







Filmetrics Profilm3D Profilometer Standard Operating Procedure

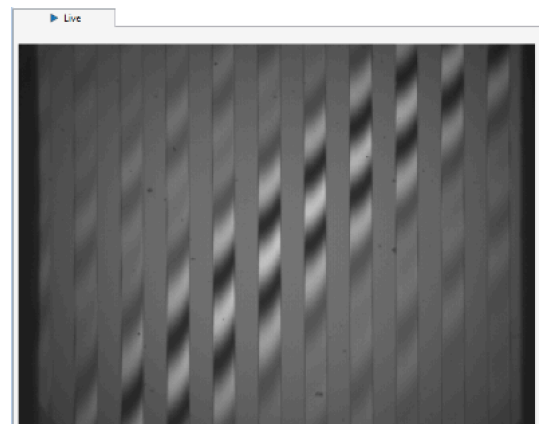
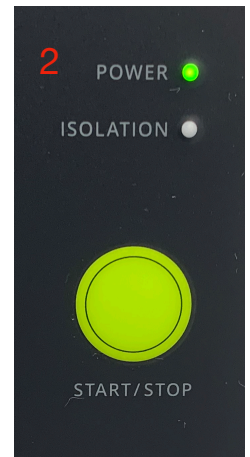
Version: 31 AUG 20

Introduction:

The Profilm3D is a white light interferometric (WLI) 3D profilometer, which uses interfering light wave patterns (constructive and destructive) to measure surface topographies. This SOP describes the basic operation of this tool using Filmetrics' software, Profilm. For the use of the advanced measurement functions available in the Profilm software, please consult the Profilm User Manual, which is available on the Profilm3D computer, as well as the KUNF website.

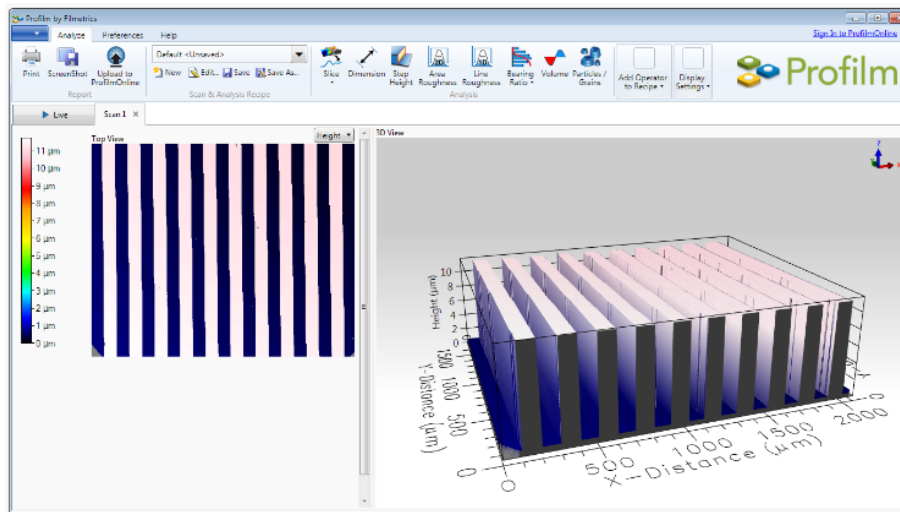
Basic Measurement Procedure:

1. Using the switch on the back (1), power on the Profilm3D.
2. Press the **Start/Stop** button (2) on the Accurion isolator power supply.
3. Log in to start the Profilm software. The screen will be blank at first while the hardware initializes. This can take a minute or so; please be patient. Once the initialization is complete, the "Live" tab below the tool ribbons will become active in the software, with a camera view of the stage and three control tabs: **Focus**, **X-Y Stage**, and **Acquisition Settings**.
4. If desired, you can change the units in the **Focus** and **X-Y Stage** tabs by selecting **Units** in the **Preferences** ribbon above. An **Edit Units and Numbers** preferences window will pop-up. Millimeters is the default for both.
5. Depending on the resolution of the measurement that you need, choose either the 10x or 50x objective by rotating the objective turret on the tool. The software will automatically detect the objective that has been selected.
6. If there is not enough vertical height between the objective and the stage for your sample, click and hold the  button in the **Focus** tab to raise the objective head to an appropriate height.
7. Press the **Load/Unload** button in the **X-Y Stage** tab to move the stage out. Place your sample on the stage, and then press the  button to move the stage back under the objective.
8. Position your sample under the objective using the buttons in the **X-Y Stage** tab.
9. In the **Focus** tab, use the course-focus buttons —  and  — to focus on the *top* focal plane of your sample. Use the fine-focus buttons —  and  — until interference patterns appear. If the pattern is tight like the image at right, the stage tilt may need



adjustment. Please consult the User Manual for instructions on adjusting the stage tilt. Once the top focal plane of your sample is in focus, click the **Set Zero** button in the **Focus** tab.

10. Use the course-focus buttons — and — to focus on the *bottom* focal plane of your sample. Alternately, if you know the approximate depth/height of your sample structures, you can enter that value (as a negative) into the **Move To** field and click the **Move** button to find the bottom focal plane. Use the fine-focus buttons — and — until interference patterns appear. Make note of the value in **Current Position** field.
11. In the **Acquisition Settings** tab, enter a **Backscan** value of 10 μm into the appropriate field. In the **Scan Length** field, enter the *absolute value* of the **Current Position** field *plus* 20 μm (2x the **Backscan** value). For example, if the **Current Position** value is -18.35 μm, enter 38.35 μm. These values tell the tool to start and stop the measurement 10 μm below and above your bottom and top focal planes, respectively. Set the **Scan Speed** to your desired setting.
12. In the **Measure** ribbon, click the **Start** button. A new “Scan” tab will pop up next to the “Live” tab with results similar to those below. The **Analyze** ribbon will replace the **Measure** ribbon.



13. To save your scan data, there are two options:
 - a. Take a screen capture of the “Scan” tab by selecting **ScreenShot** in the **Analyze** ribbon.
 - b. Export your data as a CSV file (readable in Excel) by selecting **General** in the **Preferences** ribbon. A side panel will open; select **Data Recording**.
14. When you have finished taking measurements, go to the “Live” tab and press the **Load/Unload** button in the **X-Y Stage** tab to move the stage out. Remove your sample, and then press the button to move the stage back under the objective.
15. Close the Profilm software.
16. Press the **Start/Stop** button on the Accurion power supply to disable active isolation.
17. Using the switch on the back, power off the Profilm3D.
18. Log out of the user log software.