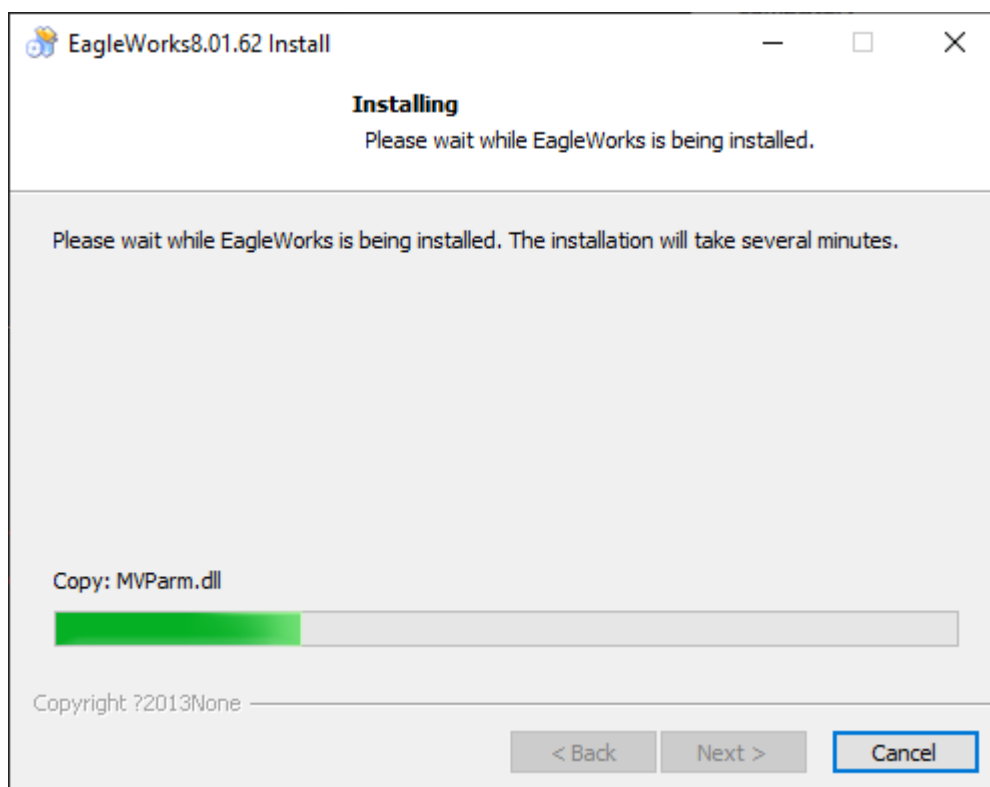
3. A setup dialog pops up. Click **Install USB driver** if you plan to connect your laser by USB.

```
Welcome to use

 ┌──────────────────┐  ┌──────────────────┐
 │ Install USB driver│  │   Uninstall USB  │
 └──────────────────┘  └──────────────────┘

        Language: English        ▽
            Type: LaserWork       ▽

          Origin: TopRight        ▽
       Size unit: mm              ▽

   ☐ Locate install path
   ☐ Plug LaserWork

 ┌──────────────────┐  ┌──────────────────┐
 │     Install      │  │       Exit       │
 └──────────────────┘  └──────────────────┘
```

> **NOTE**
>
> The installer will prompt you to connect your laser by the USB cable first, it is safe to ignore it and Windows will help you install the driver when the machine is connected the first time.

> **NOTE**
>
> The USB driver is not necessary if you plan to connect your laser by network.

4. Leave **Type** as **LaserWork**. Set **Origin** according to your laser. Set **Size unit** to your preference.

> **IMPORTANT**
>
> The option **Origin** *MUST* match the home position of your laser, otherwise, jobs will be in a wrong coordinate system, results in mirrored or flipped cutting or engraving.
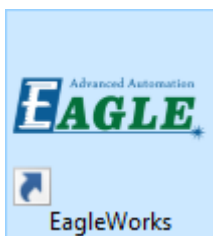
5. Click **Install** to finish the installation.

   A browser dialog will pop up if the option **Locate install path** is checked. Select a directory location, and click **OK**.
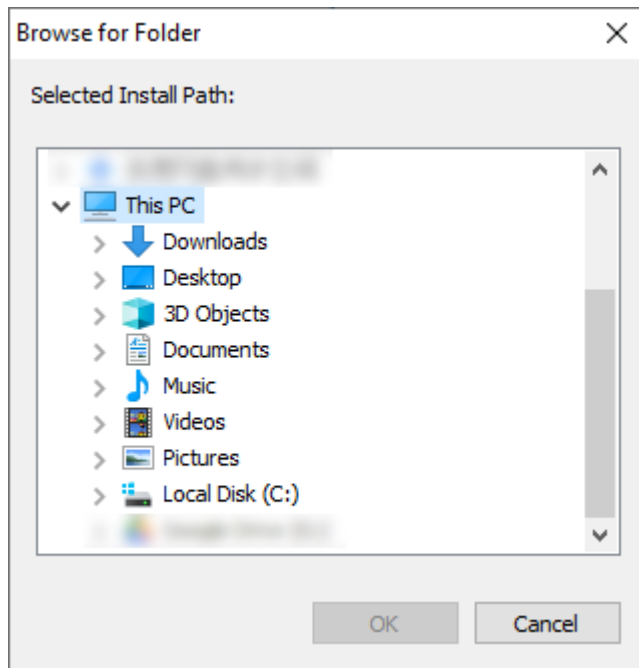
6. Click **Exit** to close the setup dialog.

An icon for EagleWorks will be automatically added to your *Desktop* and *Start Menu*. You are now ready to use the EagleWorks software.

Upgrade EagleWorks

You can always download the latest EagleWorks installation package from our official website.

You can just install the new version directly without uninstalling the old version, refer to Install EagleWorks for more details.

NOTE

You need to uninstall EagleWorks and delete the EagleWorks installation directory to completely remove the EagleWorks software. On Windows 10, go to **Settings**, click **Apps**, uninstall the software.
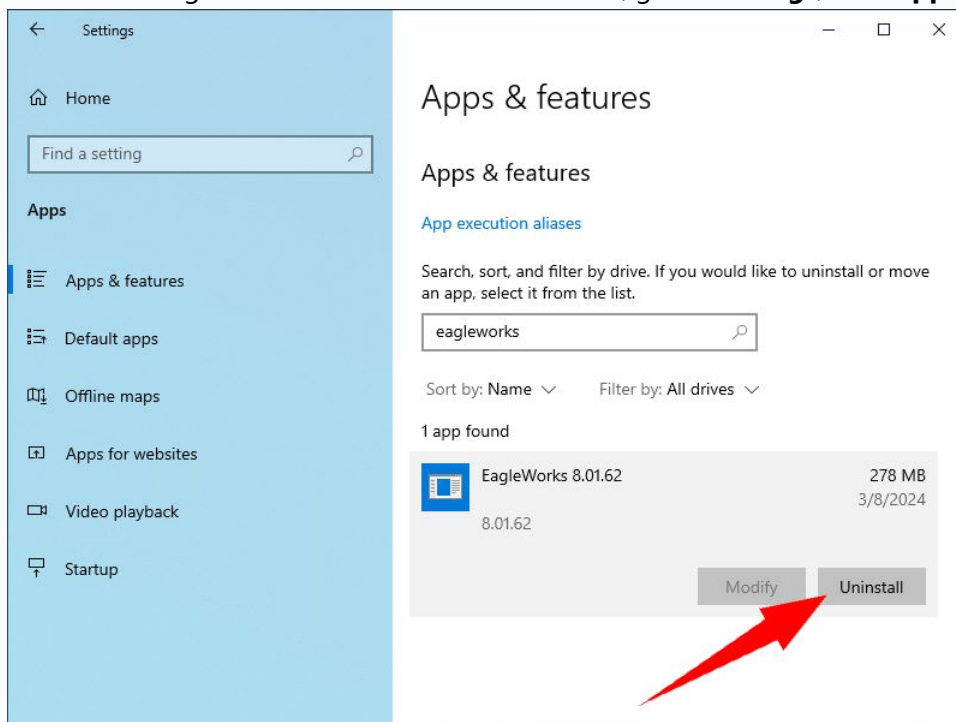
On Windows 7, or if you are more familiar with the old Windows **Control Panel**, go to **Control Panel**, click **Programs and Features**, uninstall the software.
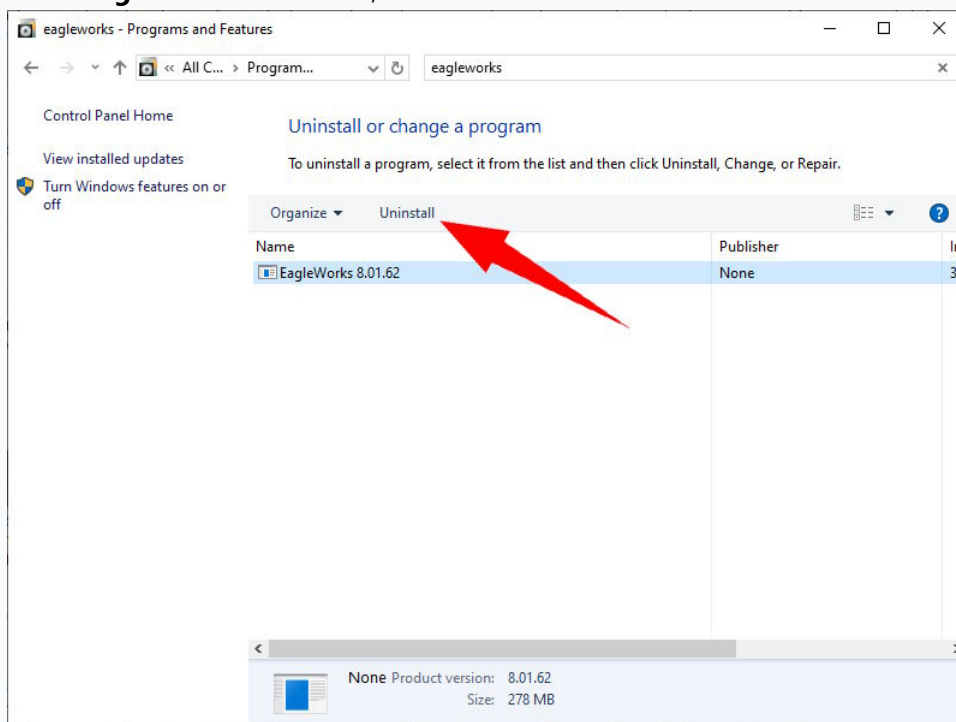
Getting Started

In this chapter, you will get familiar with the EagleWorks main user interface, learn how to connect your lasers to EagleWorks, and get to know the basics and the workflow.

- Get Familiar with the EagleWorks UI
- Set up Laser Connections
- Work with Offline Lasers
- The Workflow

Get Familiar with the EagleWorks UI

EagleWorks is a specialized CAD/CAM software, cooperated with the EagleCAM laser controllers, for laser cutting and engraving. You can create simple shapes, import artworks, lay out, set and check technology, do laser processing, all in one piece of software.

The EagleWorks main user interface is shown as below.
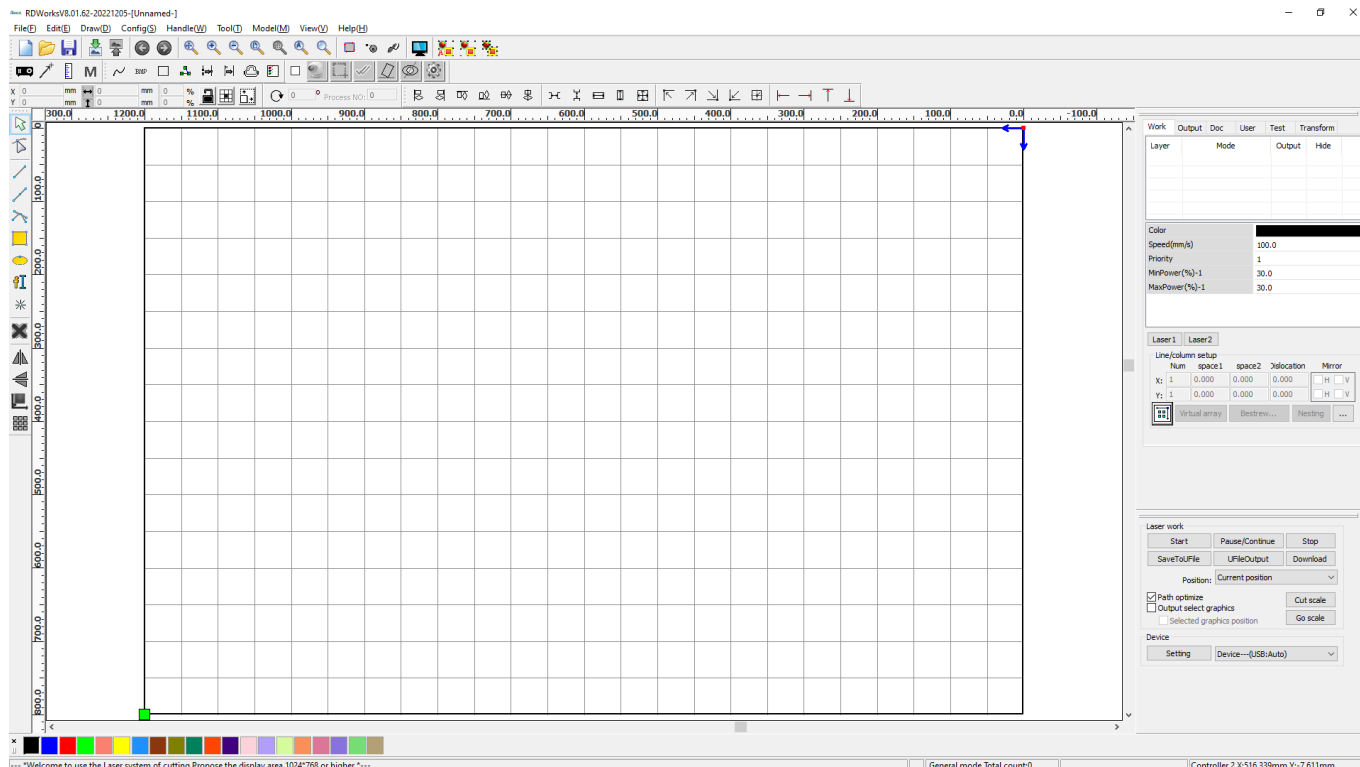
> **NOTE**
>
> You can switch the user interface language in the menu **Help**>**Language**.

Like all other CAD software, there is a big drawing window in the center. You can find the menu bar at the top, the status bar at the bottom, and some toolbars around the drawing window. There comes the CAM part on the right side, a set of panes which give you the technology and the settings of the current project, the job list, the machine settings of the current laser, laser positioning and jogging functions, a set of geometry transformation functions, and a laser panel at the bottom.

You can hide a UI element by unchecking the corresponding item in the menu **View**.
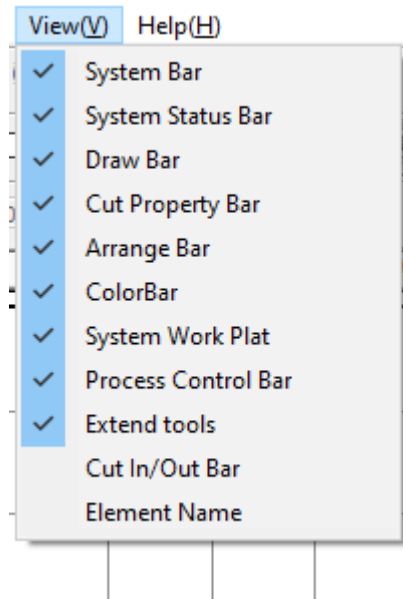
- **System Bar**

  The most commonly used functions for opening or importing files, saving, panning or zooming the view, etc, refer to Import Artworks and Panning and Zooming for more details.
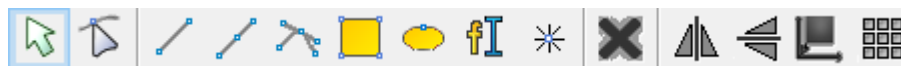

- **System Status Bar**

  Information of the drawing window, the current selection, the current operation, etc.
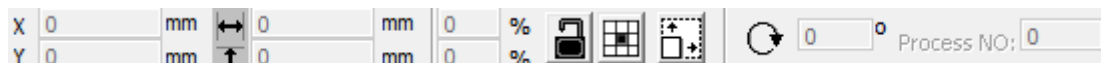
- **Draw Bar**

  The tools for creating, editing shapes, texts and simple layout, refer to Create Simple Shapes for more details.

- **Cut Property Bar**

  Edit geometry properties of shapes, refer to Transformations for more details.

- **Arrange Bar**

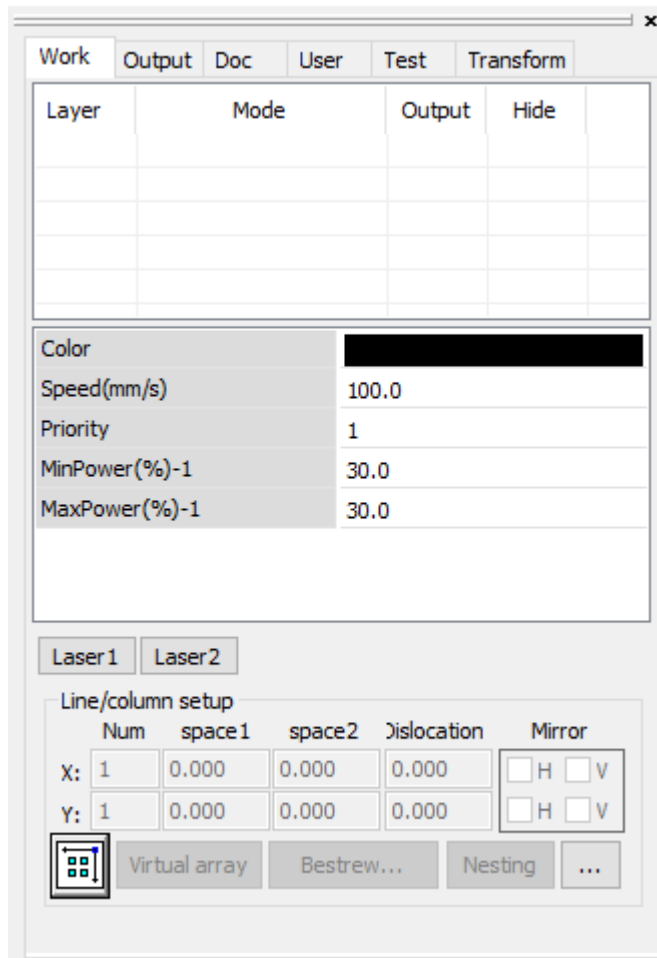 The functions for aligning and arranging shapes, refer to Transformations for more details.
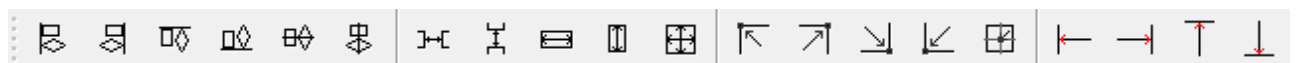
- **Color Bar**

  The colors represent the layers, and used for assigning different kinds of technology to shapes in your design, refer to Layers for more details.
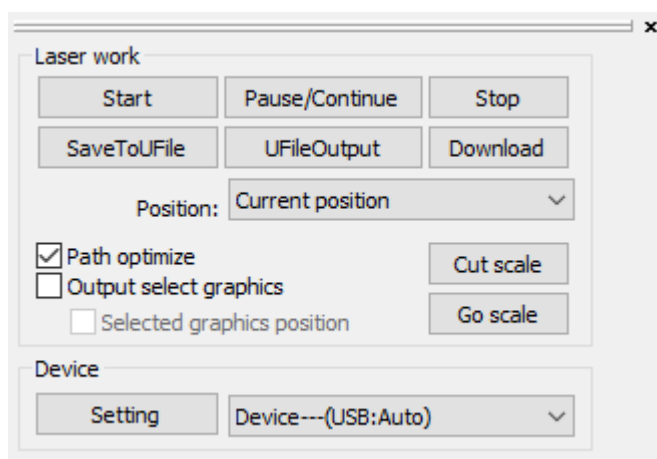
- **System Work Plat**

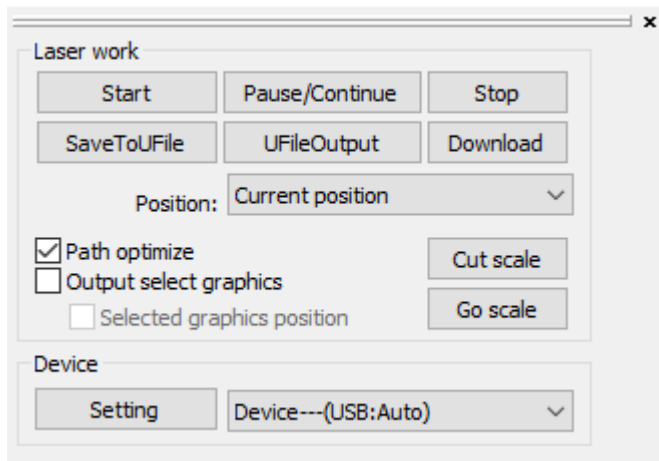 A set of panes include information, settings and functions, we will cover them in more details later.

- **Process Control Bar**

  Set up laser connections and control laser processing, refer to Set up Laser Connections and Laser Panel for more details.

Set up Laser Connections

Before starting jobs, you have to set up laser connections in EagleWorks.

Lasers could be connected to EagleWorks by USB or by network. There could be only one machine connected by USB at a time, and more than one machines connected by network at the same time.

1. Connecting by USB
   Connect the laser to the computer using the USB cable that comes with the machine. The connection should be up and running immediately because the software already has a USB device set up by default.

2. Connecting by network
   There are two ways to connect lasers to the computer by network, depends on the infrastructure and the way you work on your site.

   The laser could be connected to the computer directly using the ethernet cable that comes with the machine, just like the connection with the USB cable.

   And, the laser could be connected into the sub-network you already have. In this way, you can connect your computer wirelessly or have your workstation in another room, e.g. dedicated for job management or designing.
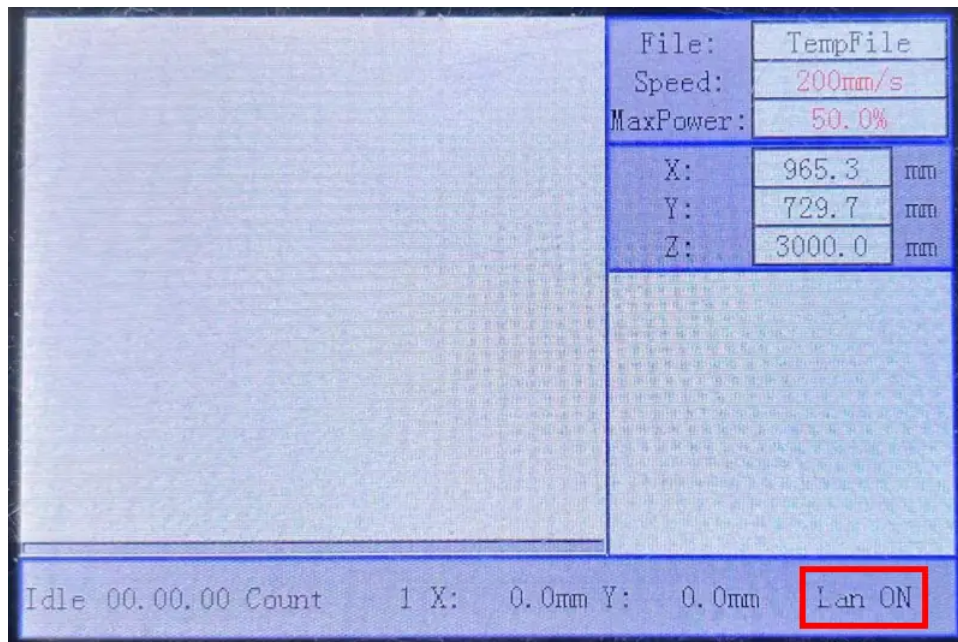
In either way, a network status prompt will appear on the control panel showing **Lan ON**, and you have to set up the network, put both the laser and the computer in the same subnet to let them communicate with each other.

Here are simple setups for example, please refer to your network administrator if there is a complex setup on your site.
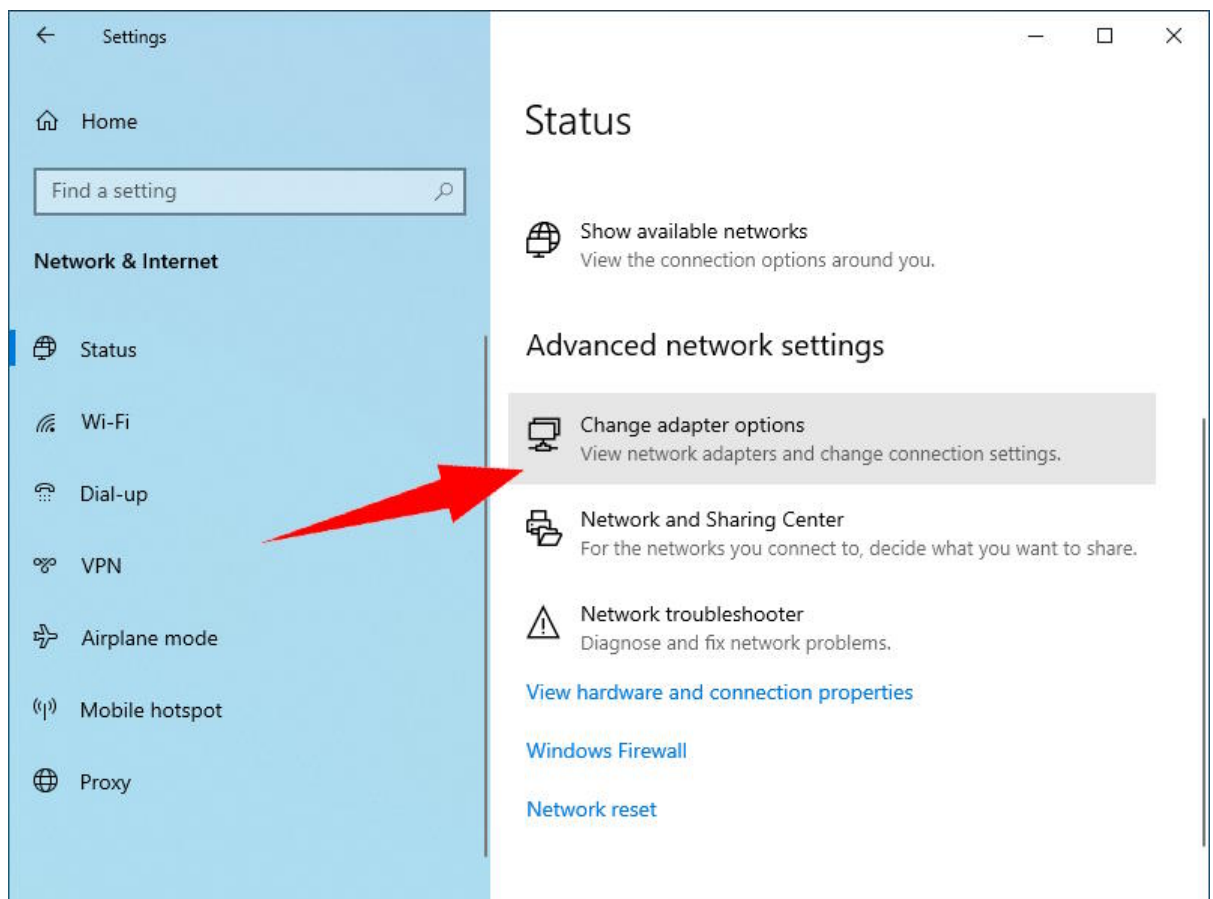
- Set up network for a direct connection
  The machine is set up to the IP address *192.168.1.100* by default. You can just set up a static IP address for your computer to put them in the same subnet.
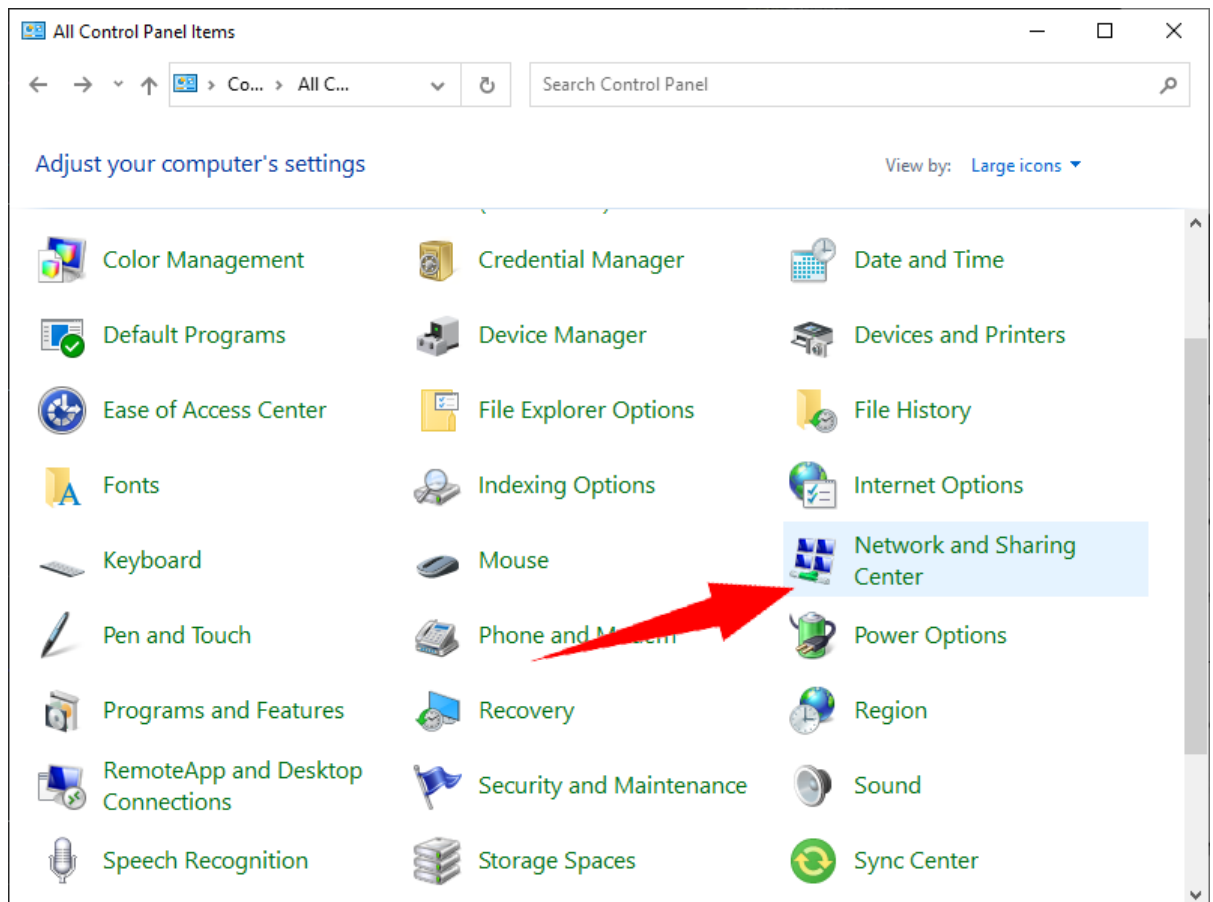
For Windows 10 users, go to **Settings**, click **Network & Internet**.
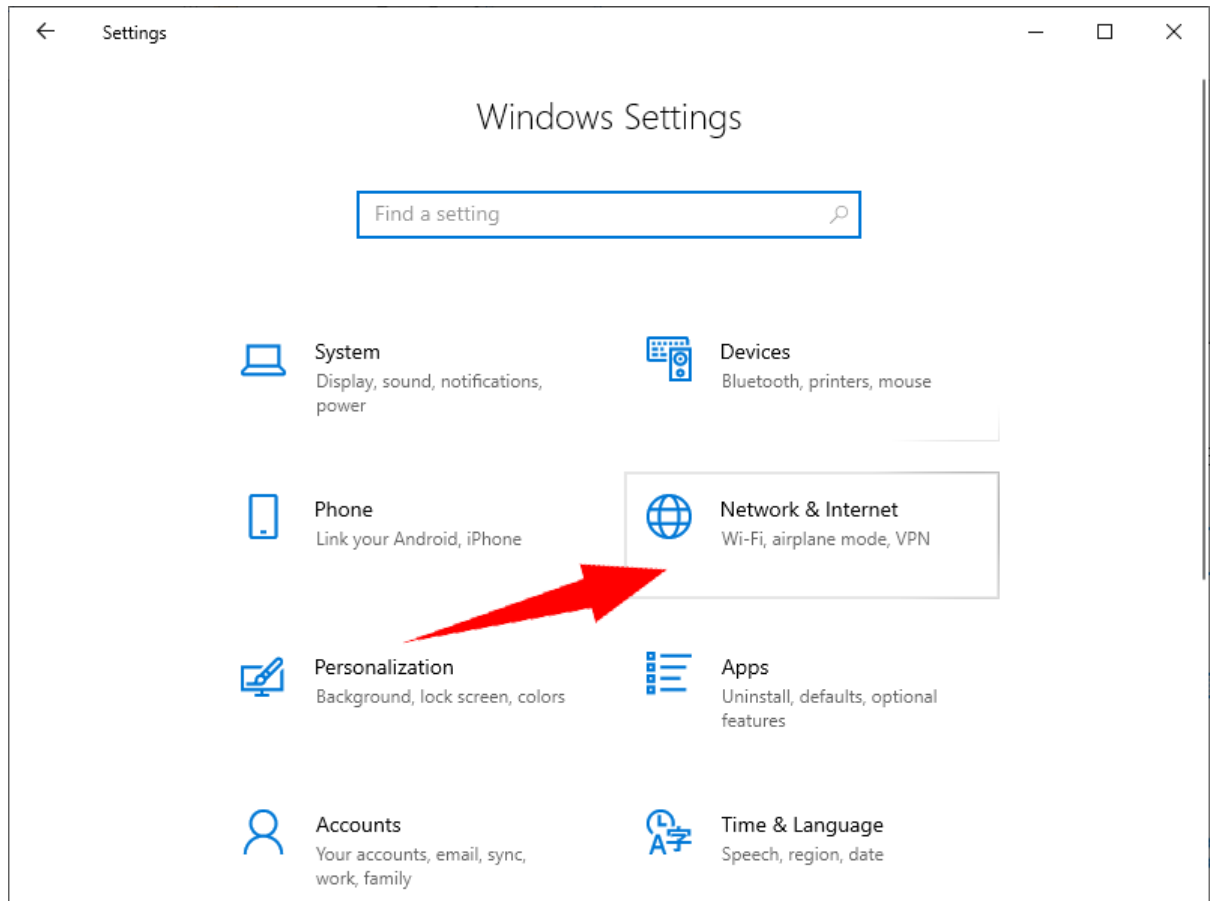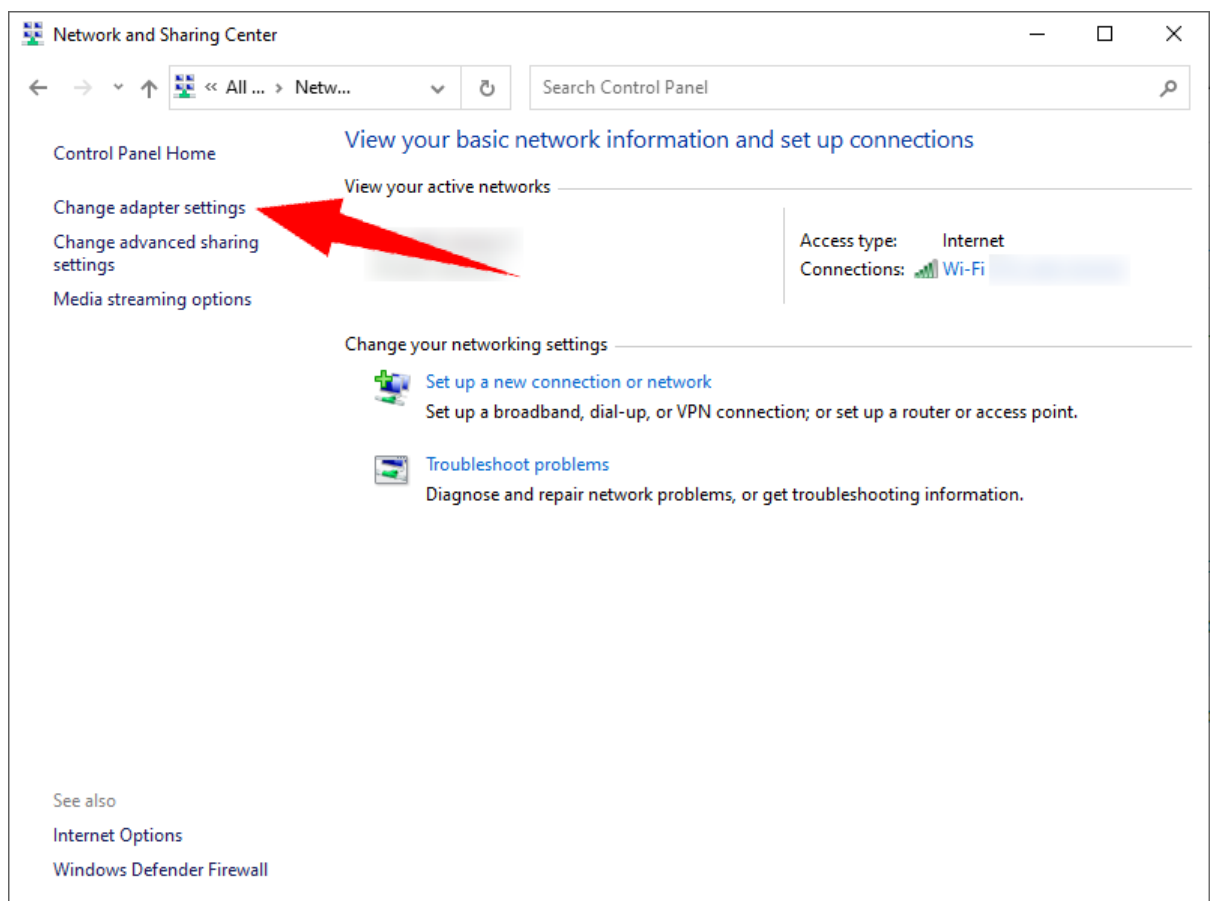

Choose **Status**, click **Change adapter options** to open **Network Connections**.
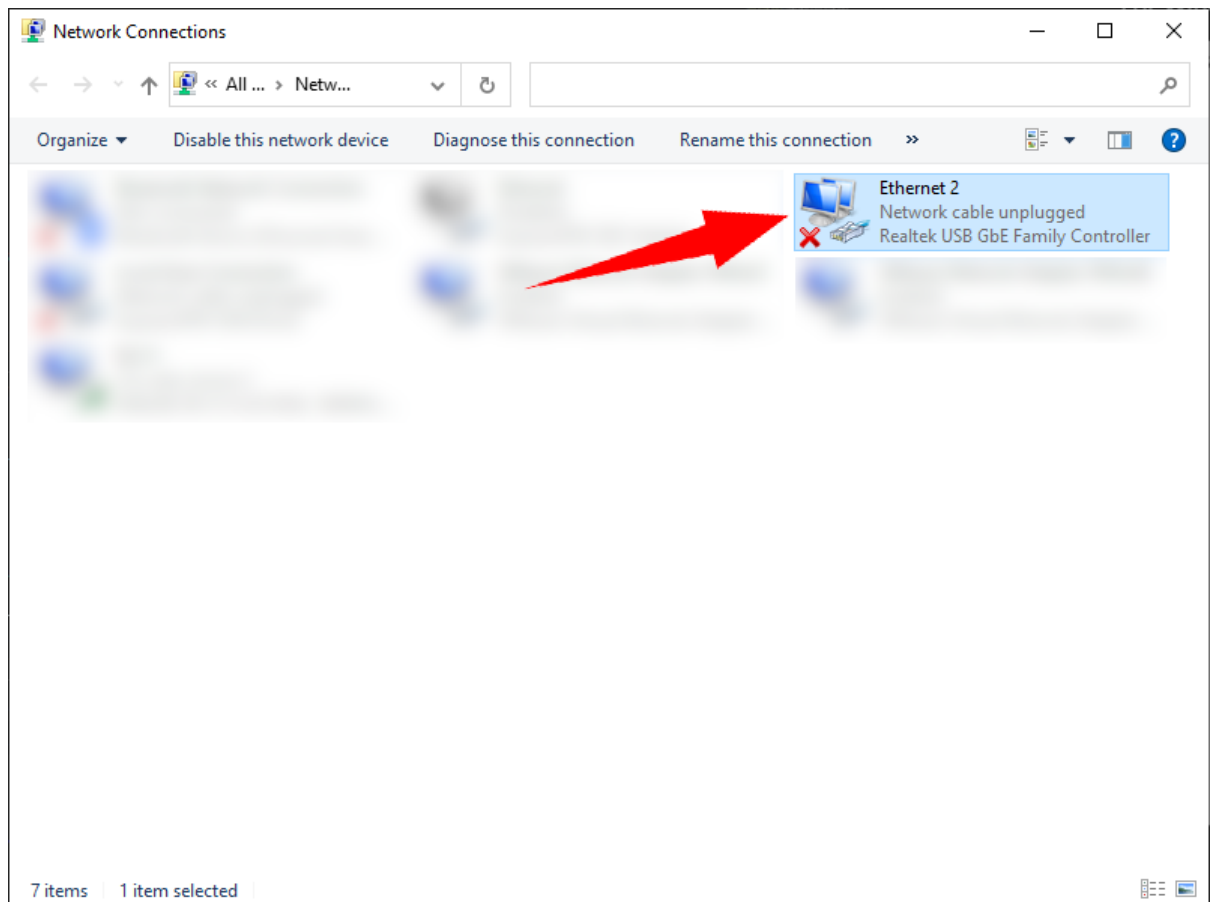
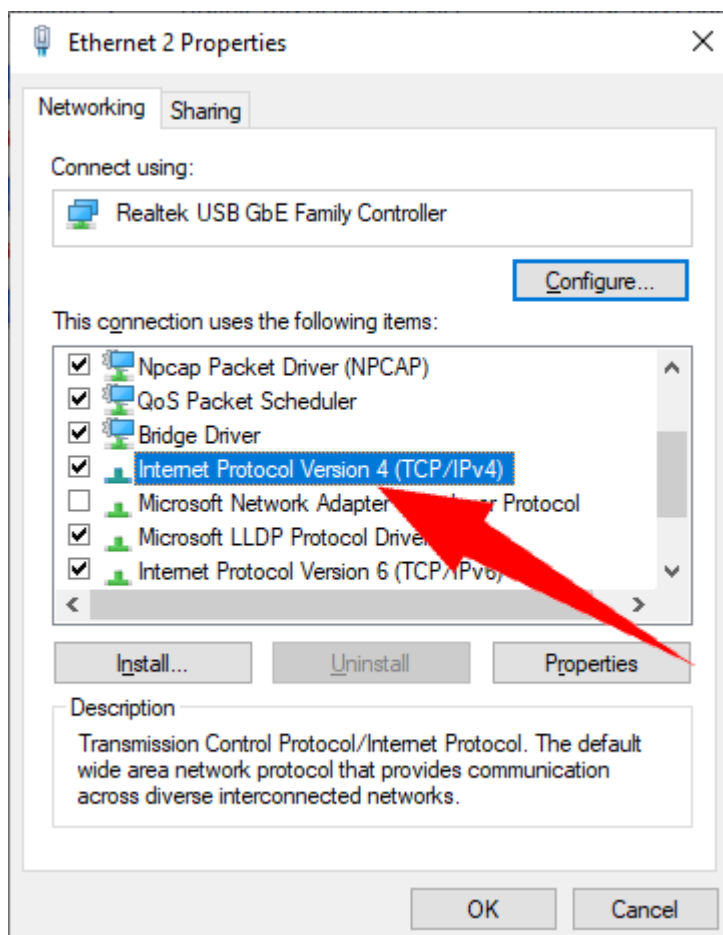For Windows 7 users, go to **Control Panel**, click **Network and Sharing Center**.

Click **Change adapter settings** to open **Network Connections**.

In **Network Connections**, double click the adapter connecting to the laser.

Scroll to and double click **Internet Protocol Version 4 (TCP/IPv4)** in the pop-up dialog.

Check **Use the following IP address** in the pop-up dialog, set **IP address** to, for example, *192.168.1.99*, set **Subnet mask** to *255.255.255.0*. Click **OK** to finish.
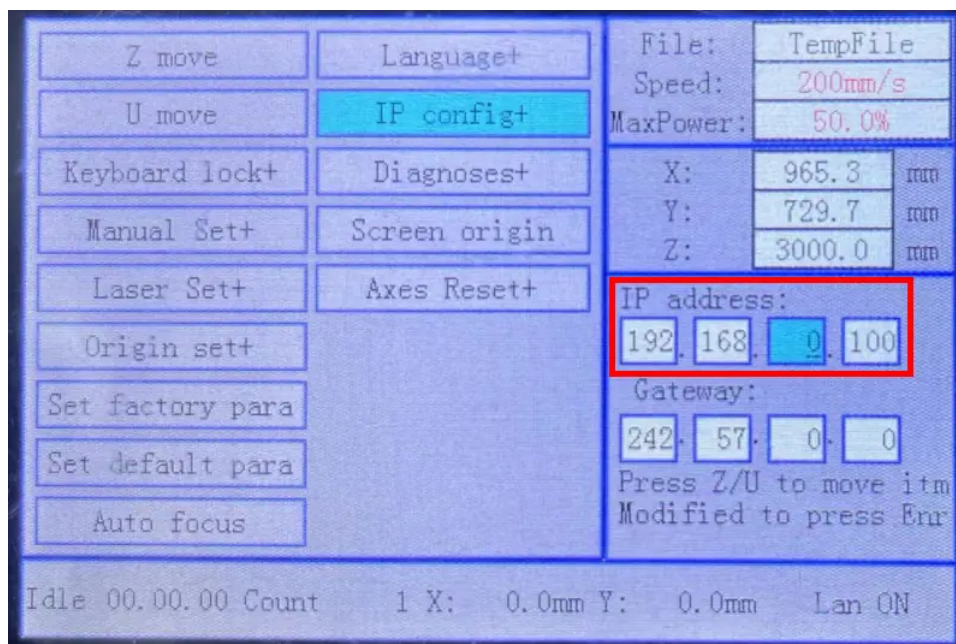
○ Set up network for connecting to an existing sub-network
First, set up a static IP address for the laser according to the existing subnet.

Press the button **Z/U** on the panel, highlight **IP config+**, and press the button **Enter**.
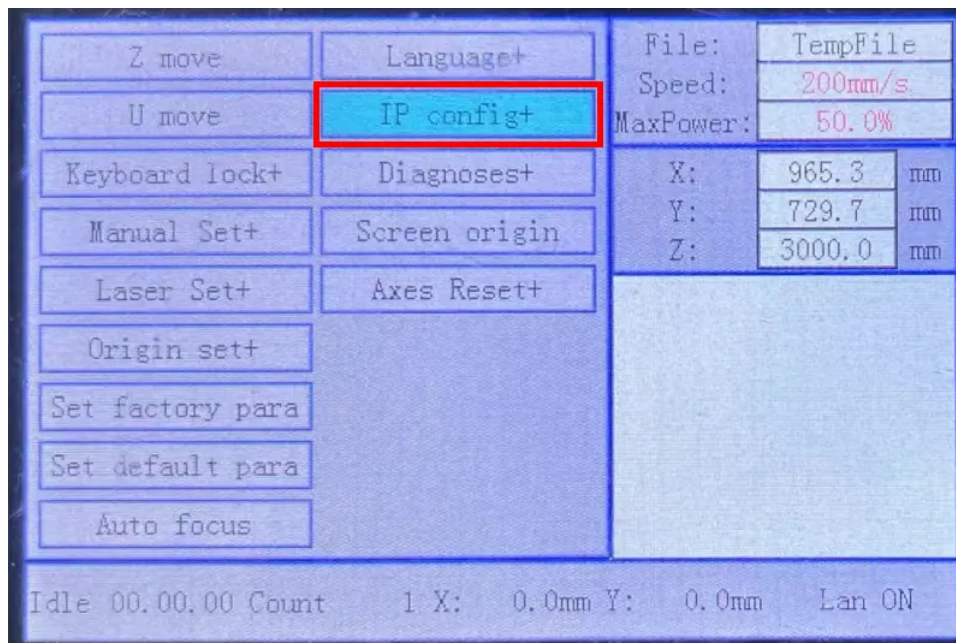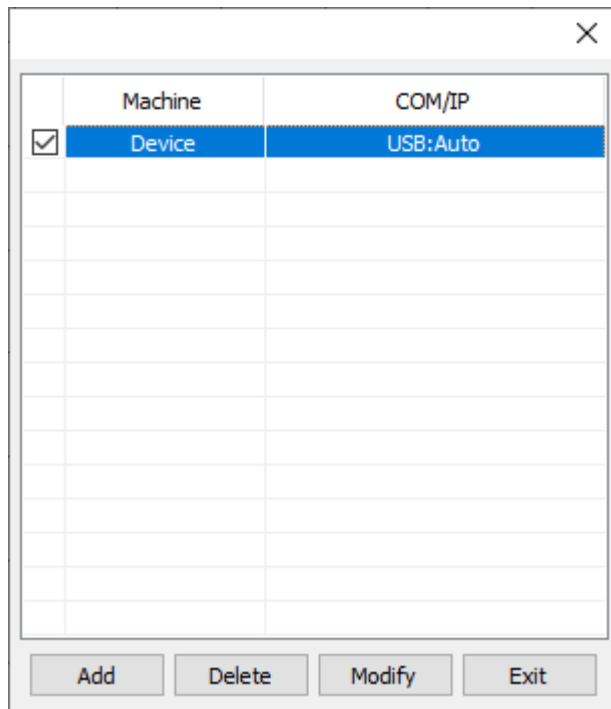

Set up the IP address, and press the button **Enter**.

Then, set up a static IP address for your computer, as described above, or get a dynamic IP address by DHCP, according to your network preference.

After setting up the network, set up a corresponding device in EagleWorks.

Click **Setting** in the section **Device** of **Progress Control Bar**, a dialog pops up, shown as below.

Click **Add** to bring up the dialog for setting up a new network device.
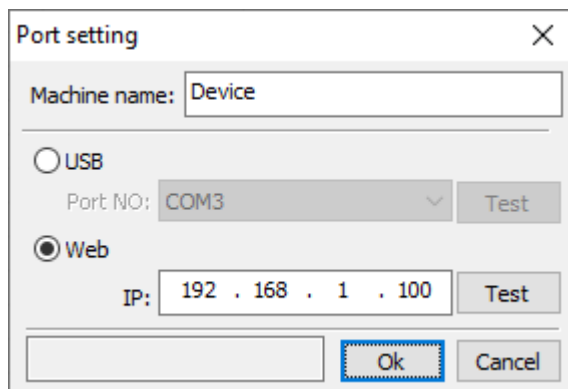
Set a name for the laser, choose **Web**, fill in the IP address of the machine. We recommend to click **Test** to do a connection test. Click **Ok** if you get a successful message, then the laser will be selected as the current one automatically and you will be good to go with it.

You can connect more than one lasers to EagleWorks by network at the same time, just remember to assign different IP addresses for them.

If there are more than one lasers connected, make sure to select the right one in the device list before starting jobs, because the software needs to identify the model of the laser and then generate the proper data.

NOTE

It is better to select the laser even before making designs, because some settings, e.g. the size of the work area, will be updated automatically according to the current machine, and the software will be in a correct configuration for your project.

Work with Offline Lasers

We have talked about setting up laser connections in the last section, but sometimes, you just cannot connect the laser, e.g. you have a workstation in a room which is far from the laser and without a network setup. In this case, you can send jobs to the laser with a USB flash: make your design, save the job to a USB flash, and read it from the laser.

There are two things you need to know when working in this way.

1. Set a correct draw area for designing
   The draw area should be the exact same as the work area of the laser.

   Click **System Setting** in the pulldown-menu **Config**.
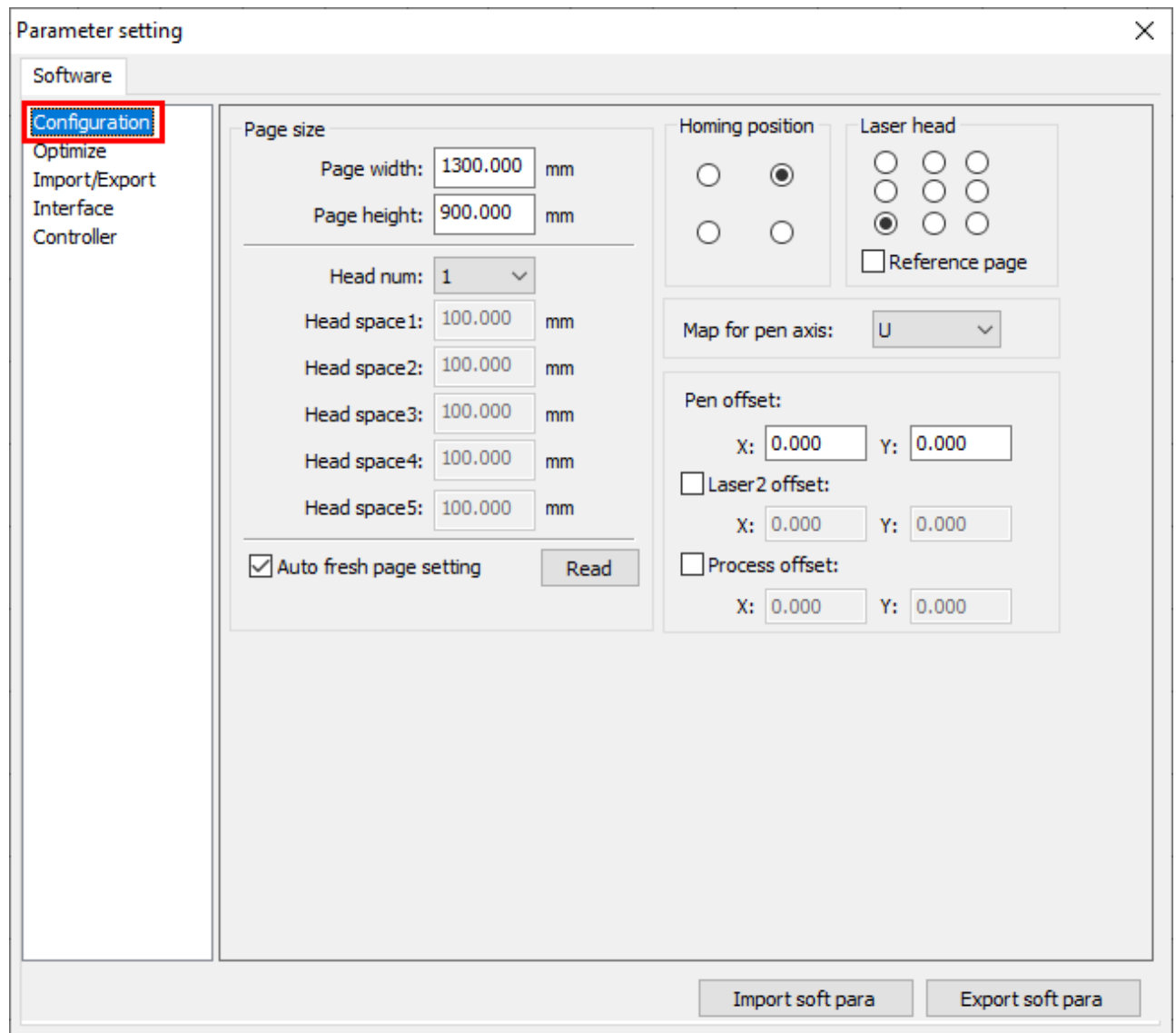
In the page **Configuration**, you can set the draw area in the section **Page size**.

> **NOTE**
>
> The software will update the draw area automatically when the laser is connected if the option **Auto fresh page setting** is checked.

2. Choose the correct laser controller

   Different lasers could be equipped with different laser controllers, you have to choose the corresponding controller in the pulldown-menu **Model** to generate correct jobs.
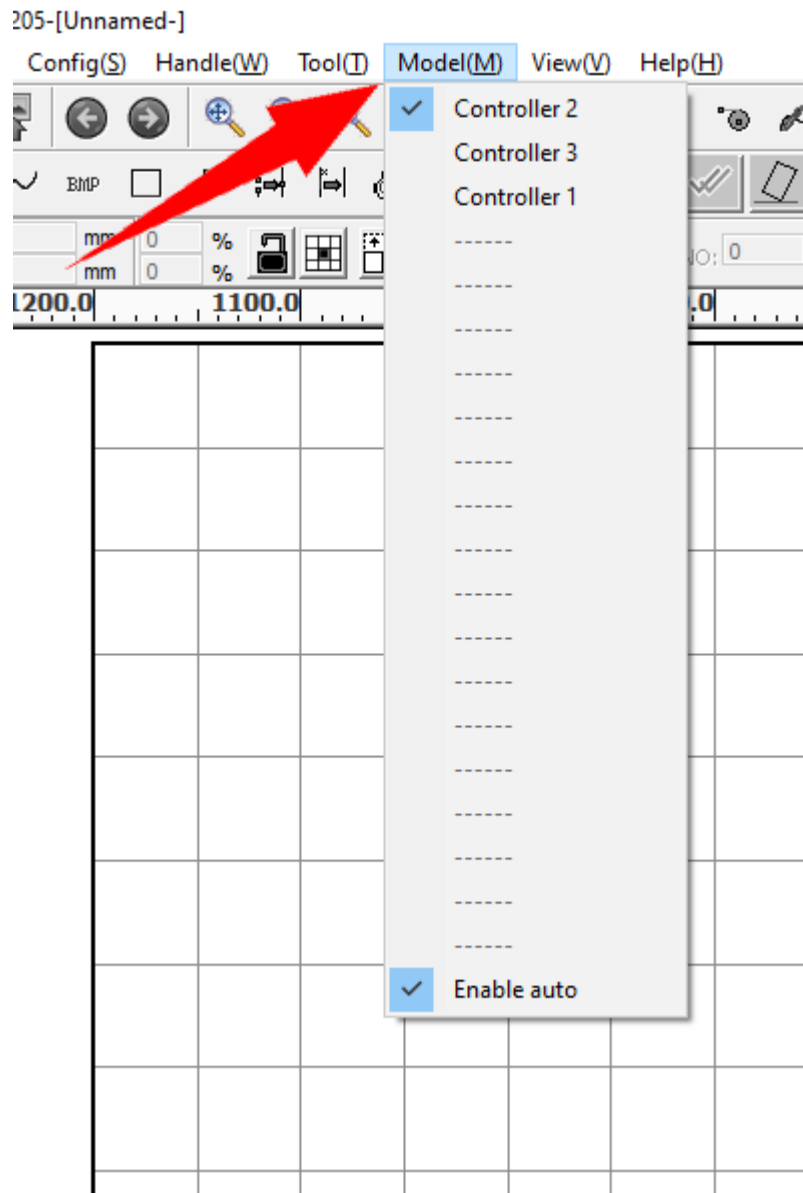
> **NOTE**
>
> The controller will be chosen automatically when the laser is connected if the option **Enable auto** is checked.

Refer to Laser Panel and the laser's manual for more details on how to save a job to and read a job from a USB flash.

The Workflow

EagleWorks is the portal between your projects and the laser. We will go through the workflow in this section.

1. Import artworks or create shapes.
2. Lay out.
3. Set technology.
4. Check technology.
5. Laser processing.

Import Artworks or Create Shapes

If you make designs in 3rd-party drawing software, e.g. Illustrator, CorelDRAW, AutoCAD, Photoshop, etc, just import them into EagleWorks. Refer to Import Artworks for more details.
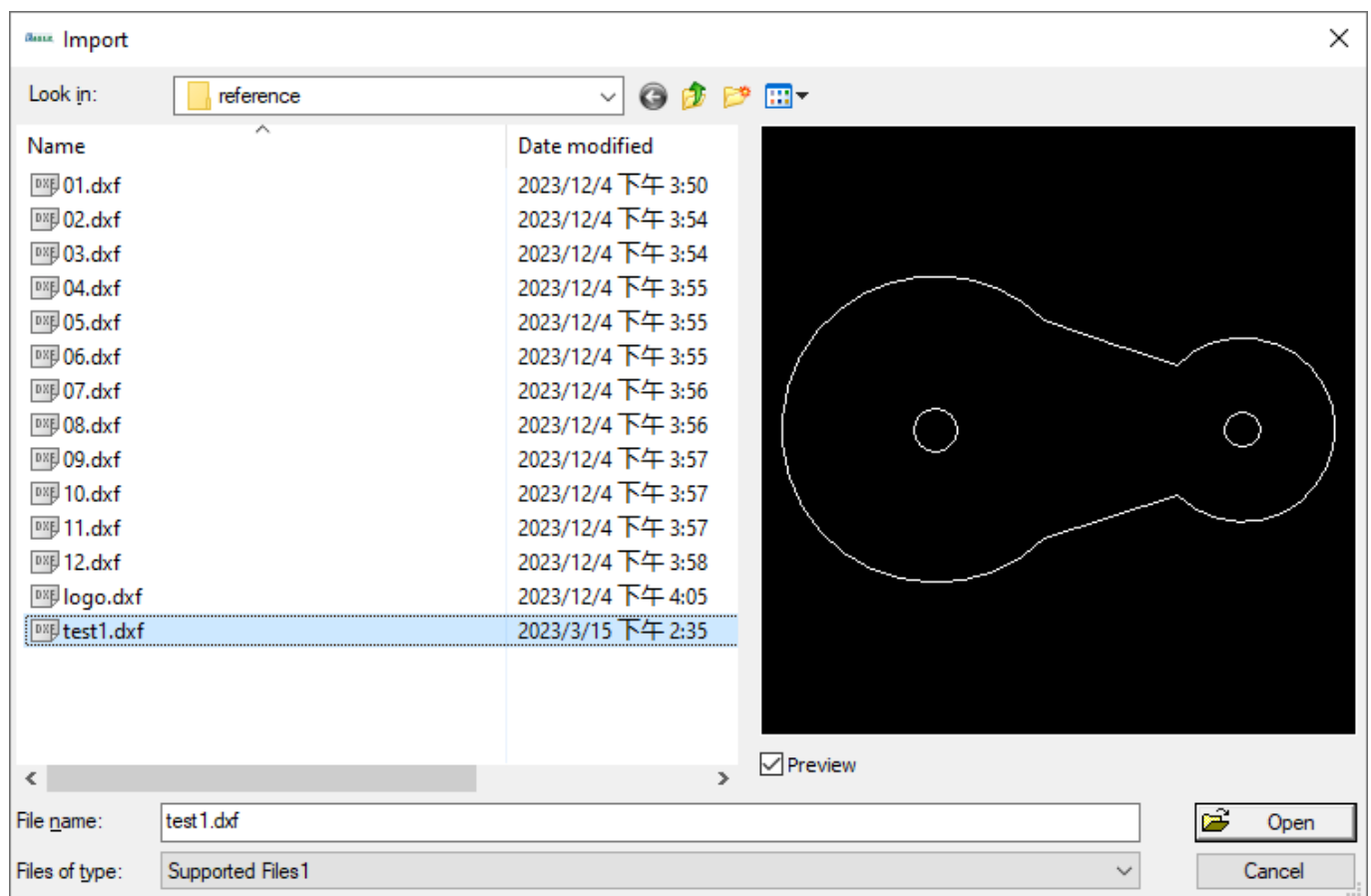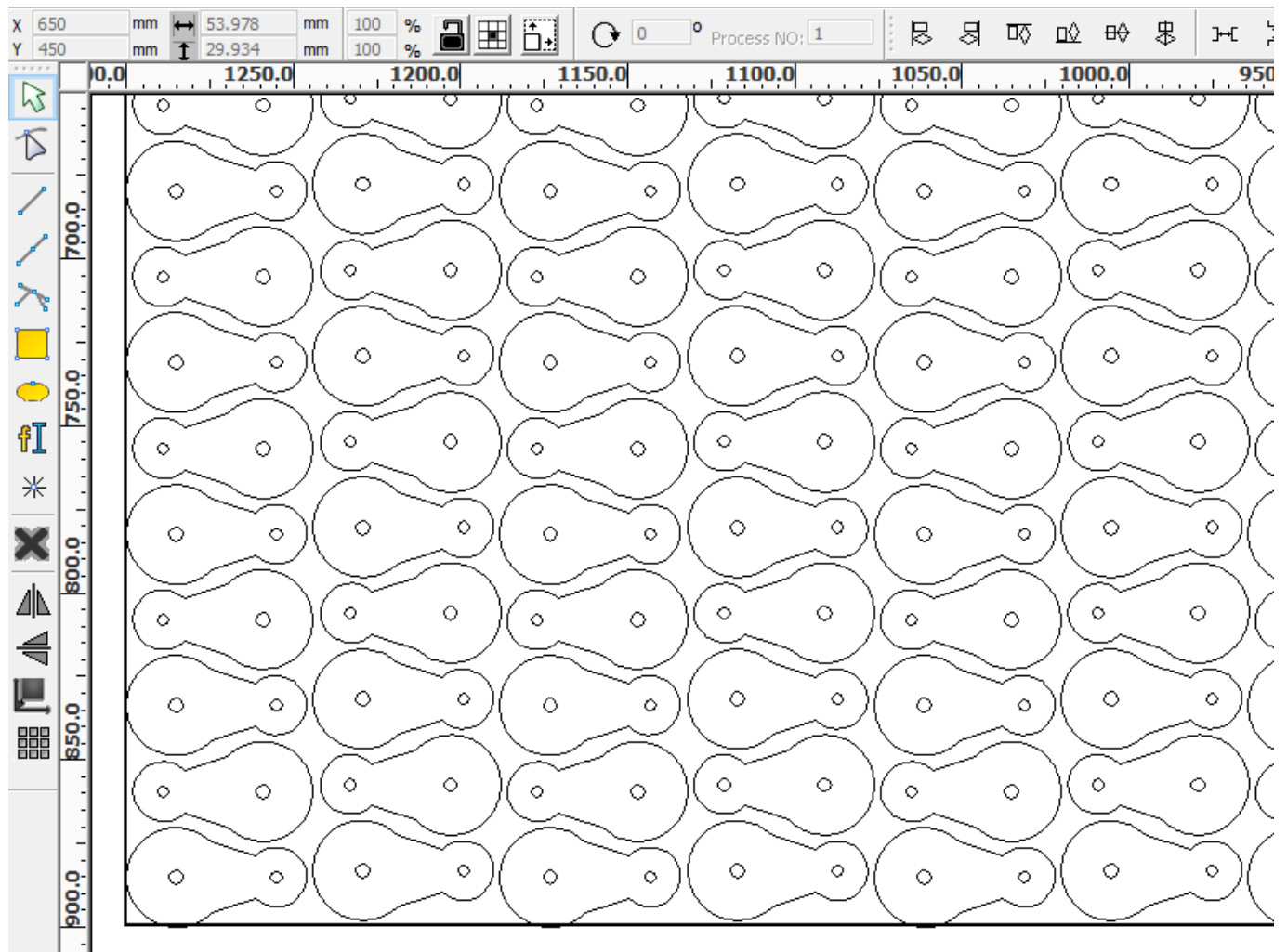

Or, you can create simple shapes directly in EagleWorks, i.e. lines, rectangles, circles, texts, etc. Refer to Create Simple Shapes for more details.
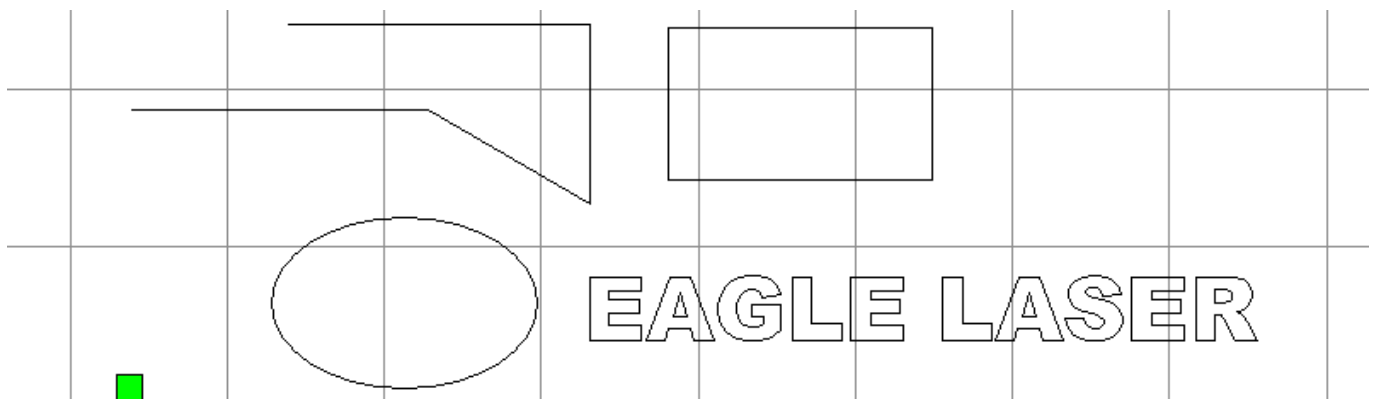
Lay out

Lay out, e.g. duplicate shapes as an array, nest shapes all over an area, etc. Refer to Lay out for more details.

Set Technology

The job will be prepared after setting technology, include cutting and engraving parameters, processing sequence, tool corrections, etc. Refer to Technology in EagleWorks for more details.

Layer Parameter	✕

Parameter library		**Seal:** 0.000 mm	Advance...
Layer: ▮▮▮▮▮			
Is Output: Yes ▾		**Open Delay:** 0 ms	
Speed(mm/s): 20.00 ☐ Default		**Close Delay:** 0 ms	
Repeat num: 1 ☐		☐ Laser through mode	
Processing Mode: Cut ▾ Advance...		**Through power1:** 50.0 %	
If Blowing: Yes ▾		**Through power2:** 50.0 %	
		Through power3: 50.0 %	

	Min Power(%)	Max Power(%)	Through power4: 50.0 %
☑ 1:	85.0	85.0	Through power5: 50.0 %
☐ 2:	85.0	85.0	Through power6: 50.0 %
☑ 3:	85.0	85.0	
☑ 4:	85.0	85.0	
☑ 5:	85.0	85.0	
☑ 6:	85.0	85.0	☐ Default

☑ Auto synchronize when Modify laser para

Apply to same   Ok   Cancel

Layer Parameter	✕

Parameter library

Layer: ▮▮▮▮▮
Is Output: Yes ▾
Speed(mm/s): 400.00 ☐ Default
Repeat num: 1 ☐
Processing Mode: Scan ▾ Advance...
If Blowing: Yes ▾

☐ Negative Engrave ☐ Optimized Scan
☐ Output direct ☐ Independent output
☐ Ramp Effect
Ramp Length: 0 mm
Overstriking: Un-process ▾
Scan Mode: X_swing ▾ Advance...
Interval(mm): 500 DPI ▾

☐ Enable blank:
Blank size: 1.0000 mm

	Min Power(%)	Max Power(%)
☑ 1:	15.0	15.0
☐ 2:	15.0	15.0
☑ 3:	15.0	15.0
☑ 4:	15.0	15.0
☑ 5:	15.0	15.0
☑ 6:	15.0	15.0 ☐ Default

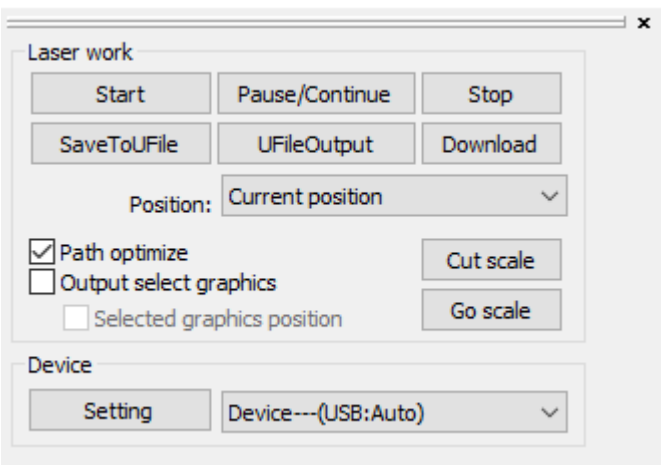☑ Auto synchronize when Modify laser para

Apply to same   Ok   Cancel

Check Technology

You can simulate the job in EagleWorks to check technology settings. Refer to Check Technology for more details.
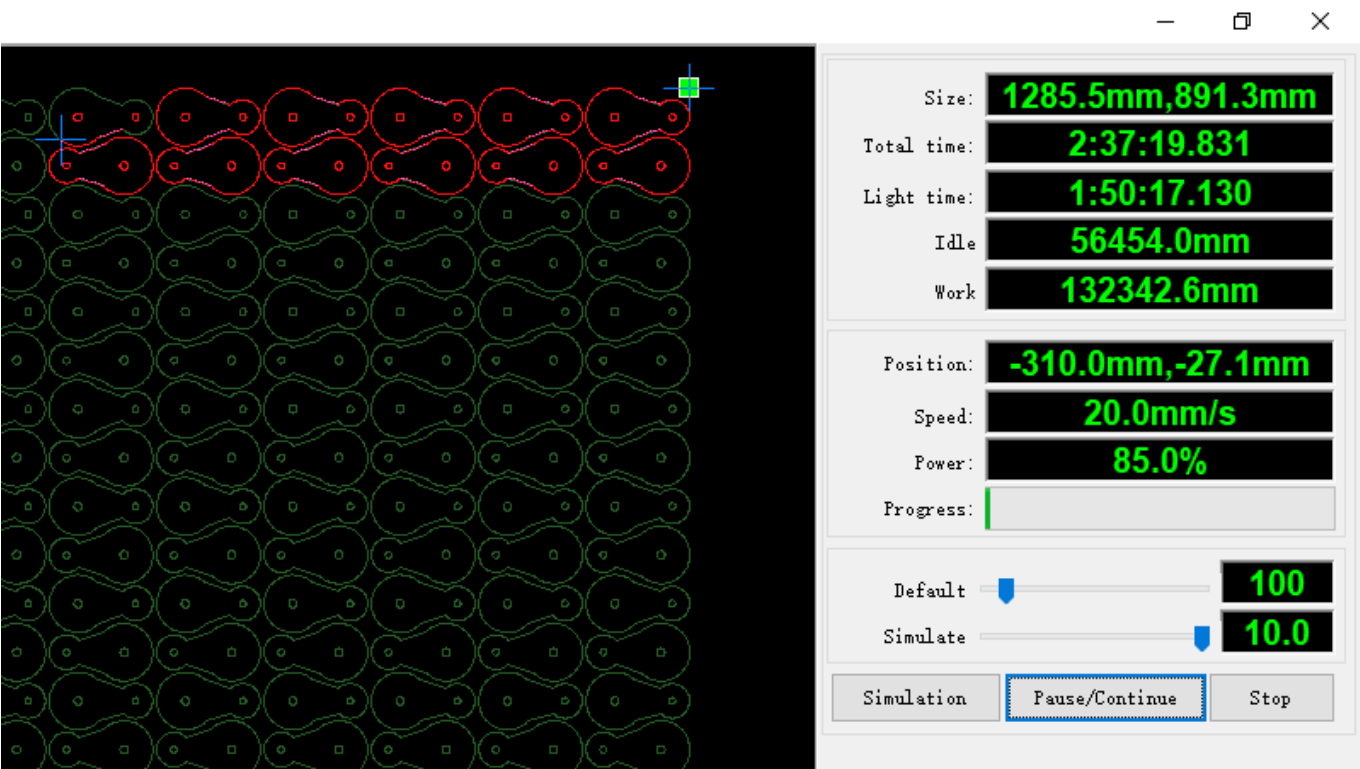
Laser Processing

Now you can start the job either directly in the software or download and then control the laser on the panel. Refer to Laser Panel for more details.

Designs in EagleWorks

In this chapter, you will get an overview of the drawing environment, learn how to import artworks and create shapes, how to do basic transformations, and how to lay out in EagleWorks.
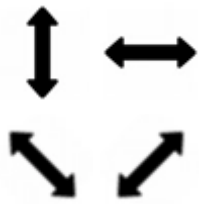
- Hints for Designing
- Import Artworks
- Create Simple Shapes
- Lay out

Hints for Designing

This section will give you an overview of the drawing environment.

Cursor

With the mouse you move the cursor over the screen. Depending on the position of the mouse and on the function which is activated, the cursor will appear in different shapes, either as a white arrow, a crosshair, an I-beam, etc.

Cursor	Description
	White arrow The cursor is on the menu bar, the tool bars, the panels, or the drawing window with no function activated.
	Crosshair The cursor is on the drawing window with a drawing function activated.
	Black arrow The cursor is on the drawing window with the node editing function activated.
	I-beam The cursor is on the drawing window with the text creation function activated.
	Cross Arrow The cursor is on the center handle of a selection.
	Double Head Arrow The cursor is on the surrounding handles of a selection.
	Hand The cursor is on the drawing window with the panning function activated.

The Draw Area

The draw area is where your design is laid out, and represents the work area of the laser.
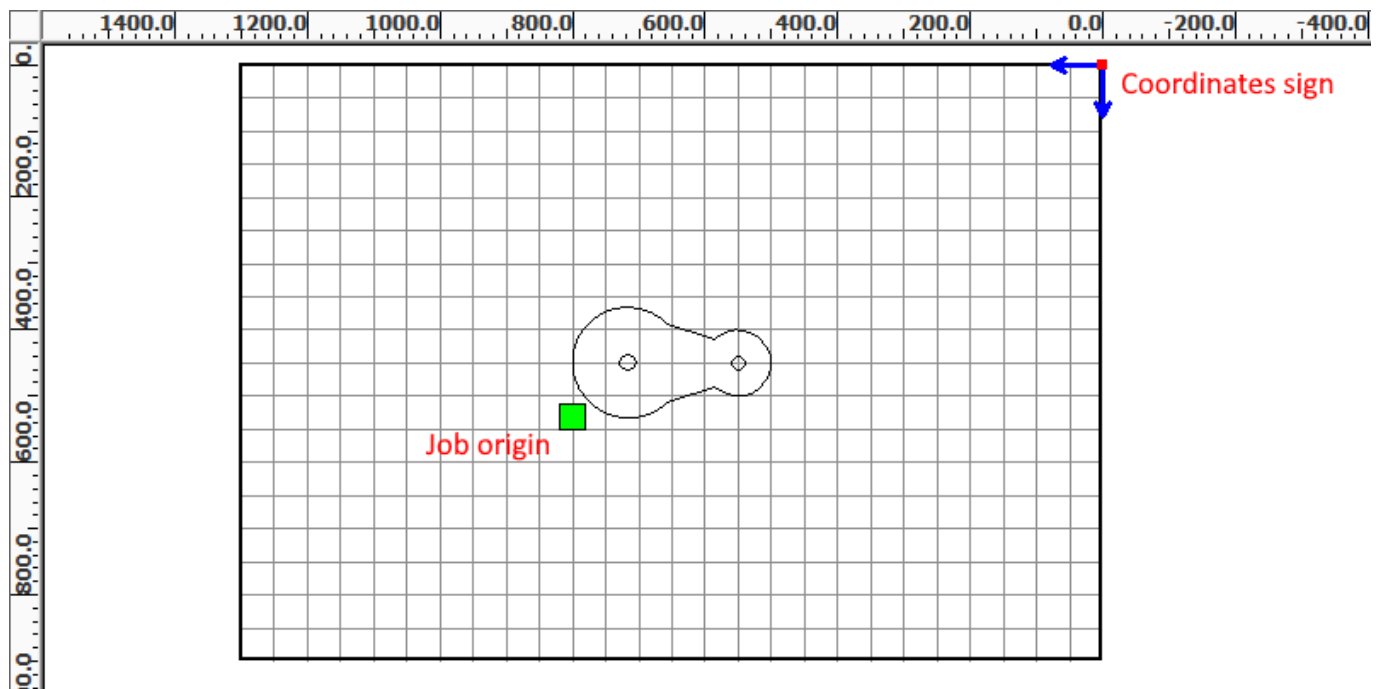
The coordinates sign shows the machine origin, and the green square shows the job origin which tells the machine how to position the job relative to the programmed origin. Refer to Coordinates and job origin for more details. The rulers and the grid give you a sense of where and how big a shape is.

You can change the size of the draw area, change the machine origin and the job origin, change the size unit, change how the draw area looks like, to make it work best for you and your laser.

Click **System Setting** in the pulldown-menu **Config**.

In the page **Configuration**, you can set the size of the draw area in the section **Page size**, which will be updated automatically when the laser is connected and set to the current device if the option **Auto fresh page setting** is checked.

> **IMPORTANT**
>
> If you want to set the size of the draw area different with the work area, make sure that the option **Auto fresh page setting** is unchecked, and be aware that you may get unpredictable results, do it only if you have a good reason.

You can change the machine origin by the 4-dot control in the section **Homing position**, and change the job origin by the 9-dot control in the section **Laser head**.

> **IMPORTANT**
>
> The machine origin **MUST** match the home position of the laser, otherwise, jobs will be in a wrong coordinate system, results in mirrored or flipped cutting or engraving.

In the page **Import/Export**, you can set the size unit to millimeter or inch in the option **Unit type**.

> **NOTE**
>
> We recommend to keep the option **Velocity Unit** as **mm/s** because we give recommended processing parameters all in *mm/s*.
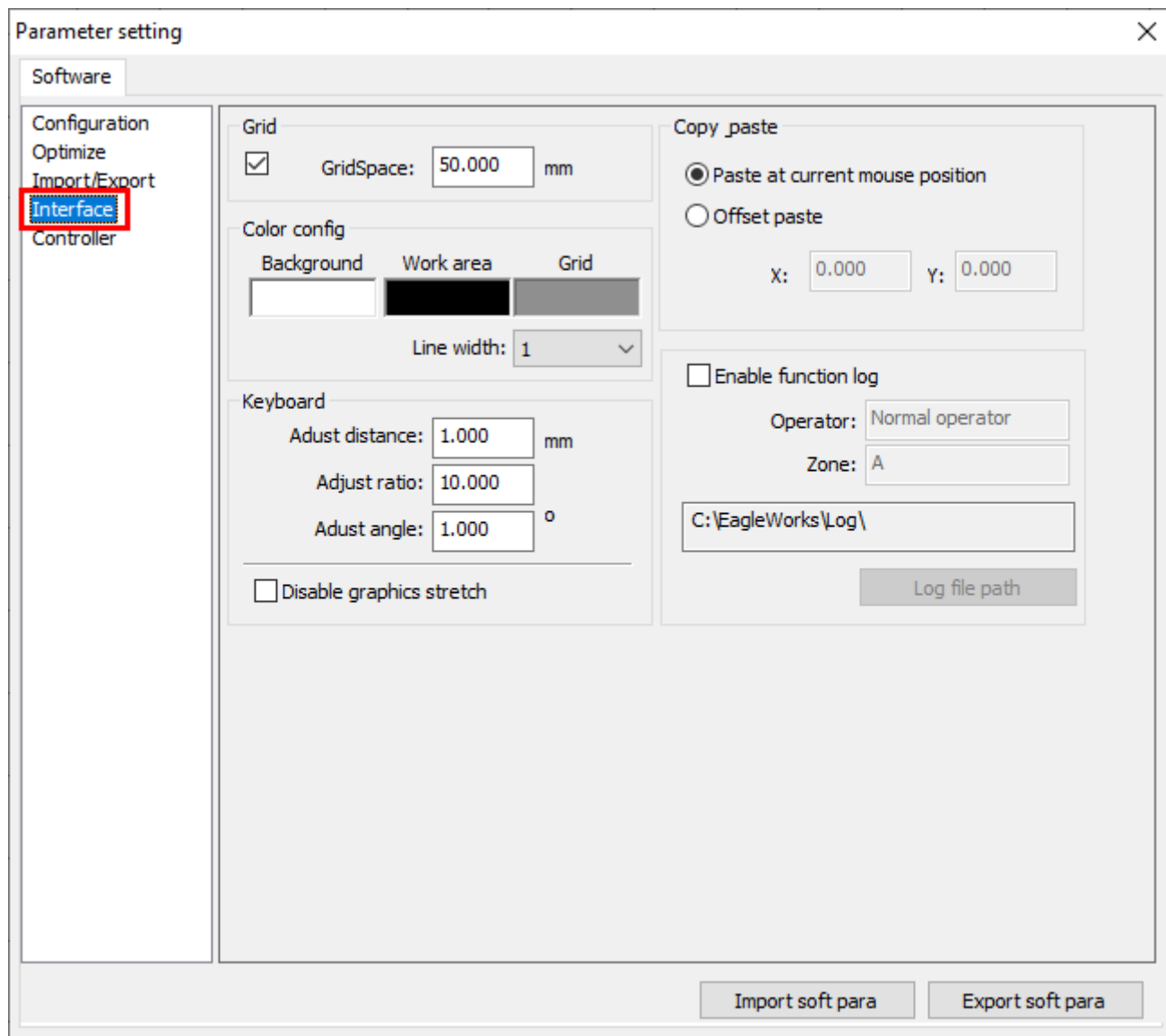
In the page **Interface**, you can set how the draw area appears in the software.

Display

There are a few settings which control the display of the software.

Check **Graph Hatch** in the pulldown-menu **Config**, the software will display filled shapes for engraving directly in the draw area. Refer to Engraving Parameters for more details. This takes longer than rendering the wire outlines, and it can hide things from you behind those filled shapes that may still be sent to the laser. We recommend to enable this only for spot-checking your work, and not for general drawing.
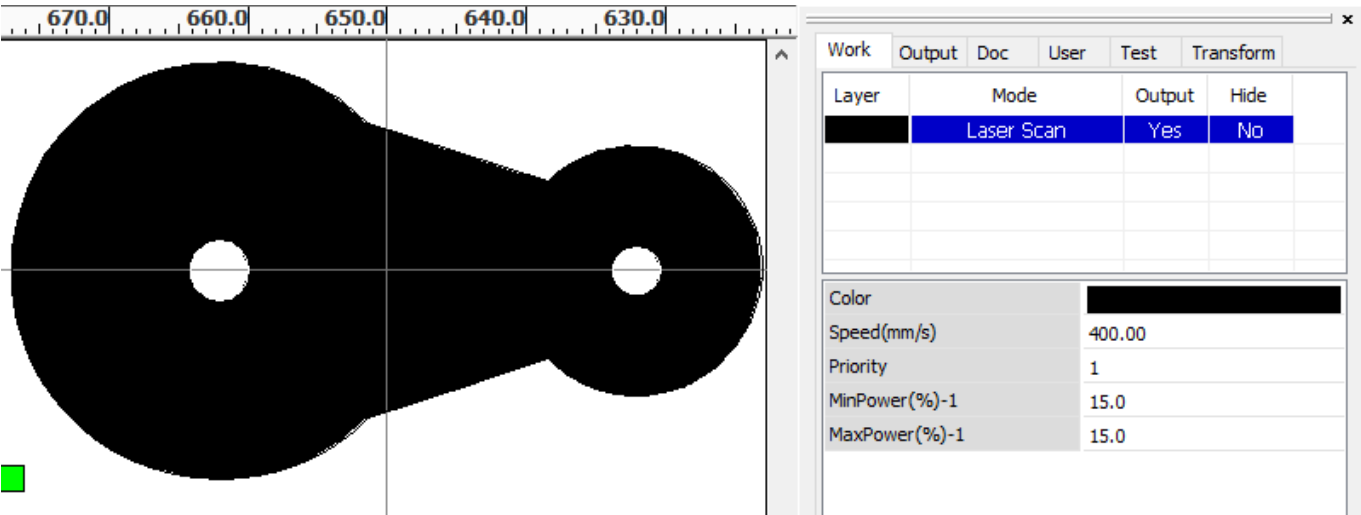
Uncheck **Show Array** in the pulldown-menu **Config**, all the shapes in a virtual array will be displayed as placeholders but only the original one, which saves the software a lot of calculation time and resources. Refer here for more details.
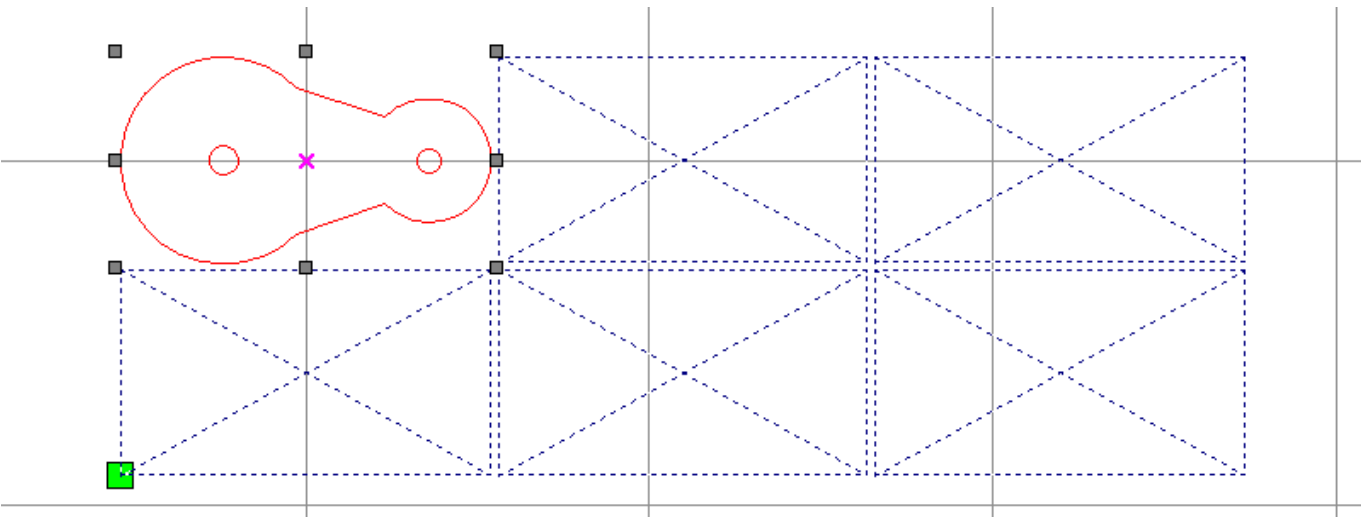
Check **Show Path** in the pulldown-menu **Edit**, the software will display the traveling parts of cutting paths, helps you figure out the start point of an outline and the processing sequence.
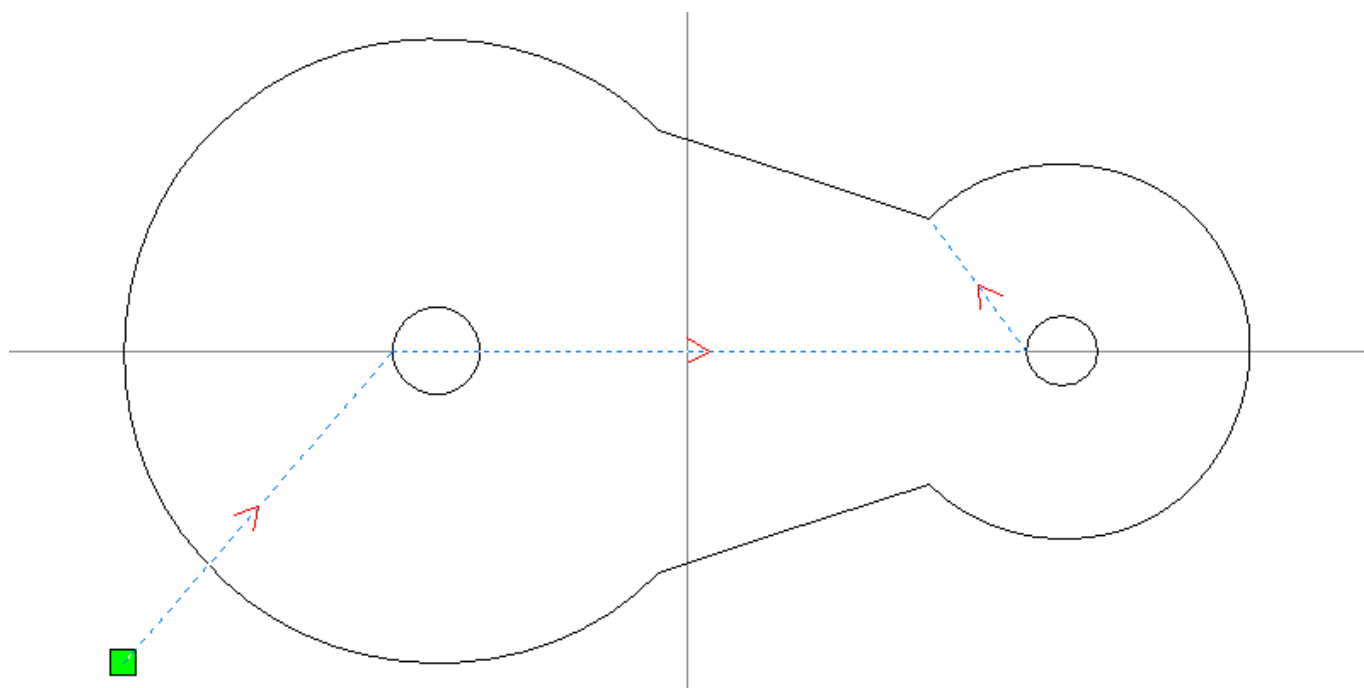
Selection

You can create a selection by left clicking on the outline of a shape or by pressing and holding the left mouse button and dragging a selection window around or across shapes.

If you drag the selection window to the right, a shape will be selected only if it is fully enclosed within the window, as shown below.
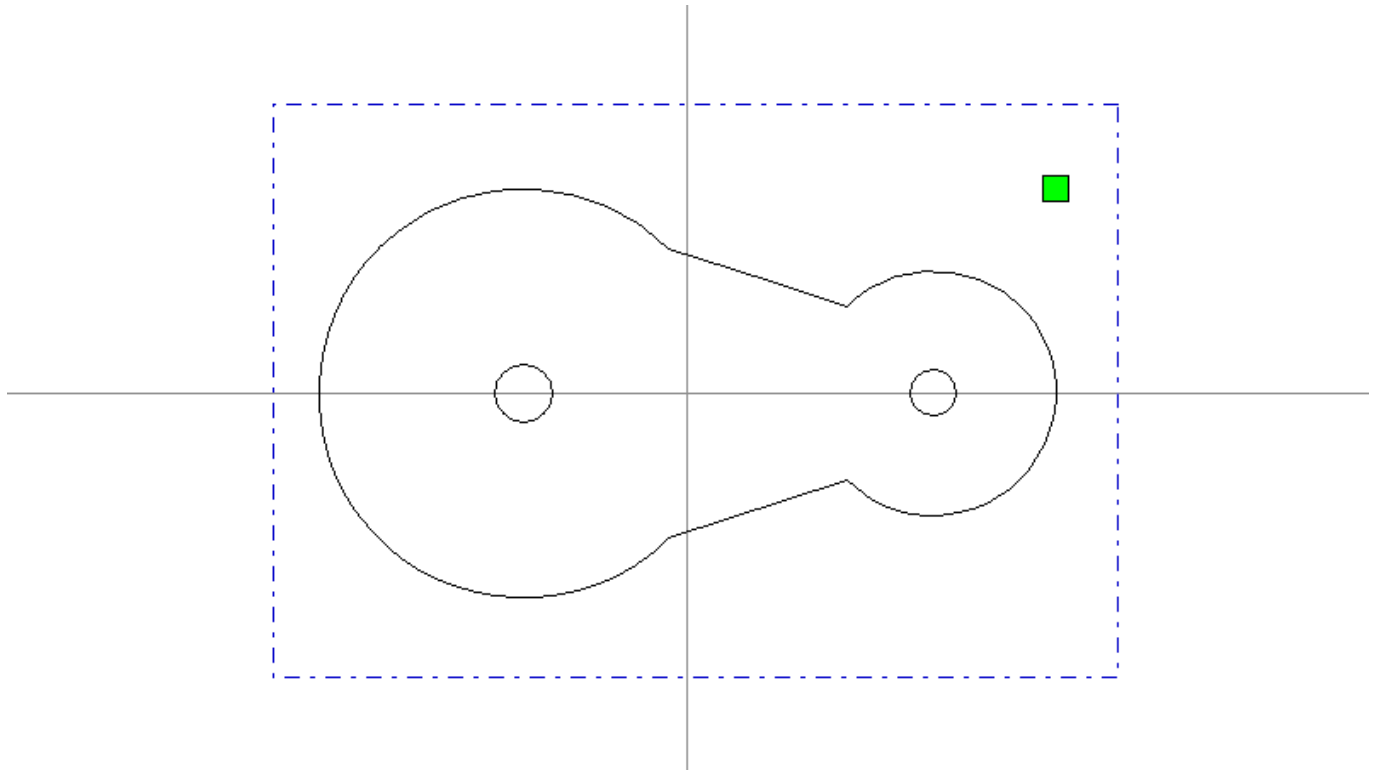
Alternately, if you drag the selection window to the left, a shape will be selected if any part of it fall within the window, as shown below.
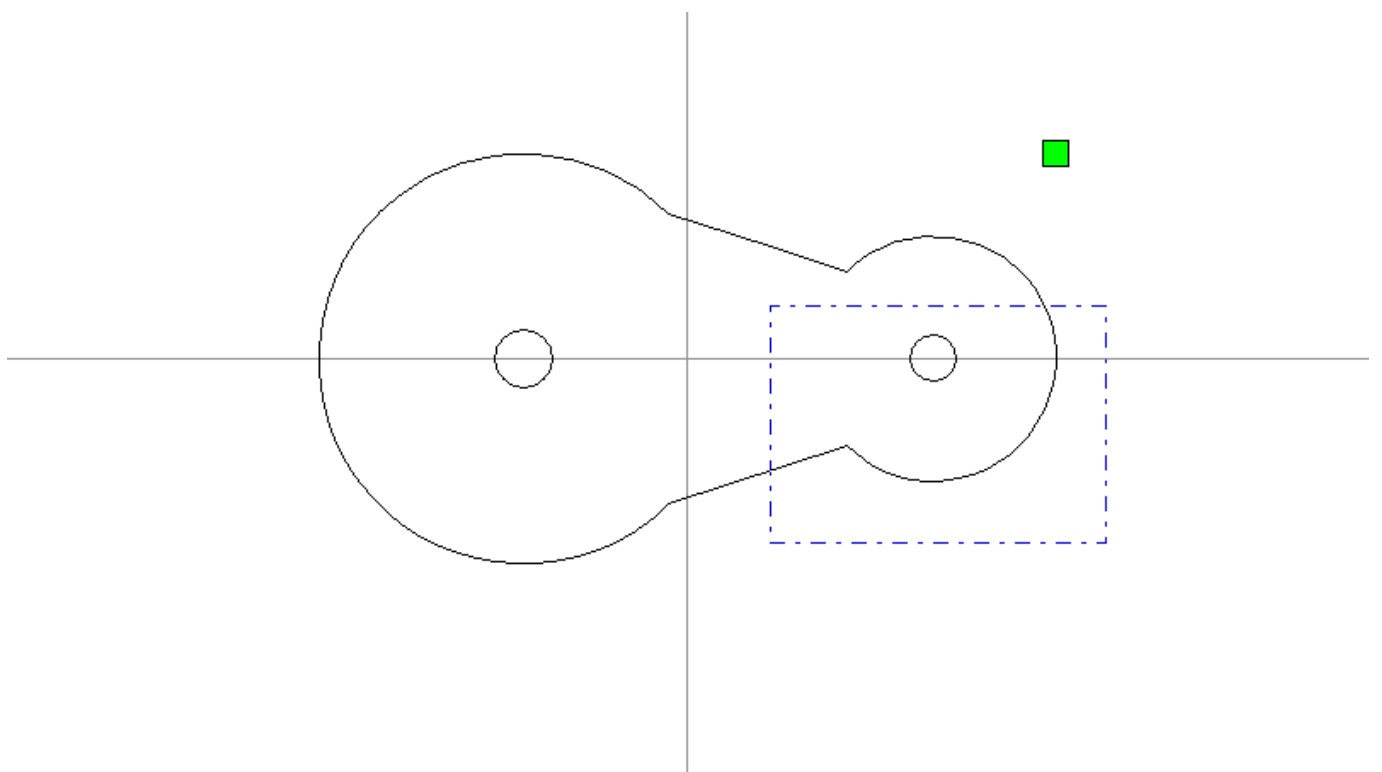
A selection can either contain a single or several shapes. With the **Shift** key held, you can increase a selection by selecting more shapes. Selected shapes appear in red (cyan if they are red) with a handle in the center and eight handles around the bounding box of the selection.
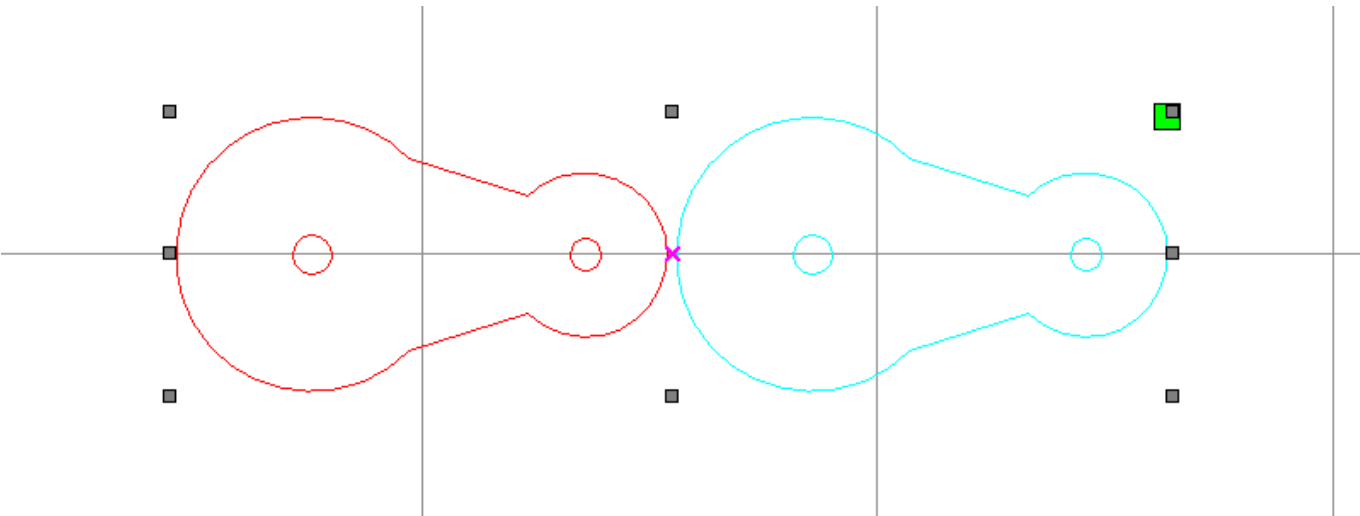
If there are shapes in different layers, refer to Layers for more details, you can right click an entry in the layer list in the tab **Work** of **System Work Plat** to select all the shapes except texts in that layer.
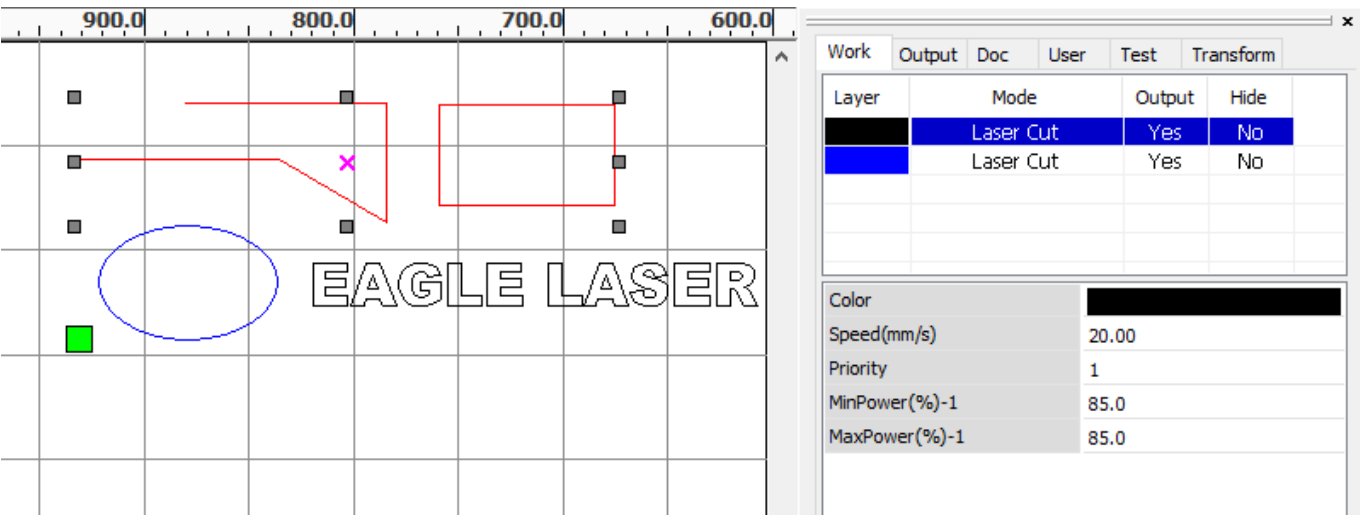
And there are a few menu commands for selection.

Menu Command	Function	Keyboard Shortcut
Select All	Select all shapes.	**Ctrl** + **A**
Select similarity	Select all the shapes which are almost the same as the selected one but with a tiny difference.	

Panning and Zooming

The draw area can be moved around and zoomed to help you focus on different parts of your design.
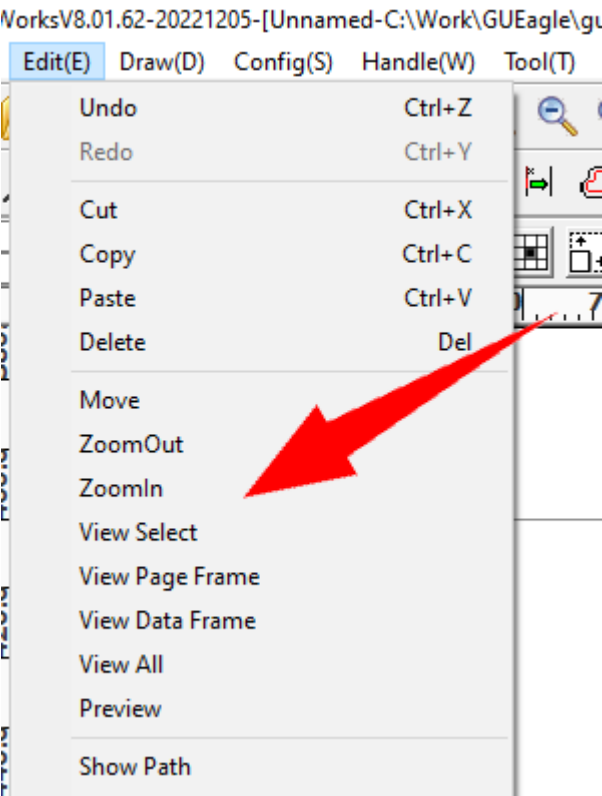
Button	Menu Command	Function
	Move	Move the draw area around.
	Zoom In	Zoom in the draw area from the center or the location of the mouse if it is in the drawing window.
	Zoom Out	Zoom out the draw area from the center or the location of the mouse if it is in the drawing window.
	View Page Frame	Adapt the whole draw area to the drawing window.
	View Data Frame	Adapt the current selection to the drawing window.
	View All	Adapt all shapes to the drawing window.
	View Select	Adapt a view window to the drawing window.

Import Artworks

EagleWorks is not intended to be a complete drawing software, you would use an external one like Illustrator, CorelDRAW, AutoCAD, Photoshop etc. When you have an artwork ready in one of these software, the next step is to import it into EagleWorks.

Click **Import...** in the pulldown-menu **File**, or click to bring up the dialog **Import**, select a file and click **Open**.
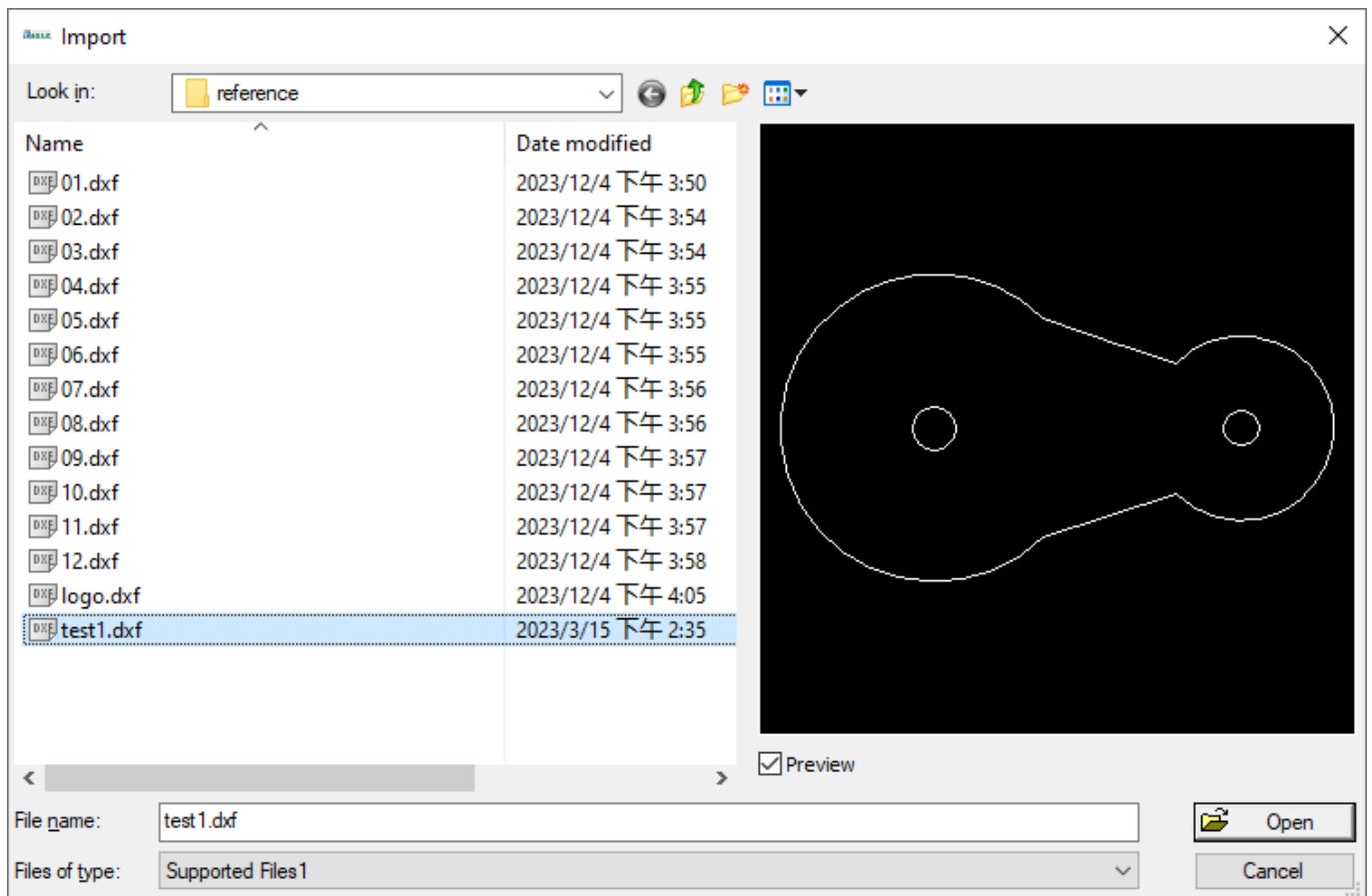
EagleWorks supports a lot of file formats, i.e. dxf, ai, plt, bmp, jpeg, etc. Not all features of every format will be supported, for vector graphics, we recommend to use old version dxf files for better compatibility.
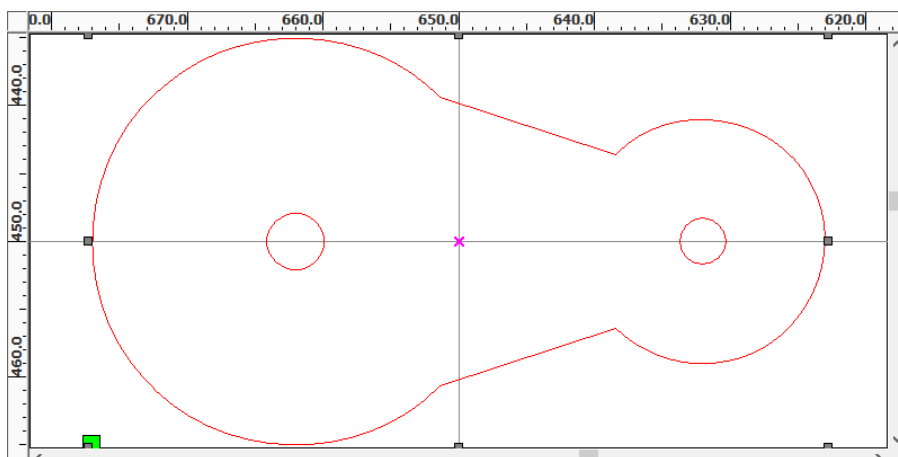
The artwork will be placed at the center of the draw area by default, be selected and zoomed to fit the drawing window. And, the software may perform a set of optimizations automatically which you can adjust in settings.

Click **System Setting** in the pulldown-menu **Config**.

In the page **Import/Export**, you can change the default position to place the imported artwork in the option **Docking import data**.

When importing a dxf file, make sure that the size unit in the option **DXF Unit** is the same as the artwork, otherwise, you will get it in wrong scale.

For vector graphics, check the option **Combine lines**, the option **Auto close curves** and set tolerance values to connect or close any lines or curves that are close enough or with a very small opening automatically.

For images, check the option **Import image to RDImage** for doing the image processing in EagleWorks, refer here for more details.
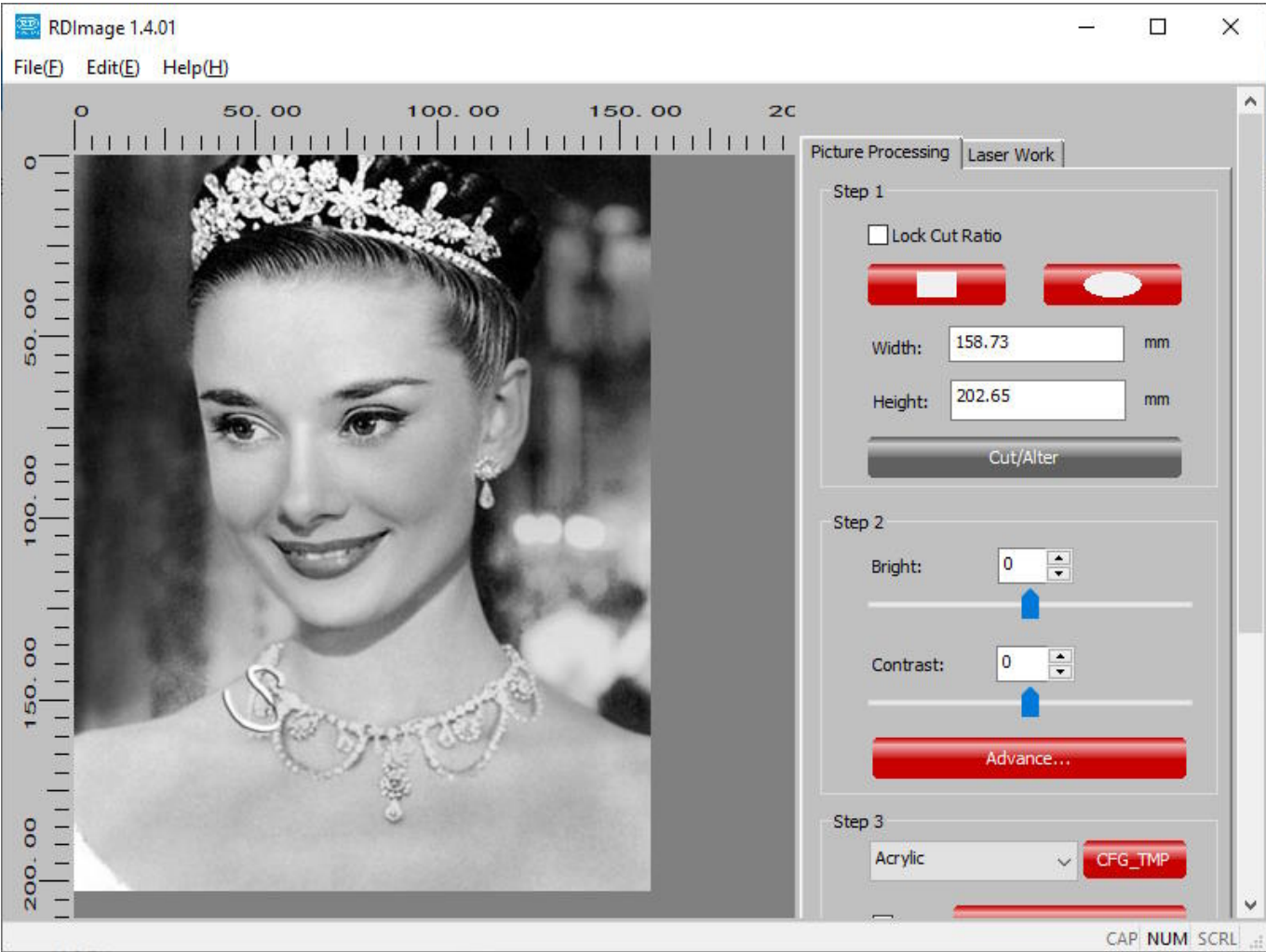
Vector Graphics Optimizations

Sometimes, there are still scattered lines, curves and other sorts of issues left in the artwork after the default optimizations of importing, it is due to that the issues exceed the range of the corrections that the optimizations can make.

Click **Data check** in the pulldown-menu **Handle** to bring up the dialog **Data check**, check all the options, and click **Check**, then you will get a list of issues, and all of the lines, curves and outlines with issues will be selected automatically.
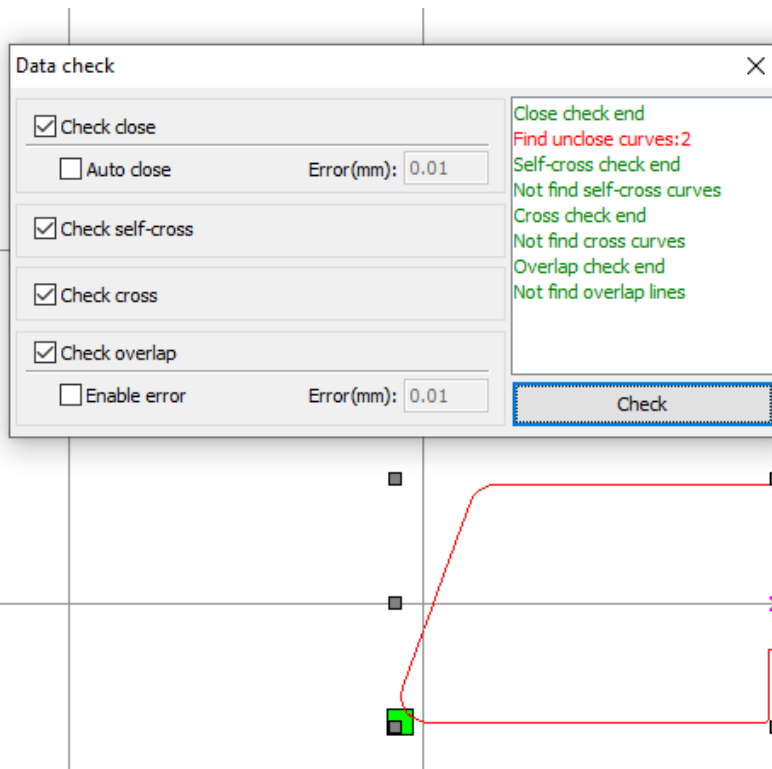
In this example, the gaps between the two curves are too big to be closed automatically.
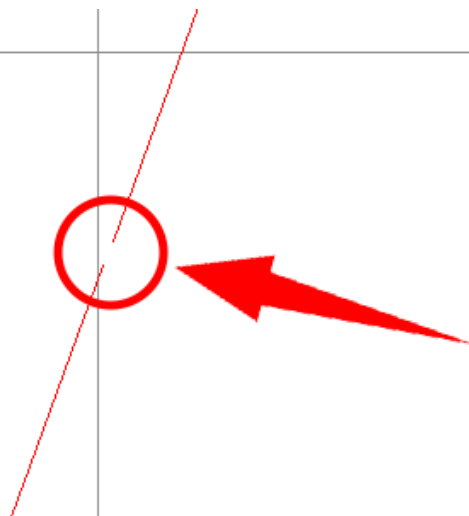
In these cases, you need to correct the issues manually by yourself. Here is a list of the optimization functions which are in the pulldown-menu **Handle**.

Button	Menu Command	Function
☐	**Curve auto close**	Close any lines and curves with an opening that is smaller than the tolerance value.
⊨⇥	**Combine curve**	Connect any lines and curves that are closer together than the tolerance value.
⊨⇥	**Delete overlap**	Delete overlapped lines, curves and outlines.
∿	**Curve smooth**	Recover smooth shapes from jagged lines.

Let's go through the steps for connecting curves that are very close to each other. The other functions work the similar way.

Select the curves which are going to be connected, and then click **Combine curve** in the pulldown-menu **Handle**.
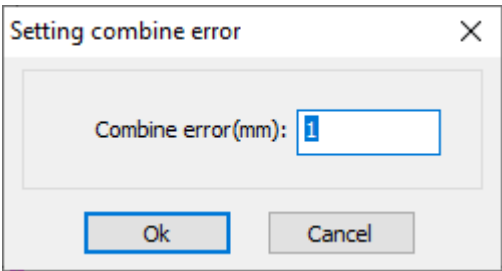
Set a tolerance value bigger than the size of the gap and click **Ok**, then the curves will be connected with each other.

Click **Measure** in the pulldown-menu **Tool** to measure the gap if you have no idea about how big it is. Left click on both ends of the gap, you will get the size which appears on the status bar.
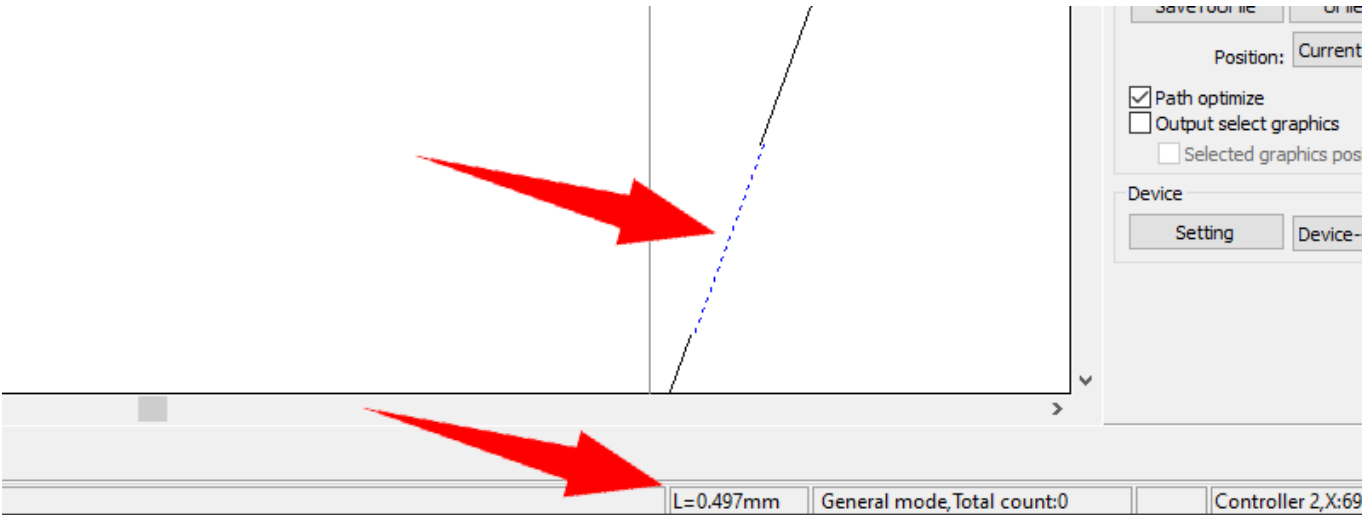
Create Simple Shapes

Instead of importing artworks, you can create simple shapes directly in EagleWorks.

Drawing

We will not cover too many details but general procedures about drawing functions in this section.

You can find all the drawing functions on the draw toolbar or in the pulldown-menu **Draw**, i.e. **Line**, **Curve**, **Rectangle**, **Ellipse**, **Text**, etc.

Here is a list of the drawing functions.

Button	Menu Command	Function
	Line	Draw a line.
	Polyline	Draw a polyline.
	Curve	Draw a curve.
	Rectangle	Draw a rectangle.
	Ellipse	Draw an ellipse.
	Text	Create text.
	Point	Draw a point.

The **Line** command will create a line segment immediately when the start and end points are specified. The **Polyline** command will create connected line segments, right click or press the key **Esc** to complete. The polyline will be closed automatically if the end point is set to the start point. Press and hold the key **Ctrl** at the same time to draw horizontal or vertical line segments.

The **Curve** command will create connected line segments and Bézier curves. It will start or continue a Bézier if you add a point by pressing and holding the left mouse button and dragging a control point, and stop a Bézier or continue a line segment if you add a point by only left clicking. Right click or press the key **Esc** to complete. The curve will be closed automatically if the end point if set to the start point.
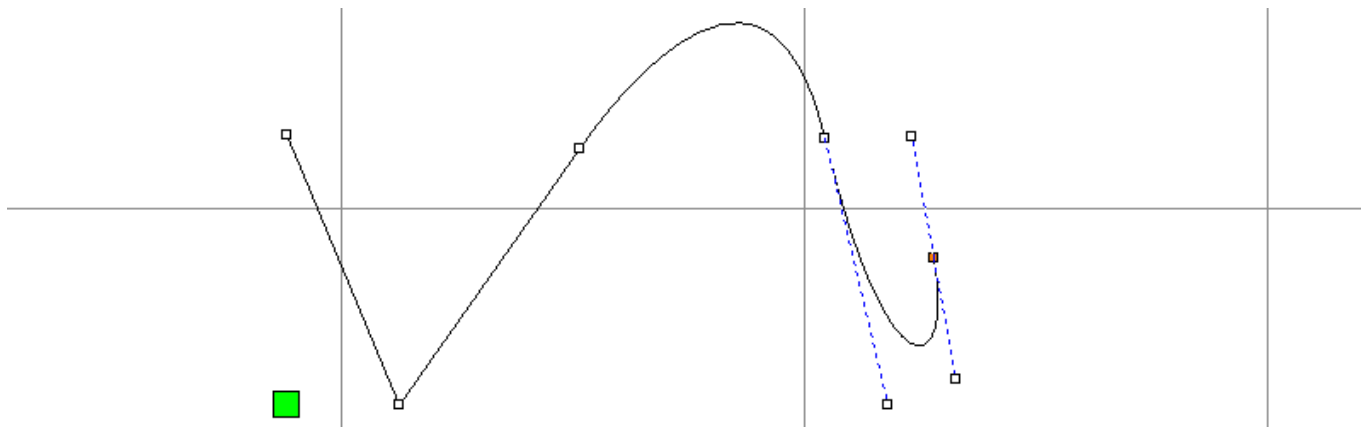
Press and hold the left mouse button and drag to create rectangles or ellipses. Press and hold the key **Ctrl** at the same time to create squares or circles. Press and hold the key **Shift** at the same time will drag the rectangle or ellipse from the center, instead of the corner.

After creating, you can edit lines, curves or outlines of shapes, like moving a node point, modeling a Bézier curve, adding or deleting a node point, converting a line to a Bézier curve or vice versa.

The **Edit Node** command initiates an edit and brings up the node edit toolbar. The node points of the selection will appear, or you can click on a geometry to select it and show the nodes up. Select one or more node points, which will appear in green, press and hold the left mouse button on a node point and drag to move, press and hold the left mouse button on a control point and drag to model a Bézier curve, press the key **Delete** to delete, click on buttons on the node edit toolbar to do other edits.
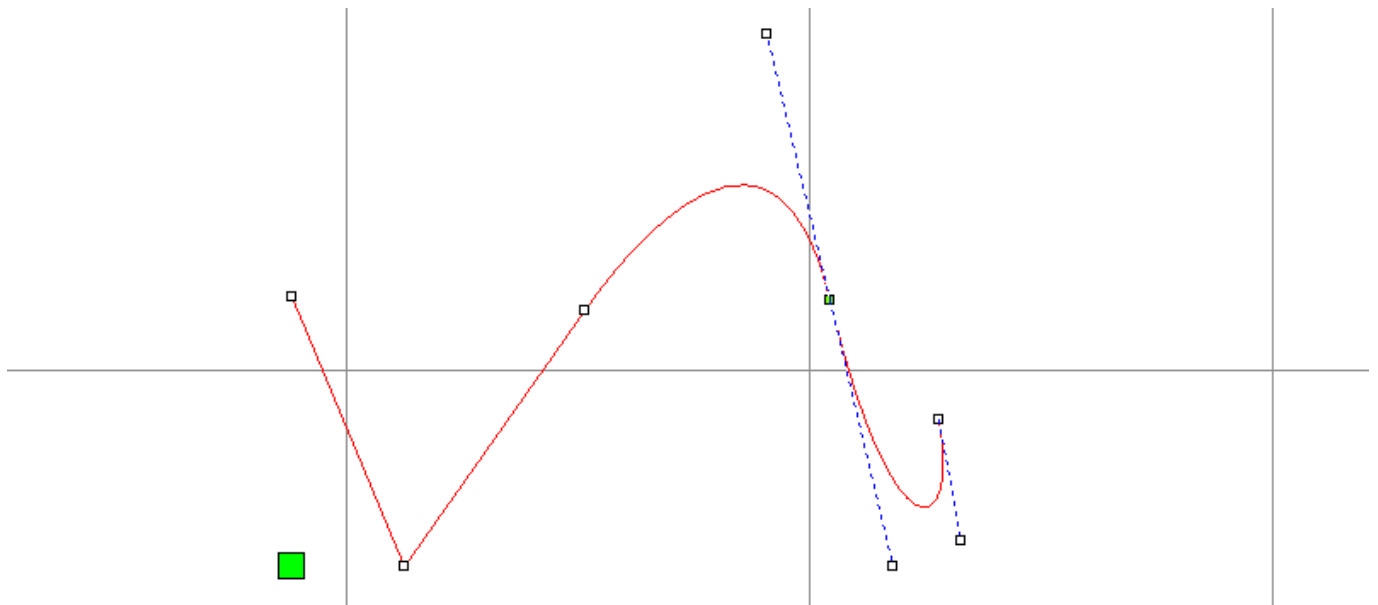
Click on somewhere on the geometry, a red square appears, to specify a point to add a node, double click on the point or click the button **Add** to add the node.

Here is a list of the functions on the node edit toolbar.

Button	Function
⊹	Add a node at the specified point.
⊟	Delete the selected node.
⇥	Connect the selected two nodes.
⊢⇥	Split the geometry from the point of the node.
╱	Convert the segment to line.
⌐	Convert the segment to curve.

The **Text** command will create or change text, which is different with other vector graphics, you can not edit its nodes but text properties, i.e. font, size, alignment and spacing, etc.

Left click somewhere on the draw area to create text, double click on an exist one to change.

EagleWorks also supports creating text of current date and time in a self-defined format, and text of serial numbers in self-defined format and rules.

Text   ✕

◉ TrueType font: 𝕋𝕋 **Arial Black**   ⌄   Width: 100   %
○ SHX font: 🅂🄷🅇 FS.SHX   ⌄   Char space: 0   mm
                                                    Line space: 0   mm

| ∧
                                                    ☑ Enable variable text
                                                    Date   ⌄
                                                    ┌─────────────────────────┐
                                                    │ default[20231214]   │∧
                                                    │ 12Hour[HH:MM][04:28]   │
                                                    │ 12Hour[HH:MM][04:28:36] │
                                                    │ 24Hour[HH:MM][16:28]   │
                                                    │ 24Hour[HH:MM][16:28:36] │
                                                    │ American Date[12/14/2023]│
                                                    │ Chinese Date[2023年12月14日]│
                                                    │ Chinese Date Time[2023年12月14│
                                                    │ Chinese Time[16时28分36秒] │
                                                    │ European Date Time[14/12/2023p]│
                                                    │ European Date[14.12.2023]│
                                                    │ Week Year[14/12/2023 16:28:36]│∨
                                                    └─────────────────────────┘
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Height: 20   mm   ▤   [Apply]   [OK]   [Cancel]

Text   ✕

◉ TrueType font: 𝕋𝕋 **Arial Black**   ⌄   Width: 100   %
○ SHX font: 🅂🄷🅇 FS.SHX   ⌄   Char space: 0   mm
                                                    Line space: 0   mm

| ∧
                                                    ☑ Enable variable text
                                                    SerialNO   ⌄
                                                       Prefix: SN-
                                                       Suffix:
                                                     Start SN: 0000
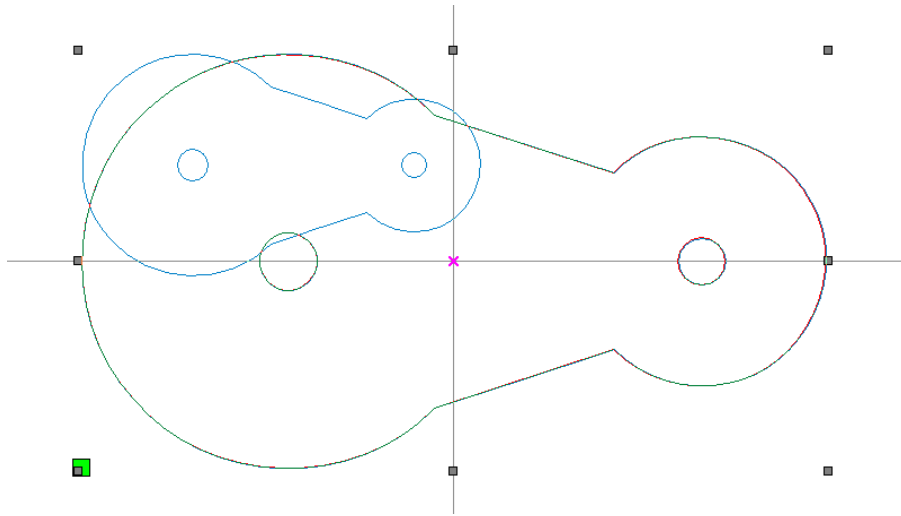   Current SN: 0000
                                                      SN Inc: 1

                                                              [Extend]
                                              ∨
        ◂   ▸

Height: 20   mm   ▤   [Apply]   [OK]   [Cancel]

Transformations

The transformation functions scale, move, align, mirror or rotate shapes.

You can do a free-hand scaling by pressing and holding the left mouse button on a bounding handle of the selection and dragging.
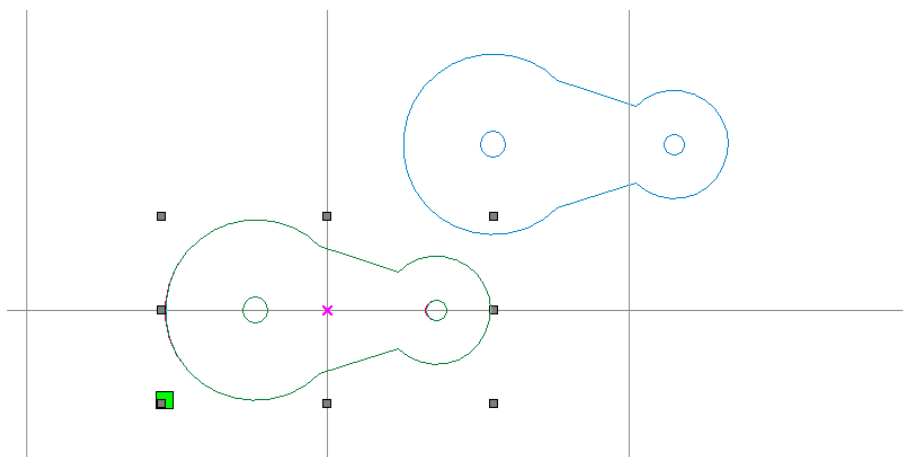
You can also set a new size in **Cut Property Bar** or in the tab **Transform** of **System Work Plat**. The position of the reference point will be kept when scaling.
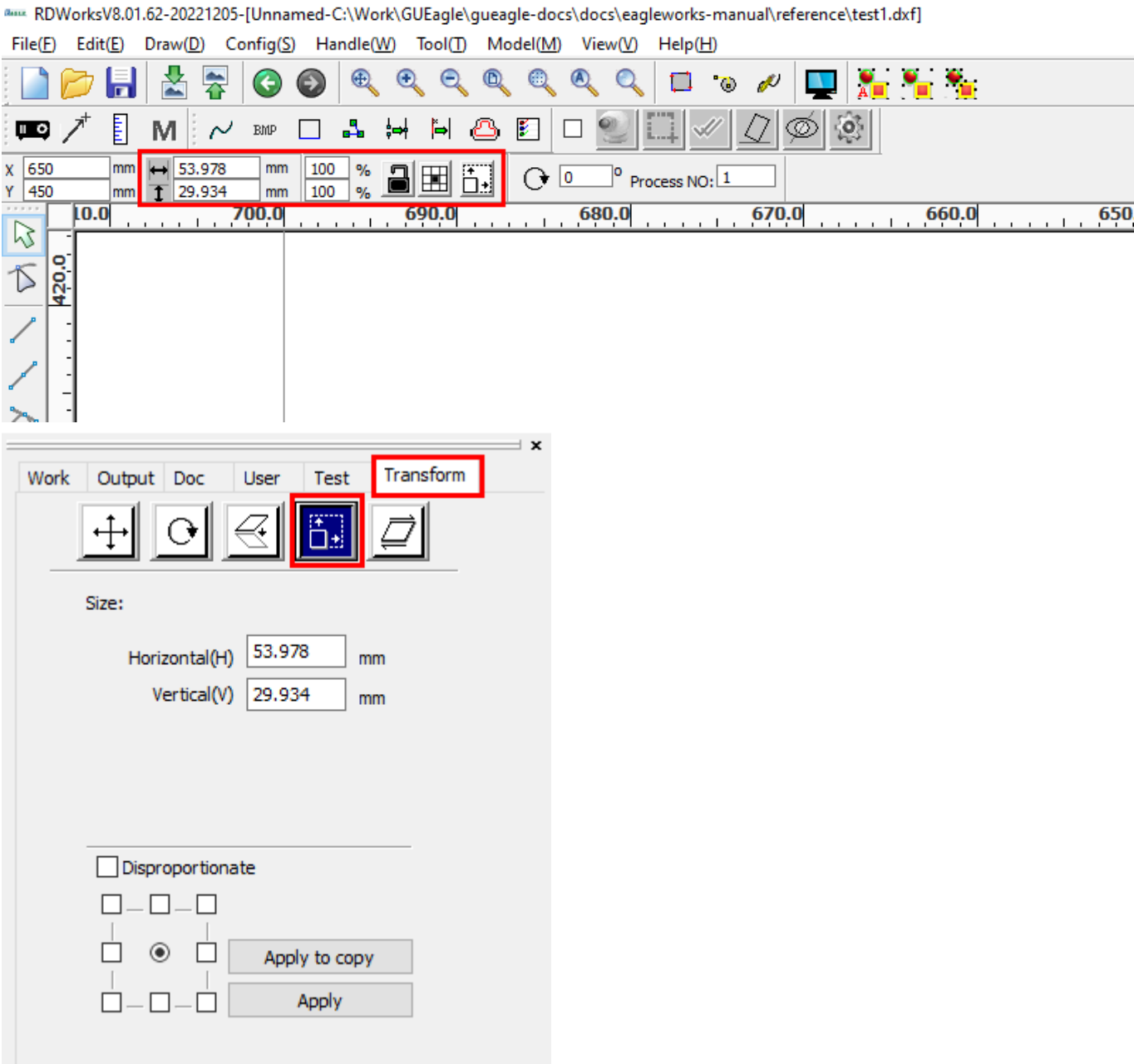

When there are more than one shape, you can set one or some to the same width, height or size as another by the following functions in the menu **Draw**>**Arrange**.

Button	Menu Command	Function
⊟	**Resize width**	Set one or some to the same width as another object.
▯	**Resize height**	Set one or some to the same height as another object.
⊞	**Resize size**	Set one or some to the same size as another object.

You can do a free-hand moving by pressing and holding the left mouse button on the center handle of the selection and dragging.

You can also set a new position in **Cut Property Bar** or in the tab **Transform** of **System Work Plat**. The selection will be moved with the reference point standing at the new position.
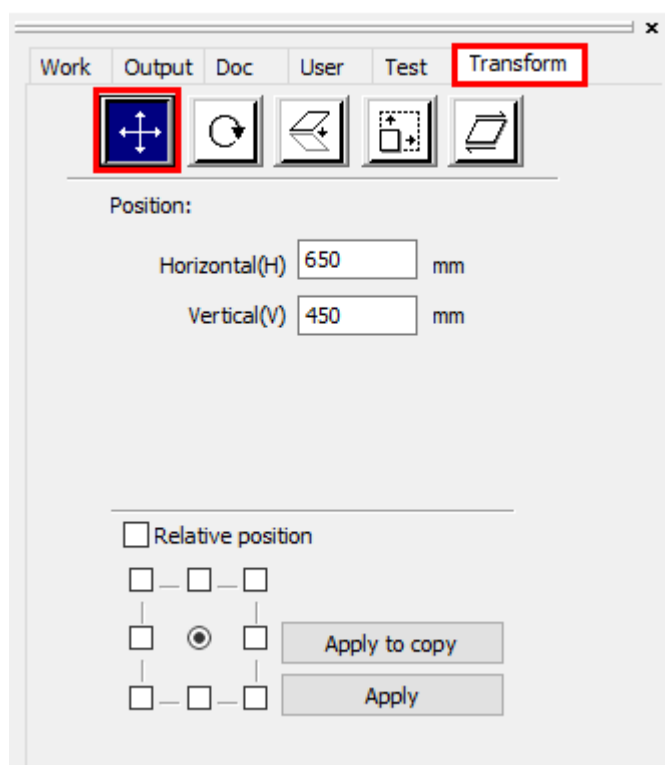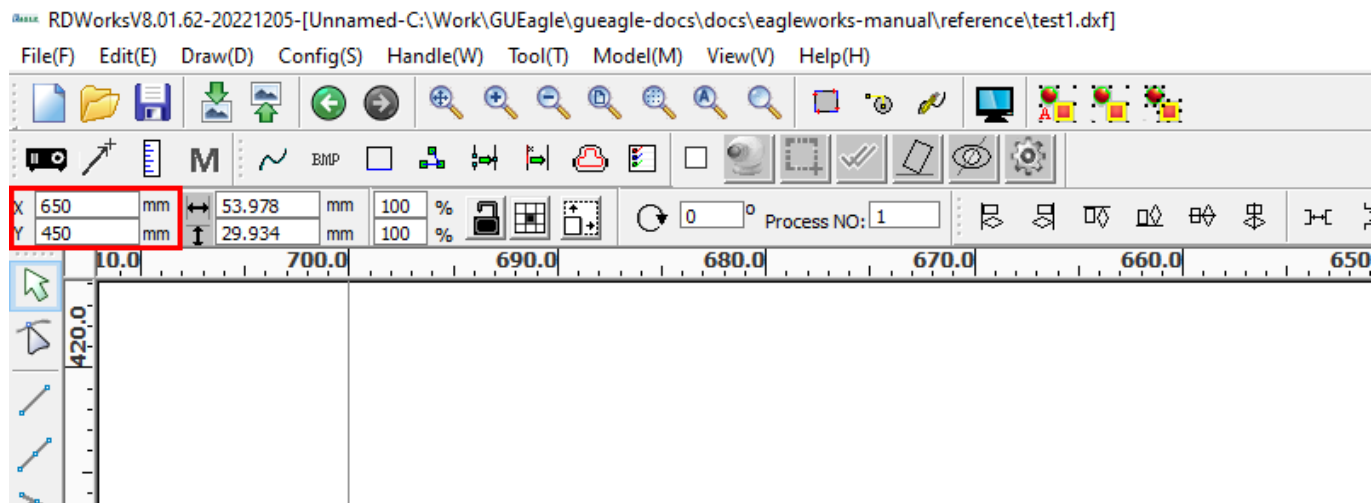
On the other hand, you can move shapes by keyboard. Press the arrow keys to move, press and hold the key **Shift** at the same time to move in a bigger step. The step length can be set in settings.

You can move shapes to a set of pre-defined positions.

Button	Menu Command	Function	Menu Position
	Data docking	Move the selection to the center.	**Draw**
	Top left	Move the selection to the top left.	**Draw**>**Arrange**
	Top right	Move the selection to the top right.	**Draw**>**Arrange**
	Bottom right	Move the selection to the bottom right.	**Draw**>**Arrange**
	Bottom left	Move the selection to the bottom left.	**Draw**>**Arrange**
	Arrange Page Center	Move the selection to the center.	**Draw**>**Arrange**
	Docking left	Move the selection to the left.	**Draw**>**Arrange**
	Docking right	Move the selection to the right.	**Draw**>**Arrange**
	Docking top	Move the selection to the top.	**Draw**>**Arrange**
	Docking bottom	Move the selection to the bottom.	**Draw**>**Arrange**

When there are more than one shape, you can align one or some to another, or space them evenly by the following functions in the menu **Draw**>**Arrange**.

Button	Menu Command	Function
	Arrange left	Align the left of one or some to another.
	Arrange right	Align the right of one or some to another.
	Arrange top	Align the top of one or some to another.
	Arrange bottom	Align the bottom of one or some to another.
	Arrange Horz Center	Align the vertical center of one or some to another.
	Arrange Vert Center	Align the horizontal center of one or some to another.
	Arrange space horizontal	Horizontally space the shapes evenly.
	Arrange space vertical	Vertically space the shapes evenly.

You can mirror shapes horizontally or vertically by the mirror functions in the pulldown-menu **Draw**.

Button	Menu Command	Function
	Horz Mirror	Mirror shapes horizontally.
	Vert Mirror	Mirror shapes vertically.

You can also do that in the tab **Transform** of **System Work Plat**.
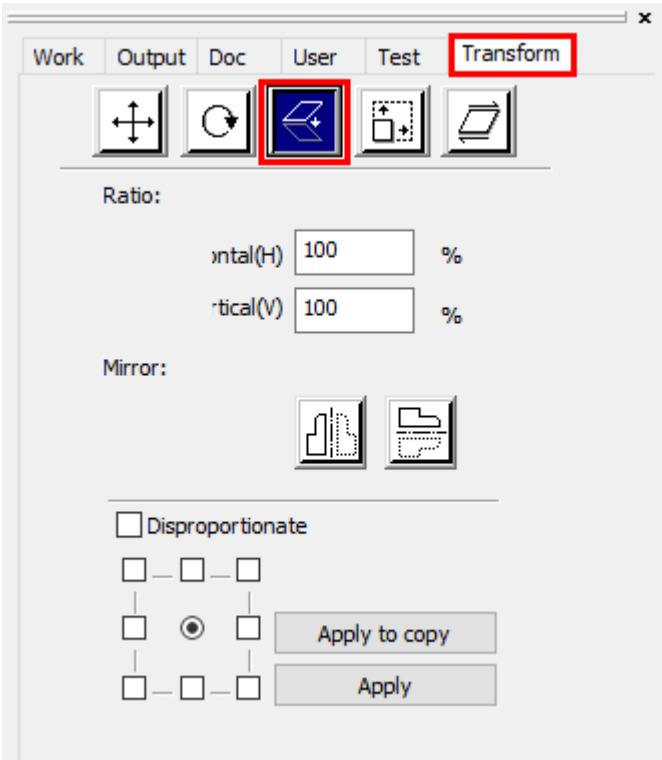
Double click on a selection to switch the bounding handles, and then you can do a free-hand rotating by pressing and holding the left mouse button on a corner handle and dragging.
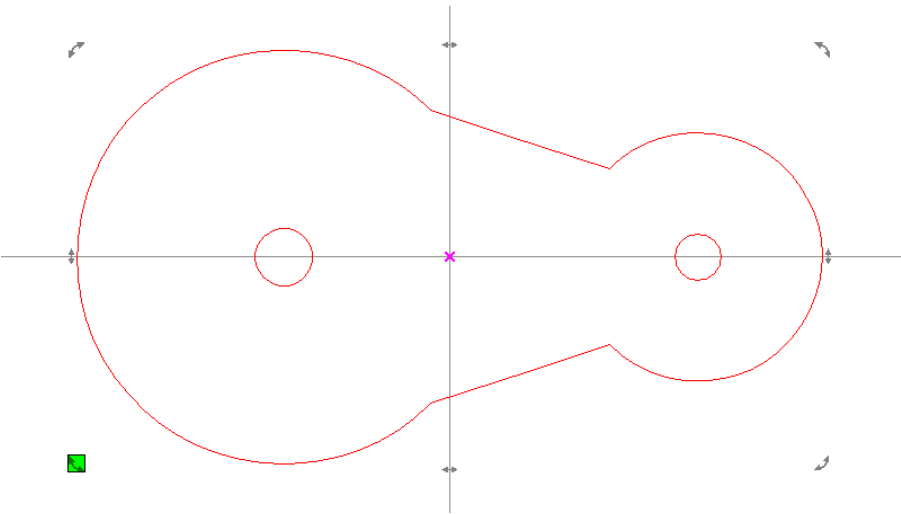
You can also set a rotation angle in **Cut Property Bar** or in the tab **Transform** of **System Work Plat**.
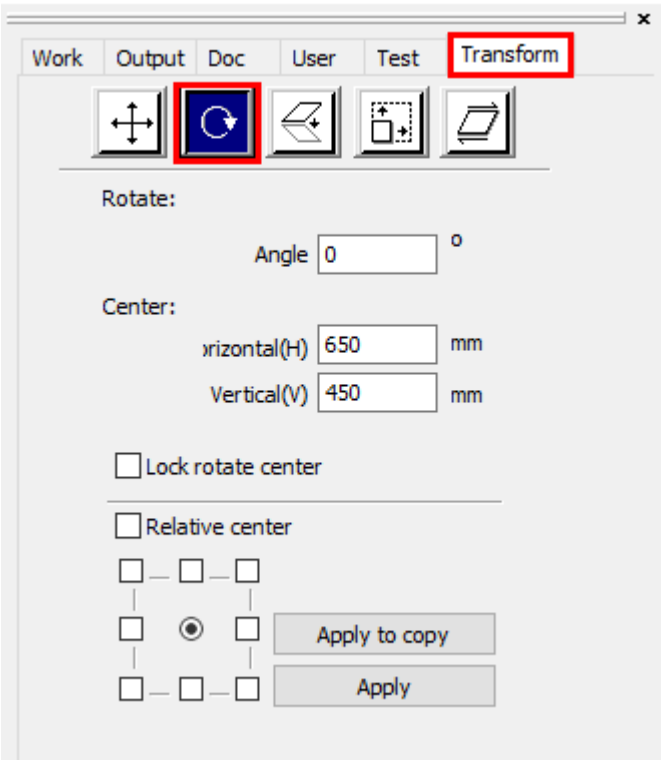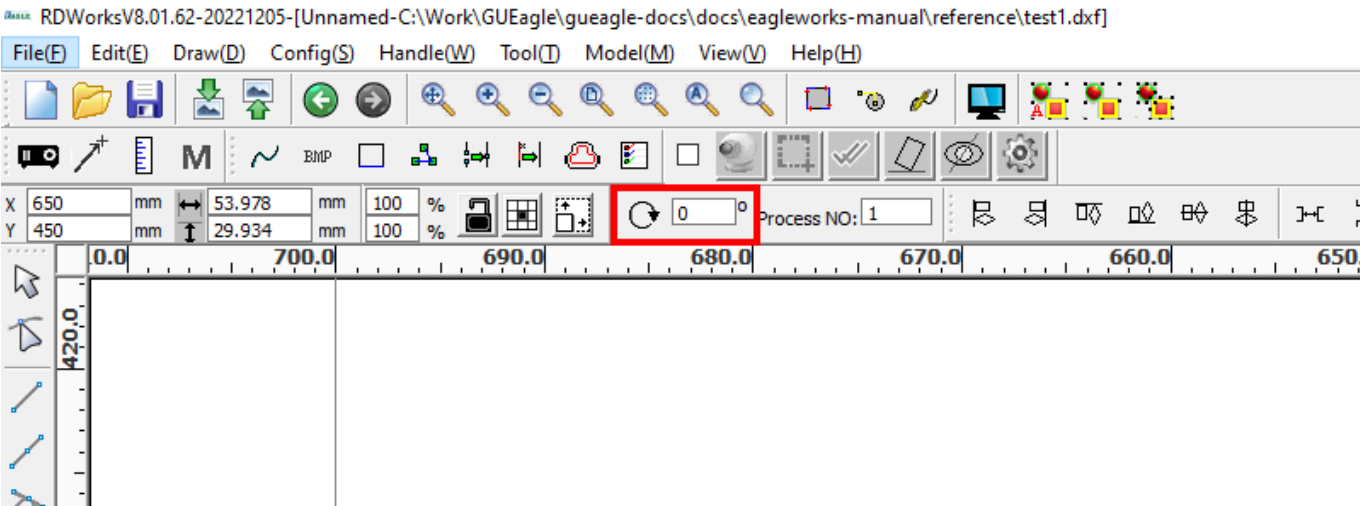
On the other hand, you can rotate shapes by keyboard. Press and hold the key **Ctrl** and press the arrow keys to rotate, press and hold the key **Shift** at the same time to rotate in a bigger step. The step angle can be set in settings .

Lay out

After importing artworks or creating shapes in EagleWorks, it is time to lay them out in the draw area. You can duplicate the selection as an array, or do nesting.

There are two kinds of arrays in EagleWorks, a concrete array, and a virtual array which includes only the original, the real copy and nothing but the layout information of the duplications.

Click **Copy Matrix** in the pulldown-menu **Draw** or click ⊞ on **Draw Bar** to generate a concrete array.
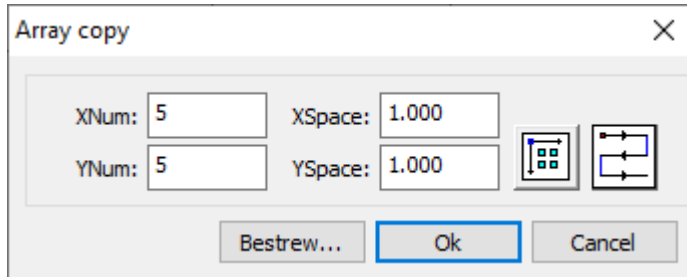
Set the number of columns in **XNum** and the number of rows in **YNum**, set the column space in **XSpace** and the row space in **YSpace**. Click ⊞ and ⊟ to change the extending direction and the pattern of the processing sequence of the duplications. If you want the software to calculate how many columns and rows can be put in a specific area, click **Bestrew...** and set the size of the area.
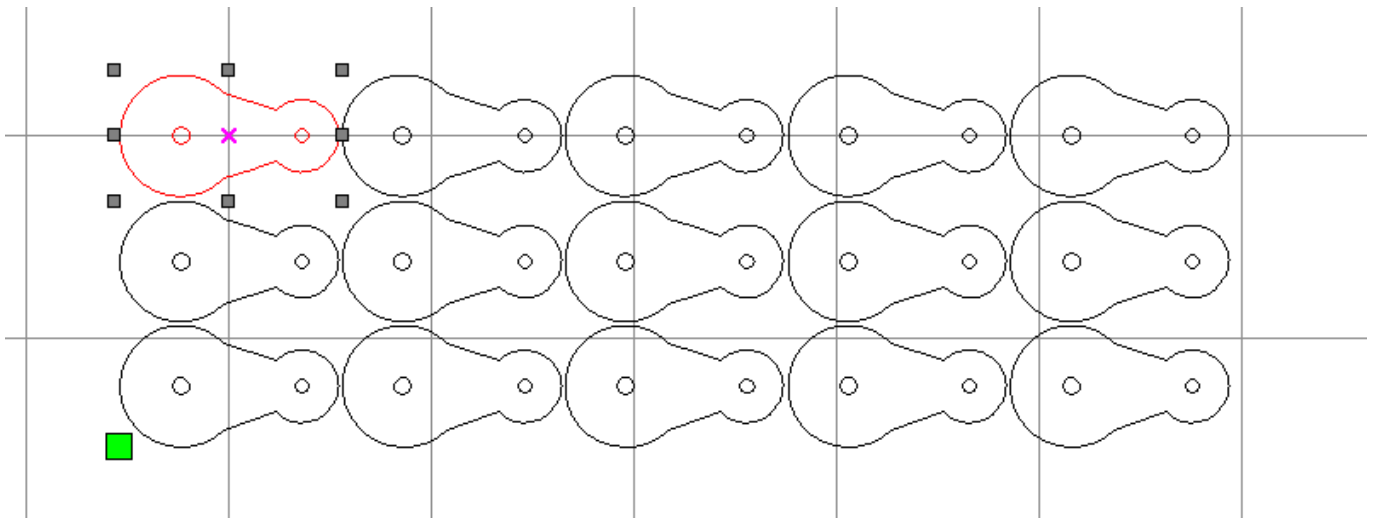
All the duplications in a concrete array are independent with each other, and you can select and edit one or some of them separately.

Click **Virtual array** in the tab **Work** of **System Work Plat** to generate a virtual array.

The settings for a virtual array are sort of similar with the settings for a concrete, but the best part is that you can even change the settings after generating, e.g. change the number of columns or rows, change the column or row space, etc.

There are two column space settings, the value at (**X**, **space1**) set the space between the duplications on an odd column and the next, and the value at (**X**, **space2**) set the space between the duplications on an even column and the next. The row space settings are sort of same. For example, we set *2* at (**X**, **space1**), *0* at (**X**, **space2**), and *2* at (**Y**, **space1**), *0* at (**Y**, **space2**), then we get a 2mm gap between column 1 and 2, between column 3 and 4, no gap between column 2 and 3, between column 4 and 5, and a 2mm gap between row 1 and 2, between row 3 and 4, no gap between row 2 and 3, shown as below.
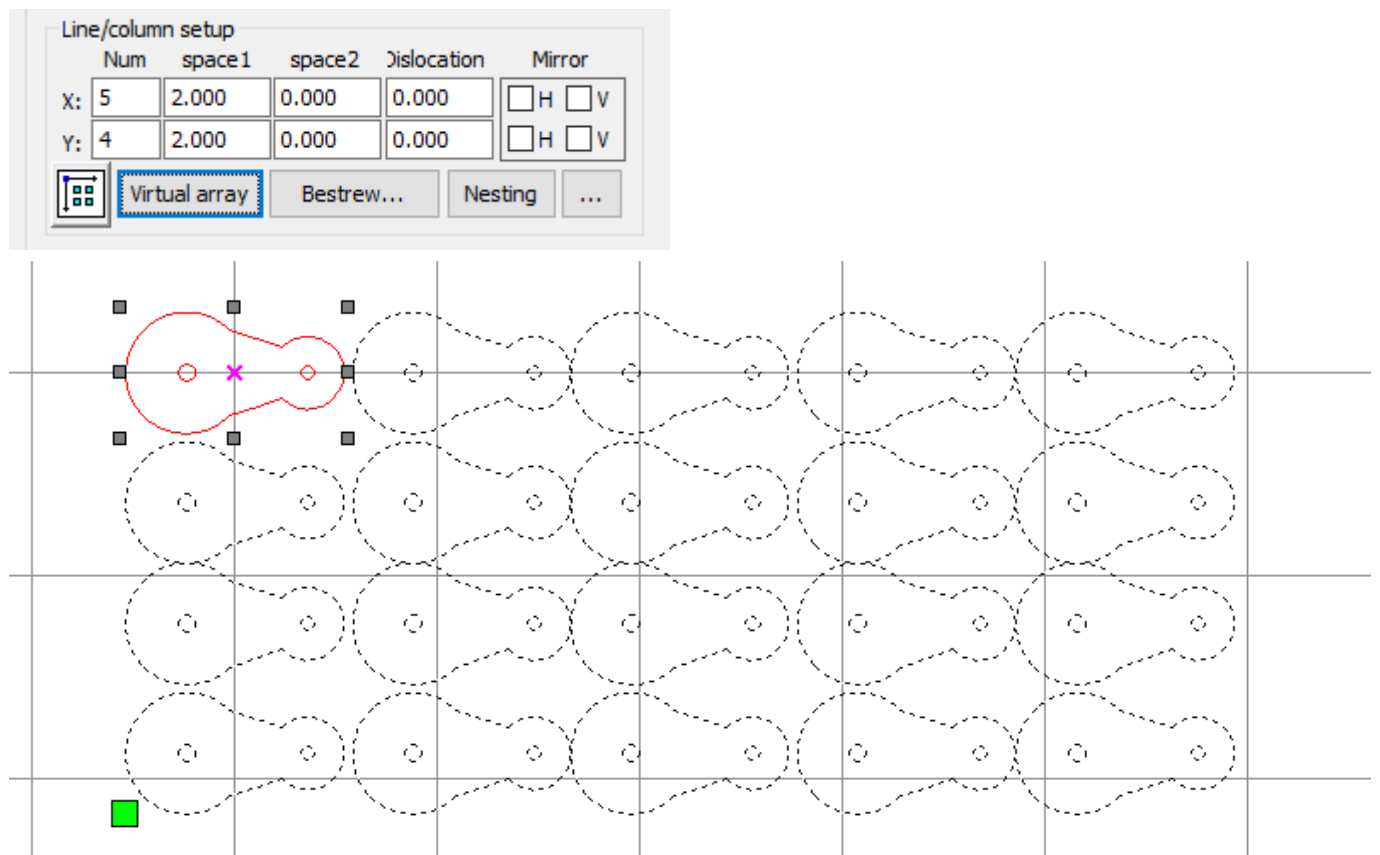
There are offset settings for getting a more compact layout and saving materials, the value at (**X**, **Dislocation**) set a horizontal offset on all even rows, and the value at (**Y**, **Dislocation**) set a vertical offset on all even columns. We usually adjust the space between rows or columns at the same time to accommodate duplications in an area as compact as possible. For example, we set *22* at (**X**, **Dislocation**), then we get a 22mm horizontal offset on row 2 and 4, shown as below.
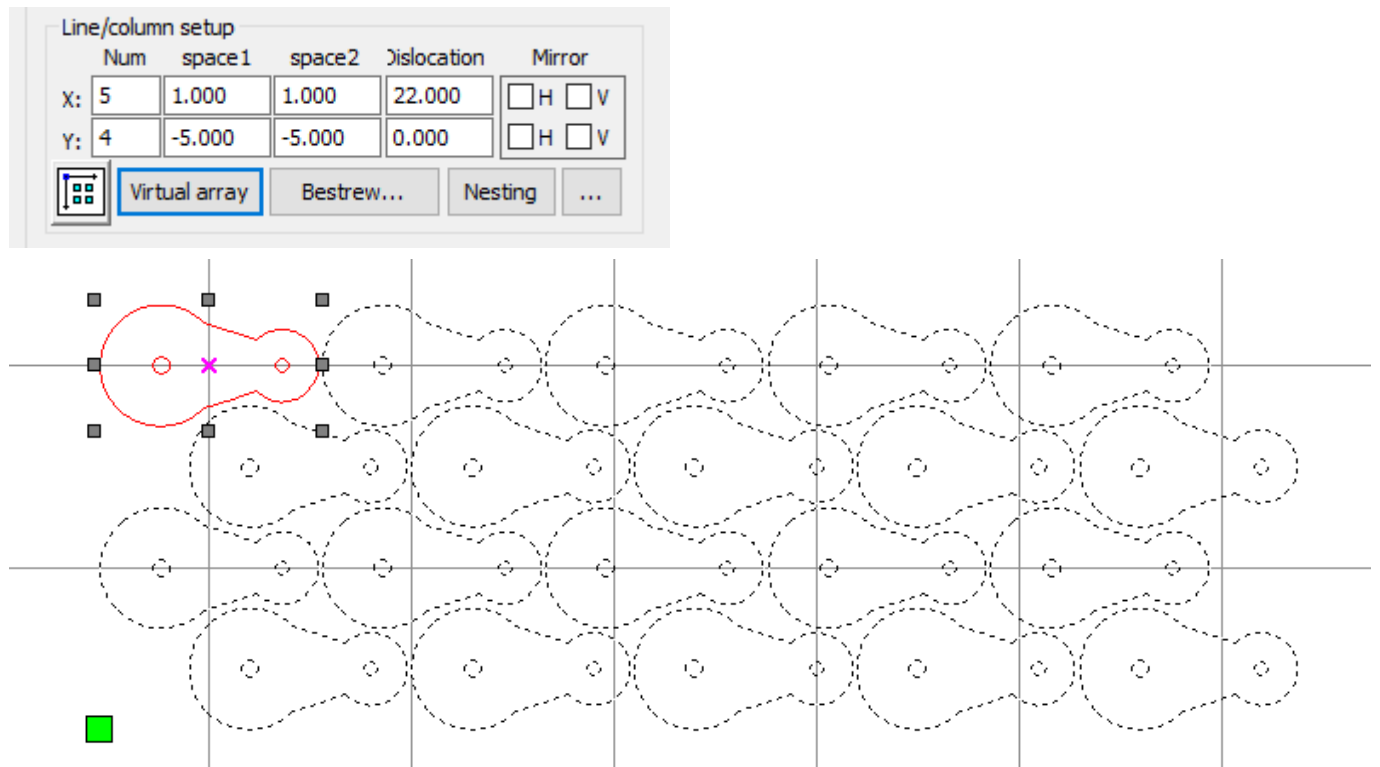
And there are mirror and flip settings also for a better layout, the option at (**X**, **H**) and (**X**, **V**) mirror and flip duplications on all even rows, and the option at (**Y**, **H**) and (**Y**, **V**) mirror and flip duplications on all even columns. And we also usually adjust the space between rows or columns at the same time. For example, we check the option at (**X**, **H**), then we get the duplications on row 2 and 4 mirrored, shown as below.
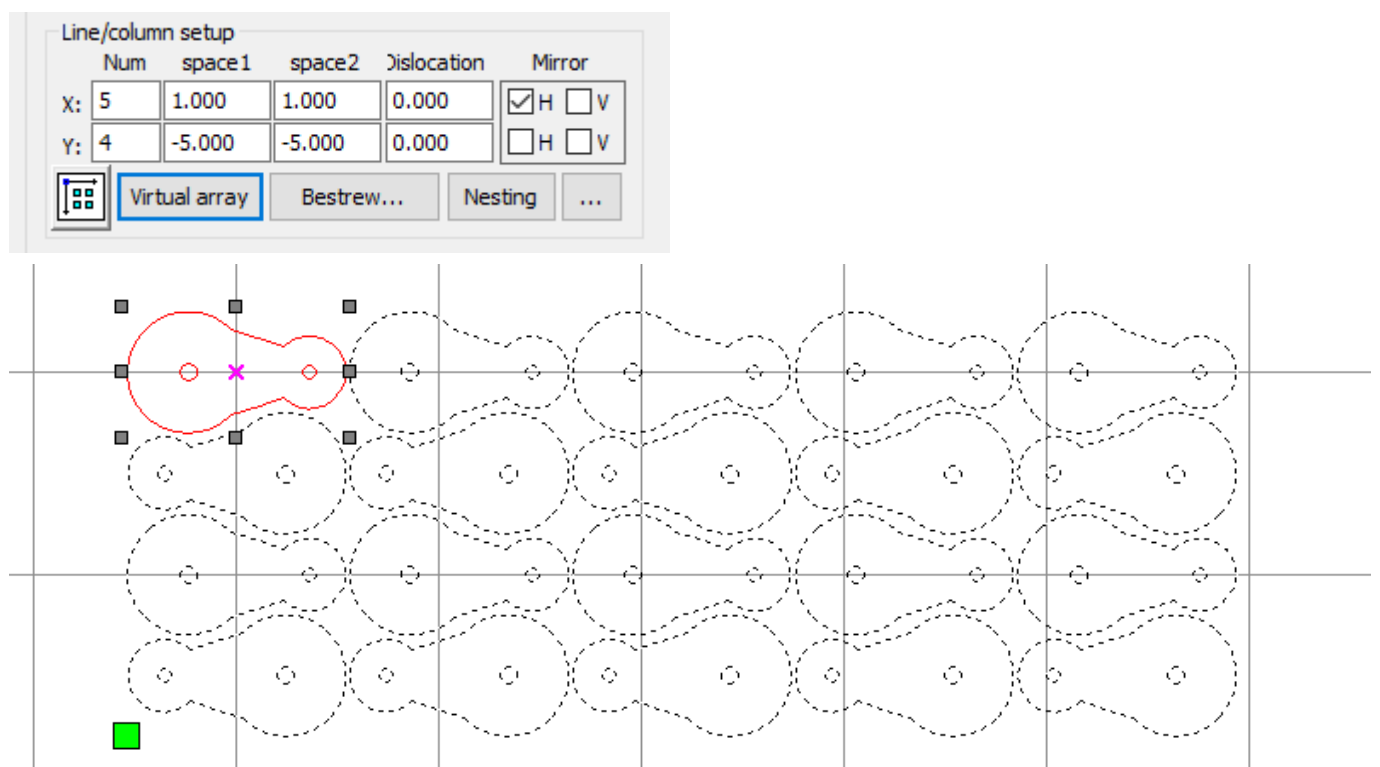
In the example below, we check the option at (**Y**, **V**), then we get the duplications on column 2 and 4 flipped, shown as below.
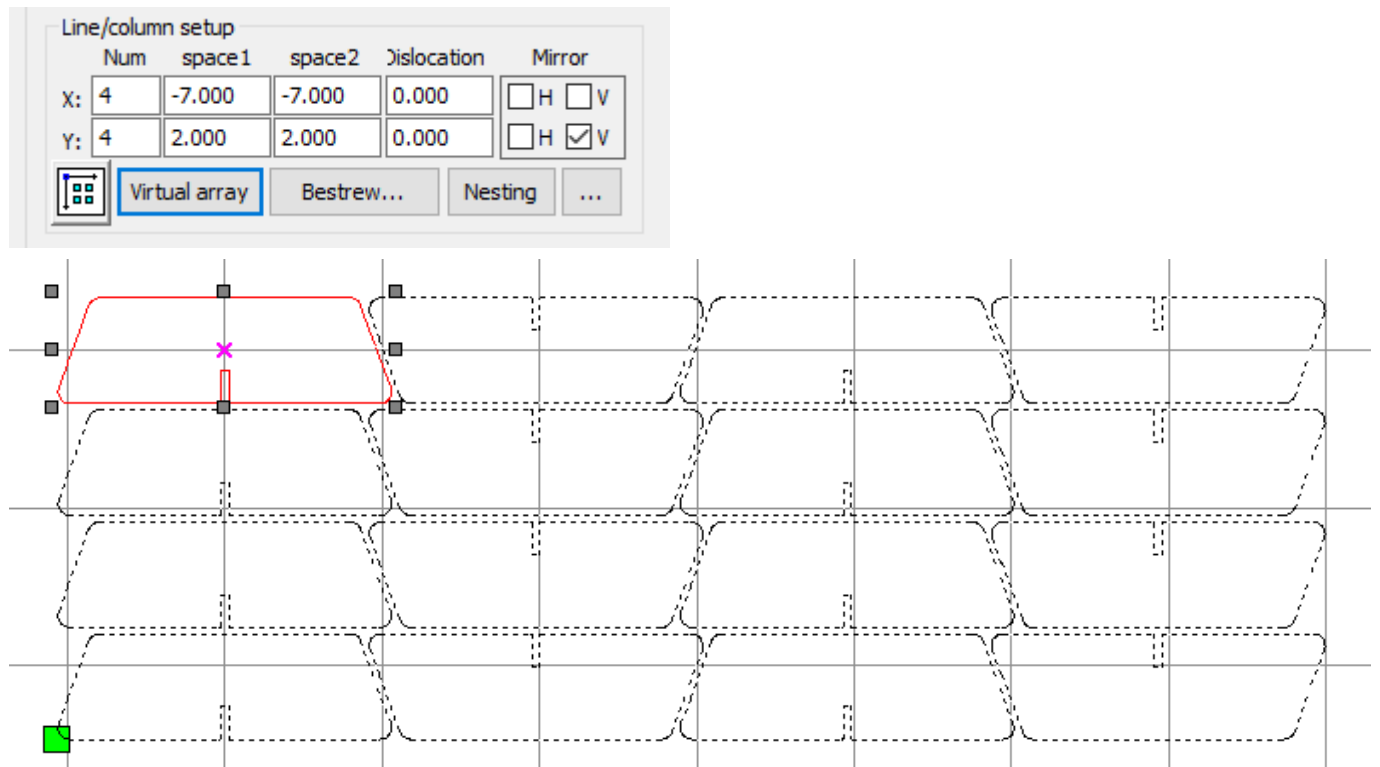
Click and **Bestrew…** for the same functions as for a concrete array.

There is essentially one and only one real copy of the shapes in a virtual array, and the array is by default a group which can not be split up. You have to select the real copy to select the whole array, and all edits being done on the real copy will be applied to all the other virtual duplications too.

By default, all the duplications in a virtual array appear the same way as the real copy, costs a lot of calculation time and resources in case of a large number of complex shapes. Uncheck **Show Array** in the pulldown-menu **Config** to let the software show only a placeholder for a virtual duplication to improve the overall performance.
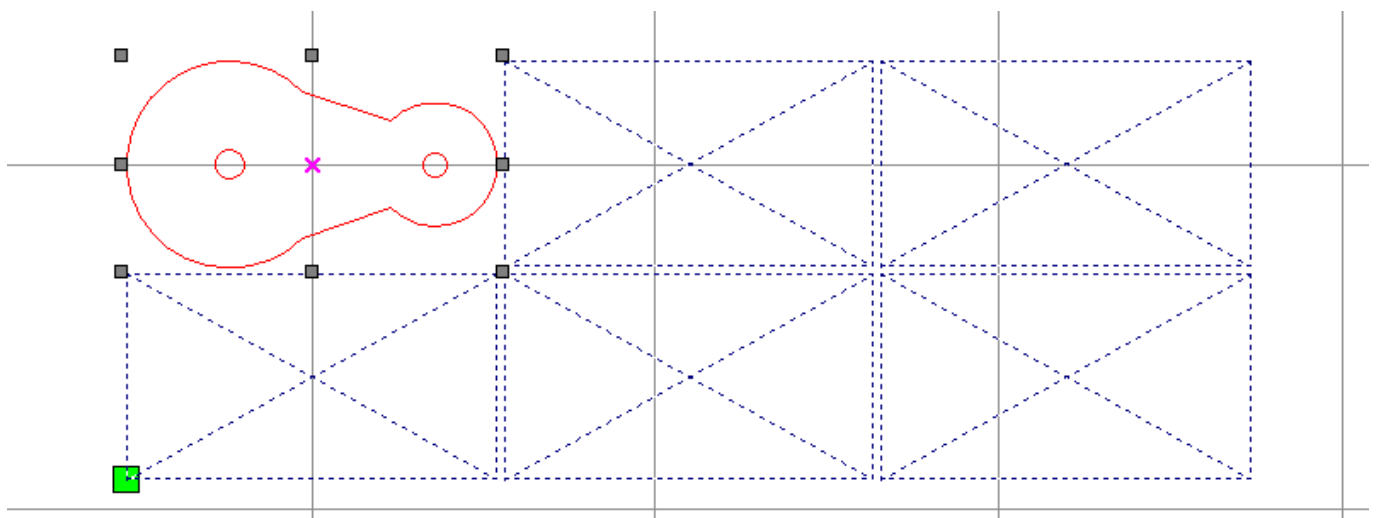
Sometimes, it is hard to figure out the best layout solution, or it just costs you too much time to do that, nonetheless, there comes the nesting function which is essentially an AI version of the virtual array function.

Click **Nesting** in the pulldown-menu **Tool** or click **Nesting** in the tab **Work** of **System Work Plat** brings up the nesting dialog.
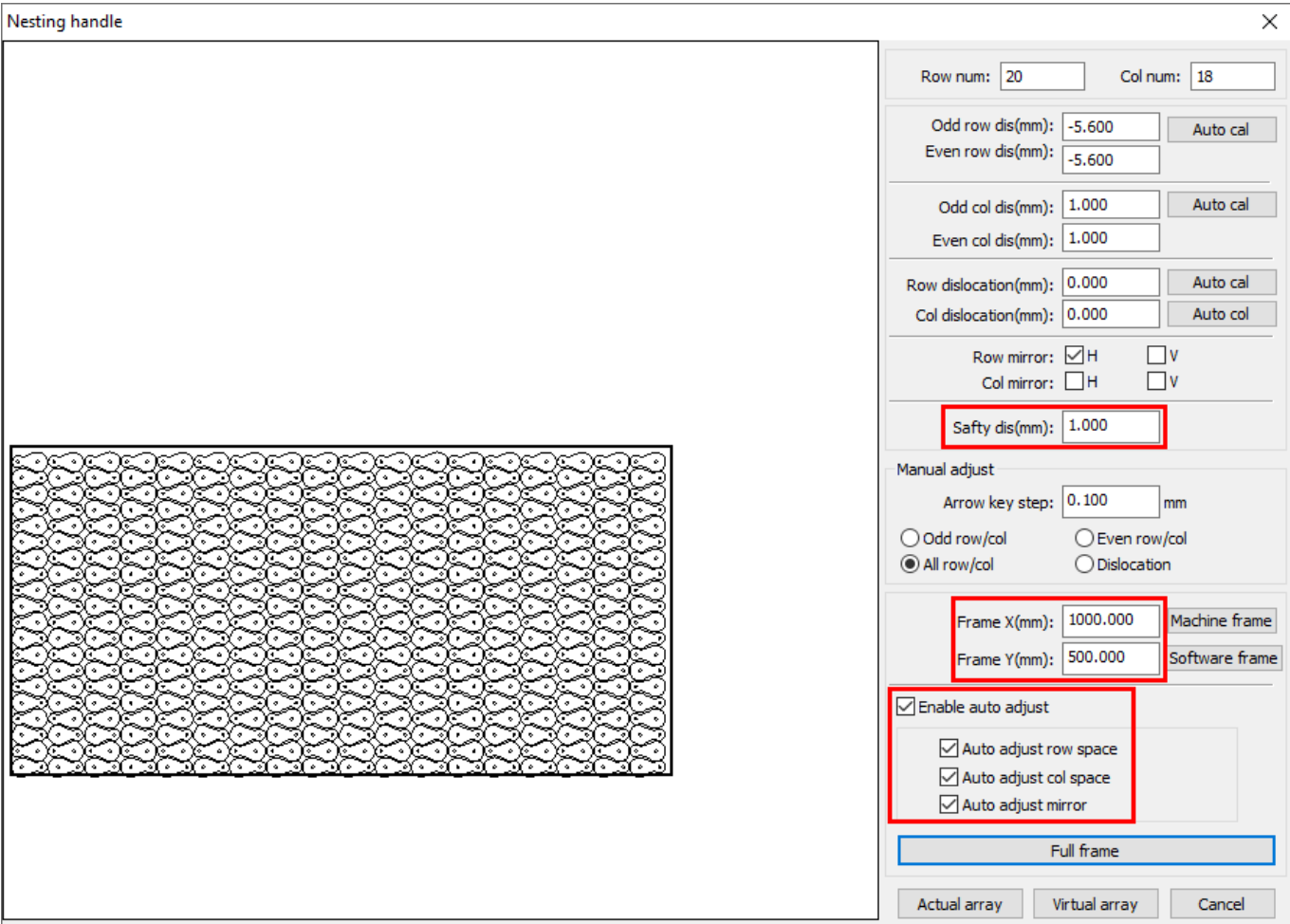
The best way to do nesting is to set only the safety space between each duplication and the area to fill, and enable all the optimizations, then click **Full frame** to let the software figure it out on its own.

After getting the layout solution, click **Actual array** or **Virtual array** to carry it out as a concrete or a virtual array.
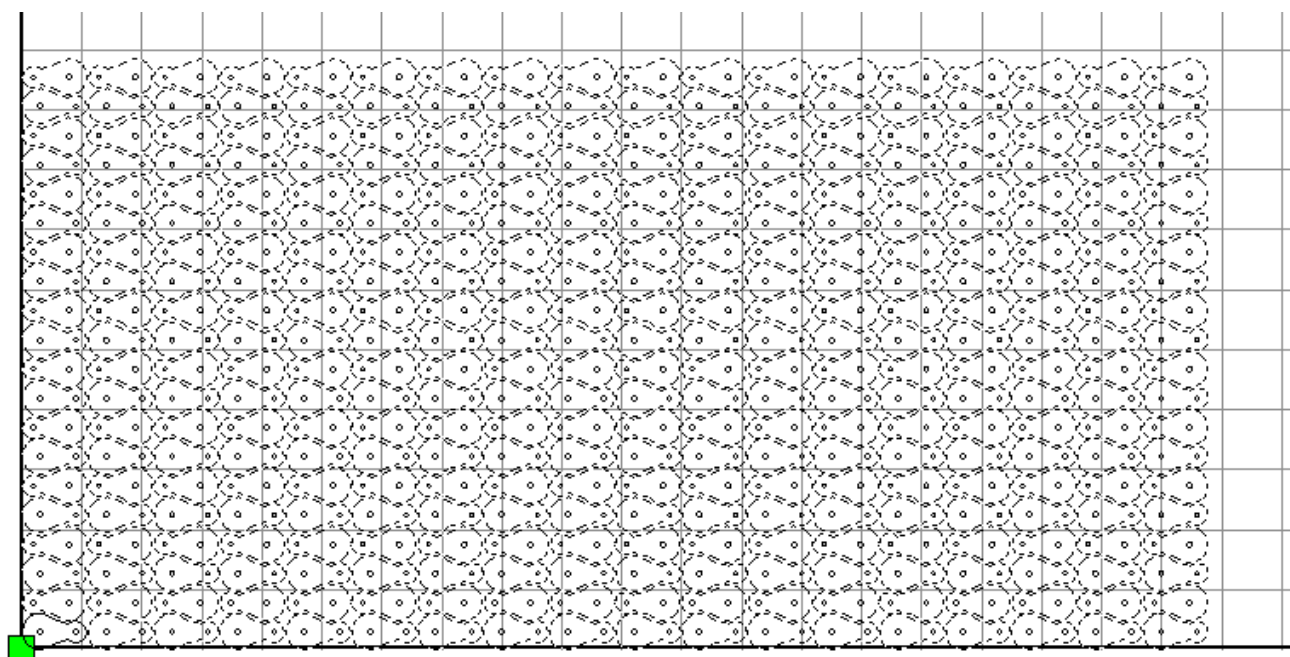
Technology in EagleWorks

In this chapter, you will learn how to set and check technology in EagleWorks.

- Important Concepts
- Job Settings
- Cutting Technologies
- Engraving Technologies
- Processing Sequence
- Check Technology

Important Concepts

So far, you are familiar with designing in EagleWorks, but you may still have questions about how the software maps your designs to cutting and engraving. We will show you some most important concepts in this section, to answer your questions and help you use EagleWorks properly.

1. Laser processing modes

    First of all, you need to get familiar with the laser processing modes, which mean what a laser can do on laserable materials. EagleWorks supports laser cutting and engraving, here is a definition of laser cutting on Wikipedia.

    > Laser cutting is a technology that uses a laser to cut materials. Laser cutting works by directing the output of a high-power laser most commonly through optics. A typical commercial laser for cutting materials would involve a motion control system to follow a CNC or Gcode of the pattern to be cut onto the material. The focused laser beam is directed at the material, which then either melts, burns, vaporizes away, or is blown away by a jet of gas, leaving an edge with a high-quality surface finish.

And here is a definition of laser engraving on Wikipedia.

> Laser engraving, which is a subset of laser marking, is the practice of using lasers to engrave an object. The technique does not involve the use of inks, nor does it involve tool bits which contact the engraving surface and wear out, giving it an advantage over alternative engraving or marking technologies where inks or bit heads have to be replaced regularly.

2. Vector graphics

EagleWorks supports both cutting and engraving on vector graphics, depending on the technology set on the layer of the shapes. Here is a definition of vector graphics on Wikipedia.

> Vector graphics is the use of polygons to represent images in computer graphics. Vector graphics are based on vectors, which lead through locations called control points or nodes. Each of these points has a definite position on the x- and y-axes of the work plane and determines the direction of the path; further, each path may be assigned various attributes, including such values as stroke color, shape, curve, thickness, and fill.

The example below is an artwork of our logo imported in EagleWorks, there are two layers, the black and the blue, in this job. We set the laser processing mode of the blue to **Scan**, which means engraving, and the mode of the black to **Cut**.
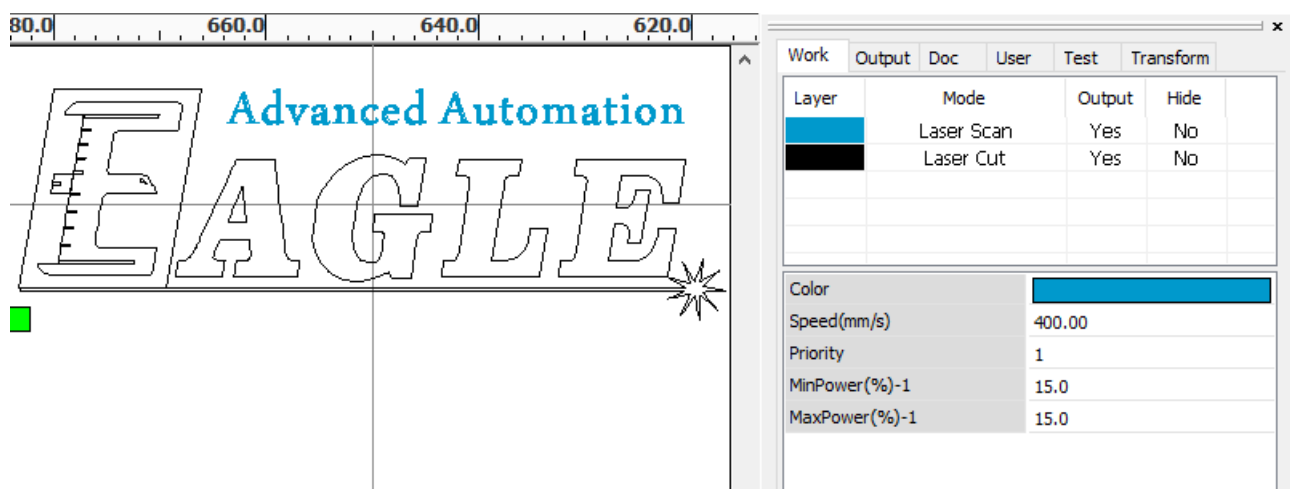
NOTE

The shapes of a layer which is set to **Scan** will still appear as vectors by default, check **Graph Hatch** in the pulldown-menu **Config** to let the software display them as filled.

3. Images

EagleWorks supports only engraving on images. Here is a definition of images on Wikipedia.

> In computer graphics, a raster graphics or bitmap image is a dot matrix data structure, representing a generally rectangular grid of pixels, or points of color, viewable via a monitor, paper, or other display medium. Raster images are stored in image files with varying formats.

The example below is a photo of Audrey Hepburn imported in EagleWorks, in a **BMP** layer with the laser processing mode set to **Scan**.
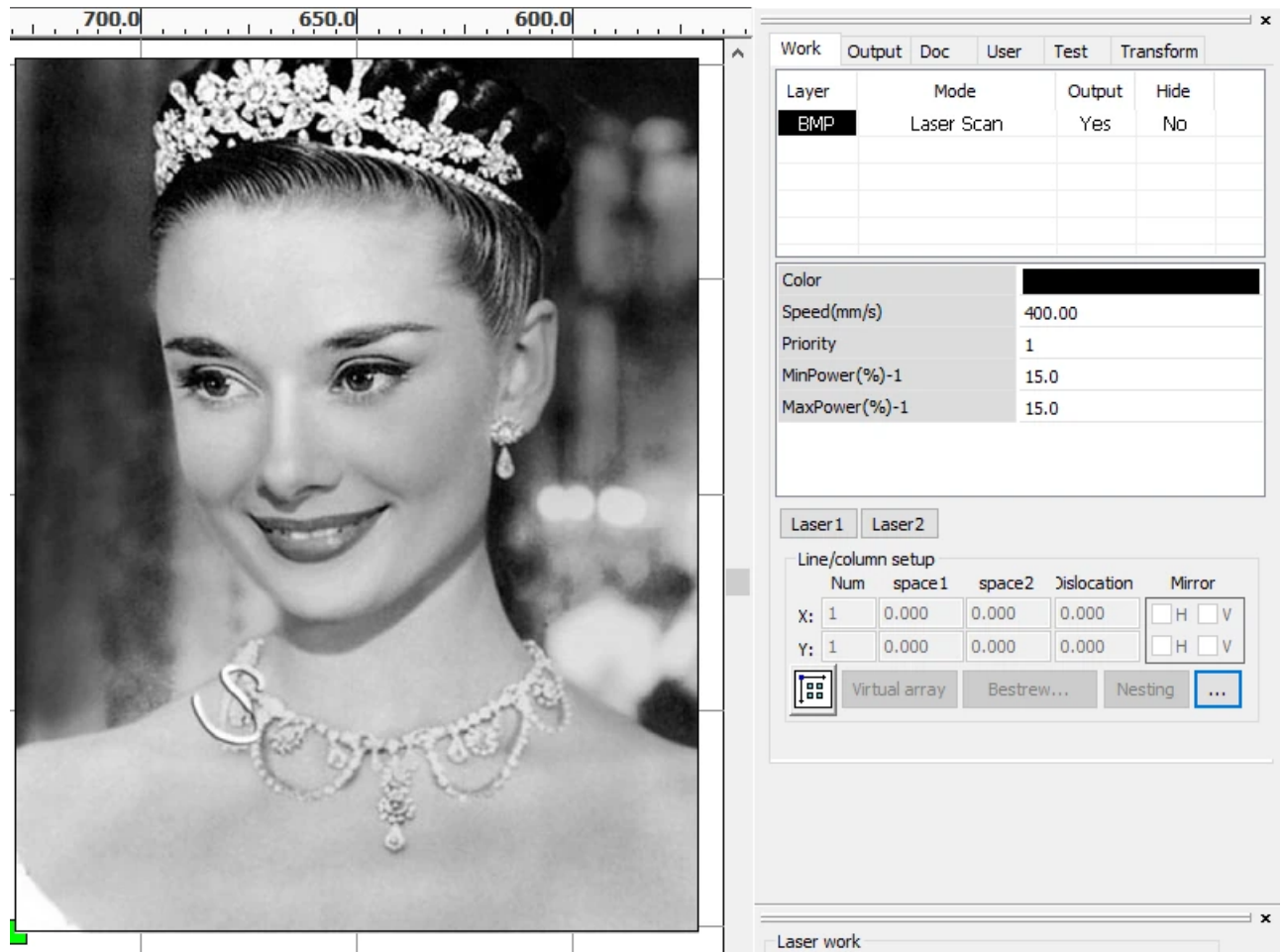
Engraving with laser is much different with printing with ink, there is no color applied on materials, laser expresses colors by etching material in different depths or densities. To map colors of an image to different depths, we convert colors to gray scales, and then map gray scales to laser power levels. But in practice, it is usually very difficult to control laser power precisely at a high rate of change, especially for some kinds of laser, such as the CO_2 glass laser which is widely used in laser machines. The better choice is to map colors to different densities. A technique called halftone is often used to simulate gray scales by the use of black dots, varying either in size or in spacing, in a result of a gradient like effect. In the pictures below, the left one shows halftone dots, the right one shows what human eyes would see from a distance far enough.
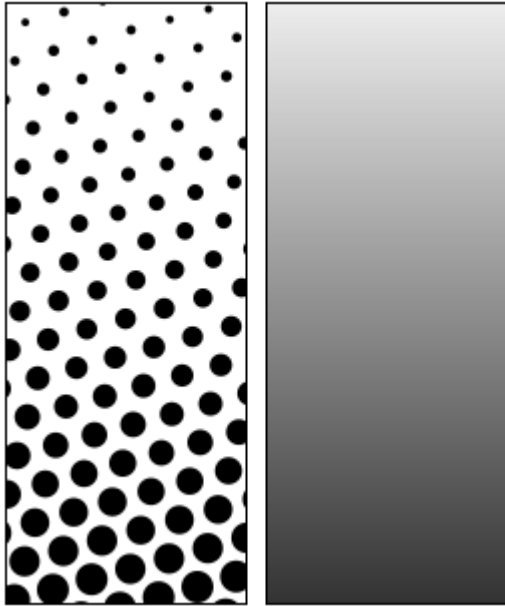
The example below shows the original and the halftoned photos of Audrey Hepburn.
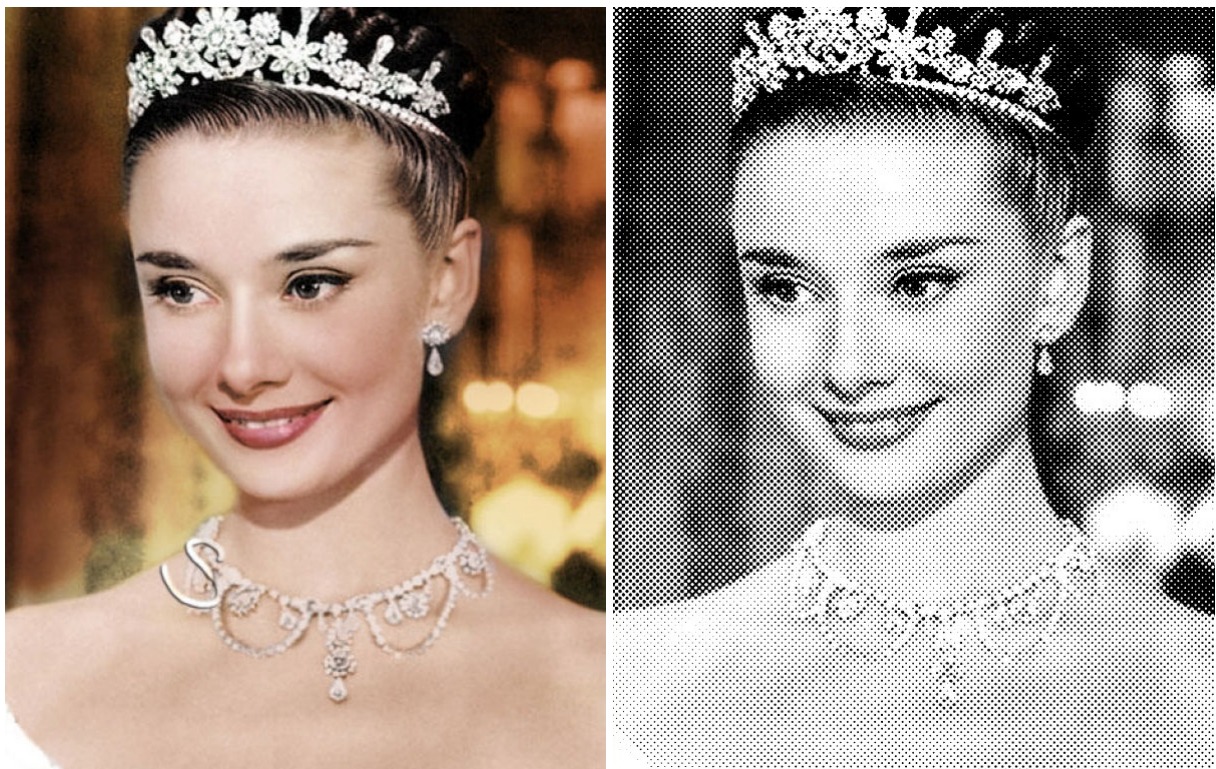
4. Coordinates and job origin

Every laser has a coordinate system set up on its work area, you must set up an exact same coordinate system, called machine coordinates or absolute coordinates, on the draw area in EagleWorks to map the laser.
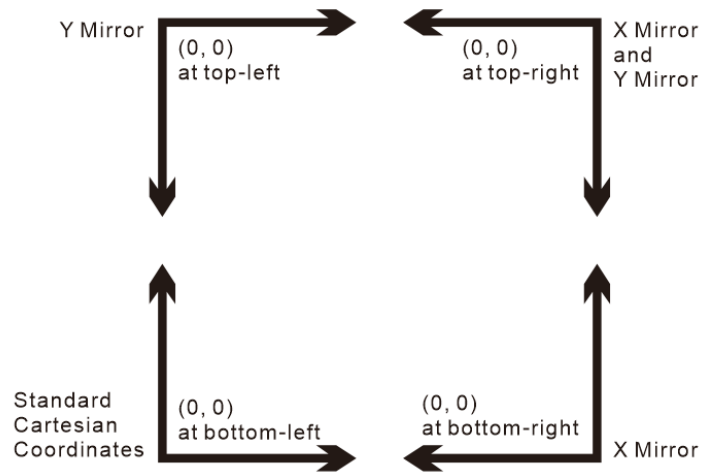
Laser controllers support standard Cartesian coordinates and its variants, laser manufactures use one of them according to their machine.

To set up machine coordinates, click **System Setting** in the pulldown-menu **Config**, in the page **Configuration**, use the 4-dots control in the section **Homing position** to set the position of the machine origin. And then you will see a coordinate sign at the corresponding position of the draw area, refer to The Draw Area for more details.

In practice, people are often used to set a position in the work area from the laser, called programmed origin, where you want your job to be aligned. And there comes the job origin in EagleWorks, which tells the machine how to position the job relative to the programmed origin.
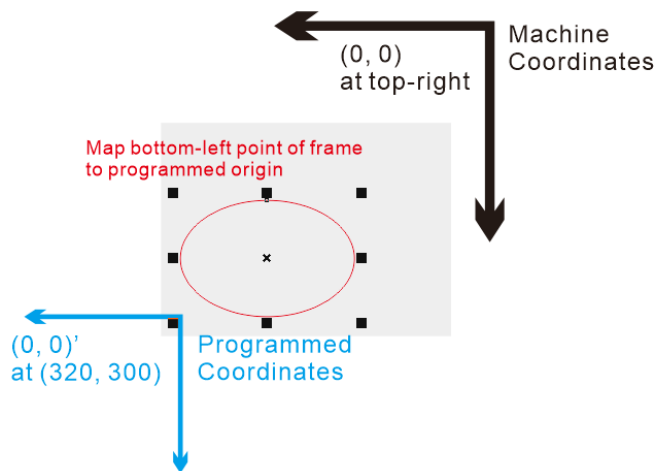
Click **System Setting** in the pulldown-menu **Config**, in the page **Configuration**, use the 9-dots control in the section **Laser head** to set the job origin. And then you will see a green square at the corresponding position of the job, refer to The Draw Area for more details.
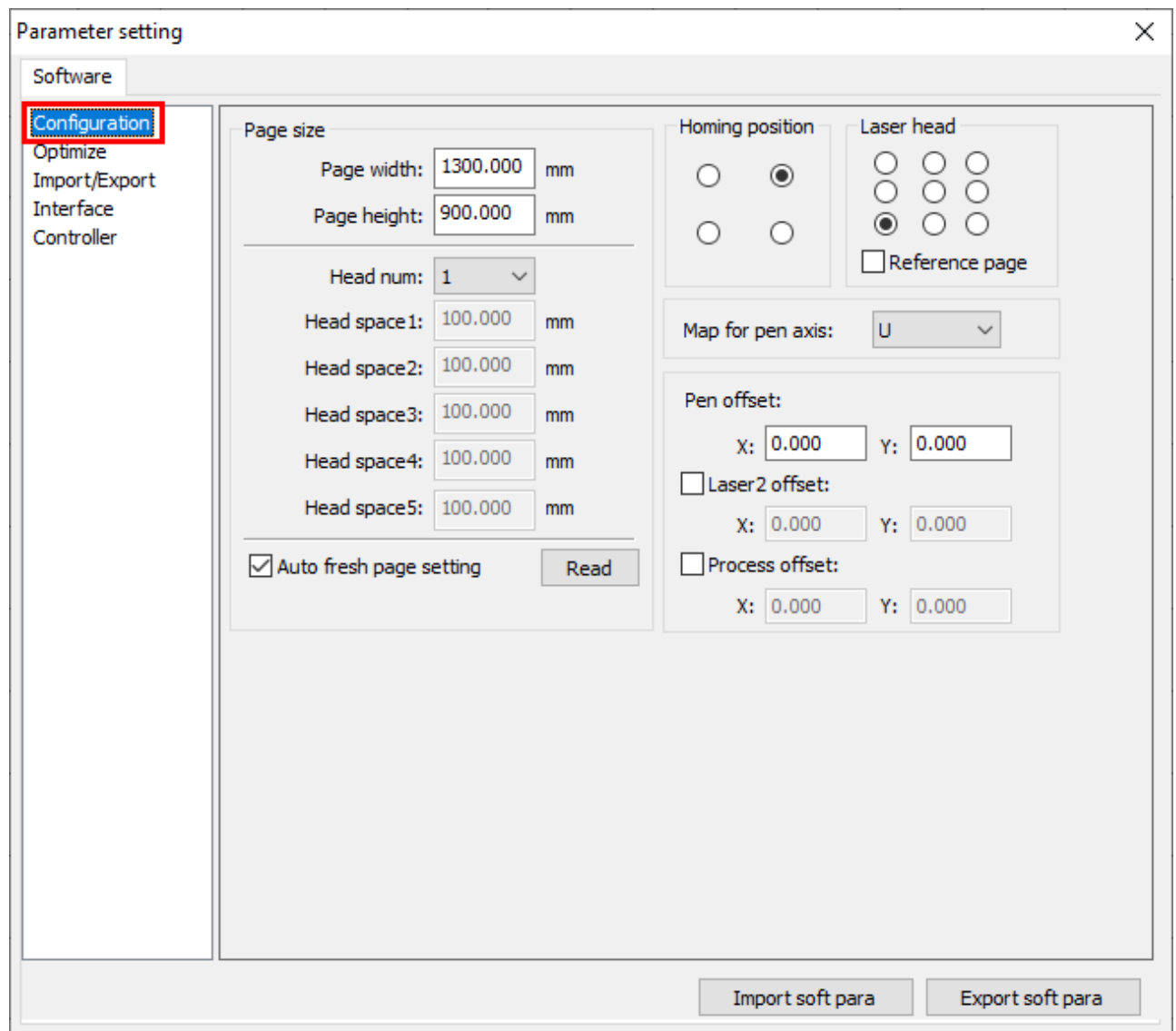
Job Settings

A set of appropriate job settings is one of the most important technology for getting good laser results.

Layers

There are twenty layers available in EagleWorks, which are represented by different colors and independent of each other. A set of processing parameters, associated with a layer, will be applied automatically to the shapes or images which are assigned to the layer.

In general, different kinds of operations on different materials with different thicknesses and surfaces require different sets of processing parameters. In practice, we recommend to create a one-to-one mapping between the most commonly used operations and the first few layers, e.g. 3mm acrylic cutting to layer ▉, 5mm plywood cutting to layer ▉, and temporarily assign other operations to the last few layers when necessary, e.g. 2mm cardboard cutting to layer ▉. When setting processing parameters, all you need to do is just assigning the shapes to the layers.

To assign a shape to a layer, select the shape and then click on the color of the layer.

--- *Welcome to use the Laser system of cutting,Propose the display area 1024*768 or higher *---
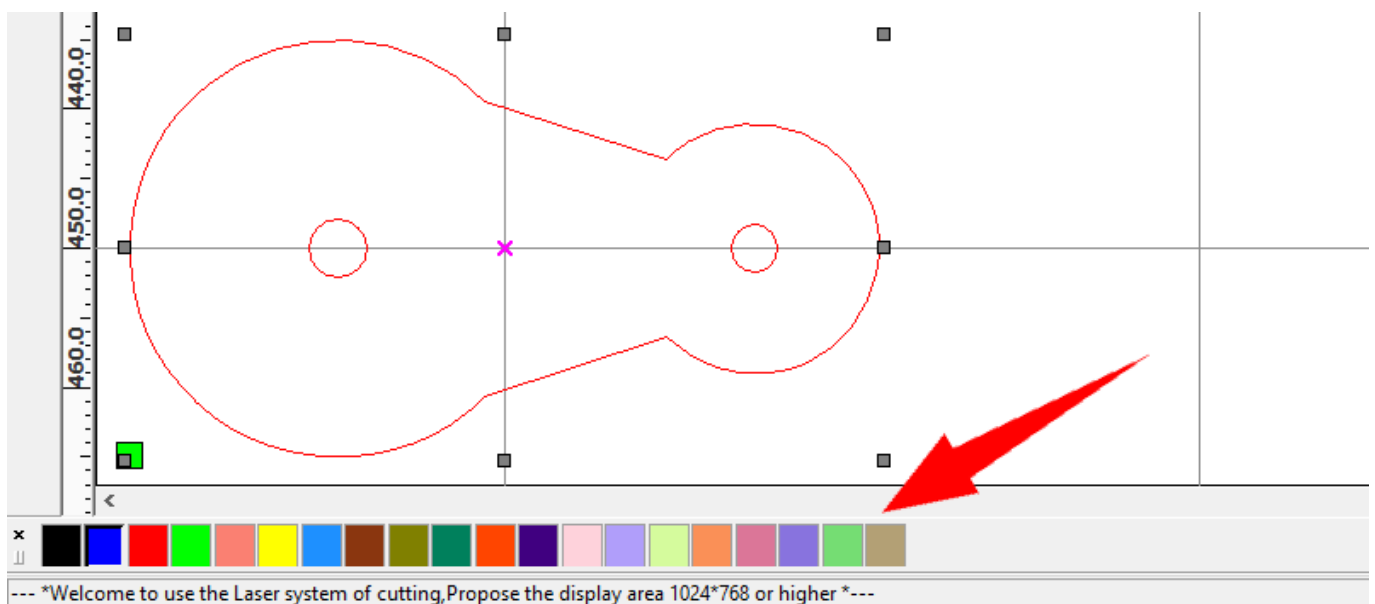
Sometimes, if you want to process just a part of your design, select those shapes which you want to ignore and assign them to the layer set to be ignored.
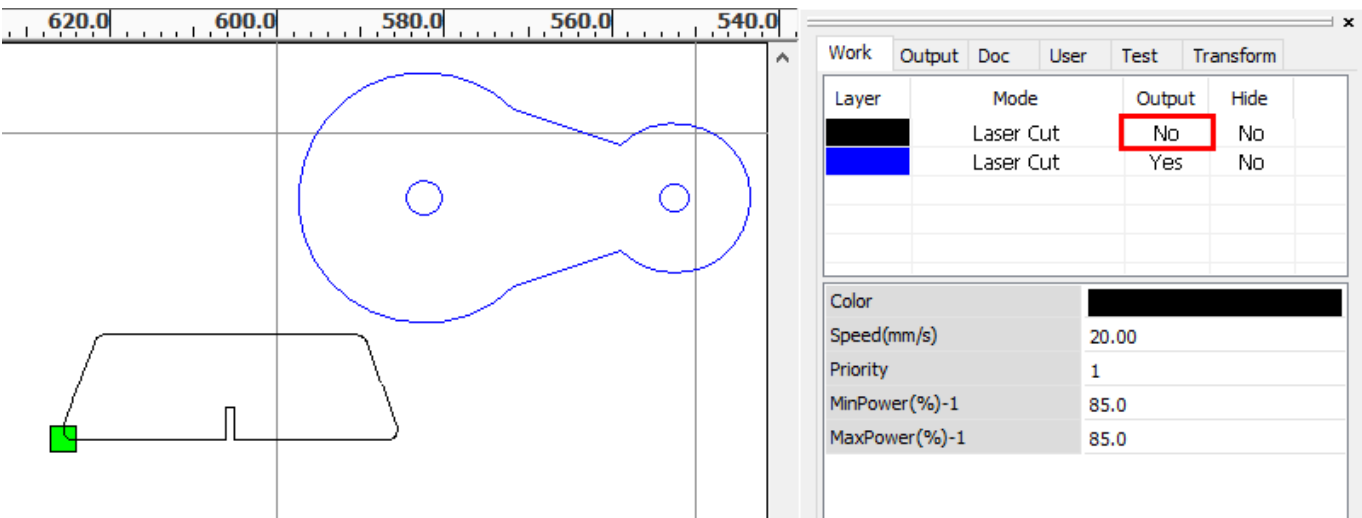
You can also check the option **Output select graphics** in **Process Control Bar** to do the same thing, refer to Laser Panel for more details.

There is a list of all the layers in your design in the tab **Work** of **System Work Plat**.
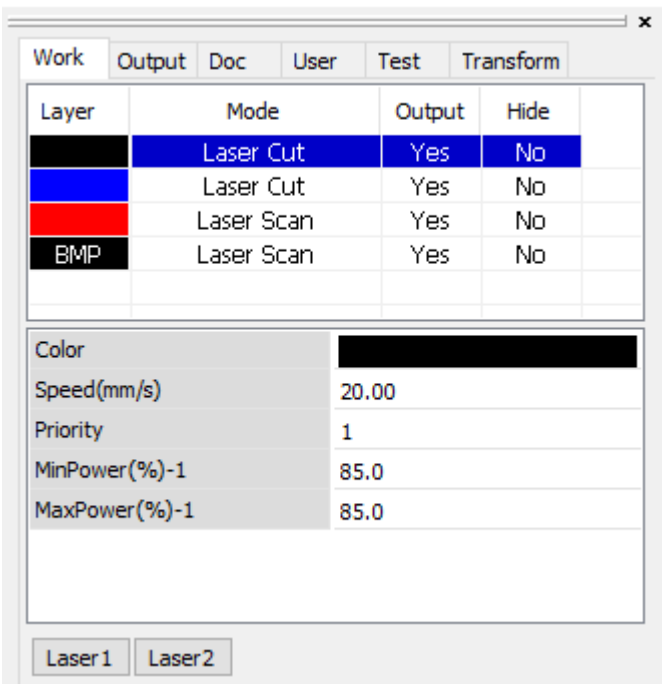
You can get some basic information in the view, i.e. the processing mode of a layer, whether the shapes of a layer will be processed, whether the shapes of a layer will be displayed. Double click on the option **Output** or **Hide** of a layer will switch its corresponding state.

By selecting a layer, you can review the speed and power settings of the layer. On a dual-laser machine, click **Laser1** to show the power of the laser 1, click **Laser2** to show the power of the laser 2. You can do a quick change by modifying the values directly here.

Shared Layer Parameters

To set the processing parameters of a layer, there must be at least one shape in the draw area.

Double click on the layer in the layer list in the tab **Work** of **System Work Plat**, the dialog **Layer Parameter** pops up.

> **NOTE**
>
> You can switch to another layer by clicking the color of the layer in the list on the left side without closing the dialog and opening it from the layer list again.

There are a set of shared parameters for both cutting and engraving.

Parameter	Description
Layer	The color representing the layer.
Is Output	Whether the shapes in the layer will be processed.
Speed	The speed for cutting or engraving.
Repeat num	How many times the laser will repeat the shapes and images in the layer.
Processing Mode	Set the processing mode of the layer.

Parameter	Description
If Blowing	Whether the exhaust will be turned on.
Min Power 1-6	The minimum power for cutting or engraving.
Max Power 1-6	The maximum power for cutting or engraving.
Auto synchronize when Modify laser para	Change the power of all lasers at the same time.

On a dual-laser machine, you need to enable the power settings for the both lasers.

Sometimes, especially when cutting thin sheets in a high speed, the material will catch a lot more heat at the start, end and sharp corners because of the low feeding speed at these positions and results in over burnt edges. In these cases, you should set a low minimum power, e.g. just above the firing threshold, and the software will generate a linear power curve, then the machine will adjust the power level based on the real-time feeding speed.

Cutting Parameters

Set **Processing Mode** to **Cut** will bring up all the cutting parameters.

Parameter	Description
Seal	The length of over-cuts which may result in more smooth edges at the start and end positions.
Open Delay	The time period after turning on the laser and before the laser head starting feeding, helping get better edges at the start positions.
Close Delay	The time period after the laser head stopping feeding and before turning off the laser, helping get better edges at the end positions.
Laser through mode	Switch the option **Open Delay** and **Close Delay** on or off.
Through power 1-6	The power setting for **Open Delay** and **Close Delay**.

Engraving Parameters

Set **Processing Mode** to **Scan** will bring up all the engraving parameters.

Parameter	Description
Negative Engrave	This will invert the image during engraving, effective for **BMP** layers only.
Optimized Scan	Let the software calculate and set the spacing between scanlines, effective for **BMP** layers only.
Output direct	Let the machine adjust the power level based on the gray scales of the image, effective for **BMP** layers only.
Independent output	The laser will engrave each shape or image separately.
Ramp Effect	The laser will slope the sides of an engraving by varying the power level, typically used for rubber stamps, especially if a design has thin regions that need extra support.
Ramp Length	Control how far from the design the slope will extend.
Overstriking	
Scan Mode	Control how the laser carries out engraving.
Interval	Control the spacing between scanlines.

When **Scan Mode** is set to **X_swing**, the laser will sweep the material in a side-to-side pattern, engraving in one direction and again for the return direction. When set to **X_unilateralism**, the laser will engrave in only one direction and travel back to the start of the next line.

We recommend to change the unit of the option **Interval** to **DPI**, a more intuitive way of representing the pixel density of the output, and then set the resolution value there, such as *500*.

Layer Parameter Library

The layer parameter library provides a way to store and organize presets for different operations on different materials, and a way to quickly apply them.

To add a preset to the library, click the button **Parameter library** after finishing setting up parameters to bring up the dialog **Parameter library**.
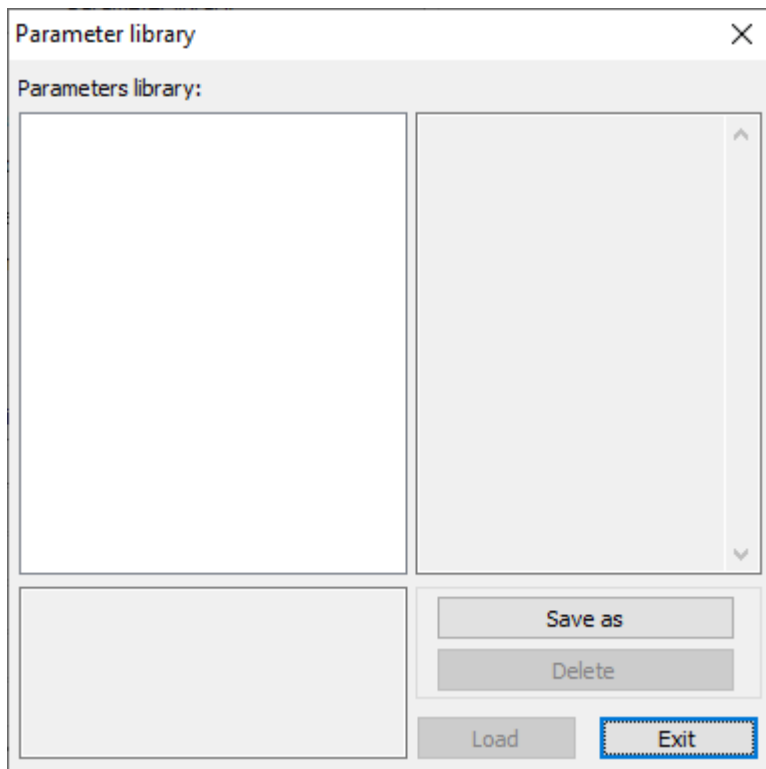
Click **Save as**, fill in a name and a note, click **Ok**. We recommend to name a preset in the format "[Laser Power]-[Material Thickness]-[Material Name]-[Processing Mode]", e.g. "130W-3mm-Acrylic-Cut"
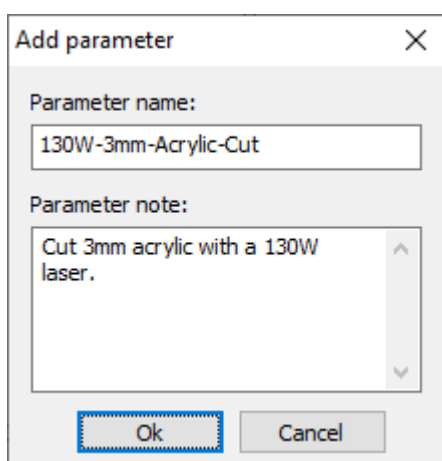
And then you will see the new preset in the list. To load a preset into the current layer, select it and click the button **Load**.
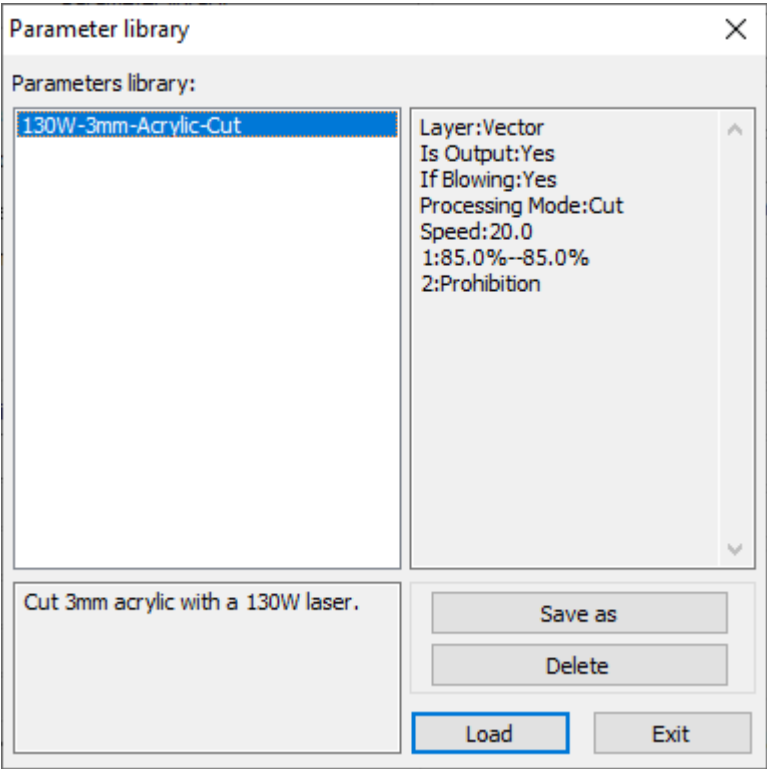
Cutting Technologies

There are a set of technologies for cutting in EagleWorks, help you get better laser results.

Kerf Compensation

Laser kerf is the amount of material that is removed or lost in the cutting process, and, if not compensated for in the design, will result in loose fitting parts.

Kerf width can vary depending on a number of factors, including the material, the thickness of the material, the laser beam width and the power, the assist gas, etc.

Follow the steps below to find the exact kerf of a specific material cut with a specific group of technologies, e.g. 3mm acrylic cut with a 130W CO_2 laser, speed set to *20mm/s* and power set to *85%*, etc.

1. Prepare a sample of the material.
2. Set the cutting parameters.
3. Cut a 30mm x 30mm square.
4. Measure the square with a set of calipers.

The difference between the design and the actual size of the square is the kerf. For example, if the square measures 29.80mm, then the kerf is 0.20mm.

The kerf compensation function offsets the cutting path by exact half the width of the kerf, in order to maintain the integrity of the original part size.

Select the drawing objects, and then select **Offset polygon** in the pulldown-menu **Handle** or click to bring up the dialog **Offset poly**.
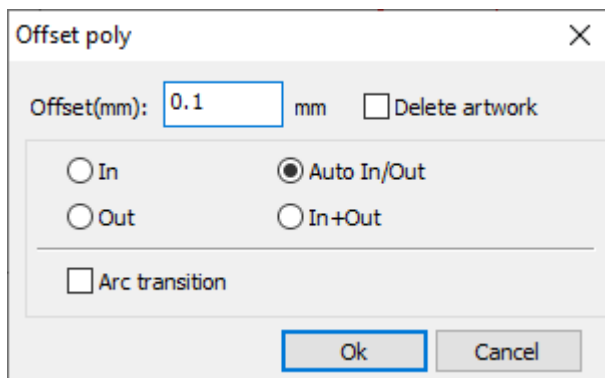
Set **Offset** to exact the half the width of the kerf, choose **Auto In/Out**. Click **Ok**, the software will create new cutting paths, which are the same distance from the original all the way around (we set a large value here to help you easily distinguish the new cutting paths from the original). Outer contours are offset outwards and inner contours are offset inwards.
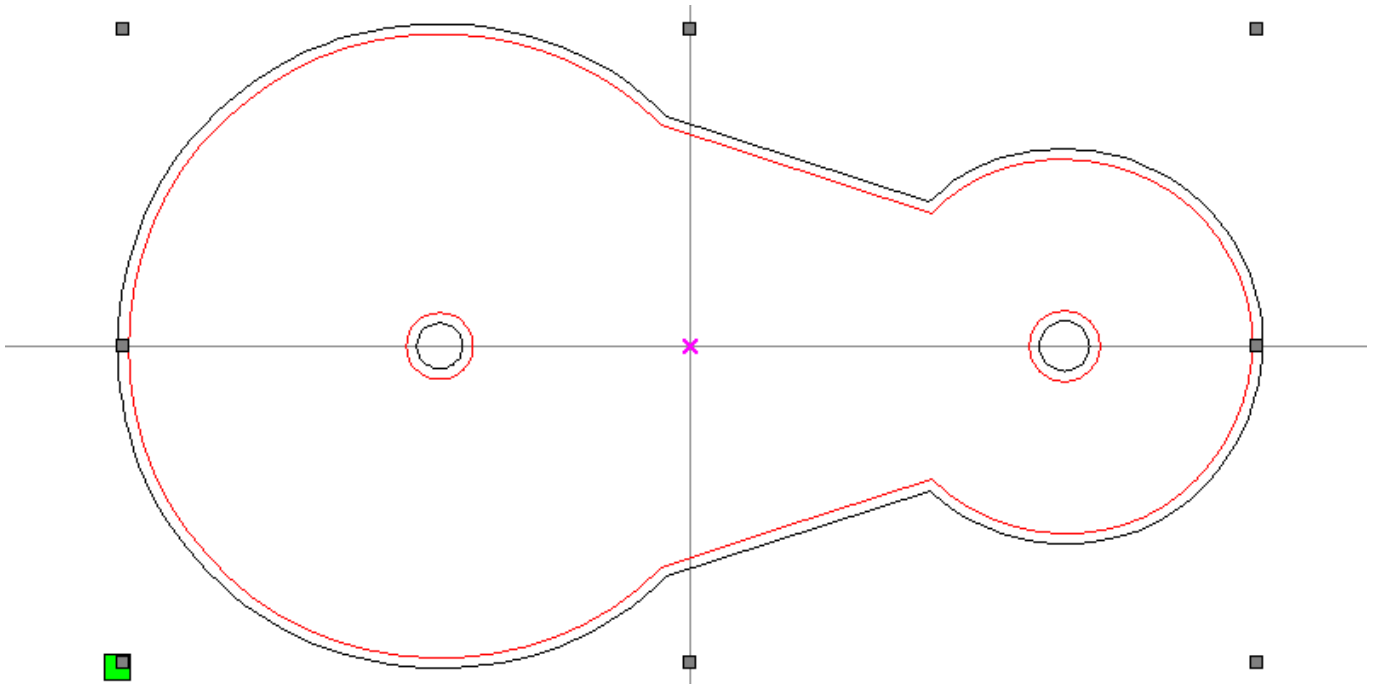
And the software will remove the original contours if the option **Delete artwork** is checked.

Limit the Cutting Speed for Small Circles

Sometimes, you have a design with both long, smooth curves and small circles. To get good cutting quality and efficiency at the same time, you should set a high cutting speed for the whole design but limit the cutting speed for those small circles.

Click **System Setting** in the pulldown-menu **Config**.
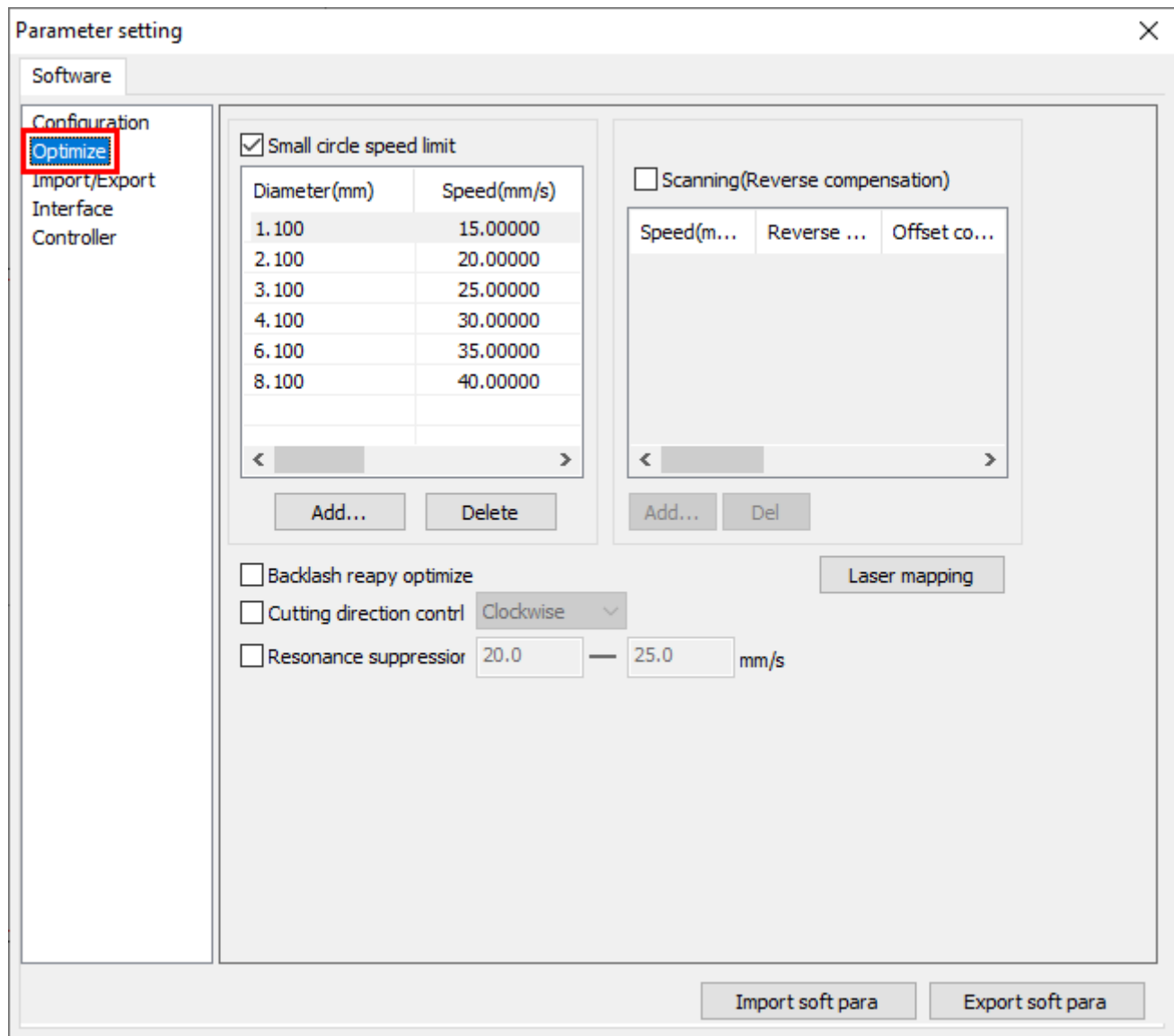
In the page **Optimize**, check the option **Small circle speed limit** to enable a set of cutting speed limits on small circles with different diameters. You can also add your own rules and delete the default settings.

Machine Settings for Cutting

There is a set of machine settings for cutting, which affects all jobs, saved in the laser controller. You can read it from the laser if the machine is connected.

In the tab **User** of **System Work Plat**, click **Read** to read the settings from the laser.

The settings are in the section **Cut parameters** in the page **Processing**.

Parameter	Description
Idle speed	The nominal travel speed. The actual travel speed is often lower than the nominal speed due to the presence of acceleration and deceleration at the beginning and the end.
Idle Acc	The travel acceleration.
Start speed	The startup speed.
Min Acc	The minimum cutting acceleration.
Max Acc	The maximum cutting acceleration.
Idle Delay	The time after the laser head traveling to the start point of the cutting path and before starting cutting.
Acc factor	

Parameter	Description
G0 Acc factor	
Speed factor	
Key setting	A group of presets matching your needs.

Before making changes, make sure to click **Save** to save the current settings in case of errors. If you have a presets file from us, click **Open** to read it and update the current settings. Change the settings only if you know what you are doing. In general, you only need to choose a preset which meet your needs, and the software will adjust the settings in a whole and make a good match.

Preset	Description
Slow cutting	The slowest mode.
Precision cutting	The slower mode.
General cutting	The medium mode.
Speed cutting	The faster mode.
Super speed cutting	The fastest mode.

After changing the settings, make sure to click **Write** to update the settings in the laser.

Engraving Technologies

There are a set of technologies for engraving in EagleWorks, help you get better laser results.

Processing Image

As we talked about in Important Concepts, you should map colors to different densities in order to express them better when laser engraving an image.

Click **Bitmap handle** in the pulldown-menu **Handle** or click BMP to process image in EagleWorks.

If the option **Import image to RDImage** is not checked in the page **Import/Export** of the settings, the dialog **Bitmap handle** pops up. We recommend to use the halftone function to process the image. Check **Dither**, check **Net graphic**, set **Frequency** (number of halftone shading dots to compute per inch), and click **Apply to view** to preview the result, then click **Ok** to confirm.
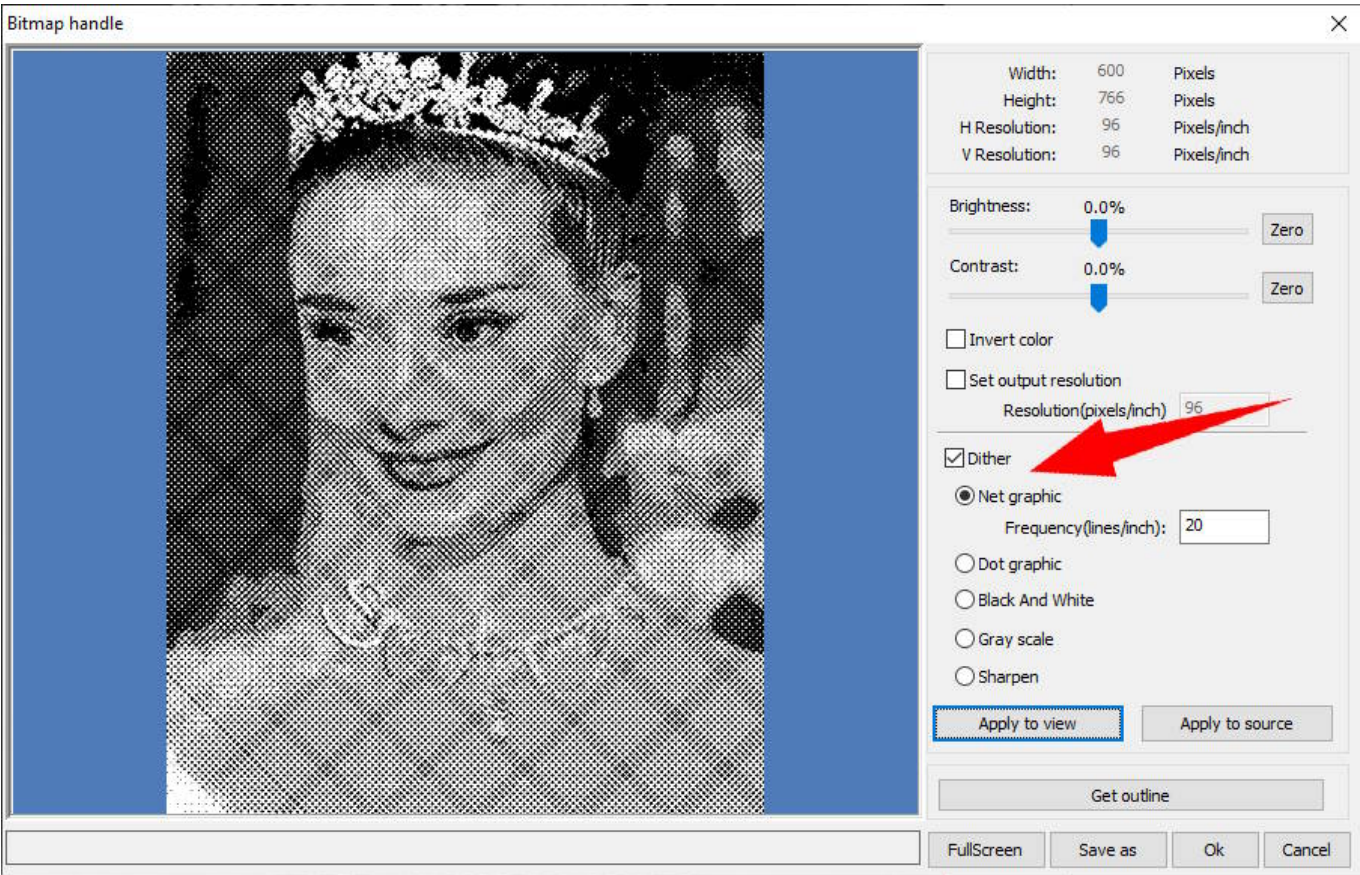
Otherwise, the software starts the tool **RDImage**.
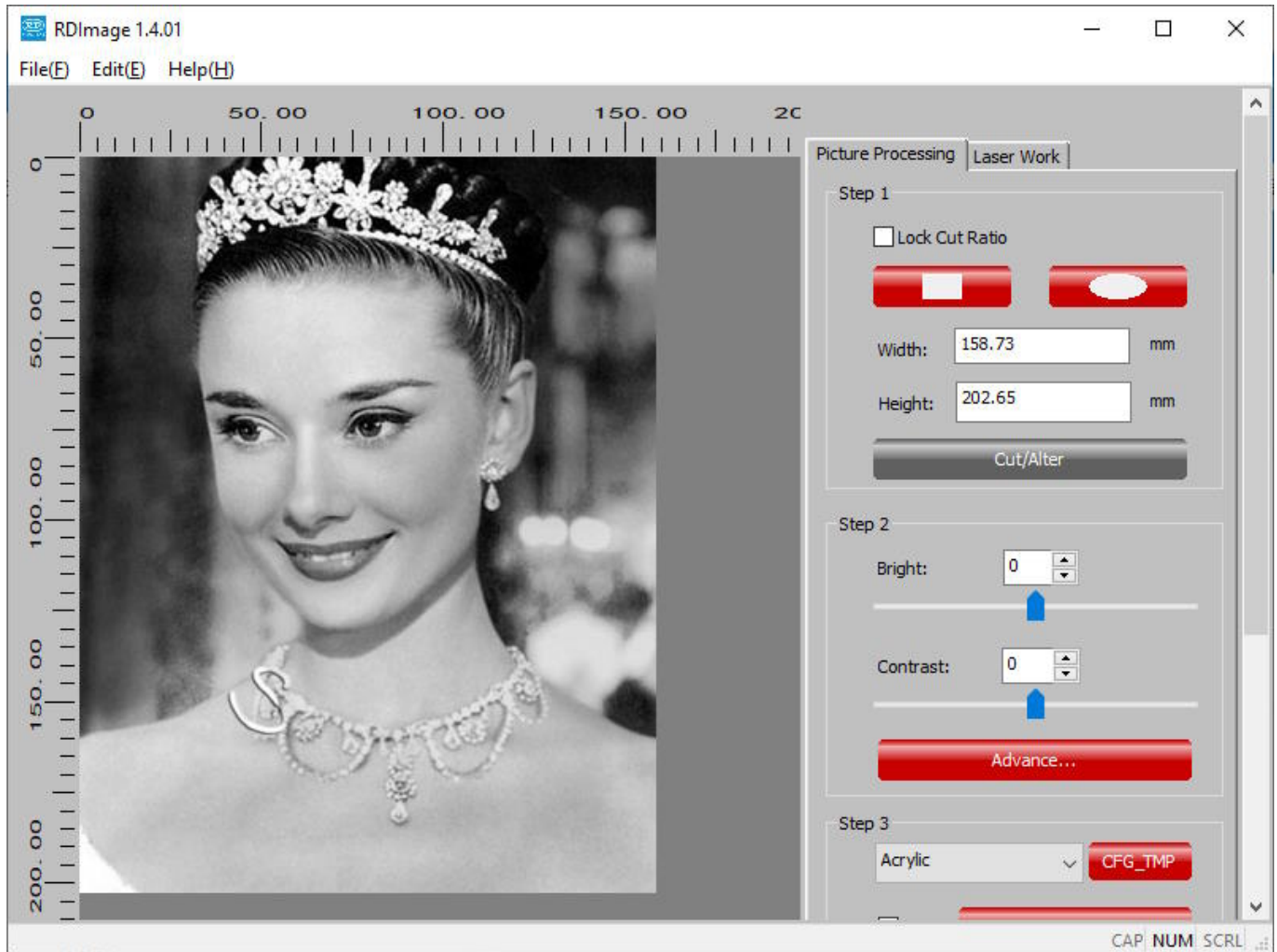
There is an intuitive workflow in the tab **Picture Processing** on the right side, just follow the instructions. You can crop the image in the **Step 1**, adjust brightness and contrast, mirror or flip, or rotate the image in the **Step 2**.
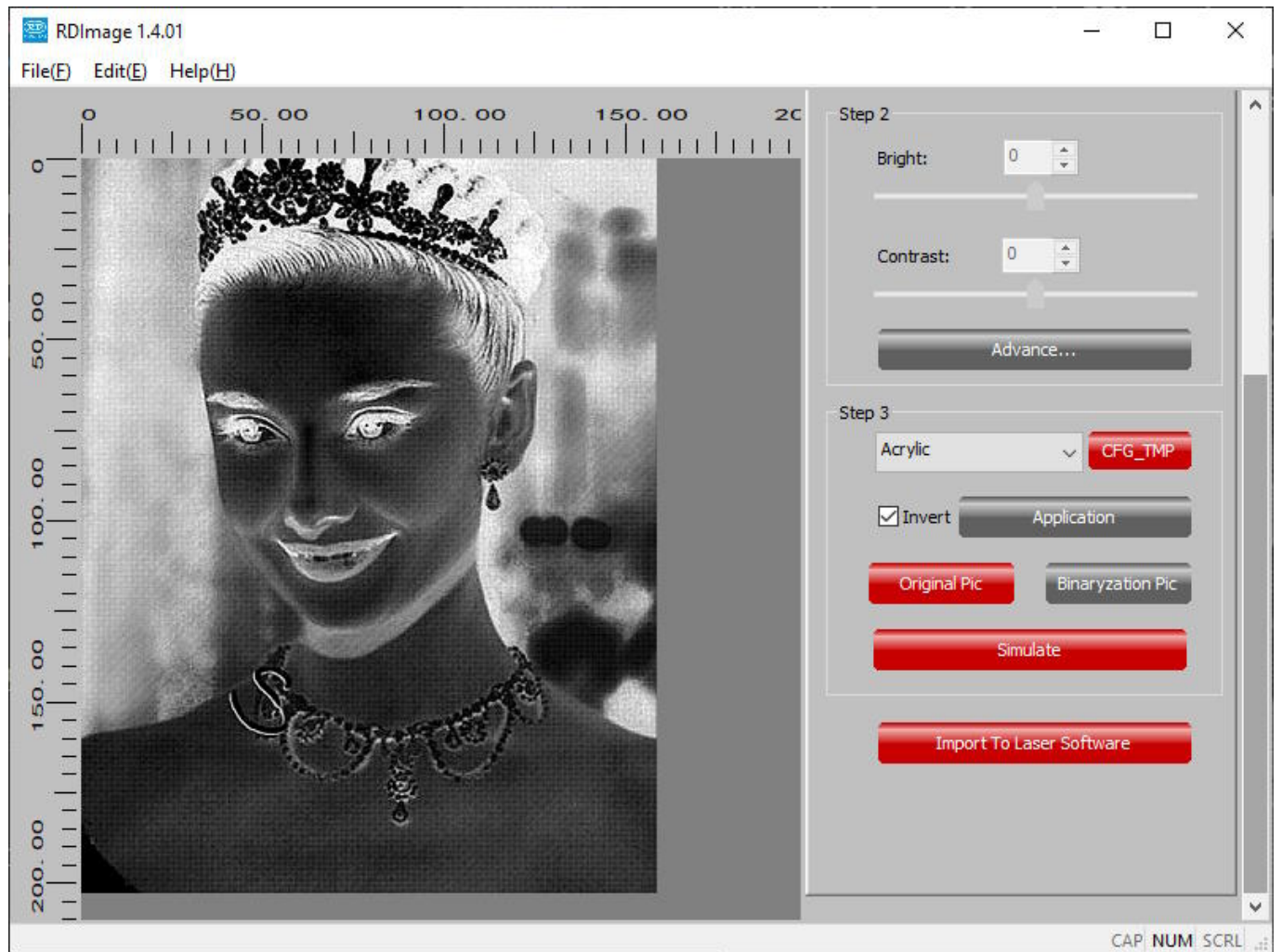
In the **Step 3**, choose the material, check **Invert** to invert the image if necessary, and click **Application** to see the processed image, then click **Simulate** to preview the expected results on the material.
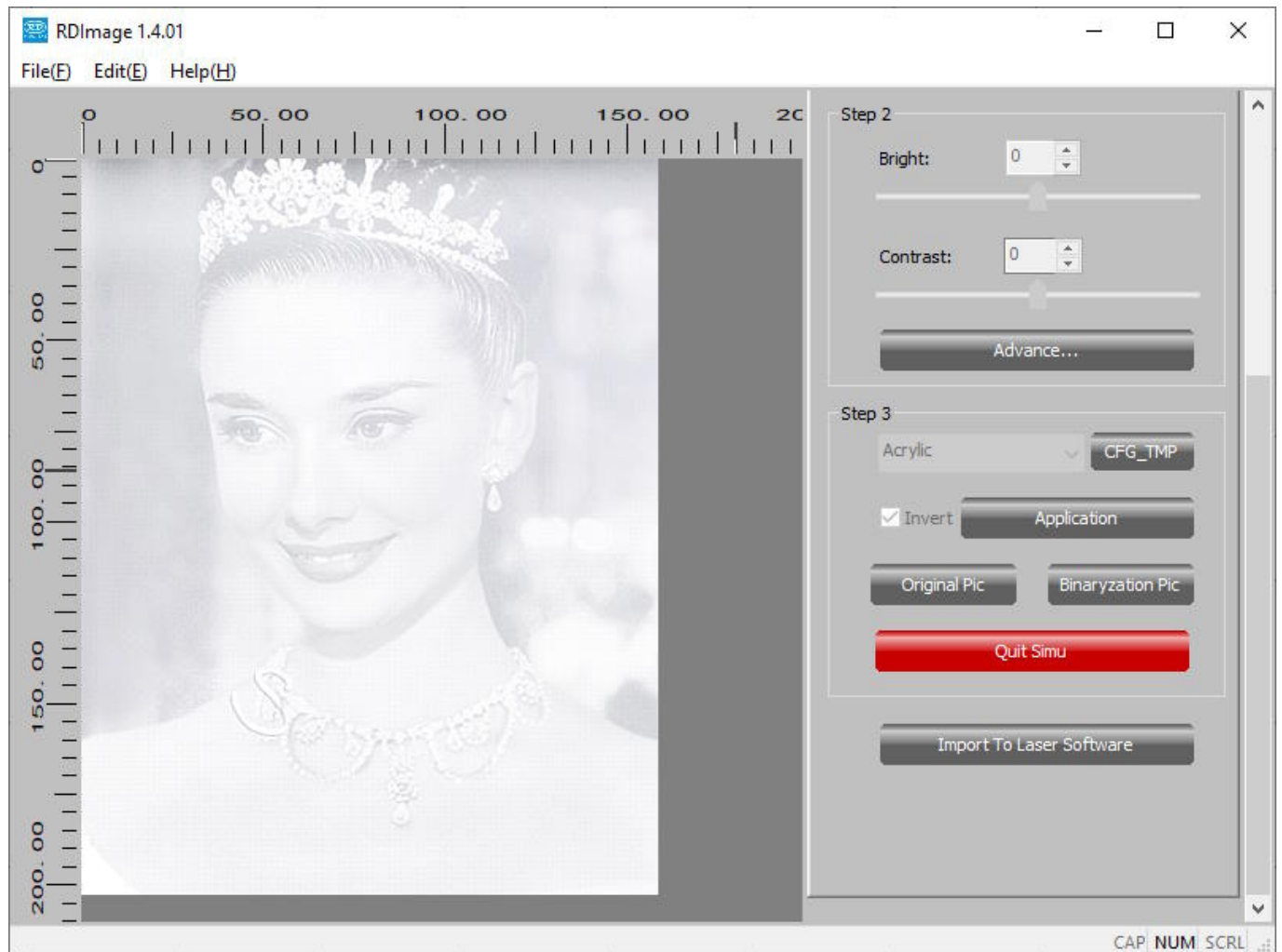
Click **Quit Simu** to quit simulation, click **Import To Laser Software** to confirm if the result is good, otherwise, click **Original Pic** to go back to the original image and adjust the processing, then apply and check again until you get a good result.

Engraving Correction

Laser engraving involves high speed moving of the laser head. In this progress, laser should be triggered simultaneously with the position control. But unfortunately, there must be some timing difference between these two execution subsystems. In a result, each scanline will shift a little with its ideal position, which will be even worse in a dual-direction engraving, and you will see jagged edges, shown as below.
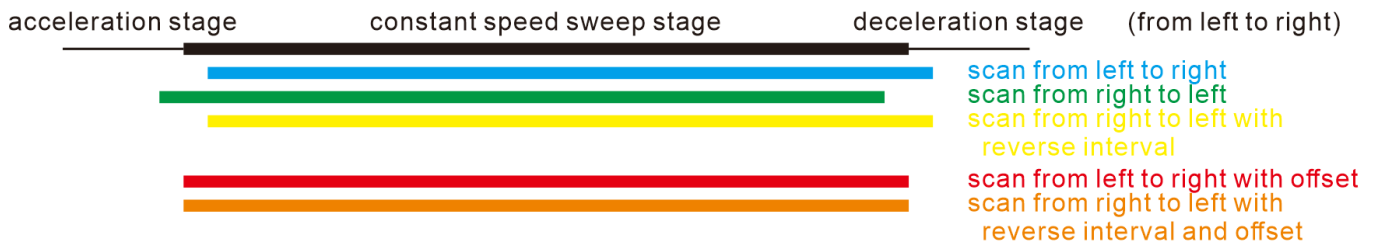
In this figure, the black line represents the ideal position of a scanline, the blue line is the real position of a scanline from left to right, and the green line is the real position of a scanline from right to left. In this example, laser is triggered a little late than the position control of the laser head.

The simple way to solve this issue is to use single-direction engraving by choosing **X_unilateralism** in **Scan Mode** in the job settings, refer here for more details. Every scanline will shift the exact same and align with each other. But in this way, it will take much longer to finish the job compare to dual-direction engraving, because the laser head travels back instead of engraving back.

EagleWorks has a setting to correct offsets in dual-direction engraving to balance quality and efficiency. To use this function, you need to measure the response of your machine at a specific speed.

1. Draw a rectangle in 80mm x 10mm, set it to engraving at the speed of, for example, 400mm/s, and set **Interval** to 0.5mm.
2. Laser the rectangle on a cardboard.
3. Measure the distance between the ends of the scanlines.

Click **System Setting** in the pulldown-menu **Config**.
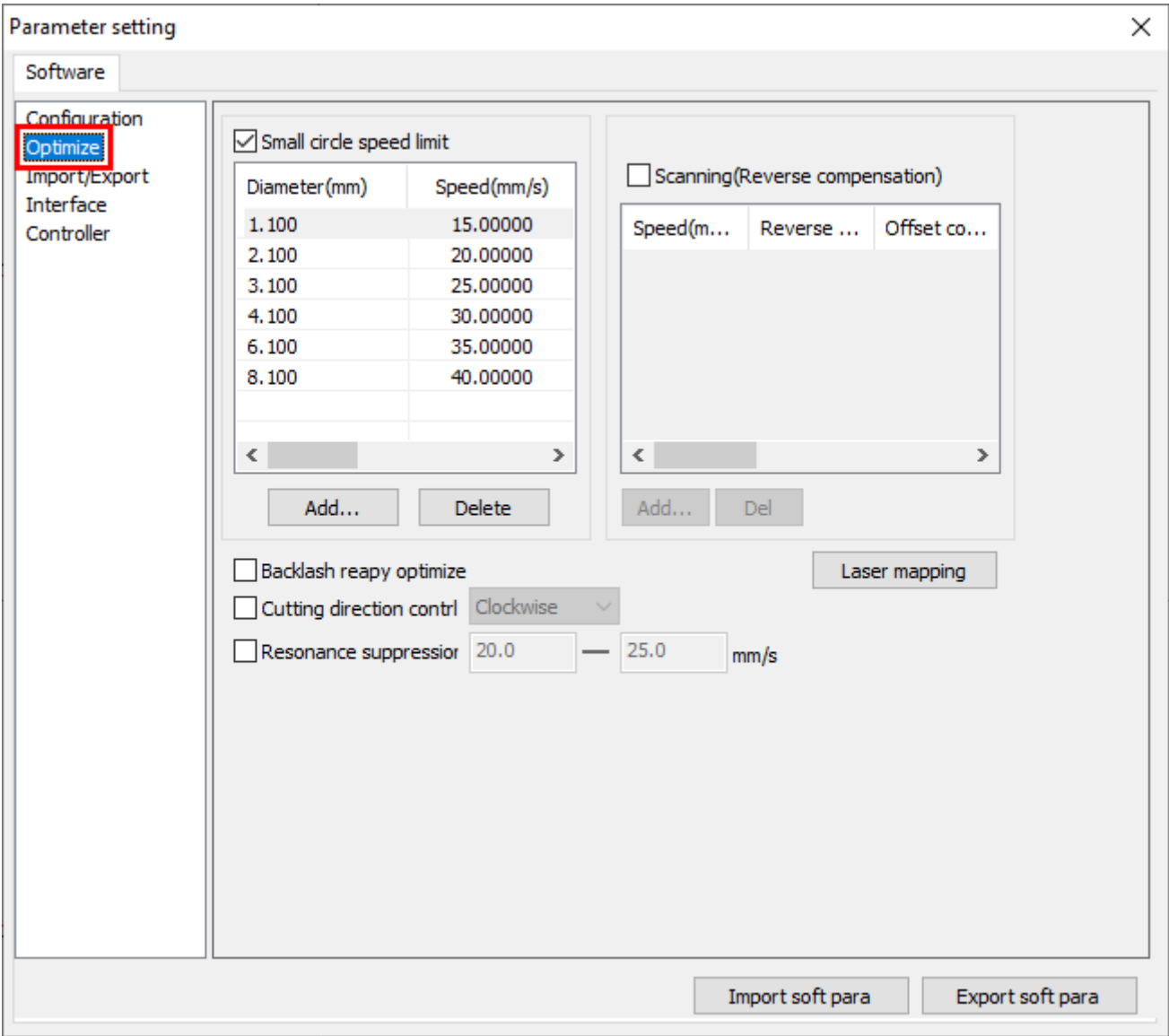
In the page **Optimize**, check the option **Scanning(Reverse compensation)** to enable the engraving correction, and click the button **Add...** to add an entry for a specific speed.
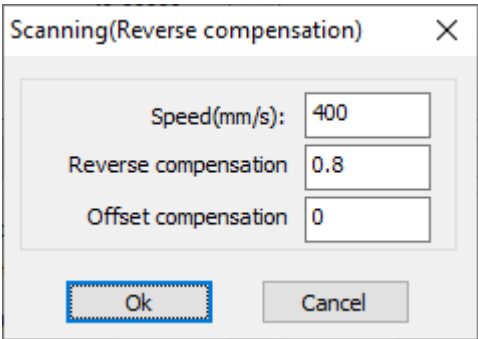
> **NOTE**
>
> The reverse compensation value could be minus, depend on your laser.

Enter the speed and reverse compensation values, click **Ok** to confirm. You may need to do this multiple times, making minor adjustments to get a clean result.

Machine Settings for Engraving

There is a set of machine settings for engraving, which affects all jobs, saved in the laser controller. You can read it from the laser if the machine is connected.
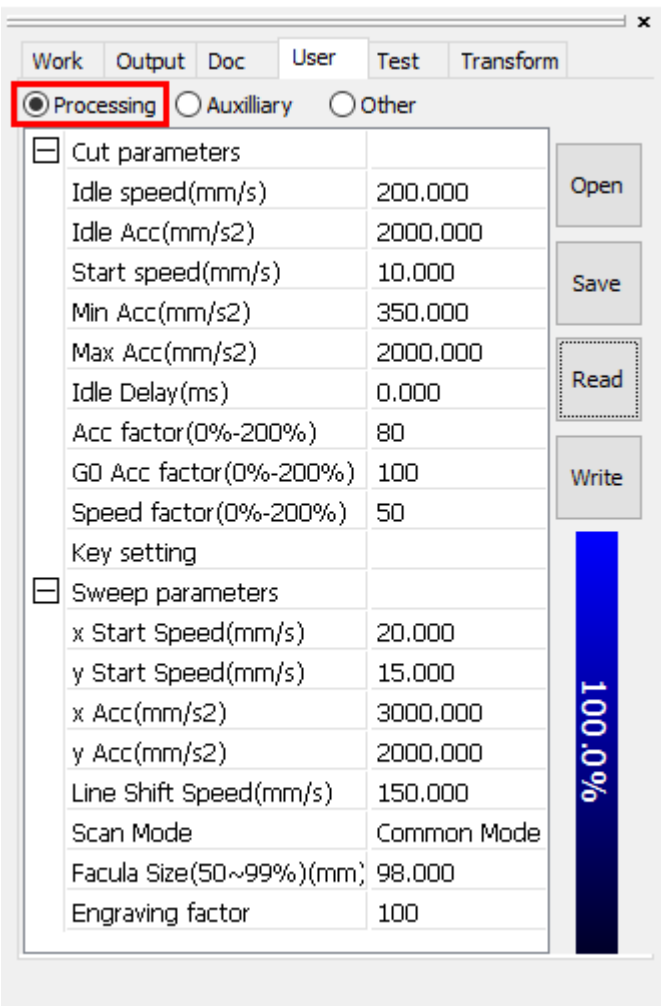
In the tab **User** of **System Work Plat**, click **Read** to read the settings form the laser.

The settings are in the section **Sweep parameters** in the page **Processing**.

Parameter	Description
x Start Speed	The startup speed when engraving along the X-axis.
y Start Speed	The startup speed when engraving along the Y-axis.
x Acc	The acceleration when engraving along the X-axis.
y Acc	The acceleration when engraving along the Y-axis.
Line Shift Speed	The shifting speed to the next scanline.
Scan Mode	
Facula Size	
Engraving factor	

Before making changes, make sure to click **Save** to save the current settings in case of errors. If you have a presets file from us, click **Open** to read it and update the current settings. Change the settings only if you know what you are doing. After changing the settings, make sure to click **Write** to update the settings in the laser.

Processing Sequence

The software will assign an initial processing order to every shape when importing or creating, e.g. *1* for the first, *2* for the second, etc.
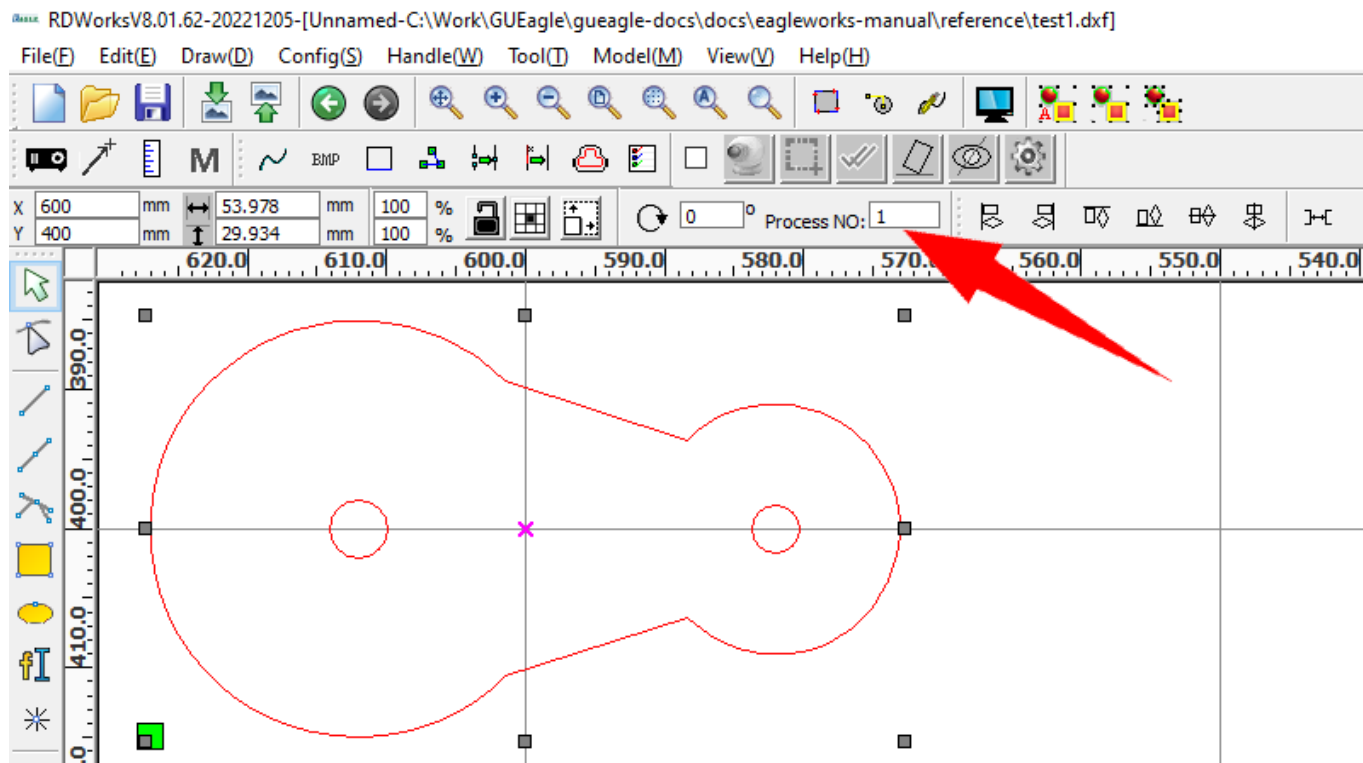
You can let the software process the shapes in that order, or in an optimized one which fits your needs better, e.g. less traveling, more efficient, engraving before cutting, etc.

Click **Cut optimize** in the pulldown-menu **Handle** or click to bring up the dialog **Cutting optimize handle**.
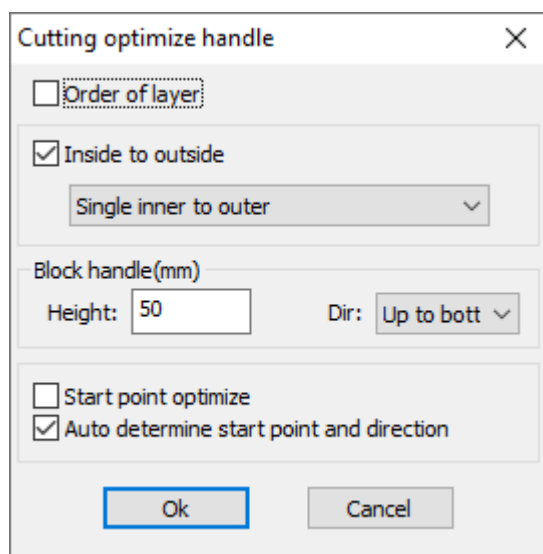
Here you can set the rules for generating the best processing sequence.

Rule	Description
Order of layer	The software will order the shapes in a layer before another.
Inside to outside	The software will order the shapes inside before the ones outside.
Block handle	The software will split the whole draw area into a few narrow strips, and order the shapes in each strip one by one.
Start point optimize	The software will try to find the optimal start point of a shape to achieve less traveling.
Auto determine start point and direction	The software will order shapes in a way with less traveling.

Click **Ok**, the software will do the optimization and give each shape a new processing order. In general, the default settings can do a good job. Check the option **Start point optimize** will slow the whole process a lot if there are a lot of shapes in the design. Check the option **Order of layer** if you want to process the shapes in different layers in a specific order. Click and hold the left mouse button on a layer and drag to arrange it in the layer list, or set the priority value directly.
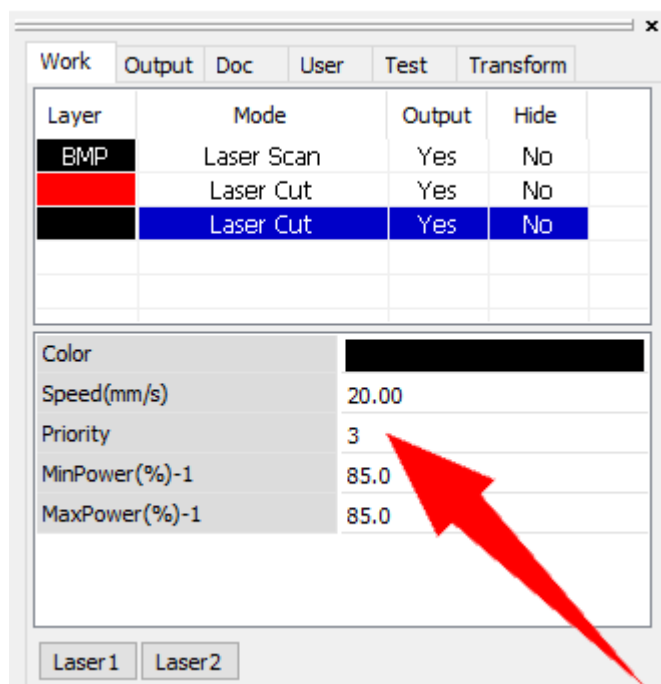
If the option **Path optimize** is checked in **Process Control Bar**, the software will optimize the processing sequence automatically.

If you are not happy with the optimization, you can order shapes manually by yourself.
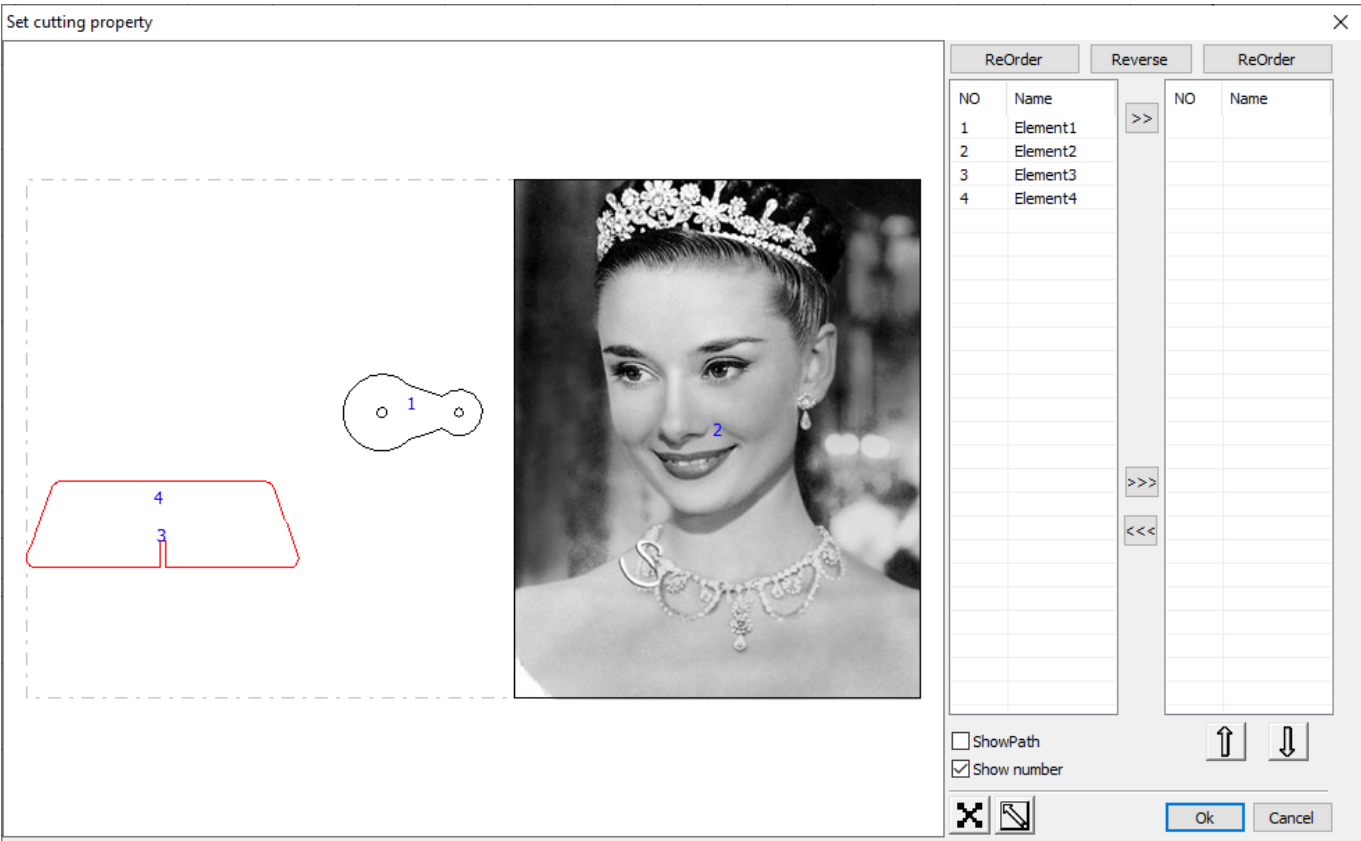
Check the option **Show number** to show up the current processing order on each shape. Select a shape from the initial list on the left, click >> to move it to the result list on the right. You can order the shapes one by one, or click >>> to move all the shapes at a time. Click ⇧ or ⇩ to adjust the order of a shape in the result list.

Click **Ok**, the software will carry out the result. Do not forget to uncheck the option **Path optimize** in **Process Control Bar**, otherwise, the software will do the optimization again and break your result.

Check Technology

You can check the technology settings with a simulation, to preview the path the laser will take and get a rough idea of the final result, while getting an estimated time of how long the program will take.

Click **Preview** in the pulldown-menu **Edit** or click 🖥 to start the tool **Preview**.
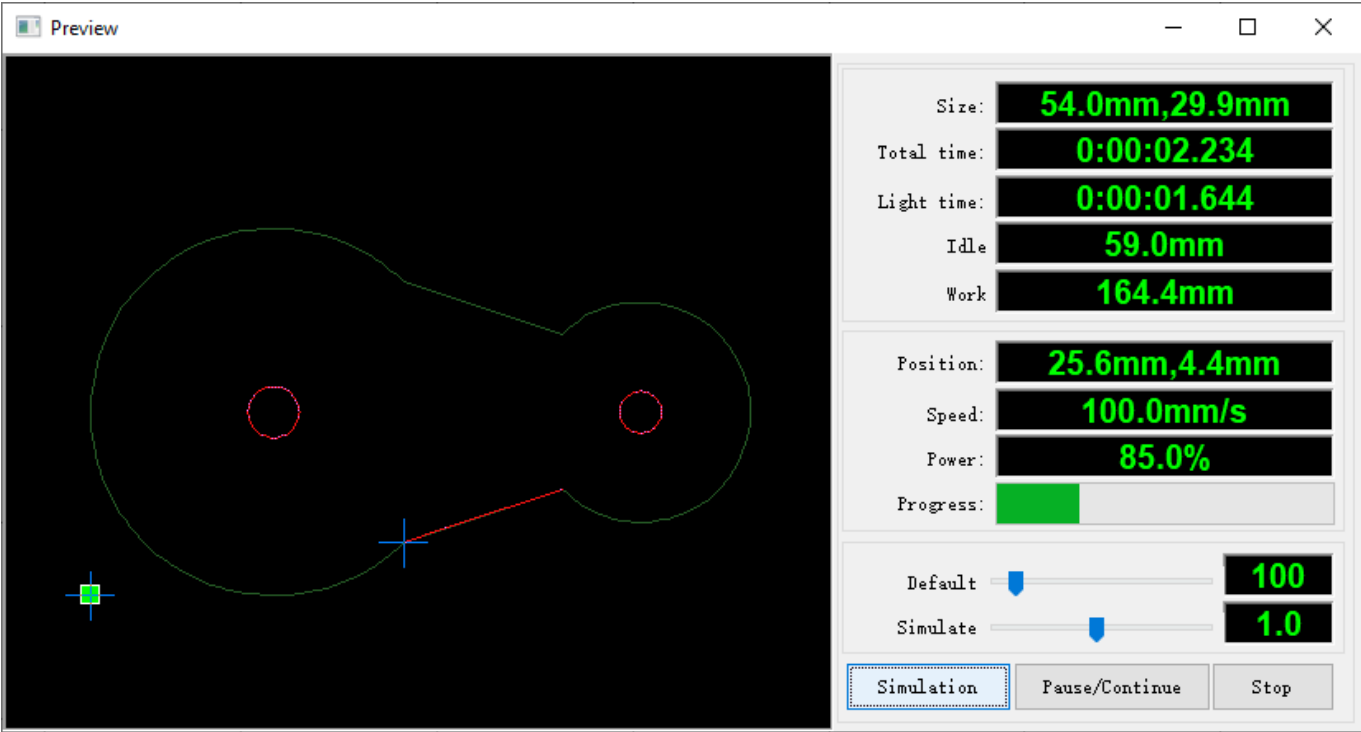
Click **Simulation** to start simulating. You can control the process by clicking **Pause/Continue** or **Stop**, and control the simulation speed by changing the value of **Simulate**. Right click on the simulate area and click **Config** to bring up the settings dialog.
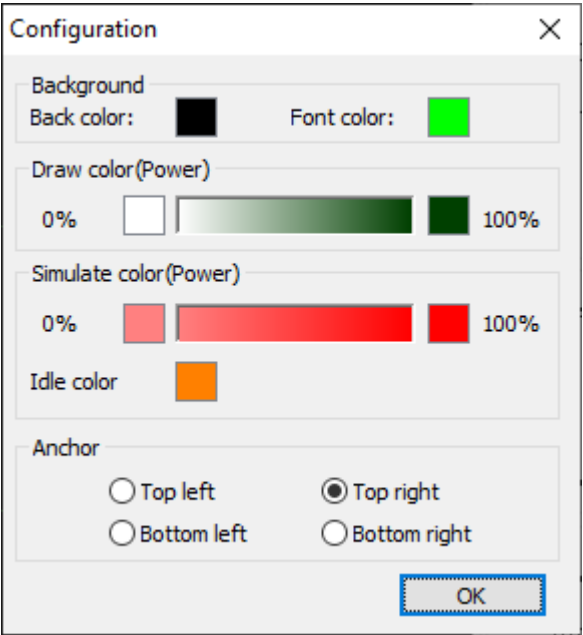
Laser Processing

In this chapter, you will get familiar with the laser panel, learn how to use a rotary, how to manage offline jobs, how to position and jog laser in EagleWorks.

- Laser Panel
- Using A Rotary
- Managing Offline Jobs in EagleWorks
- Positioning and Jogging in EagleWorks
- Auxiliary Machine Settings

Laser Panel

Now you can generate and output data for laser processing. You can control the processing directly in EagleWorks, or send data to the laser as an offline job.

The processing control functions are grouped in **Process Control Bar** on the right side of the software.
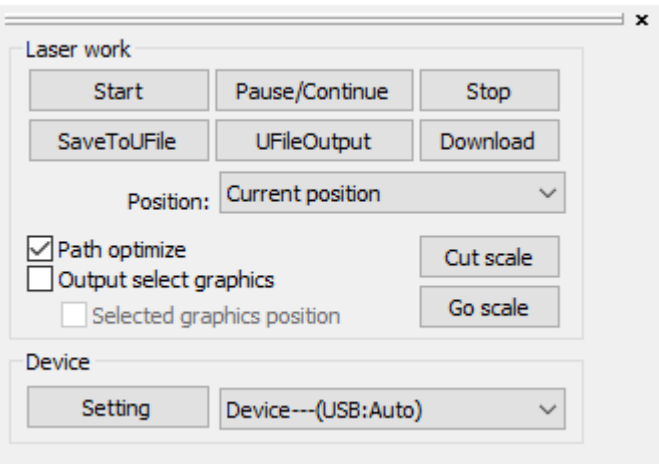
If the option **Path optimize** is checked, the software will optimize the processing sequence automatically before processing, refer to Processing Sequence for more details.

If the option **Output select graphics** is checked, the software will process only the selected shapes or images. And the software will use the job origin of the selection if the option **Selected graphics position** is checked at the same time.

If the laser is connected, click **Start** to start processing, click **Pause/Continue** to pause and click again to continue, click **Stop** to stop processing. In this case, the job will be placed within the work area of the machine according to the option **Position**, refer to Coordinates and job origin for more details.

Position	Description
Current position	Align the job origin to the current position of the laser head.
Anchor point	Align the job origin to the programmed origin.
Machine zero	Align the job origin to the machine origin.
Absolute coordinate	Place the job to the corresponding position in the work area as in EagleWorks.

Click **Go scale** if you want to frame the job before processing. Click **Cut scale** if you want to cut the job down around the frame after processing.

Click **Download** to send data to the laser as an offline job, and then control the processing from the panel.

If the laser is not connected, click **SaveToUFile** to save data into a file, and you can send it to the laser by a USB flash, then read it and control the processing from the panel.

Using A Rotary

To generate and output data for rotary processing, you have to enable and set up rotary first. For the instructions on the machine side, refer to the laser's manual for more information.

In the tab **User** of **System Work Plat**, click **Read** to read settings from the laser machine.
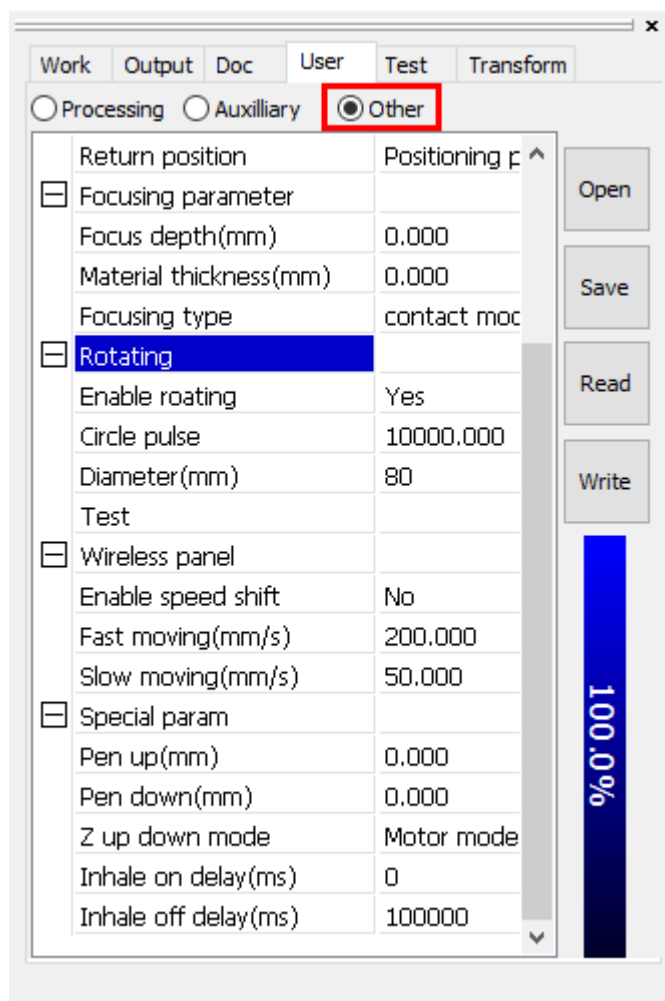
In the section **Rotating** of the page **Other**, set **Enable rotating** to **Yes**, set **Circle pulse** to *10000* (*51200* or *25600* if you have an old model), and set **Diameter** according to the current workpiece. Click **Write** to update settings in the machine.

If it is the first time you work with a rotary, click **Test** to do a whole round test to check whether the **Circle pulse** is correct.

Now, the software is ready for rotary processing. Just follow the workflow of the normal processing and the software will take care of the rest.

Managing Offline Jobs in EagleWorks

If the laser is connected, you can manage offline jobs in EagleWorks.

In the tab **Doc** of **System Work Plat**, click **Read** to read jobs from the laser.

You can get a brief information of each job in the list and a summary of all at the bottom. Click **Process** to start, click **Delete** to delete, click **Cal time** to get the processing time of the selected job. Click **Delete All** to delete all the jobs.

Positioning and Jogging in EagleWorks

If the laser is connected, you can position or jog the laser in EagleWorks.

In the tab **Test** of **System Work Plat**, click **Current Position** to get the current position of the laser head.

If you want to move the laser head to a specific position, set the coordinates of the new position and then click **Moving head**.

You can jog the laser by clicking **X+**, **X-**, **Y+** or **Y-**, the laser head will move the step in the speed you set, and move continuously if the option **Continuous moving** is checked.

Auxiliary Machine Settings

There are some auxiliary machine settings you can set for the laser.

Work	Output	Doc	User	Test	Transform	×

○ Processing ● Auxilliary ○ Other

Feeding para		
Delay before feed(s)	0.000	
Dealy after feed(ms)	0	
Progressive feeding	No	
Progressive feeding compe	0.000	
Last feeding	Yes	
Home para		
Home speed(mm/s)	80.000	
Auto home X	Yes	
Auto home Y	Yes	
Auto home z	No	
Auto home U	No	
Go Scale para		
Go scale mode	Close laser	
Go scale blank(mm)	0.000	

Open Save Read Write

100.0%

Work	Output	Doc	User	Test	Transform	×

○ Processing ○ Auxilliary ● Other

Other		
Array processing	Bi-dir Array	
Backlash X(mm)	0.000	
Backlash Y(mm)	0.000	
Blow type	Laser on blo	
Return parameter		
Return position	Positioning p	
Focusing parameter		
Focus depth(mm)	0.000	
Material thickness(mm)	0.000	
Focusing type	contact mod	
Rotating		
Enable roating	No	
Circle pulse	10000.000	
Diameter(mm)	100.000	
Test		
Wireless panel		
Enable speed shift	No	
Fast moving(mm/s)	200.000	
Slow moving(mm/s)	50.000	

Open Save Read Write

100.0%