OPTOPOL
technology

REVO FC
OCT | Fundus Camera

As simple as pressing
the start button

NEW OCT STANDARD
Multiple Functions in One Device

Once again the REVO goes beyond the limits of standard OCT. With its new software, the REVO enables a full functionality from the cornea to the retina, combining the potential of several devices. With just a single REVO OCT device, you can measure, quantify, calculate, and track changes from the cornea to the retina over time.

OCT easier than ever

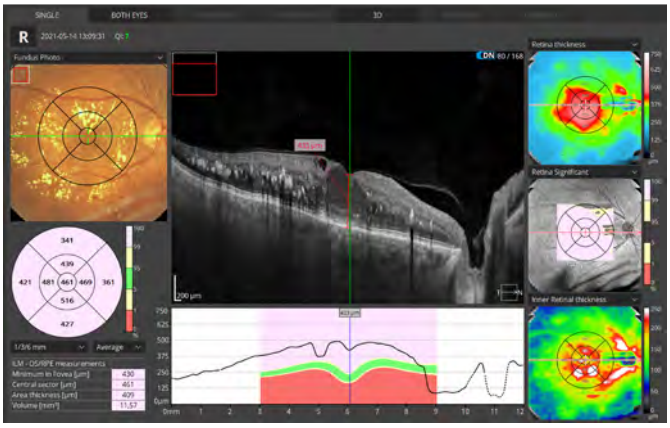
Simply position the patient and press the START button to acquire examinations of both eyes. The REVO FC guides the patient through the process with vocal messages, which increases comfort and reduces patient chair time.

A perfect fit for every practice

With its small system footprint and single cable connection, the REVO FC can be placed in the smallest of exam rooms. The REVO can easily function as both a screening or an advanced diagnostic device with its variety of examination and analysis tools.

The Revo FC is an all-in-one device you can use in a number of ways

- as a color fundus camera
- as a combo providing simultaneous OCT and fundus imaging
- for high quality OCT imaging including OCT-A
- as a biometry device



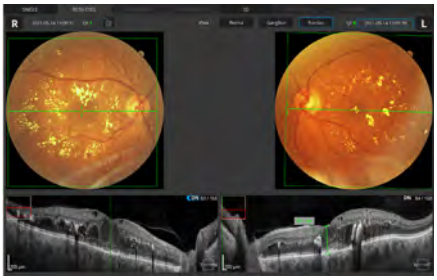
The device offers all proven advantages of the REVO systems, with the addition of a cutting-edge color fundus camera for a new level of diagnostic certainly. High quality OCT scanning and a comprehensive analysis of the retinal layers combined with a fundus imaging make the examination more versatile than ever.

The REVO FC has a built-in, non-mydriatic 12.3 Mpix fundus camera capable of capturing ultra-high quality and detailed color images. The REVO FC fundus camera is fully automated, safe, and easy to use.

- The new advanced optical system ensures high quality imaging at a viewing angle as wide as 45°.
- The new linking function makes it possible to link a single fundus photo to several OCT exams to reduce the number of photos.
- Easy to use image processing tools such as RGB channel, brightness, contrast, gamma and sharpness adjusters used with filters deliver a stunning retinal image.
- Available view modes present detailed photos of one or both eyes as well as a time comparison of fundus photos.

SOCT with the complete fundus camera functionality

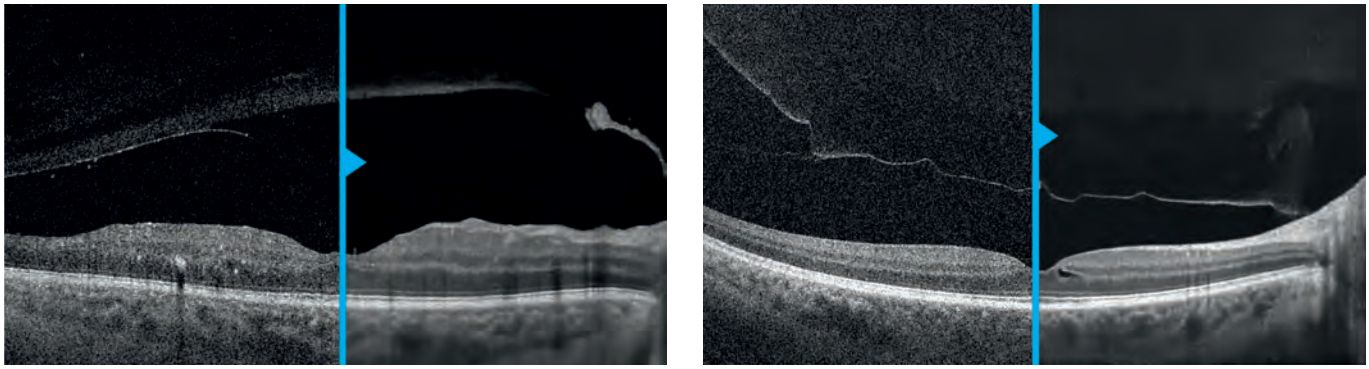
Combining a full-featured OCT with a color fundus camera in a compact, all-in-one device provides the possibility to obtain high-quality OCT scans and detailed fundus images in just one shot, optimizing the use of office time and space. The device now comes with hardware-based tracking to further reduce examination time. The iTracking function is still available and proves useful while examining patients who find it difficult to maintain fixation.



DN AI DENOISE

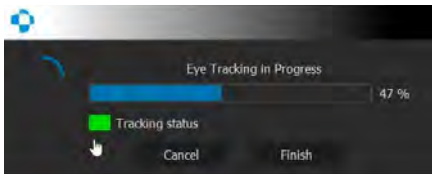
Improved tomogram quality powered by Artificial Intelligence. Advanced AI algorithms of the AI Denoise function enhance the quality of a single tomogram to the level of an averaged tomogram obtained through multiple scans, effectively reducing patient chair time.

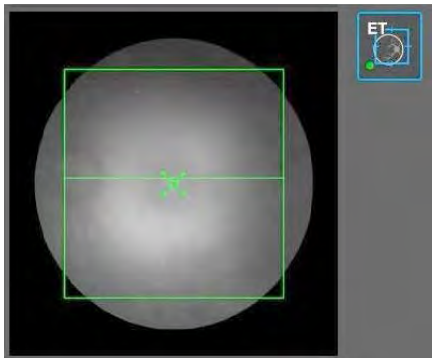
Raw Tomogram / AiDenoise Tomogram



AccuTrack™ – real-time hardware eye tracking

The REVO FC now comes with a real-time hardware eye tracking function which compensates blinks, loss of fixation, and involuntary eye movements during OCT scanning.

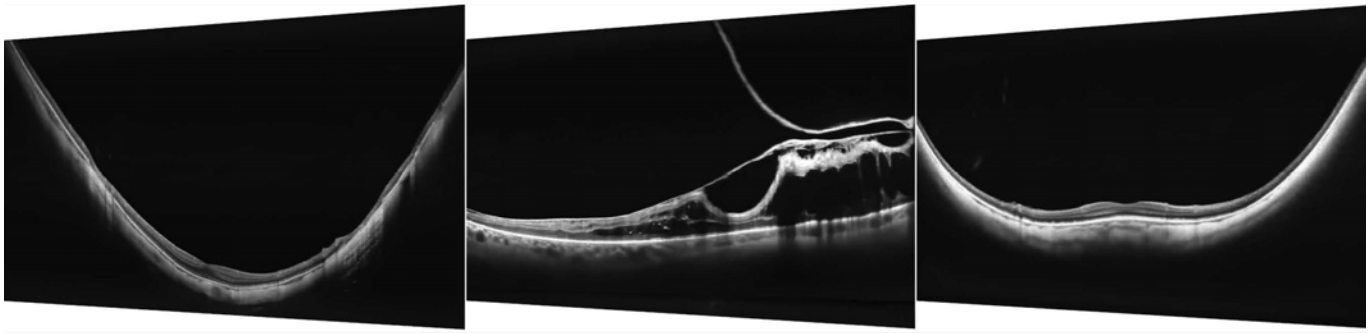




FR FULL RANGE

With scans presenting New Extended Depth™ software, based on our Full Range technology, this new imaging mode provides scans of increased depth for reliable and convenient observation of challenging cases. The Full Range mode is perfect for diagnosing even highly myopic patients.

~ 6 mm scan depth Full range scans



*Images courtesy of Bartosz L. Sikorski MD, PhD

FUNDUS CAMERA

What makes the REVO FC truly unique is its non-mydriatic 12.3 Mpix fundus camera integrated into into this all-in-one OCT device, capable of capturing detailed colour images of ultra-high quality. The REVO FC is fully automated, safe, and easy to use.

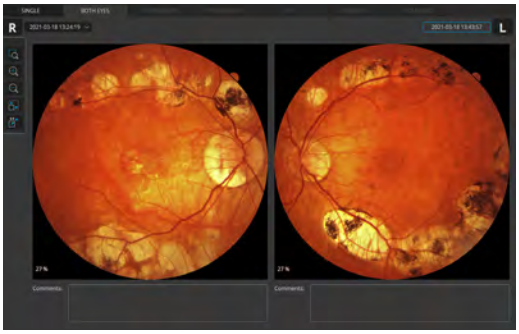
Color fundus image capture is possible with a pupil as small as 3.3 mm, and the minimum pupil size for OCT is 2.4 mm.

Easy to use fundus image processing tools deliver a stunning retinal image.

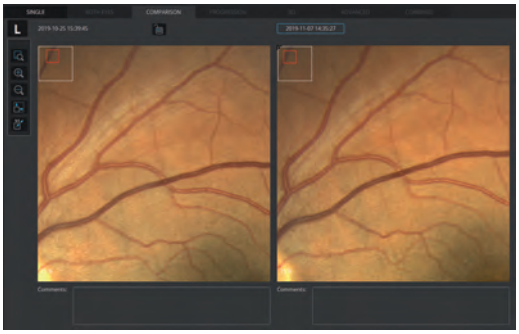
Available modes deliver detailed photos of one or both eyes as well as a chronological comparison of the fundus photos.

Linking a single fundus photo to several OCT scans is available.

Fundus Photo Both Eyes View



Fundus Photo Comparson View



Auto Flash

In the Auto Flash mode, the IR fundus preview parameters and the photo capture settings are adjusted automatically based on the IR fundus preview. This ensures correct automatic flash setting for perfect images regardless of the pupil size and eye pigmentation.

You will never have to re-take images because of wrong flash settings.

Fundus photograph quality adjustment

By selecting the flash intensity, the operator can determine the image quality level based on the type of result they want to obtain – a detailed image or a regular screening photo. This means that in many cases the exam time and miosis can be reduced to increase patient comfort.

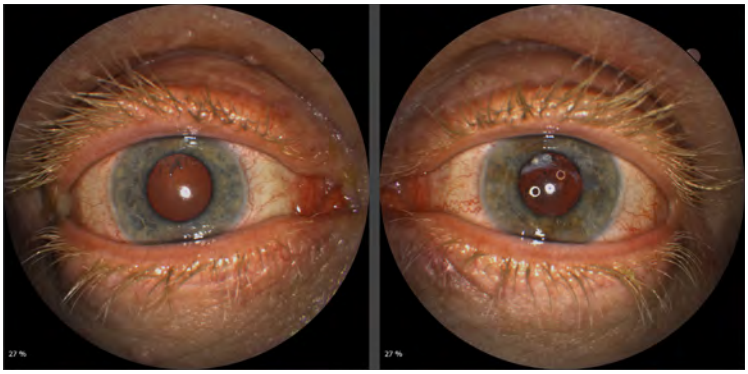
Fundus photograph screening

To meet the requirements of screening programs and allow the user to take exams of both eyes in non mydriatic mode, the device now has three auto flash levels. Using the Flash Low setting, it is possible to take pictures of both eyes in less than 25 seconds.

ANTERIOR PHOTO

The new anterior segment photograph mode allows the user to take color photos of the anterior segment, presenting the cornea, eyelid, pupil and sclera.

Anterior Photo Both Eyes View



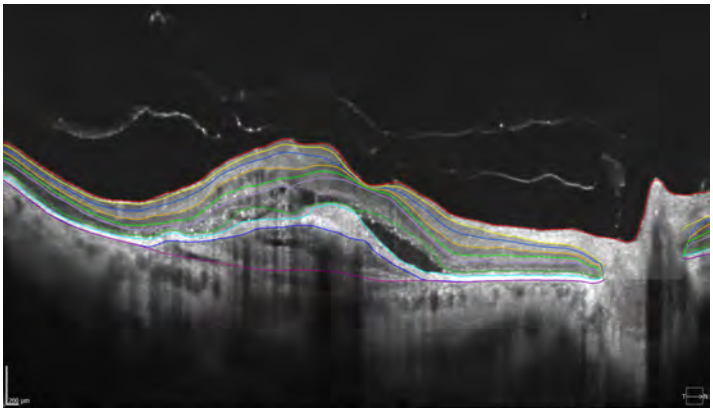
NEW

AI RETINA

This new layer segmentation for the posterior segment is based on artificial intelligence, resulting in more accurate recognition of retinal layer boundaries. The AI system has a direct impact on the accuracy of the clinical assessment and the assessment of the status of areas of pathology in the retina.

This level of detection accuracy empowers the eye care and results in more detailed screening. Overall, it is a more effective way of running a pathology evaluation.

Automatically detected 10 retinal layers



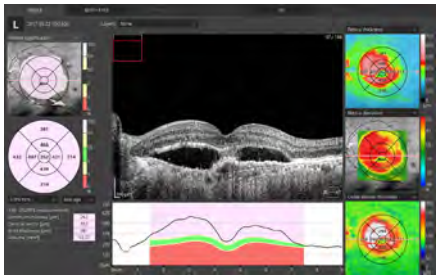
AI segmentation will be important for follow-up examinations, bringing a more accurate diagnosis when analysing pathology over time. It can also be used in patients who have already been monitored.

In addition, a new definition of ILM – BM retinal thickness has been added for more sensitive monitoring patients with subretinal disorders.

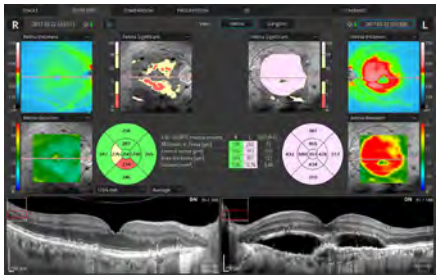
RETINA

A single 3D Retina scan is all it takes to perform a comprehensive Retina and Glaucoma analysis. During the analysis, the software automatically recognizes ten retinal layers to ensure a more precise diagnosis and mapping of any changes in the patient's retina condition. A variety of result analysis and presentation methods improves workflow and efficiency.

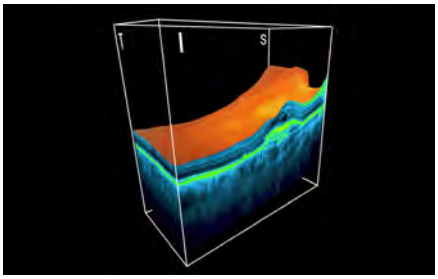
Single



Both



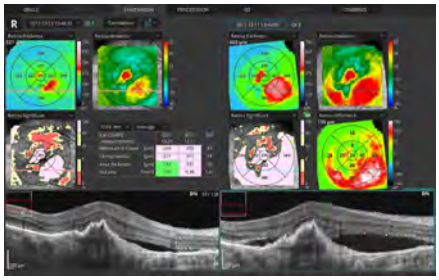
3D



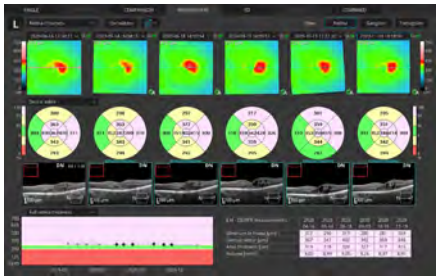
FOLLOW-UP

High density of standard 3D scans allows the operator to precisely track disease progression. The operator can analyse changes in morphology, quantified progression maps and evaluate the progression trends.

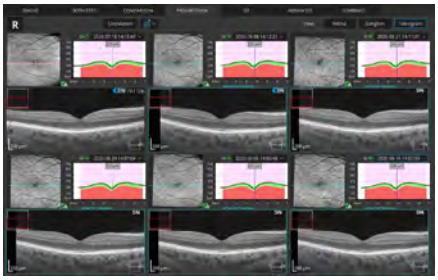
Comparison



Progression Quantification



Progression Morphology



EXTRACTED TOMOGRAMS

Increased follow-up precision. Advanced correlation now enables the creation of Extracted Tomograms which compensate for image misalignment occuring between sessions to enable easier and more precise progression analysis.

NEW

ULTRA-WIDEFIELD MODULE[1]

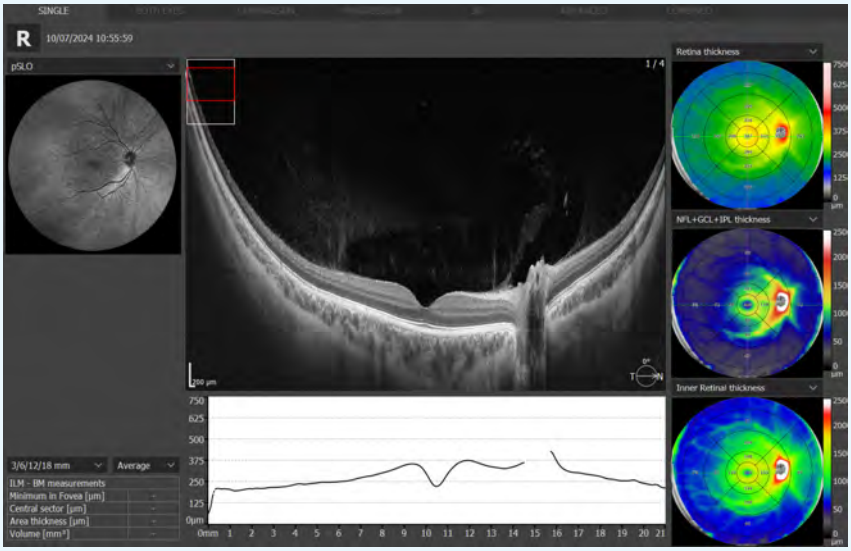
UWF

The UWF module provides a new wide perspective of imaging up to ~105° with a single scan. It allows the user to image the macular area along with the far periphery to capture the early stages of disease in the posterior part of the eye. The module allows 3D imaging for full analysis, averaging in enhancement mode, and angio OCT with the ability to visualise perfusion problems in the periphery.

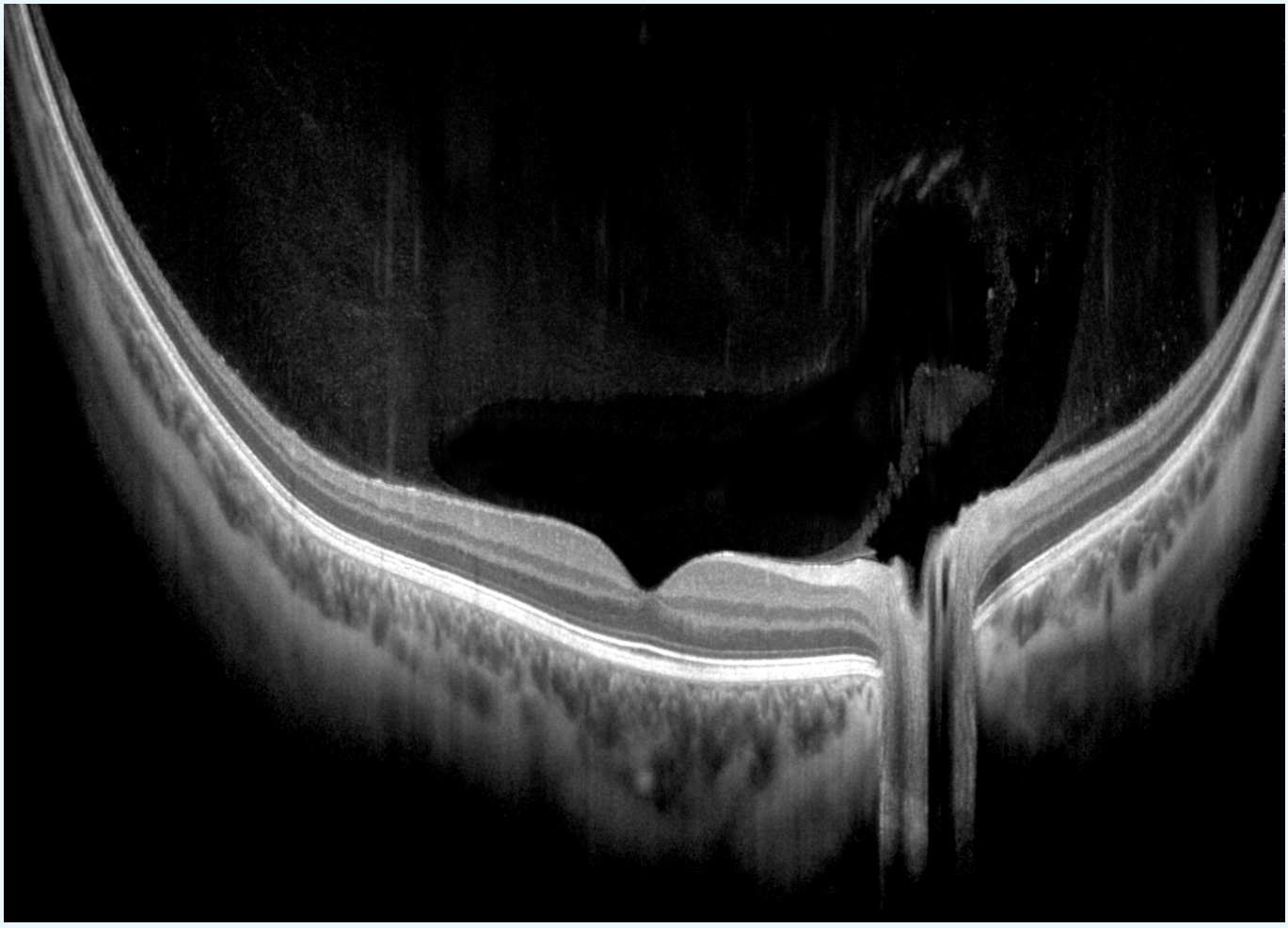
For patients with difficulties, the UWF feature will provide an option of a Radial scan. This scan will take less time to attain a proper signal from the eye.

With the UWF feature in Extended Depth™ software, the diagnostic of high myopia patients will be even easier while selecting Full Range scanning technology.

Widefield 21 3D report



UWF FR Line scan – 21 mm width and 6 mm depth



[1] *An optional software module*

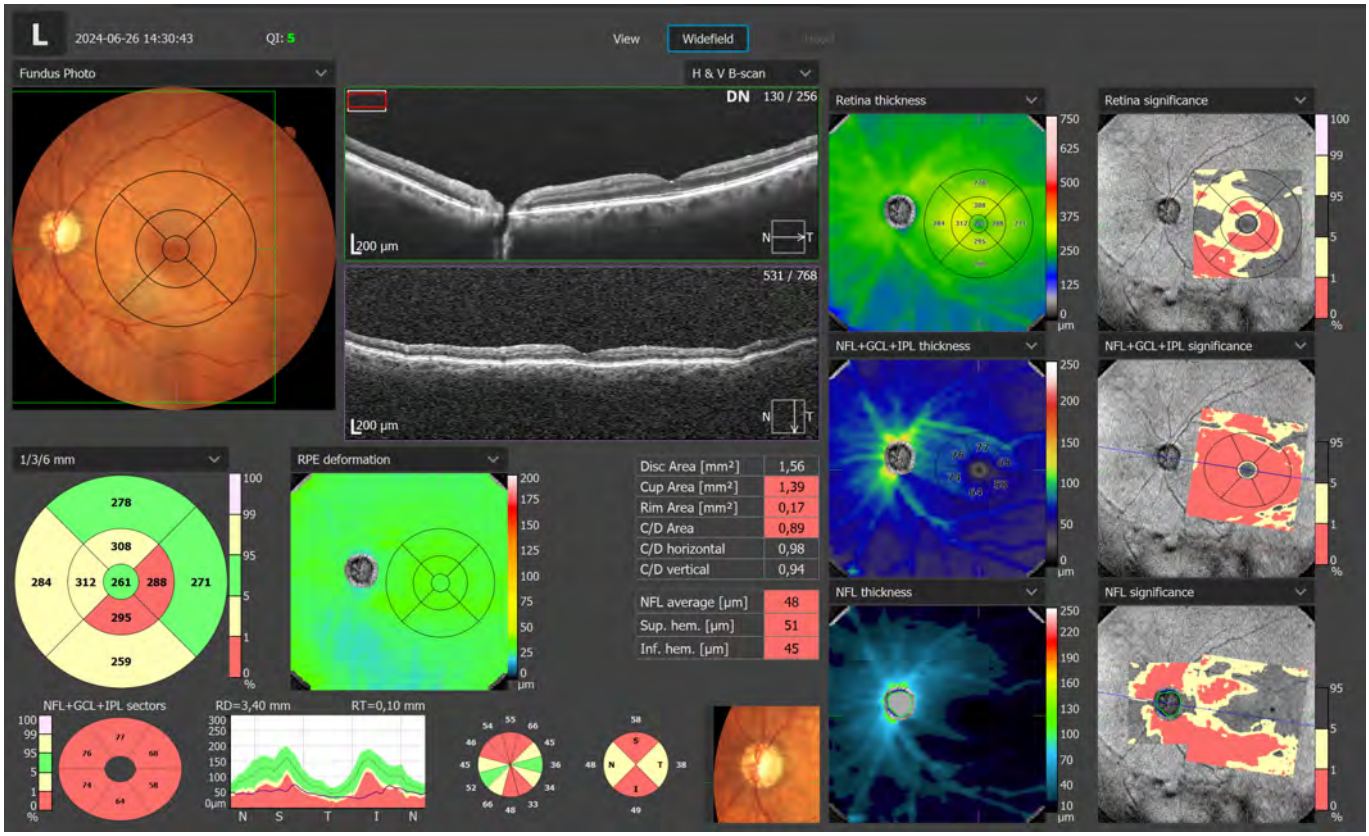
NEW

WIDEFIELD ANALYSIS

A single Widefield 3D examination is now sufficient for the rapid assessment of both the retina and the glaucoma. Visualize and assess the thickness of the retina, ganglion cell, nerve fibers layers and optic nerve head on comprehensive data report when performing a rapid examination mapping up to 15×15 mm section.

Widefield report presents horizontal and vertical tomograms and will include the topography of the disc creating helpful observation of glaucoma patients.

3D Widefield scan



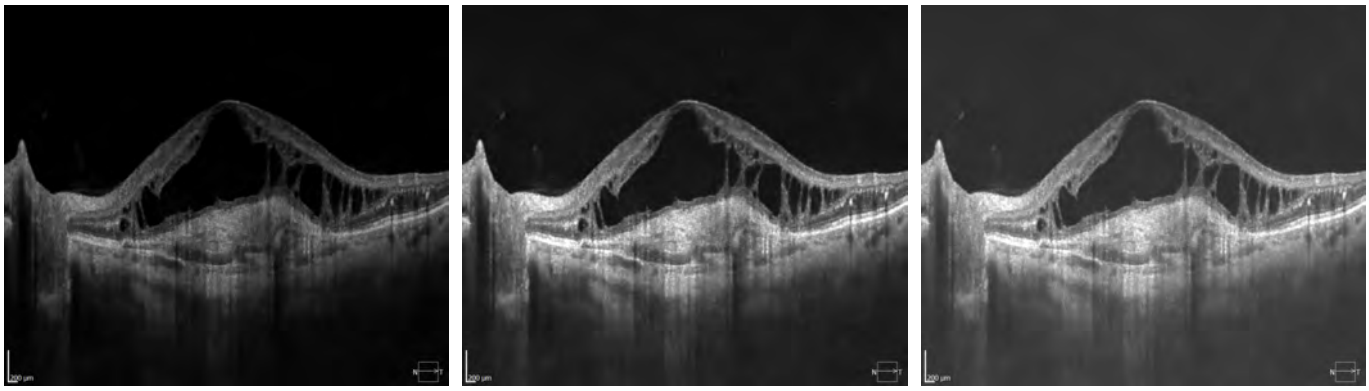
NEW

CATARACT MODE

The cataract mode in the REVO series opens up new possibilities for patients with challening cases. This feature allows for the visualisation of structures hidden beneath opaque layers, making it ideal for diagnosing eye conditions that were previously difficult or impossible to study in patients with cataract, corneal oedemas or very dense floaters.

The cataract mode allows the scanning speed and sensitivity of the OCT to be modified for better visualisation of patients with opaque media.

Normal | Fine | Ultra Fine



GLAUCOMA

Comprehensive glaucoma analytical tools for quantification of the Nerve Fiber Layer, Ganglion layer and Optic Head with DDLS provide precise diagnostics and monitoring of glaucoma over time.

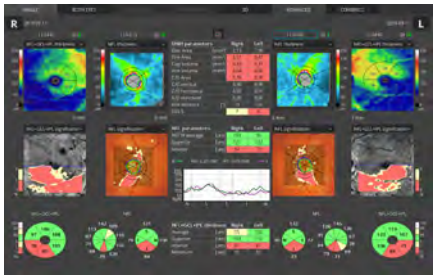
With the gold standard 14 optic nerve parameters and a new Rim to Disc and Rim Absence, the description of the ONH condition is quick and precise.

Advanced view provides combined information from Retina and Disc scan to integrate details of the Ganglion cells, RNFL, ONH in a wide field perspective for comprehensive analysis.

Asymmetry Analysis of Ganglion layers between hemispheres and between eyes helps to identify and detect glaucoma in early stages and in non-typical patients.

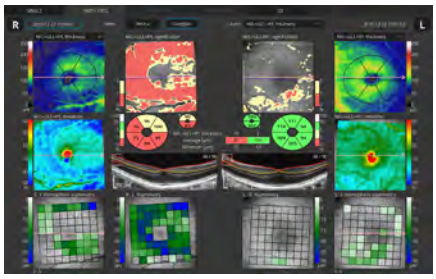
The REVO DDLS (Disk Damage Likelihood Scale) uses 3 separate classifications for small, average and large discs. It supports the practitioners in a quick and precise evaluation of the patient's glaucomatous disc damages.

Advance Retina & ONH

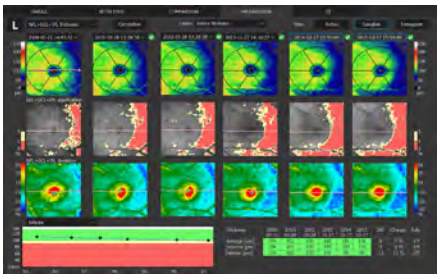


ONH Single

Ganglion Both

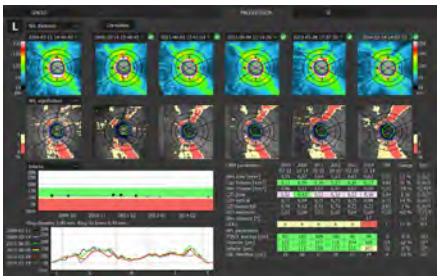


Ganglion Progression



ONH Both

ONH Progression

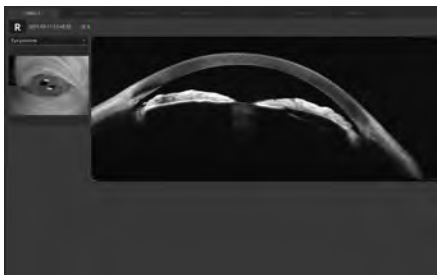


COMPLETE YOUR GLAUCOMA REPORT

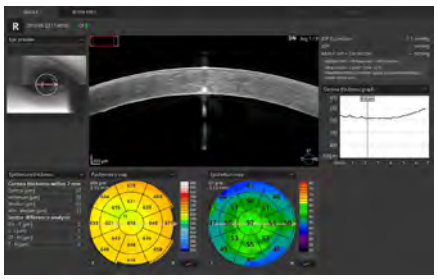
To eliminate the common problem with the understanding of the patient's IOP, the pachymetry module provides IOP correction value. With the implemented Adjusted IOP formula, you can quickly and precisely understand the measured IOP value.

The Pachymetry and Anterior Chamber Angle Verification require no additional attachments. The predefined Glaucoma protocol, which consists of Retina, Disc and Anterior scans, can be done automatically to reduce patient chair time.

Narrowing Angle



Anterior Single View

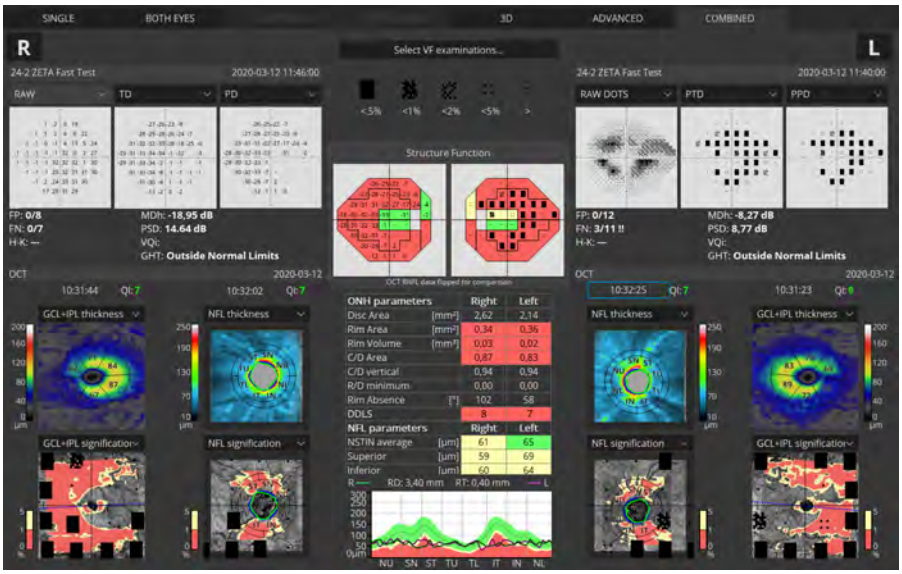


COMPREHENSIVE GLAUCOMA SOLUTION[1]
STRUCTURE & FUNCTION - Combined OCT and VF results analysis

Invaluable combination of information about the functional quality of vision based on comprehensive data on retinal Ganglion Cells, RNFL and Optic Nerve Head for both eyes on a single report page. The S&F report contains:

- VF sensitivity results (24-2/30-2 or 10-2)
- Total and Pattern Deviation probability graphs for VF results
- Reliability and Global indices for VF results
- Combined map of Structure & Function
- Ganglion cells analysis (GCL+IPL or NFL+GCL+IPL)
- ONH and NFL analysis including charts and comparison tables
- NFL Asymmetry Plot
- Nasal and Temporal sectors have been spilt to present structural changes better
- Compare exact numerical sensitivity values

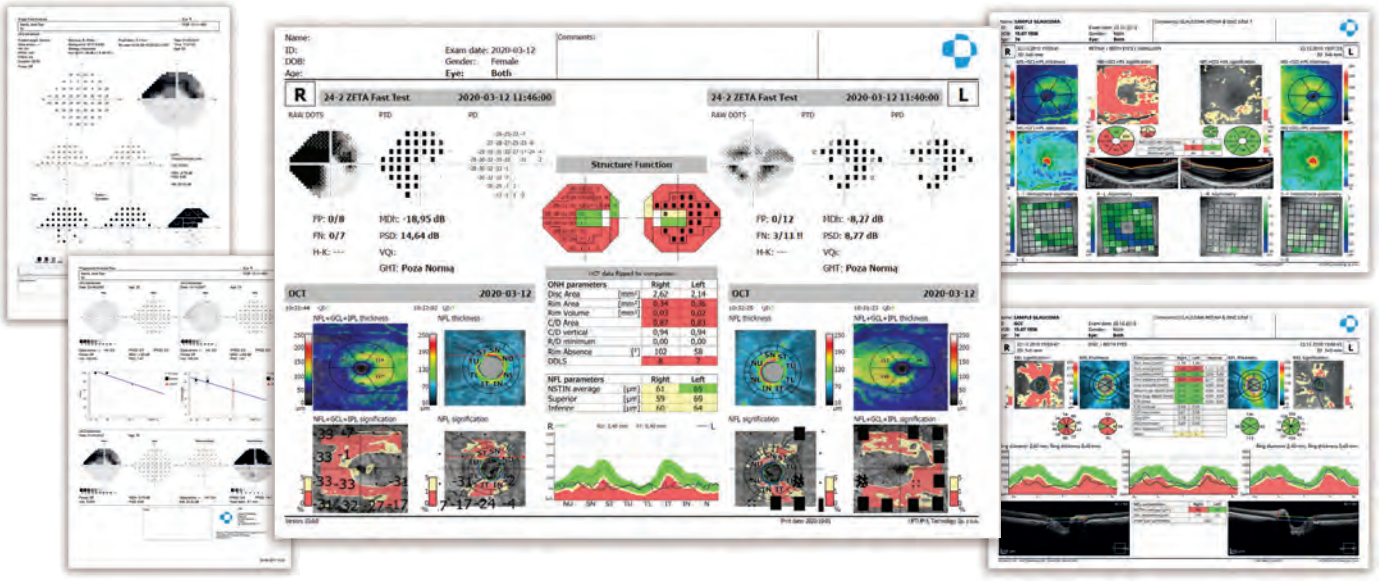
Structure & Function



The S&F report compares in a natural way the anatomical relationship between VF and RNFL/Ganglion maps.

SINGLE PAGE REPORT[1]

S+F provides a quick and comprehensive single page report for glaucoma management.



[1] *Connection with PTS software version 3.8 or higher is required*

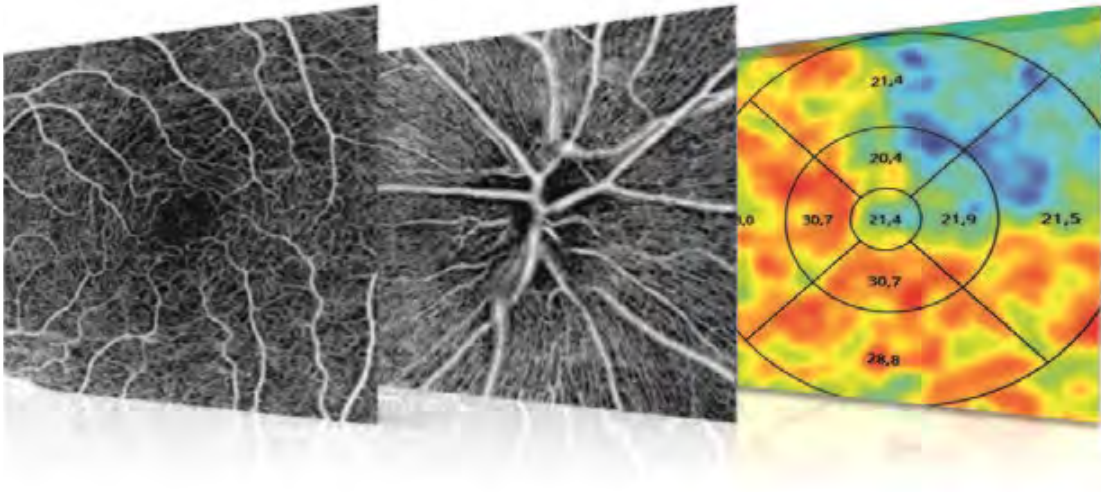
SOCT ANGIOGRAPHY[1]

This non-invasive, dye free technique provides visualization of the microvasculature of the retina. Both blood flow and structural visualization give additional diagnostic information about many retinal diseases. OCT Angiography scan enables assessment of the structural vasculature of the macula, periphery or the optic disc.

[1] *an optional software module*

QUANTIFICATION

The quantification tool provides quantification of the vasculature in the entire analyzed area together with values in specific zones and sectors. The heat map of the analyzed vasculature helps to evaluate structure conditions much faster. Multiple quantification methods increase the sensitivity of analyses for specific diseases.

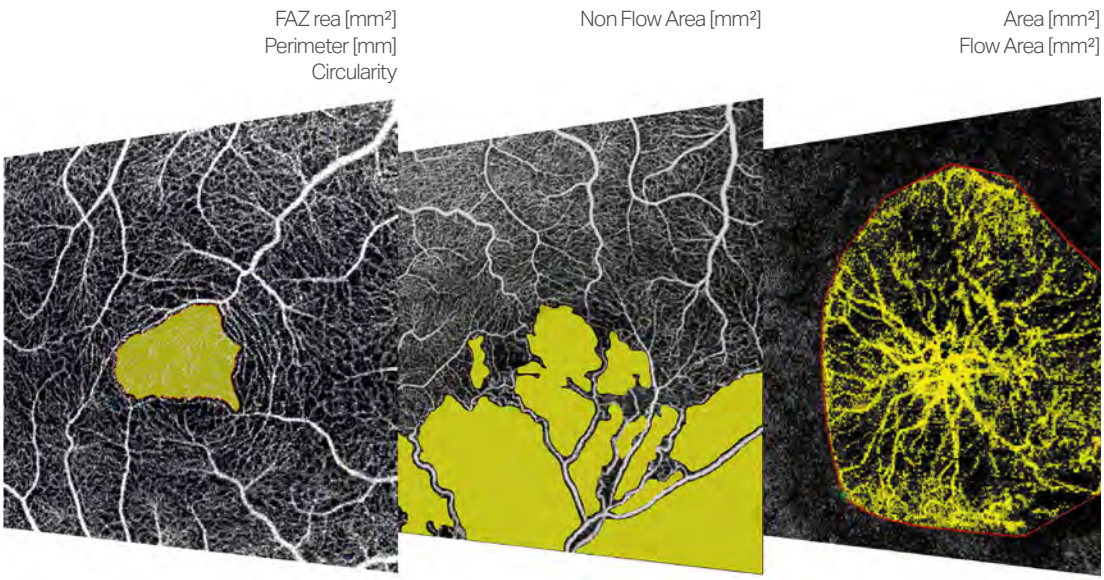


ANGIO-ANALYTICAL TOOLS

FAZ – Foveal Avascular Zone measurements enable quantification and monitoring of changes in superficial and deep vascular layers. FAZ tool is also available for narrow and wide scans.

VFA – Vascular Flow Area can be used to examine pathologically affected structures to precisely measure the vascularization area. The user can easily measure area on a predefined or own selected vascular layer.

NFA – Non Flow Area measurement makes it possible to quantify the Non Flow Area on the OCT Angio examination. It provides the sum of all marked areas.



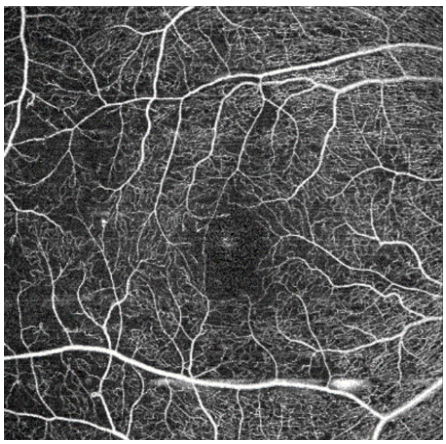
NEW

MIP

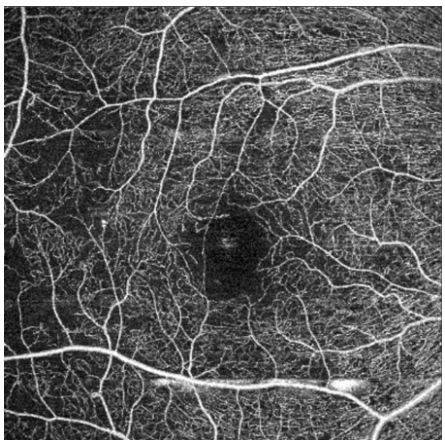
MAXIMUM INTESITY PROJECTION – THE MIP ALGORITHM

Choose better visualization of angio data for analysis with the Maximum Intensity Projection (MIP) feature. This tool is useful for visualizing OCT-A data as it enables easier identification and tracking of high-intensity structures such as blood vessels.

AIP



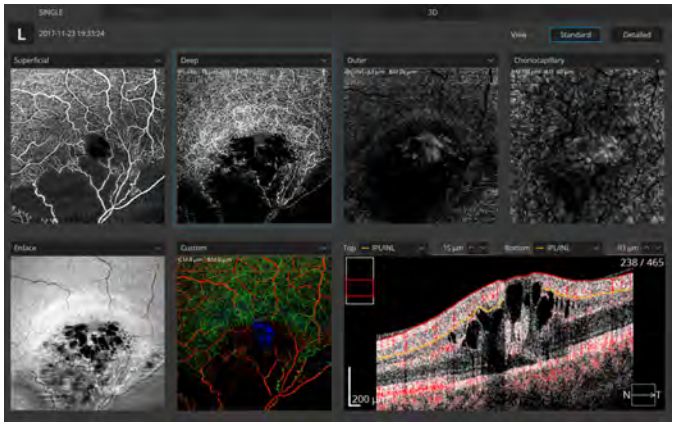
MIP



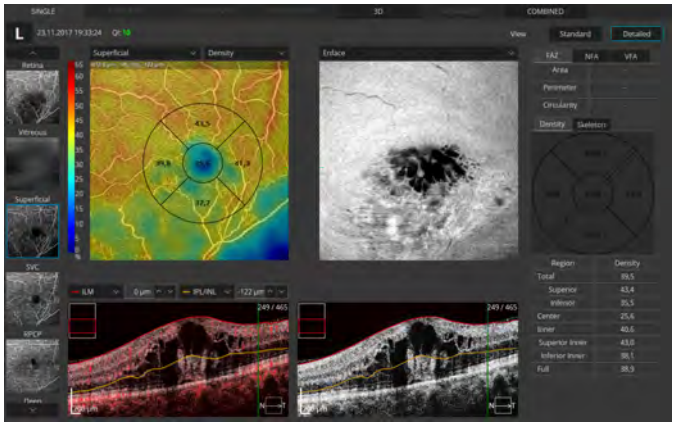
A COMPLETE SET OF ANGIO OCT ANALYSIS VIEWS

This software allows the user to observe, track and compare changes in the microvasculature of the retina in both eyes.

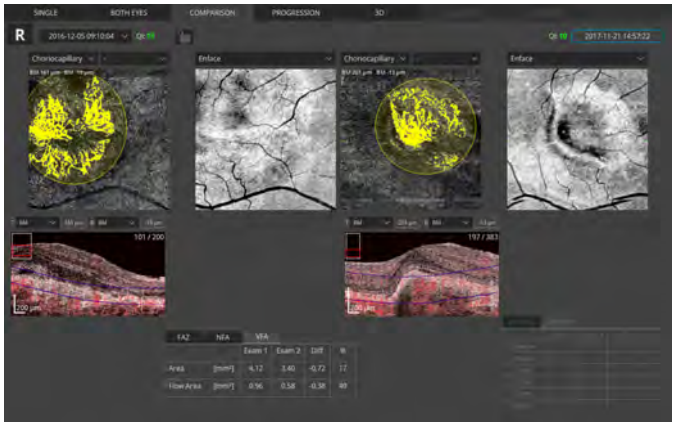
Standard Single View



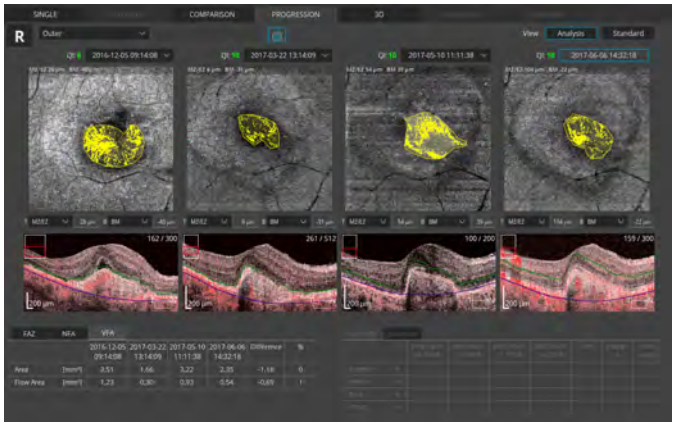
Detailed Single View



Comparison view



Progression Analysis View

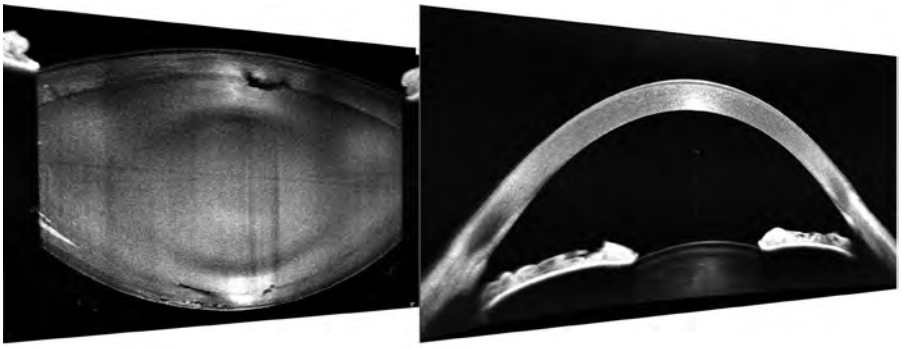


AC

ANTERIOR CHAMBER

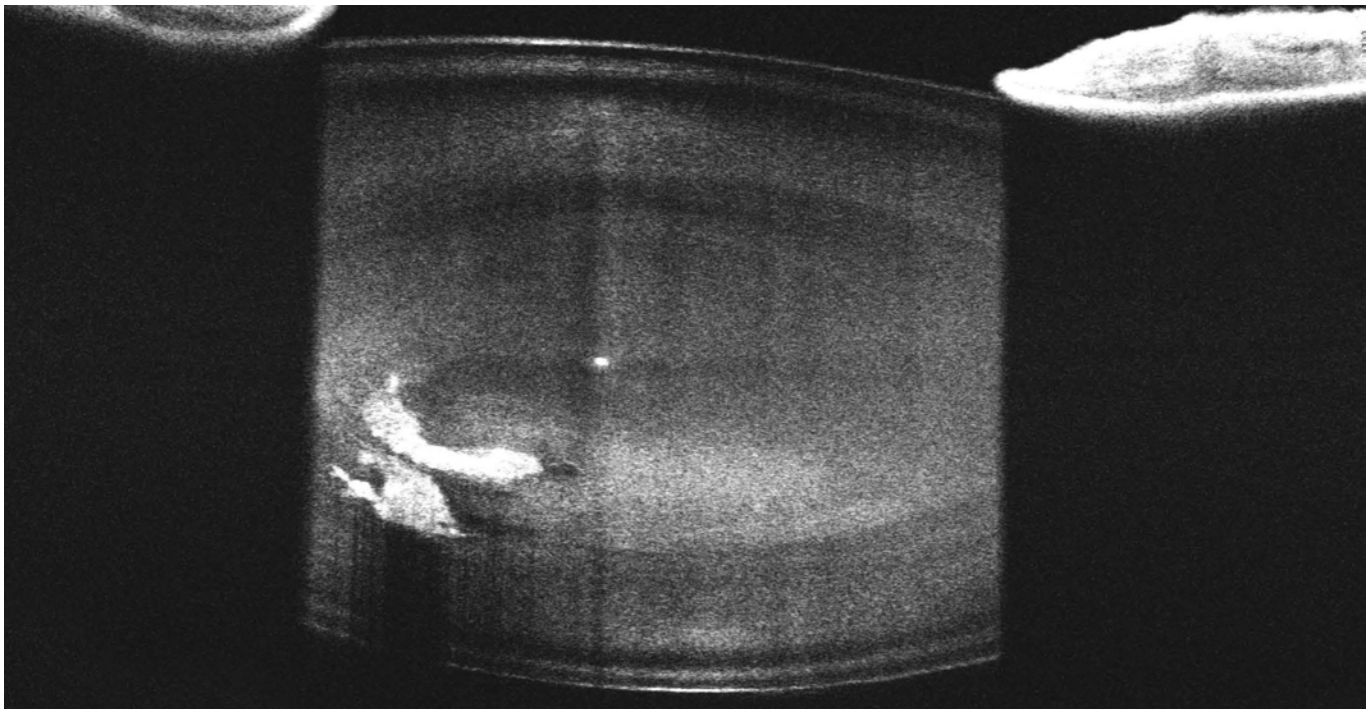
The REVO FC comes with a built-in anterior lens to allow the user to perform imaging of the anterior segment without installing an additional lens or a forehead adapter. You can now display the whole anterior segment or focus on a small area to bring out the details of the image.

Anterior Chamber exam with a fast view of the whole Anterior Chamber makes the evaluation of gonioscopy and the verification of cataract lens easier and faster.



OCT gonioscopy provides visualization of both iridocorneal angles together with information on iris configuration on a single, high-resolution scan for glaucoma evaluation.

OCT Gonioscopy



Anterior Radial 16 mm scan, Full Range Mode

Images courtesy of Prof. Edward Wylęgała MD, PhD

OCT TOPOGRAPHY[1,2]

T-OCT™ is a pioneering way to provide detailed corneal Curvature maps by using posterior dedicated OCT. Parameters of the anterior and posterior surfaces, and the corneal thickness provide True Net Curvature information. With the Net power, a precise understanding of the patient's corneal condition is easy and free of errors associated with modelling of posterior surface of the cornea. The REVO T-OCT module provides axial maps, tangential mas, total Power map, height maps, epithelium and corneal thickness maps.

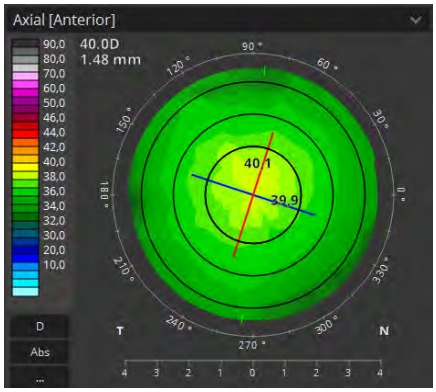
The corneal topography module clearly shows the changes in the cornea on a difference map. The user can customize the view by selecting from a variety of available maps and display options. The fully automatic capture function with examination time of up to 0.2 sec makes testing quick and easy. The topography module provides: full featured corneal mapping of the anterior and poerior surfaces as well as the power presentation (SimK: Anterior, Posterior, Real, Meridian and Semi-Meridian ø 3, 5, 7 mm zones).

[1] *An optional software module*
[2] *Available only for new REVO FC devices*

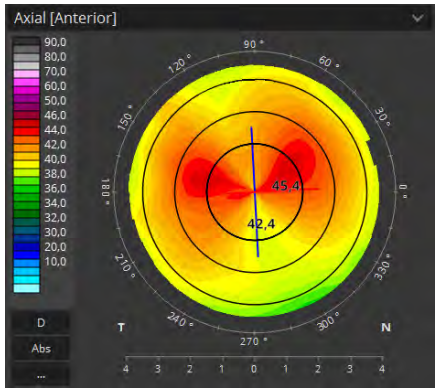
KERATOCONUS SCREENING

Easily detect and classify keratoconus with the Keratoconus classifier. The classification is based on KPI, SAI, DSI, OSI, and CSI. In the early stages of keratoconus, the results can be complemented by epithelium and pachymatery maps.

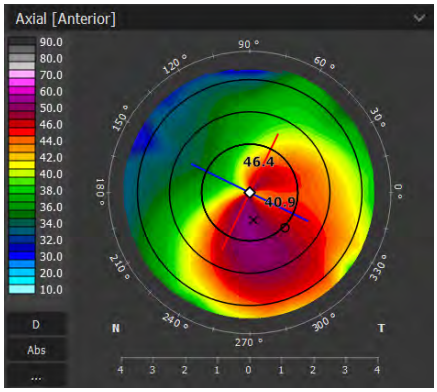
Normal



ATR Astigmatism



Keratoconus



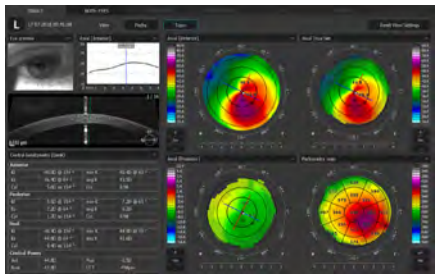
COMPARE THE EXAMS

The comprehensive SOCT software features a range of selectable views: one or both eyes, comparison and progression. See details on standard Single view and easily see corneal asymmetry on the Both view.

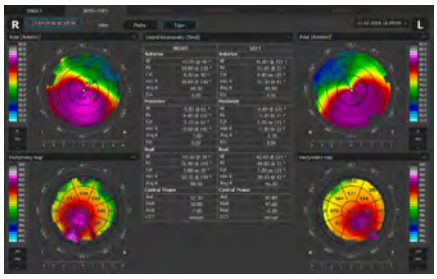
The follow-up feature in the T-OCT™ module gives the possibility to fully compare the changes in the corneal topography over time for:

- LASIK undergone patients
- Keratoconus patients
- Contact lens wearers

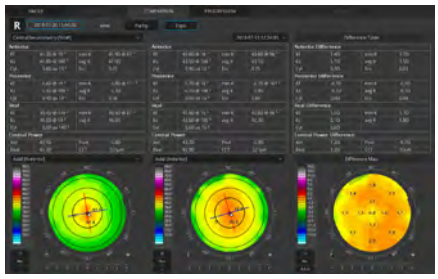
Single Eye View



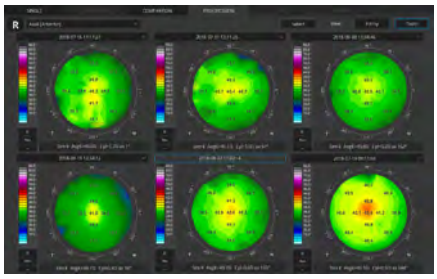
Both Eye View



Comparison View



Progression Analysis View



NEW

HIGH MYOPIA[1]

The Myopia Forecast module opens progression of the ocular structure parameters according to trends over population mode. Usage reference based on research from multiple universities along with environmental factors allow the monitoring of changes from childhood to adolescence.

The REVO offers exclusive selection of reference data based on different studies over various time frames and demographics. Reference data can be selected from NICER[2] study San Diez[3] or Tideman[4].

This module significantly enhances myopia risk assessment for patients initial prediction for child's myopia risk, additionally providing the possibility of refractive errors and K readings monitoring.

Highlighting the treatment period through graphs enables easy interpratation of treatments effects to evaluate counteracting while myopia progression.

High myopia trend analysis

[1] *An optional software module*

Based on:

[2] *Sara McCullough, Gary Adamson, Karen M. M. Breslin, Julie F. McClelland, Lesley Doyle & Kathryn J. Saunders; Axial growth and refractive change in white European children and young adults: predictive factors for myopia*

[3] *Pablo Sanz Diez, Li-Hua Yang, Mei-Xia Lu, Siegfried Wahl, Arne Ohlendorf; Growth curves of myopia-related parameters to clinically monitor the refractive development in Chinese schoolchildren*

[4] *Jan Willem Lodewijk Tideman, Jan Roelof Polling, Johannes R. Vingerling,Vincent W. V. Jaddoe, Cathy Williams, Jeremy A. Guggenheim and Caroline C. W. Klaver, Axial length growth and the risk of developing myopia in European children ("Acta Ophthalmol" 2018: 96: 301–309 doi: 10.1111/aos.13603 https://creativecommons.org/licenses/by/4.0/")*

OCT BIOMETRY[1]

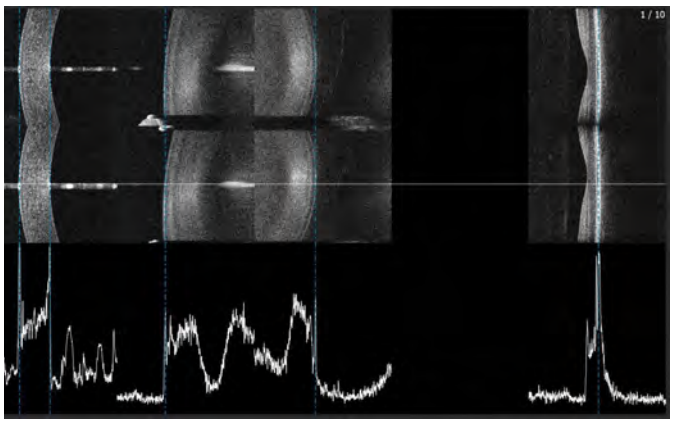
B-OCT® is an innovative method of using the posterior OCT device to measure ocular structure along eye axis.

OCT Biometry provides a complete set of biometry parameters: Axial Length (AL), Central Cornea Thickness (CCT), Anterior Chamber Depth (ACD), Lens Thickness (LT), Pupil size (P), and White to White (WTW).

The B-OCT® module is available in two options:

- Standard: featuring IOL calculator
- Basic: for managing high myopia cases

Single View



Result view

[1] *An optional software module*

IOL Calculator[1,2]

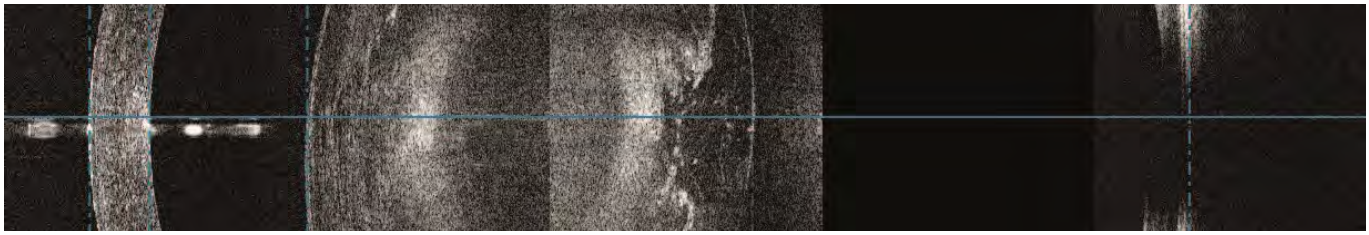
IOL formulas allow the user to calculate IOL implant parameters. Our systems now support the latest IOL data base standard, IOLCon.org so that you can always keep your library up-to-date.

VERIFY YOUR MEASUREMENT VISUALLY

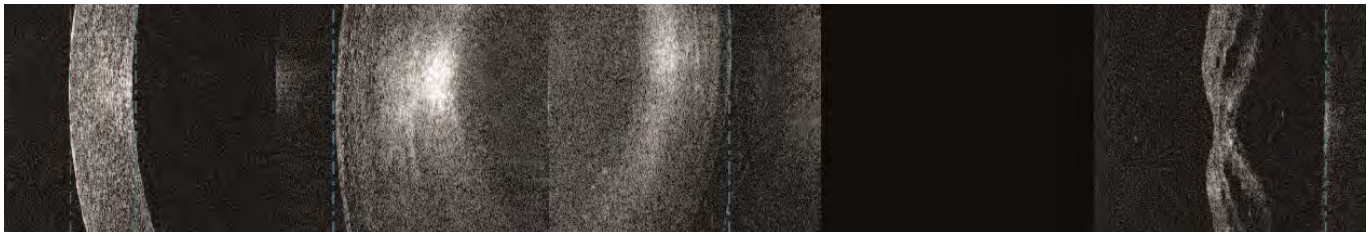
The biometry image provided by the REVO FC presents measurement calipers on all structural boundaries of the eye. This enables easy visual identification of the measured structures or manual correction of the measurement. With a simple cursor shift it is possible to precisely set boundaries in difficult cases with 5 µm axial resolution. The device eliminates the common uncertainty as to how your optical biometer classifies the boundaries in non-typical patients.

IOL Calculation

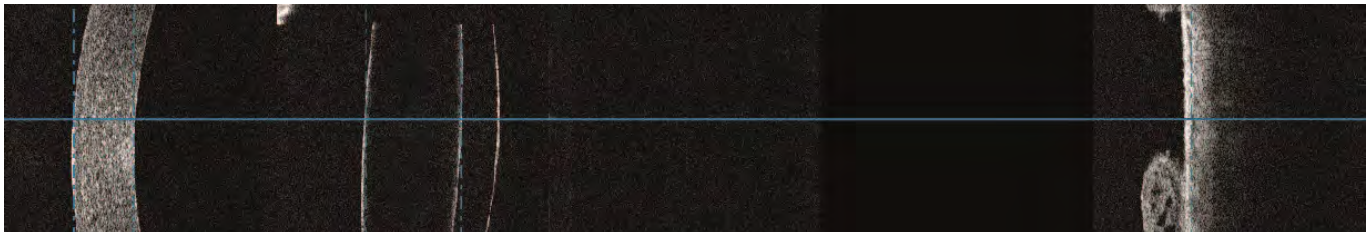
Dense cataract and high myopia



Retinal detachment



PPV and Macular Hole



[1] *Biometry module required*
[2] *IOL Calculator required seperate licence*

DICOM, EMR, NETWORK INTEGRATION

A proficient networking solution increases productivity and enhances the patient experience. It allows you to view and manage multiple examinations from review stations in your practice. It effortlessly facilitates patient education by allowing you to interactively show examination results to patients. Every practice will have different requirements which we can cater for by tailoring a bespoke service. With DICOM connectivity, the REVO can be connected to into large hospital medical systems, with functionality of sending worklists (MWL) and reports (C-storage) or the whole examination to viewing stations. CMDL interface enables the integration of the REVO into practice management systems. There is no additional charge for the networking and DICOM functionality.

REVO FC
OCT | Fundus Camera

TECHNICAL SPECIFICATION

FUNDUS CAMERA

Type	Non-mydriatic fundus camera
Photograph type	Color
Angle of view	45° ± 5%
Min. pupil size for fundus	3.3 mm
Camera	12.3 Megapixel
Photography	Fundus (Retina, Central, Disc, Manual fixation), Anterior photo
Flash adjustment, Gain, Exposure	Auto, Manual
Intensity levels	High, Normal, Low

OPTICAL COHERENCE TOMOGRAPHY

Technology	Spectral Domain OCT
Light source	Superluminescent Diode, SLED Central wavelength: 850 nm Half bandwidth: 50 nm
Scanning speed	80 000 A-scans per second
Min. pupil size for OCT	1.7 mm
Axial resolution	2.8 µm digital, 5 µm in tissue
Transverse resolution	12 µm, typical 18 µm
Overall scan depth	2.8 mm / ~6 mm in Full Range mode
Focus adjustment range	-25 D to +25 D
Scan range	Posterior 5 mm to 15 mm, Angio 3 mm to 9 mm, Anterior 3 mm to 18 mm
Scan types	3D, Angio[1], Full Range Radial, Full Range B-scan, Radial (HD), B-scan (HD), Raster (HD), Cross (HD), TOPO[1], Biometry AL[1]
Fundus alignment	IR, Live Fundus Reconstruction
Alignment method	Fully automatic, Automatic, Manual
Fundus Tracking	Real time active, iTracking
Retina analysis	Retina thickness, Inner Retinal thickness, Outer Retinal thickness, RNFL+GCL+IPL thickness, GCL+IPL thickness, RNFL thickness, RPE deformation, MZ/EZ-RPE thickness
Angiography OCT[1]	Vitreous, Retina, Choroid, Superficial Plexus, RPCP, Deep Plexus, Outer Retina, Choriocapilaries, Depth Coded, SVC, DVC, ICP, DCP, Custom, Enface, FAZ, VFA, NFA, Quantification: Vessel Area Density, Skeleton Area Density, Thickness map
Glaucoma analysis	RNFL, ONH morphology, DDLS, OU and Hemisphere asymmetry, Ganglion analysis as RNFL+GCL+IP and GCL+IPL, Structure + Function[3]
Angiography mosaic	Acquisition method: Auto, Manual Mosaic modes: 10 mm × 6 mm, Manual up to 12 images
Biometry OCT[1]	AL, CCT, ACD, LT, P, WTW
IOL Calculator[2]	IOL Formulas: Hoffer Q, Holladay I, Haigis, Theoretical T, Regression II
Corneal Topography Map[1,2]	Axial [Anterior, Posterior], Refractive Power [Kerato, Anterior, Posterior, Total], Net Map, Axial True Net, Equivalent Keratometer, Elevation [Anterior, Posterior], Height, KPI (Keratoconus Prediction Index)
Anterior (no lens/adapter required)	Anterior Chamber Radial, Anterior Chamber B-scan, Pachymetry, Epithelium map, Stroma map, Angle Assessment, AIOP, AOD 500/750, TISA 500/750, Angle to Angle view
Connectivity	DICOM Storage SCU, DICOM MWL SCU, CMDL, Networking
Fixation target	OLED display (the target shape and position can be changed), external fixation arm
Dimensions (L×W×H) / Weight	479 mm × 367 mm × 493 mm / 30 kg
Power supply / consumption	100 V to 240 V, 50 / 60 Hz / 90 VA to 110 VA

UWF LENS[4]

Scan angle	~105°[5]
Working distance	15 mm
Scan types	3D, Radial, Line, Angio[1], Full Ranger Radial, Full Range Line
Fundus tracking	iTracking
Overall scan depth	2.8 mm / ~6 mm in Full Range mode

[1] An optional software module
[2] The Biometry module and a separate license for the IOL Calculator are required
[3] Via connection with PTS software version 3.4 or higher
[4] Ultra-wide field imaging is available with the optional UWF lens
[5] Measured from the center of the eye

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