OPTOPOL
technology

1st SD-OCT in the World
20 Years of REVOlution

# REVO 80

As simple as pressing
**the start button**

# REVOlution starts again

Our supreme experience in Spectral Domain OCT allows us to provide the market with a state of the art instrument which comes with new advanced technologies and remarkable simplicity of operation. The REVO 80 will expand the daily demands of any modern practice.

## OCT made simple as never before

Position the patient and press the START button to acquire examinations of both eyes. The Revo 80, guides the patient through the process with vocal messages to increase comfort and reduce patient chair time.

## New OCT standard - All functionality In One device.

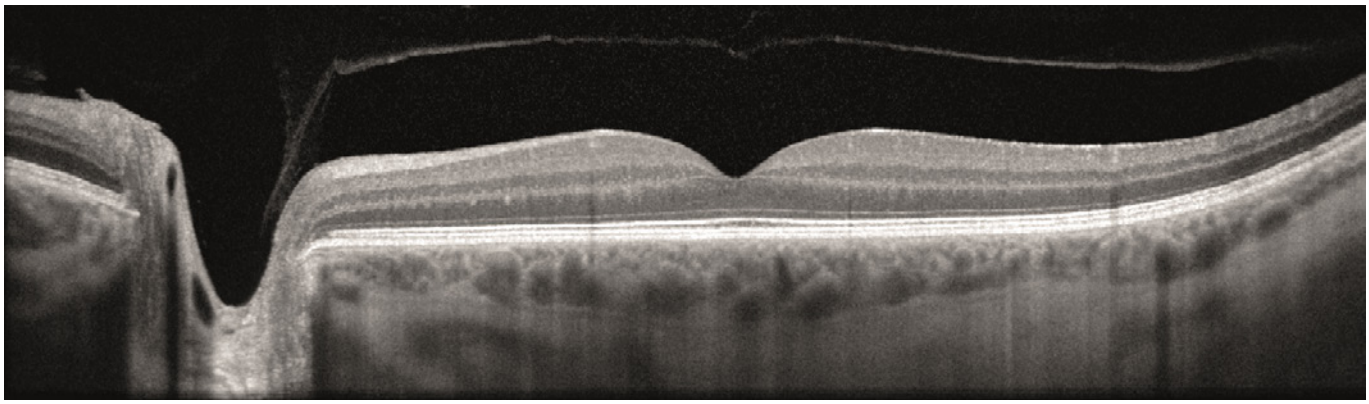
Once again REVO goes beyond the limits of standard OCT. With its new software, the device provides a full functionality from the retina to the cornea to combine the potential of several devices. With REVO you can measure, quantify, calculate and track changes from the cornea to the retina over time with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

## A perfect fit for every practice.

Small system footprint, various operator and patient positions and connection by a single cable allows the installation of REVO 80 into the smallest of examination room spaces. With its variety of examination and analysis tools, the REVO can easily function as a screening or advanced diagnostic device.

## High quality of OCT image

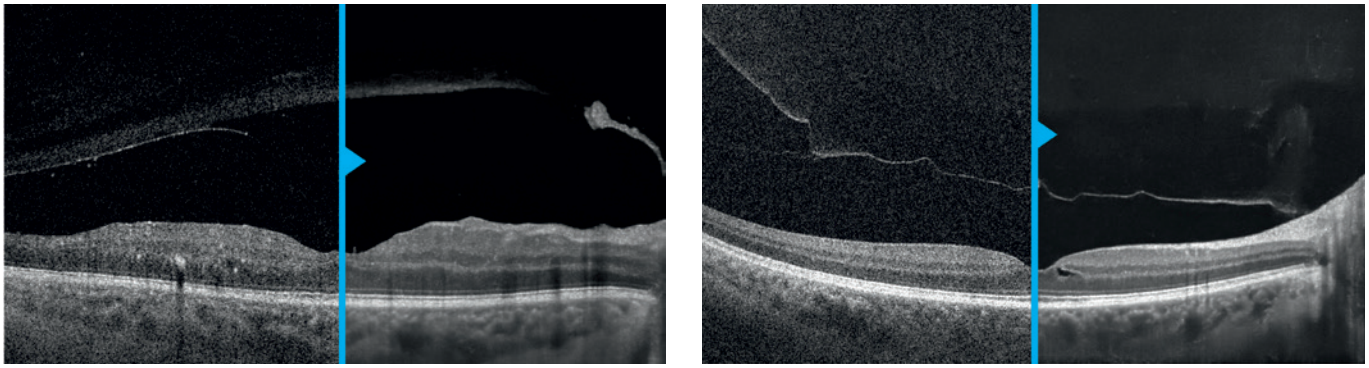
The noise reduction technology provides the finest details proven to be important for early disease detection.



## DN AI DENOISE

Improved tomogram quality powered by Artificial Intelligence. Advanced AI algorithms enhance the quality of a single tomogram to the level of an averaged tomogram obtained through multiple scanning.

Raw Tomogram / AiDenoise Tomogram



NEW

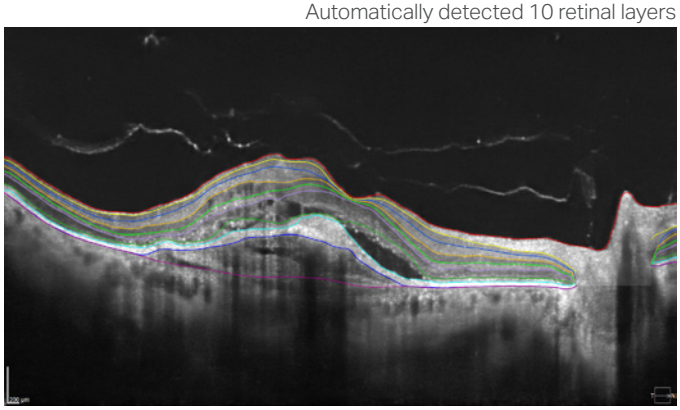
## AI RETINA

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.

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.

Automatically detected 10 retinal layers

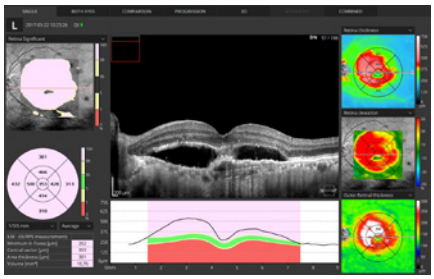


In addition, a new definition of ILM – BM retinal thickness has been added for more sensitive monitoring patients with subretinal disorders.

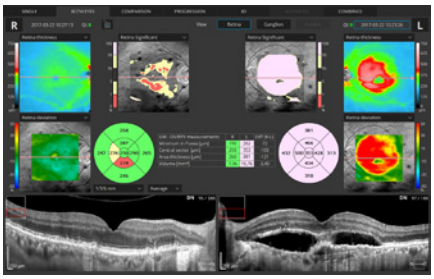
## RETINA

A single 3D Retina scan performs both Retina and Glaucoma analysis. The software automatically recognizes 8 retinal layers which assists with precise diagnosis and mapping of any changes in the patient's condition. A variety of result analysis and presentation methods allows the most suitable selection to increase efficiency.

Single



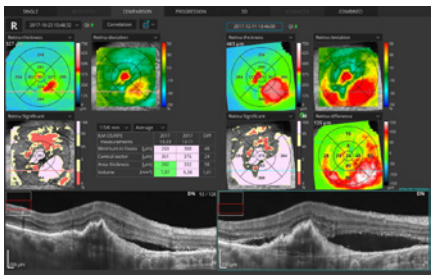
Both



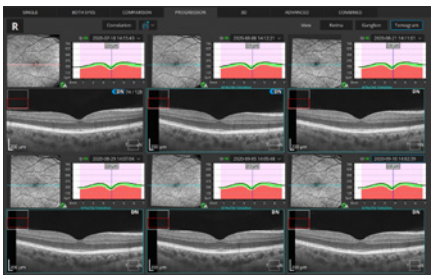
## FOLLOW-UP

REVO's standard high density scanning capability and blood vessel structure recognition enable a precise alignment of past and current scans. The operator can analyse changes in morphology, quantified progression maps and evaluate the progression trends.

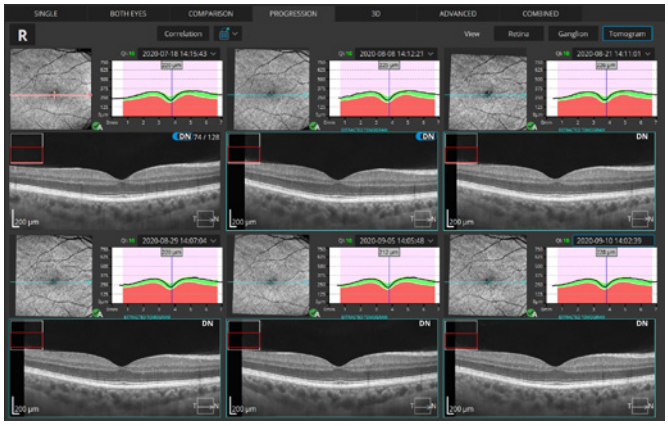
Comparison



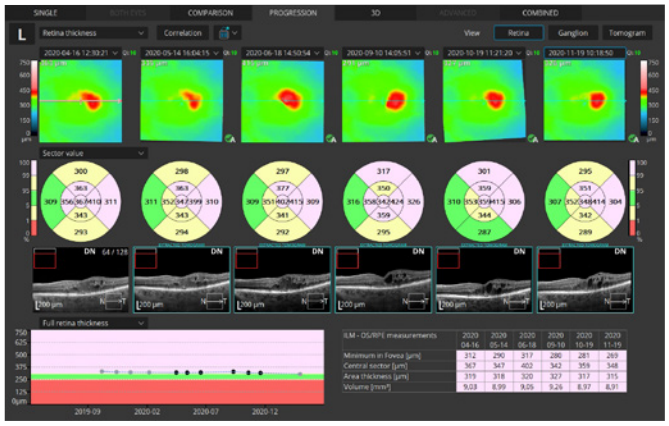
Progression



Progression Morphology



Progression Quantification



# REVOlution starts again

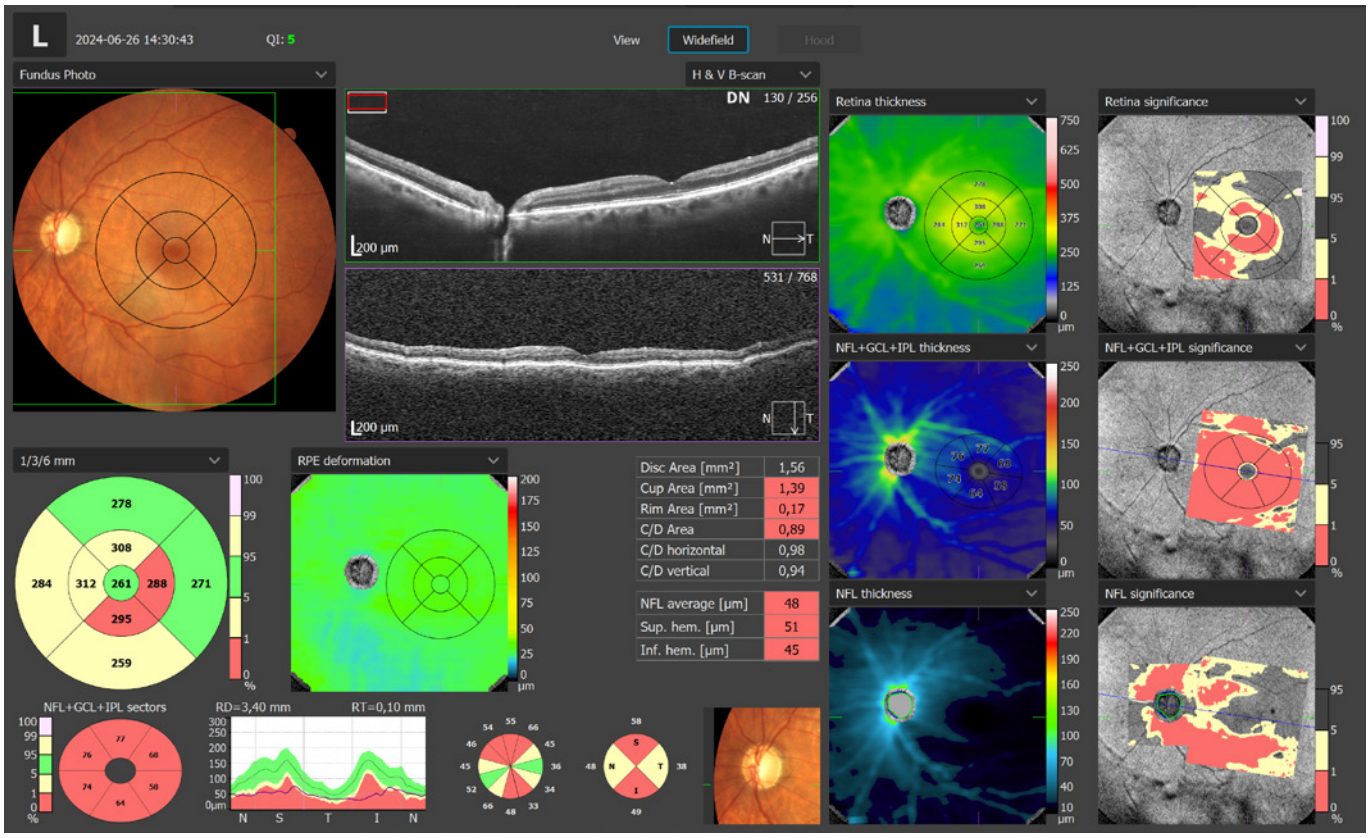
NEW

## 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



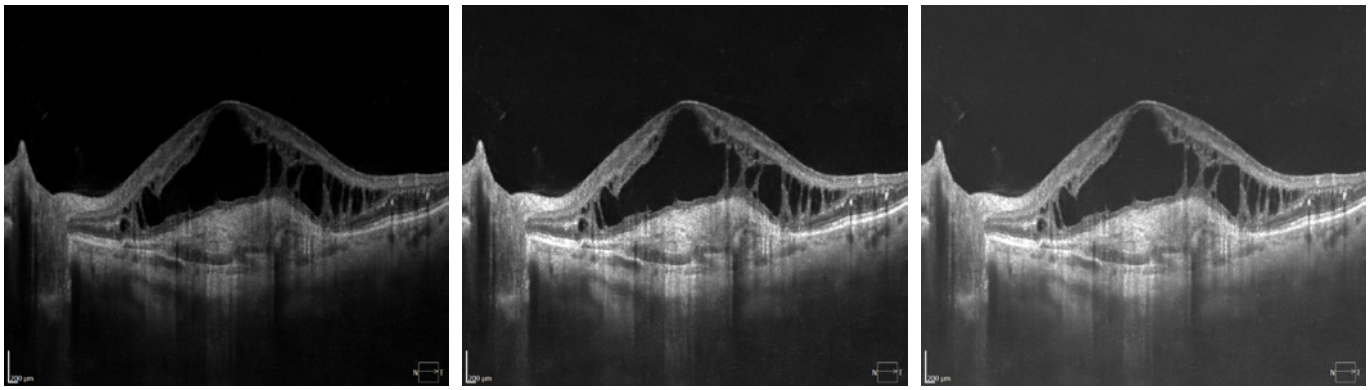

NEW

## CATARACT MODE

The cataract mode in the REVO series opens up new possibilities for patients with challening cases. This feature provides 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.

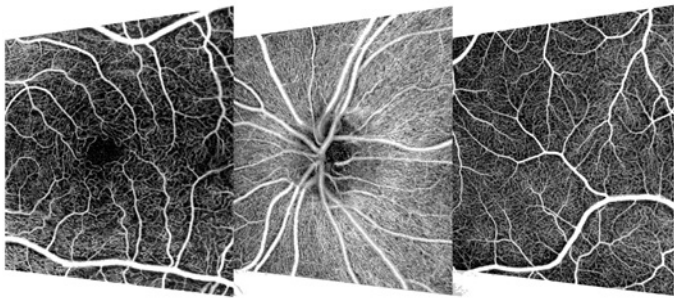
Normal | Fine | Ultra Fine



## ANGIOGRAPHY SOCT[1]

This non-invasive dye free technique allows the visualization of the microvasculature of the retina. Both blood flow and structural visualization give additional diagnostic information about many retinal diseases. Angiography scan allows assessment of the structural vasculature of the macula, the periphery or the optic disc. Extremely short scanning times of 1,6 seconds in standard resolution or 3 seconds in high resolution.

Now Angiography OCT can become a routine in your diagnostic practice.



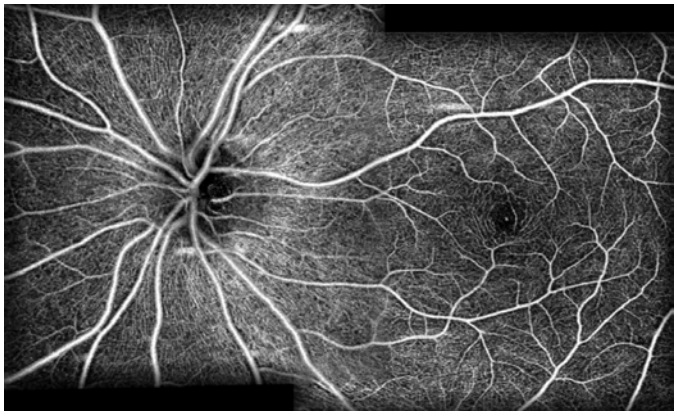
## ANGIOGRAPHY MOSAIC[1]

The Angiography mosaic delivers high-detail images over a large field of the retina. Available modes allow to see predefined region of the retina in a convenient way.

In manual mode it is possible to scan the desired region. Built-in analytics allow the user to see vascular layers, enface or thickness maps.

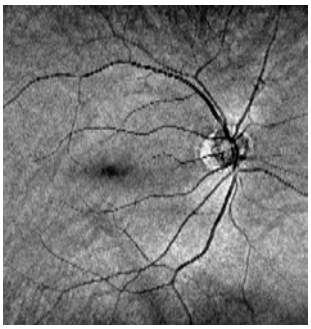
Dedicated FAZ, VFA tools provide easy tracking and quantification of changes.

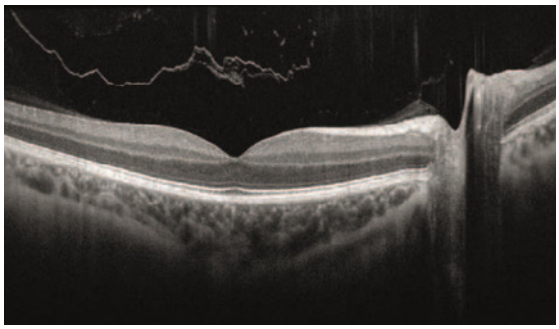
Mosaic mode: 10x6 mm



## WIDEFIELD SCAN

12x12 mm Widefield Central scan is perfect for fast and precise screening of the patient's retina.

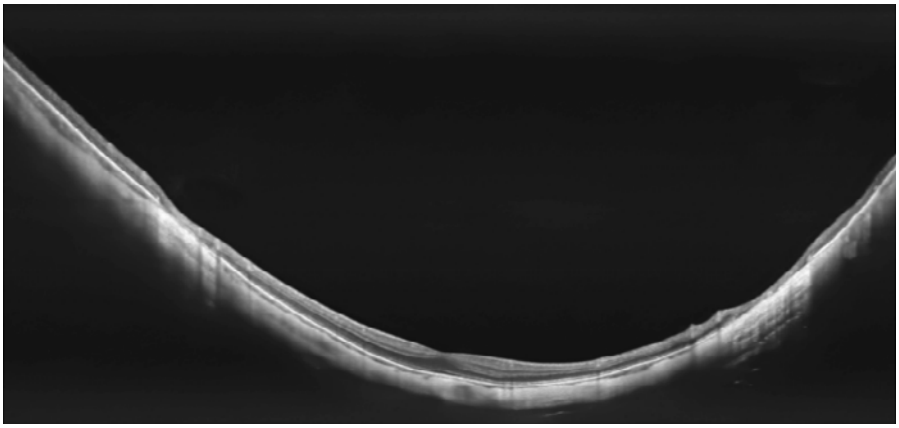




## FULL RANGE

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

Central B-scan 12 mm scan, Full Range Mode



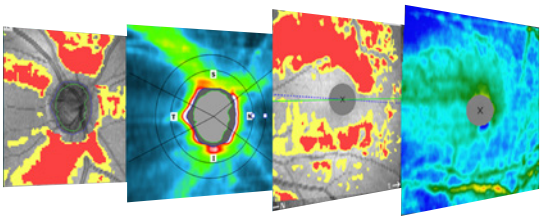
Images courtesy of Bartosz L. Sikorski MD, PhD

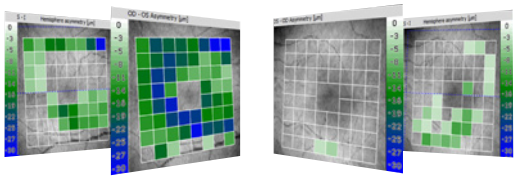
[1] *an optional software module to purchase.*

# REVOlution starts again

## GLAUCOMA

Comprehensive glaucoma analytical tools for quantification of the Nerve Fiber Layer, Ganglion layer and Optic Head with DDLS enable the user to perform precise diagnosis and monitoring of glaucoma over time.





With the Asymmetry Analysis of Ganglion layers between hemispheres and between eyes it is possible to identify and detect glaucoma in early stages and in non-typical patients.

## STRUCTURE & FUNCTION[2]

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

- 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

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

## TOPOGRAPHY OCT[1]

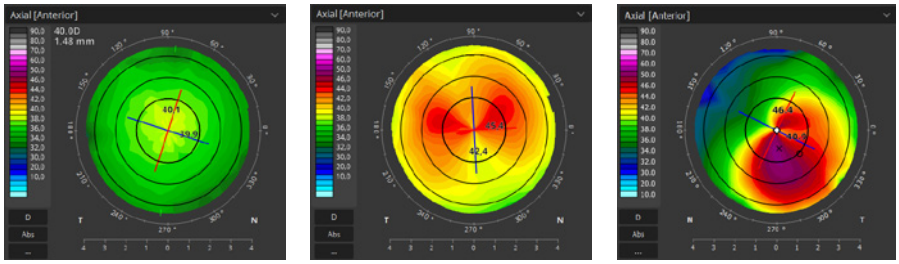
T-OCT™ is a pioneering way to provide detailed corneal Curvature maps by using posterior dedicated OCT. Ante-rior, Posterior surfaces and Corneal Thickness provide the True Net Curvature information. With the Net power a precise understanding of the patient's corneal condition comes easily and is free of errors associated with model-ling of posterior surface of the cornea. SOCT T-OCT module provides Axial maps, Tangential mas, Total Power map, Height maps, Epithelium and Corneal thickness maps.

Corneal topography module clearly shows the changes in the cornea on the difference map view. Customize favoured view by selecting from a variety of available maps and display options. Fully Automatic capturing with examination time of up to 0.2 sec makes testing quick and easy. Topography module provides: Full featured Corneal mapping of Anterior, Posterior and Real Precise Astigmatism Display Option (SimK: Anterior, Posterior, Real, Meridian and Semi-Meridian ø 3, 5, 7 mm zones.

### KERATOCONUS SCREENING

Easly detect and classified keratoconus with 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



[1] *an optional software module*

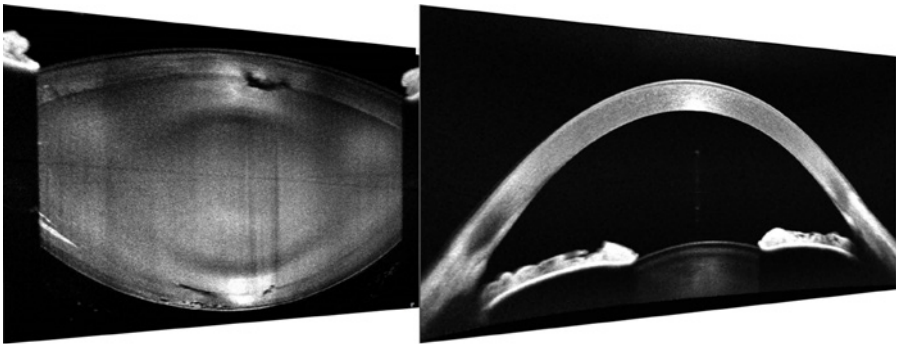
[2] *connection with PTS software version 3.4 or higher is required*

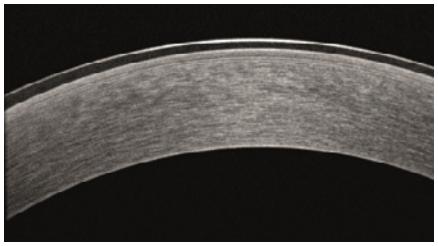
AC

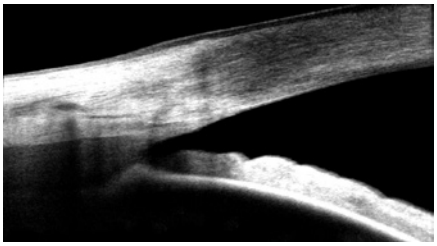
## ANTERIOR CHAMBER

Built-in anterior lens allows the user to perform the imaging of the anterior segment without installing additional lens or forehead adapter. Now you can 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 make the evaluation of gonioscopy situation and the verification of cataract lens easier and faster.



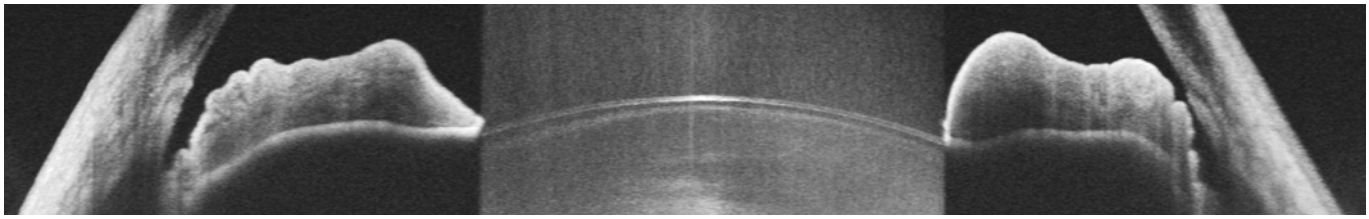




## ANTERIOR

For all anterior examination, no additional lens is required. This allows the examiner to quickly complete the scanning procedure.

OCT Gonioscopy



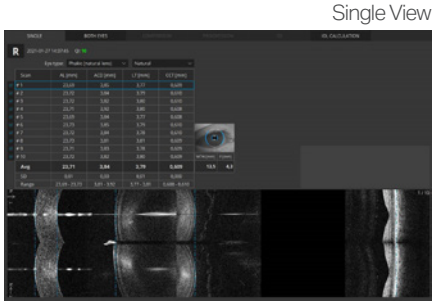
* Images courtesy of Prof. Edward Wylegała MD, PhD

AL

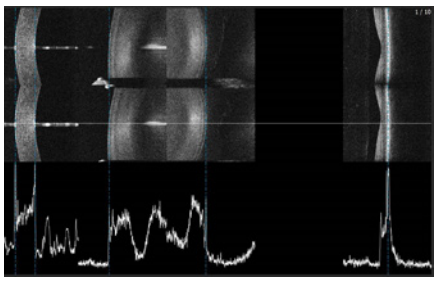
## BIOMETRY OCT[1]

B-OCT® Innovative method of using the posterior OCT device to measure ocular structure along eye axis. OCT Biometry provides 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.

Single View



Result view



### VISUALLY VERIFY YOUR MEASUREMENT

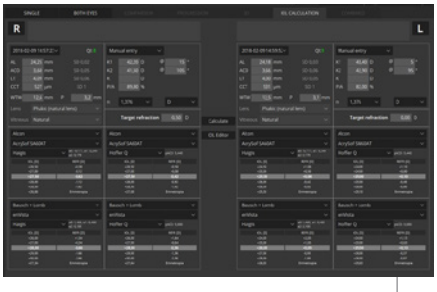
All measurement calipers are shown on all boundaries of OCT image provided by REVO. Now, you can visually verify, identify and if needed correct which structure of the eye has been measured.

IOL

## IOL Calculator[3,4]

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.

IOL Calculation



[1] *an optional software module*
[3] *Biometry module required*
[4] *IOL Calculator required seperate licence*

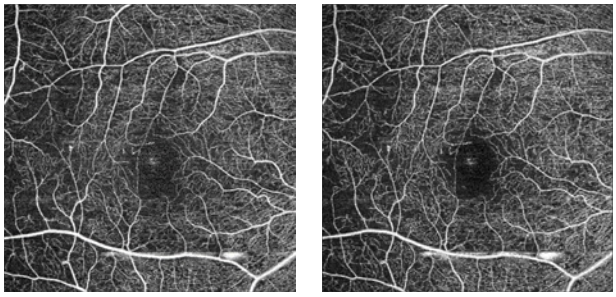
REVOlution starts again

NEW

## 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



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/")*

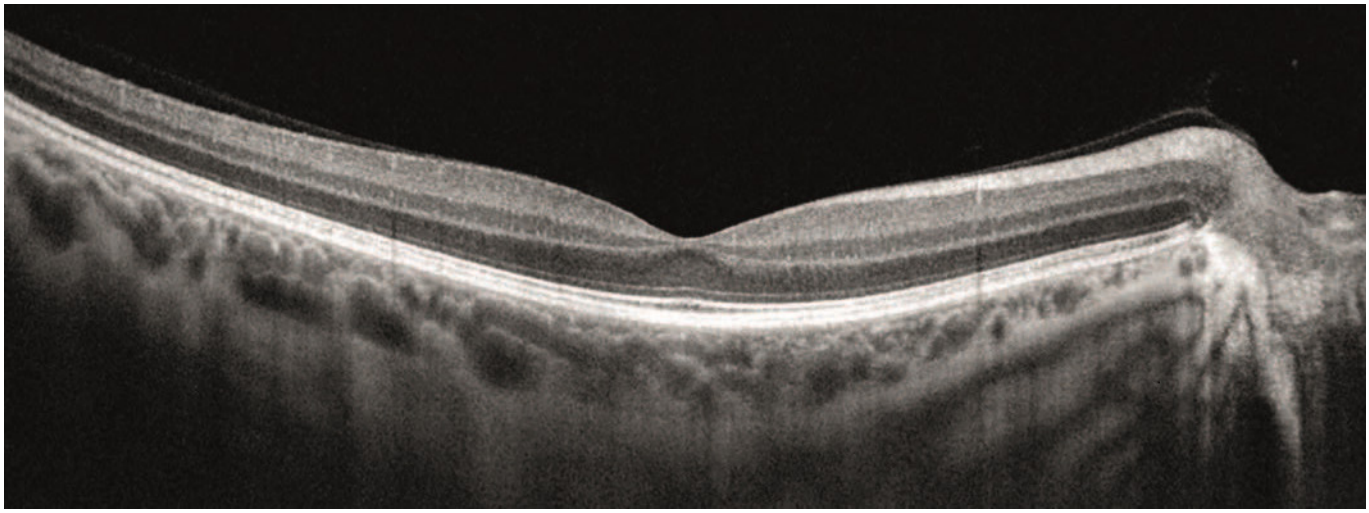
### EXTRACTED TOMOGRAMS

Increased follow-up precision. Advanced correlation now enables the creation of Extracted tomograms which compensate for image misalignment occuring between sessions to make cross-sectional images of the same area available during consecutive sessions.

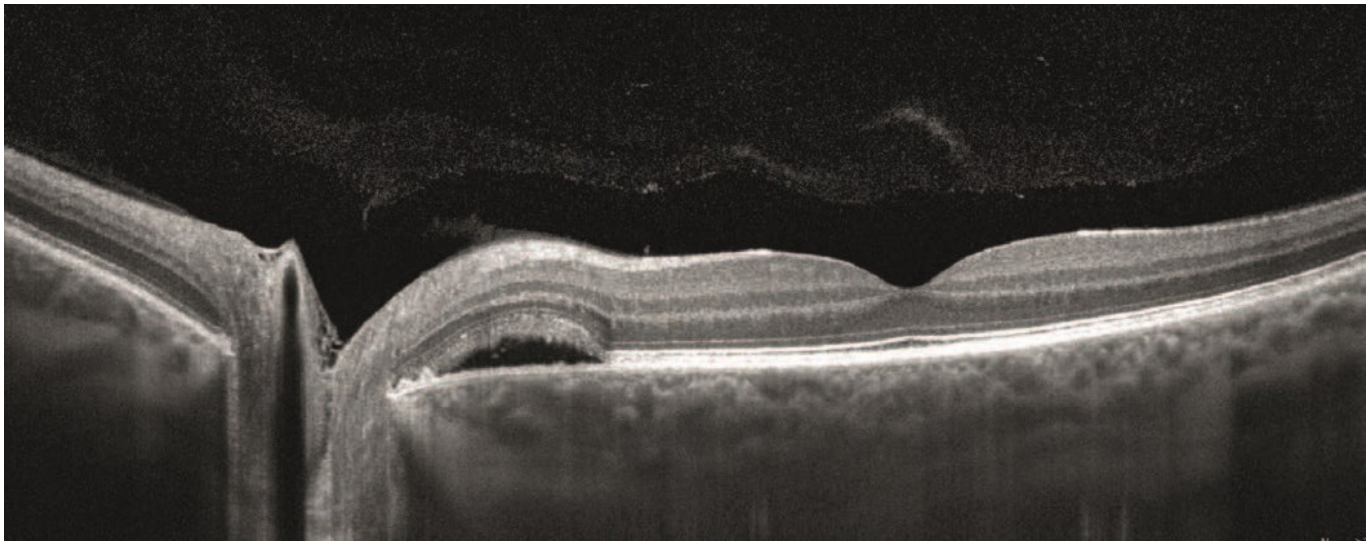
## DICOM, EMR, NETWORK INTEGRATION

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. DICOM connectivity allows the connection of the REVO into large hospital medical systems. It is possible to send 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.

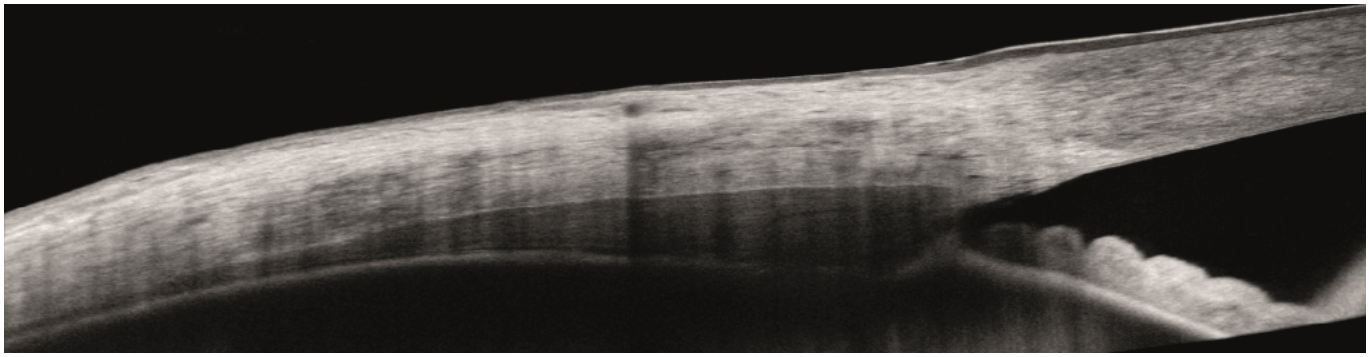
Choroidal observation



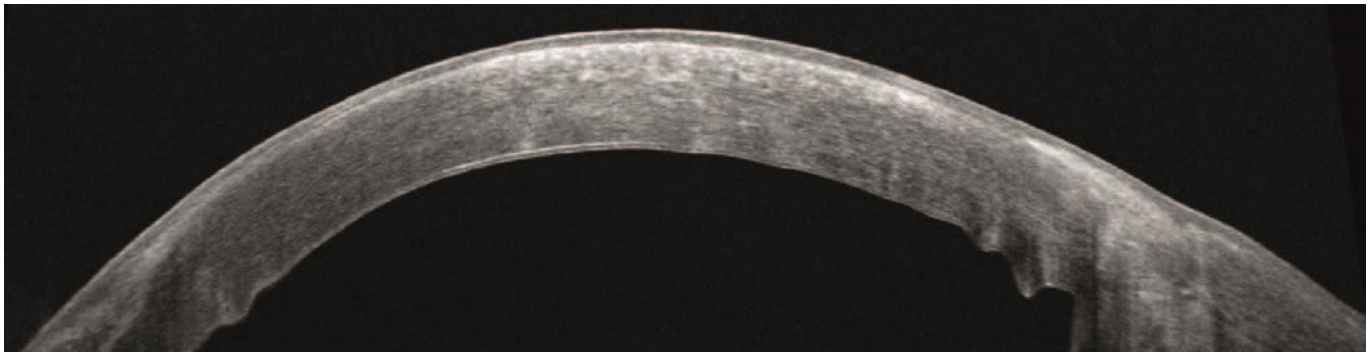
Wide Central scan



Sclera and Anterior Structure



Cornea wide scan



REVO 80

# TECHNICAL SPECIFICATION

| | |
|---|---|
| Technology | Spectral Domain OCT |
| Light source | Superluminescent Diode, SLED<br>Central wavelength: 850 nm<br>Half bandwidth: 50 nm |
| Scanning speed | 80 000 A-scans per second |
| 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 6 mm, Anterior 3 mm to 18 mm |
| Scan types | 3D, Angio[1], Full Range Radial, Full Range B-scan, Radial, B-scan, Raster, Cross, TOPO[1] ,<br>Biometry AL[1] |
| Fundus image | Live Fundus Reconstruction |
| Alignment method | Fully automatic, Automatic, Manual |
| Retina analysis | Retina thickness, Inner Retinal thickness, Outer Retinal thickness,<br>RNFL+GCL+IPL thickness, GCL+IPL thickness, RNFL thickness, RPE deformation,<br>MZ/EZ-RPE thickness |
| Angiography OCT[1] | Superfi cial Plexus, Deep Plexus, Outer Retina, Choriocapilaries, Choroid,<br>Depth Coded, Custom, Enface, Thickness; FAZ, VAS, NFA tools |
| Angiography mosaic | Acquistion method: Auto, Manual<br>Mosaic modes: 10×6 mm, Manual up to 12 images |
| Glaucoma analysis | RNFL, ONH morphology, DDLS, Ganglion analysis as RNFL+GCL+IP and GCL+IPL,<br>OU and Hemisphere asymmetry, Structure+function[2] |
| Biometry OCT[1] | AL, CCT, ACD, LT, P, WTW |
| IOL Calculator[3] | IOL Formulas: Hoffer Q, Holladay I, Haigis, Theoretical T, Regression II |
| Corneal Topography Map[1] | Axial [Anterior, Posterior], Refractive Power [Kerato, Anterior, Posterior, Total, Anterior,<br>Posterior], Net, Axial True Net, Equivalent Keratometer, Elevation [Anterior, Posterior], Height |
| Anterior | Pachymetry, Epithelium map, Stroma map, AIOP, Angle Assessment, AOD 500/750,<br>TISA 500/750 |
| Anterior *(no lens/adapter required)* | Anterior Chamber Radial, Anterior Chamber B-scan, 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 (W×D×H) / Weight | 479 mm × 367 mm × 493 mm / 29 kg |
| Power supply / consumption | 100 V to 240 V, 50/60 Hz / 90 VA to 110 VA |

[1] *An optional software module*
[2] *Connection with PTS software version 3.4 or higher is required*
[3] *The Biometry module and a separate license for the IOL Calculator are required*

CE 0197