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Subject: Calibrate the Tip Alignment Station Location on the Icon Microscope

System(s) Affected: Icon

Action Category: As Required

Summary: Icon Alignment Calibration

**NOTE:** This document will go over how to calibrate the tip alignment station Location on the Icon. When alignment station is not calibrated, clicking the "move to alignment station", you would get a error message: "Alignment station is not calibrated". This would prevent users to move to alignment station to align the laser. With alignment station precisely calibrated, users are able to move to alignment station without an error message.

## Calibrate the Tip Alignment Station Location procedure:

- 1. Please mount a standard probe holder with probe
- 2. Initialize the Stage, if not done so
- 3. Locate tip using the "SETUP" icon on the left side of the screen, focus on the tip. DO NOT GO TO THE ALIGNMENT STATION!
- 4. Click on the "NAVIGATE" icon.
- 5. Navigate to the Alignment station manually use XY control or trackball

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Alignment station



Figure 1

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Figure 2

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Figure 3

- 6. move to middle of the mirror area of the optical standard (Alignment station), then focus. see figure 3 above.
- 7. Write down the Z, X, & Y Coordinates as shown in the bottom right corner of the NS software screen.

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Z: -16691.4 µm   Optics: -3514.3 µm X: 38150.0 µm	Y: 53933.0 µm	Tip: Secured

Figure 4

8. Add +500um to the Z Coordinate

Original Z value	-16691 um
Add 500um	+ 500 um
New Z value	-16191 um

Why add +500 um? Because we want extra microscope clearance over the optical standard.

9. go to set up, then focus on the **shadow** of the tip, see figure figure 5 below. if you focus on the shadow of the tip, you should be able to see the laser. Write down the optics value at the bottom of the software.

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Workflow Toolbar	×		
1	Probe Setup     1.1 Currently selected probe and laser spot size:     Dorbe Tune: Scandard Air. Tin Social & Helmour.		
Scan ScanAsyst in Air	Installed On: 02/18/2020 Calibration: Estimated on 02/18/2020 at 17:08 Scan QR Ecde Select Probe		
Setup Setup Navigate Check Parameters	Align Laser on Probe     2.1 Move to Laser Alignment Station - optional		
Engage	More to the Magnet Siden 2.2 Align laser using top controls ( <u>Watch Viden</u> )	<b>÷</b>	
Stan	2.3 Align faster using side controls ( <u>Watch Video</u> )     Focus Tip		
🕹 Withdraw	3.1 Move back from Laser Alignment Station		
	Four Crimb		



- 10. Exit Nanoscope Software.
- 11. Using Notepad, open the file: PAR\staged4.par located in your Nanoscope program directory: right click on the Nanoscope software>>properties>>open file location>>PAR folder>>stageD4. par

12. Modify staged4.par

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- 13. Save staged4.par
- 14. Exit Notepad software
- 15. Start Nanoscope software (be sure to use the correct version)
- 16. In setup, Press the "Alignment station" icon, let the AFM move to the alignment station. if anything weird happens, click abort if needed.
- 17. once done, if you can't see the shadow of the tip, Focus the microscope so that you can see the cantilever reflection (shadow of the tip) and the laser spot.
- 18. Adjust the Illumination so that the laser spot and cantilever can been easily seen.
- 19. In setup, return to the alignment station, then you should see the actual cantilever in the camera (not the shadow of the cantilever).
- 20. Exit the Nanoscope software and open again to ensure that the optics position and illumination values at the alignment station are saved.