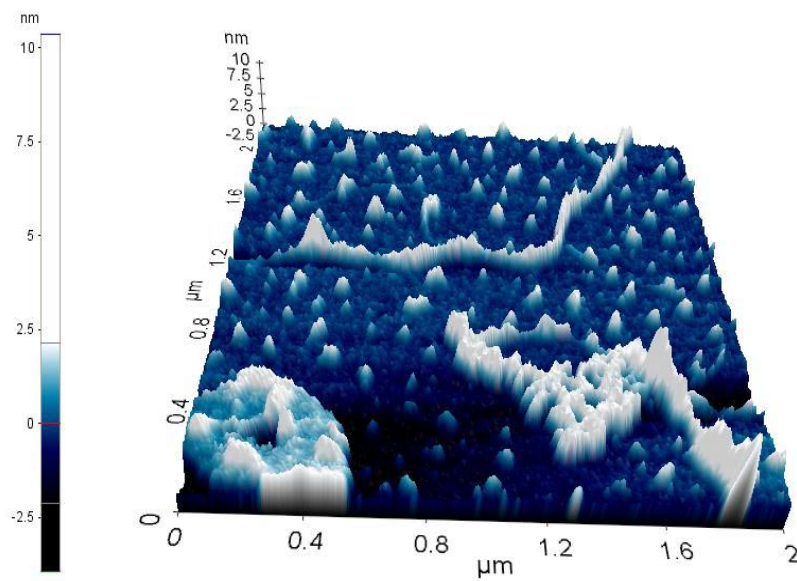


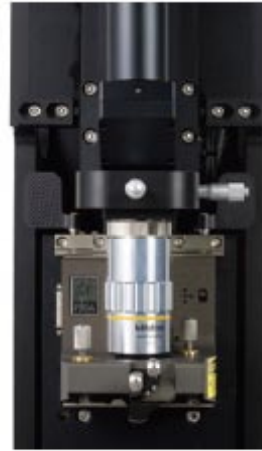
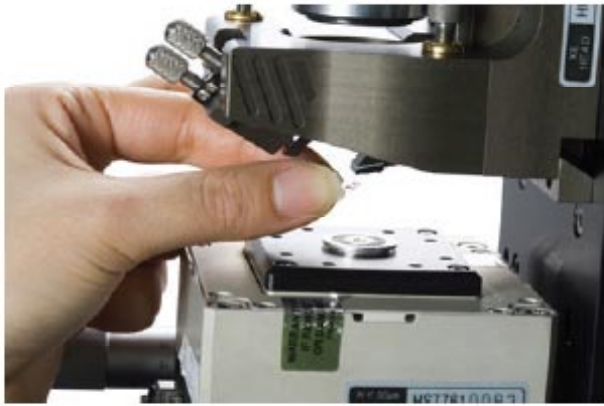
ATOMIC FORCE MICROSCOPE (AFM) OPERATING INSTRUCTIONS



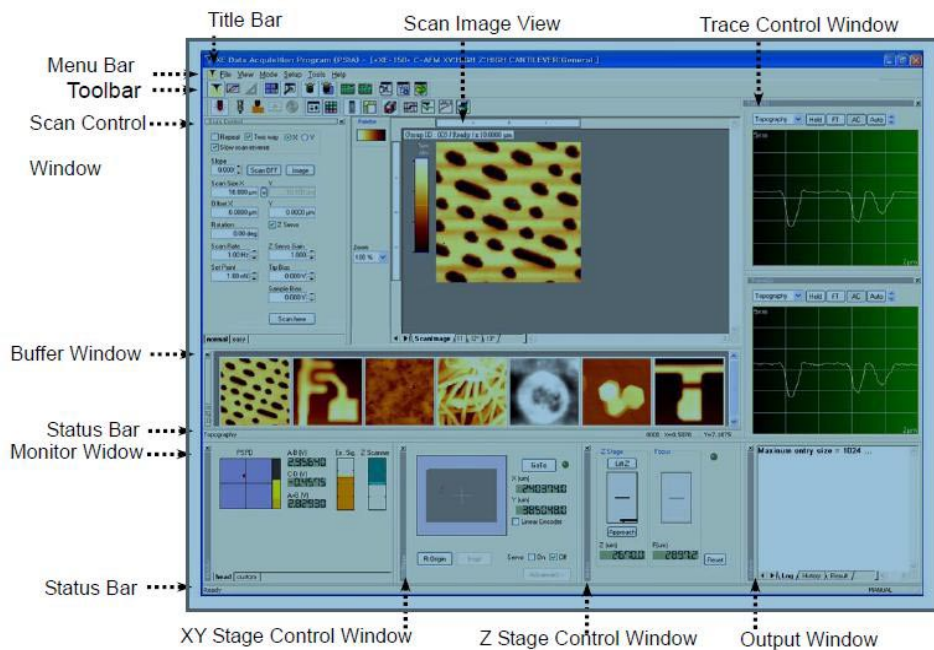
PSIA XE-100E



- ❖ Before you open the PSIA imaging software, be sure that the tip is on the head. If tip is not on the head part, take a tip on the head part carefully.



- ❖ Open the PSIA software on the desktop and then switch on the head.



XE-100E Imaging Software Interface

- ❖ After you see the software interface, small window that shows resonance frequency appears on the screen. If dont see any frequency, **dont PANIC!** (You must find the laser and align it)

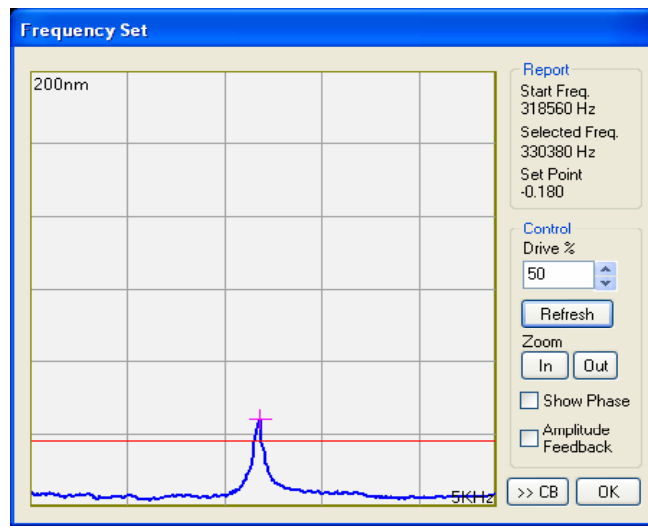
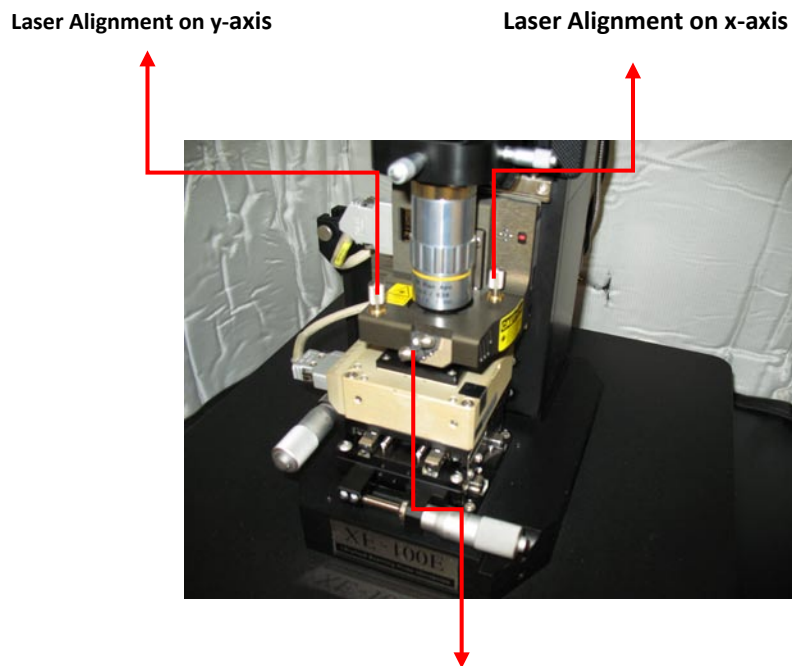


Fig.1 Frequency Selection Window

- ❖ There is a camera software on the desktop. Open it with the camera light bank.
- ❖ Focus the objective to the tip by camera and see the tip clearly.
- ❖ Align the laser (x-y direction) on the tip by tuning the knobs on the head till it reaches where the maximum signal you have. (Fig.2)



Alignment of laser on detector (center alignment)

Fig.2 PSIA Head Part

- ❖ After that, align the signal on the four quadrant photodiode until signal is on its center. (Meaning you align the signal on the center of crosshair appearing on the software interface)
- ❖ Ensure that you have A+B voltage value is between 2.5V-3.0V and A-B is -1V-1V.

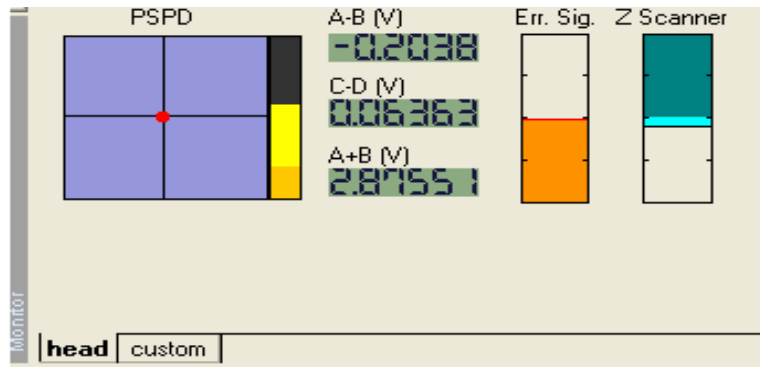


Fig. 3 Laser Voltage Levels on detector

- ❖ Select the type of tip you have from the Part Selection Menu. (NCHR-MFMR-Contact mode cantilever)

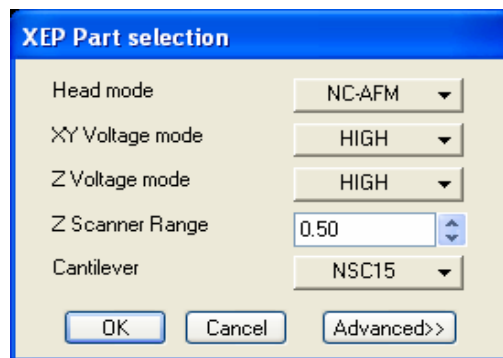


Fig.4 Cantilever Selection Window

- ❖ Press the button (NCM Setup) on the software to get natural frequency of the cantilever. Select the frequency (on the right or left side of the curve) and set point. (Fig.1)
- ❖ After that you are ready for imaging.
- ❖ Close the tip to the sample by hand with the help of software. Come closer to the surface. DONT HIT THE SURFACE!

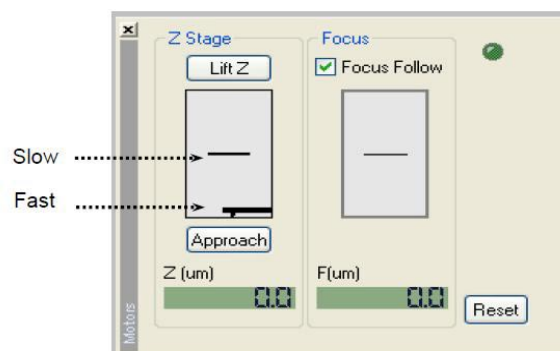


Fig.5 Motors Control Window

- ❖ Press the Approach Button on the software to reach to setpoint by itself.
- ❖ You touching softly to the surface, you see the z-scanner voltage value drop (halfy) on the screen.
- ❖ Select the resolution from scan config and the channels you want to see, select the input config window.

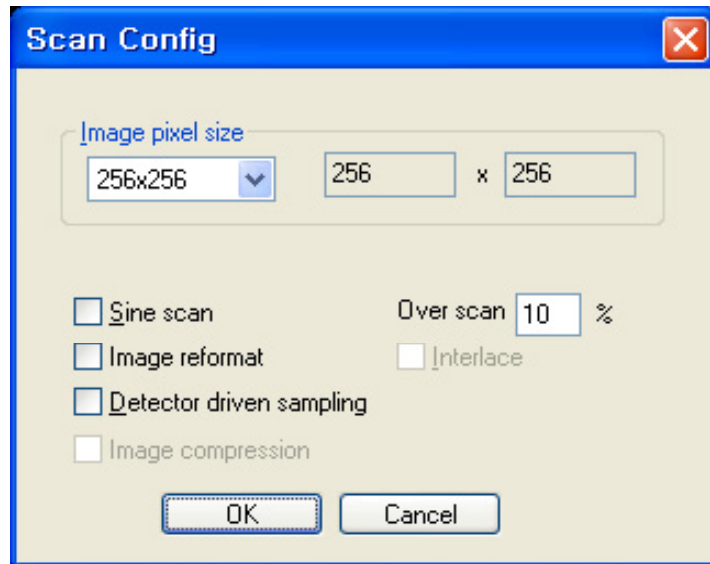


Fig.6 Scan Config Window

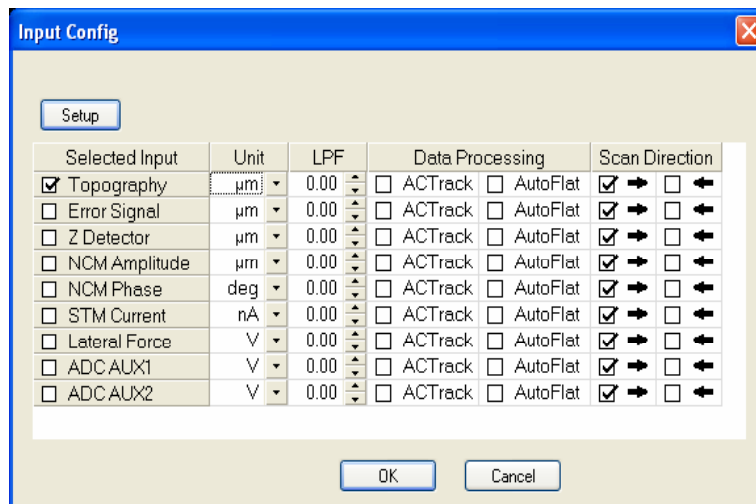


Fig.7 Input Config Window

- ❖ Select your scanning area size and scanning rate.
- ❖ Adjust the gain, setpoint or drive value to have a stable topography trace.

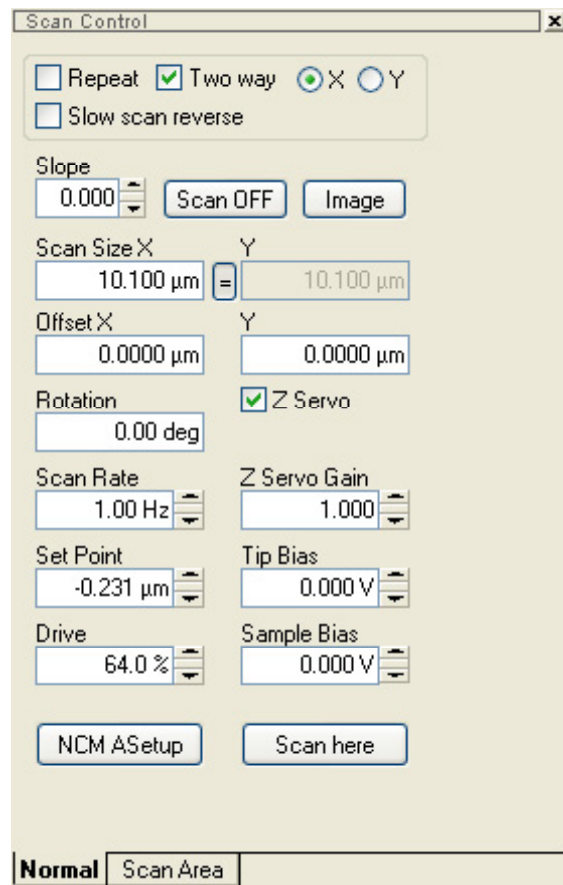


Fig.8 Scan Config Window

- ❖ If you want to see your surface by camera, slightly hold your tip from the surface, open the camera and see your region you want to scan by adjusting micrometers on the x-y scanner.
- ❖ Approach again.
- ❖ Press start button for imaging.

IMPORTANT NOTES

- If you encounter a problem with the tip you use and if you believe that it must be changed, please inform Burkan Kaplan (tel. :3513) and take a note on the logbook that must contain the information about new tip and put the other tip in the tip box.
- Dont forget to fill logbook with the right time you start and finish, and give necessary explanations about your measurement and any problems about the instrument.

Burkan KAPLAN

UNAM- Optic Characterization Lab (3513)

