GALILEI™

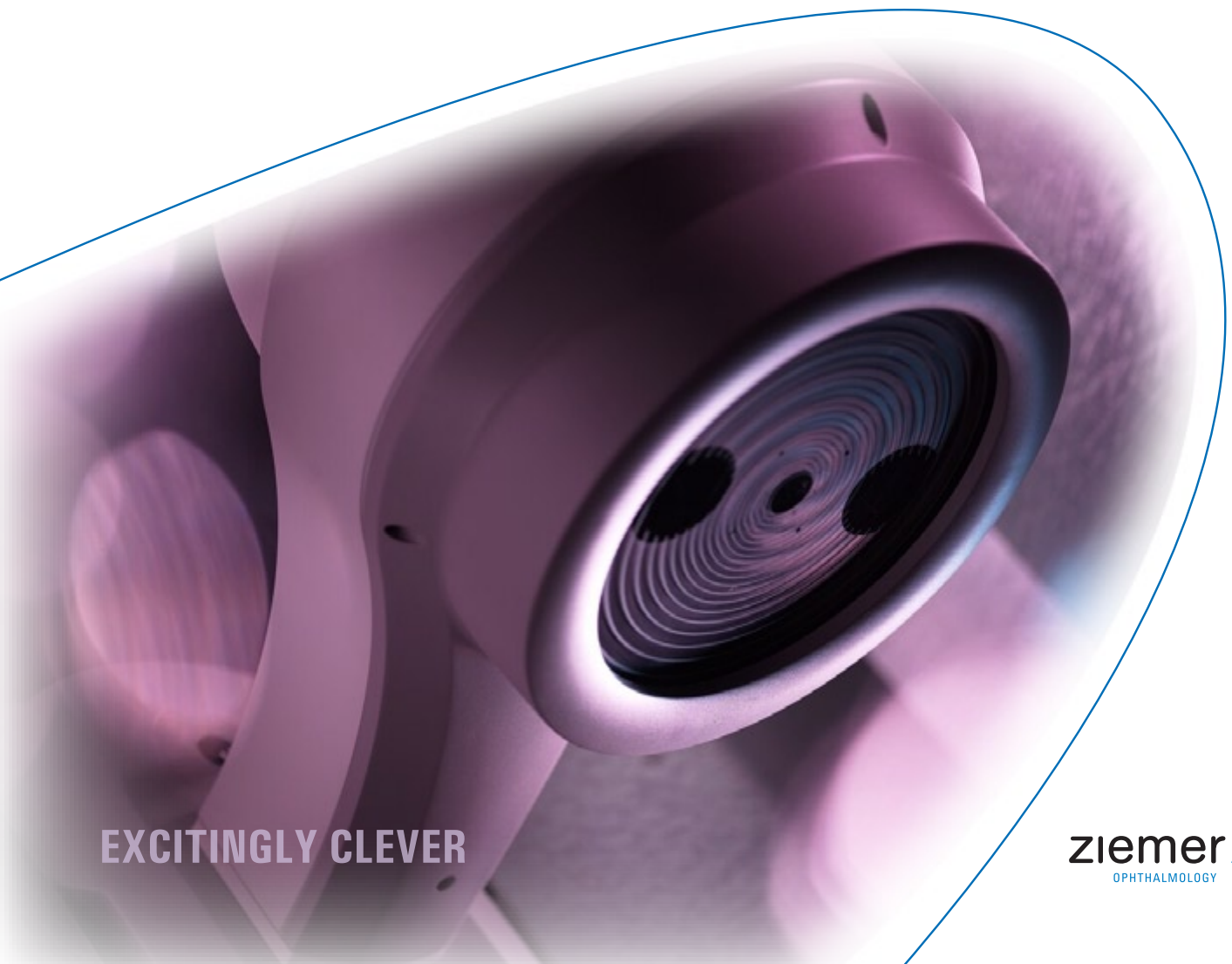## DUAL SCHEIMPFLUG ANALYZER

Beyond Topography.
Precision mapping of Cornea
and Anterior Segment.

EXCITINGLY CLEVER

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GALILEI™

DUAL SCHEIMPFLUG ANALYZER

The GALILEI™ Dual Scheimpflug Analyzer is a high precision optical system for corneal topography and three dimensional analysis of the anterior eye segment, based on a Revolving Dual Channel Scheimpflug Camera and a Placido Disk.

GALILEI™ combines the advantages of two technologies: Placido imaging furnishes high accuracy curvature data, while Scheimpflug imaging is optimal for precise elevation data.

Ziemer Group

We develop, manufacture and market diagnostic and surgical products that excel with unusual and superior features, provide extraordinary benefits to the user, and meet the highest standards of quality and safety. Our diagnostic and surgical products generate results that re-define the state of the art in terms of precision and accuracy.

GALILEI is a complete, self-contained system that includes the optical module, high-performance computer and LCD monitor, and a movable, height-adjustable table with headrest.

GALILEI Highlights:

- Dual Scheimpflug Camera for precision pachymetry
- Combined Placido and Scheimpflug imaging for precise elevation and curvature information
- High Precision Eye Tracker for optimal motion correction

GALILEI Functionalities:

- High resolution Scheimpflug images
- Corneal pachymetry
- Curvature, elevation, and power maps
- Keratoconus assessment
- Corneal and lens densitometry
- Manual measurements
- Anterior chamber depth, volume and angles
- Corneal wavefront analysis
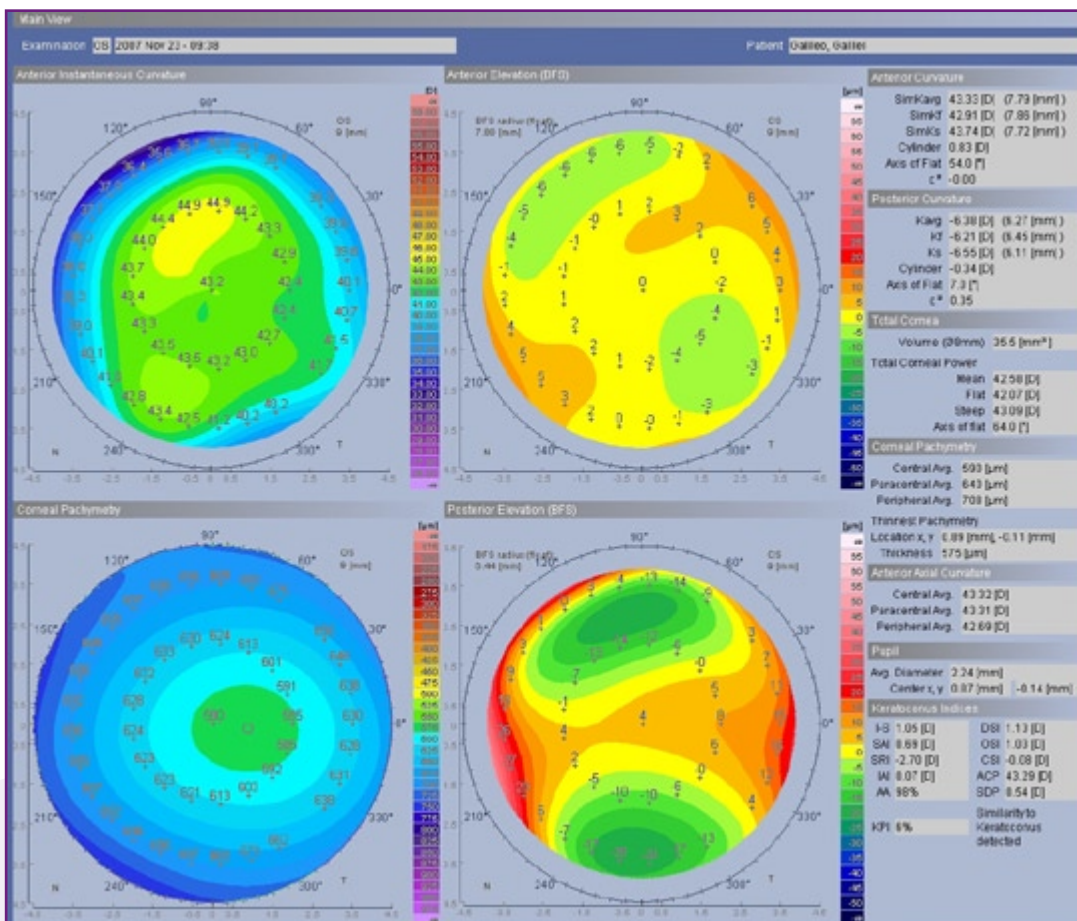
Versatile Analysis Software

High resolution Anterior Chamber images

The Galilei Dual Scheim-pflug Analyzer produces high resolution images of the anterior chamber of the eye. Elements such as lens, iris, sulcus and both surfaces of the cornea can be made visible in great detail. Camera position and angle of the meridian can be seen at the top left of the Main View window. Using the Image Selection tool, all recorded scans may be viewed, and a 3D view of the anterior chamber may be obtained. Zoom then allows to home in on specific locations of interest. The images can be further enhanced by adjusting brightness and contrast and by inverting or introducing colors.
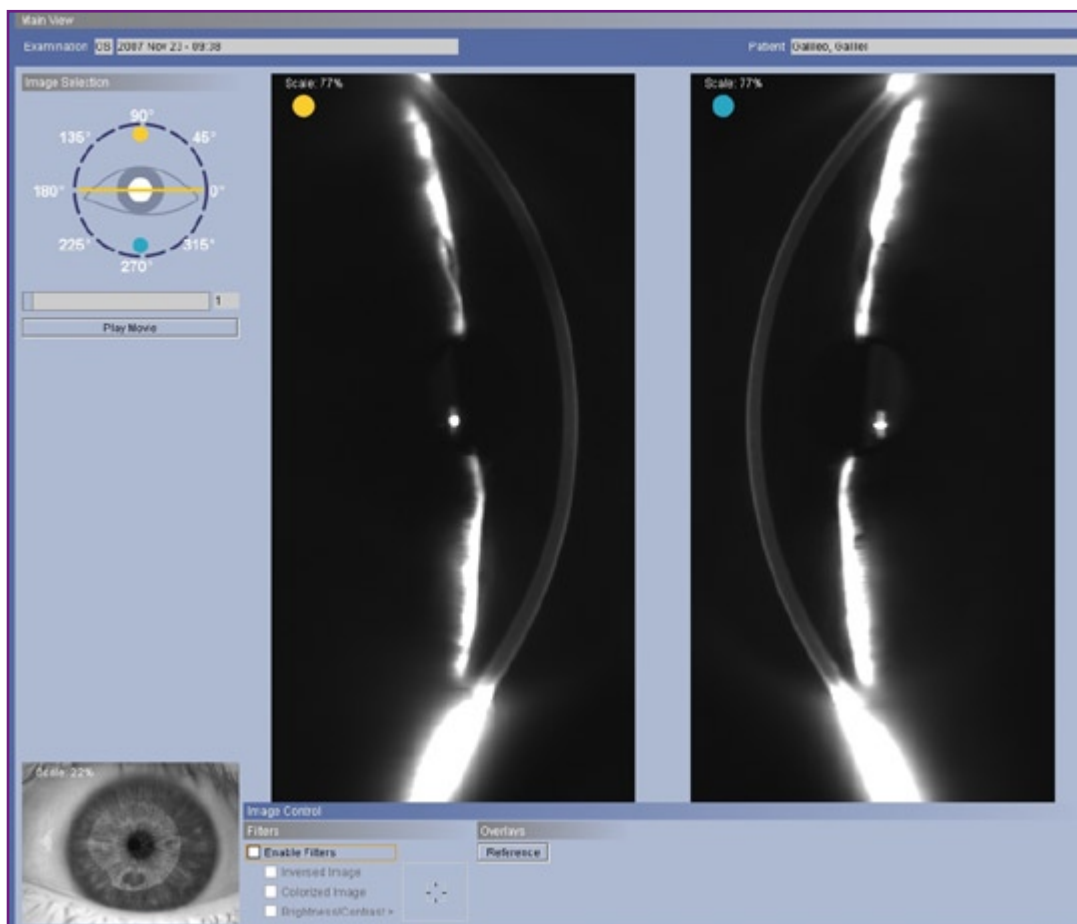
## Reports facilitate analysis

There are two reports to assist in scan data analysis: a Refractive Report and a Keratoconus Report. The maps in these reports are fixed. They have been selected by and for corneal refrac-tive surgeons because they provide a compre-hensive overview of the corneal structure in a single screen. This includes patient and examination data as well as detailed topographic data for both anterior and posterior surfaces of the cornea. In addition, the most important numerical corneal values and Keratoconus Indices are displayed. Through a few easy steps users can shape the look of the reports to their prefer-ence, making analysis even easier.

Versatile Analysis Software

Special features for in-depth analysis

The GALILEI Dual Scheimpflug Analyzer has all the tools needed for in-depth analysis and provides maps that can be selected by the user and that can be super-imposed over an image of the eye taken during the examination scan. In addition to the indices describing the cornea, geometrical indices characterizing pupil, limbus, and anterior chamber (depth, volume, and angles) are also provided.
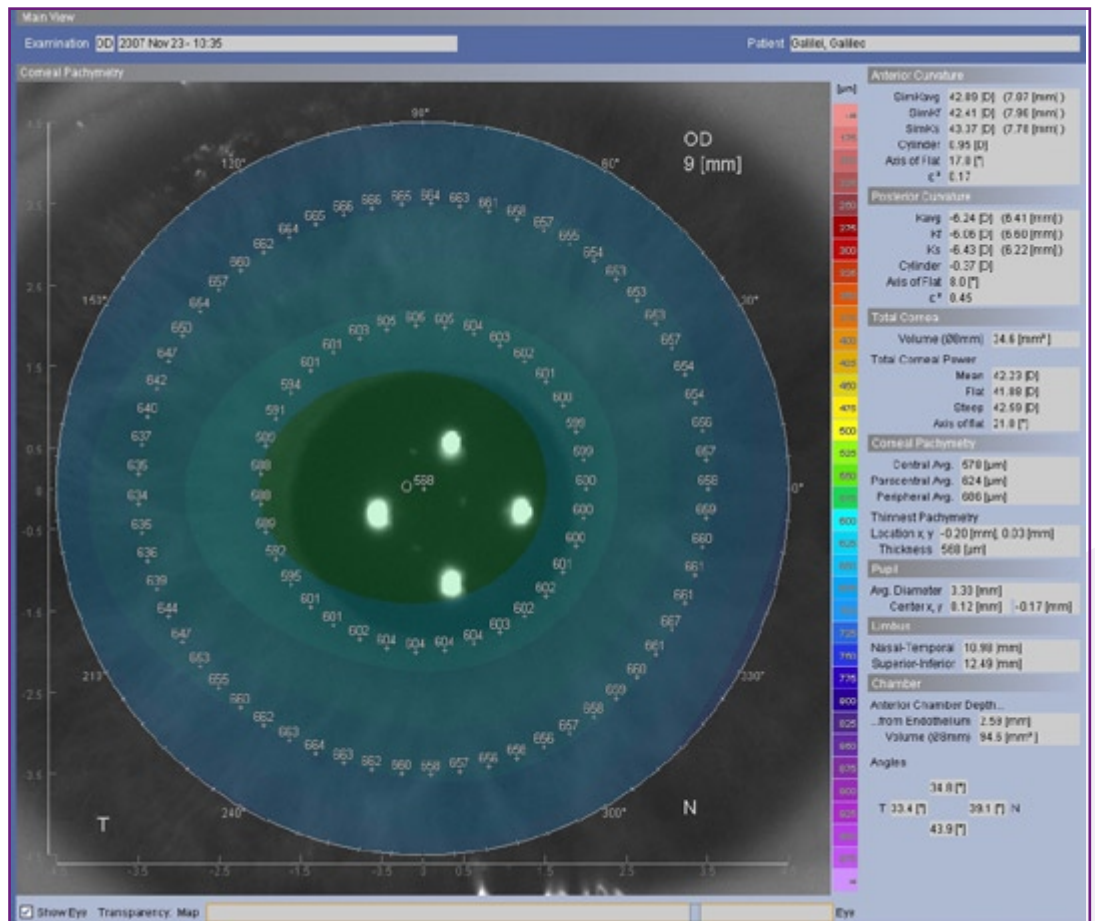
Anterior Segment analysis

Further important information may be derived from Scheimpflug images by means of the Densitometry Graph tool. This allows for qualitative and quantitative analysis of pacifications in the cornea and lens by simple movement of the computer mouse cursor. Using the Image Selection tool, all recorded scans and their associated densitometry graphs may be selected and viewed, or the meridians may be reviewed in a continuous «movie» sequence.
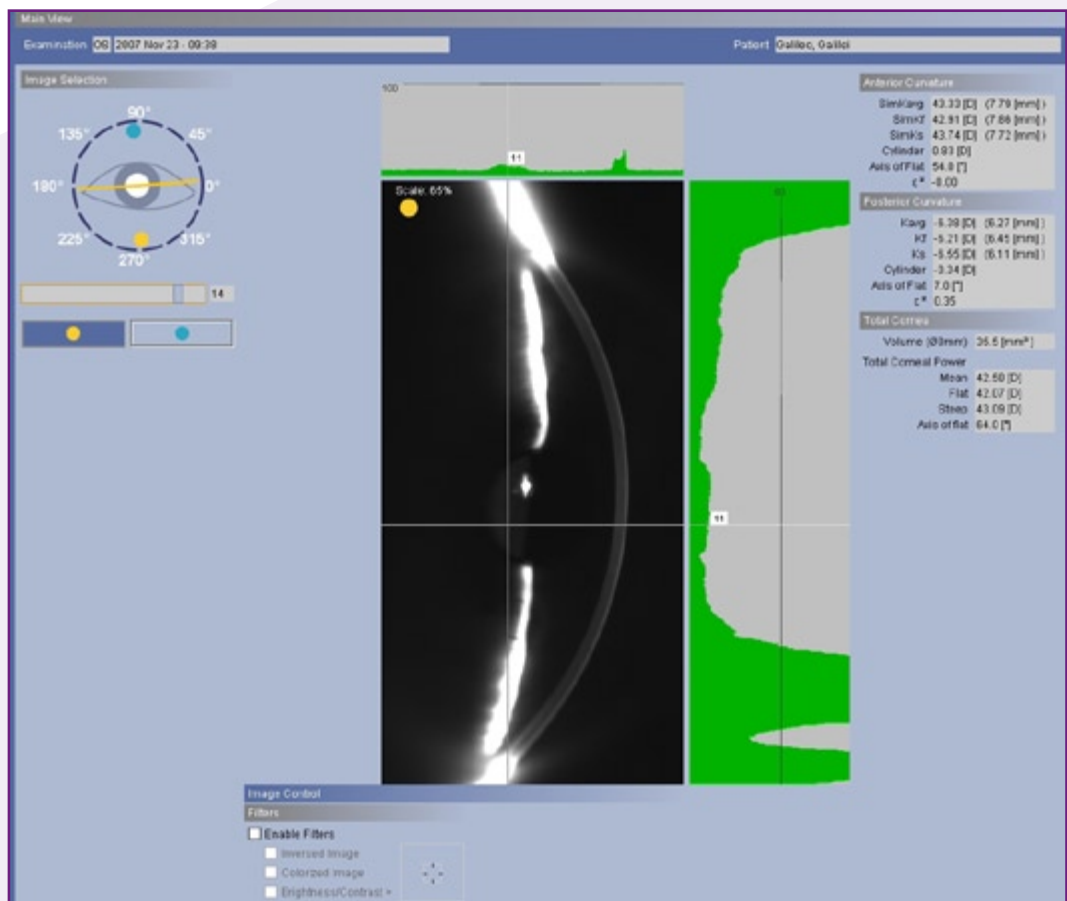
Technical Features

Dual Scheimpflug Imaging

GALILEI™ captures slit images from opposite sides of the illuminated slit, and averages the elevation data obtained from corresponding opposite slit images. This Dual Scheimpflug Imaging technique improves the detection of the posterior corneal surface and provides for outstanding accuracy in pachymetry across the entire cornea, even when the camera is decentered due to eye movements.

## Merging of Placido and Scheimpflug data

Although the resolution of Scheimpflug images is high enough to deliver accurate profile data, it is insufficient to calculate central corneal power (curvature data) with acceptable accuracy. GALILEI™ overcomes this limitation by merging Placido and Scheimpflug data, acquired simultaneously by the two techniques, into a comprehensive single data set. This is essential for obtaining highest accuracy for both elevation and curvature data across the entire cornea.

Near/Far Fixation Target

The GALILEI™ Dual Scheimpflug Analyzer features an adjustable near/far fixation target that allows the examination of the anterior chamber, crystalline lens, and any intraocular lenses at different accommodation states.

Key advantages of Dual Scheimpflug Imaging with integrated Placido topography:

- Direct measurement of anterior corneal surface curvature
- Direct measurement of elevation of all anterior segment structures
- Pachymetry calculation that is insensitive to decentration
- Motion correction from top view camera
- Greater coverage area in combining both technologies
- Same reference axis for both technologies.
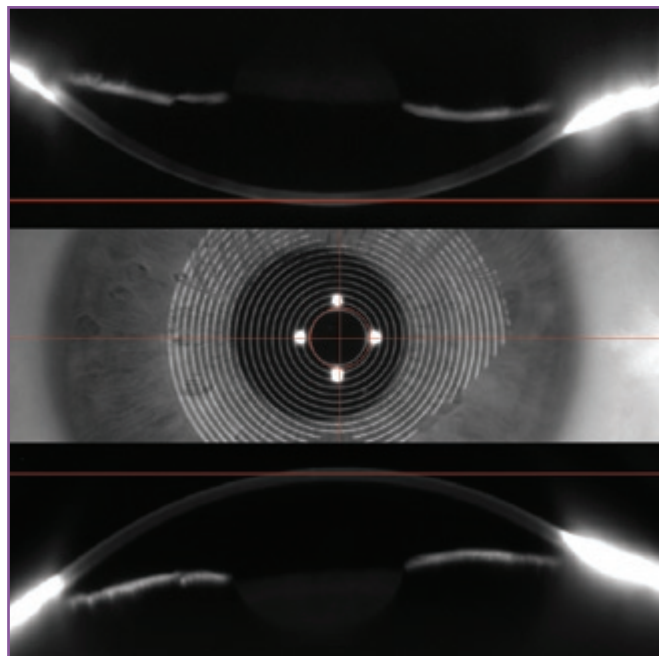
The software interface allows the user to view the acquired Placido or Top View image (center) and simultaneously acquired Scheimpflug images, left (top) and right (bottom). This combined image is used for aligning the optics module in front of the patient's eye.
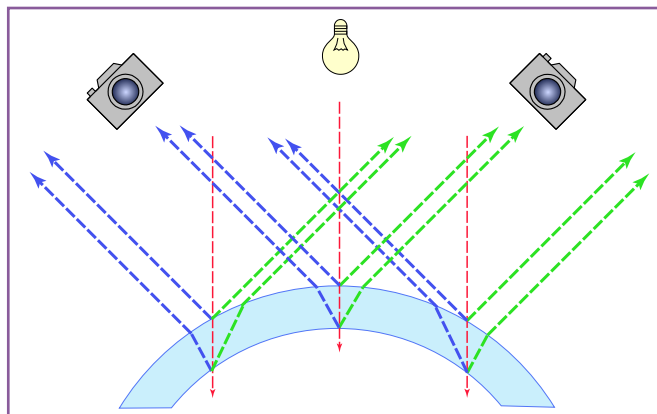
Living human eyes are always in motion. Therefore, the rotational device axis may become decentered from the aligned vertex position during the course of the rotational scan acquisition. In this situation, the projected slits impinge upon the anterior surface at different angles, resulting in two apparent slit images representing a different relative thickness. 1 mm of deviation may generate errors of up to 30 μm in apparent thickness.
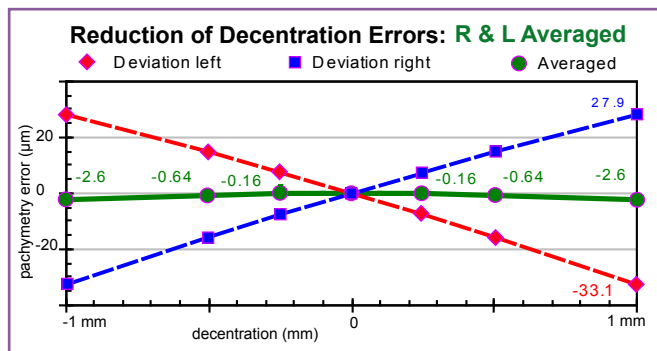
Simple averaging (green line) of the thicknesses in the two corresponding Scheimpflug views (red and blue lines) reduces the decentration error by a factor of 10, without the need for correcting the misalignment.

Technical Data

System Dimensions

Dimensions (HxDxW) of optics module	507 x 301 x 293 mm (20 x 12 x 11.5")
Dimension (HxDxW) of system with table	1235–1435 mm (H) x 612 mm (D) x 930 mm (W) (49–57" x 24" x 37")
Weight of optics module	11 kgs (24 lbs)
Weight of complete system with table	105 kgs (230 lbs)
Power requirement	110–120 VAC, 50–60 Hz, fused 8A 220–230 VAC, 50–60 Hz, fused 6.3A

System Characteristics

Measuring principle	Rotational scan of Dual Scheimpflug slit images, merged with Placido Disk images
Scheimpflug camera:	1000 x 1000 pixel CCD
Top view camera	1024 x 786 pixel CCD
Placido disk	20 monochrome rings, 200 mm diameter
Observation illumination	Infrared LED 810 nm
Slit illumination	Blue LED light (UV free), 470 nm

System Dimensions

No. of Scheimpflug images per scan	typically 15–60 (set by user)
No. of measured data points per scan	> 122'000
Time for a full scan	1–2 secs
Total area covered	10 mm

Data Processing and System Control

Computer	Dual Core Processor
Operating System	Windows XP Professional
Storage Capacity	2 GB RAM; 240 GB Hard Disk
Monitor	17" LCD monitor, 1280 x 1024 pixel

Product Information

- Manufacturer: SIS Surgical Instrument Systems AG, CH-2562 Port, Switzerland (a Ziemer Group Company)   CE 0120

- Sales & Service: Ziemer Ophthalmic Systems AG, CH-2562 Port (Switzerland) and its network of established ophthalmic equipment distributors. Visit www.ziemergroup.com for details.

- Availability: Europe: CE-marked. USA: FDA 510(k) cleared. For other countries, availability may be restricted due to local regulatory requirements; please contact Ziemer Ophthalmics for details.

- Configuration: self-contained system includes: optics module containing dual Scheimpflug camera, top view camera, Placido disk, and auxiliary monitor, mounted on a joystick-controlled cross-slide; computer with 17" LCD color monitor, keyboard & mouse; table on wheels, with motorized height adjustment.

- Accessories: optional printer (not supplied; any Windows-compatible printer with USB connection may be used).

- Service: Maintenance and Repair Service is available from the manufacturer and from local certified Service Centers (please contact your local distributor or consult the Ziemer Group website for address information).

- Warranty: Ziemer's GALILEI system comes with a 12–month limited warranty on parts and workmanship. Please consult Ziemer Ophthalmic Systems' Warranty Terms for details.

- Caution: Federal (U.S.) law restricts this device to sale by or on the order of a physician.

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