

Refractive Index Calibration Guide

Your Lumedica OQ LabScope or OQ StrataScope provides depth and width measurements of your sample in the review tab. However, these tools are not calibrated upon arrival because *depth measurements are dependent on the optical properties of your sample*. Use the provided plastic ruler and procedure below to calibrate the measurement tools.

OCT measures optical pathlength. The optical pathlength is equal to the physical pathlength divided by the index of refraction.

For this procedure, you can also use anything with a known thickness and refractive index, like a glass slide. You will need the refractive index of your sample. For many materials the refractive index is a known value available on the internet.

Depth per Pixel Calibration

1. Place the ruler on top of the provided roll of tape under the scanner (Figure 1).
2. Start the scan and position the scanner so that the top and bottom edges of the ruler are visible on the OCT image.
3. Adjust the “Dynamic Range Bottom” slider up to increase the contrast of the image. The top and bottom edge should be visible as two bright lines (Figure 2).
4. Stop Scan.
5. From the configuration tab, set the Depth per Pixel to 1. Select “Layer Thickness” under Measurement Drawing Mode.
6. From the review tab, click above the top edge of the ruler on the image, drag below the bottom edge, and release (Figure 3). This will provide the layer measurements in mm. Use the average thickness.
 - a. Depth per pixel is in μm so multiple the average thickness by 1000. This is the number of pixels shown for the thickness of the ruler.

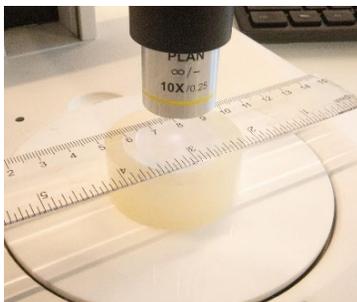


Figure 1

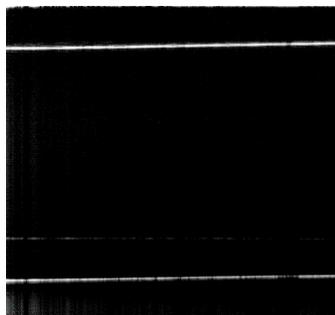


Figure 3

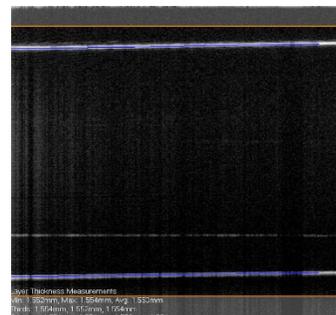


Figure 2

7. Divide the actual physical thickness of the ruler, 1.59 ± 0.01 mm, by the number of pixels measured in step 6. Multiply by the index of refraction of the ruler, 1.566. This is the depth per pixel in air.
8. Divide the depth per pixel in air by the index of refraction of your sample. This is the depth per pixel in your sample.
9. From the configuration tab, adjust the depth per pixel to the value calculated in step 8. The layer analysis and calipers tools are now calibrated to display the actual physical depth of your sample according to its index of refraction.

Width Per Pixel Calibration

1. Move the ruler on the role of tape so that the metric edge is visible under the scanner. The ruler must be flat (Figure 4).
2. Start the scan. Adjust so that the edge of the ruler is visible. The image should appear as a dashed line with long bright dashes and short dark dashes (Figure 5).
3. For the most accurate measurements, the displayed line must be horizontal. If there is an angle, then the ruler is not perpendicular to the scanner or parallel to the role of tape. Adjust the role of tape until the displayed line is horizontal on the screen.
4. Stop Scan.
5. From the configuration tab, set the Width per Pixel to 1. Select "Calipers" under the Measurement Drawing Mode.
6. From the review tab, click and drag horizontally from the left edge of one dark dash to the left edge of the adjacent dark dash (Figure 6)
7. The physical distance between dashes is 1 mm or 1000 μm . The width per pixel calibration is not dependent on the index of refraction of your sample.
 - a. From the configuration tab adjust the width per pixel until the measurement from the right of one dark dash to the left of the next dark dash equals 1000 μm .
 - b. OR divide the caliber measurement in step 6 by 1000 μm and place this value in the width per pixel input in the configuration tab.

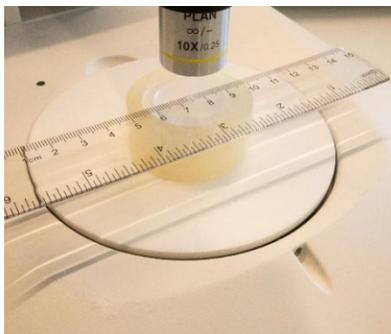


Figure 6

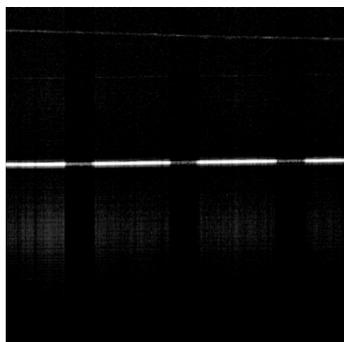


Figure 5

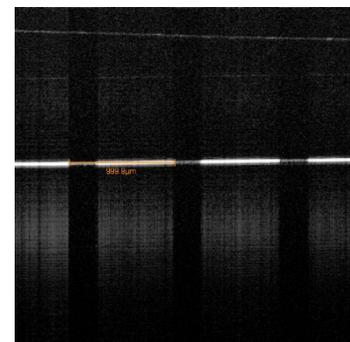


Figure 4