VLS HPDFO Upgrade Instructions

Place all screws in a safe place for reuse.

1. Turn the VLS on.
2. Run the **Laser Beam Check and Alignment** with the standard beam window. Once complete proceed to the next step.
3. Turn off and unplug the VLS.

4. Once the VLS’s Laser Beam is aligned with the standard beam window you will need to remove the beam window. Unscrew the 2 button head screws that hold the standard beam window in place. Store the beam window and screws in a safe place.

5. Before installing the Collimation Optics verify that the 3 small screws (only 2 showing) are protruding from the back of the Collimation Optics.
6. Install the Collimation Optics.
   a. To install the 2 mounting screws use some needle nose pliers to hold the screw in place and use an Allen wrench to screw the screws through the mounting screw access holes.
   b. Insure that the flat top of the Collimation Optics is facing up.
   c. **DO NOT** over tighten the screws.

7. Turn the VLS on again.
8. Run the **Laser Beam Check and Alignment** with the Collimation Optics. Once complete proceed to Step 9.

9. Once all beam alignment procedures are done you will need to run the **CPU Initialization / Auto-Z and Rotary Calibration for HPDFO**.
Laser Beam Check and Alignment

Make sure the table is clear of any objects that could obstruct the movement of the motion system. **The red diode is ONLY a guide.** The red diode may be slightly off center compared to the burn mark you will make in the following steps so we recommend you make a burn mark for best results.

1. Power the VLS ON and let it home, or re-home it by clicking the Home XY button in the Viewer Tab of the UCP.

2. Remove the optics from the Focus Lens Carriage and place in a safe, clean place.

3. Place a strip of masking tape over the hole on the left side of the Focus Carriage.

4. The red diode beam should appear on the tape. The red diode beam should be fairly centered over the hole.
5. Using the Focus Feature (1) of the Viewer Tab in the UCP, verify the position of the red diode beam relative to the hole in the focus carriage in all four corners of the table.

6. The red diode should be **fairly centered** on the hole in all four corners of the table. If this is the case, you can remove the masking tape from the hole in the focus carriage and reinstall the optics. The laser beam is aligned.

7. If the red diode beam is **not centered** on the hole in all four corners of the table, the beam will need to be aligned. Do not remove the masking tape or reinstall the optics.

8. Power off the VLS and unplug the unit.

9. Slowly move the X-axis arm (1) forward.

10. Locate and carefully remove the two screws securing the cover on the left-hand side of the X-axis arm. Remove this cover.
11. Plug in the VLS and turn the power on with the top door open.
12. Once it finishes homing proceed to the System Tab then click on the Alignment Launch button. The Alignment Mode window will appear.

13. Click on the upper left hand Move button. The VLS’s focus carriage will move to the indicated X, Y position.

14. With the cover removed, locate the three adjusting screws on the #2 Mirror mount on the left-hand side of the X-axis arm. Turn these screws to center the red dot diode.

**Note:** To create a small burn mark on the tape in the next step you will need to adjust your Power and Seconds settings in the Alignment Mode screen (lower left side). Lower power laser tubes require higher power settings and higher power laser tubes require lower power settings to make the burn mark on the tape.

15. Adjust the Power and Seconds settings on the lower left side of the Alignment Mode window. Start of with 5% Power and 2 Seconds.

16. Close the top door if it’s not already closed and then click on the Activate Laser button.
17. If the burn mark is not centered adjust the corresponding screw on the #2 Mirror mount.
18. If the burn mark is centered continue to step 20.
19. Continue making a burn mark on a new piece of tape until the burn mark is fairly centered on the upper left hand corner.
20. Once the burn mark is centered keep the piece of tape on the focus carriage.

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<th>Image 1</th>
<th>Image 2</th>
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21. Now click on the lower right side Move button.  
22. Close the top door if it's not already closed and then click on the Activate Laser button. Take note of the burn mark.

23. Both burn marks should be overlapping each other near the center. If they are not continue to adjust the #2 Mirror for the lower right hand corner.
24. Once aligned Exit the Alignment Mode Window and remove the masking tape from the Focus Lens Carriage and reinstall the optics.
25. Power off and unplug the VLS.
26. Reinstall the cover and two screws over the #2 mirror mount from step 10.
CPU Initialization / Auto-Z and Rotary Calibration for HPDFO

This procedure must be performed with the solid aluminum Engraving Table installed. Do not use the honeycomb Cutting Table for this procedure.

1. Power up your computer and the VLS. Home the Z-axis by clicking the HOME Z button in the VIEWER tab of the VCP.

2. Using the UP and DOWN arrow buttons, either on the machine or in the UCP, bring the Z-axis table up. Using the appropriate Focus Tool for the lens installed (the standard is 2.0, other Focus Lens Kits are optional), focus directly on the surface of the table.

3. In the UCP, click the SYSTEM tab and choose 2.0 from the Lens Size list.
4. Click on the Calibrate button within the Lens Size box of the System Tab. The following window appears. Click on Save to accept the new Z Position. Your 2.0 Lens has now been calibrated.

5. If you have purchased the 1.5 or HPDFO optional lens kits, calibrate the lens kit according to steps 1 through 4. Be sure you select the proper lens size from the list before calibrating.

6. You must now set the Y-axis Rotary Position even if you have not purchased the optional Rotary Fixture.
7. Lower the Z-axis table, halfway down. Loosen the two thumbscrews on the Engraving table and remove.

8. Locate the Rotary Fixture Alignment Pin. Then raise the Z-axis platform as high as it will go.

9. Using the focus feature in the VIEWER tab of the VCP, position the red dot directly in the center of the Rotary Fixture Alignment Pin. Try to get is as close to the center of the pin as possible. You can also use your keyboards arrow keys to move the focus carriage to an exact location.
10. DO NOT exit the focus feature. While still on the focus feature click on the SYSTEM Tab and click on the Rotary Calibrate button. The Rotary Calibrate window appears. Click on the Save button for the Y Position. Accept the new position.

11. CPU Initialization is now complete.

CPU calibration is necessary for two reasons: You must have a “0.00” reference point so that the machine properly adjusts the Z-axis to focus the laser beam accurately when selecting the different lenses. Also, it needs to know where the centerline of the Rotary Fixture is so that the x-axis arm will move out to the correct position (highest point of the cylinder) to engrave cylindrical objects.