

# Laser Juice – Initial Set-up and Calibration

## System Requirements

To run Laser Juice, you will need to download and install Derivative's TouchDesigner. For hobbyist or non-commercial purposes, there is a free download to get started here

<https://www.derivative.ca/088/Downloads/>. For more advanced commercial applications, please refer to licensing terms here <http://www.derivative.ca/wiki088/index.php?title=Licensing>.

- For laser output: Ether Dream (v1 or 2) or sound card based DAC.
- Operating system: Microsoft Windows 7 and up or Apple macOS 10.11 and up
- CPU: quad core i5 or similar, i7 is recommended.
- GPU: 1gb GPU memory and Nvidia GeForce 600 series, AMD HD 7000 series, Intel HD4000 or better.

## Download Laser Juice

You can [download and license Laser Juice from our website](#).

Unzip Laser Juice and double click "Laser Juice.toe" to open Laser Juice with TouchDesigner. Note: you can open Laser Juice with TouchPlayer, but you will not be able to re-size the window.

## Safety Reminder

Pressing the space bar will effectively stop any laser signal from Laser Juice. It is expected the owner and operator of the laser has taken the proper safety precautions necessary when operating any laser potentially controlled by Laser Juice. For basic laser safety information, visit the ILDA website here <http://www.ilda.com/safety-basics.htm>. Note: the creators of Laser Juice are not liable for personal injuries or damage to equipment when using this program.

## Ether Dream DAC

You will need to allow the following network ports to operate through your firewall (if applicable). Any Ether Dreams on the network will be detected automatically and will appear in the drop-down list.

Outbound: TCP port 7765

Inbound: UDP port 7654

## System Settings

Select a sample rate (scan rate) that is appropriate for your laser projector. If you are not sure, start with a conservatively low value somewhere between 12000 and 15000. Pattern Length suggested value is your Sample Rate / 60.

Depending on your setting you may want to reduce the x scale and y scale values before turning on your laser. Select an ether dream and click the “Activate Laser” button to toggle laser display.

Under Global Settings, click “Display Laser Safety Zone”. From there, you can set up the projection zone using the geometry controls. The abstracts will not travel outside the borders of the safety zone.

## Calibrate Ether Dream Buffer Size

If using an Ether Dream DAC, you will need to properly calibrate the buffer size and sample rate. If the laser continuously outputs but has stuttering animation, there are not enough points in the buffer. Either lower the queue time to shorten the buffer or increase the sample rate. If the laser repeatedly cuts out, it means the sample rate is high enough that the buffer is running out entirely. Increase the queue time (or the decrease sample rate) to give the Ether Dream more of a buffer. You can see the number of points in the buffer by running the Ether Dream Diagnostics Tool in the background <https://ether-dream.com/downloads.html>. The number of points in the buffer should be under 1,000 for a quick response time.

## Calibrate Maximum Frequency

‘scale freq’ will scale your maximum frequency downwards. If your scanners are making a lot of noise, or your laser image is distorted from the preview, reduce the ‘scale freq’ value until undesired behavior stops. BasicLissajous is a good preset for testing frequency calibration. If one end of the laser pattern sticks out in an asymmetrical manner, then your scanners are distorting and you may wish to reduce the frequency.

## Help, My Laser Cuts Out Randomly!

This is most likely because either the sample rate and Ether Dream queue time are not balanced, or the computer CPU is too slow. See “Calibrate Ether Dream Buffer Size” to check the former. If you experience flickers or dropouts when clicking on dropdown menus, it is likely the computer CPU that is too slow. Here are some ways to decrease the load on the CPU:

- Close the System Settings window
- Disable Audio Out if not in use (“Activate Laser”)
- Disable Audio In if not in use (“React Active”)
- Disable Ether Dream if not in use (“Activate Laser”)
- Disable “Display Graphs”
- Lower Sample Rate

## Help, The Audio-in Modulators Cut Out Randomly!

This is most likely because the computer CPU is too slow. Here are some ways to decrease the load on the CPU:

- Close the System Settings window
- Disable Audio Out if not in use (“Activate Laser”)
- Disable Ether Dream if not in use (“Activate Laser”)
- Disable “Display Graphs”
- Lower Sample Rate