LENSTAR 900
Improving outcomes

Look closer. See further.

HAAG-STREIT
DIAGNOSTICS

Lenstar 900
The all-in-one optical biometer & IOL planning platform

From automated and precise measurement acquisition to IOL calculation and surgical planning, Lenstar 900 provides a seamless workflow that boosts your practice's efficiency and optimizes your patients' refractive outcomes.

With a single scan, Lenstar 900 captures axial dimensions, keratometry, and pupillometry, while simultaneously generating a cornea map* to assess the regularity and symmetry of astigmatism. The dual zone keratometry is equivalent to manual keratometry, providing precise K values, axis, and astigmatism measurements[1,2].

Equipped with state-of-the-art formulas such as Hill-RBF, Olsen, Barrett, and the EyeSuite IOL toric planner, Lenstar 900 ensures accurate IOL predictions for any patient.

**Availability may vary by region. Please contact your local Haag-Streit Distributor for details.*

Precise measuring data for the Hill-RBF Method

The Lenstar 900's precise measurement technique in combination with the unique Hill-RBF Method allows accurate prediction of the IOL power for all types of eye.

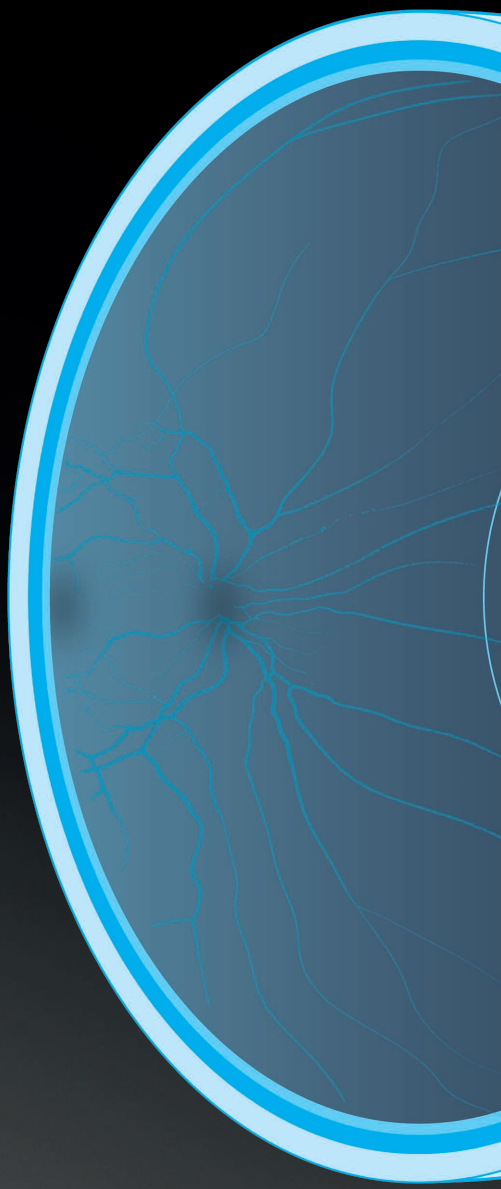
Perfect K values – best toric results

The Lenstar 900 features dual zone keratometry or T-Cone topography for precise astigmatism and axis measurement[1,2]. Its toric calculator, featuring Barrett[3], Hill-RBF[4], and Olsen[5], predicts toric IOL power, considering the posterior cornea for best refractive outcomes.

For post-refractive cases – quick & reliable

Barrett True-K, Shammas No-History, and Masket IOL calculation methodologies can be used for post-refractive patients even without any clinical history available [6,7,8].

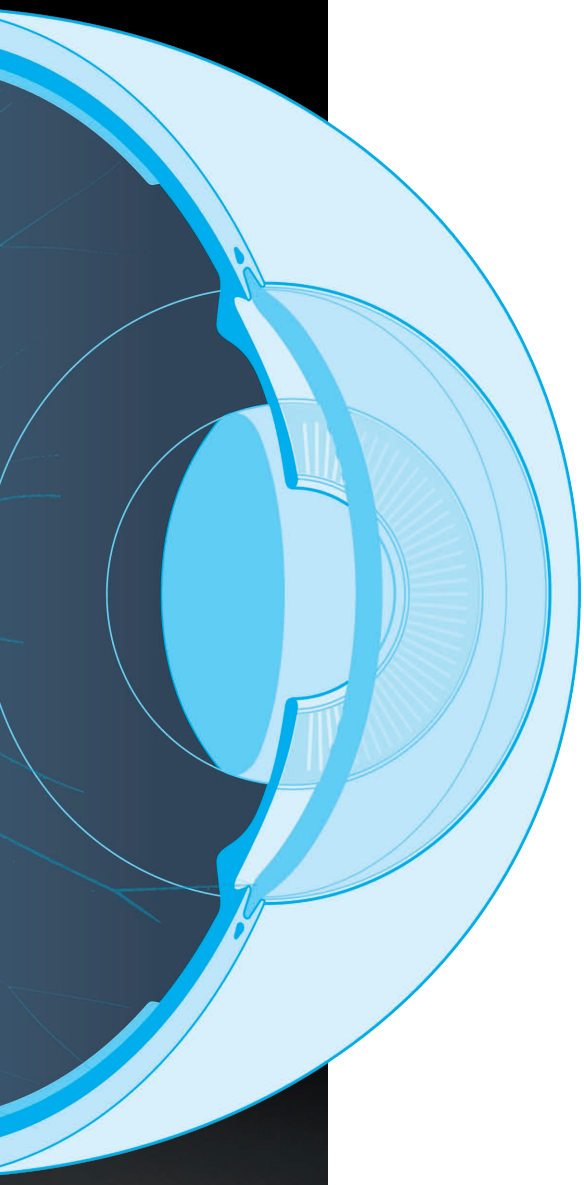
Optical biometry
Fast & precise measurement of the anterior & posterior segments of the eye



The Lenstar 900 delivers fast and precise optical biometry for a variety of eye types, including regular, aphakic, pseudophakic, and silicone oil-filled eyes.

Its optional Automated Positioning System (APS) utilizes dynamic eye-tracking to facilitate automated and accurate measurement acquisition.

If necessary, each measurement can be evaluated and adjusted to ensure complete biometric accuracy.



Axial dimensions

Using Optical Low Coherence Reflectometry (OLCR), Lenstar 900 precisely measures all key axial dimensions such as central corneal thickness (CCT), anterior chamber depth (ACD), lens thickness (LT), and axial length (AL) with high precision and reproducibility.

The Dense Cataract Measurement (DCM) mode uses advanced digital signal processing to achieve high success rates in AL measurements, even in patients with dense cataracts.

White-to-white & pupillometry

Based on high-resolution color photography of the eye, Lenstar 900 provides reliable white-to-white measurements to be used in advanced IOL calculation formulas. In addition, Lenstar 900 includes measurement of the pupil diameter, an indicator of the patient's suitability for premium IOLs, as well as for laser refractive procedures.

Keratometry

Lenstar 900's unique dual zone keratometry provides axis and astigmatism measurements equivalent to the "gold-standard" manual keratometry[1,2]. The closely spaced 32 measurement point pattern improves precision, both delivering more data and minimizing the need for software data interpolation.

Cornea map*

Simultaneously with the keratometry measurement, the Lenstar 900 generates an axial curvature map of the central 3 mm zone of the anterior cornea using 48 measurement points. The cornea map indicates the astigmatism's regularity and symmetry and therefore provides decision support in choosing the appropriate IOL type for toric candidates.

T-Cone topography

For even greater confidence in toric procedures, the optional T-Cone toric platform offers a mountable true 11-ring Placido topographer, delivering detailed axial, tangential, and elevation maps of the central 6 mm optical zone. Integrated with the EyeSuite IOL toric planner, the T-Cone toric platform ensures optimal intervention planning, improving surgical outcomes and accuracy.

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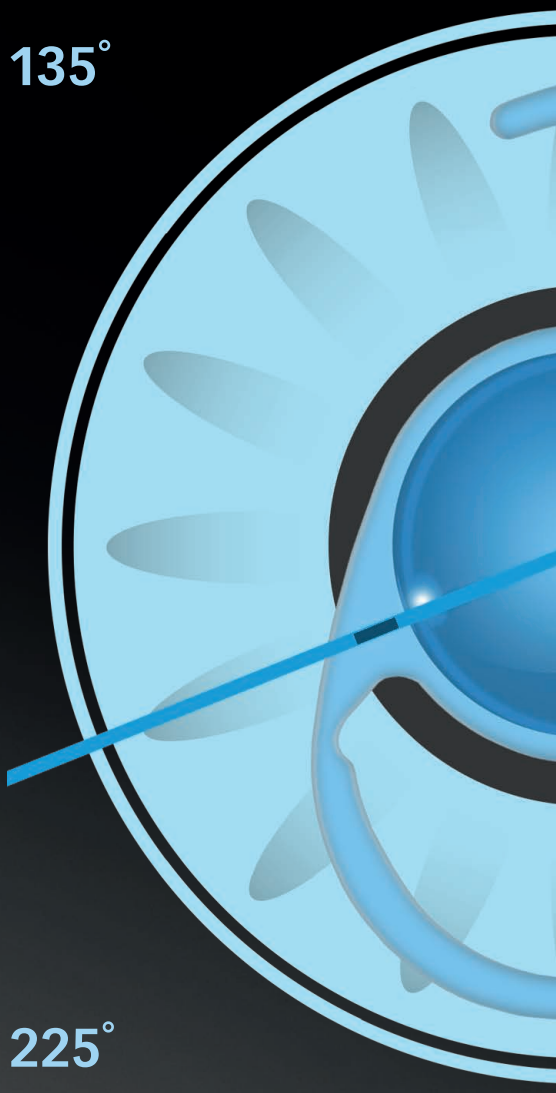
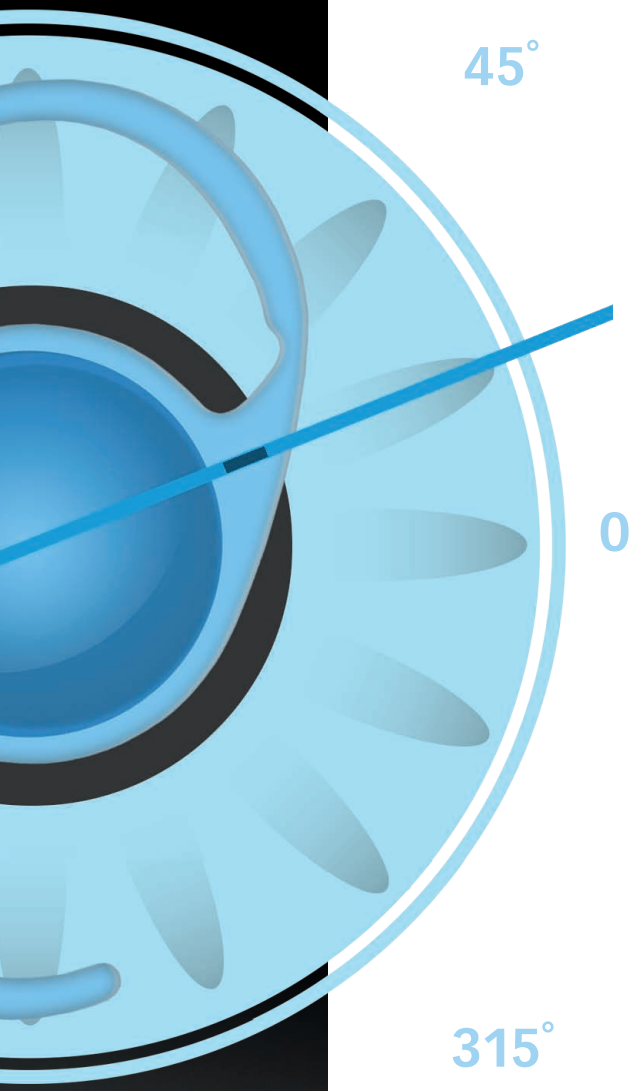
EyeSuite IOL
The comprehensive IOL calculation platform



EyeSuite IOL is designed to meet the needs of all patients, including those with toric or post-refractive requirements. Its intuitive dashboard ensures accurate IOL power calculations and streamlines lens selection. The platform enables side-by-side comparisons of IOL calculation methods and anticipated outcomes for monofocal, toric, or multifocal lenses across manufacturers.

The IOL editors streamline management and customization of the IOL database, allowing surgeons to adjust IOL constants based on their outcomes and improve calculation accuracy. The database can also be expanded with IOLs from new manufacturers or external libraries like IOL Con, ensuring maximum flexibility and adaptability to individual preferences.



Hill-RBF 3.0

Hill-RBF 3.0 uses the predictive power of artificial intelligence, built on high-quality data collected by leading cataract surgeons worldwide. By leveraging pattern recognition and big data, it delivers highly accurate IOL predictions for any anatomical configuration[4]. Its unique reliability check identifies unusual eye configurations and labels them as outliers, providing confidence beyond simple power values.

Barrett Universal II & Olsen

Standard IOL calculations work well for average eyes but often fall short in cases like short or long eyes or those with unique anatomical features, as they tend to misinterpret lens positioning. To enable excellent refractive results for any patient anatomy, EyeSuite IOL features latest generation IOL calculation formulas, i.e., Barrett Universal II[3] and Olsen[5]. For improved IOL prediction, they include anterior chamber depth (ACD) and lens thickness (LT) in their calculation besides the standard axial length measurements and K-readings.

Post-refractive solutions

IOL calculation for post-refractive patients presents unique challenges. To support surgeons managing patients with prior RK, LASIK, RK or PRK, EyeSuite IOL offers a comprehensive set of cutting-edge formulae for post refractive patients. For patients without surgical history, the integrated Barrett True-K and Shammas No-History methods are employed. If the change in refraction caused by the refractive procedure is known, then the Barrett True-K with history, Masket and modified Masket formulae may also be used[6,7,8].

Toric solutions

For planning toric IOLs, correct calculation of the cylinder power and orientation are key. To achieve this, the optional EyeSuite IOL toric planner features the Barrett Toric Calculator, the Hill-RBF, Koch/Abulafia toric planner[9], and Olsen Toric[5] for accurate IOL prediction.

EyeSuite IOL toric planner
Enhance efficiency & refractive outcomes

EyeSuite IOL toric planner is an intuitive platform designed to simplify toric intervention planning. It displays the implantation axis, the incision location and overlays of critical data such as IOL orientation or curvature maps. The incision optimization tool helps surgeons identify the ideal incision location to minimize residual astigmatism.

To enhance intraoperative orientation, surgeons can manually mark anatomical landmarks on the iris and sclera images. They either serve as a baseline point for the intraoperative orientation or as a fallback strategy if external marking is not successful.

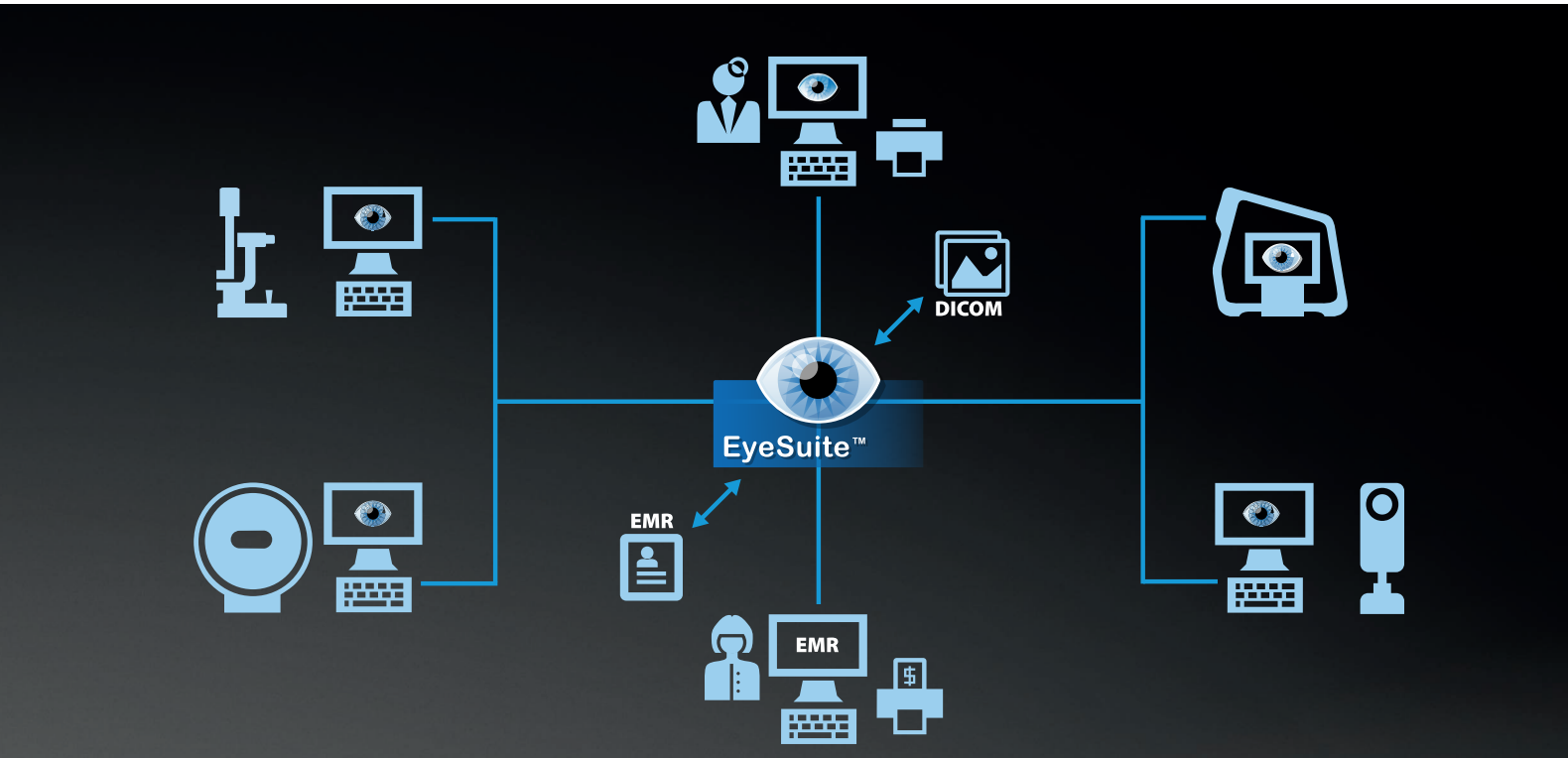
All critical planning details—including IOL data, calculations, and custom markings—are consolidated into a tailored printout, providing clear, actionable guidance for the operating room.

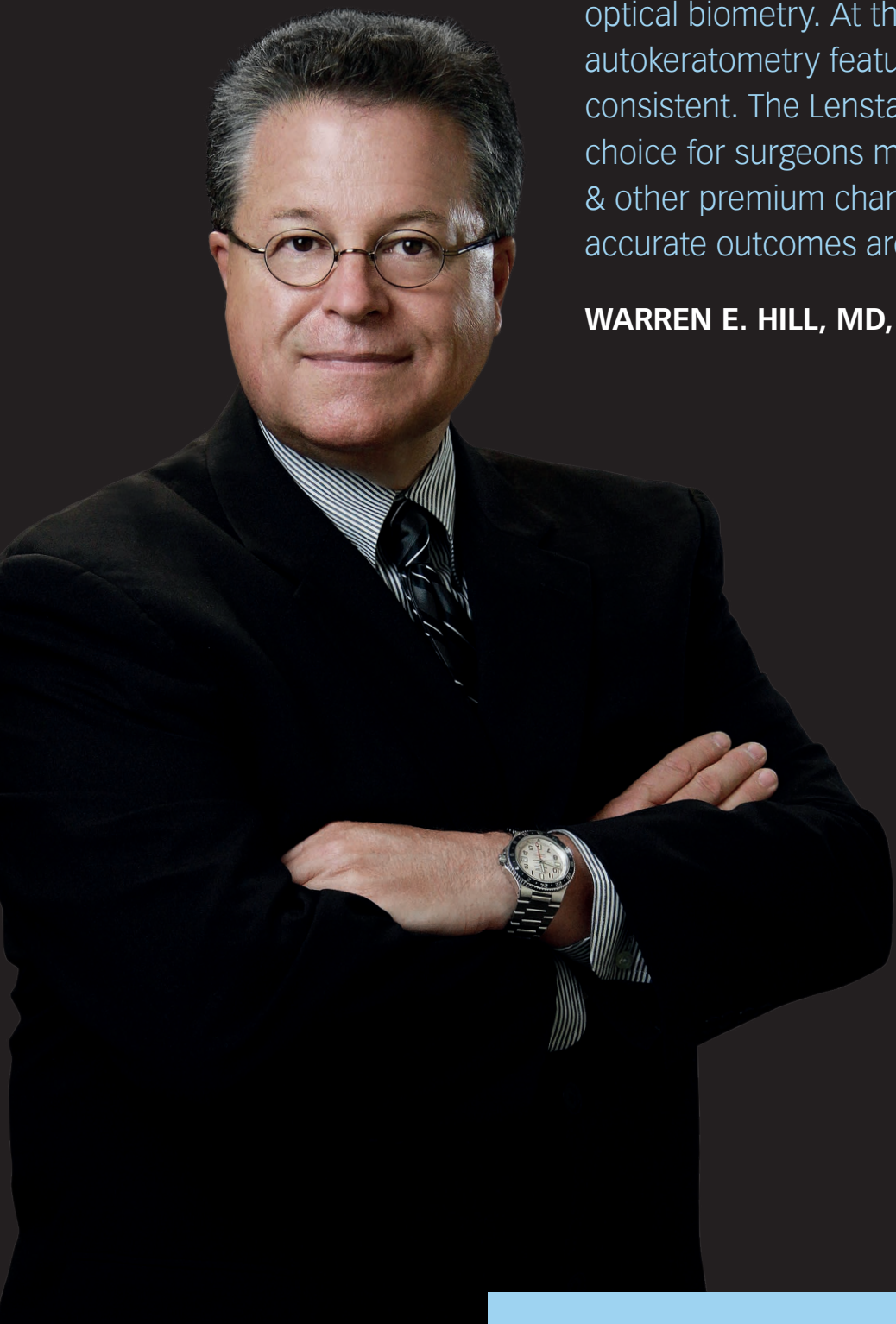
Connectivity is key
Seamless integration for optimal workflow

With EyeSuite software, the Lenstar 900 seamlessly integrates into your practice network, providing real-time access to all data.

Standardized interfaces, such as GDT or DICOM, enable effortless connection to most electronic medical record (EMR) systems. Additionally, EyeSuite's open data interface and Lenstar 900's separate computer automatically populate data fields with imported values from refraction devices or your EMR.

This integration not only saves time but also reduces the risk of transcription errors, ensuring efficiency and accuracy throughout your workflow.





"The Lenstar 900 is a remarkably easy to use all-in-one IOL power calculation tool that delivers exceptionally accurate axial length, anterior chamber depth & lens thickness by optical biometry. At the same time, its dual zone autokeratometry feature is precise & uniformly consistent. The Lenstar 900 is an excellent choice for surgeons migrating towards torics & other premium channel IOLs where highly accurate outcomes are critical for success."

WARREN E. HILL, MD, FACS

Technical specifications
Lenstar LS 900

Measured variables & modes

Corneal thickness CT

Measurement range	300–800 µm
Display resolution	1 µm

Anterior chamber depth ACD

Measurement range	1.5–6.5 mm
Display resolution	0.01 mm

Lens thickness LT

Measurement range	0.5–6.5 mm
Display resolution	0.01 mm

Axial length AL

Measurement range	14–32 mm
Display resolution	0.01 mm

White-to-white distance WTW

Measurement range	7–16 mm
Display resolution	0.01 mm

Keratometry K

Measurement range for radius	5–10.5 mm
Display resolution	0.01 mm
Measurement range for axis angle	0–180°
Display resolution	1°

Pupillometry PD

Measurement range	2–13 mm
Display resolution	0.01 mm

Measurement modes

- 'Normal' eye
- Aphakic eye
- Pseudophakic eye
- Silicone-filled eye
- Combination of the above.

Laser safety

Class 1 laser product

Onboard IOL calculation formulae

Hill-RBF Method, Hill-RBF/Abulafia-Koch Toric Calculator, Olsen, Barrett Universal II, Barrett True-K, Barrett True-K Toric, Barrett Toric, Haigis, Hoffer Q, Holladay 1, SRK/T, SRK II, Masket, Modified Masket, Shammas No-History.

IOL calculation data interfaces

- Holladay IOL Consultant Professional Edition (Holladay 2 formula & Holladay toric calculator)[10]
- PhacoOptics (Olsen formula)[11]
- Okulix (Ray-Tracing by Prof. Preussner)[12].

Electronic medical record system interfaces

- DICOM (SCU)
- EyeSuite Script Language
- GDT
- EyeSuite command line interface.

The above-mentioned measurement ranges are based on the standard settings of the device for automatic measurement and analysis.

Lenstar LS 900 optical biometer intended use

The Lenstar LS 900 is a non-invasive, non-contact OLCR (optical low-coherence reflectometry) biometer used for obtaining ocular measurements and performing calculations to assist in the determination of the appropriate power and type of IOL (intraocular lens) for implantation after removal of the natural crystalline lens.

The Lenstar LS 900 measures:

- Axial length
- Corneal thickness
- Anterior chamber depth
- Aqueous depth
- Lens thickness
- Corneal curvature
- Radii for flat and steep meridian
- Axis of the flat meridian
- White-to-white distance
- Pupil diameter.

1 Hill W, Osher R, Cooke D, Solomon K, Sandoval H, Salas-Cervantes R, Potvin R. Simulation of toric intraocular lens results: manual keratometry versus dual zone automated keratometry from an integrated biometer. J Cataract Refract Surg. 2011 Dec; 37(12): 2181-7. **2** Gundersen KG, Potvin R. Prospective study of toric IOL outcomes based on the Lenstar LS 900 dual zone automated keratometer. BMC Ophthalmol. 2012 Jul 16; 12:21. **3** Barret G. Flight of the arrow: improving outcomes with toric intraocular lenses, XXXII Congress of the ESCRS 2014 London, Video Prize Winner, Category Innovation, available on ESCRS on demand, http://escrs.conference2web.com/content/23476/ accessed March 16, 2015. **4** W.E. Hill; IOL Power Selection by Pattern Recognition; ASCRS EyeWorld Corporate Education; ASCRS 2016. **5** Olsen T. Improving IOL power Calculation by measurement of the lens thickness with the Lenstar LS 900 presented at the ESCRS in Paris 2010. **6** Wang L, Hill WE, Koch DD. Evaluation of intraocular lens power prediction methods using the American Society of Cataract and Refractive Surgeons Post-keratorefractive Intraocular Lens power Calculator. J Cataract Refract Surg. 2010 Sep; 36(9): 1466-73. **7** McCarthy M, Gavanski GM, Paton KE, Holland SP. Intraocular lens power calculations after myopic laser refractive surgery: a comparison of methods in 173 eyes. Ophthalmology. 2011 May; 118(5): 940-4. **8** Wang L, Tang M, Huang D, Weikert MP, Koch DD. Comparison of Newer Intraocular Lens Power Calculation Methods for Eyes after Corneal Refractive Surgery. Ophthalmology. 2015 Dec;122(12):2443-9. **9** Abulafia A, Barrett GD, Kleinmann G, Ofir S, Levy A, Marcovich AL, Michaeli A, Koch DD, Wang L, Assia EI. Prediction of refractive outcomes with toric intraocular lens implantation. J Cataract Refract Surg. 2015 May;41(5):936-44. 10 https://www.hicsoap.com/ 11 https://www.phacooptics.net/ 12 http://okulix.de

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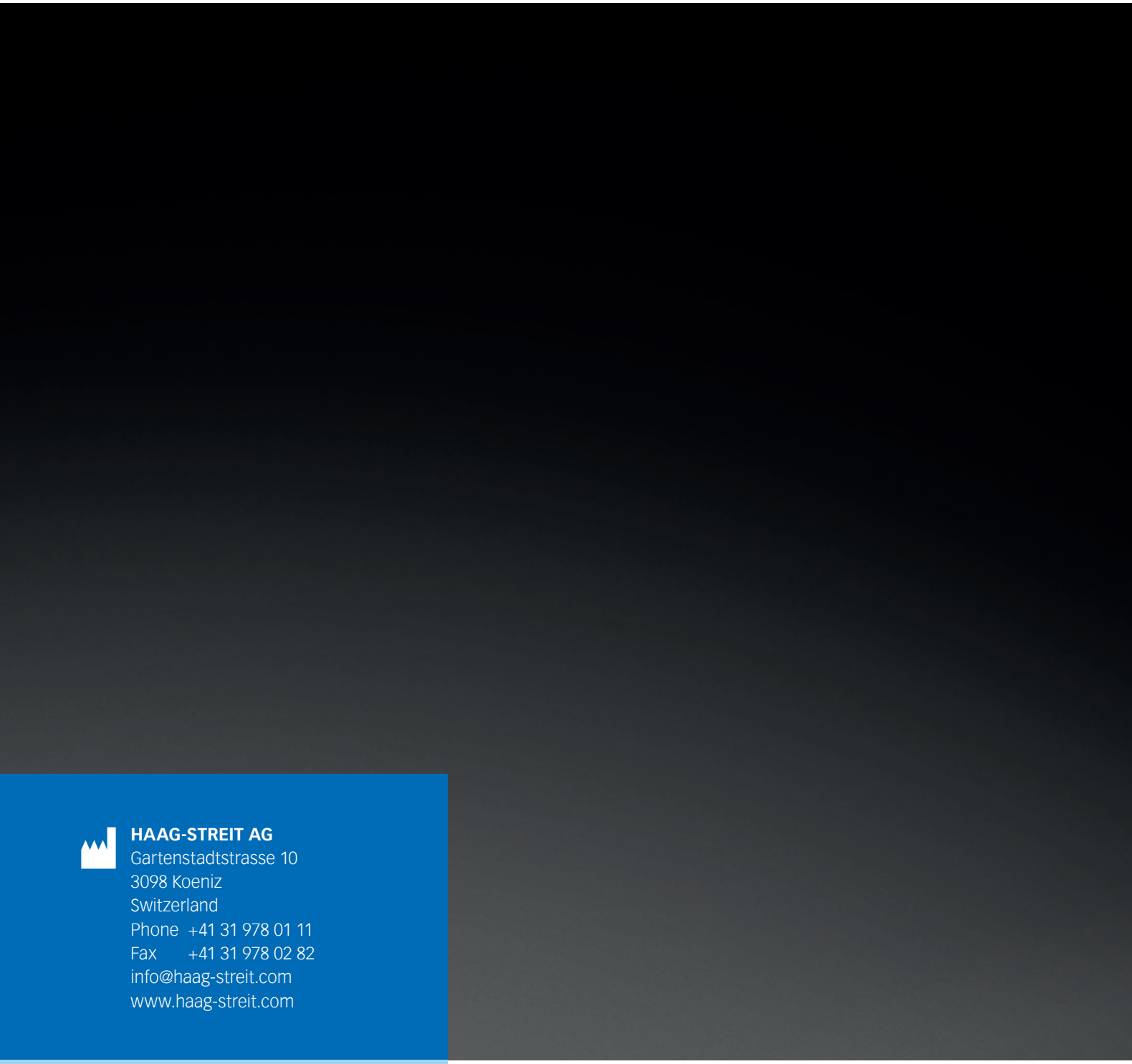

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