

Technical Data

IOLMaster® 500	
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, 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
	Export database for Holladay IOL Consultant and HIC.SOAP Pro
	Ethernet port for network connection and network printer
Line voltage	100–240 V +/- 10% (self sensing)
Line frequency	50–60 Hz
Performance consumption	max. 90 VA
Laser class	1



- 1) <http://www.analey.com/AnaleyASCRS2008.xls>
2008 ASCRS survey results
For 73.5% of respondents, the IOLMaster ist the preferred method of biometry
<http://www.analey.com/ESCRS2008ByCountry.htm>
2008 ESCRS survey results
For 76.2% of respondents, the IOLMaster ist he preferred method of biometry
- 2) 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.
- 3) Haigis W, Clinical Experience with the IOLMasterAdvanced Technology software, presented at the ESCRS meeting in Stockholm, 2007
- 4) Olsen Th, Improved clinical results with the IOLMaster Advanced Technology, presented at the ESCRS meeting in Stockholm, 2007
- 5) Holladay IOL Consultant software <http://www.hicsoap.com>
- 6) Haigis W, Intraocular lens calculation after refractive surgery for myopia: Haigis-L formula. J Cataract Refract Surg. 2008 Oct;34(10):1658-63.
- 7) User Group for Laser Interference Biometry <http://www.augenklinik.uni-wuerzburg.de/sulib/c1.htm>
- 8) 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.
- 9) Haigis W, IOL-Kalkulation bei hohen Ametropien Ophthalmologe. 2008 Nov;105(11):999-1004.
Hill W, Intraocular Lens Power Calculation. <http://doctor-hill.com/iol-main/formulas.htm>
The Royal College of Ophthalmologists, Cataract Surgery Guidelines 2004
<http://www.rcophth.ac.uk/docs/publications/published-guidelines/FinalVersionGuidelinesApril2007Updated.pdf>
- 10) <http://www.iolmaster-online.zeiss.com>
- 11) 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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IOLMaster 500

Experience the essence
of non-contact biometry



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IOLMaster 500

Surgeons' clear preference in biometry.

Mastery is achieved through constant refinement. A decade ago, the IOLMaster® revolutionized cataract surgery as the world's first non-contact, all-in-one biometer. Since then, it has become synonymous with measurement precision, simple operation and excellent refractive outcomes. After years of continuous improvement, the IOLMaster is widely regarded as the gold standard for dependable biometry and straightforward IOL power calculation.¹

Precision

Simplicity

Outcomes



Enter the IOLMaster 500.

Today, selecting the right IOL to meet individual patient expectations is more crucial than ever. A complete workstation for low-hassle biometry and high-confidence IOL selection, the IOLMaster 500 incorporates advancements designed with the challenges of today's busy cataract practice in mind. Its guiding principles: precision, simplicity, outcomes.

Focused on customer needs



Precision

Dependable data for clinical confidence

The IOLMaster® 500 stands on a long heritage of highly precise measurement data. Proven in the field for more than a decade, the IOLMaster Partial Coherence Interferometry (PCI) technology is the acknowledged reference point in biometry today.

Composite signal evaluation has not only significantly increased the fraction of cataracts measurable with optical technology. It has also greatly increased signal-to-noise values, a measure of the outstanding reliability of IOLMaster data.^{2,3,4}

With the IOLMaster 500, this level of clinical confidence is easier to achieve than ever: In the new Twin Technology dual measurement mode, multiple axial length and keratometry readings are captured largely automatically, with a simple push of a button.



Simplicity

Customer-centric innovation in biometry

The IOLMaster® 500 takes its cue from the day-to-day requirement of today's eye care professionals – starting with striking simplicity of the workflow and the interpretation of results.

Providing all measurements needed for state-of-the-art IOL power calculation has always been the hallmark of the IOLMaster as a comprehensive biometry solution. Seamlessly integrated on-board IOL power calculation offers the shortest possible path to the result that really matters: high-confidence IOL power selection. Clearly structured, concise reports deliver these results where and when they are needed – to the FORUM archive and review solution, to an EMR system, or on paper.

The IOLMaster 500 re-defines simplicity. Its redesigned graphical user interface yields more data with fewer clicks. The optional Sonolink ultrasound connection provides an optimal workflow even for those few cases where an optical axial length reading is not possible.



Outcomes

Clinical results that make a difference

Patient expectations of cataract surgery outcomes have never been higher. Whether it's aspheric, multi-focal, toric or any other type of premium or standard IOL: patients have come to expect the best refractive outcome achievable.

The IOLMaster has long been an indispensable tool in meeting patient expectations and delivering on the promise of premium intraocular lenses. The IOLMaster 500 offers a wide range of on-board IOL calculation options, including the fourth-generation Haigis formula and convenient data export to the Holladay IOL Consultant software.⁵

For patients with prior laser vision correction (LVC), IOL selection can be a challenge. In its post-LVC calculation toolbox, the IOLMaster 500 includes the Haigis-L formula, which requires no clinical history data.⁶

Any intraocular lens calculation is only as reliable as the lens constants it is based on. The long clinical experience with the IOLMaster is reflected by the Users' Group for Interference Biometry (ULIB) website.⁷ For virtually all common IOL types, the ULIB database contains lens constants optimized specifically for the IOLMaster. And the IOLMaster 500 allows these constants to be further refined and personalized.



Measurement

As exact as the most exacting demands

IOLMaster® 500 accuracy and precision satisfy the most exacting demands of clinicians for whom optimal refractive outcomes are a baseline expectation.

Fast operation with minimal effort

In a busy practice throughput is key. The IOLMaster 500 does not waste precious chair time on cumbersome setup, tricky alignment or lengthy calculations. The new Twin Technology dual measuring mode reduces acquisition time to a minimum: axial length and keratometry are now captured at once; changeover between modes happens without user interaction.

Safety is the top priority

What could be more important in biometry than measurements you can rely on? The composite signals of the IOLMaster 500 take the guesswork out of interpreting axial length scans. With the solid signal-to-noise ratio values of the composite signal algorithm, dependable data can be achieved for a remarkable number of patients.^{2,3,4}

Common sources of error are eliminated through an easy-to-understand traffic light indicator: a green light signals best alignment. Right-eye and left-eye values for axial length and corneal radii are compared and checked for plausibility – adding confidence especially for challenging eyes.

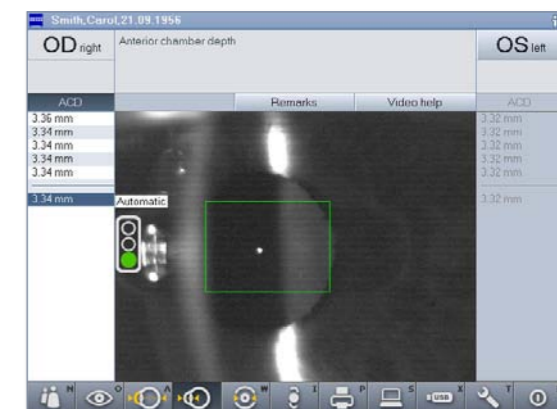
The user independence and high reproducibility of IOLMaster measurement results have been documented in the scientific literature.⁸ Clinical experience has shown that the state of accommodation, pupil diameter and high ametropia do not compromise the axial length data.

Measures virtually anything

The true test of a biometer are challenging eyes. The IOLMaster® measures along the visual axis, yielding the relevant axial distance even with staphyloma. Pseudophakic, silicone-filled, or eyes with a phakic implant: it's as simple as selecting the right measurement mode, even after data acquisition. Axial length measurements with the IOLMaster 500 are fast and distance independent – a great help with poorly fixating or restless patients. Even the penetration of dense cataracts has improved significantly since the early days of optical biometry.^{2,3,4}



Dual mode for axial length measurement and keratometry



Anterior chamber depth measurement



White-to-white and pupil size determination



IOL calculation

Results that leave nothing to be desired

As a comprehensive biometry solution, the IOLMaster® 500 leaves nothing to be desired, delivering high-precision IOL power calculations with exceptional convenience.

Confidence in picking the right formula

Knowing which IOL formula works best is not always trivial. The IOLMaster 500 software offers a range of recognized formulas for the automatic calculation of the targeted IOL power. To help choose the right one, the IOLMaster 500 automatically marks the set of appropriate formulas for a given axial length, based on recommendations in the scientific literature.⁹

Optimized constants for optimum outcomes

Ultimately, the refractive outcome depends on the right lens constant. Ten years of clinical experience are a key asset: with lens constants for more than 160 IOL types, based on over 30,000 sets of patient data from about 200 clinical sites,⁷ the ULIB database is an indispensable resource for IOLMaster users.⁶ The constants, which were optimized specifically for the IOLMaster, are delivered with each new instrument. They can also be conveniently downloaded from the ZEISS Website.¹⁰

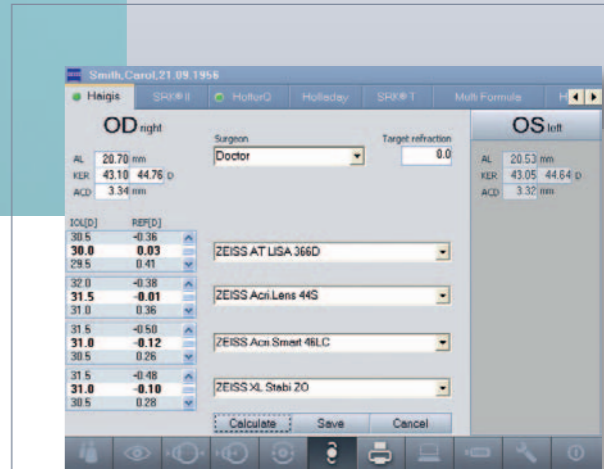
Premium IOL patients rely on excellent outcomes.

Refining lens constants is a key ingredient of refractive predictability. The IOLMaster 500 allows personalization of IOL constants based on post-operative data - including all three constants in the Haigis formula.

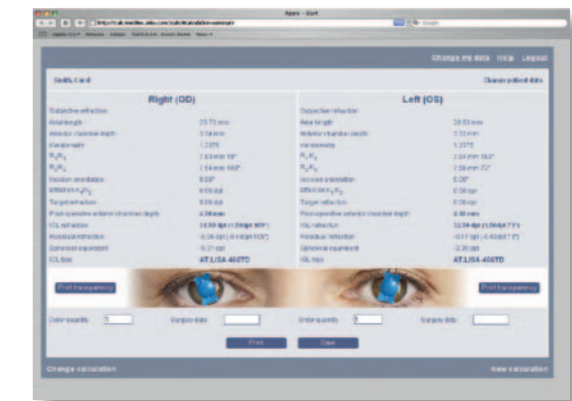
No history? No problem!

The number of cataract patients with prior LASIK, LASEK or PRK is growing rapidly. But often, clinical history data is not available. With its on-board Haigis-L formula, the IOLMaster 500 greatly simplifies IOL power calculation in these cases, no matter whether the refractive procedure was myopic or hyperopic.

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.



IOL power calculation



Online toric IOL calculation with Z-CALC





Data transfer to and from the A-Scan synergy at the push of a button



FORUM eye care data management

Workflow

Working at what works best for the user

Product innovation at Carl Zeiss is guided by one overriding principle: We work to improve on what works best for the user.

Designed with the clinical workflow in mind

Well-designed user interfaces can help avoid user error and simplify operator training. The highly intuitive IOLMaster® interaction design has set standards for easy-to-learn, easy-to-delegate biometry. The redesigned IOLMaster 500 graphical user interface continues this success story. It eliminates even more clicks and guides the user along a well thought-out workflow sequence.

The ultrasound advantage

Previously, a patient not measurable optically meant a break in the workflow. With the Sonolink connection, IOLMaster 500 patient data is easily transferred to the Accutome A-Scan synergy with a few simple clicks. After ultrasound measurement, the A-scan data is imported back to the IOLMaster 500 for

IOL calculation just as quickly and easily. Patient data, measurements and calculation results are kept together in one database and the risk of data entry errors is greatly reduced.

When working with both optical biometry and ultrasound A-scan, the relative calibration of the two axial length devices is crucial. A clinical study has shown excellent agreement of data between IOLMaster and Accutome A-scan data.¹¹

A world of efficiency

The days of stand-alone instruments are over. The IOLMaster 500 fits perfectly in 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, 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 IOLMaster printouts to be displayed 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.

IOLMaster 500 online information:

For more information on the IOLMaster 500 visit the product website at

www.meditec.zeiss.com/iolmaster

For more information on the ULIB database and the calculation of ZEISS toric intraocular lenses visit the new IOLMaster online website at

www.iolmaster-online.zeiss.com