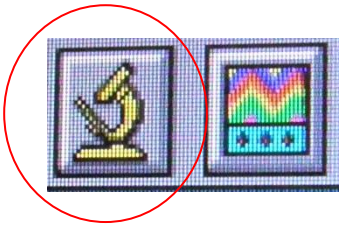
Dimension 3000 SPM Quick Guide

A. Sign in to GMSF Equipment Kiosk

B. Launch NanoScope Software—Select Scope Icon

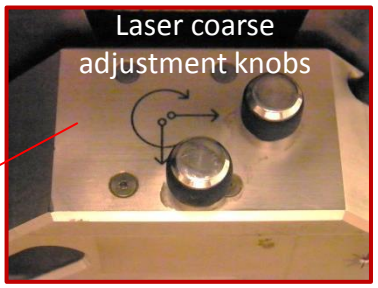


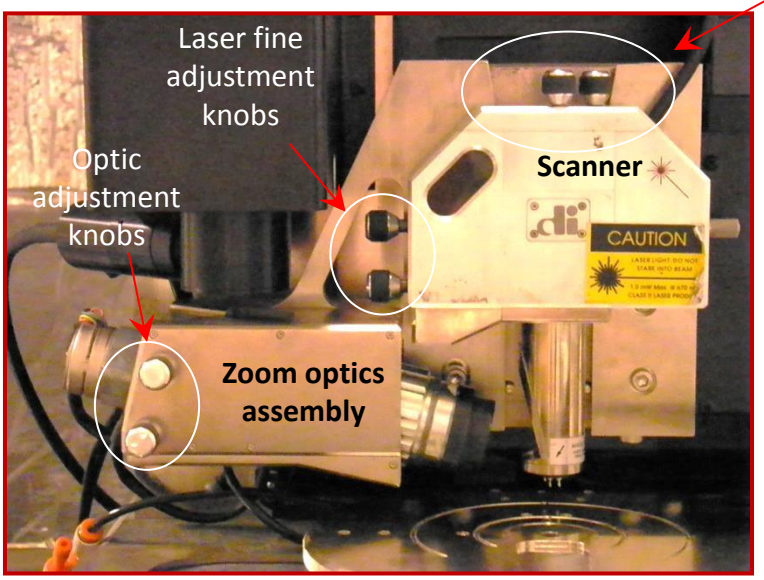
C. Load Tip Onto Cantilever Holder

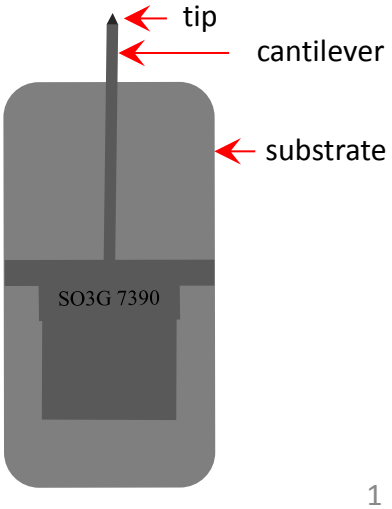
D. Pin Cantilever Holder to the end of Optical Tube on Scanner

E. Align Laser

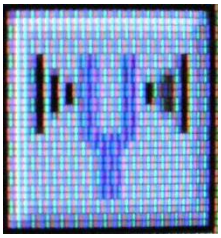
- Using coarse adjustment knobs to achieve at least 2 volts SUM.
- Using fine adjustment knobs to align red spot to center of photodetector.
- Make sure you are not aligned to the substrate. You can check this by rotating the front, coarse adjustment knob forward and back. If the SUM drops off quickly you are moving the laser from one side of the cantilever to the other—correct position. If it does not, you are moving the laser from one side of the substrate (wider portion of the probe) to the other—incorrect position.

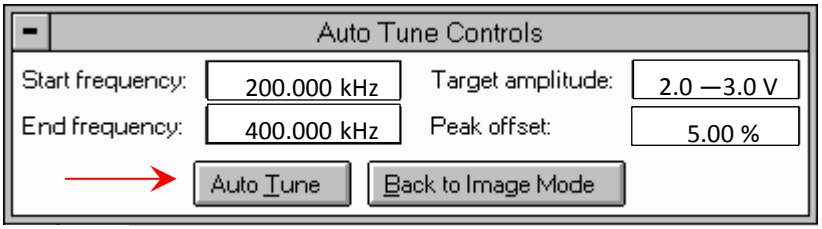






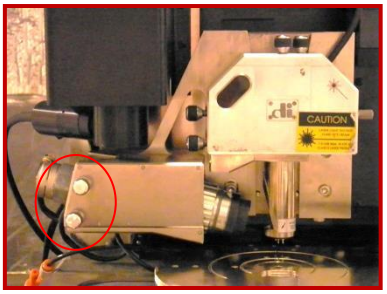
F. Cantilever Tune





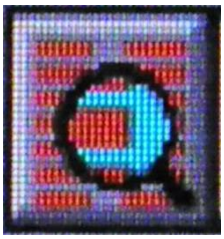
G. Locate Tip

Open GrabBee and center the tip in the camera field of view using the optics adjustment knobs located on the side of the zoom optics assembly.



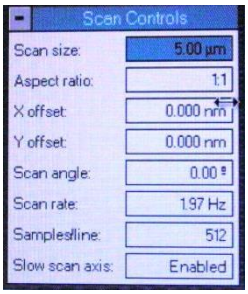
Focus on tip using the trackball.

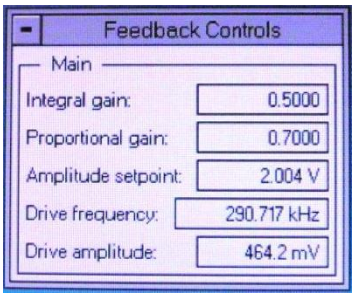
H. Focus Surface

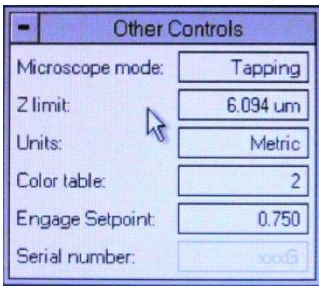


Focus on the surface using the trackball with the bottom left button depressed.
Rolling toward you or down moves stage closer to the tip.
Rolling away from you or up moves stage away from the tip.

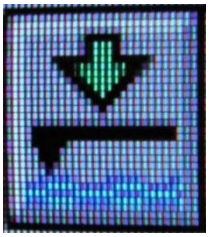
I. Initial Scanning Parameters







J. Engage



A pre-engage check begins, followed by Z-stage motor motion.

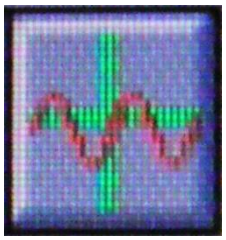
Check for false engage by observing Center Position. If at fully extended or fully retracted position, you are false engaged.

If no engage or false engaged, withdraw tip. →

Possible fixes: If it never engaged, check Focus Surface position and move the sample closer to the tip. move laser spot to a lower RMS value or change tip. Be sure to retune the tip in each case.

K. Select Scope Mode

Adjust scan parameters while in Scope Mode →



- Increase integral then proportional gain to improve trace/retrace tracking—decrease when noise appears
- Proportional gain can be 30%—100% higher than integral gain
- Slow scan rate to improve trace/retrace tracking

L. Return to Image Mode →

- Monitor Scan
- Adjust area of interest using x/y offsets or zoom feature on image display

Diana Convey
GWC-B72
480.965.9614
diana.convey@asu.edu