FrankenLaser TorbanStein

December 2019
V1.0

Quick Reference Guide

These instructions are designed such that a user is able to exercise the following order of operations.

Protect the user from harm.

Protect the Laser from harm.

The laser is potentially a dangerous piece of equipment that, like any piece of equipment, can fail.

If at anytime a failure, or misuse, produces an environment that is no longer safe for humans to inhabit:

- **Depress the Emergency Stop**
- **Sound the Alarm**
- **Evacuate the Area**
- **Call 911**

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SAFETY WARNING

Laser safety is the safe design, use and implementation of lasers to minimize the risk of laser accidents, especially those involving eye injuries.

The laser has safety mechanisms to prevent the laser from operating while the lid is open.

DO NOT ATTEMPT TO CURCUMVENT THESE MECHANISIMS

They are in place for your safety. The light emitted by this laser is invisible, but will cause permanent damage to your eyes.

The most important safety mechanism is a properly trained operator.

IN THE EVENT OF A LASER MALFUNCTION, DEPRESS THE EMERGENCY STOP BUTTON IMMEDIATELY.

FOREWORD

This document is designed to be a quick reference for people trained on the old lasers, to transition to the new system.

This document is not, a LightBurn tutorial, although Lightburn will be referenced. For more information on LightBurn see

https://lightburnsoftware.com/pages/lightburn-documentation

https://www.youtube.com/channel/UC-TdV9ThMD6E4MZztA6eZsQ

This document is also not a complete Ruida control panel reference. For more information on the Ruida control panel, see:

http://en.rd-acs.com/Private/Files/a4d9f12fe9e32eb7.pdf

Worlflow Summary

1. Prepare design in software of your choice and import / open with LightBurn.

2. Transfer file to a connected computer.

3. Verify laser / material settings in LightBurn

4. Check Job Origin / Start Coordinates

5. Set laser head is set to its highest position, ensure there are no obstructions on the laser bed.

6. Turn on fan.

7. Turn on laser main power. (The breaker located on the right hand side of the laser)

8. Turn on keyswitch.

9. Allow laser to complete its boot process.

10. Position material.

11. Position laser head at appropriate distance above work material.

12. Check cut boundary using either frame button from within LightBurn

13. Close lid. (A friendly reminder, just in case you forgot.)

14. Press white button immediately before starting the laser in LightBurn

15. Start the laser in LightBurn
16. Monitor progress. (Now is a good time to remind yourself of the fire extinguisher locations.)

17. When complete, the laser will beep 3 times.

18. Press white button to de-energize the laser.

19. If you've cut something that created large volumes of smoke, allow a few minutes for the vent fan to do its job before opening the lid.

20. Set laser head to highest position.

21. Before removing your material, move the laser head to the home position, again using caution while removing material.

22. Turn off keyswitch.

23. Turn off side breaker.

24. Turn off exhaust fan.

25. Enjoy your freshly lazed cool thing!

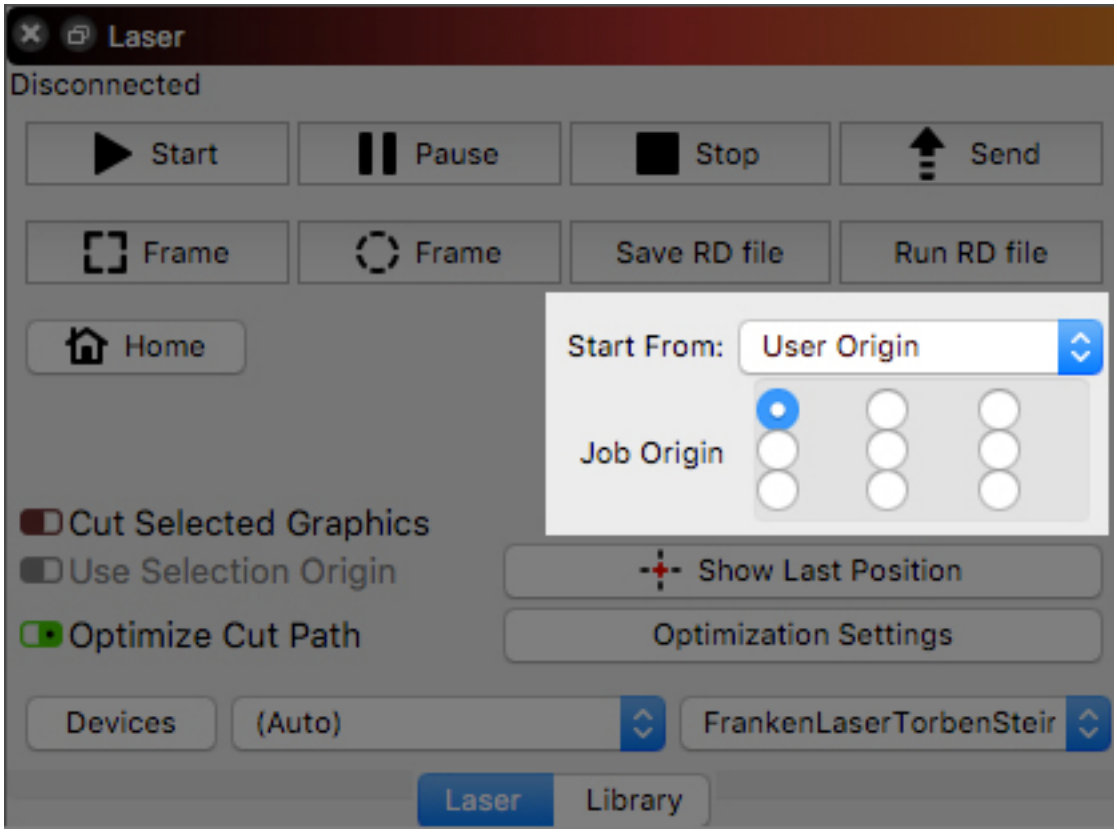
Expanded Workflow

1. If you are using LightBurn on your own computer, you can import many different file types. Once your design is imported into light burn you can save it within LightBurn as a .lbrn file.

2. This is the file you will open in a computer that is connected to the laser. This can be accomplished using your own USB drive or via the network drive SPACEFILES (If you're new, make yourself a folder on SPACEFILES. If you need help with this just ask someone!)

3. Once your file is open, verify the laser settings. Cross check speed / power settings from the wiki. If you're lasing a new material not listed on the wiki, please share the settings that worked for the rest of us! We'll update the wiki with known working settings.

4. Check Job Origin / Start Coordinates The "Laser" workpane on the right hand side of Lightburn has Start From and Job Origin options. The options for Start From are Current Position, User Origin, Absolute Coords.



Absolute Coords is the simplest. The grid in the main editing window represents the machine work area. The green square in the upper left corner represents the Job Origin, while the red square represents the machine origin. When set to Absolute Coords, both squares will always be in the same position. You will notice that you are unable to change the Job Origin settings while in Absolute Coords mode.

If using **Current Position**, it is good practice to update the location of the laser head by clicking “Get Position” in the “Move” workpane. Your job will cut relative to the current position of the laser head when you hit the Start button. The "Job Origin" value in the Settings window to tell LightBurn how to position the job relative to the laser. Notice when you change the "Job Origin", the green indicator square has moved.

User Origin works almost exactly the same as Current Position, except that the starting location is "programmable". Our laser has an "Origin" button on the Ruida controller. You jog your laser to the position you want your job to start from, hit the "Set Origin" button,

and then you're free to move the laser around again. If you specify "User Origin" as the "Start From" value, the laser will move back to that programmed location and start the cut from there.

Regardless of which mode, you can very accurately assess the position of the laser head over your workpiece by using the “Pulse” button on the Ruida control panel.

5. Set laser head is set to its highest position. Hold the laser head with one hand, and ensure it doesn’t fall onto the bed. With the other hand loosen both finger screws and move the laser head up. Once in the highest position, tighten the finger screws so the head does not fall unintentionally. Visually inspect the work area for obstructions. While in the boot process the laser will fast move through during its self test. It cannot be understated how important it is to protect the laser head from damage. The lens is enclosed within the head, needless to say, it is expensive. Also the head has been adjusted and calibrated, if it is nudged out of place, the laser may not perform as desired.

6. Turn on the fan. The fan switch on the wall also powers the water pump that is essential for the laser to function.

7. Turn on laser main power. The breaker located on the right hand side of the laser.

8. Turn on the keyswitch.

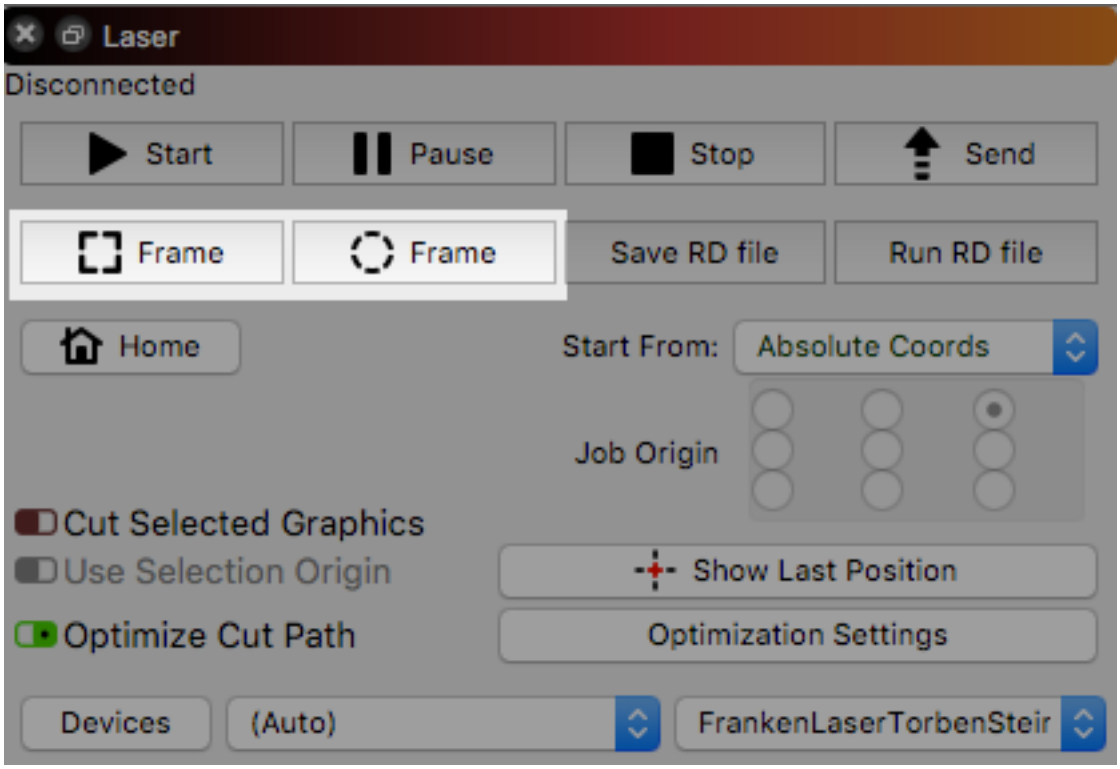
9. Allow the laser to complete its self test and boot process.

10. Position material. The default origin is near the left rear of the bed. This is the “home” of the laser head after a boot sequence. If you are not aligning your material with the edges of the laser bed, the origin can be adjusted from within LightBurn.

11. Position the laser head at appropriate distance above the work material. Always support the laser head with one hand while loosening the finger screws with the other. Support the laser head

while you lower it to the desired height above the work material. Once the adjustment is complete, re-tighten finger screws. The optimal cutting distance is 8mm above. You can use either the red 8mm spacer, or one of the etched plexiglass angled rulers. Other distances may be appropriate for different operations, such as etching. Experiment at your own risk.

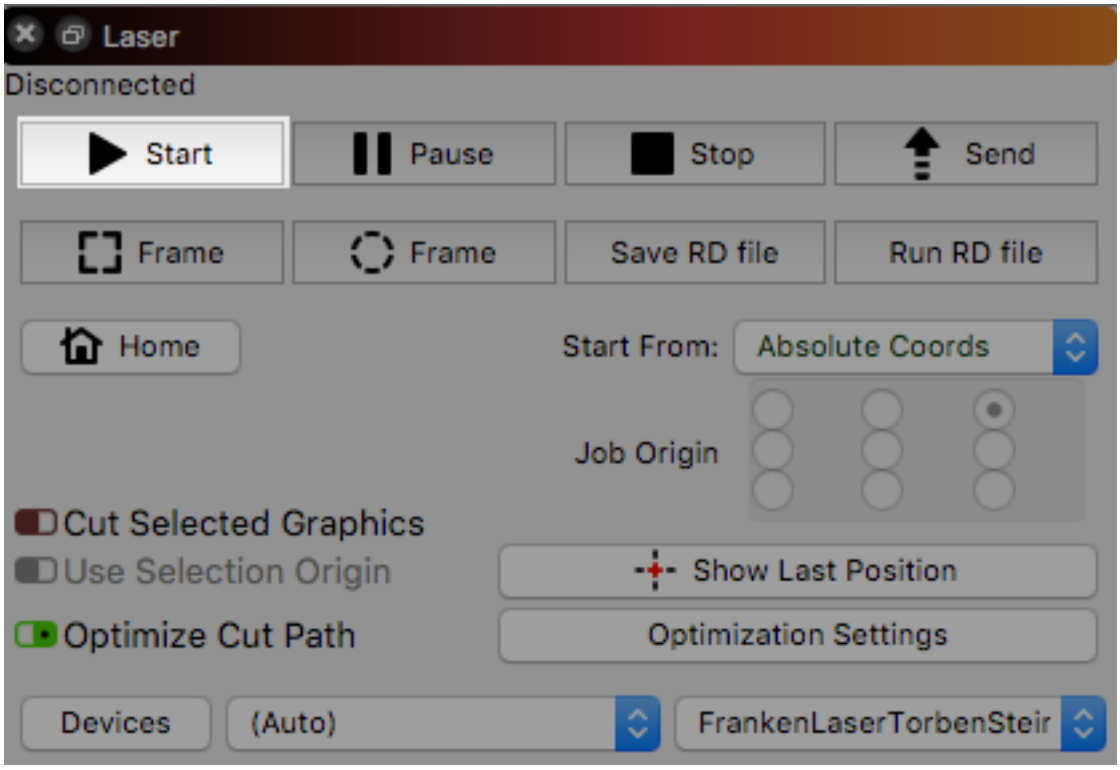
12. Check cut boundary using either frame button from within LightBurn. This will enable you to determine if the cut area extends further than your material, or if your material is positioned such that the cut or etch is where you want it to be.



13. Close lid. (A friendly reminder, just in case you forgot.)

14. Press white button immediately before starting the laser in LightBurn

15. Click Start in LightBurn



16. Monitor progress. (Now is a good time to remind yourself of the fire extinguisher locations.)

If you get any errors, pause or stop your job and investigate.

If the smoke from your job isn't evacuating properly, pause or stop your job and investigate.

If you see fire that doesn't self extinguish, pause or stop your job and investigate.

This list is not an exhaustive list of what to watch for while your job is in progress. If you see, hear, smell, taste, spidey senses tingle, ESP or otherwise determine that something doesn't seem right, pause or stop your job and investigate.

If you are unable to determine the cause of the trouble:

- Proceed to step 17, to shutdown the laser. Consider leaving the fan running for a few minutes to evacuate any smoke or fumes.

- Placard the laser with a sign so that it is obvious to another user that the laser is not functional.
- Send an email to thespace@sktechworks.com with a brief description of the problem and what you were doing when you discovered it.

17. When complete the laser will beep 3 times.

18. Press white button to de-energize the laser.

19. If you've cut something that created large volumes of smoke, allow a few minutes for the vent fan to do its job before opening the lid. Monitor work area to ensure that there is no fire.

20. Set laser head is set to its highest position. Hold the laser head with one hand, and ensure it doesn't fall onto the bed. With the other hand loosen both finger screws and move the laser head up. Once in the highest position, tighten the finger screws so the head does not fall unintentionally.

21. Before removing your material, move the laser head to the home position, again using caution while removing material.

22. Turn off keyswitch.

23. Turn off side breaker.

24. Turn off exhaust fan. (It is good practice to leave the fan on for a few minutes to remove any residual smoke or fumes.)

25. **Enjoy your freshly lazed cool thing!!**