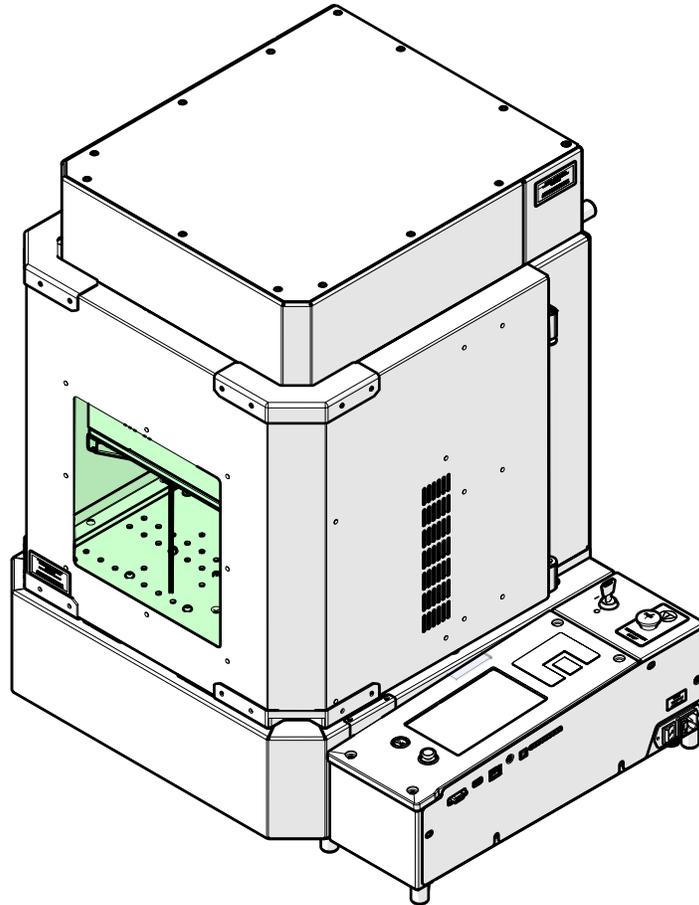


## Focus and Camera Calibration G100



### Parts Required

- GC0208 - Target, Camera Calibration, G100

### Tools/ Materials Required

- 8" x 8" piece of anodized aluminum
- 1/8" Allen wrench

## Overview

Focus and camera calibrations should be completed periodically to ensure that the engraver is operating at the correct focal height and the cameras are accurate.

The focus and camera calibrations should always be completed together. Failure to do so may result in an inaccurate camera stream, which will prevent proper artwork placement on the marking material.

Complete this procedure if any of the following behaviors are observed:

- Laser power appears weak at the currently calibrated focal height
- Galvo platform movement appears to not coincide with user focus input or crashes
- Inaccurate artwork placement using the IRIS camera system

Additionally, certain component replacements require that the focus and camera calibration procedures to be completed. These components include:

- Z-Axis PCB
- Fiber laser
- Control module
- Galvo head assembly
- Overhead camera assembly
- Galvo Lens

The G100 has two lenses which allow the engraver to work in a 4" x 4" or a 6" x 6" marking field. Focus and camera calibrations must be completed with each lens installed to ensure proper focus while working in each marking field.

The following procedure will outline the focus and camera calibrations with the 6" x 6", or F254 lens installed in the engraver; however, the procedure for the 4" x 4", or F163 lens is identical. Use this procedure for both lens and camera calibrations.

This procedure contains multiple steps which should be completed in succession and at the same time, they are:

Galvo Platform Calibration	3
Fiber Focus Calibration	4
Red Dot Diode Calibration	7
Manual Focus Gauge Calibration	9
Camera Calibration	10
Galvo Calibration	12

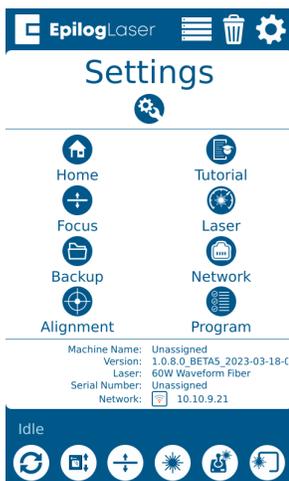
## Galvo Platform Calibration

The Galvo Platform calibration is a crucial step in the laser focus calibration. During this procedure, the galvo platform moves from the top to the bottom of the z-axis, locating the magnetic sensors along the z-axis PCB. This step must be completed for a successful and accurate focus calibration.

1. Press the gear icon to enter the Settings Menu:



2. Press the Focus button to enter the Focus Command/Calibrations Menu:



3. Press the Calibration button to activate Calibration Mode:



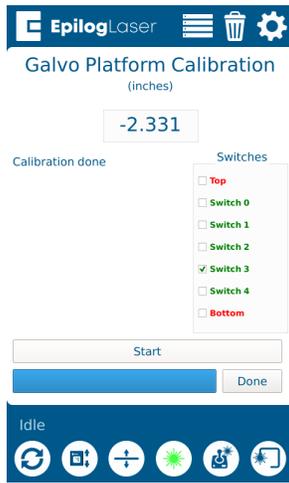
4. Press Galvo Platform to enter the Galvo Platform calibration:



5. Press the Start button to start the Galvo Platform calibration:



6. Allow the engraver to complete the calibration. Once complete, a message should appear:



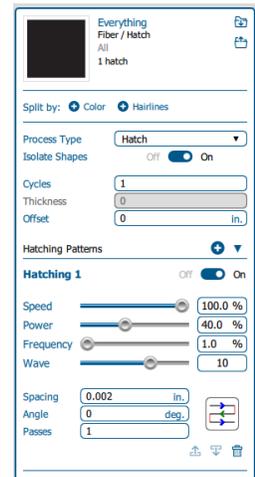
7. Press Done.

## Fiber Focus Calibration

The Fiber Focus calibration establishes the focal height of the fiber laser and manual focus gauge. You will run a small job while adjusting the galvo platform to find the correct focal height.

1. Open your preferred illustrating program and create a black, raster box measuring ~2" x 2" or 50mm x 50mm.
2. Send the job to the Software Suite.
3. Set the process type to "hatch", and assign the following settings to the job:

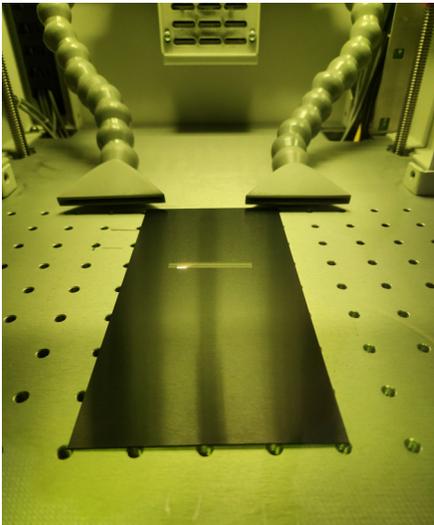
- Speed: 100
- Power: 40
- Wave: 10



4. Send the job to the engraver.
5. Place the anodized aluminum in the middle of the worktable and close the engraver door.
6. Press the Go/Play button to start the job.

## 18000 - Focus Calibrations

- Once the job is running, press the Focus button and slightly raise and lower the galvo platform with the joystick while observing the spark coming from the laser hitting the anodized aluminum:



- Once the correct focal height has been found, let go of the joystick and press the Go/Stop button to pause the job. Then press the Reset button to stop the job:



- Remove the anodized aluminum from the engraver.
- Press the gear icon to enter the Settings Menu:



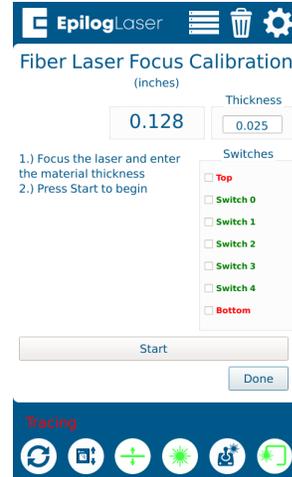
11. Press the Focus button to enter the Focus Command/Calibrations Menu:



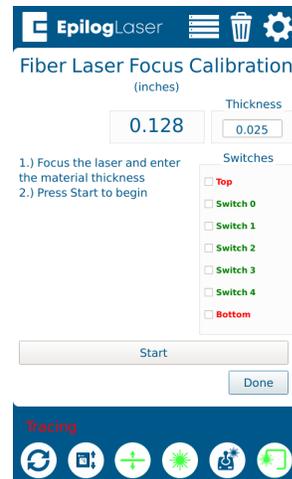
12. Press Fiber Focus to enter the Fiber Focus calibration:



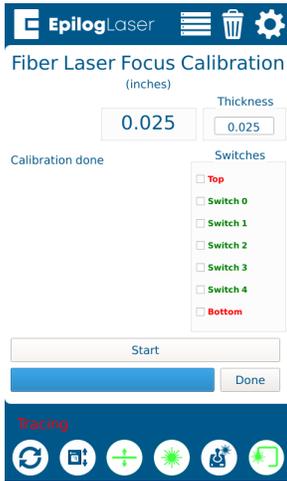
13. Ensure that the material thickness used during the previous step is entered in the Thickness box. If using anodized aluminum provided by Epilog Laser, input a thickness value of 0.025":



14. Press the Start button. The Fiber Focus Calibration is very fast as the engraver notes and saves the current position of the galvo platform:

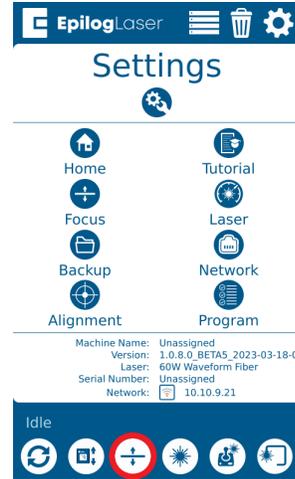


15. Allow the engraver to complete the calibration. Once complete, a message should appear:

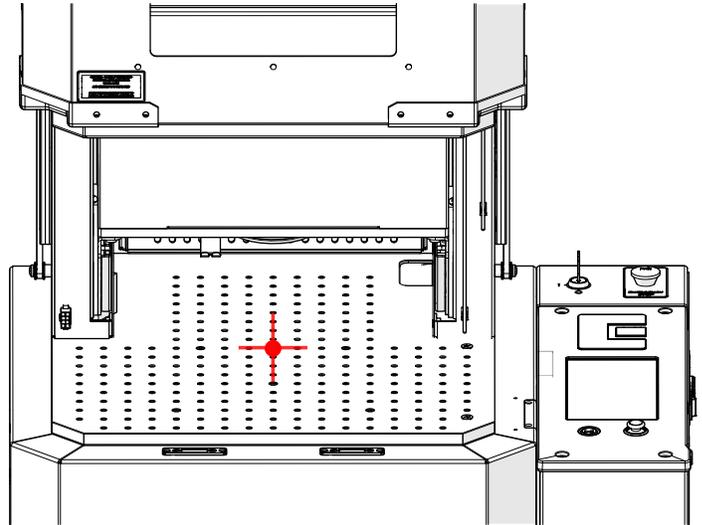


## Red Dot Diode Calibration

1. Press the focus button to turn on the focus cross hair and the focus red dot:

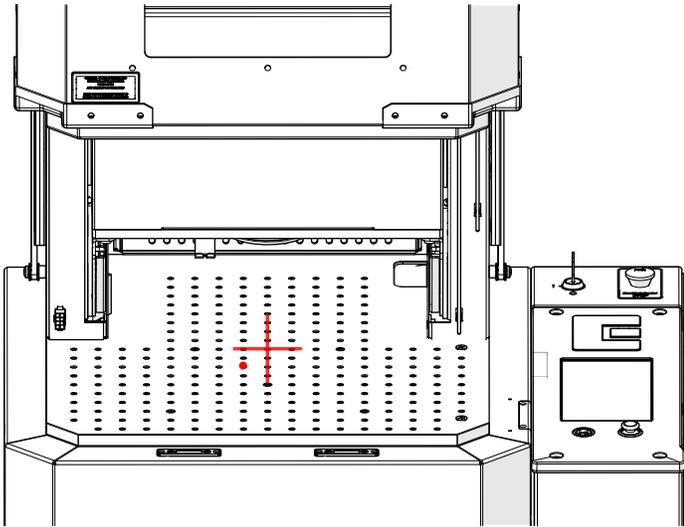


2. When the galvo platform is at the correct focus height (showing a focus reading of 0.00), the red dot should be in the center of the focus cross hair:

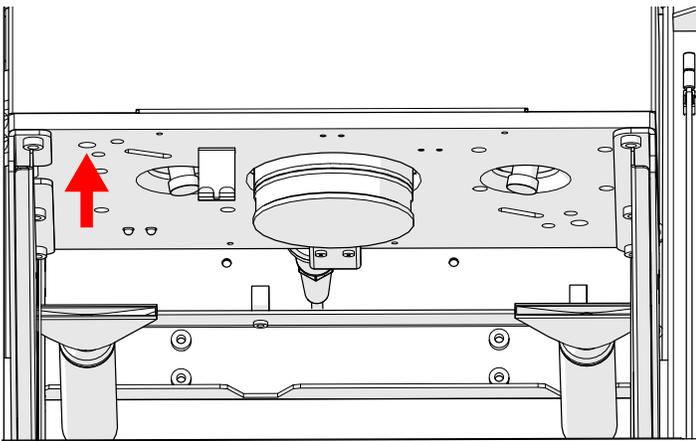


## 18000 - Focus Calibrations

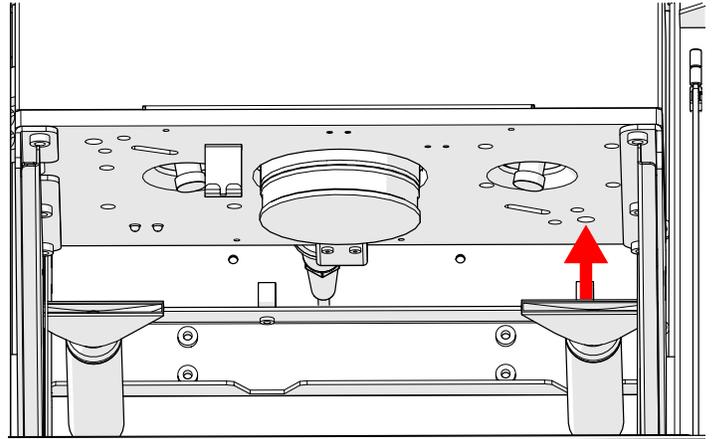
3. If the red dot is not at the center of the focus cross hair when the galvo platform is at the correct focus height, the red dot will need to be adjusted:



4. To adjust the red dot location, loosen or tighten the 1/8" Allen screw on the underside of the red dot assembly.
5. If calibrating the F163, or 4" x4" field lens, adjust the Allen screw shown below:

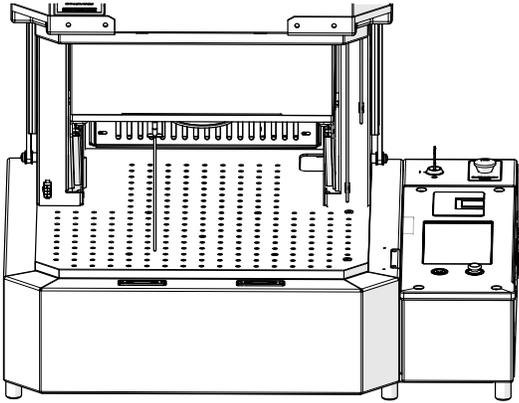


6. If calibrating the F254, or 6" x 6" field lens, adjust the Allen screw shown below:

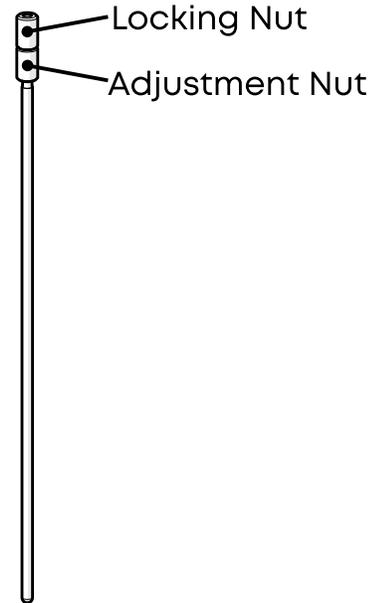


## Manual Focus Gauge Calibration

1. With the galvo platform at the correct focal height, place the manual focus gauge in the focus gauge bracket next to the focus lens.
2. When the galvo platform is at the correct focal height (showing a focus reading of 0.00), the manual focus gauge should be fully seated in the focus gauge bracket and the tip of the manual focus gauge should be in contact with the work table:



3. If the manual focus gauge is not fully seated in the bracket or not making contact with the table, the manual focus gauge will need to be adjusted.
4. To adjust the manual focus gauge, loosen the locking nut and tighten or loosen the adjustment nut to the desired length. When the manual focus gauge is at the correct length, tighten the locking nut:

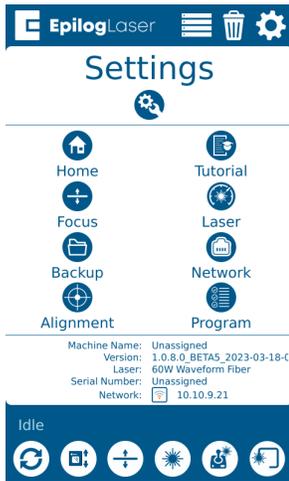


# Camera Calibration

1. On the display, press the gear icon to enter the Settings Menu:



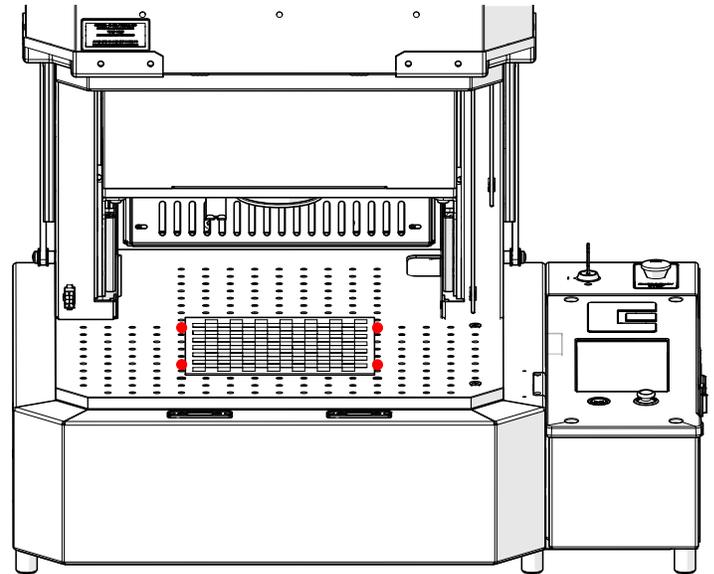
2. Press and hold the “Settings” word to access the Advanced Settings Menu:



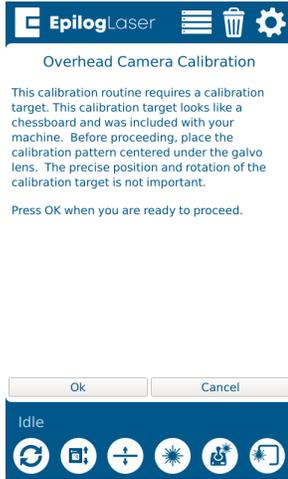
3. Press Calibrate Cameras:



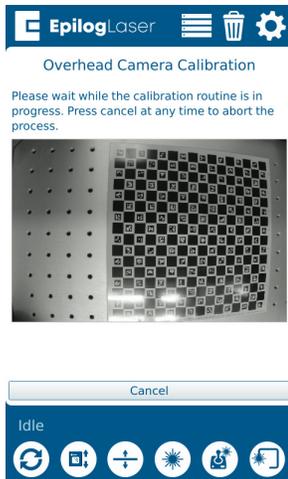
4. Place the camera calibration mat in the center of the worktable and insert four of the red-capped thumbscrews to hold it flat:



5. Press "OK" to begin the overhead camera calibration:



6. Allow the engraver to work through the calibration. During this procedure a camera feed will appear on the control module of the engraver. This feed will appear skewed or slanted- this is normal and will not have a negative affect on the calibration:



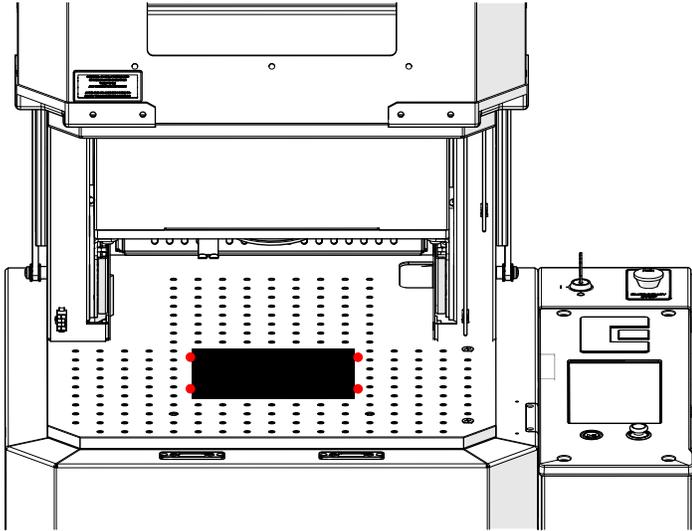
7. When the overhead camera calibration is complete a message will appear with a calibration score:



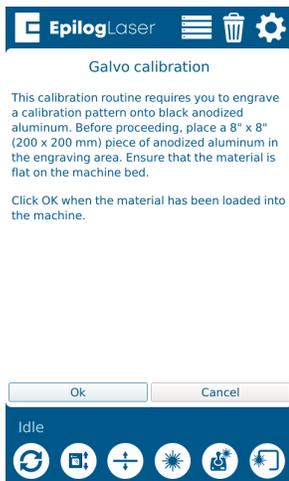
8. Press OK.
9. The camera calibration score will vary based on many factors including lens type, lighting, and the flatness of the camera calibration mat.
10. A camera calibration score of 1.2 or less represents a good camera calibration. A camera calibration score of 1.2 - 1.7 represents an acceptable, but marginal camera calibration. A camera calibration score of 1.8 or higher may prompt the user to attempt the calibration again.
11. If a camera calibration yields a poor calibration score, ensure the following:
  - The focus calibrations have been completed before attempting the camera calibration
  - The camera calibration mat is completely flat and undamaged
  - There is no material in the engraver aside from the camera calibration mat

## Galvo Calibration

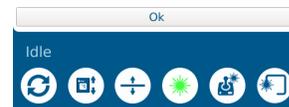
1. Place an 8" x 8" piece of anodized aluminum in the center of the worktable and insert four of the red-capped thumbscrews to hold it flat to the worktable:



2. Press "OK" to begin the galvo calibration:



3. Allow the engraver to work through the calibration. During this procedure the engraver will mark the piece of anodized aluminum. Once the aluminum is marked, the cameras will inspect the mark and make any necessary adjustments to ensure that the galvo and camera positioning systems align.
4. When the galvo calibration is complete a message will appear with a calibration score:



5. A galvo calibration score of 1.8 or less represents a good galvo calibration. A galvo calibration score of 1.9 - 2.5 represents an acceptable, but marginal camera calibration. A camera calibration score of 2.5 or higher may prompt the user to attempt the calibration again.
6. If a camera calibration yields a poor calibration score, ensure the following:
  - The focus calibrations have been completed before attempting the galvo calibration
  - The anodized aluminum is completely flat and has not been previously marked on
  - There is no material in the engraver aside from the anodized aluminum

## 18000 - Focus Calibrations

If further assistance is needed, contact Epilog Tech Support by phone at 303-215-9171, or by email at [tech@epiloglaser.com](mailto:tech@epiloglaser.com)