

DEKTAK 3 Profilometer: Standard Operating Procedures (S.O.P.)

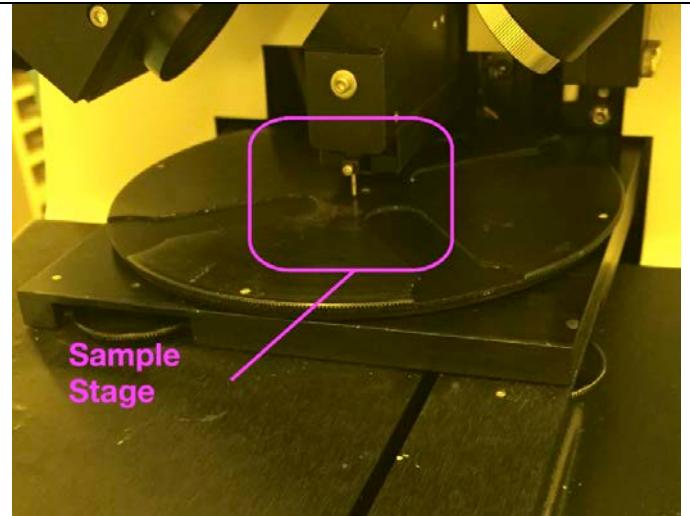
The Profilometer is a machine that displays the landscape of a sample. The program, Dektak 3ST is the interface between the machine and user. The process of viewing and measuring your sample is a multi-step process. In order to produce sufficient results, please read thoroughly to understand the entirety of the process.

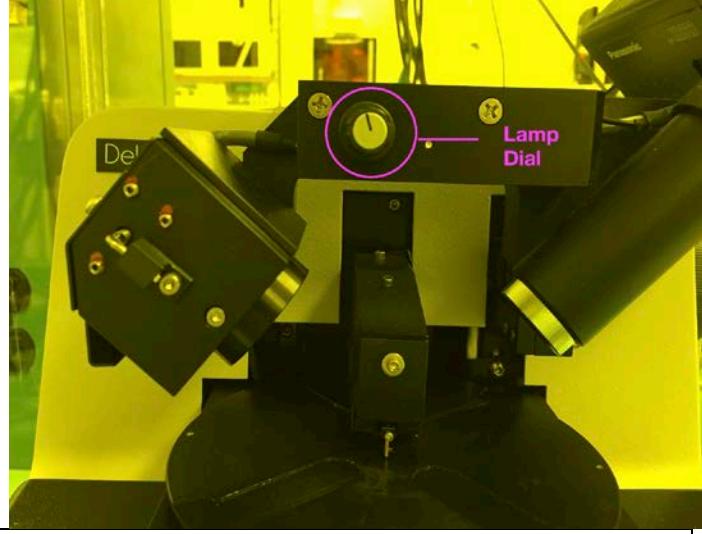
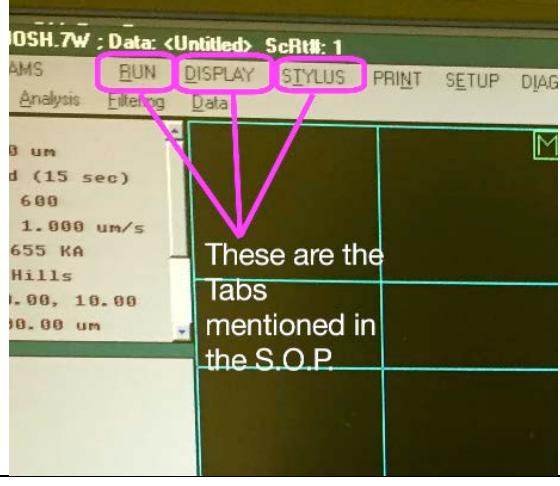
-Open the Environmental Shield door.

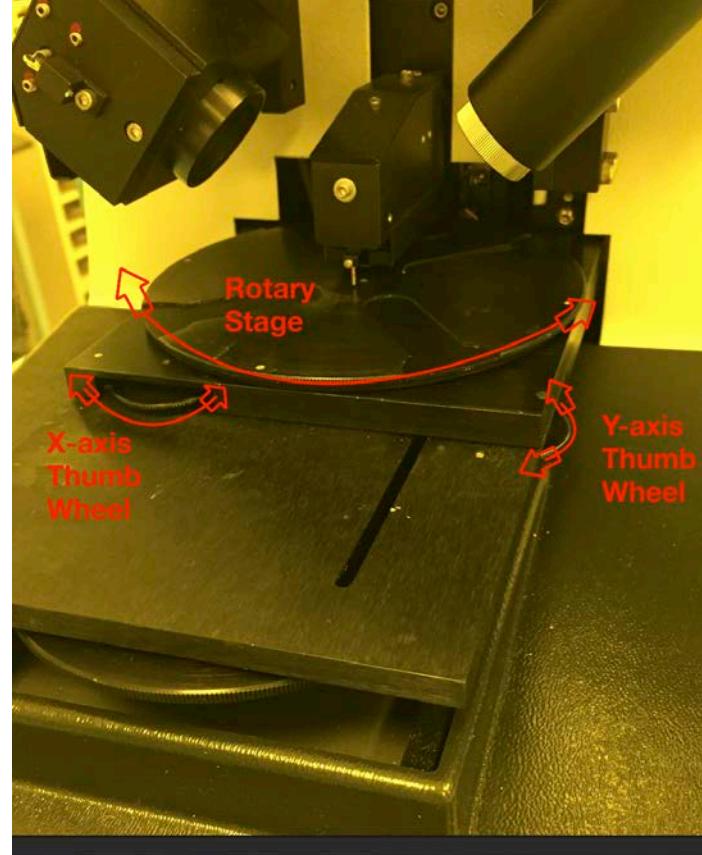
- o Note: This door should always be closed, aside from when the user is positioning the sample. This door prevents contaminants, such as dust or even the draft of the air from affecting data.

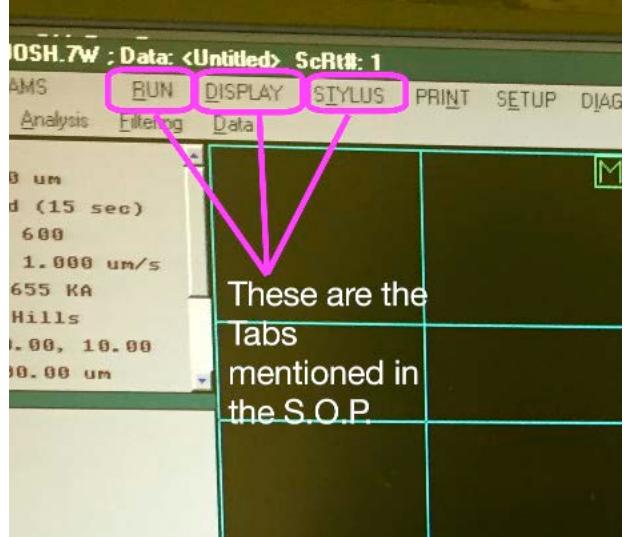


-Place your sample on the Stage



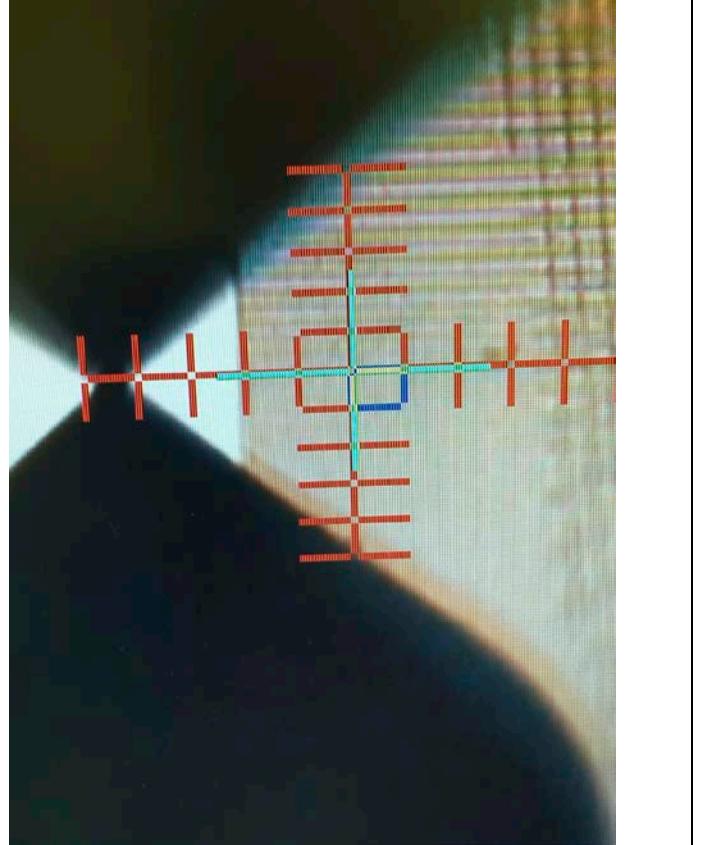
<p>-Turn the gray Lamp knob, centered above the stylus, to the 3' O clock position.</p>	
<p>-Place the area of the sample that you wish to inspect under the center of the spot of light from the lamp.</p> <ul style="list-style-type: none"> o Note: Don't spend too much time on this step, there are instruments that allow for fine tuning the desired area on the sample 	
<p>-Select the program named Dektak 3ST on the desktop if the program is not already open</p>	
<p>-Select "Display" at the top of the screen, and then select "Sample Positioning." This will display the sample on the stage</p>	 <p>These are the Tabs mentioned in the S.O.P.</p>
<p>-Now, to adjust the sample</p>	

<p>without making contact with it, use the wheels to move the stage.</p> <ul style="list-style-type: none"> ○ IMPORTANT: before moving any wheel KNOW WHAT THEY DO 	
<p>-Far wheel on the right: This is used to move the camera up or down, changing the focus of the camera. This knob should rarely be adjusted, only if necessary. Be careful when adjusting. This knob will come in useful when the tip of the stylus and horizontal crosshair need to be aligned.</p>	
<p>-Rotary Stage: This is the stage where the sample is placed. It can rotate in either direction.</p> <p>DO NOT TOUCH THIS WHEEL->>></p>	
<p>-Y Thumb Wheel: This moves the</p>	

platform in the Y axis. The range of this transition is 3 inches.	
-X Thumb Wheel: This wheel moves the platform along the X axis. The range of this transition is 6 inches.	
-Note: Since the Camera is at a 90 degrees, the thumb wheels may move the stage on the X and Y axis, but on the Display on the computer the movements will look as if they are moving on opposite axis's.	
-Once sample is positioned on the screen in the desired area for measurement, select "Stylus" at the top of the screen and select "Stylus Down" or use the Yellow F3 key.	 <p>These are the Tabs mentioned in the S.O.P.</p>

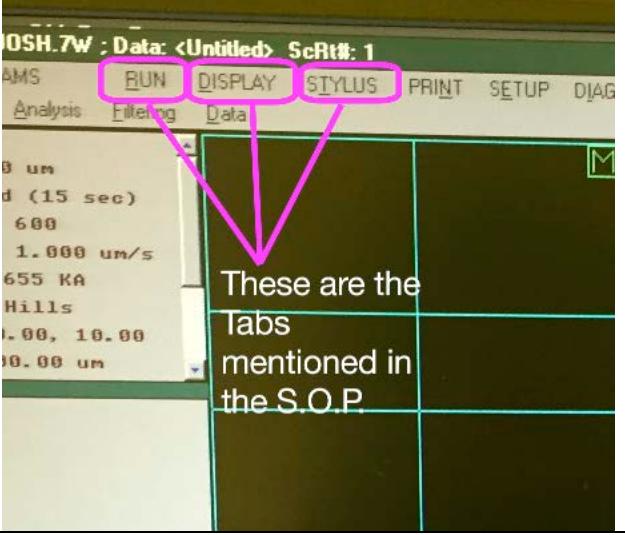
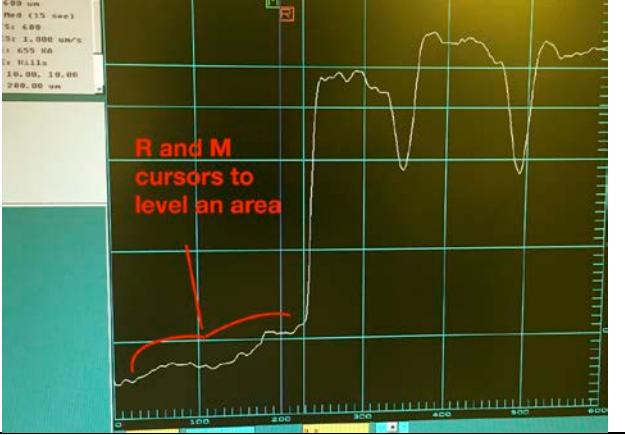
-You will see a triangle point downwards and a triangle pointing upwards with both tips touching, this is the Stylus and its shadow. The bottom point of the stylus should be perpendicular to the Horizontal component of the Cross Hair. The stylus can be aligned with the Cross Hair by using the knob on the far right of the machine.

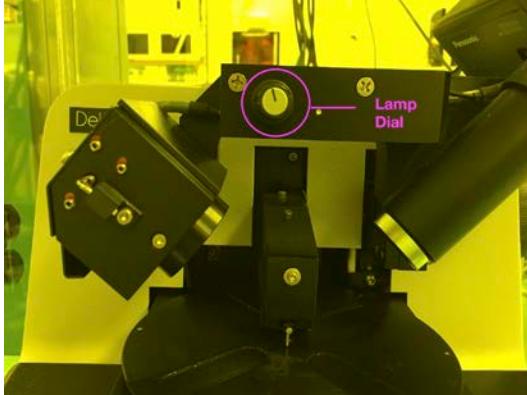
- Note: The stylus will scan along the Horizontal Cross Hair.



-In the case of measuring the height of a "step" on a wafer, for the best results, place the Dark Blue Horizontal line on the Cross Hair over the "step" (this will help center your data).
*This part might take a while to get the part of the sample aligned with the Crosshair as seen in the picture.



<p>-Once everything is aligned and the area of the sample is focused, select “Run” at the top of the screen and select “Run Single-Scan” or use the Green F8 key</p> <p>*CLOSE DOOR BEFORE SCAN</p> <p>-If a pop-up appears, saying something about the “ADC Connection Error”, click “OK” and run a Single Scan again.</p>	 <p>These are the Tabs mentioned in the S.O.P</p>
<p>-After the data appears, now you can manipulate the data to get a better reading of the desired heights</p>	
<p>-The R and M cursors that appear can be moved using the arrow keys. Press the F6 key to activate the R cursor. The left and right keys can move the cursor, and the up and down keys increase the width of the cursor (incase of “noise”, increasing the cursor can average the height within the cursor)</p>	 <p>R and M cursors to level an area</p>
<p>-Place the R and M cursor at the desired width to the left of the step. Press the Level F8 key to level the height between the R to M cursor. Repeat this step but on the right side of the “step”.</p> <ul style="list-style-type: none"> o Note: By doing this, the height of the “step” on the wafer is isolated <p>-To find the ASH (Average Step Height), place the R cursor to the left of the step, close to where you want to measure the bottom of</p>	

<p>the step; then place the M cursor to right of the step, just above the step.</p> <p>Select the Analysis tab, then Analytical Functions. Select “Measure” and “ASH”, and then Compute. On the left of the data you will see a value appear labeled “ASH: (value)”</p>	
<ul style="list-style-type: none"> -The height of the “step” on the wafer can then be read. 	
<ul style="list-style-type: none"> -Make sure the Stylus is Up 	
<ul style="list-style-type: none"> -Remove sample from stage 	
<ul style="list-style-type: none"> -Turn off the Lamp, make sure you hear a click 	
<ul style="list-style-type: none"> -CLOSE THE DOOR 	



If you have any problems with the profilometer please report it to the Super User or other MPF staff, immediately, at mpf@physics.ucf.edu