# M-2000 Woollam Ellipsometer

The following instructions are for the operational aspects of the Woollam M-2000 Ellipsometer.

Data analysis can be done in the Computer Room at IAC.

Instructions for use

1. Turn on the electronic unit and the lamp power supplies located beneath the Ellipsometer table. Press the buttons in the order indicated in the picture below. One should wait 30 minutes before collecting data to ensure the lamp sources are fully warmed up. Turn on the vacuum pump if you are planning to use it to hold down large wafers on the sample table
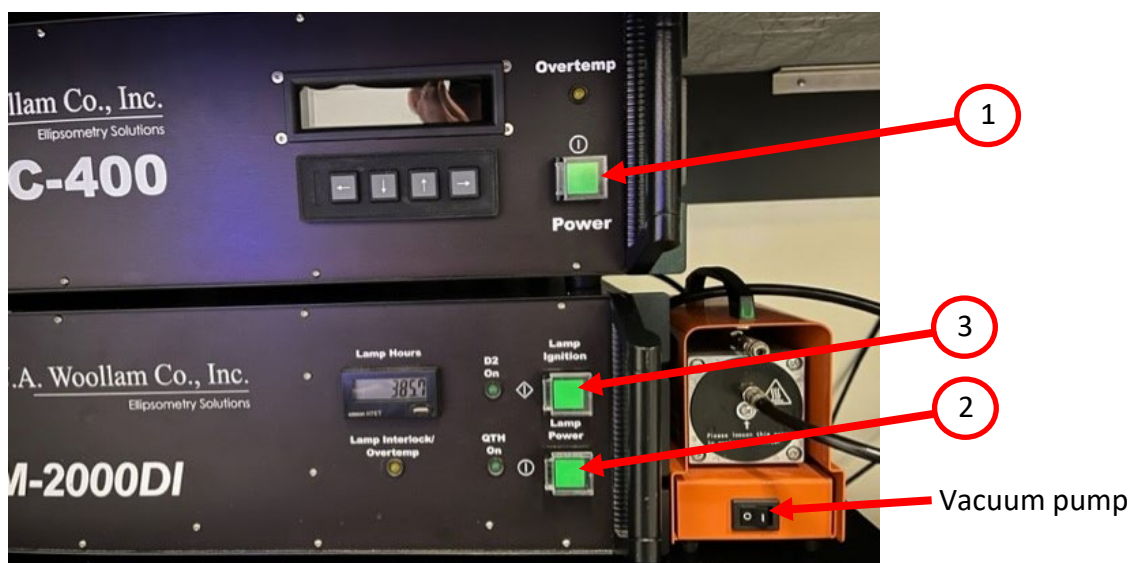

2. Open *CompleteEASE* to begin the data acquisition (Located on the Desktop Computer). The software will scan the hardware and initialize the drives to their home position (this may take a few minutes). After that the system status should read "Waiting to acquire Data".
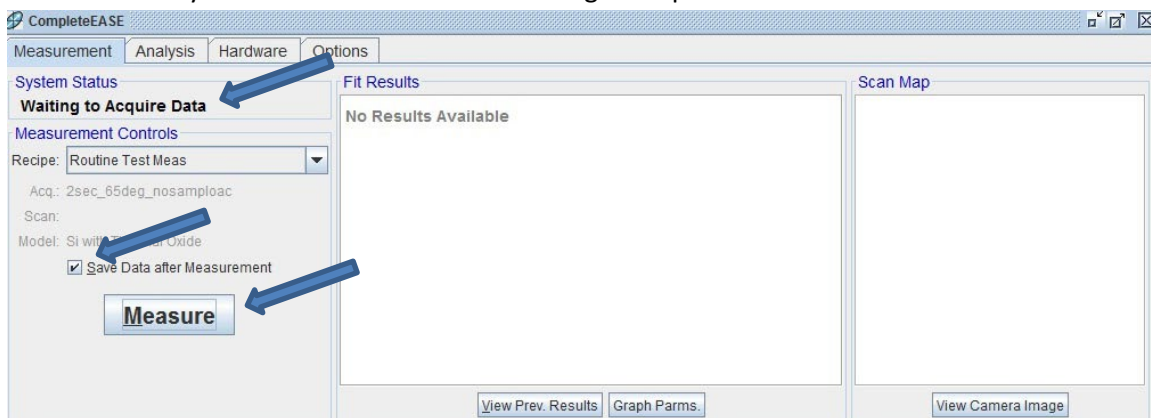

3. Make sure the "Save Data after Measurement" box is checked.

4. Place your sample on the sample table and turn on the vacuum pump to hold your sample in place. The switch is located on the lower left side or the frames (see below)
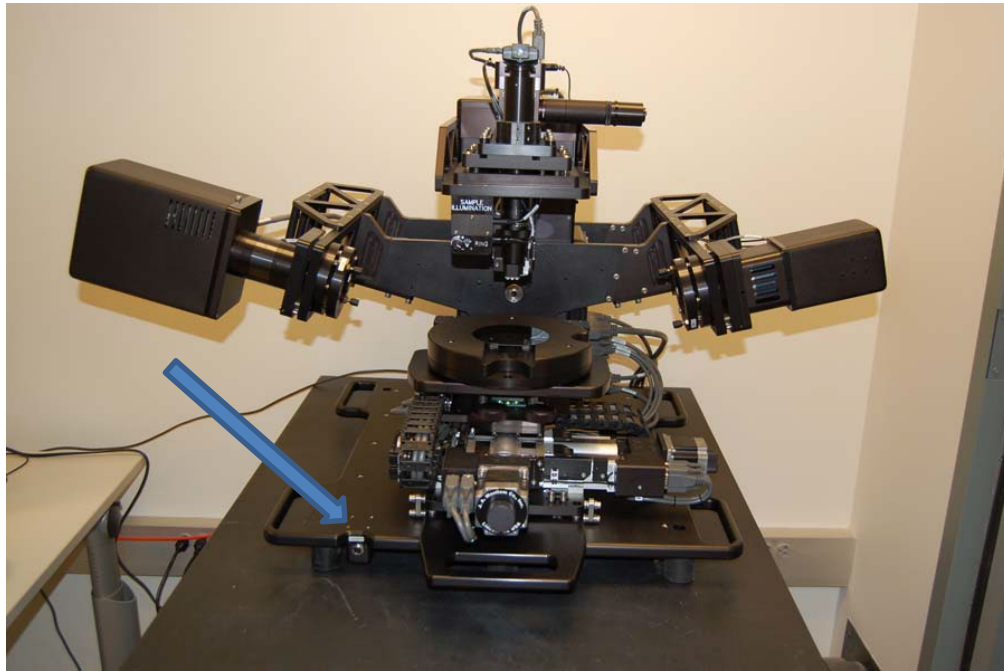
5. Select a recipe in the "Measurement control". It is possible to select a preprogramed recipe or to create your own. The recipe sets up the variables for the scan, such as the range of the incident angle and the dwell at each step. If you are unsure, you may select "**Routine Test Measurement**".

6. Press the "Measure" button to begin the measurement.

7. You will be prompted to select a saving location for your data, choose C:/CompleteEASE/User/ directory and create a folder for your future use. The system will now start taking data.

8. Once the Data Run has completed, a graph will appear in the lower window and display both Psi and Delta graphs.
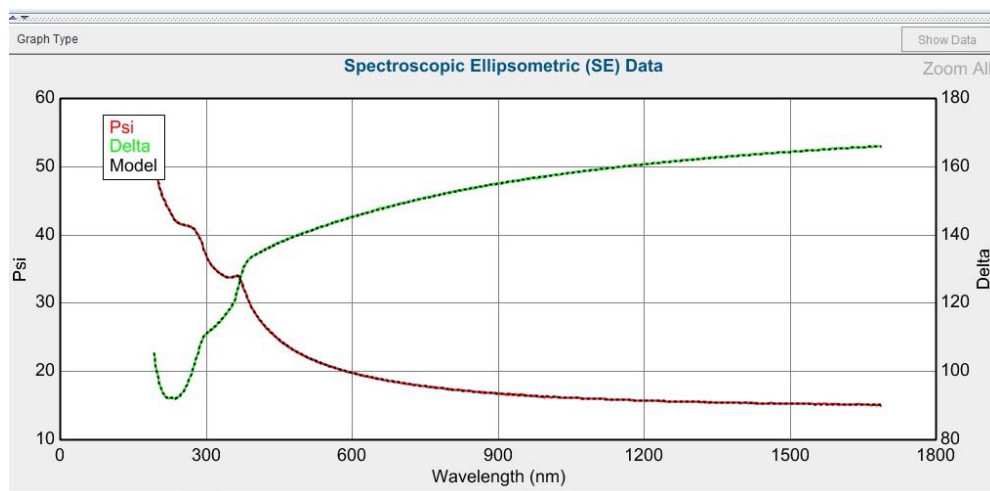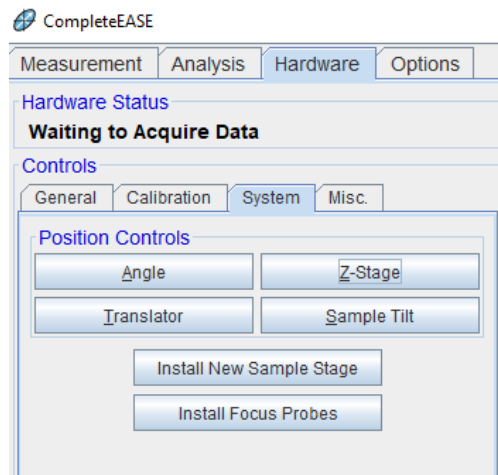
9. For manual control of the acquisition parameters choose <Prompt for Acquisition Parameters> in Recipe pull-down menu in the Measurement Controls panel. When you hit "Measure" button and set the data file location, the acquisition parameters window will appear:
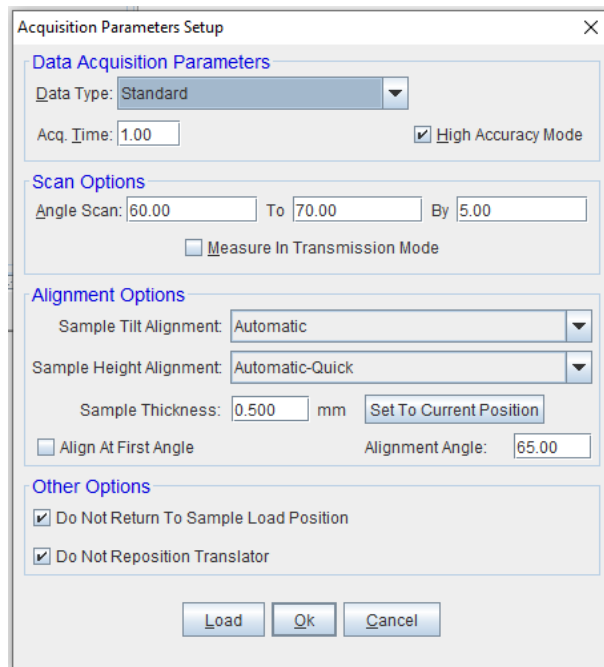
Most typical settings are shown above. If you want to collect ellipsometry data at several angles, use Scan Options menu. With the above settings, the data will be collected at 60, 65, and 70 degrees. If you want to use only one incidence angle, put that angle value in both Angle Scan: and To: cells.

10. Automatic Tilt and Height Alignments will work only if at least some portion of the reflected beam hits the detector aperture. If the beam is completely off, go to Hardware tab, System tab:


Here you can use Z-Stage and Sample Tilt buttons to manually direct the reflected beam to the detector aperture.

11. For manual sample alignment, use Hardware, General tabs, then Sample Alignment button. Choose "No" on the prompt, the alignment screen will appear. Switch the detector to "Receiver". Adjust the

tilt using the arrow keys on the keyboard to drive the red crosshair to the center, and use PgUp and PgDn keys to change Z-position trying to maximize the overall signal intensity.

12. For sample mapping, choose <Prompt Recipe Components> in Recipe pull-down menu in the Measurement Controls panel. When you hit "Measure" button the Recipe Components window will appear:
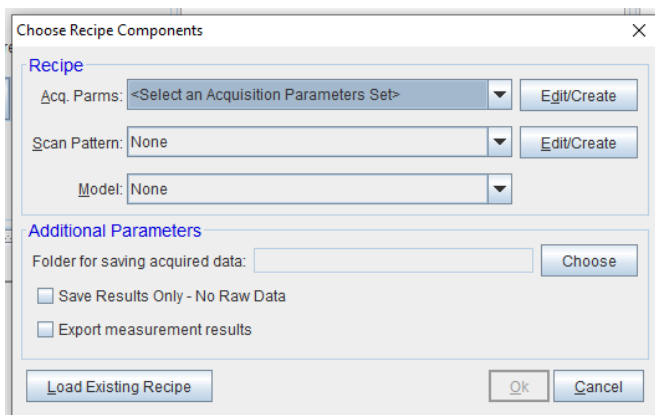
Here Acq. Param. Edit/Create button sends you to the same window as described in section 9. You will need to save the parameters as a file. In Scan Pattern you can define the map you want to create. If you selecting some pre-created Model, the data will be analyzed immediately after collection for each point of the map.

13. Data Analysis can to be performed in the IAC center computer suite where additional licensed copies of the software can be found. Copy your data to the internet server (IAC Data Server shortcut). You will be able to access it through the same server in the IAC computer center.

14. Upon completion of your measurement, turn off the lamps and remember to **sign the logbook** and **log out of the login control system**.

Emergency Information:

Medical Emergencies: Contact 911 and Public Safety (609) 258-1000
Room / facility emergencies: Contact Public Safety (609) 258-1000
Issues related to the instrument:
1. Contact IAC Staff.
2. Leave system as is.

Audible/Siren Emergency Alerts:
Follow previous steps and leave the building.

Emergency Contact Information:

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