

Work Example — Engraving (RDWorks V8)

RSD-SUNMAX Series
SUNMAX LASER

About this document: This is an English translation of the Japanese original prepared by SUNMAX LASER for reference purposes. In case of any discrepancy, the Japanese original shall prevail. Specifications are subject to change without notice.

Work Example — Engraving (RDWorks V8)

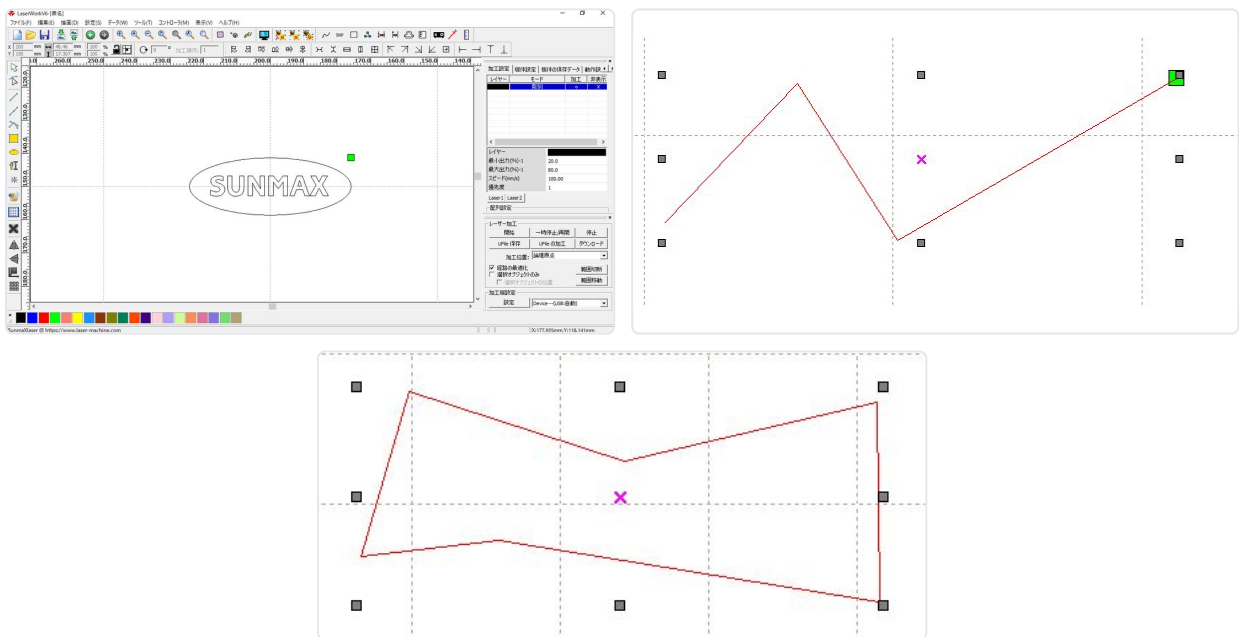
- This document assumes that the laser machine has been set up correctly.
- This document assumes that the honeycomb table is installed.
- This document assumes that RDWorks V8, the control software for the RSD-SUNMAX series, has been installed correctly.

1. Creating the Engraving Design in RDWorks V8

Create your engraving design using the tools available in the "Draw" menu or on the toolbar.

When creating data, always make sure that every path is closed.

— Path not closed (bad example) — — Path closed (good example) —

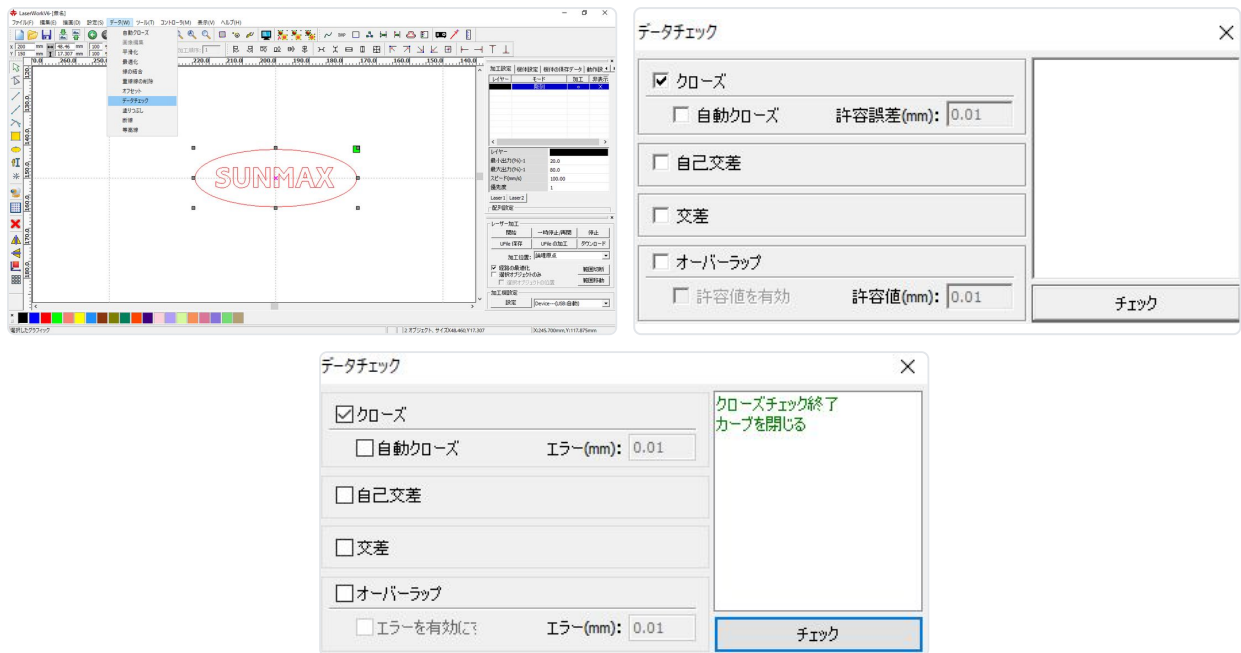


RDWorks V8 can check the integrity of your data. On the menu, click "Tools" > "Data Check".

Note: Before running a data check, you must first select the data you want to check.

When engraving, check only the "Close" option.

Click the "Start" button to begin the data check. If "Result: 0" is displayed, the data has no problems.



If the following message appears, the data needs to be corrected: a result of "Result: XX" with a value of 1 or higher indicates that the data contains unclosed paths.

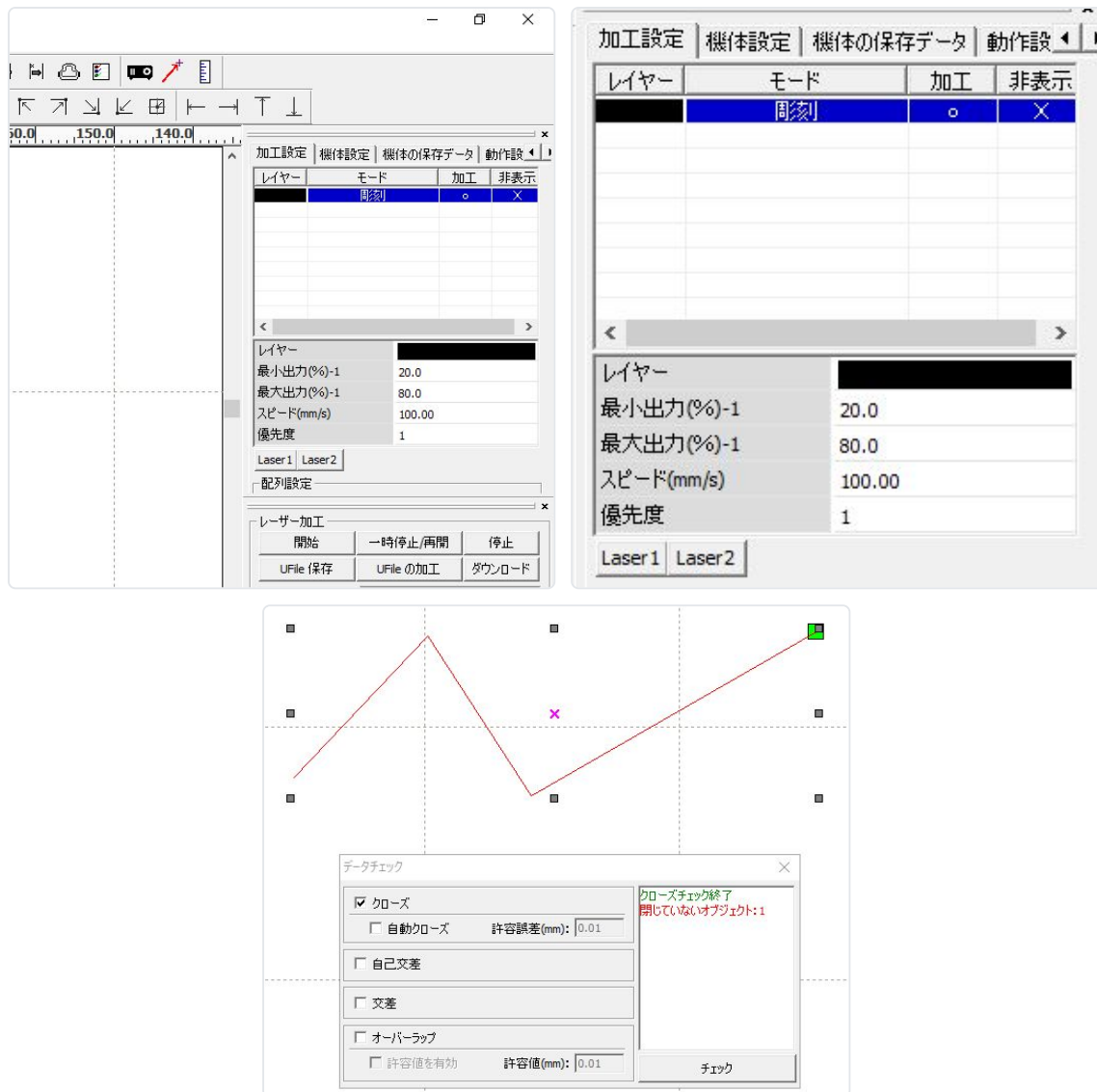
2. Processing Settings

Double-click the layer to open the layer dialog.

Note: The "Mode" column shows "Cut" in the figure below, but a different mode name may be displayed depending on the current state of RDWorks V8.

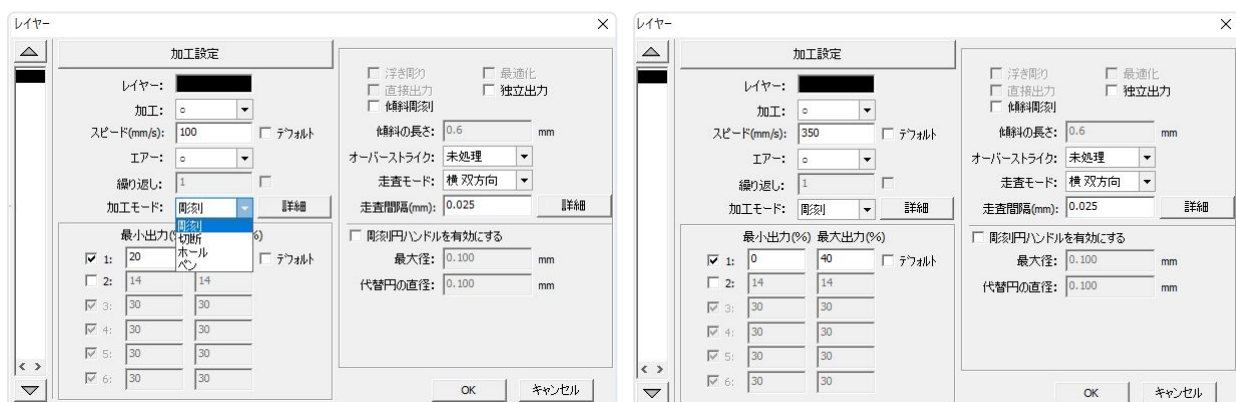
Note: The settings for each mode are remembered, so the values you set last will appear as the defaults the next time you create a job.

Double-click here



The layer dialog appears. Select "Scan" (engraving) as the processing mode.

You can configure the processing details in the layer dialog. The values shown here are for wood approximately 2 mm thick.



Speed: Sets the processing speed. The unit is [mm/s]. For engraving, set the processing speed in mm/s. The appropriate value varies with the job content, the material, the processing mode, and so on. For engraving, values up to about 600 are typical. Increasing the value makes the laser head move faster and shortens the processing time, but the engraving becomes shallower.

Max Power: Sets the maximum laser output. The unit is [%], and the setting range is 0–100. Decimal values can also be entered. Increasing the value makes the laser output stronger and the engraving deeper. To limit the load on the laser tube, the setting is generally kept to about 90 [%] at most.

Interval: Specifies the scan interval for engraving. The unit is [mm]. The minimum value is 0.025 [mm], and settings are normally made in increments of 0.025. In general, smaller values improve the mechanical processing precision, but depending on the material and the data, making the interval too fine serves no purpose. Larger values shorten the processing time. If you want to speed up production even at the cost of a coarser finish, increasing this value will shorten the production time. For example, if a job engraved at 0.05 is changed to 0.1 and engraved again, the production time is cut in half.

Scan Mode: Select horizontal bidirectional. The laser fires on both directions of the scan. If bidirectional is not selected, the laser fires in one direction only. Horizontal unidirectional scanning can sometimes give better processing quality, but the processing time doubles.

Air: Not supported on the RSD-SUNMAX series.

Advanced: Not normally used. For details of this function, refer to the separate RDWorks V8 User Manual.

3. How to Determine the Setting Values

The engraving settings must be adjusted according to the material, the desired depth, and the required quality. No single set of values works uniformly for every material. For example, even when engraved with identical settings, cedar and ebony produce completely different engraving depths because of the difference in the hardness of the wood. Rubber and glass also engrave to different depths depending on their composition. Furthermore, for materials that melt (i.e., that are melted by the laser and then solidify as they cool), such as resin, the finish varies depending on the balance between engraving speed, maximum power, and scan interval. Fundamentally, you need to engrave repeatedly while changing the conditions and observing the finish until you find settings that meet the required quality.

An efficient way to determine the settings is as follows.

Easily combustible materials include wood, rubber, paper, leather, resin, and fabric.

Materials that do not burn easily include stone, glass, ceramic, and metal.

For easily combustible materials, start with a fast engraving speed and low maximum power, then gradually raise the maximum power and afterwards lower the engraving speed, checking the finish as you go. This is an efficient way to arrive at the right settings.

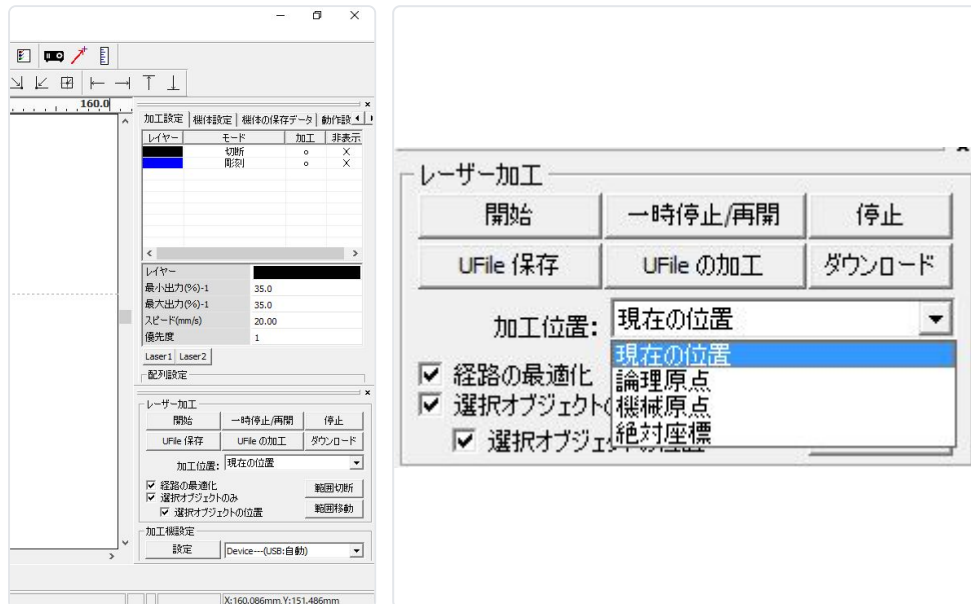
For materials that do not burn easily, start with a slow engraving speed and high maximum power, then gradually raise the engraving speed and afterwards reduce the maximum power, checking the finish as you go.

4. About the Origin

Before starting a job, you need to confirm and set the processing start position.

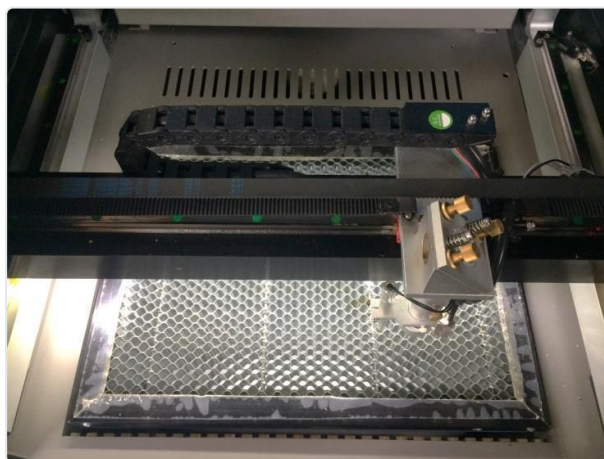
When you start a job from the control panel, the logical origin is always the processing start position. Refer to "Machine Control Panel" > "About the Logical Origin" in the separate RDWorks V8 User Manual.

When you start a job from RDWorks V8, you can choose from four origin types depending on the setting.



4.1 Current Position

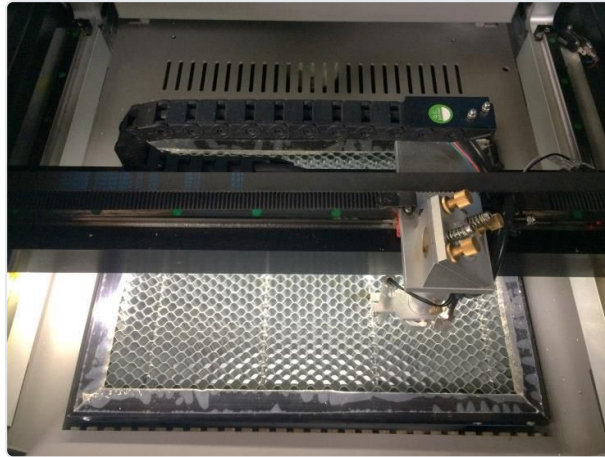
When "Current position" is selected, clicking the "Start" button in RDWorks V8 runs the job using the current position of the laser head as the data origin.



Processing origin

4.2 Logical Origin

When "Logical origin" is selected, clicking the "Start" button in RDWorks V8 runs the job using, as the data origin, the logical origin position that was set with the "Origin" button on the laser machine.

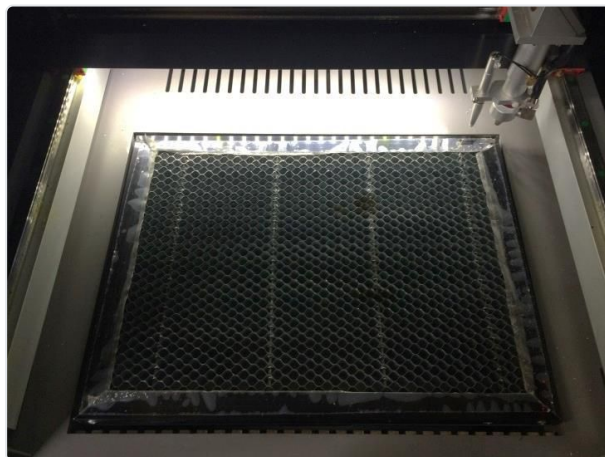


Press the "Origin" button on the machine control panel. Even if the laser head is then moved, when processing starts the laser head moves back to the logical origin and begins the job.

4.3 Machine Origin

When "Machine origin" is selected, clicking the "Start" button in RDWorks V8 runs the job using the machine origin position (rear right — the position the machine homes to when the laser machine starts up) as the data origin.

When processing from the machine origin, only cutting is possible.



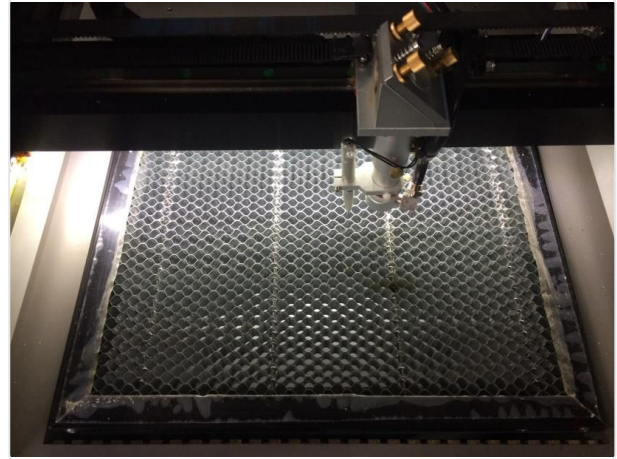
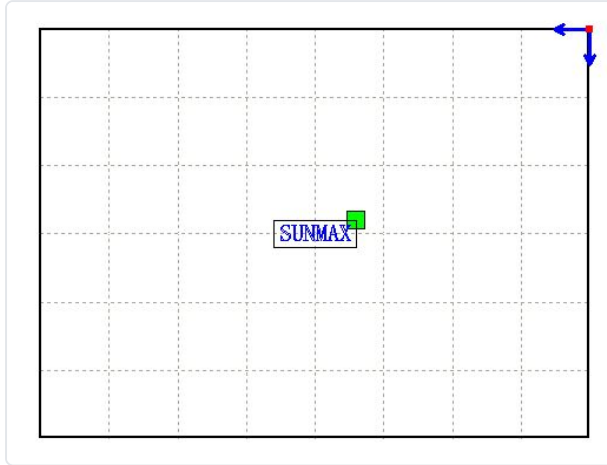
When processing starts, the laser head moves to the machine origin and begins the job.

When processing starts, the laser head moves to the same coordinates as on the RDWorks V8 design screen and begins the job.

Place the objects in RDWorks V8.

4.4 Absolute Origin

When "Absolute Origin" is checked, the logical origin set with the "Origin" button on the control panel and the processing-position settings used when running a job from RDWorks V8 are disabled; the job is processed at the position shown on the RDWorks V8 design screen.



8. Downloading the Data

Once the processing settings and the processing position have been set, send the job data to the laser machine.

When you download the data and run the job from it, processing is started from the control panel, so the processing start position is always the logical origin position.

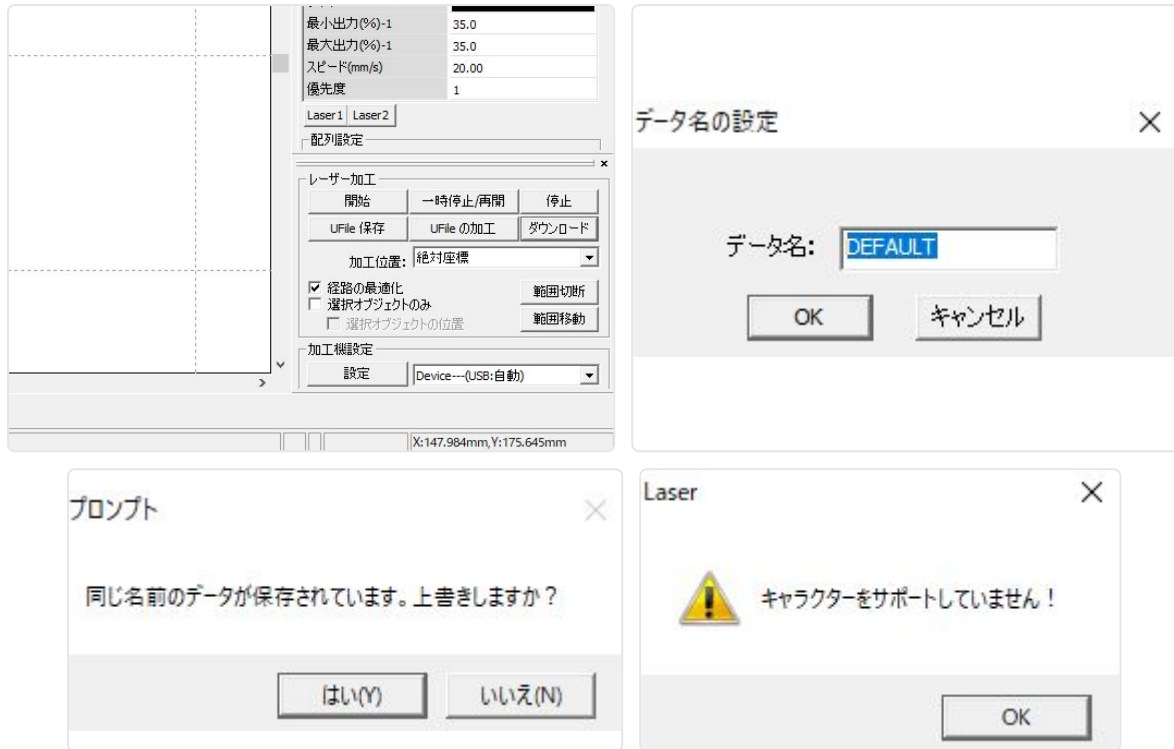
* If you start the job from "Start" in the machine control pane of RDWorks V8, the data is not downloaded.

Click "Download" under Laser Work at the lower right of the screen.

When you click the Download button, a dialog for setting the data name appears. Enter any name you like.

* If a file with the same name already exists on the laser machine, a dialog asking whether to overwrite it is displayed.

* Only single-byte alphanumeric characters can be used. Entering Japanese characters causes an error to be displayed.



Starting the Download

Clicking the button starts the data download.

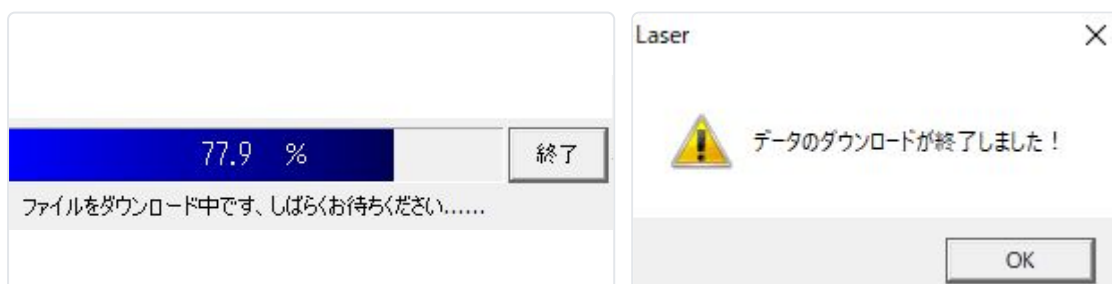
The download is finished when the download progress bar reaches 100%.

* If you have created a large data file, this step may take some time.

Download Complete

When the progress bar reaches 100%, a download-complete dialog is displayed.

Click the OK button.



6. Processing

The job data is now stored on the laser machine, so you can run the job. Start processing by following the steps below.

6.1 Installing the Table

The RSD-SUNMAX series lets you use three types of work tables.

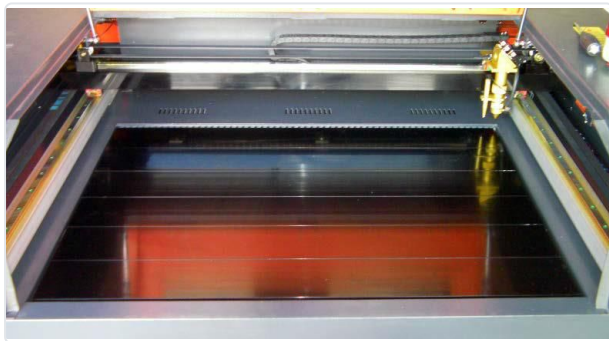
Engraving Table

With the engraving table, no attachment is used; the material is placed directly on the lift table of the laser machine for processing.

- As a rule, use it only for engraving; do not use it for cutting. When cutting, the laser beam must pass through the bottom face of the material, but because the engraving table is a flat plate, the beam cannot pass through it. It is therefore used for engraving.
- Cutting on the engraving table becomes possible if you place spacers under the material to create a gap between the table and the material. In general, a gap of about 2 to 5 mm is required between the table and the material.
- The engraving table is well suited to holding and processing thick materials.

Honeycomb Table

The honeycomb table is used by placing it on the lift table. Both engraving and cutting are possible. In addition, by connecting an exhaust blower to the honeycomb table box, the material is held by suction from underneath, so even light materials such as cloth and paper can be fixed in place.



Cutting Table

In addition to the honeycomb table, the RSD-SUNMAX series comes with a cutting table.

By installing the supplied cutting-table parts on the table, you obtain a cutting table that causes less scorching and melting on the back of the material from laser reflection than the honeycomb table does. When the cutting table is installed, autofocus cannot be used. Focusing is adjusted with the cylinder on the laser head.

In this example, we will use the honeycomb table for processing.

For how to install and remove each table, refer to the machine's instruction manual.

6.2 Focusing

The distance to the laser head differs for each workpiece.

You can set the focus either with autofocus, or manually by adjusting the height using the focus gauge.

Caution: Always perform focusing whenever the height of the workpiece changes.

Caution: When using the cutting table, autofocus cannot be used. Set the focus manually.



Using Autofocus

With autofocus, a sensor mounted on the machine automatically adjusts the focal distance.

<Adjustment procedure>

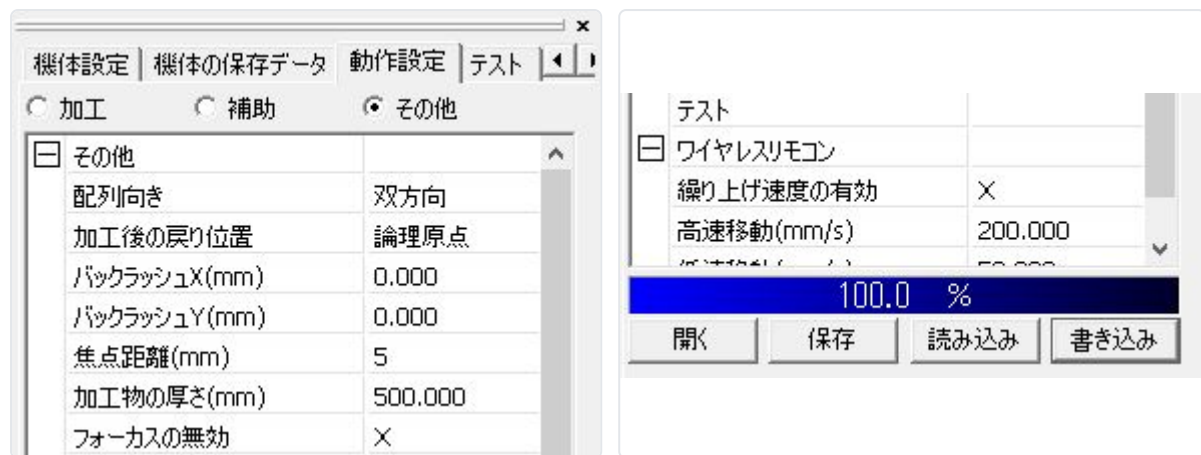
The autofocus focal distance is set by entering a value in RDWorks V8 under "Operation settings" → "Other" → "Focus distance"; this value determines the return distance for autofocus. Adjust the value using the focus gauge so that the head ends up at the proper position.

After entering the setting value, write the data to the machine.

Press the "Z/U" button on the machine's control panel to display the option screen.

-Control panel-

Press



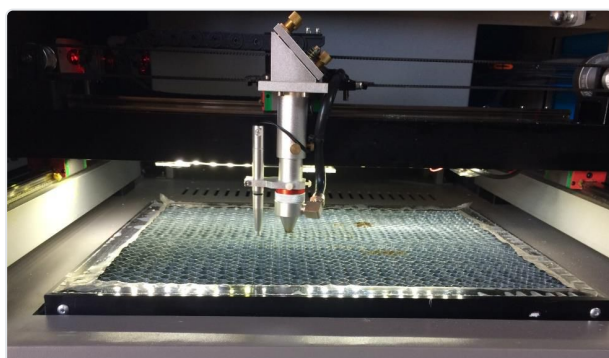
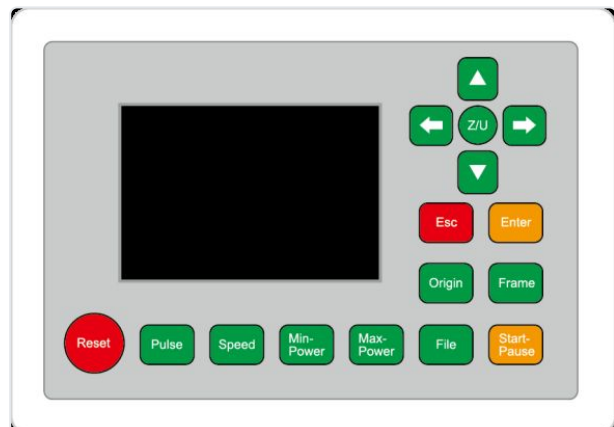
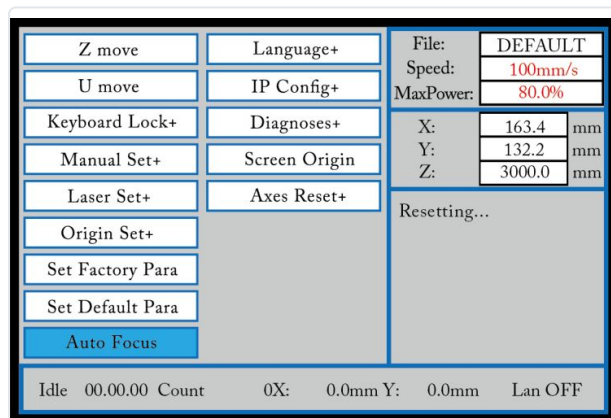
Select "Auto Focus" with the arrow keys and press "Enter".

-Control panel screen-

The lift table rises until it touches the autofocus switch, and the focus is then set automatically to the focal-distance value you configured.

(1) Select

(2) Press



Manual Focusing (Focus Gauge)

In the manual method, you operate the lift table by hand and set the focus using the focus gauge.

This allows you to set the focus more accurately than with autofocus.

-Focus gauge-

<Adjustment procedure>

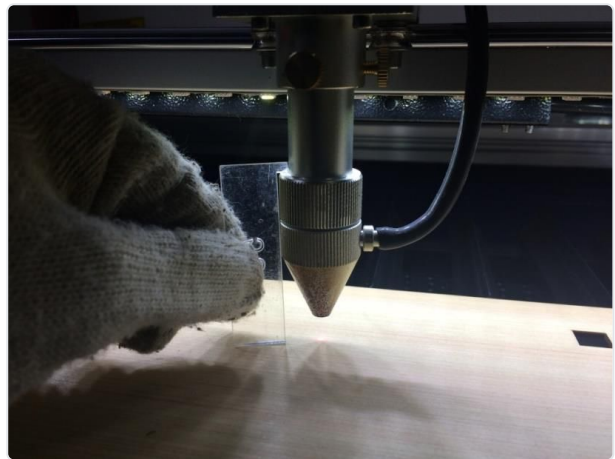
Insert the focus gauge between the laser head and the workpiece.

Press the "Z/U" button on the control panel to display the option screen.

-Control panel-

Insert the focus gauge

Press



With "Z move" selected, press the left/right arrow keys on the control panel to move the lift table up and down.

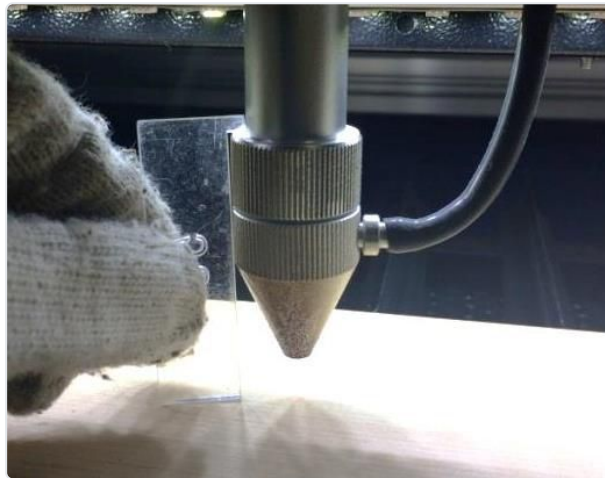
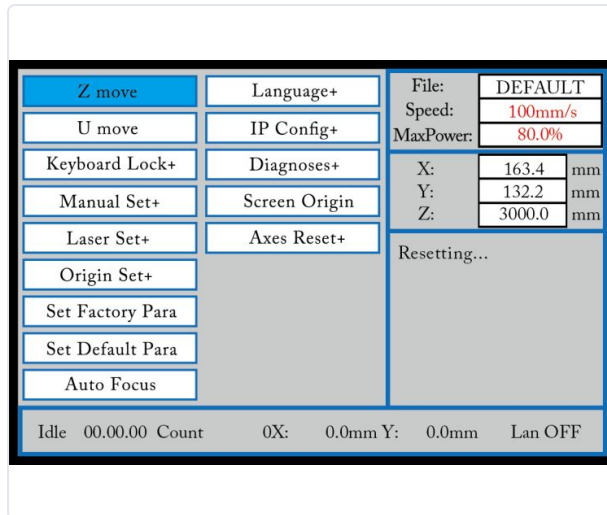
-Control panel screen-

Adjust the table until the focus gauge just barely rubs against the workpiece.

Up

Down

Until the gauge just barely rubs



When Using the Cutting Table

When the cutting table is used, the lift table cannot be raised or lowered. The focus must be set manually (this differs from the normal manual adjustment method).

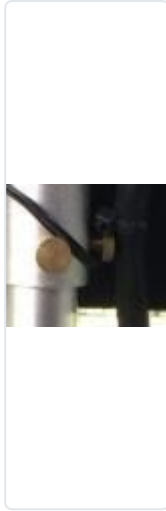
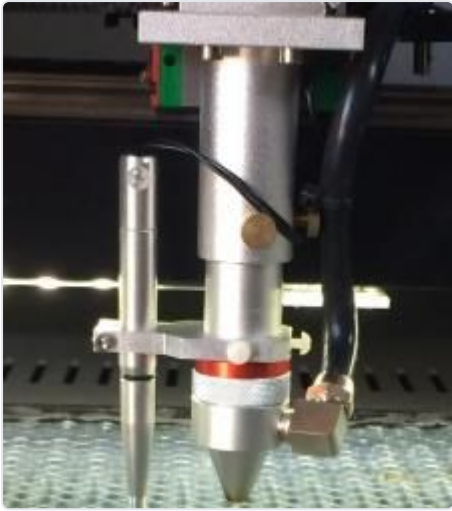
<Adjustment procedure>

Loosen the screws on the laser head; the head length can then be adjusted. (There are two screws.)

After loosening the screws, insert the focus gauge in between and adjust the height until the gauge just brushes, then tighten the screws.

Turning counterclockwise loosens the screws; turning clockwise tightens them.

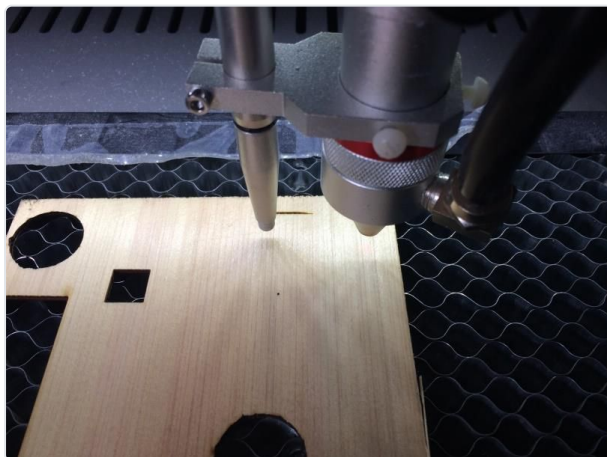
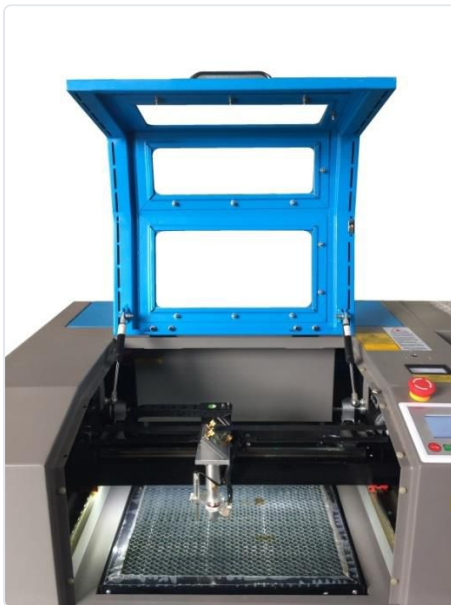
Once the height has been set with the focus gauge, tighten the screws.



6.3 Cover

When preparation is complete, close the top door.

Caution: The laser will not fire while the top door is open.



6.4 Power Supply for External Equipment

Confirm that the automatic water chiller, the air compressor, and the exhaust blower are switched ON.

6.3 Starting the Job

Processing is carried out using the "Logical Origin" processing method.

Use the arrow keys on the control panel to move the laser head to the position where you want processing to start, then press "Origin" to set the logical origin.

Move the laser head with the arrow keys. Set the origin with "Origin".

Press "Start" on the control panel to begin processing.

When processing is finished, the laser machine sounds a beep.

Open the protective cover and remove the processed material.



8. Other

[Producing several copies of the same engraving]

In RDWorks V8, click "Array Copy" on the drawing toolbar and configure the settings, or configure them with "Array Output".

Array Copy copies the selected object according to the specified row and column settings. Therefore, after an array copy, each copied object can be repositioned or edited individually.

Array Output outputs the selected object according to the specified row and column settings. Because the objects are not copies, individual objects cannot be repositioned or edited after an array output. However, flexible automatic placement is possible — for example, row and column offsets can be specified.

Note: For details, refer to "Difference between Array Copy and Array Output" in the RDWorks User Manual.

配列出力

	数	間隔	ズレ	
X:	3	20.000	0.000	
Y:	2	30.000	0.000	
配列		範囲指定		