OCULUS Keratograph 5M

Topographer

OCULUS®

OCULUS Keratograph 5M

Topographer

The multi-purpose topographer has become an integral part of the ophthalmological and optometric practice. Examiner-independent measurements provide reliable data, clear analyses and full documentation. Clear and easy-to-understand representations facilitate communication with your patients and ensure a time-saving workflow.

"The Keratograph 5M is one of the most versatile instruments that we have in our practice. It is highly valuable and efficient for a very busy and technology-driven eye care practice such as ours."

Barry Eiden, OD, USA

"The Keratograph – with easy handling when it comes to performing meibography and excellent quality images really won me over!"

Elisabeth Messmer, MD, Germany

"I use the R-Scan for contact lens fitting and documentation of ocular changes – what a helpful visual consultation tool!"

(FH) Marc Schulze, PhD, Dipl. Eng., Canada

"In my clinic we use the automated pupillometry of the Keratograph for more accurate diagnosis of mild concussions. The examination takes one minute to complete. One minute for clinicians to reduce neuropsychological problems among athletes."

Rolando Toyos, MD, USA

"The information that I get from this instrument plays a very important role in the fitting of all forms of rigid gas-permeable contact lenses, as well as, the simple fits of everyday soft lenses."

Chris Eksteen, DipOptom, South Africa

"I use the Keratograph imaging tool to assess the fit of contact lenses without any additional fluorescein!"

Sebastian Marx, PhD, Dipl. Eng., Germany

OCULUS Keratograph 5M – The Allrounder

Measurements With Placido Ring Illumination

White ring illumination is used to measure thousands of points on the entire corneal surface. Infrared ring illumination is also available for analyzing the tear film in order to prevent reflex tear secretion caused by glare.

LED Measurements

The Keratograph 5M proudly offers the perfect illumination for each function: White diodes for tear film dynamics, blue diodes for fluorescein images and infrared diodes for meibography.

white illumination

infrared illumination

blue diodes

Where to find?

- Precise measurement of the corneal shape
- Extensive analyses and graphics
- Topographic keratoconus screening

- JENVIS Pro Dry Eye Report
- Tear film analysis
- Meibography
- Classification of redness

- Selection of contact lenses
- Fluorescein image simulation

- Course of disease displays
- Image and video documentation
- Measuring instruments

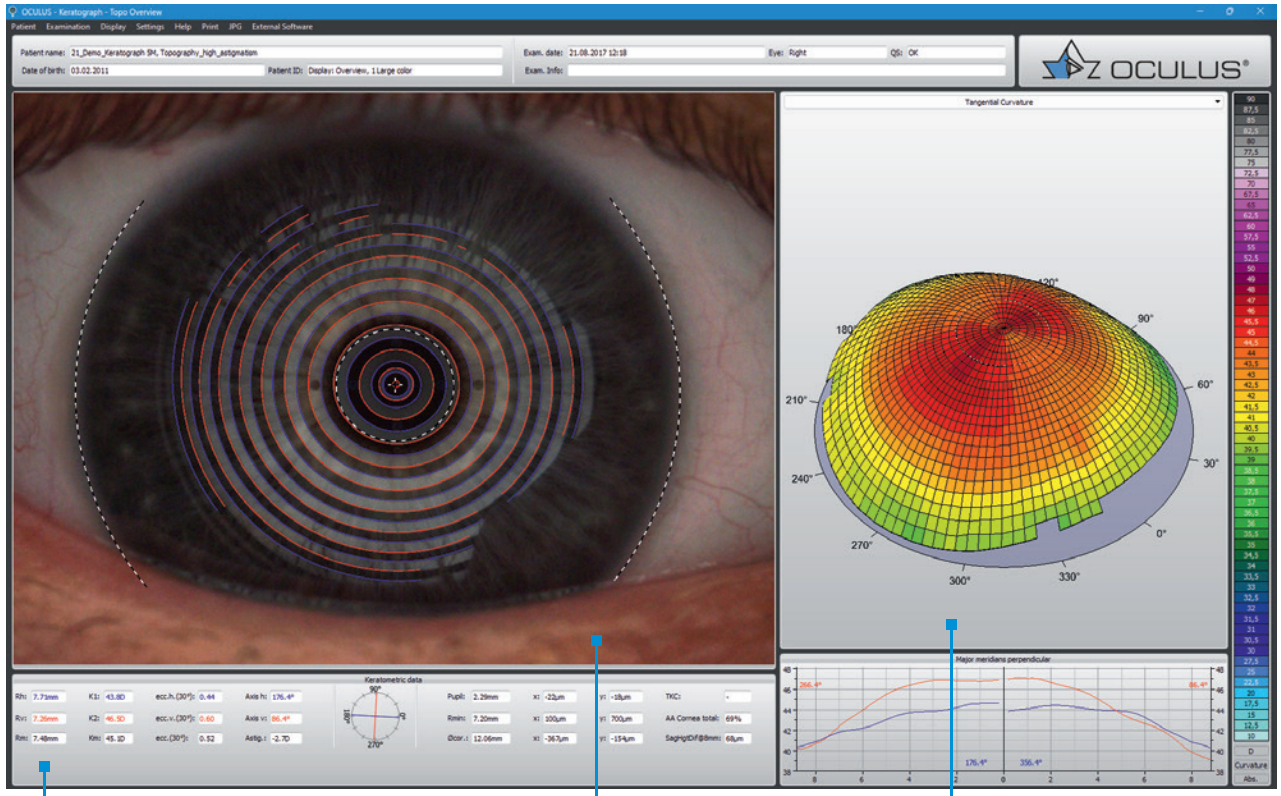
- Software overview
- Network connection ability
- Technical data

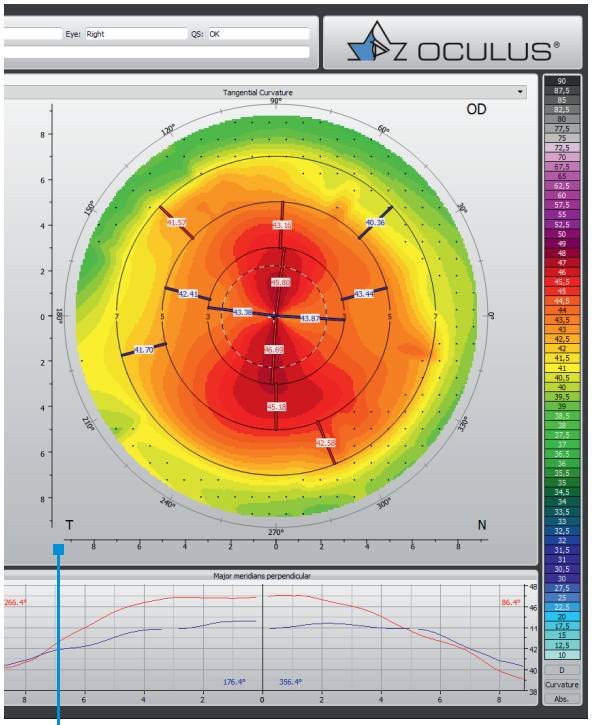
Topography	Dry Eye Screening	Contact Lens Fitting	Documentation & Pupillometry	Technology & Software

Topography

Quick, precise and clear

Aside from topography and topographic keratoconus screening, the Keratograph 5M provides a large contact lens data base and many analyses for daily practice. The built-in keratometer and automatic measurement ensure the utmost accuracy and reproducibility. After completing the measurement, the overview display provides a detailed outline.





Keratometric data, diameter of the cornea and pupil, K-values and topographic keratoconus classification index, as well as size of the analyzed surface

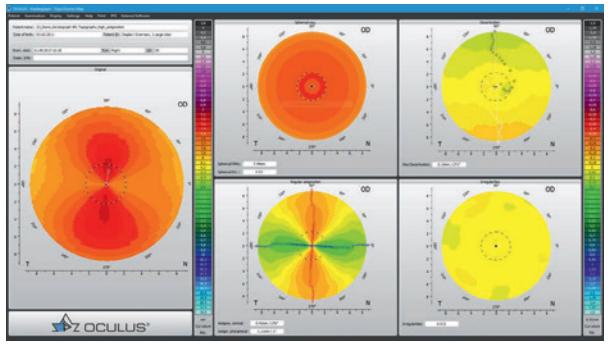
Built-in measuring instrument for measurements in the camera image

3D view can be selected and displayed directly next to the camera image

Display as sagittal or tangential curvature, elevation data or refractive power, overlay of apex position, pupil centre and contour, numerical values and major meridians

Detailed Display of the Cornea

The Keratograph software includes a reliable screening package for corneal disease detection, lens fitting and refractive surgery. The complex corneal surface structure is measured by means of mathematical analyses, which serves as the basis accurate detection of irregularities like keratoconus. In addition, optical properties of the front surface of the cornea are exactly characterized.

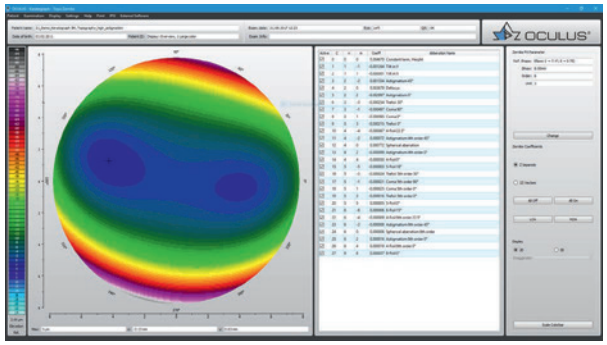


Fourier Analysis

The refractive power of the front surface of the cornea consists of different components. The Fourier Analysis identifies four of them which are shown in the following displays:

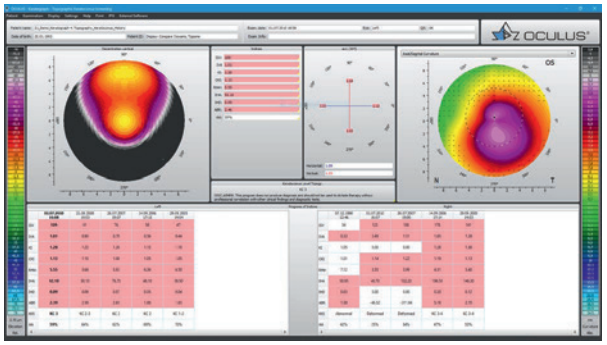
- Spherical component
- Decentration
- Regular astigmatism
- Irregularities

Pathological changes can be quantified and possible effects on visual acuity can be explained.



Zernike Analysis

Zernike polynomials are adapted to the elevation data of the cornea, which is crucial for locating the apex. The apex position is labelled with a cross. This display shows you if a back toric lens is applicable to the particular case. Zernike polynomials and the aberration coefficient give you important indications of the imaging quality of the corneal surface. Abnormal values are marked in colour.



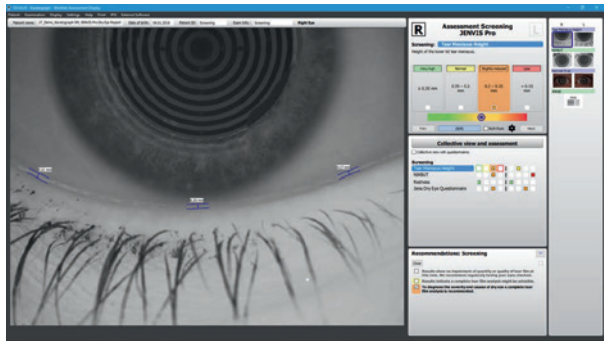
Topographic Keratoconus Screening

Keratoconus classification is based on numerous parameters. The Topographic Keratoconus Screening display merges these parameters. The coloured label illustrates abnormal values. Temporal changes of the parameters are shown side by side in a table, to facilitate your follow-ups. The Amsler classification system is applied to the keratoconus domains.

JENVIS Pro Dry Eye Report

Combine quick screening with well-founded measurement and loyalty-building counselling

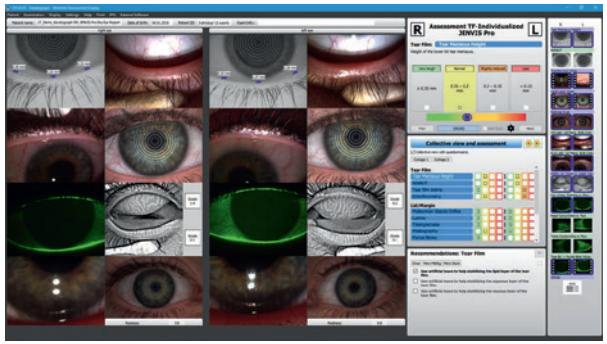
Find the cause of dry eye syndrome quickly and reliably. The JENVIS Pro Dry Eye Report in the Keratograph 5M will help you as you go along. Perform a comprehensive screening, using the measuring results as a basis for diagnosing dry eye syndrome. All results are documented in accordance with the Medical Products Law and summarized for your patient in a neat and easily understandable printout.



Screening for a Quick Overview

The four-part screening test quickly and accurately reveals abnormalities in tear film quantity and quality. This 5-minute screening should be carried out routinely before every refraction. The JENVIS Pro tear film screening routine includes measurement of the tear meniscus height, tear film break-up time, bulbar redness and a short questionnaire.

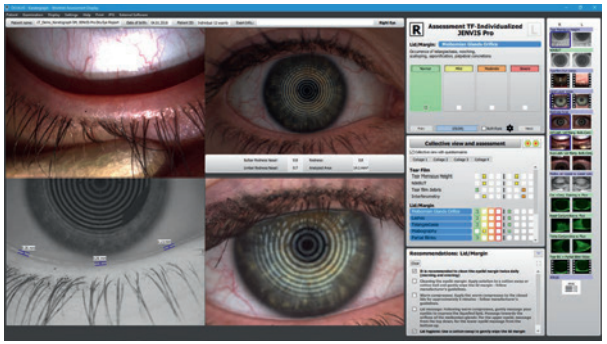
Make a quick and easy decision whether your patient has dry eye symptoms.



Individualized – Impressive and Complete

The JENVIS Pro Dry Eye Report provides you with a fail-safe test sequence covering all the assessment criteria required for a comprehensive analysis for dry eye syndrome. It provides you with useful hints and optimized, predefined settings to support you in your measurements, enabling you to perform a quick and efficient analysis for dry eye syndrome and document your anterior segment findings.

Get equipped to give your patients specific advice for easing their dry eye symptoms.



Follow-up – Retain Customers by Monitoring their Success

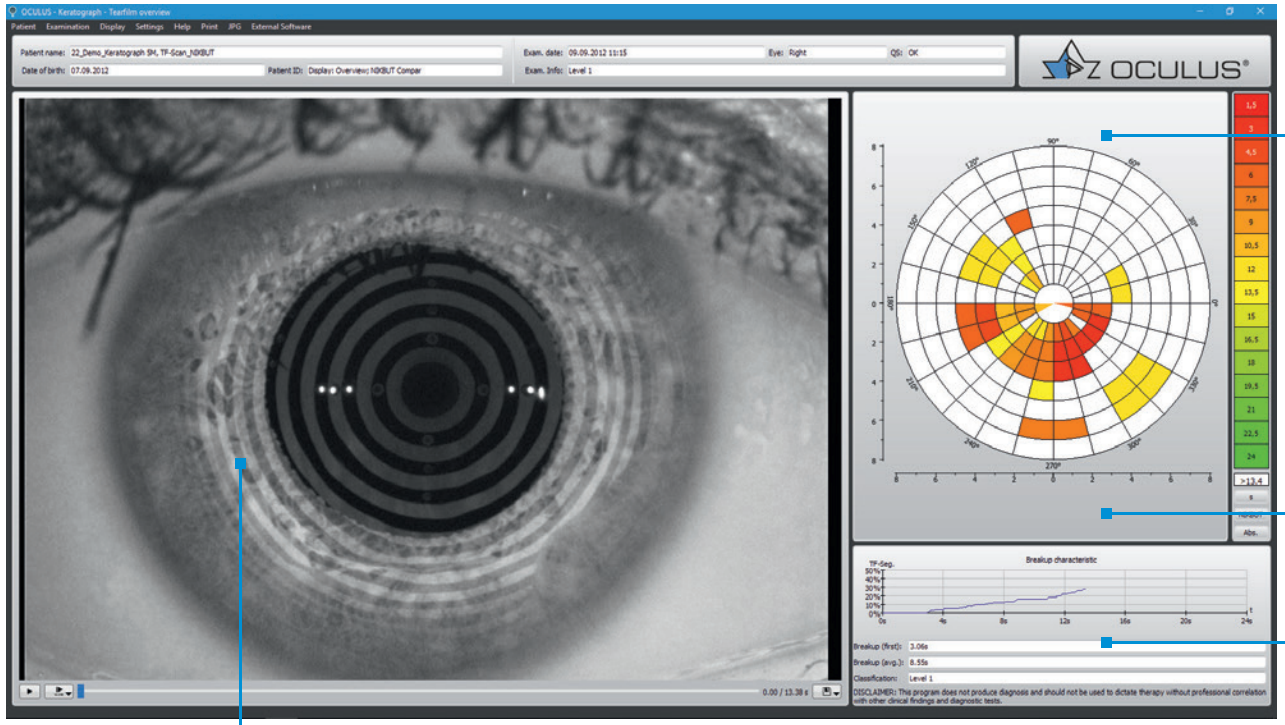
You want to know whether your treatment recommendations have been successful? Then use the follow-up function with its setting options for characterizing the initial cause. This will enable you successfully document improvements in your patients' tear film condition.

Regular check-ups will make you the go-to specialist for your patients.

TF-Scan

Evaluation of non-invasive tear film break-up time

The non-invasive Keratograph tear film break-up time (NIKBUT) measures tear film stability. The NIKBUT is automatically measured within seconds, without fluorescein application. Human eyes are not able to perceive infrared illumination. Glare and reflex tear secretion are therefore avoided during the examination. The TF-Scan visualizes the results in an easy and understandable way – for you and your patients.



The Tear Map shows the affected areas: The respective break-up time is graphically illustrated for each segment in seconds and according to the principle of a traffic light.

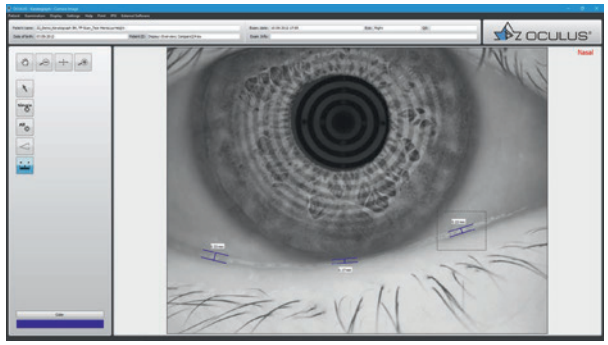
The graph shows percent of the examined area that is affected during the measuring period.

Data field showing tear film break-up time (NIKBUT) in seconds and the corresponding classification.

You can watch the video after the measurement. The break-up areas detected by the software are highlighted accordingly.

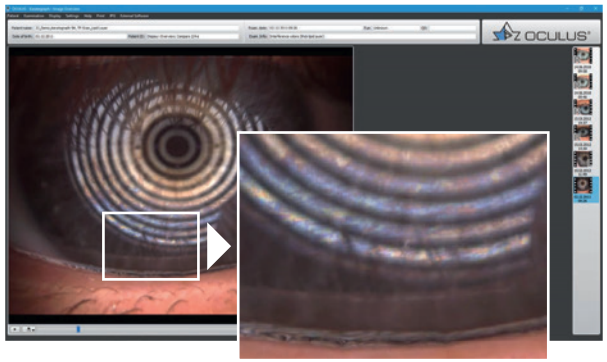
Quantity and Quality of the Tear Film

The high-resolution colour camera makes the smallest structures visible. This enables you to measure the tear meniscus height and evaluate the lipid layer, as well as analyse the tear film dynamics. Not only do you gain very important findings about tear film break-up time, but also those about the quantity and quality of the tear film.



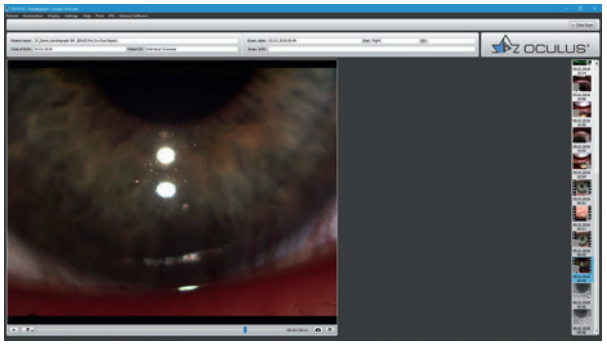
Tear Meniscus Height

Never has a precise measurement been so easy. You can evaluate the course of the tear meniscus along the eyelid by means of the new infrared illumination and precisely measure the tear meniscus height with the built-in ruler. Different magnification levels facilitate measurement and the resulting value is automatically saved in the patient file.



Evaluation of Lipid Layer

Hyper-evaporative dry eye is easily overlooked when using conventional tests. Thus evaluating the lipid layer of the tear film is even more important. With the Keratograph 5M you can record videos of interference patterns of the lipid layer. Distribution characteristics, morphology and thickness of the lipid film can be continuously evaluated.



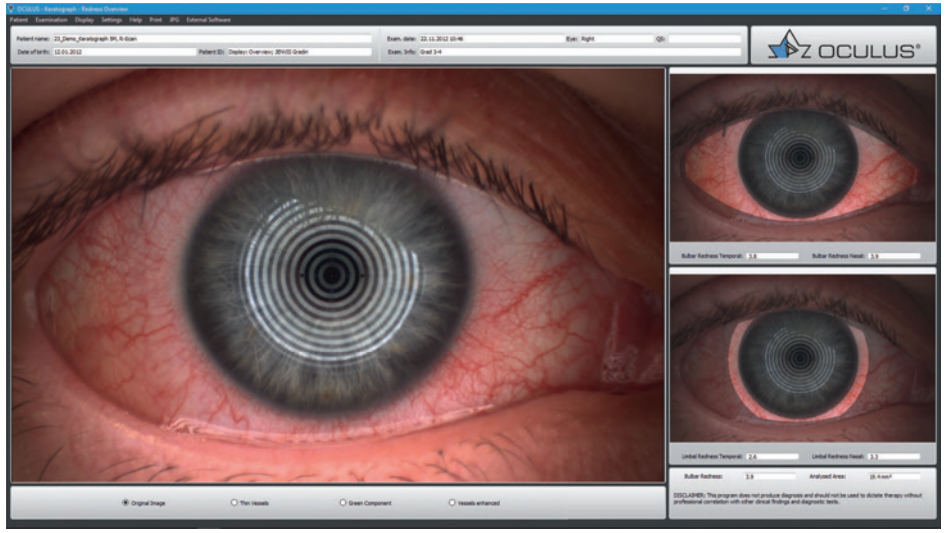
Tear Film Dynamics

The tear film contains numerous particles. These can be made visible using a specific light source. These particles are distributed in the tear fluid from bottom to top during each blink. The velocity of these particles provides information on tear film viscosity. You can quickly and easily evaluate the quantity and movement of these tear film particles using the TF-Scan.

R-Scan

Automatic classification of conjunctival redness

Previously, conjunctival redness evaluation was subjective and varied depending on the examiner's qualifications. With the R-Scan it is possible to objectively classify bulbar and limbal redness fully automatically. The R-Scan detects vessels in the conjunctiva and evaluates the degree of redness. The automatic classification saves you laborious comparison and gives you more certainty in your asessment.



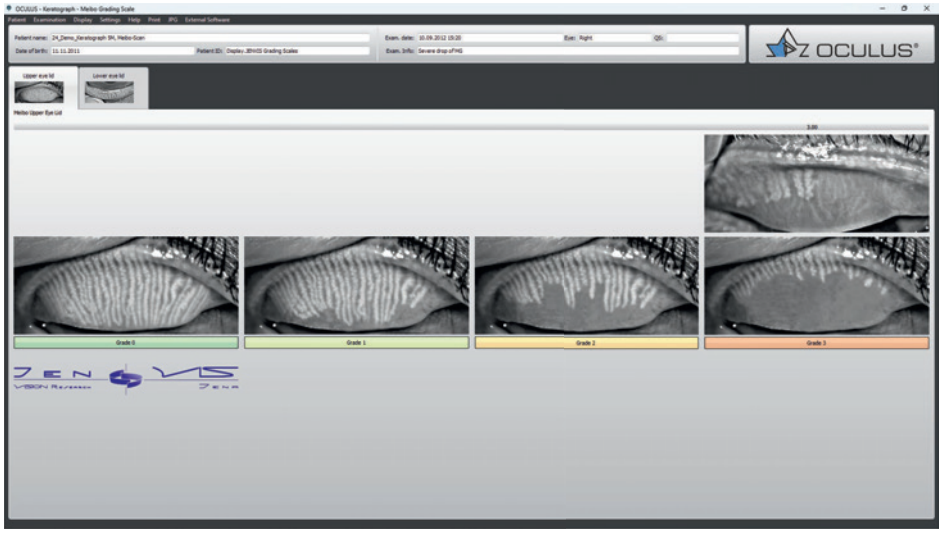
Bulbar and Limbal Redness

Different display options help to classify the degree of redness. Choose between camera image, view of fine vessels in the conjunctiva, red-free or contrast-enhanced display. Bulbar and limbal redness are evaluated in the temporal and nasal areas and all results are saved automatically.

Meibo-Scan

Meibography of the upper and lower eyelid

With the Keratograph 5M, even difficult examinations such as meibography can be carried out easily. It visualizes meibomian gland dysfunction (MGD), the most common cause of dry eye disease. Morphological changes in the glandular tissue of the upper and lower eyelid are shown. Up to four images from examinations of the same eyelid can be compared in a single display to assess the patient's progress.



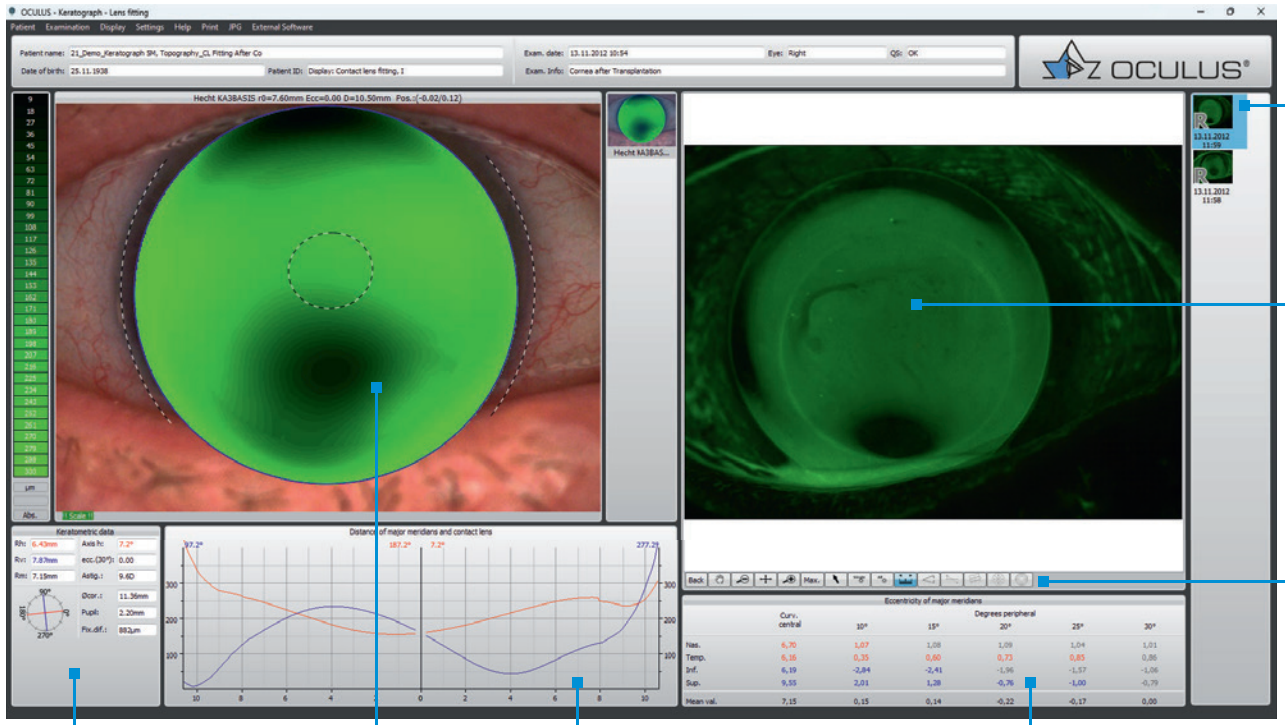
JENVIS Grading Scales

These four-point grading scales allow easy classification of MGD based on an individual meibography. Reference-state images assist in classifying the gland structure as normal or indicative of mild or severe MGD.

Contact Lens Fitting

Professionalism through innovation

An ideal lens is chosen from the large lens data base and is then suggested in the Lens Fitting display. Based on this topographic data, a simulated fluorescein image of this particular lens is created. You can then take real fluorescein images with the Keratograph 5M and compare them with the simulated images.



Preview bar of captured images and videos

Selected fluo image or video

List of tools for editing the image above

Keratometric data, diameter of the cornea and pupil, fixation deviation

Simulated fluorescein image of a toric RGP lens

Distance of major meridians of the cornea from the lens

Eccentricity values for both major meridians


OCULUS Z KERATOGRAPH
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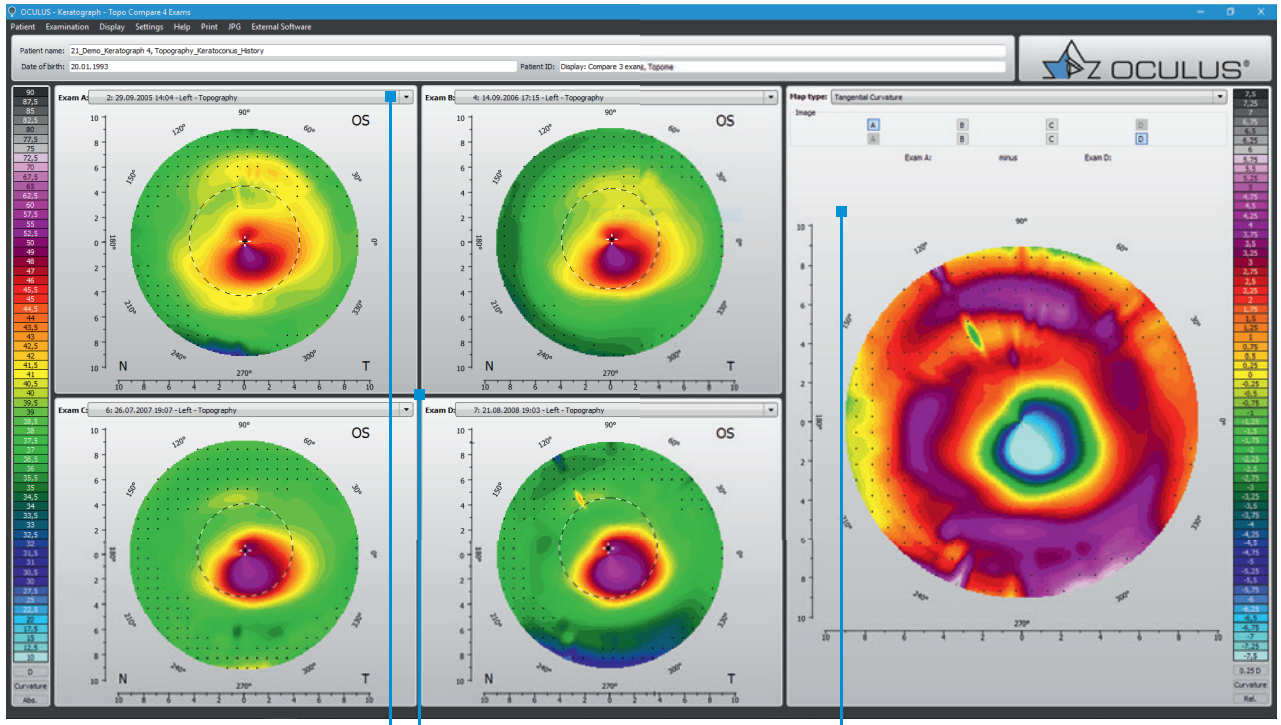
Complete Documentation

Follow-ups provide reliability

Follow-ups require comparison of several examinations. In doing so, changes can be easily detected and fully documented. Regular follow-up examinations provide reliability and increase the trusting relationship between you and your patient. The Keratograph software contains both data and image documentation.



Selection of examination from the patient data base

"Course of Disease" display showing four examinations

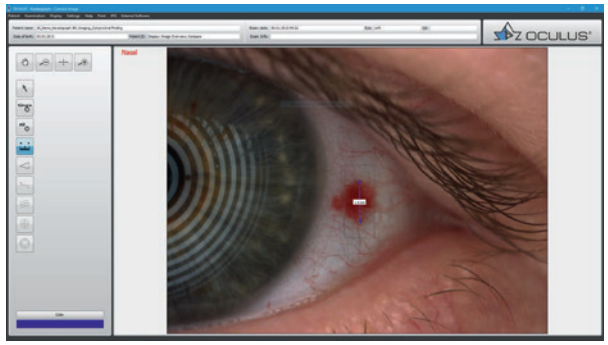
Graphic display of differences between individual examinations. Display as axial/sagittal or tangential curvature, elevation data or refractive power.

Comparing Examinations

With the new Compare 4 Exams display you can now compare up to four examinations. Changes from the first to the latest measurement can easily be displayed, reflecting the course of disease over time. Select the examination that you wish to compare (A, B, C, D) with only two clicks and see the results right away – independently of the curvature type. The easy-to-understand display helps you describe even complex matters to your patient.

A Picture Is Worth a Thousand Words.

The Keratograph 5M contains features that offer optimal conditions for your image documentation.
An image aids in communication with education of your patients, thus eliminating the need for long explanations. You save time with only one mouse click.

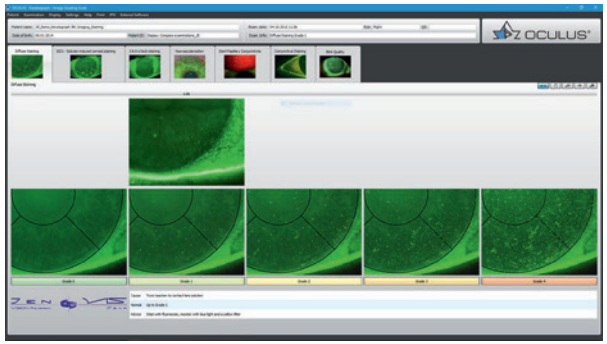


Precise Measurements Instead of Rough Guesses

The Keratograph 5M is the ideal device for your professional documentation. The imaging software includes features such as

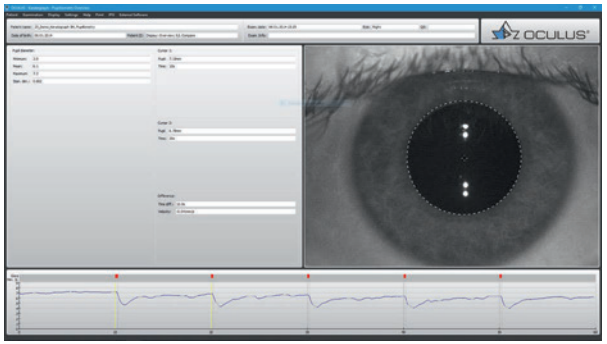
- magnification function
- hand tool
- measuring tool
- angle measurement

Pathological changes can be exactly localized, and changes in size can be determined. This ensures that all of your patients questions will be answered.



Reliable Diagnosis Documentation

The resulting classification from corneal staining requires well-trained examiners. It is difficult to estimate the number of hyper-fluorescent dots on the corneal surface, but the integrated JENVIS Grading Scales facilitates this evaluation. Every image taken can be compared with a sample image on the screen. Vessel injections can also be evaluated and documented in this way.



Pupillometry

Using the “Pupillometry” option is a quick and easy way to measure the pupil size of your patients under different illumination conditions. This option not only supports you when fitting multifocal lenses, but also when measuring the optical zone before refractive or cataract surgery.

All Features at a Glance

Customize the OCULUS Keratograph 5M to your own requirements!

Standard software included

- Topography
- CL Back Surface
- Overview
- 1 Large Color Map
- 4 Maps Selectable
- Camera Image
- 3D Cornea
- Fourier Analysis
- Zernike Analysis
- Topographic Keratoconus Screening
- Elevation Map
- Corneal asphericity
- Lens Fitting
- Show 2 Exams
- Compare 2 Exams
- Compare 3 Exams
- Compare 4 Exams
- Imaging

Optional software modules

JENVIS Pro Dry Eye Report
Comprehensive summary display of all available dry eye tests, including:

- TF-Scan
  Evaluation of lipid layer and tear film dynamics, measurement of tear meniscus height and non-invasive tear film break-up time (NIKBUT)
- R-Scan
  Automatic classification of bulbar and limbal redness
- Meibo-Scan
  Meibography of upper and lower eyelid

Keratoconus package
Includes Topographic Keratoconus Screening and Zernike Analysis

Lens Fitting
Simulation of fluorescein images of RGP lenses

Pupillometry
Examination of pupillary response using the pupillometer, asymmetry test and manual measuring mode

DICOM
Digital Imaging and Communications in Medicine (DICOM) interface

Floating License Key

More flexibility with the OCULUS license model

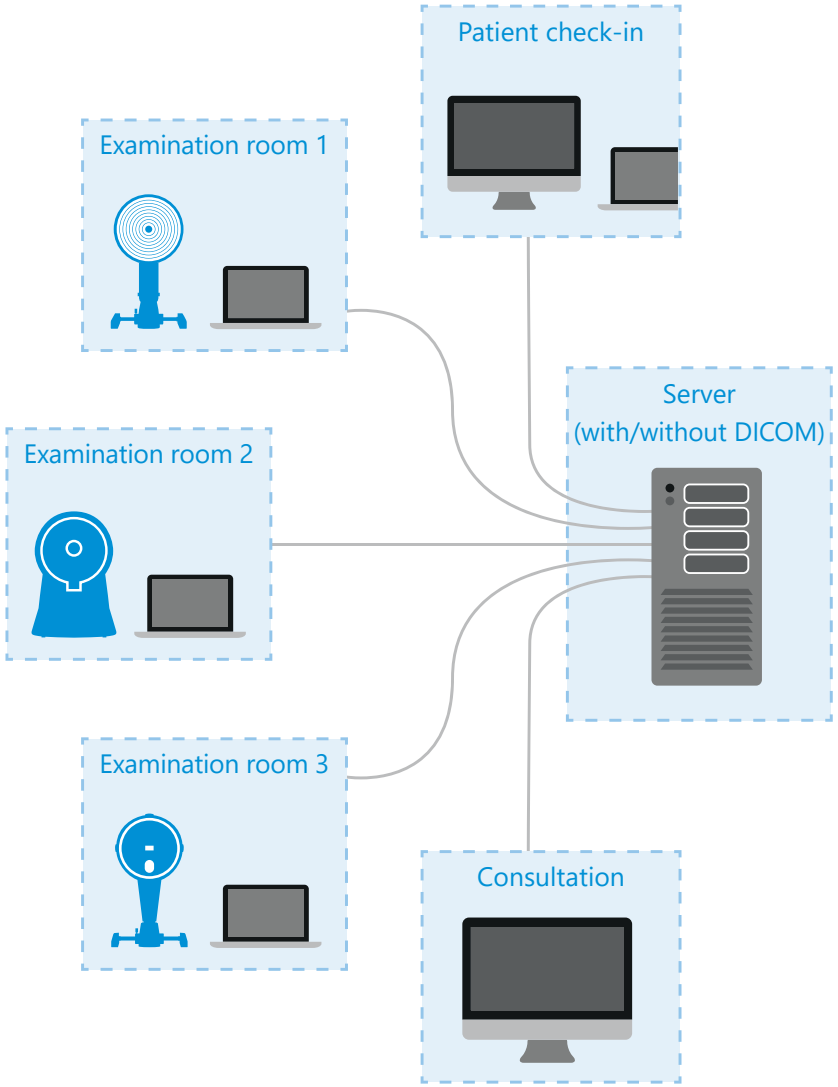
Activate Functions Exactly as You Need Them

The choice is yours in how you use the Keratograph 5M and which examination and evaluation functions you desire. You can order additional licenses according to the modular principle. After purchase, licenses for the respective evaluation functions are activated on the OCULUS Floating License Key and are provided in your network. Optional examination functions are released on the Keratograph. It is possible to call and view previously performed examinations for free on all workstations within the network.

Optional evaluation functions
JENVIS Pro Dry Eye Report
Keratoconus package
Lens Fitting

Optional examination functions
TF-Scan
R-Scan
Meibo-Scan
Pupillometry

You can decide which additional functions to allocate to each device.



Efficiency Through Networking

The OCULUS patient data management system enables you to merge all OCULUS devices in a local network. It allows you to collaborate with external data management systems (EMR) to optimize your workflows. DICOM interface is not necessary for device connection.

OCULUS Keratograph 5M
Technical Data

General information		
Accuracy	± 0.1 D	
Reproducibility	± 0.1 D	
Number of rings	22	
Working distance	78 / 100 mm	
Number of measuring points	22 000	
Camera	Digital CCD camera	
Light source	Placido illumination:	white diodes
	Placido illumination:	infrared diodes (880 nm)
	Imaging illumination:	blue diodes (465 nm)
	Meibography:	infrared diodes (840 nm)
	Tear film dynamics:	white diodes
	Pupillometry illumination:	infrared diodes (880 nm)

Technical specifications	
Dimensions (W x D x H)	275 x 320 - 400 x 480 - 510 mm (10.8 x 12.6 - 15.7 x 18.9 - 20.2 in)
Weight	Measuring head: 3.2 kg (7.1 lbs) With xy base: 6.1 kg (13.5 lbs)
Max. power consumption	18 W
Voltage	100 - 240 V AC
Frequency	50/60 Hz
Recommended computer specifications	Intel® Core™ i5, 500 GB SSD, 8 GB RAM, Windows® 11, Intel® HD Graphics

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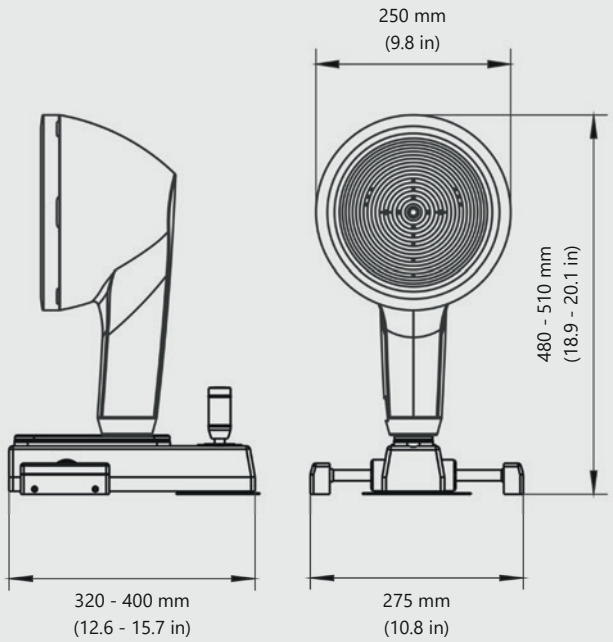

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The OCULUS QM system is certified in accordance with ISO 13485 (MDSAP) and (EU) 2017/745 (MDR)

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