Measure at the speed of light ...



Biometry



Explore new dimensions ...

 Complete optical biometer – including CCT, lens thickness and retinal thickness

Align once, get all results -

fast biometrical assessment

Non contact, highest precision -

all measurements on the visual optical line



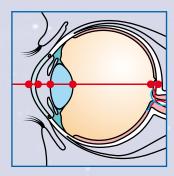
The first optical biometer of the entire eye ...



NINE MEASUREMENTS IN ONE SHOT

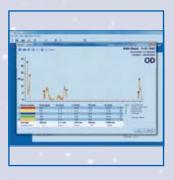
Precise measurement of eye parameters is critical in modern cataract treatment.

The LENSTAR® provides the surgeon with all necessary parameters needed to calculate the optimal IOL using latest multivariable formulae in one single measurement. The measurement includes corneal thickness, anterior chamber depth, lens thickness, axial length, keratometry, white-to-white distance, pupillometry, eccentricity of the visual optical line and retinal thickness.



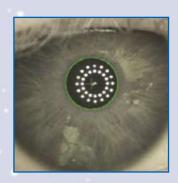
FAST AND PATIENT FRIENDLY MEASUREMENTS

The measurement process of the LENSTAR® is optimised to ensure maximum patient comfort and minimum process time. The device has to be aligned only once to get all measurements in a single shot. Blinking of the patient and loss of fixation is detected and only good measurements are used for the analysis.



PRECISION ON THE VISUAL OPTICAL LINE

The patient fixates directly on the measurement beam. This ensures that all readings are taken on the visual optical line. Furthermore all length measurements are assessed with optical coherence biometry, leading to highest precision and accuracy. Multiple markers ensure a stable and reliable measurement of the corneal curvature.



The future begins now ...

The all in one optical biometer

Optical coherence biometry revolutionised cataract surgery, the LENSTAR® is about to revolutionise optical biometry. State-of-the-art, multivariable IOL calculation formulae demand more than just the axial length and keratometry values of the eye. LENSTAR® provides the user with a complete biometrical assessment of the patient's eye in a single measurement procedure, including lens thickness, anterior chamber depth (lens position) and retinal thickness.

CENTRAL CORNEAL THICKNESS (CCT)

CCT is measured using optical coherence technology, leading to unmatched accuracy and precision. Reproducibility of this measurement is as good as $\pm 2\mu m$, providing one of the base parameters for possible laser correction of the cataract surgery.

KERATOMETRY

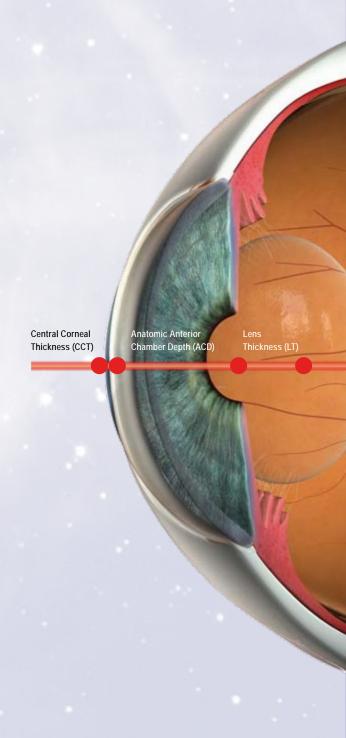
A 32 marker pattern ensures precise assessment of the corneal curvature. The distribution of the marker on two concentric circles allows stable measurements even with non-compliant patients.

WHITE-TO-WHITE

For sulcus fixated IOLs and for the calculation of the IOL power using 3rd and 4th generation formulae, LENSTAR® measures white-to-white distance (horizontal iris width).

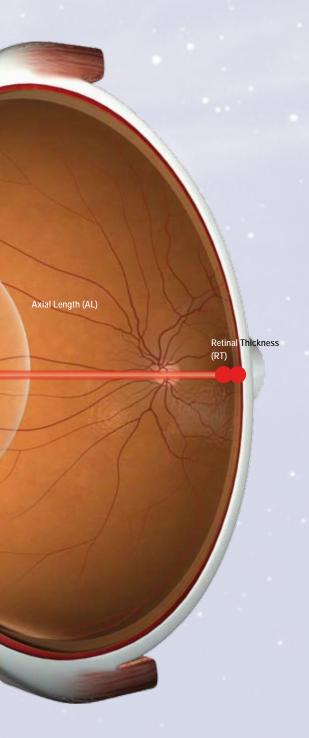
PUPILLOMETRY

The software allows for measurement of the patient's pupil diameter in ambient light condition.



CENT SE

Unlimited optical biometry ...



LENS THICKNESS

Modern multivariable IOL calculation formulae use the patient's lens thickness as an input parameter. LENSTAR® provides the user with the measurement of true lens thickness on the visual optical line of the patient using optical coherence technology (OLCR). No estimation or additional ultrasound measurement is required to get this important parameter.

ANTERIOR CHAMBER DEPTH (ACD)

Just like all other length measurements ACD is assessed with optical coherence technology (OLCR). Combined with the CCT measurement, LENSTAR® provides the user with the anatomical as well as ACD as measured by ultrasound biometers.

AXIAL LENGTH (AL)

Optical coherence technology using a superluminescent diode as light source allows the measurement of the axial length of the patient's eye on the visual optical line in highest precision and through dense cataracts.

ECCENTRICITY OF THE VISUAL OPTICAL LINE

The eccentricity of the visual optical line is assessed with respect to white-to-white as well as to the pupil centre. Both are important parameters for laser refractive procedures.

SPECIAL EYE CONDITIONS

All of the described measurements are available for the measurement of the "normal" cataract patient as well as for aphakic, pseudoaphakic and silicone oil filled eye conditions. In case of an error, you may even change the selected eye condition after completion of the measurement procedure.

Reach for the stars ...

User-friendly and ergonomic

In addition to the ease of using only a single measurement, the LENSTAR® also provides a user-friendly application and navigation of the software interface. This allows even inexperienced persons to easily begin to use the device without intensive training. Measurements can be performed by assistants, thus improving the efficiency of the clinic.



Best measurements for optimum IOL prediction

LENSTAR® provides the user with a complete assessment of the human eye with the highest precision using OLCR technology. The patient fixates on the measurement beam, ensuring that all length measurements are taken on the visual optical line.

CEN SE





Comprehensive measurements for optimal IOL calculation ...

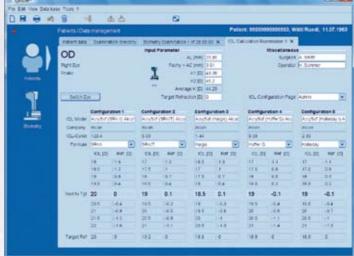
Ready for the future in IOL power calculation

The integrated IOL power calculator incorporates all state-of-the-art IOL prediction formulae. Measuring not just the parameters used in current formulae, LENSTAR® is ready for the next generation of IOL power calculation formulae.

Intuitive and open

Combined with the IOL power calculator, LENSTAR® features a sophisticated database to handle the user's preferred IOL collection. Along with the power range of the IOL, LENSTAR® provides three independent IOL-constant sets as well as three independent power step sizes.





Ergonomic solutions for you and your patients ...



LENSTAR® on instrument table HSM 901 IT with an integrated small personal computer.

Space saving solution: LENSTAR® on instrument table HSM 901 in combination with a laptop.



Installation of the LENSTAR® on refraction units is feasible as the examination unit and the PC can be separated.

LENSTAR LS 900® technical specifications ...

MEASURED VARIABLES

300 – 800 μm
1 µm
(1.σ) +/- 2 μm

Anterior chamber depth (ACD)

 $\begin{array}{lll} \mbox{Measurement range} & 1.5 - 5.5 \mbox{ mm} \\ \mbox{Display resolution} & 0.01 \mbox{ mm} \\ \mbox{In-vivo repeatability} & (1.\sigma) +/- 20 \mbox{ } \mu \mbox{m} \\ \end{array}$

Lens thickness (LT)

 $\begin{array}{lll} \mbox{Measurement range} & 0.5-6.5 \mbox{ mm} \\ \mbox{Display resolution} & 0.01 \mbox{ mm} \\ \mbox{In-vivo repeatability} & (1.\sigma) +/-50 \mbox{ } \mu \mbox{m} \\ \end{array}$

Axial length (AL)

Keratometry

Measurement range for radius5-10.5 mmDisplay resolution0.01 mmIn-vivo repeatability $(1.\sigma) +/-30 \mu m$ Measurement range for axis angle $0-180^{\circ}$ Display resolution 1° In-vivo repeatability $(1.\sigma) +/-9^{\circ}$

White-to-white distance

Measurement range7 - 16 mmDisplay resolution0.01 mmIn-vivo repeatability $(1.\sigma)$ +/- 0.3 mm

Pupillometry

Measurement range 2 – 13 mm Display resolution 0.01 mm

Eccentricity of the visual optical line

Display resolution 0.01 mm

Retinal thickness Manually assessed

Display resolution 1 μm

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



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Precision by Tradition