

Laser Cutter Operation Manual

Step ZERO: Before you begin

- turn on the central Ventilation
- turn on the Chiller
- plug in the blower fan
- plug in the compressor

Step 1: Turn on the Laser Cutter

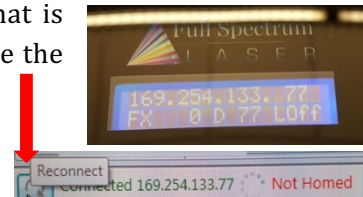
- Turn the engagement key.
- Turn the red switch on.



Step 2: Run the Retina Engrave Software

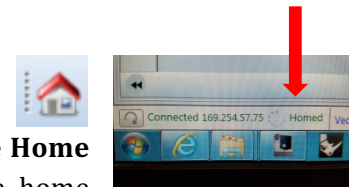
-Wait for the software to connect to **the same IP address** that is indicated on the laser cutter LCD. When connected, you can see the same IP address on the bottom left corner in **green**.

-If it did not find the address automatically, you would click on the **refresh** to search the network.



Step 3: Homing

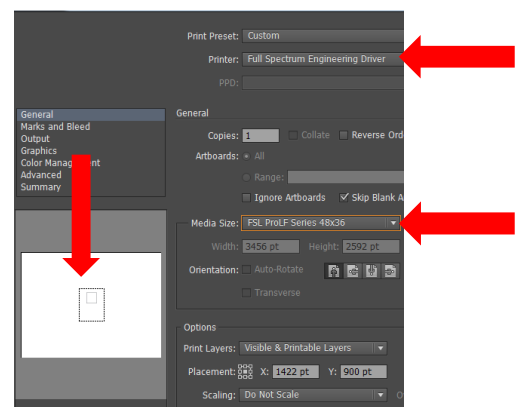
-Make sure nothing is in the way of the laser head and click on the **Home** button. The laser head will return to top right corner of the home indicator on bottom left of the software interface will turn **green**.



Step 4: Import your file

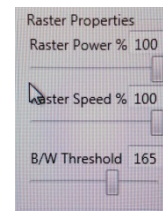
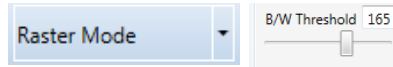
-From any software you are using, go to Print and select **Full Spectrum Engineering driver**.

- From Adobe Illustrator CC Print Dialogue, change Defined by Driver to **FSL ProLF Series 48x36**. Make sure the design is somewhere in the print area. Hit print, and the design will automatically be exported to **Retina Engrave**. The software should already be running and connected. (Step 2).

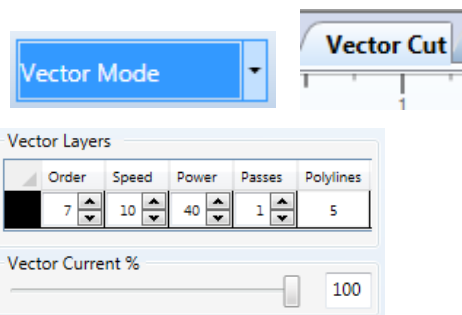
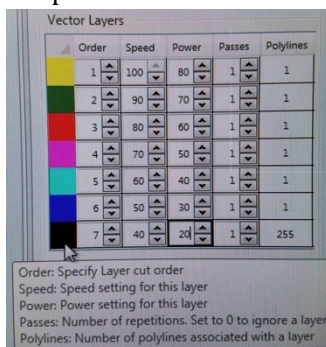


Step 5: decide what you are doing: Raster Engrave, Vector Cut or Both

-If you are Raster Engraving, you should have assigned **Yellow** or **Cyan** to your vector lines, and you should not see them in the raster tab. If you do, adjust the **B/W Threshold** on right to get rid of the vector lines in Raster tab. Then, adjust **Speed** and **Power** for rastering. Remember that usually a number between 10 and 40 is a good number for Raster Engraving.



-If you do vector cutting, make sure the **vector mode** is selected (at the top) and you are in vector tab. If you have assigned different colors to your lines, they should be visible in those colors. You can have up to seven different colors, and you can change the colors in Retina Engrave software as well. You need to adjust the setting for each one of them on right. You can also change the order of cutting. Number of passes could be set to zero if you wish not to perform a cut on a vector with a designated color.

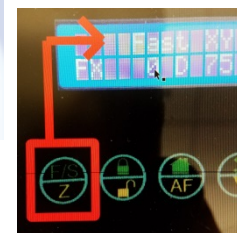
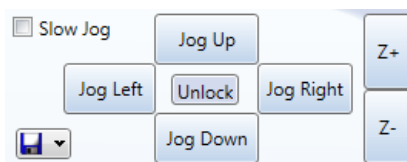


-Raster and Vector mode together is not recommended. Finish your raster first, and do the vector cut afterwards.

Step 6: Move the laser head to position

-After adjusting the settings, move the laser head completely over the material. The gold gauging part should also be on top of the material.

Use the cursers on the LCD screen to do so. **Do not** use the fast Z. Only use **SLOW Z** when you want to move the bed up and down. To Change the mode between XY and Z tap on **F/S button** under the LCD Screen. You can move the laser head both using the Laser cutter LCD interface and the Jogging tools in Retina Engrave.




-Click on the **Autofocus Z** button on the top (the blue line), and the machine will automatically adjust the height. Sometimes, it is recommended to move the bed lower than what the autofocus suggests. This will increase the distance between the lens and the material, and it is particularly useful when your material is 100% flat, and you are afraid that it might hit the laser head in some areas.



-You can move the laser head again if you'd like to. You only need to do the autofocus once for your material.

Step 8: Run the job perimeter

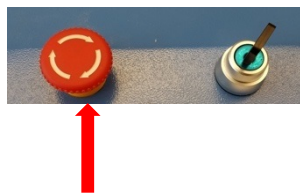
- Click on the **run job perimeter button** . The laser head will run the perimeter without firing the laser. This way you know that your desired cut is within the material boundary.

Step 7: Begin cutting

-If you are ready, make sure the **chiller, central ventilation, blower,** and the **compressor** are on. If you are cutting thin paper, do not turn the compressor on, and set the vector current setting lower than usual (50 or lower perhaps).

-Hit run  (**Play** symbol by the Stop and Pause) to start the job.

-If you see anything unusual, or you need to stop the machine by clicking on pause or stop in the software interface. If it is an emergency, in case of fire for example, hit the **red button** on the laser cutter.



Step 8: When you are done:

- Turn off the laser cutter, the chiller, the blower, and the compressor.
- Close the Retina Engrave, your email account or any personal information on the desktop.
- Don't forget your flash drive.
- Remove any debris or left over.

- Clean the laser cutter bed.
- Do not leave any leftover or trash in the lab. Take your trash to the dumpsters outside.

DO NOT LEAVE THE LASER UNATTENDED UNDER NO CIRCUMSTANCES!
IF YOU NEED TO GO AWAY FOR A SHORT TIME, PAUSE THE LASER CUTTER.

General File Preparation Guidelines for Laser Cutting

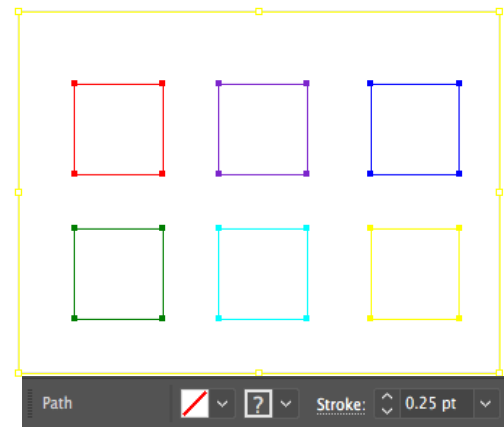
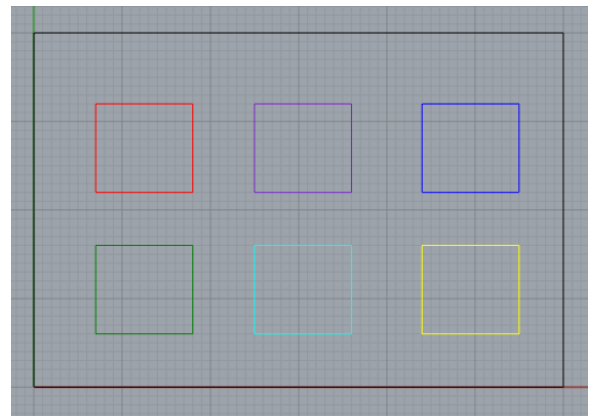
Step 1: Decide what you are cutting

- A. Vector cutting
- B. Raster Engraving
- C. Vector and raster combined

Step 2: Prepare the file

A. Vector:

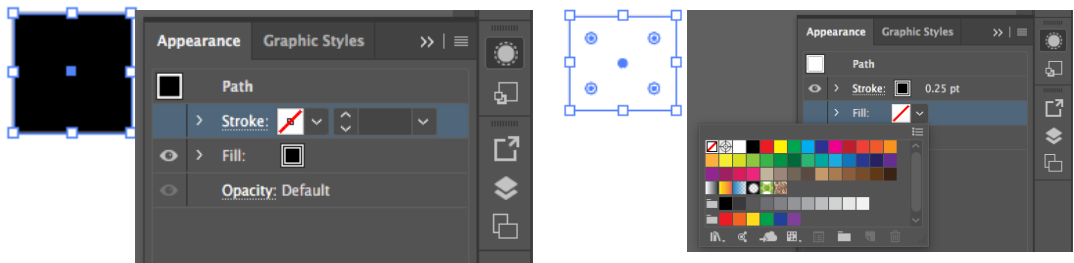
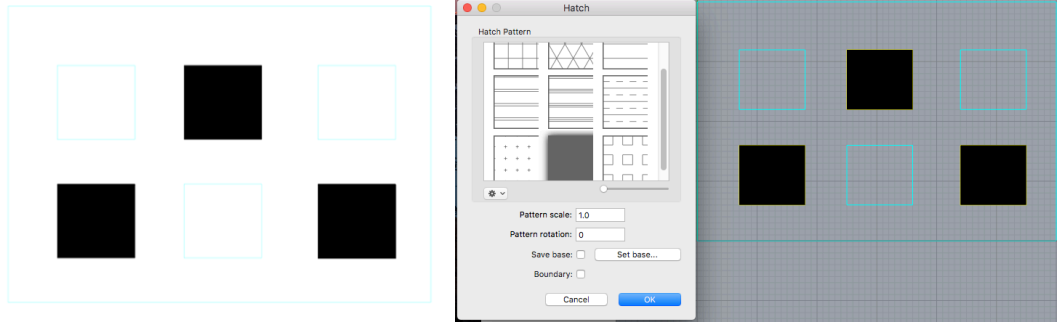
- You can have up to seven different colors assigned to your curves:
 - Black, Blue, Red, Magenta, Green, Cyan, and Yellow from the **RGB** color palette. **Avoid Black whenever possible.**
 - Each line can have a different power and speed setting yet they can be cut together.
- Convert all the lines to **hairline**. 0.1 to 0.25 would also work just fine.
- For predictable output, vector drawing segments should be closed as much as possible. Use Join in both Rhino and Illustrator.



B. Raster:

- Assign **Yellow** or **Cyan** to the lines and curves you'd like to engrave. Later in the laser cutter software, Retina Engrave, we will specify really low settings to those lines so that they won't be cut all the way through.

- In Rhino, **hatch** the areas you'd like to engrave and delete the outline curve.
- In Illustrator, **turn off** the stroke, and fill the area you'd like to engrave with black.



C. Raster and vector combined:

- The vector cut lines should be **Yellow** or **Cyan**
- The raster areas need to be hatched, and just like the steps above get rid of the outline of the areas that will be engraved in both rhino and Illustrator

