

The IOLMaster 700

New technology provides increased speed, ULIB compatibility, and fewer refractive surprises.

BY WALTER SEKUNDO, MD

The IOLMaster 700 (Carl Zeiss Meditec AG; Figure 1) is an entirely new biometric technology that combines optical biometry with SWEPT Source OCT technology to image and measure the entire eye length, from the cornea to the retina. This article describes the clinical experience my colleagues and I in the department of ophthalmology at the Philipps University of Marburg, Germany, have had since adopting the IOLMaster 700.

SWEPT SOURCE OCT IMAGING

The capability of visualizing anatomical details enabled by SWEPT Source OCT technology may assist me in reducing refractive surprises by revealing abnormal shapes or structures, such as tilt or decentration of the crystalline lens. Clearly, this capability is especially useful for abnormal eyes in which measurements are traditionally difficult to obtain.

Importantly, the IOLMaster 700 also allows us to visually verify the ocular structures that have been measured. This capability eliminates the need to interpret A-scans and potential sources of error as a result.

FIXATION CHECK

Another unique feature of the IOLMaster 700, the Fixation Check (Figure 2), allows us to see the foveal pit to ensure the patient has correctly fixated. Whereas other biometric devices lack a means of confirming that the patient has fixated properly, this function gives us more confidence in image capturing and therefore also in verifying biometric readings.

In our daily routine we may also identify unusual foveal pit morphologies such as macular holes, epiretinal membranes, and age-related macular degeneration. As the IOLMaster 700 clearly is not intended to be used for diagnostics, findings need to be verified and diagnosed with a dedicated retina OCT. Nevertheless in our high-volume practice, as in most clinics, the ability to detect these eyes preoperatively is invaluable.

B-SCAN VS A-SCAN

A-scans do not provide a true image of the ocular structure being measured, but only peaks and valleys that must be interpreted.



Figure 1. IOLMaster 700 from ZEISS.

In contrast, B-scans generate true images of intraocular structures that can be measured (Figure 3); the information they provide is more objective compared to A-scans. With B-scans, we can evaluate the intraocular anatomy, such as the position of the crystalline lens, and determine sources that may affect the biometric readings.

MEASUREMENT SPEED AND ULIB COMPATABILITY

Like most high-volume cataract surgeons I do not perform preoperative measurements myself, but instead delegate this task to either technicians or doctors in training. The technicians in my clinic have been impressed by the speed at which the IOLMaster 700 measures the eye from front to back. At 2000 scans per second with the SWEPT Source OCT imaging, the new system's speed is an enormous clinical benefit in terms of reduced chair time and workflow efficiency.

Another advantage using the new IOLMaster 700 is that I still have access to the full User Group of Laser Interference Biometry (ULIB) database—the new system is fully compatible with former

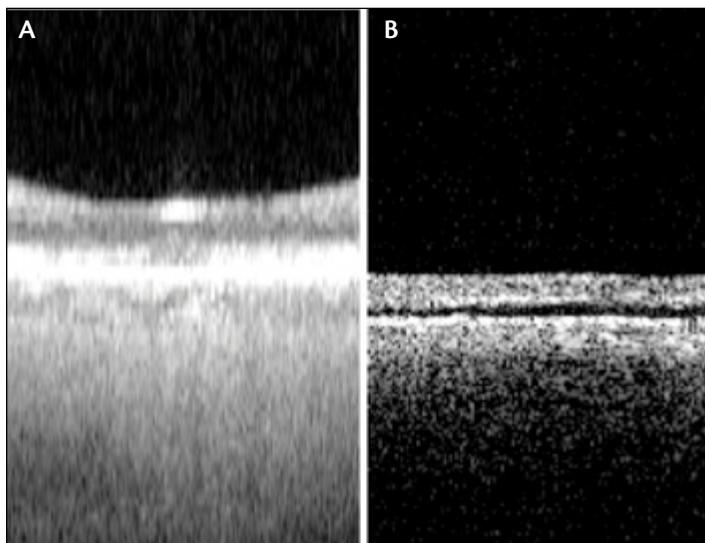


Figure 2. Correct fixation: the foveal pit is visible (A). Visible separation of the retinal pigment epithelium from the underlying Bruch's membrane is shown. Diagnosis verified with retina OCT (B).

versions of the IOLMaster. The ULIB database contains optimized lens constants for over 270 commercial IOLs. These lens constants were created from data collected from more than 50,000 cataract surgeries.

THE FUTURE OF BIOMETRY

The IOLMaster 500 has been the gold standard of biometry in ophthalmology for quite some time, and it continues to be highly relevant. The IOLMaster 700 offers a host of next-generation diagnostics for those practices that are integrating premium-channel technologies such as multifocal, toric, and accommodating IOLs. For example, the device includes markerless toric IOL alignment via the Reference Image, which uses an eye's own blood vessels to reference its astigmatic axis relative to the position of the eyeball. During surgery, the reference image is used for intra-operative matching

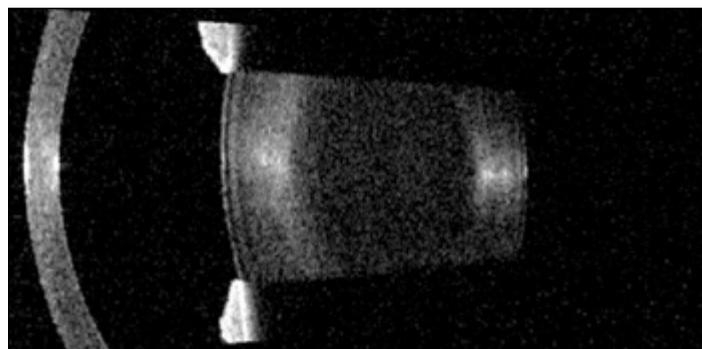


Figure 3. The IOLMaster 700 B-scan.

with the live eye image. Therefore, the data needed are projected into the eyepiece of the surgical microscope. Corneal marking and additional measurements for toric IOL alignment become obsolete.

CONCLUSION

My colleagues and I have found it easy to integrate the IOLMaster 700 into our high-volume clinical practice. The learning curve has been quite short—its functionality is very streamlined. ZEISS made the device very user-friendly, with a minimal number of steps. Many of the device's functions can be performed by pushing a single button. Moreover, the time we save with the IOLMaster 700's speed of measurements is significant and contributes to our bottom line. The opportunity to provide even better outcomes to one's patients via advanced biometry, SWEPT Source OCT technology, increased speed, Fixation Check, the ULIB database integration, markerless toric alignment, and myriad other clinical benefits is enough to justify the investment. ■

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