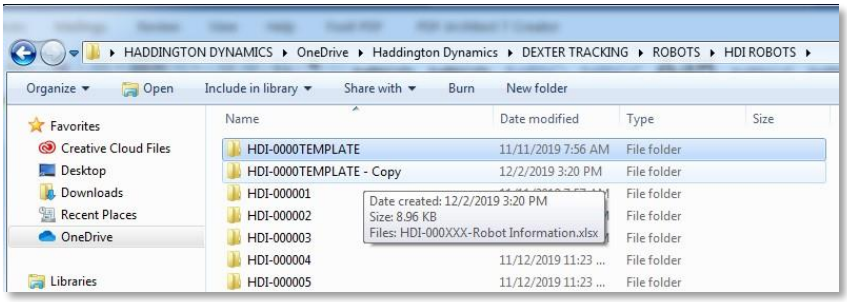
INSTRUCTIONS for beginning HDI CALIBRATION STEP TWO

CRITICAL STEPS before starting the calibration process:

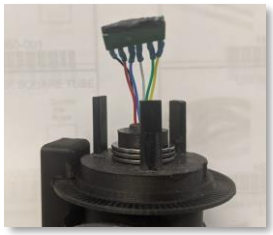
(Always wear a properly grounded grounding sleeve when handling any part of the FPGA board)

1. This process assumes that files for tracking robot builds is on place already. Right mouse click and copy the HDI-000TEMPLATE and rename the copied file to your Robot's serial number. This keeps the original template available for the next robot. Also rename the excel within and use this same folder to keep screenshots of each joints calibration results and any subsequent notes regarding all future service interactions with the robot.



2. Open your newly created Excel file and update lines 1-8. This process is not only for keeping track of all future interactions with the robot but critical proof that the SD Card has been inserted in the FPGA board, the Motors have passed OHM testing and the End Effector wires are protected from making contact and shorting out the board on startup (See below).

	A	B	C	D	E	F
1	Serial Number:	HDI000123		Stress Test Notes:		Issues:
2	Built by:	Mike				
3	IP Address:	192.168.1.142				
4	Image Version:	2019_09_24_HDI				
5	Manufacture Date:	2019_07_04				
6	SD Card Inserted:	2019_07_08				
7	OHM Test Motors:	2019_07_08				
8	Protect end effector wires before Cal.	2019_07_08				

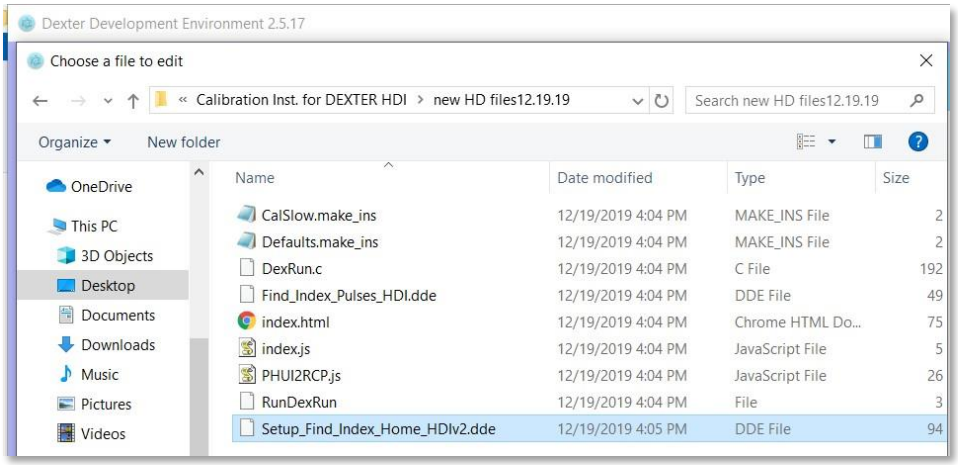


3. Secure the robot onto a surface that has plenty of area for the robot to make rotations on all axes, free and clear of obstructions. Also remove the front part of the end effector if it is already installed.

CALIBRATION

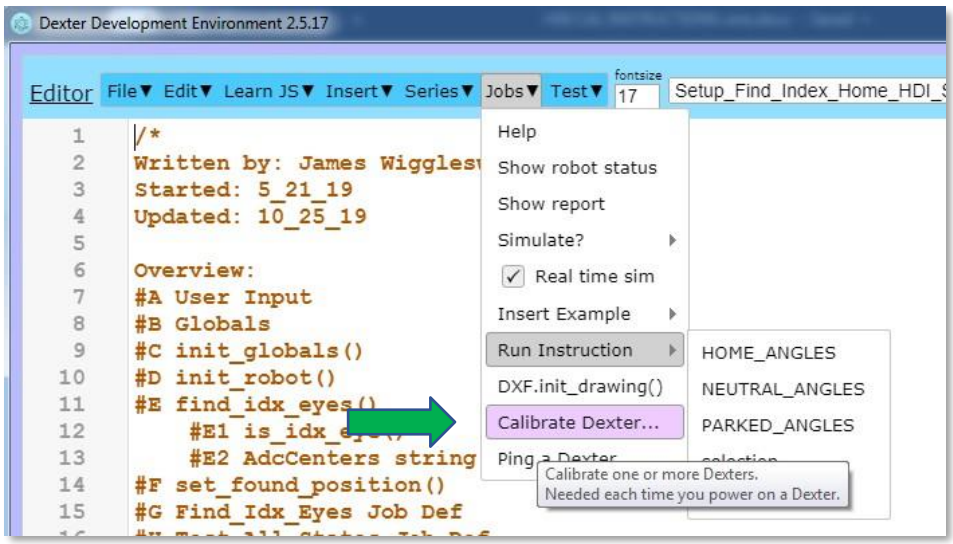
1. Line up the X designated on the Base Long with the center of the ExGear Mount Bottom (the J3 motor wires are located here). Fine tune the location of the base by lining up the right edge of the J1 OptoBlock with the raised notch on top of the Base Code Disk.
2. Position the robot to its most upright position (home position), the J5 code disk assembly is level and end effector home notch is positioned correctly at the J5 OptoBlock.
3. Power on your robot.

4. Open DDE, click File, Open, then select the file highlighted below.

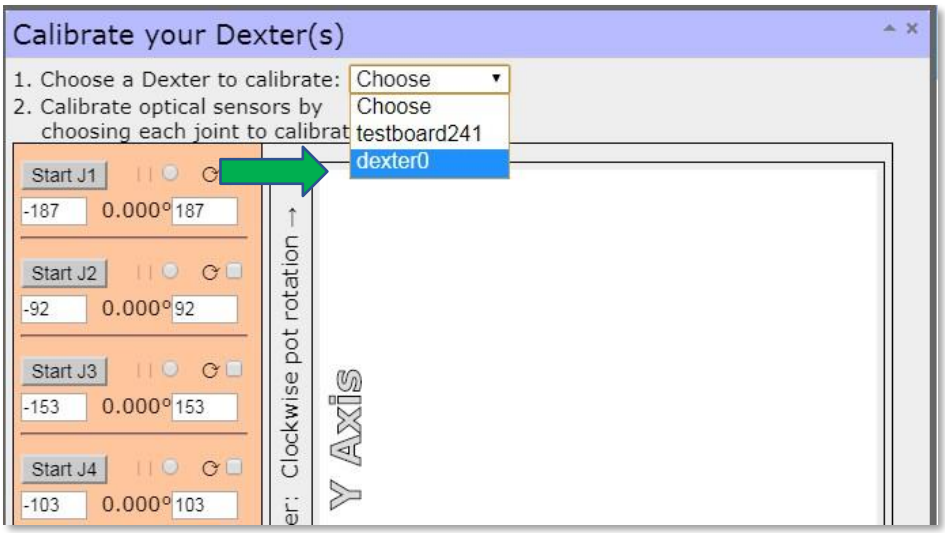


Navigate to your file location that has the folder containing Dexter Files with the newest date: then select the Setup_Find_Index_Home_HDIv2.dde

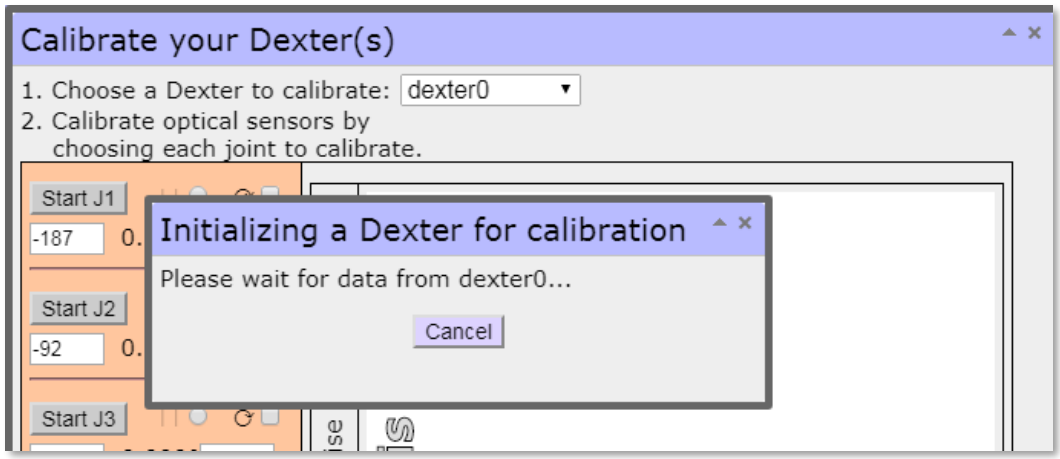
5. Next Select Jobs and choose Calibrate Dexter



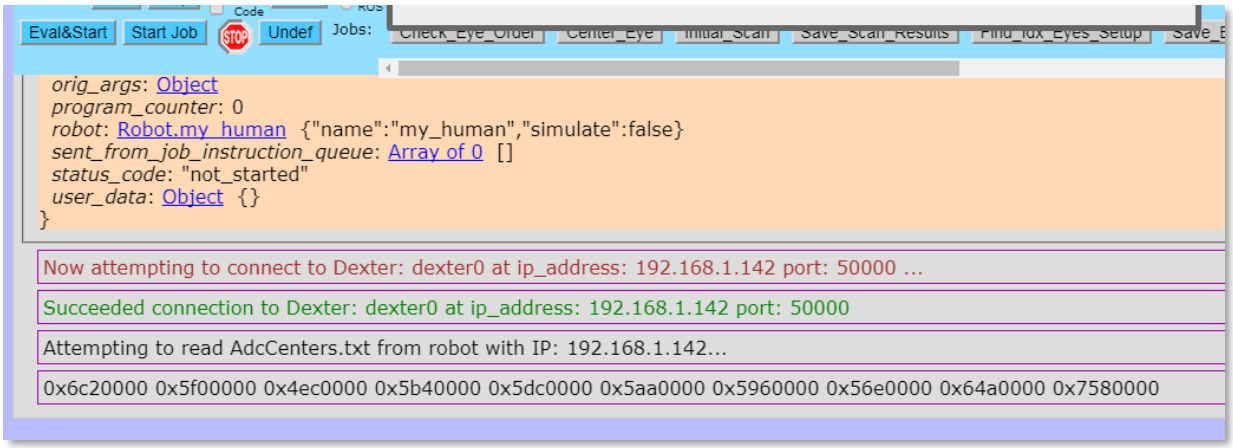
6. In the Calibrate screen select Choose then select dexter0



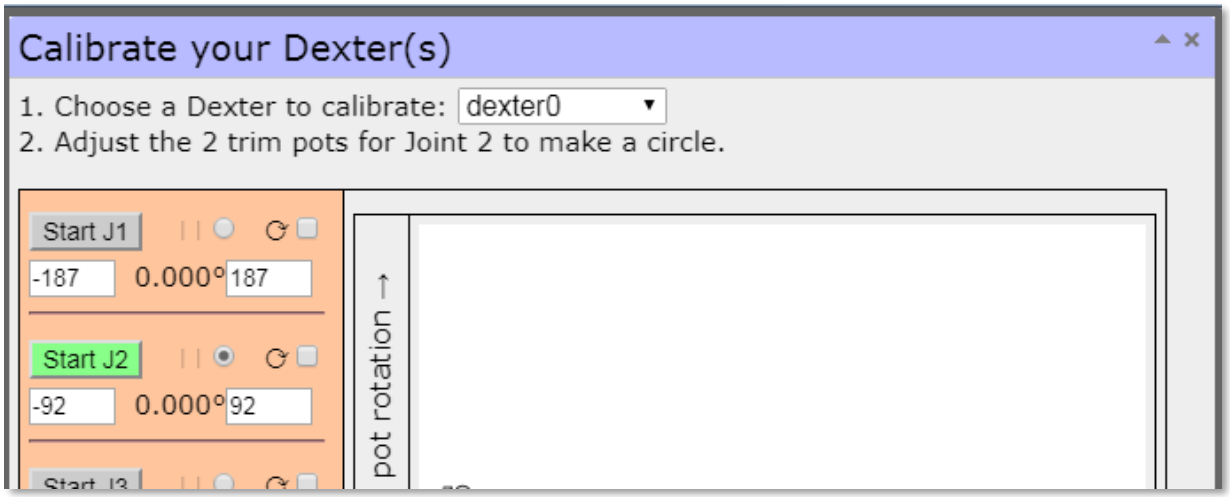
7. The Initializing Window will appear and go away once the Robot is connected to DDE



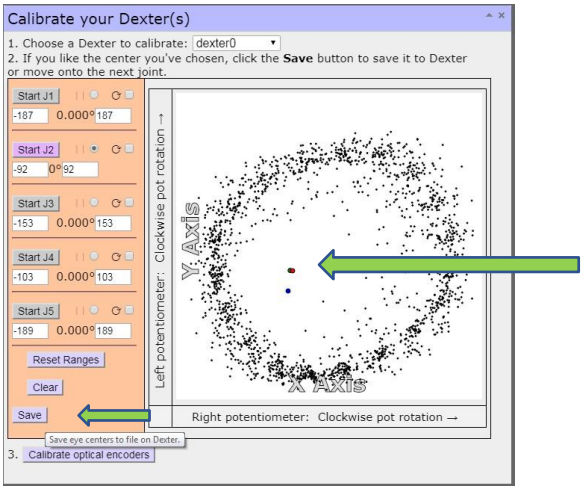
8. You will also see the following dialog in the lower window of DDE that shows connection



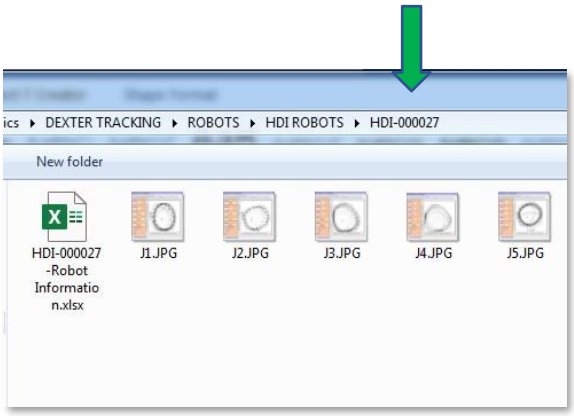
9. Start the calibration with J2 (in case J1 and J2 are wired incorrectly) this will avoid overreaching your J2 range and your robot hitting the surface if they are backwards. Select Start J2.



10. Run through the J2 cycle, adjusting the potentiometers “pots” until you get a centered circular cycle similar to the image to the right. The cycle should be counter-clockwise. If not, then the Phototransistors were installed backwards and will need to be switched before moving forward. You can adjust the pots and hit clear to view the changes during the cycle. Once you have a good circle and open eye, restart the cycle and have it run a complete cycle without making any adjustments. When complete, select the center of the open eye (usually the green or blue dot will show you the best center) and click Save.



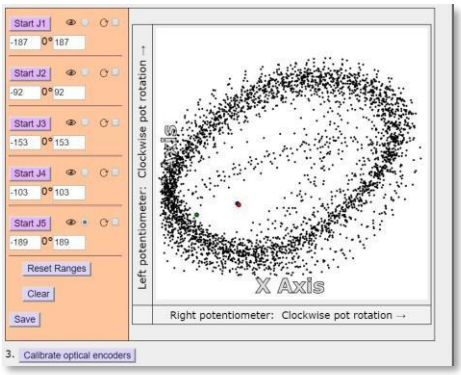
11. Once you save each joint, use the snipping tool to capture a screen shot of each Calibration window and save into the Dexter’s serial numbered folder.



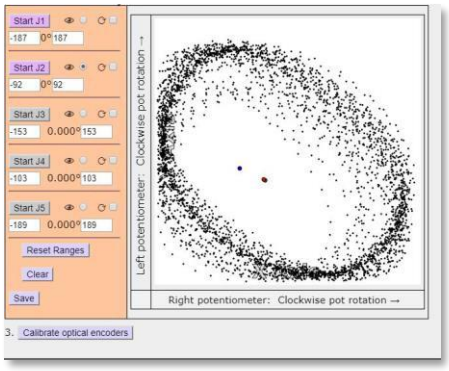
12. Continue the same process with each joint. Once are you completely done with the initial joint calibration proceed to the STEP TWO document for the final calibration processes.

TROUBLESHOOTING ISSUES

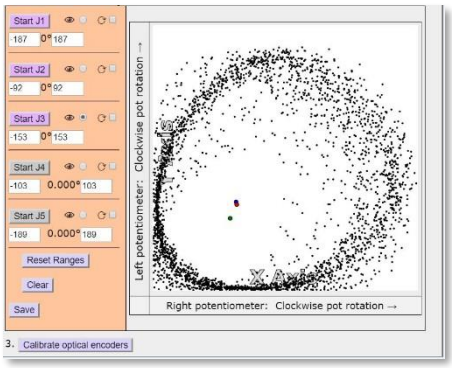
The following are screen shots to assist with obtaining a good calibration eye.



Leaning to the right, the Opto Block needs to be closer.



The Opto Block needs to be shimmed. Start with an .05 shim add shims until you obtain a decent circle.



The Opto Block holes for the Photo transistors may be too small and the block needs to be reviewed or replaced.