

# Bruker DekTak XT-S

## Standard Operating Procedure

Faculty Supervisor: Prof. Robert White, Mechanical Engineering (x72210)

Safety Office: Peter Nowak x73246 (Just dial this directly on any campus phone.)

(617 )627-3246 (From off-campus or from a cell phone)

Tufts Emergency Medical Services are at x66911.

Revised: January 12, 2015

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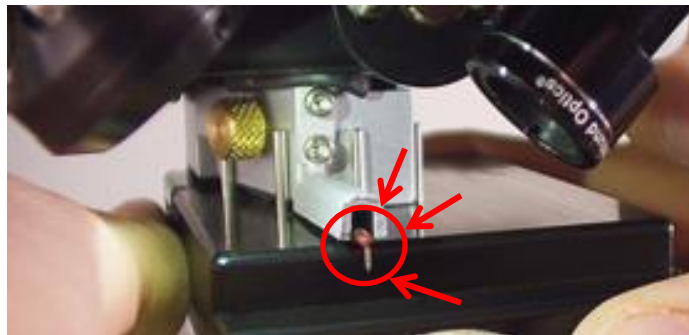
## 1.0 Material Requirements:

1.1 Equipment: wafer tweezers

1.2 Personal Protective Equipment: safety goggles, nitrile gloves

## 2.0 Procedure:

ALWAYS BE CAREFUL OF THE STYLUS TIP. IF YOU BUMP IT – YOU CAN EASILY BREAK IT. THIS IS THE FRAGILE PART OF THE TOOL, PLEASE BE CAREFUL!



### 2.1 Turning on the DekTak.

2.1.1 Log in to computer. Password is on the tape on the monitor base.

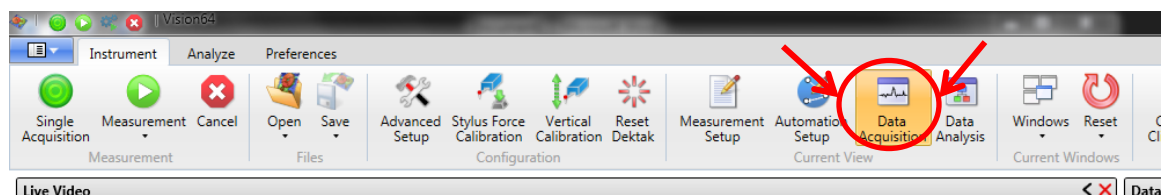
2.1.2 Turn on power to the DekTak by pushing the white button on the box just to the left of the tool.

2.1.3 Run the “Vision64” software from the taskbar or start menu.



### 2.2 Loading a sample

2.2.1 Click on “Data Acquisition” at the top. This is the screen from which you move the tower around, see your sample on the microscope and set the location you plan to measure from.



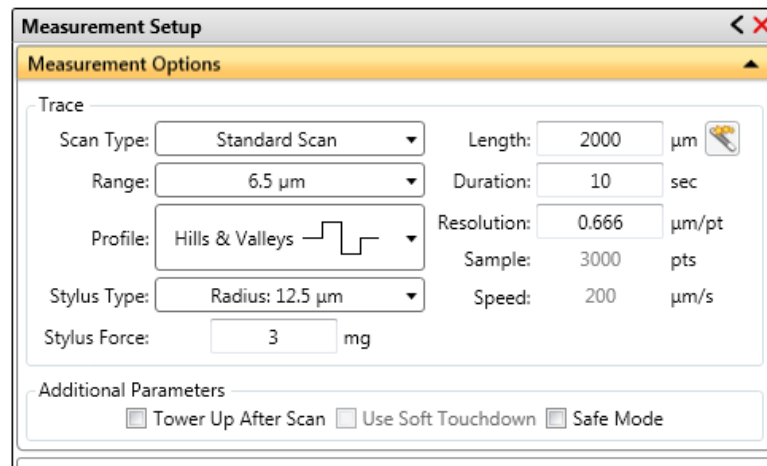
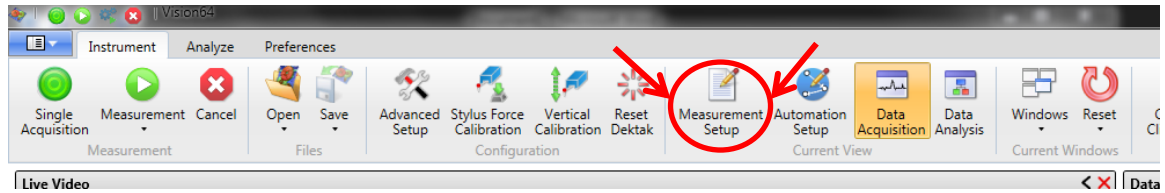
- 2.2.2** Click on “Unload Sample” – the head will move up out of the way and the stage will move forward. If the stage is not far enough forward, depress the lever on the right side of the stage and pull the stage forward.



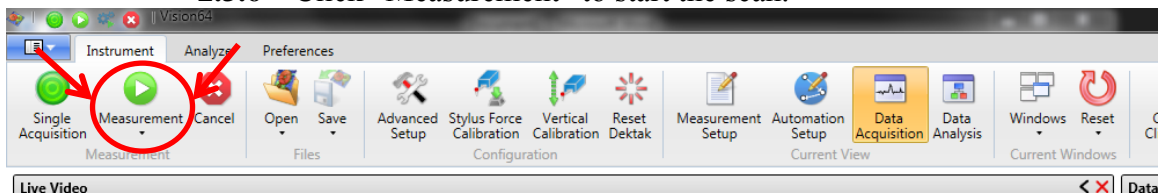
- 2.2.3** Load your sample onto the center of the stage. There are alignment pins for a 4 inch wafer if you want to use them. If desired, turn on vacuum (for 4” wafer) to hold the sample down. The vacuum switch is to the right of the stage.
- 2.2.4** Click “Load Sample”. The stage should move back. If the tip is not centered over your sample, then move the stage using the two release levers on the front and side of the stage to move the sample under the tip.
- 2.2.5** Click “Tower Down”. The tip should move down and touch your sample.

## 2.3 Setting up and taking your measurement

- 2.3.1 Select “Measurement Setup” to set up the measurement – scan length, stylus force, measurement range.

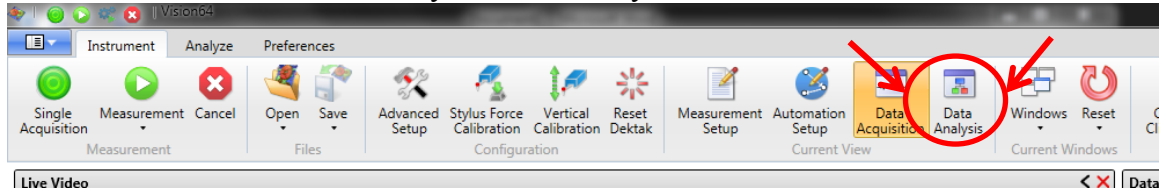


- 2.3.2 A typical scan would be about 1000 um long, with a duration of about 10 seconds. Maximum scan length for the XT-S is 55 mm (55000 um).
- 2.3.3 You will certainly want to adjust the vertical range of the measurement and the type of profile depending on what size features you are trying to measure. You should use the smallest range which can measure your maximum feature for best results. The maximum vertical range is 1 mm.
- 2.3.4 You should also select the stylus type depending on which one is currently loaded in the tool. Most of the time it will be the 12.5 um radius tip.
- 2.3.5 Now, use the large black micrometers on the front and right side of the tool stage to move the stylus tip to the location you want to start the scan. The scan will be from front to back (bottom to top on the screen). The scan will start from the red crosshairs.
- 2.3.6 Click “Measurement” to start the scan.



## 2.4 Analyzing the results

### 2.4.1 Select “Data Analysis” to look at your data.

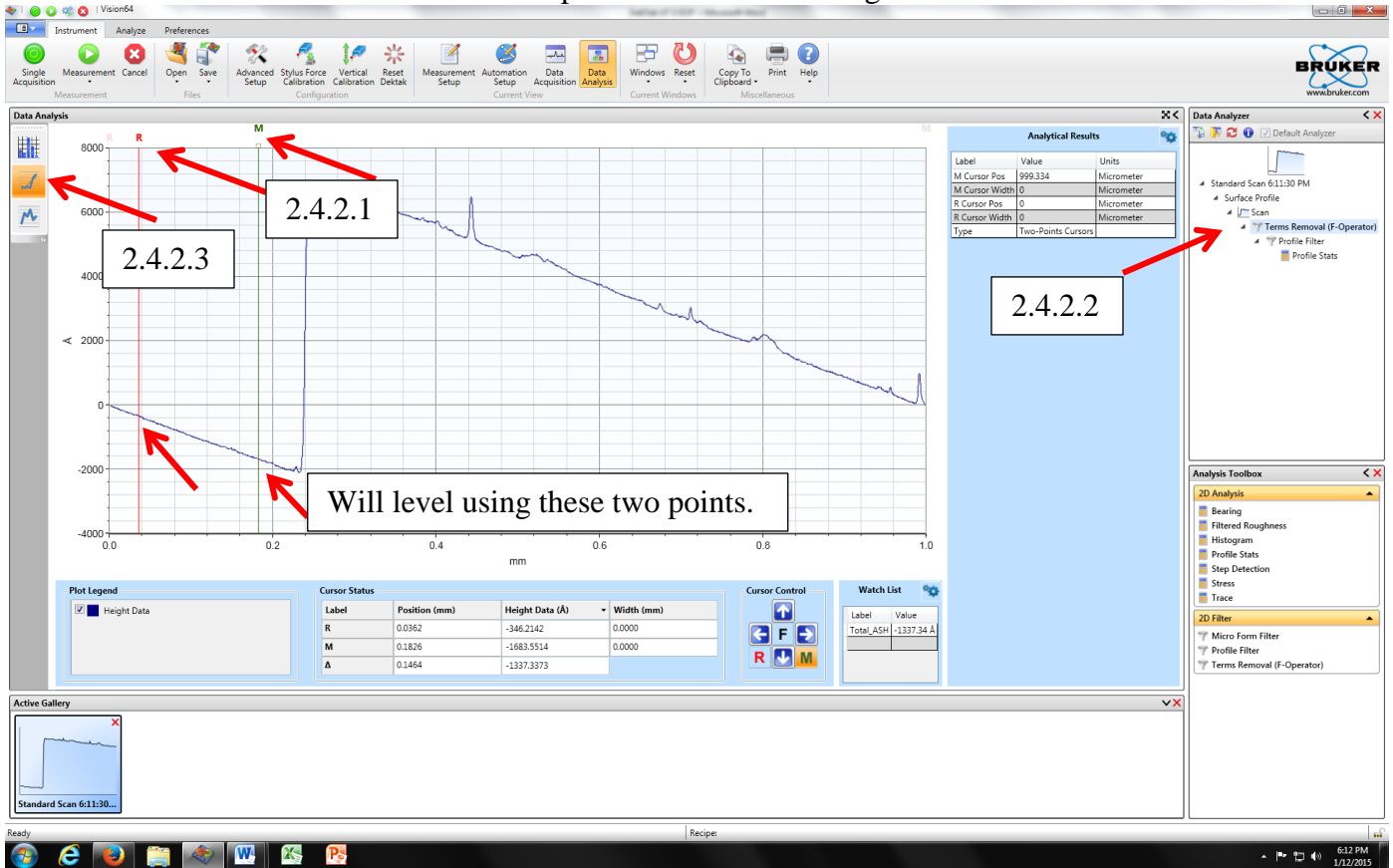


### 2.4.2 Leveling the scan:

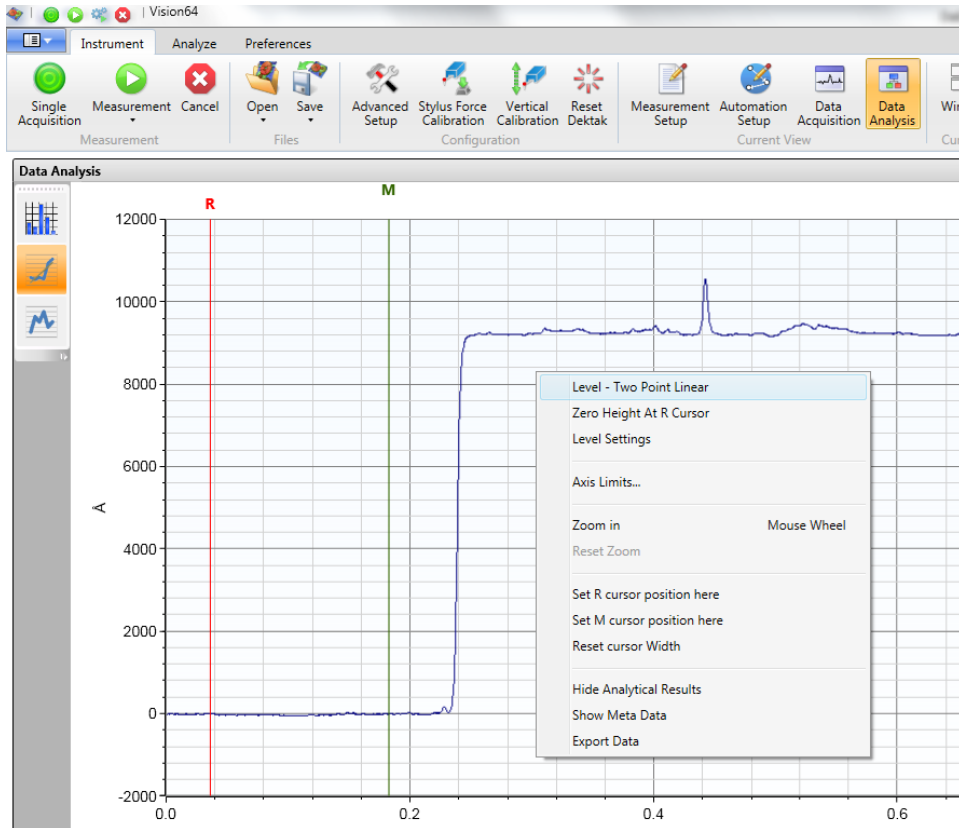
2.4.2.1 To level the data, drag the “M” and “R” cursors in from the left and right of the screen.

2.4.2.2 Click on “Terms Removal (F-Operator)” in the tree style panel on the far right.

2.4.2.3 Make sure you have selected the plot on the left that looks like a plot with a line fit through it.



2.4.2.4 Now you should be able to right click anywhere in the graph and select “Level Two Point” to level the data to the M and R cursor locations.



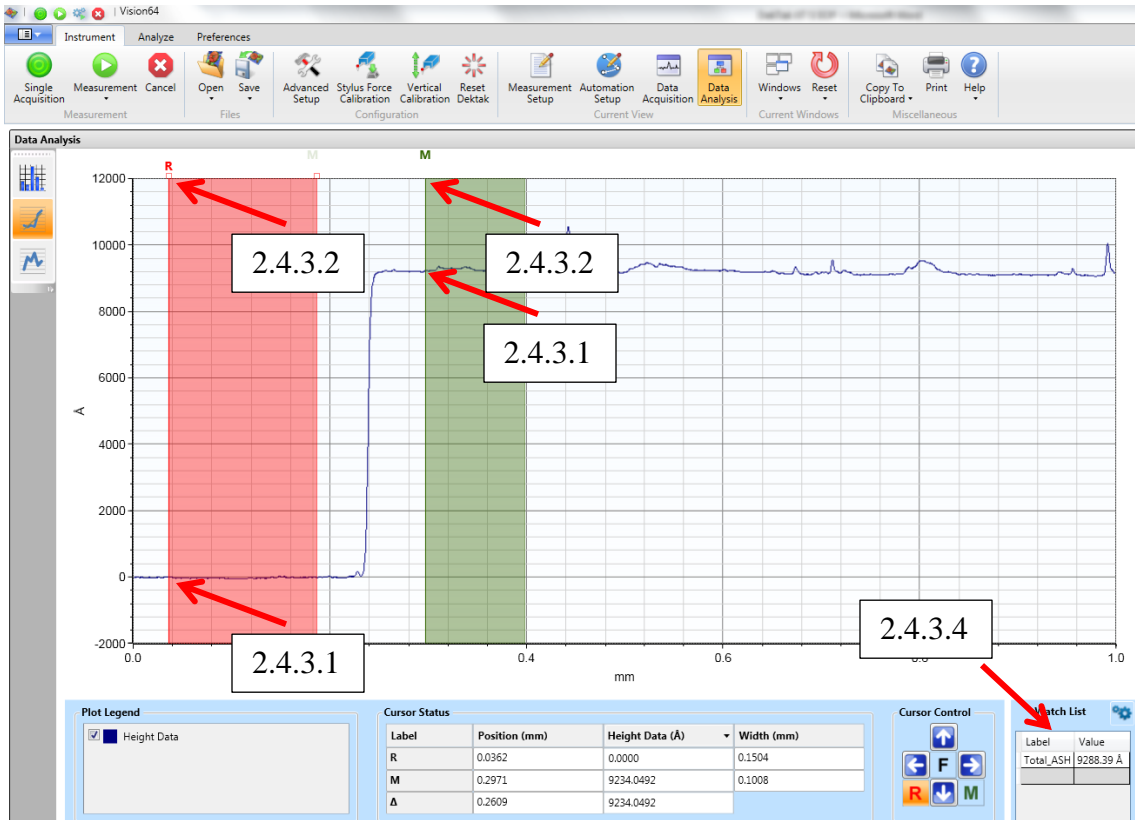
2.4.3 Measuring a step height (see figure on next page):

2.4.3.1 Put the M and R cursors at the top and bottom of the step.

2.4.3.2 Use the little square boxes at the top of the cursor to drag the cursor to give it a width – it will average over this width.

2.4.3.3 Put one at the top and one at the bottom of the step.

2.4.3.4 Step height will be reported in the little window on the bottom right as Total\_ASH. (ASH stands for average step height)



## 2.5 Unloading your sample.

**2.5.1** Go back to “Data Acquisition”.

**2.5.2** Click on “Unload sample” the tower should move up and the sample stage move forward.

**2.5.3** Turn off the vacuum if you used it.

**2.5.4** Remove your sample.

## 2.6 Shutting down.

**2.6.1** Close the Vision64 software.

**2.6.2** Log off (leave the PC turn on but log off of Windows).

**2.6.3** Turn off the DekTak by pushing the black button on the small power box to the left of the unit.

If at any time you feel a situation is dangerous, do not hesitate to call the safety office (x73246, Peter Nowak) the faculty supervisor/lab manager (x72210, Robert White), or Tufts Emergency Services (Police/Fire/Ambulance at x66911).