

Nanoelectronics Lab, SR B14

3 – Equipment Training Procedure

To use equipment in SR B14 independently you must be approved

Typically you will be trained by a student/postdoc, then you will be expected to answer questions and demonstrate proficiency to Alan Seabaugh. Familiarize yourself with the manuals for the equipment you will use on the Nanoelectronics Lab facilities page <https://seabaugh.nd.edu/facilities/>.

For use of the probe stations:

Cascade East, West, Semiautomatic, and Cryogenic prober

make sure your trainer teaches you

1. The principles of force/sense in current-voltage measurements and how triaxial guarding works.
2. The probe types (3) we use and when to use them
3. How to clean and test probes
4. How to replace probes and dispose of used probes
5. How to fix vacuum leaks of the vacuum positioners.
6. How to adjust tension in the lever arm.

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STEP BY STEP INSTRUCTIONS
CASCADE EAST AND WEST PROBERS

1. Check that the vacuum is securing all probes on the station. If any are loose fix them by rubbing the gaskets with oil from your fingers or by applying a thin film of apiezon grease.

2. Choose the probes you will use and wire these to the semiconductor parameter analyzer.

3. Check that probes are showing less than 4 ohms resistance when lowered into contact with the wafer chuck.

4. Turn off LCD screen to semiconductor parameter analyzers when not in use. Turn off the semiconductor parameter analyzer if you suspect that it will not be used for more than a day.

5. Report any problems to seabaugh.1@nd.edu

FOR TEMPTRONIX THERMOCHUCK OPERATION

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TEMPTRONIX THERMOCHUCK OPERATION

1. You must not leave the lab for extended periods when conducting temperature-dependent measurements. Temperature control sometimes lost and can damage the chuck.
2. Probes must be raised during temperature changes because of thermal expansion.
3. If you will cool below room temperature turn on nitrogen flow to 2 SCFM.
3. Final I-V measurement should be made at the same temperature as the initial measurement to assure the device has not been damaged by repeated probing.
4. Shut down procedure

If the chuck is returning to room temperature from a higher temperature, cool to 0 °C.

If the chuck is returning to room temperature from a lower temperature, heat to 40 °C.

Then turn off Temptronix power and turn on flowing nitrogen.

Updated 1.21.2021