1) Place a sample (for example, Si/SiO\textsubscript{2} wafer coated with parylene) at the center of the sample stage.

2) Adjust the height of the optical probe by moving it up/down the post. Typically, the distance of 5 - 10 mm between the probe and the sample gives an optimal signal.

3) Turn on the light source by pushing the red button on the side.

4) Open “TFCompanion” software by double-clicking the icon.

   The username is “Admin_Hdw” and the password is “psw”.

5) Two windows (TFCompanion and Signal monitor) will open. Close the “Signal monitor” window.

6) Now you can input the information about your sample in the “TFCompanion” window.
a) Double-click “paryleneSiO2” as a filmstack in the “Filmstacks Library” on the left side of the window (indicated in the Figure with a blue circle).

b) Now you can see that filmstack is changed from “SiO2” to “parylene” (indicated by the green circle). Double click that button “parylene.chy(10000.0A)”.

7) Another sub-window will pop up.

Input the expected thickness of parylene film that you would like to measure precisely (red circle). The closer the inputted value to the actual thickness, the easier the curve fitting procedure will be. Then press “OK” button in the sub-window.
8) Press “Measure” button (red circle below) in the main window. When the notice window pops up, select “Default Reflectance” (blue circle below).

9) Now the spectrometer starts collecting the signal and integrating it. Once the program completes the fitting analysis, it shows the results of acquired signal and its fitting curve.

10) You will see the measured thickness of parylene on the right (green circle). It’s important that the period of the oscillations in the data curve (red) and in the fit (blue) match.

11) Close all the windows and turn off the light source.
Calibration:

If measurement of your sample results in a plot similar to the one shown below, you need to perform a calibration using the bare silicon reference wafer (provided by Semiconsoft company and labeled “USB 4000” on the wafer case). This reference wafer only has an extremely thin layer of native oxide on its surface. Such calibration is usually necessary, if the probe vertical position or angle has been changed by the previous user.

1) Select “Si_bare” in the filmstacks library in the TFCompanion window (indicated by blue circle below).

2) Select “Measure” (red circle) -> “Clear Calibration” in the TFCompanion window.
3) Place the bare Si reference sample at the center of the sample stage (polished side up).

4) Click “Measure” (blue circle below).

5) Select “Default Reflectance”.
6) Click “Calibrate Now” in the pop-up window.

7) Start calibration by clicking “OK”.

...
8) When the sub-window “Dark Current measurement” pops up, block the light inputted from the light source into the fiber and click “OK”.

**Note:** you can block the light by turning off the light source and inserting the rough black sponge-like filter kept in same tray with our reference Si wafer (red circle below).

9) You would probably see the data similar to that shown below when you finish the dark current calibration. Then click “Continue”, while the bare Si reference wafer is still sitting on the stage. This will prompt the measurement of the bare Si wafer as an extra control test (see the next step).
10) If you get a plot similar to that shown below with the bare Si wafer, you are ready to measure other samples.

11) Next, as an extra control step, it is recommended that you measure oxide thickness on a Si wafer with the known SiO$_2$ thickness. To do that, place a piece of wafer with 300 nm of SiO$_2$ (located at the same box with other reference samples) right after the calibration procedure. Measure this wafer as described above. In the example shown below, the measured thickness of SiO$_2$ is 287.4 nm (green circle), which is within the typical variations of the oxide thickness on commercial SiO$_2$/Si wafers (< 10 %). If you get this right, the setup is ready for measurements of unknown samples.