



IOLMaster 500

Defining biometry



We make it visible.

The moment IOL power calculation
becomes second nature.
This is the moment we work for.

// IOLMASTER 500
MADE BY CARL ZEISS



Efficiency

Working with you

In a busy practice, throughput is key. For over a decade, we have partnered with surgeons, like you, to continue improving the gold standard in biometry. The IOLMaster® 500 is the clear choice for effortless biometry that facilitates high-confidence IOL selection.¹



Mastery is achieved through constant refinement

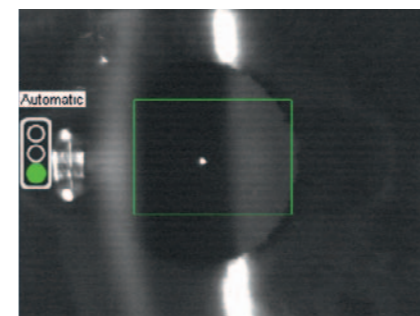
The IOLMaster 500 is dedicated to low-hassle biometry and high-confidence IOL selection. Designed for robustness, reliability and exceptional system integrity, the IOLMaster 500 offers a wide range of built-in IOL power calculation options, including the latest Haigis and Holladay 2 formulas.

- 1) Leaming DV, 2010 Practice Styles and Preferences of U.S. ASCRS Members Survey
- 2) Chen YA, Hirschall N, Findl O, Evaluation of 2 new optical biometry devices and comparison with the current gold standard biometer, *J Cataract Refract Surg.* 2011 Mar;37(3):513-517
- 3) Hill W, Angeles R, Otani T, Evaluation of a new IOLMaster algorithm to measure axial length. *J Cataract Refract Surg.* 2008 Jun;34(6):920-4.
- 4) Haigis W, Clinical Experience with the IOLMaster Advanced Technology software, presented at the ESCRS meeting in Stockholm, 2007
- 5) Olsen T, Improved clinical results with the IOLMaster Advanced Technology, presented at the ESCRS meeting in Stockholm, 2007



High-speed biometry

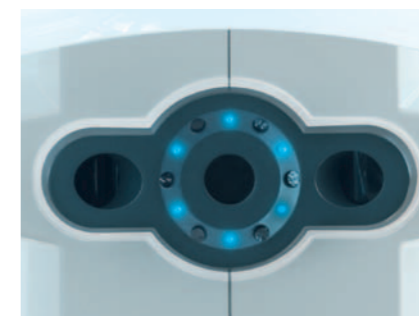
Minimize acquisition and chair time by performing accurate measurements quickly. In the Dual Mode, axial length and keratometry are captured in one measurement. Changeover between modes is completely automated and does not require any user interaction. The average time needed to take a reading on the IOLMaster 500 is up to 4 times faster compared to other optical devices.² A difference you and your patients will notice every day.



Changeover between modes is completely automated and does not require any user interaction

Challenging patients

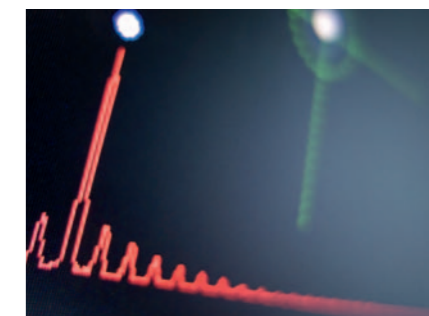
Axial length and keratometry measurements with the IOLMaster 500 are fast and distance independent – a great help in restless or poorly fixing patients. The IOLMaster 500 enables you to measure and calculate even pseudo-phakic, silicon-filled eyes or eyes with a phakic implant. The one-click selection of the correct eye status can be easily adapted even after data acquisition.



Easier alignment through distance independent measurements of axial length and keratometry

Best cataract penetration

The IOLMaster 500 achieves a measurement success ratio that is up to 20 percent higher than that of other optical biometry devices. The underlying Composite Signal evaluation not only significantly increases the fraction of cataracts measurable with optical technology, it also greatly increases signal-to-noise values – a measure of the outstanding reliability of the data the IOLMaster 500 provides.^{3,4,5}



Composite signal evaluation for best cataract penetration in the industry

Simplicity

Thinking with you

Based on years of experience working with you, the IOLMaster® 500 has been designed to make your life simpler. The new platform provides efficient workflow, easy delegation and peace of mind.



Dual Mode enables one-click axial length and keratometry measurements

Intuitive and user-independent

The IOLMaster 500 redefines simplicity. Its redesigned graphical user interface incorporates more than a decade of experience in optical biometry. It yields more data with fewer clicks. A great example of this superior usability is the Dual Mode, which facilitates measurements of axial length and keratometry without the need for manual interaction. A detailed evaluation and processing of the measurement results is possible at any time – offering full transparency.

6) Holladay IOL Consultant software. <http://www.hicsoap.com>

7) Haigis W, Intraocular lens calculation after refractive surgery for myopia: Haigis-L formula. *J Cataract Refract Surg.* 2008 Oct;34(10):1658-63.

// SIMPLICITY
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Confidence in meeting patient expectations

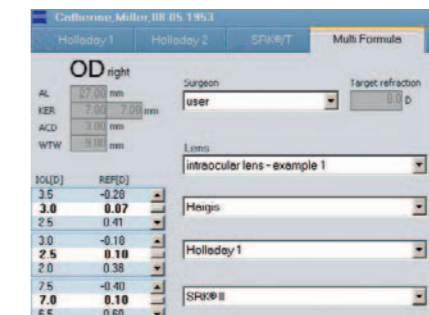
Common sources of error are eliminated through an easy-to-understand traffic light indicator: a green light signals best alignment. With the integrated automatic mode, it is easy to delegate and trust the measurements. Right-eye and left-eye values for axial length and corneal radii are compared and checked for plausibility – providing confidence especially for challenging eyes.



IOLMaster 500 yields more data with fewer clicks

Most comprehensive set of formulas

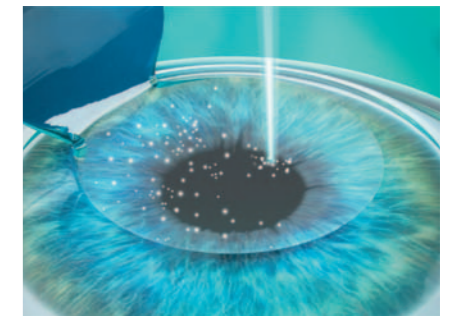
The IOLMaster 500 provides a comprehensive set of onboard IOL power calculation formulas. Included are fourth generation Haigis and Holladay 2.⁶ Seamlessly integrated IOL power calculations offer the shortest path to the result that really matters – high confidence IOL power selection.



Certainty at your fingertips: with the most comprehensive set of onboard IOL power calculation formulas

Post-LVC patients

The number of cataract patients with prior laser vision correction (LVC) is growing rapidly. But often, clinical history data is not available. With its on-board Haigis-L formula, the IOLMaster 500 simplifies IOL power calculation in these cases – no matter whether the refractive procedure was myopic or hyperopic.⁷

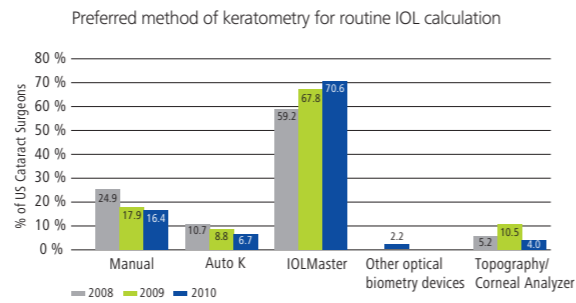
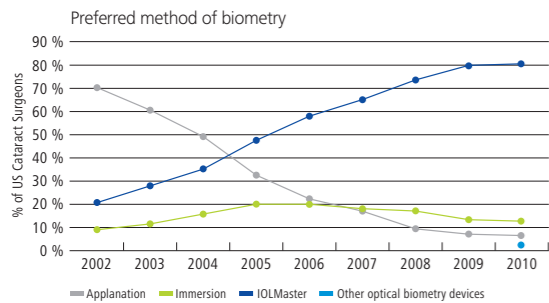


The IOLMaster 500 simplifies IOL power calculation for patients with prior laser vision correction

Outcomes

Calculating with you

You might have noticed the rising patient expectations in your practice: Premium IOL patients and post-LVC patients are demanding cases. What could be more important in biometry than measurements you can rely on?



The vast majority of cataract surgeons prefer the IOLMaster 500 for its accuracy and reliability⁸



Precision counts

In terms of accuracy and precision, the IOLMaster[®] 500 satisfies the demands of clinicians looking for optimal refractive outcomes. The Composite Signals of the IOLMaster 500 facilitate the interpretation of axial length scans. With its solid signal-to-noise ratio values of the Composite Signal algorithm, dependable data can be achieved for a great number of patients.^{3,4,5} The user independence and high reproducibility of IOLMaster 500 measurement results have been documented in the scientific literature.⁹

Optimizing outcomes

with integrated Holladay 2*

You can continuously minimize your prediction error for IOL power calculation on an individual basis. With the Holladay 2, now running on the IOLMaster 500, you just need to enter the postoperative refraction of your patients. All other data is automatically fed into the Holladay 2 software calculation.⁶ There is no longer a need to export data to the Holladay IOL Consultant software. Holladay 2 is now integrated into your IOLMaster 500. The IOLMaster 500 combines it all.

* Holladay 2 formula available for shipment in 2012.

Challenging eyes

The true test of a biometer is its performance with challenging eyes. The IOLMaster 500 measures along the visual axis, yielding the relevant axial distance, even with staphyloma, pseudophakic and silicone-filled eyes. Calculation of phakic intraocular lenses is another growing need. A database of anterior and posterior phakic IOL types makes the selection of the appropriate dioptric power straightforward and reliable.

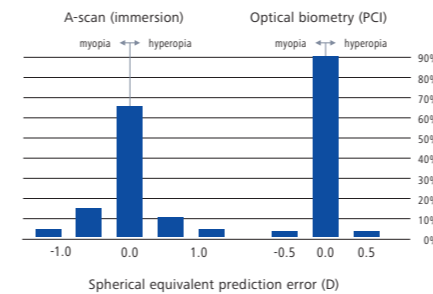
Post-LVC cases

Eye care professionals are facing an increasing number of patients with prior laser vision correction (LVC). These patients can be a challenge when it comes to cataract diagnosis and treatment. The IOLMaster 500 includes the Haigis-L formula, which is dedicated to myopic and hyperopic post-LVC cases. As all formulas on the IOLMaster 500 the Haigis-L formula is scientifically proven.³ Haigis-L is especially convenient as it requires no clinical history data.

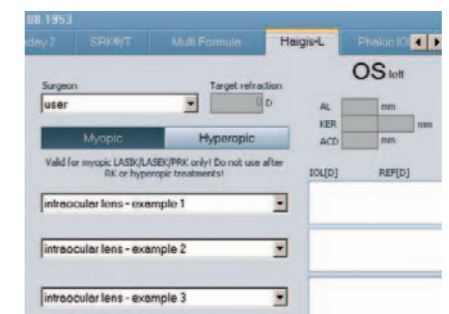
Continuously optimizing lens constants with ULIB

Any intraocular lens calculation is only as reliable as the lens constants it is based on. The extensive clinical history of the IOLMaster 500 is reflected by the Users' Group for Interference Biometry (ULIB) website. For virtually all common IOL types, the ULIB database contains more than 160 lens constants optimized with over 30,000 sets of patient data created with the IOLMaster 500.¹¹ These lens constants are continuously optimized and can easily be downloaded from the ULIB website onto your IOLMaster 500.

- Hill W, Angeles R, Otani T, Evaluation of a new IOLMaster algorithm to measure axial length. *J Cataract Refract Surg.* 2008 Jun;34(6):920-4.
- Haigis W, Clinical Experience with the IOLMaster Advanced Technology software, presented at the ESCRS meeting in Stockholm, 2007
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- Leaming DV, 2010 Practice Styles and Preferences of U.S. ASCRS Members Survey
- Vogel A, Dick HB, Krummenauer F., Reproducibility of optical biometry using partial coherence interferometry: intraobserver and interobserver reliability. *J Cataract Refract Surg.* 2001 Dec;27(12):1961-8.
- User Group for Laser Interference Biometry. <http://www.augenklinik.uni-wuerzburg.de/ulib/c1.htm>



Proven accuracy and precision to meet rising patient expectations (data courtesy of Warren E. Hill, MD, FACS)



Reliable and accurate IOL power calculation for post-LVC patients with the Haigis-L formula

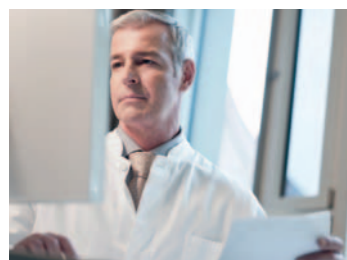
nominal	Haigis	Haigis-L	Haigis-L	SRK1	SRK II	in
A=118.0	a0=0.445 a1=0.250	a0=0.445 a1=0.250	a0=0.445 a1=0.250	A=118.2	A=118.1	445
A=118.0	a0=0.75 a1=0.00	a0=0.75 a1=0.00	a0=0.75 a1=0.00	A=118.0	A=118.1	203
A=118.1	a0=0.88 a1=0.00	a0=0.88 a1=0.00	a0=0.88 a1=0.00	A=118.1	A=118.2	81
A=118.5	a0=1.38 a1=0.00	a0=1.38 a1=0.00	a0=1.38 a1=0.00	A=118.5	A=119.2	117
A=118.2	a0=1.45 a1=0.00	a0=1.45 a1=0.00	a0=1.45 a1=0.00	A=119.1	A=119.4	35

The ULIB "for ZEISS IOLMaster": the latest set of continuously optimized IOLMaster 500 lens constants

Workflow

Connecting with you

Product innovation at Carl Zeiss is guided by one overriding principle: We work to improve on what works best for your practice. Providing you with optimal connectivity solutions, you can concentrate on what matters most, your patients.



Workflow efficiency with IOLMaster 500



High-speed biometry workflow at any place



Easy connection to ultrasound

Biometry workflow

Well-designed user interfaces can help avoid user error and simplify operator training. The highly intuitive IOLMaster® design has set standards for easy-to-learn, easy-to-delegate biometry. The redesigned graphical user interface continues this success story. It eliminates even more clicks and guides the user through an optimized workflow sequence.

FORUM eye care data management

The days of stand-alone instruments are over. The IOLMaster® 500 fits perfectly into today's networked practice environments. It is part of the overall ZEISS data management solution FORUM®, providing all relevant diagnostic data when it is needed and where it is needed. The IOLMaster 500 also seamlessly integrates with CALLISTO eye®, the new ZEISS data management system for the operating room.

Exporting IOLMaster 500 data to CALLISTO eye not only allows you to display IOLMaster 500 results on the OR Cockpit display, but also enables on-the-fly changes of the selected IOL. For connectivity with electronic medical records (EMR) and practice management systems, the IOLMaster 500 provides an interface based on the DICOM standard.

Connecting ultrasound

Previously, a patient not optically measurable meant a break in the workflow. With the Sonolink, the IOLMaster 500 easily connects to the Accutome A-Scan synergy ultrasound device. Ultrasound measurements with the A-Scan are quickly and easily imported into the IOLMaster 500 for IOL calculation. Patient data, measurements and calculation results are kept together in one database, and the risk of data entry errors is greatly reduced.¹²

IOLMaster 500 technical data

Measurement range	Axial length 14–38 mm
	Corneal radii 5–10 mm
	Anterior chamber depth 1.5–6.5 mm
	White-to-white 8–16 mm
Display scaling	Axial length 0.01 mm
	Corneal radii 0.01 mm
	Anterior chamber depth 0.01 mm
	White-to-white 0.1 mm
IOL calculation formulas	SRK® II, SRK®/T, Holladay 1 and 2, Hoffer Q, Haigis
	Clinical history and contact lens fitting method for calculation of corneal refractive power following refractive corneal surgery
	Haigis-L IOL calculation for eyes following myopic / hyperopic LASIK / PRK / LASEK surgery
	Calculation of phakic anterior and posterior chamber implants
	Optimization of IOL constants

Interfaces	Ultrasound data link (to Accutome A-Scan synergy)
	ZEISS data archive and review solution FORUM
	ZEISS OR management system CALLISTO eye
	Data interface for electronic medical record (EMR) / patient management systems (PMS)
	Data export to USB storage media
Line voltage	Export database for Holladay IOL Consultant and HIC.SOAP Pro
	Ethernet port for network connection and network printer
Line frequency	100–240 V ± 10 % (self sensing)
Performance consumption	50–60 Hz
Laser class	max. 75 VA
	1

IOLMaster 500 at a glance

- All-in-one biometer: axial length and keratometry measurements as well as IOL power calculation in one device
- Dual Mode: axial length and keratometry measurements without unnecessary manual interaction
- Easy patient adjustments: distance independence of axial length and keratometry
- Composite Signal: for best-in-class cataract penetration
- Flexible platform: automatic or manual mode for customized treatments
- Robust platform: fully integrated system components, including formulas
- One consistent graphical user interface: for all formulas, including Holladay 2
- Most comprehensive set of formulas: includes fourth generation Haigis and Holladay 2
- Holladay 2 onboard: incorporated into the IOLMaster 500 formula selection; no need to export data, reducing transcription errors
- Haigis-L formula: for post-LVC patients
- Measurements along visual axis: for relevant axial distance, even in eyes with staphyloma
- Measures challenging eyes: pseudophakic and silicone-filled eyes as well as eyes with phakic IOL
- More comprehensive IOL calculation: for virtually all common IOL types
- Phakic IOL calculation: both anterior and posterior
- ULIB database: contains continuously optimized IOL lens constants to improve refractive outcomes
- Convenience: Sonolink for integrating Accutome A-Scan synergy ultrasound device
- Data integration: into FORUM data management system
- DICOM interface: for integration into EMR systems

12) Haigis W, Mlynski J, Comparative axial length measurements using optical and acoustic biometry in normal persons and in patients with retinal lesions, White Paper, Carl Zeiss Meditec, 2009

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0297



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Publication No: 00000-1966-318 10L.3905
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