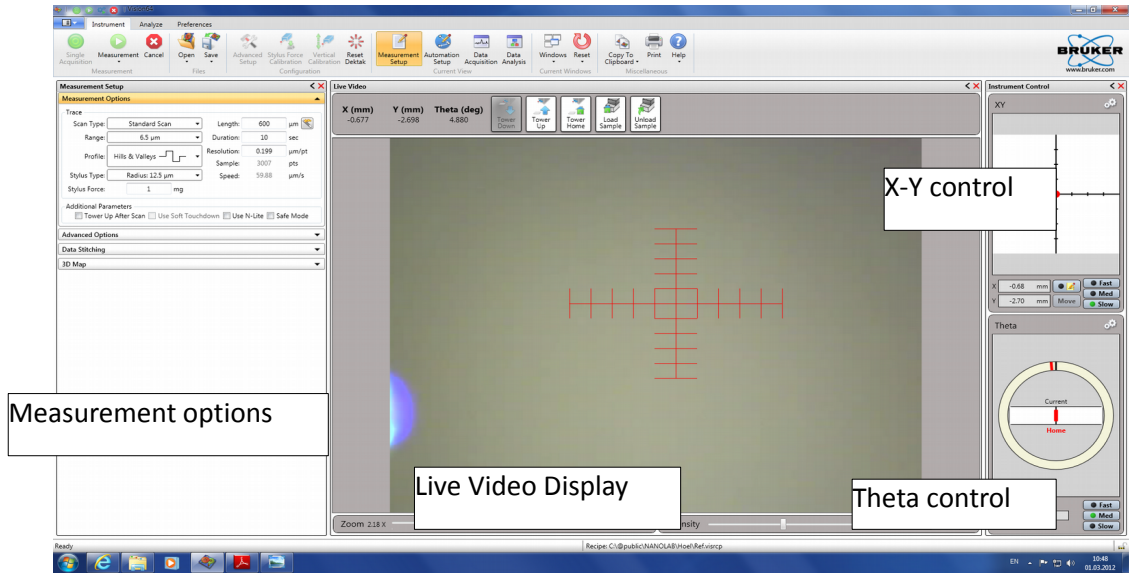
DEKTAK XT - MECHANICAL PROFILOMETER

Quick 2D measurement

How to do a measurement

1. Open the software Vision64, click **OK** for the XY initialization and **OK** for the Theta initialization and wait for the home page below.



2. Click on **Unload Sample** on the toolbar above the live Video Display to move the scan stage forward, then place the sample on the chuck and switch on the vacuum if necessary.

3. Click on **Load Sample** to move the scan stage backward to its home position.

4. Click on **Tower Down** to put the stylus in contact to your sample. Please check that your are not above a deep trench because this can induce a tip break during the move down of the stylus.

NEVER touch the stylus, this may cause damages!

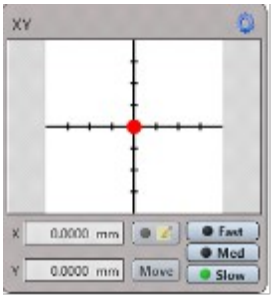
5. If need it, adjust the light level of the video image by moving the slider on the Intensity Bar at the bottom of the right pane of the Live Video Display.

6. If need it, adjust the focus level of the video image by moving the slider on the focus Bar at the bottom of the left pane of the Live Video Display.

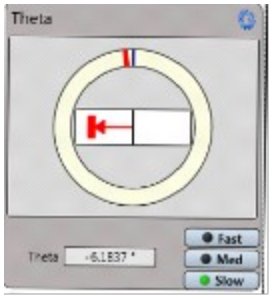
7. Once the tip has touched the surface of yours sample, the stylus automatically retracts. At this moment, you can fine tune the tip position above the area of interest of your sample. You have to know that the measurement is done form the bottom to the top when you look at the screen. The adjustment of the motorized XY sample-positioning stage can be done either by keeping clicking on the red point of the X-Y control panel and moving the mouse or by entering the coordinates directly by clicking on the pen of the X-Y control panel to activate the option and then press **Move** to execute the displacement.

Same thing, for the Theta, either you use the mouse in rotating the vertical red marker on the left or on the right, or you enter directly the angle value after activation of the option by clicking on the pen.

NB : The measurement is done from the bottom to the top when you look at the video. It recommended to keep a significant distance between the starting point of the measurement and the step you want measure.



X-Y stage control



Theta stage control

8. In the **Measurement Setup** menu, you have access to the main measurement parameters :

- **Scan Type : Standard Scan**
  A normal scan type in which the scan is performed across the surface of a sample. Because the tower is nulled before each scan, each successive scan has its ownreference point

- **Range: 6.5 um, 65 um , 525 um or 1 mm**
  The value depends on the step you have to measure

- **Profile**: **Valleys or Hills and Valleys or Hills**
  Valleys: Provides 90% of the measurement range below the zero horizontal grid line. This
  option is used primarily for measuring etch depths.
  Hills and Valleys: Provides 50% of the measurement range above the zero horizontal grid line and 50% below. This option is used in most applications, especially if the surface characteristics of the sample are not well known, or if the sample is out of level.
  Hills: Provides 90% of the measurement range above the horizontal grid line. This option is
  used primarily for measuring step heights.

- **Stylus Type**: Currently installed stylus type is 12.5 um. 2.0 um available on request

- **Stylus Force**: Enter a value between 1 mg and 15 mg.

- **Length**: Enter a scan length between 50 um and 55,000 um (55 mm) for a non-stitched measurement.

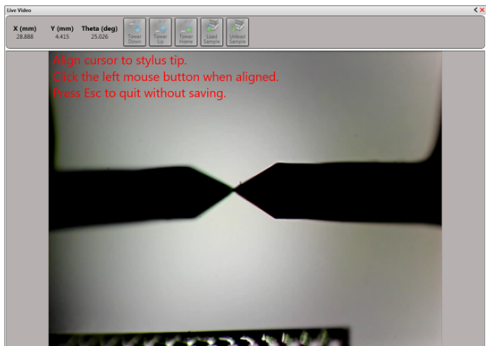
- **Duration**: Enter amount of time it will take to complete a given scan. Scan duration, in conjunction with scan length, determines the horizontal resolution of a scan. For most applications, a 10 – 20 second scan provides adequate resolution and throughput.

- **Resolution**: Enter the horizontal resolution for the scan length and scan duration. The scan resolution is expressed in um/sample, indicating the horizontal distance between data points.

- **Sample**: Indicates the number of data points that the system should take on the sample during a measurement.

- **Speed**: Indicates the scan speed in units of um/s.

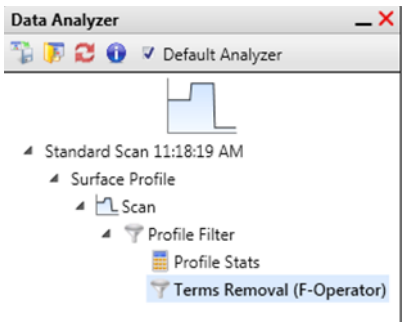
If you need to start the measurement at an accurate position, you have to align the tip on the red cross. The measurement will start at this point. To align the tip, click right on the screen, select reticule, select align and left click at the junction of the reticule and the wafer.



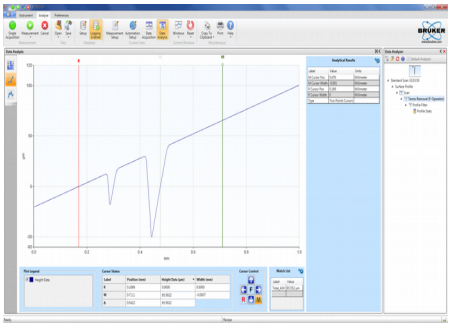
9. Click on **Single Acquisition** for the measurement

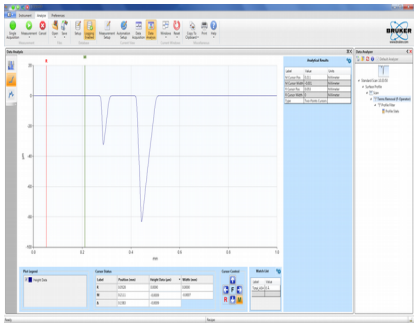
10. At the end of the measurement, the Data Analysis window appears.

11. To do a levelling, activate **Terms Removal (F-Operator)** option in the Data Analyzer window on the right.

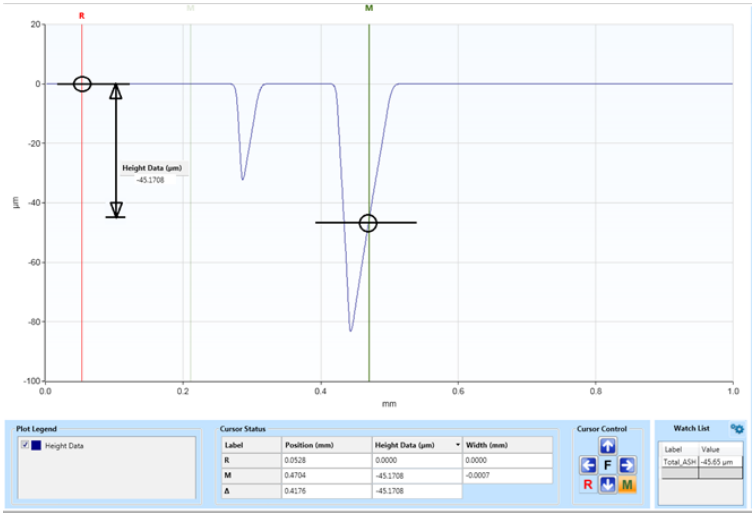


Then place the two cursors (R and M) corresponding to a flat zone on your sample, click right, and select **Level Two Point Linear.**





To proceed to a height measurement, place the cursors (R & M) on the two points you want to measure:



12. To quit the equipment, click on **Unload sample.**