



## AUTOMATED ROAD AND PAVEMENT CONDITION SURVEYS

### Water Tray Calibration

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**CAUTION: ALWAYS WEAR PROPER EYE PROTECTION SAFETY GLASSES AND/OR GOGGLES AND USE EXTREME CAUTION WHEN OPERATING THE LASERS ON THE PATHRUNNER. SERIOUS INJURY OR LOSS OF EYE SIGHT CAN BE CAUSED WITHOUT PROPER EYE PROTECTION.**

The purpose of this document is to show how to perform a water tray calibration test. A water tray calibration test should be performed only once a year unless otherwise instructed by Pathway Services.



**Warning: Put on laser safety glasses and make sure no one will be walking behind the Pathrunner.**

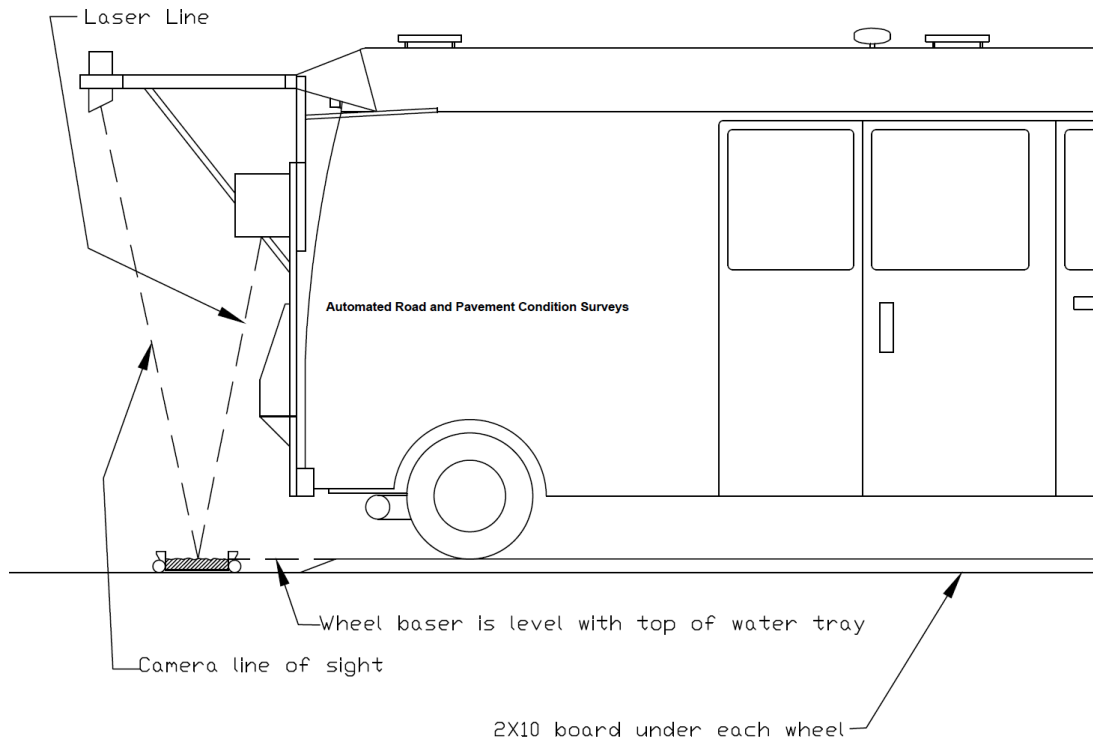
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Before proceeding with the rutting calibration, it is important to create a backup copy of the C:\ drive for the 3D computer. Copy the "3D\_Camera.cal", "3DHi3D\_Mark\_16\_ROI\_140\_Exp\_Enable0\_900scans\_NoTrigger.prm" and the "3DCamera.exe" to a USB drive for safe keeping.

1. Position the Pathrunner on blocks to elevate the base of the vehicle wheels to the same level as the water tray and position the lasers and camera on the center of the water tray. Make sure the wheels are straight and completely centered on the blocks:



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2. Set up the water tray, fill with water, lay velum paper on water and lightly coat the paper with a flat gray spray paint to cover the paper entirely.

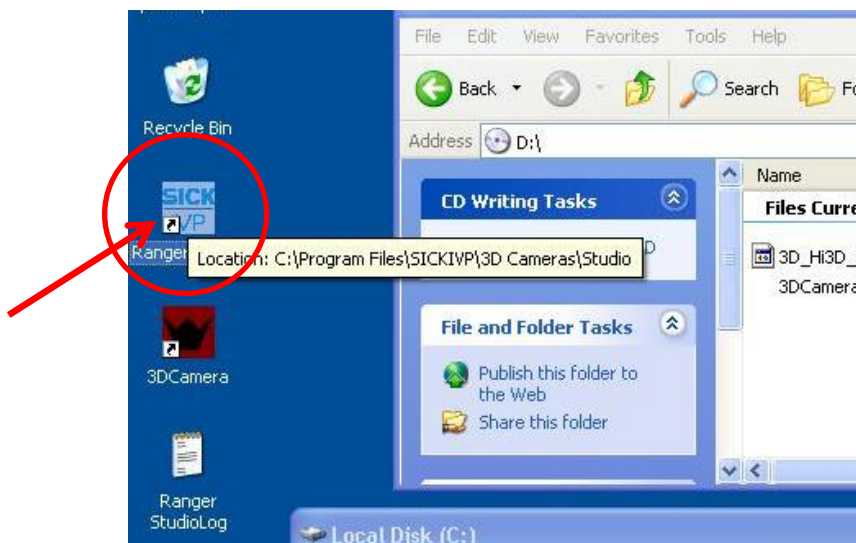




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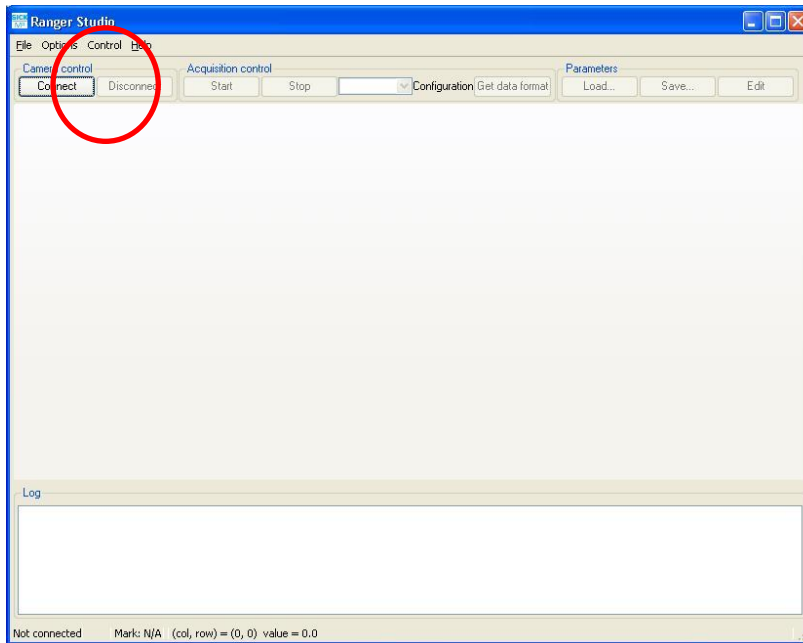


3. Turn on the Profiler computer and the 3D computer.
4. Load the "SickIVP" software by double clicking on the "SICK IVP" icon on the desktop.



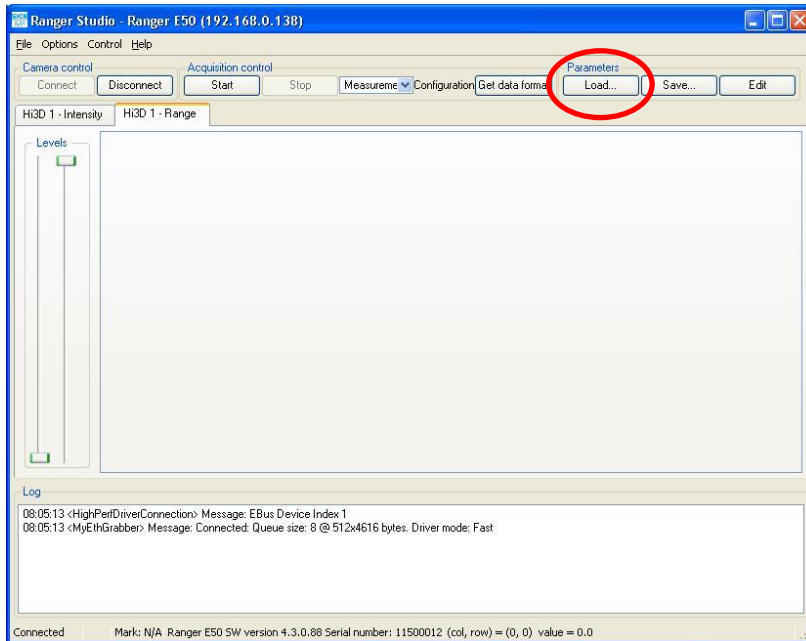
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5. A window will open similar to the one shown below. Click “Connect” in the upper left corner. The camera will connect to the software. This may take a few minutes.

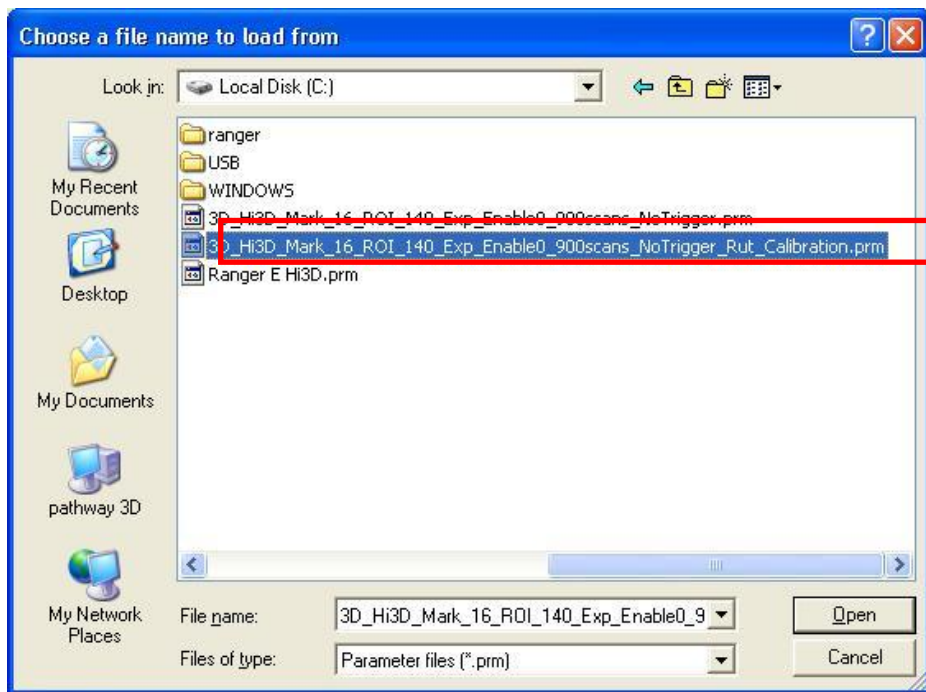


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6. Once the camera is connected, the “Start” icon will be active. Click the “Load” icon on the upper right side.

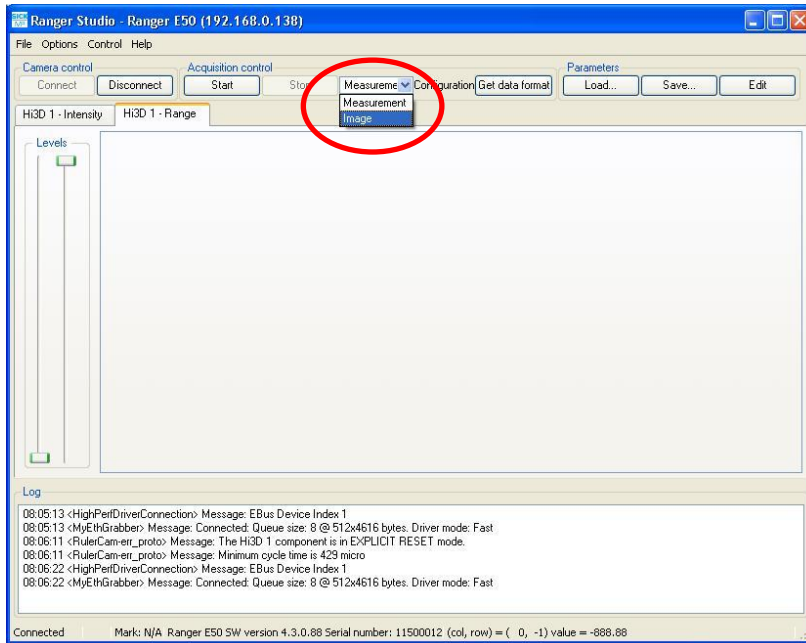


7. A window will appear to choose the \*.PRM file. Select the new “3DHi3D\_Mark\_16\_ROI\_140\_Exp\_Enable0\_900scans\_NoTrigger\_Rut\_C.prm” and click “Open”.

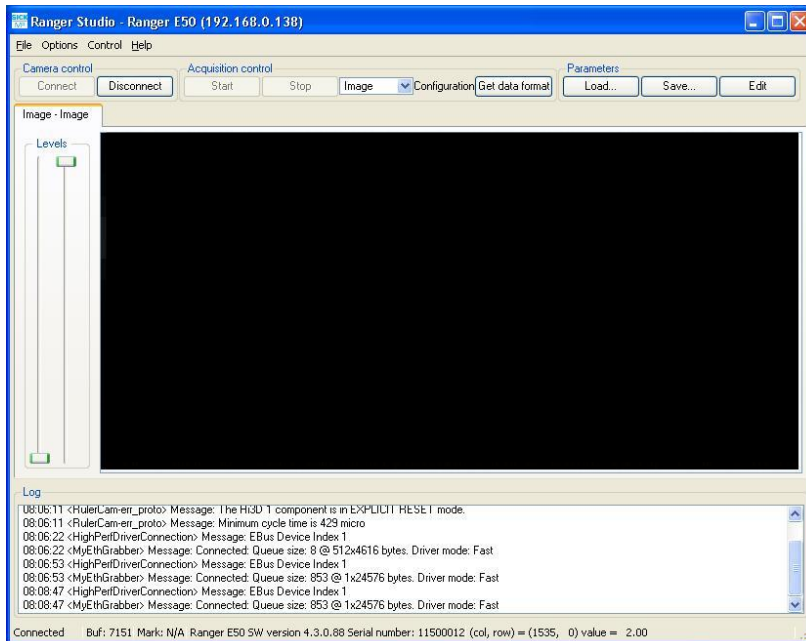


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- Click on the drop down menu at the top of the screen and select "Image".



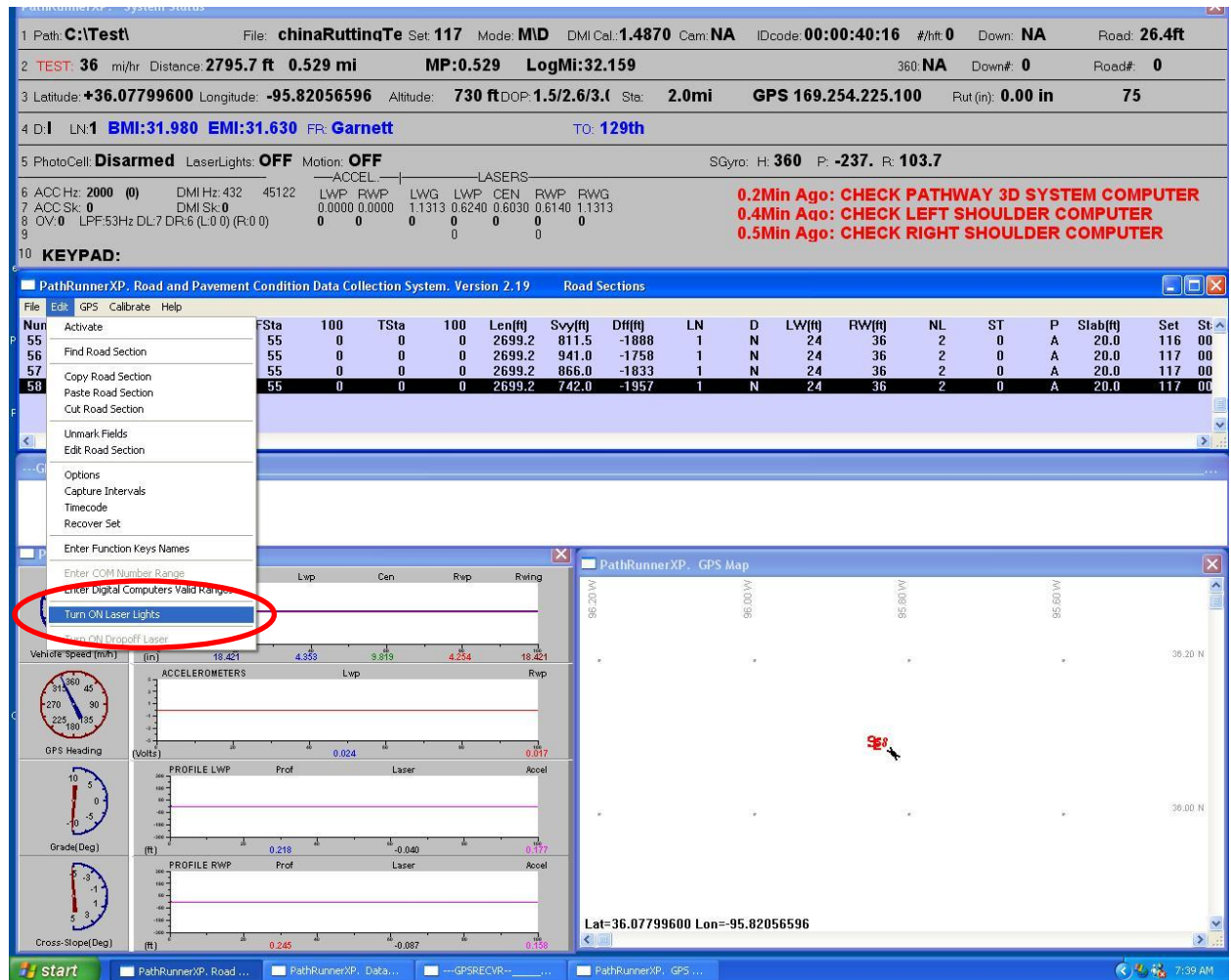
- Click the "Start" button on the upper left side of the window. A window will appear similar to the one shown below. The image will appear all black if the laser lights are not turned on.



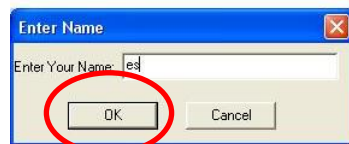


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10. Switch to the Profiler computer. Open the Pathrunner software and choose “Edit”  
→ “Turn ON Laser Lights”.



11. Enter the User's name and click “OK”.



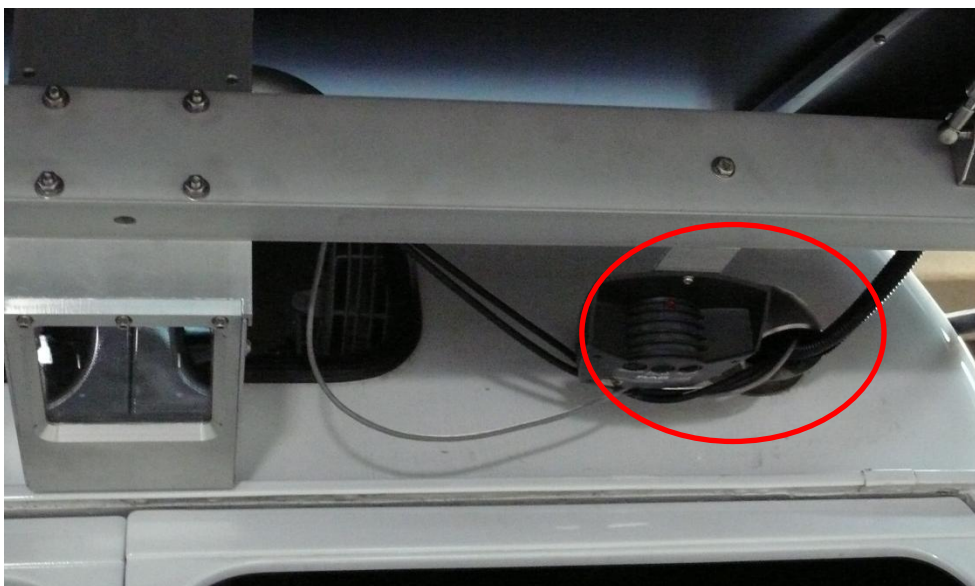
12. Make sure it is safe to turn on the laser lights and click “Yes”



13. The Profiler software will show that the laser lights are on:

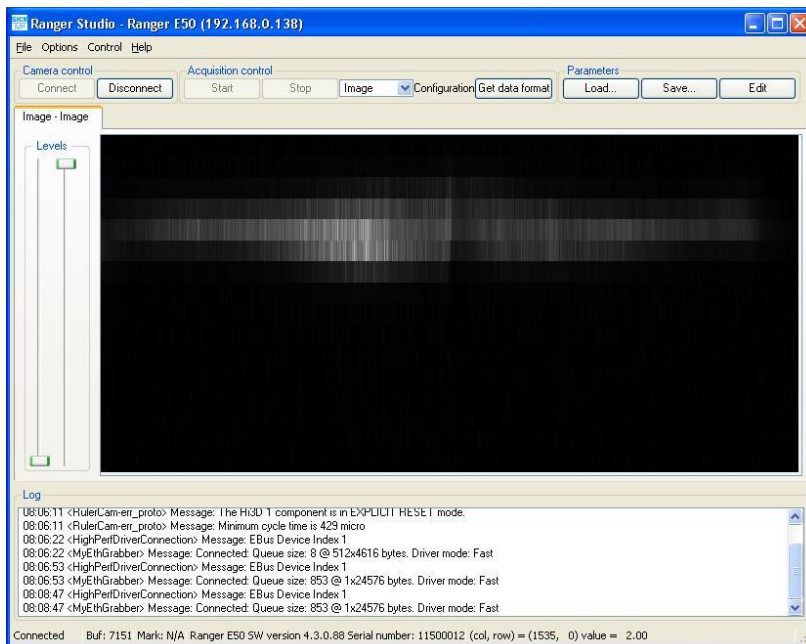


14. If a person or moving object is behind the Pathrunner, the Profiler might detect movement and turn the laser lights OFF. The Profiler will say “Motion Detected”.  
(A piece of tape or towel might need to be installed to cover the black motion sensor on the back of the Pathrunner during the calibration process. Remove this when the calibration is finished. It is very important to make sure any person in the vicinity of the laser lights is aware of the potential dangers and the safety procedures to follow when near the Pathrunner.)



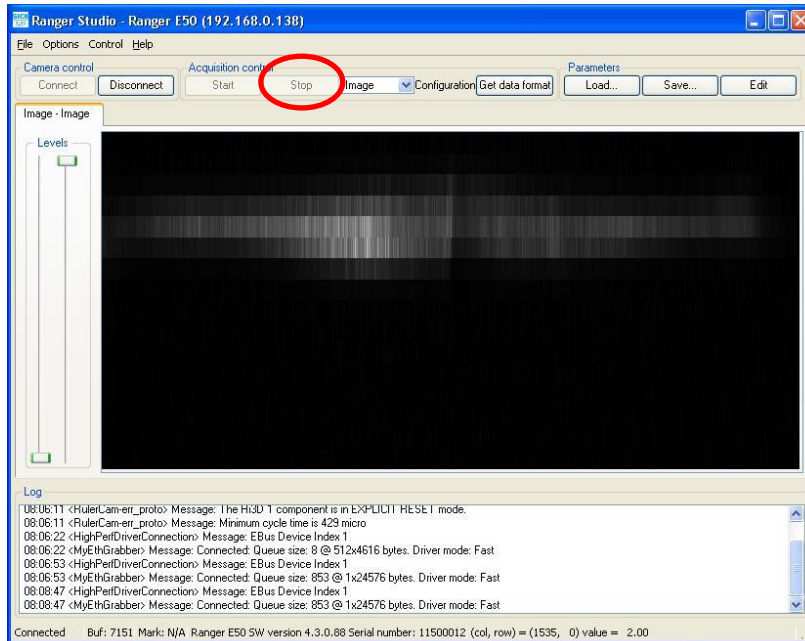
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15. If a person is detected or if the Profiler is not touched for 7 minutes, the Profiler will turn the laser lights off. To turn the laser lights on again, choose “Edit” → “Turn OFF Laser Lights” and then choose “Edit” → “Turn ON Laser Lights”
16. When the laser lights are turned on, switch to the 3D computer. The laser light should appear in the image now and will look like this:



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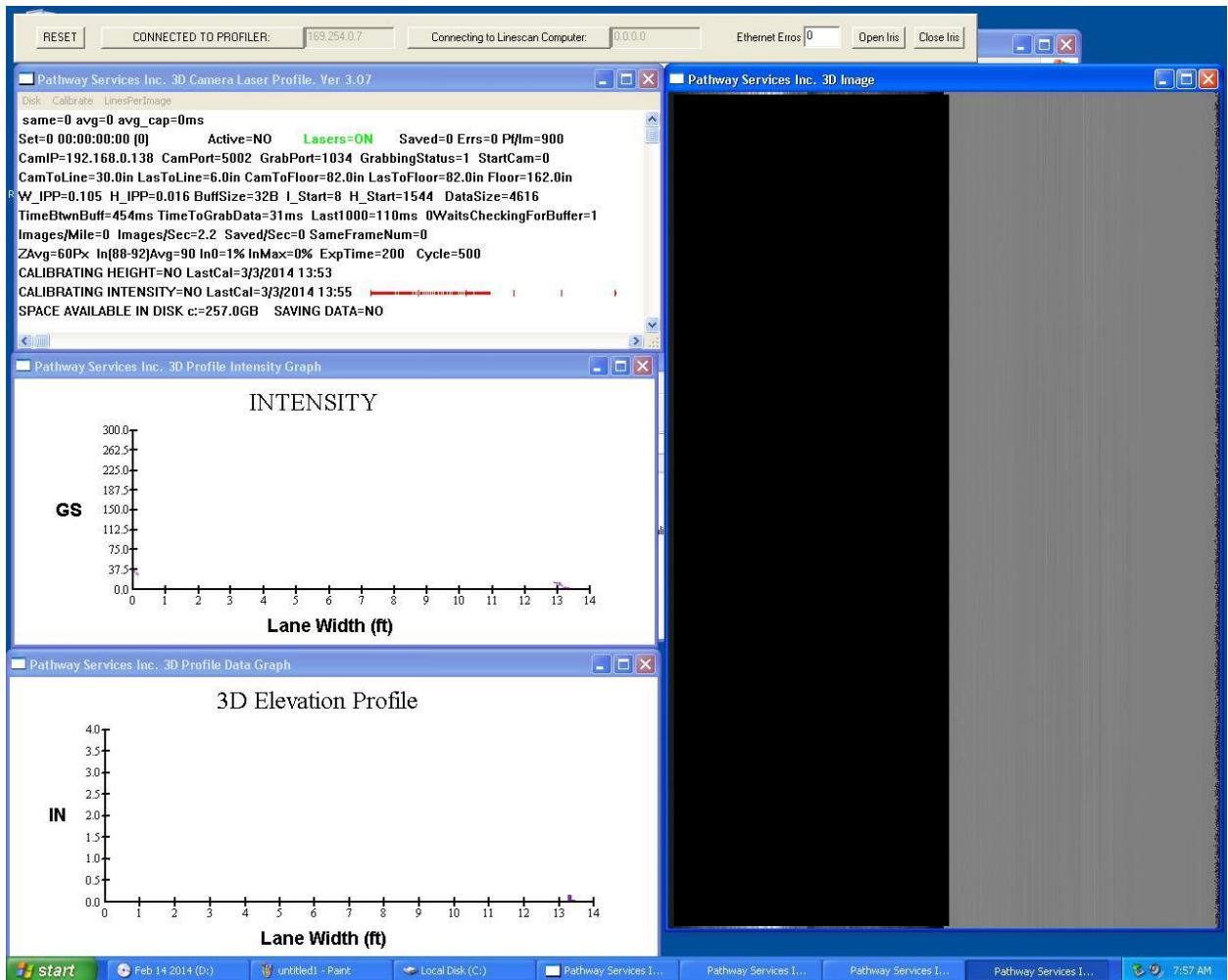
17. Once the lasers are calibrated by Pathway Services they should not move. If the laser lights are not straight or do not meet in the middle contact Pathway Services immediately. If the laser light line looks straight, click the “Stop” button.



18. Close the “Ranger Studio” software by clicking the red “X” on the upper right corner of the screen.

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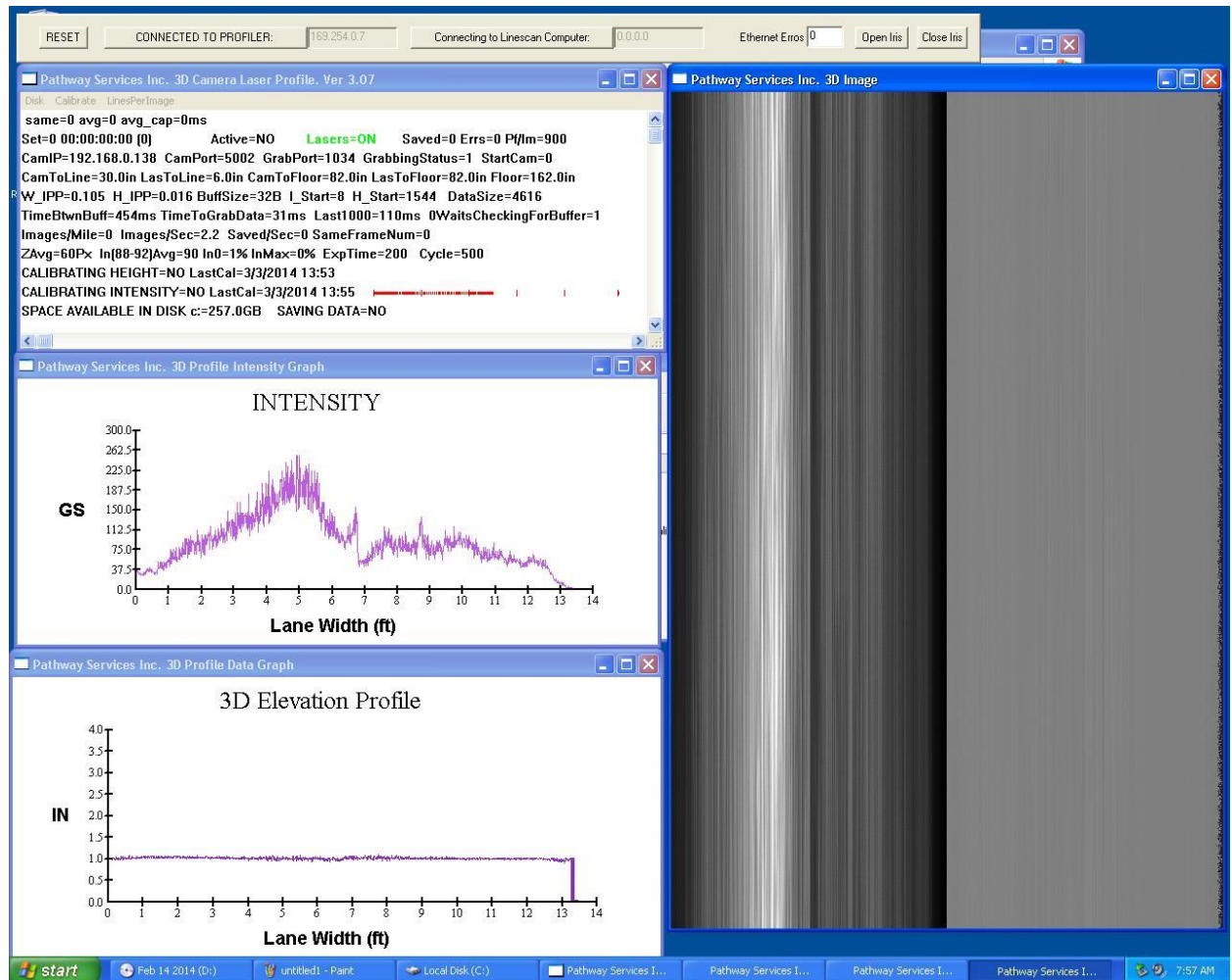
19. Launch the Pathway 3D camera software. A series of windows will appear similar to the ones shown below. If the laser lights are not turned on, the purple profiles will not appear and the image windows will look black and gray.





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20. Switch to the Profiler computer to turn on the laser lights by choosing “Edit” → “Turn On Laser Lights”. Switch back to the 3D computer. With the laser lights on, a profile should appear on the “Intensity” and “3D Elevation Profile”.

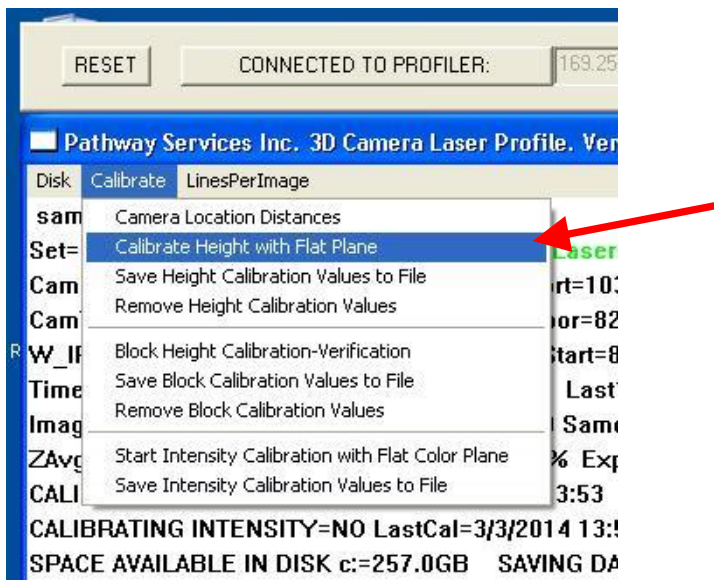


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21. With the laser lights “ON” and the lasers in the middle of the water the rutting calibration can be performed.



22. In the 3D software, choose “Calibrate” → “Calibrate Height with Flat Plane”

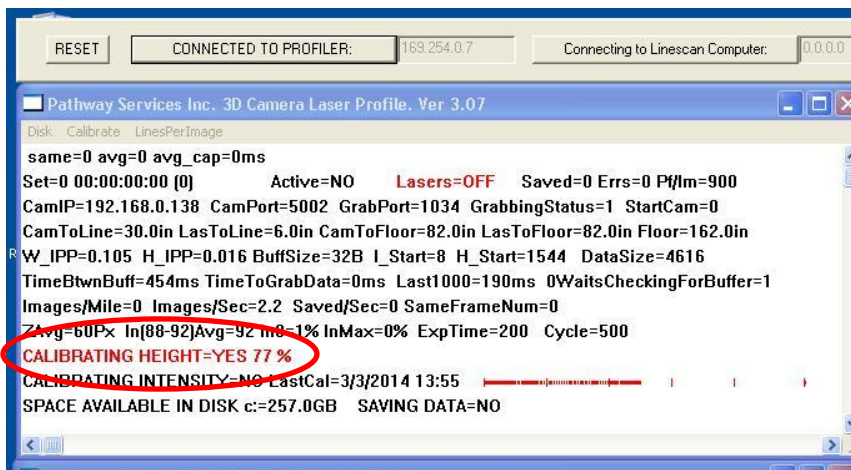


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23. Make sure the laser lights are “ON” and the laser lights are on a flat plane on the water tray. Click “Yes”

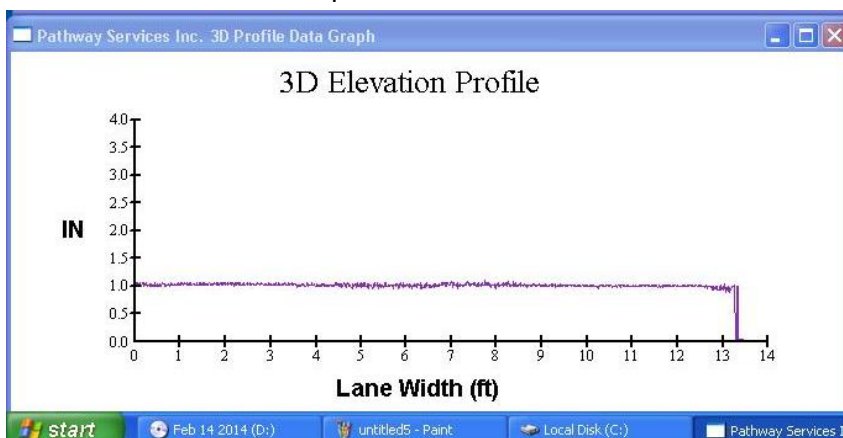


24. The 3D Computer will begin the rutting calibration. A red warning will appear during the rutting calibration process. When the process has reached 100%, it will turn black. Make sure the laser lights remained active for the entire calibration process.

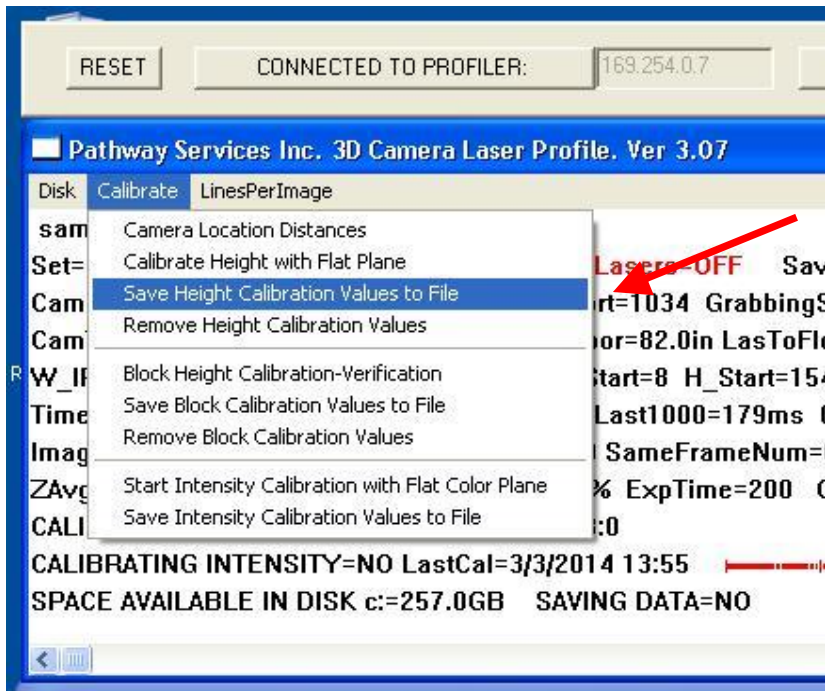


**DO NOT MOVE THE PATHRUNNER UNTIL THE CALIBRATION IS COMPLETE!!**

25. Once the calibration is complete and the “3D Elevation Profile” is flat and level, the calibration is complete.



26. Click “Calibrate” → “Save Height Calibration Values to File” in the 3D computer software.



27. After the “Flat Plane” calibration is complete, the intensity values will need to be calibrated as well. Before this can be done, the glass window for the 3D camera will need to be removed to allow access to the auto-iris on the 3D camera.
28. Go to Calibrate menu in the Pathway 3D window. Click “Start intensity Calibration with flat color plane.”
29. Carefully close the iris of the camera by turning the gear mounted to the 3D camera lens.
30. Start calibration.

NOTE: Do not step over the water tray or move the vehicle or drastically change the lighting while calibration is in process.

31. Click “Calibrate” → “Save Intensity Calibration Values to File” in the 3D computer software.