

# CA-800

Corneal Analyzer



# CA-800 - Fully featured

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## Ease of use

The CA-800 is extremely easy to handle and use. From image acquisition to analysis, the on-board software is intuitive and user-friendly and the 10.1 inch capacitive touch screen provides quick navigation. Visual guidance supports fast and easy alignment and focusing on the eye; the “best image” selection mode automatically acquires the best-focused image. The CA-800 is a placido-based topography system that delivers accurate, high resolution images of the anterior corneal surface. The keratoscope cone with 24 rings equally spaced on a 43D sphere analyses over 100,000 data points with axial and instantaneous curvature evaluation.

## Integrated PC

The compact design of the CA-800 includes a fully integrated PC, so that an external PC is not required to manage a patient database, for archiving and re-analysis purposes. The patient database is stored on an internal 320 GB SATA hard disk and the CA-800 includes a 32 GB SSD for a quick start up of the instrument and user interface.



# CA-800 - Corneal Analyzer

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Accurate, full  
examination  
of the anterior  
corneal surface



## CA-800 fully featured

### Topography map

- | Map full screen mode
- | Ring editing
- | Keratoconus screening (KPI)
- | Full 3D map of corneal surface
- | Automated best image selection

### OD/OS results on same screen

### Corneal wavefront (Zernike) analysis

### Corneal surface height map

### Comparison map

- | Reviewing of previous patient examinations

### Differential map

- | Post-operative monitoring of corneal healing

### Pupillometry

- | Automated pupil recognition
- | Dynamic, Photopic, Mesopic & Scotopic
- | Latency graph

### Real time fluorescein acquisition and imaging

- | Internal yellow barrier filter

### White to white measurement

### Meibomian gland analysis

### Tear film breakup time analysis

### Contact lens fitting simulation

- | Complete contact lens fitting software
- | Contact lens database on-board

### Toric IOL calculation

- | Oculentis

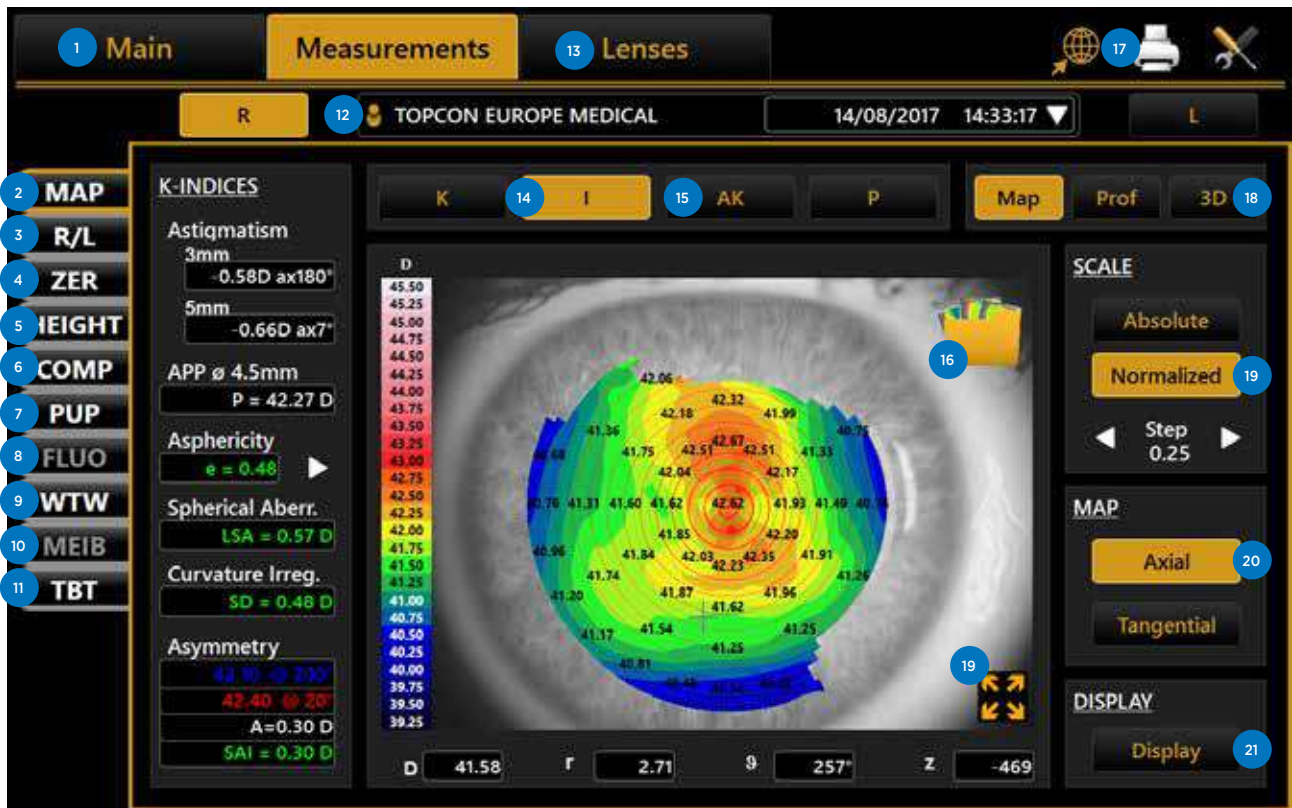
### 10.1 inch Capacitive touch screen

### Fully integrated patient database

### DICOM Compliance

### IMAGENET 6 Compliance

All features accessible on just one screen



- |                                  |   |
|----------------------------------|---|
| 1 Patient database & acquisition | 11 Tear film breakup time                 |
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# CA-800 - Corneal Analyzer



## Acquisition

The CA-800 is easy to use. Visual signals support fast and easy alignment and focusing on the patients eye. The CA-800 has a right and left eye detection and prevents incorrect savings in right/left eye measurements.

The automated best image selection mode in the software of the CA-800 decides the best focused position and automatically acquires the image. Acquisitions can be made for topography, pupillometry and real time fluorescein imaging.



## Keratoconus screening

With the CA-800, signs of asymmetry of the cornea can easily be detected even in an early stage. By analyzing the apical curvature, apical gradient and symmetry of the cornea, a Keratoconus probability index will show in color code (green, yellow & red) if the topography is compatible with Keratoconus.

With the CLMI (Cone Location and Magnitude Index) it is easy to followup on Keratoconus and Keratoconus-like patterns.



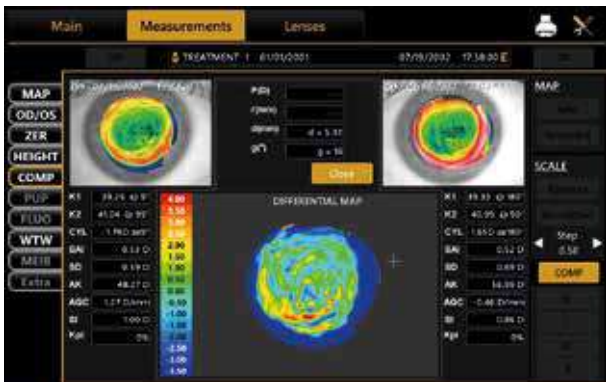
## Corneal Zernike analysis

The Zernike analysis module consists of 36 polynomials into the 7th order, and provides a clear view on the optical deficiencies which can disturb vision. Based on this information, the CA-800 provides the visual acuity summary. Zernike analysis is the basis for the calculation of the ablation area for laser treatment.

The Zernike expansion coefficient is used to determine which component(s) dominate the aberration structure of the cornea and to what degree.



## All features accessible on just one screen



### Corneal comparison & differential map

With the CA-800, it is easy to compare topography maps between two examinations of a patient, which can be used for follow up and for pre- and post-operative corneal analysis. With the differential map, progress in recovery of the cornea can be observed after refractive surgery. Parameters such as keratometry, apical curvature and corneal symmetry can be analyzed to follow the development of any corneal surface changes. The CA-800 comparison and differential maps help you with the treatment of collagen cross linking to stop the development of corneal keratoconus.



### Pupillometry

The CA-800 is equipped with two white LED's for dynamic and static pupillometry. With the CA-800 on-board, the user can check the pupil position and diameter (from Photopic to Scotopic condition) in relation to the position of the optical zone in Ortho-K, laser treatment or refractive surgery treatments. Dynamic pupillometry provides clear information on the reaction time of the pupil and the contraction of the pupil.

### Fluorometry

The CA-800 incorporates eight blue LED's for fluorescein images and real time fluorescein videos which are essential for contact lens fitting. During every measurement the CA-800 automatically registers the pupil diameter, which is critical information during contact lens fitting. Real time fluorescein films allow the eye care practitioner to judge the movement of the contact lens on the cornea, the distribution of the tear film under the contact lens as well as the wetting of the outer contact lens surface. The corneal condition can be observed by recording a real time fluo film without wearing a contact lens. The tear film condition, corneal artifacts and break up time (BUT) can be observed.



# CA-800 - Corneal Analyzer



## Meibomian gland analysis

With the infra-red illumination of the CA-800, the Meibomian Glands of the upper and lower eyelid can be captured and analyzed. Posterior blepharitis is the most common form of lid margin disease. MGD (Meibomian Gland Dysfunction) can cause or exacerbate dry eye symptoms and eyelid inflammation. The oil glands become blocked with thickened secretions. Chronically clogged glands eventually become unable to secrete oil which results in permanent changes in the tear film and dry eyes. With the CA-800, MGD can easily be observed and compared with previous Meibomian gland examinations of the patient.



## Contact lens fitting simulation

The CA-800 provides the perfect platform for contact lens fitting. Simulation software is provided on-board, which automatically selects the best fitting contact lens based upon an included complete contact lens database for all the main manufacturers (upgradable and customizable by the user). With the option to input refractive powers, the contact lens proposal is accurate and complete. The on-board fluorescein acquisition system allows full control of the contact lens position on the eye. The comparison between different contact lenses is easy in order to ensure the best fit.



# All features accessible on just one screen

## Tear film breakup time analysis

Dry eye syndrome is a growing public health concern causing visual disturbance due to tear film instability. The CA-800 offers a comprehensive analysis of the tear film by using the Blink detection and Tear Breakup Time measuring modes.

### Blink detection

The Blink detection records the patient blinks over a period of time. Blinks are automatically detected the average blinks per minute and blinks interval are calculated. The summary of the Blink analysis includes:

**IBI Average:** average Inter-Blink Interval, used to calculate the Ocular Protection Index (OPI)

**IBI standard deviation:** standard deviation of the Inter-Blink Interval values

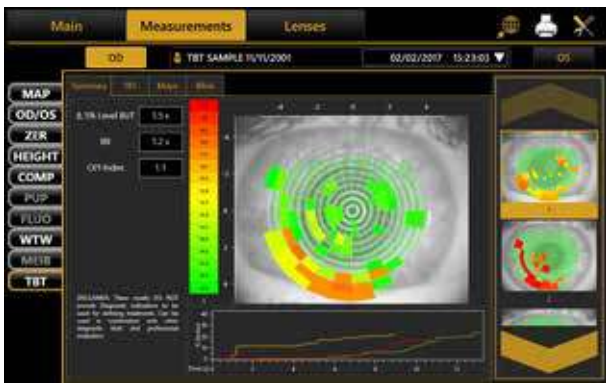
**Duration:** total duration of the time range analyzed

**Blink/min:** average number of blinks per minute



### Tear Breakup Time

The Tear Breakup Time (TBT) records the patients tear film condition while they hold their blink and calculates the time of first breakup and average time for breakup of the Tear Film. This new feature allows video playback with a colored overlay to show the quality of the corneal surface. The TBT displays statistics and graphical data related to the Tear Film condition for the selected TBT acquisition. The sectors will be color-coded from green to red according to the scale on the left side of the image, showing the breakup overtime of the Tear Film. Acquisition stops automatically when a second blink is detected.





# DICOM™ Compliance



The DICOM panel in the CA-800 connectivity section allows the user to set the needed parameters for the connections to the available DICOM features:

- | Modality Worklist
- | Patient Root Query
- | Storage
- | Storage Commitment



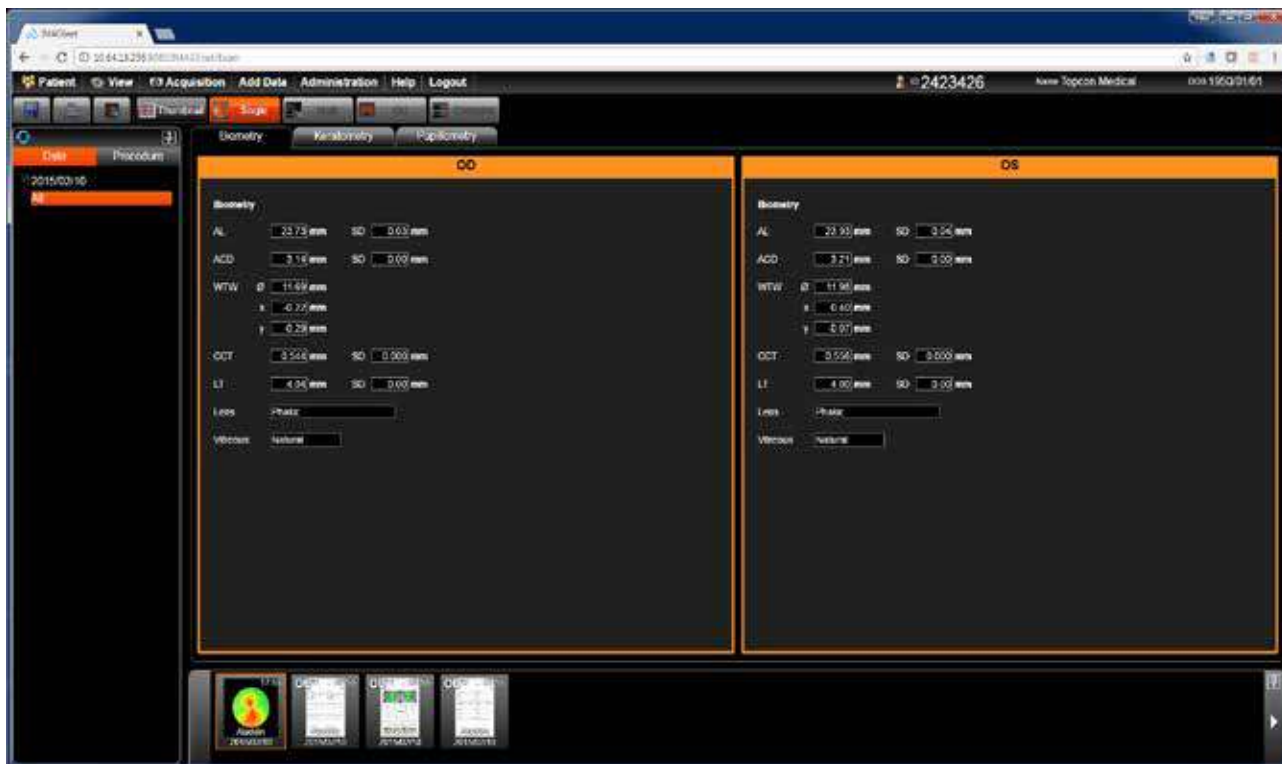
# IMAGEnet®6 Compliance



## IMAGEnet®6 viewer software

IMAGEnet®6 is Topcon's web based digital software platform for ophthalmic imaging, capable of acquiring, displaying, enhancing, analyzing, and saving digital images and reports obtained with a variety of Topcon devices such as the CA-800.

IMAGEnet®6 provides flexibility of viewing Biometry, Keratometry, Pupillometry data and all available CA-800 exported reports in a network environment. There are a variety of software configurations available. Additional components can be added according to your clinic's needs.



Screenshot of Biometry data in IMAGEnet®6

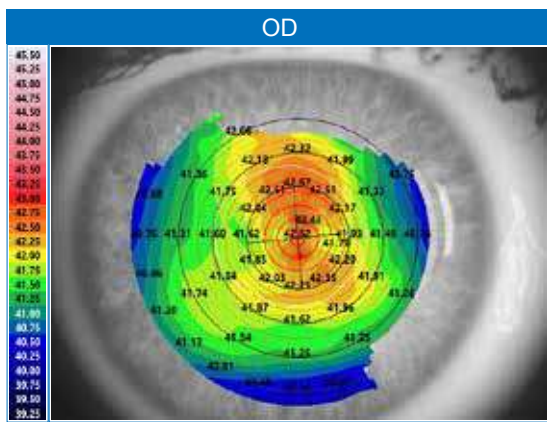


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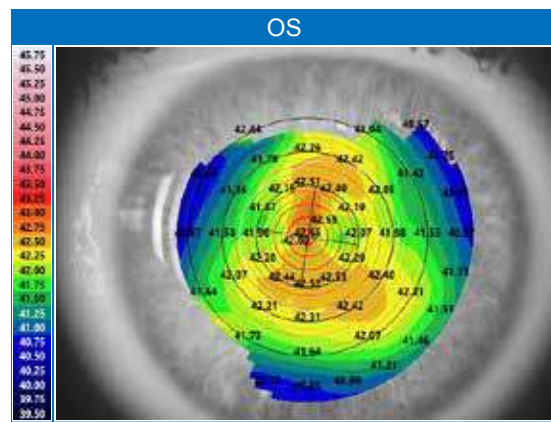
### Patient Information

Patient	TOPCON EUROPE MEDICAL	Gender	F
Patient ID	123456789	Exam Date	14/08/2017 14:33:17
Date of Birth	01/01/1900	Surgeon	

### TOPOGRAPHICAL MAP



OD Normalized - Axial



OS Normalized - Axial

### Sim-K

K1	K2	CYL	K1	K2	CYL
41.79 @ 5°	42.43 @ 95°	-0.64D ax5°	42.00 @ 171°	42.55 @ 81°	-0.55D ax171°

### Cornea Data

Cornea Decentralization X - Y			Cornea Decentralization X - Y		
-0.39 mm	-0.15 mm		0.43 mm	-0.14 mm	
Diameter 12.33 mm			Diameter 12.19 mm		
Pupillar Decentralization X - Y			Pupillar Decentralization X - Y		
H= -0.25 mm	V= 0.06 mm		H= 0.36 mm	V= -0.01 mm	
Avg. Pupillar Diam. 4.24 mm			Avg. Pupillar Diam. 4.55 mm		
Avg. Pupillar Power 4.5mm: 42.27 D / 3mm: 42.35 D			Avg. Pupillar Power 4.5mm: 42.37 D / 3mm: 42.42 D		

### Keratoconus Screening

AK	AGC	SI	Kpi	AK	AGC	SI	Kpi
42.62 D	0.71 D/mm	-0.28 D	0%	42.83 D	0.67 D/mm	0.27 D	0%
Topography not compatible with keratoconus				Topography not compatible with keratoconus			
A	D	Ro - Teta	Rnd	A	D	Ro - Teta	Rnd

### Keratrefractive Indices

SD	SAI	e	Kc	SD	SAI	e	Kc
SD = 0.48 D	SAI = 0.30 D	e = 0.48	42.51	SD = 0.37 D	SAI = 0.16 D	e = 0.26	42.54

### Notes

# Reports Pupillometry



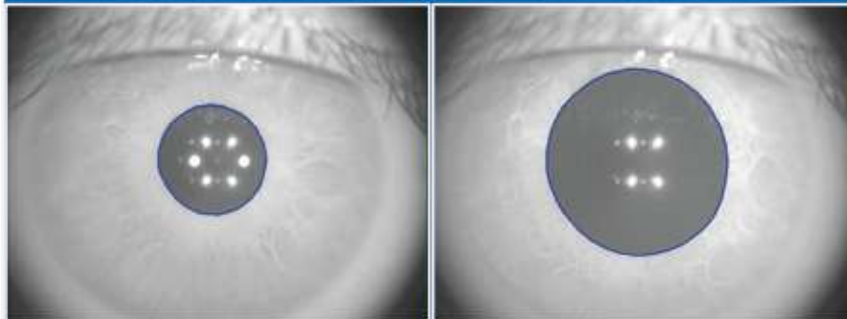
TOPCON

## Patient Information

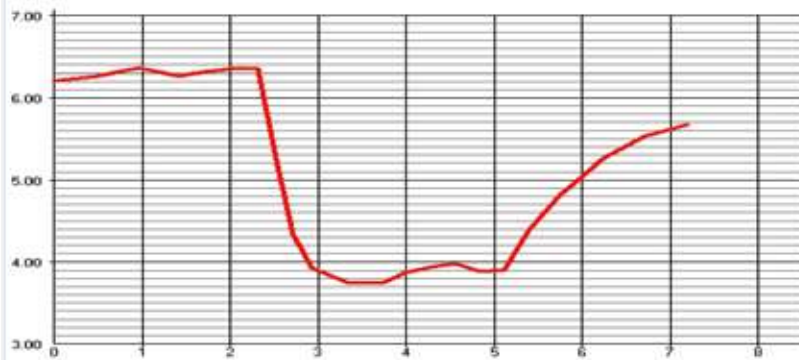
Patient	CORNEAL ANALYZER	Gender	M
Patient ID	12345678	Exam Date	06/03/2015 18:06:43
Date of Birth	01/01/2000	Surgeon	

## PUPILLOMETRY

OD



Latency



Dynamic pupillography			
Diameter		Pupil Center	
Min	Max	Center Mean	Std Dev.
3.74 mm	6.36 mm	-0.22 mm	0.02 mm
		0.01 mm	

Photopic pupillography			
Diameter		Pupil Center	
Avg. Diam.	Diam. Std Dev.	Center X - Y	Cen. Std Dev.
3.76 mm	0.06 mm	-0.20 mm	0.06 mm
		0.03 mm	

Mesopic pupillography			
Diameter		Pupil Center	
Avg. Diam.	Diam. Std Dev.	Center X - Y	Cen. Std Dev.
4.90 mm	0.33 mm	-0.18 mm	0.33 mm
		0.02 mm	

Scotopic pupillography			
Diameter		Pupil Center	
Avg. Diam.	Diam. Std Dev.	Center X - Y	Cen. Std Dev.
5.53 mm	0.11 mm	-0.16 mm	0.11 mm
		-0.01 mm	

## Notes



# Reports Zernike analysis



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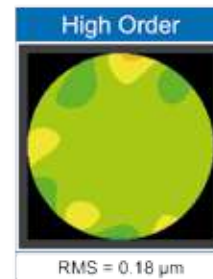
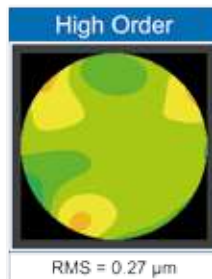
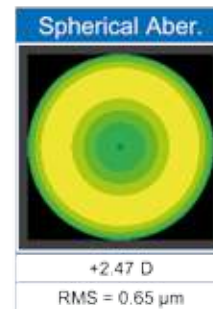
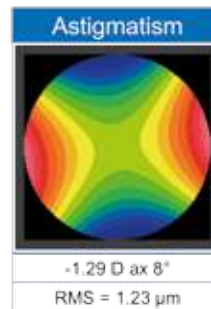
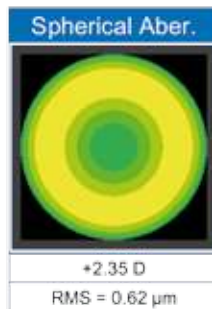
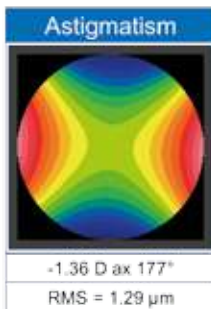
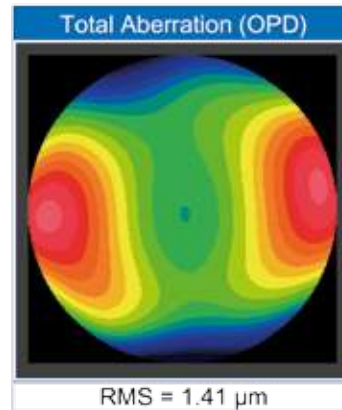
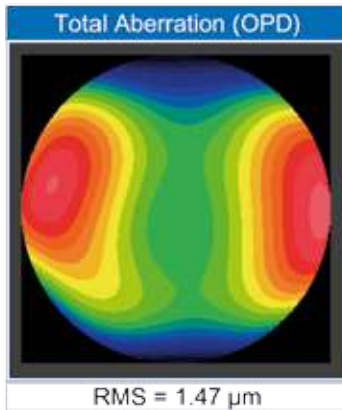
## Patient Information

Patient	CORNEAL ANALYZER	Gender	M
Patient ID	12345678	Exam Date	17/02/2015 13:37:29
Date of Birth	01/01/2000	Surgeon	

## ZERNIKE

OD


OS



## Notes

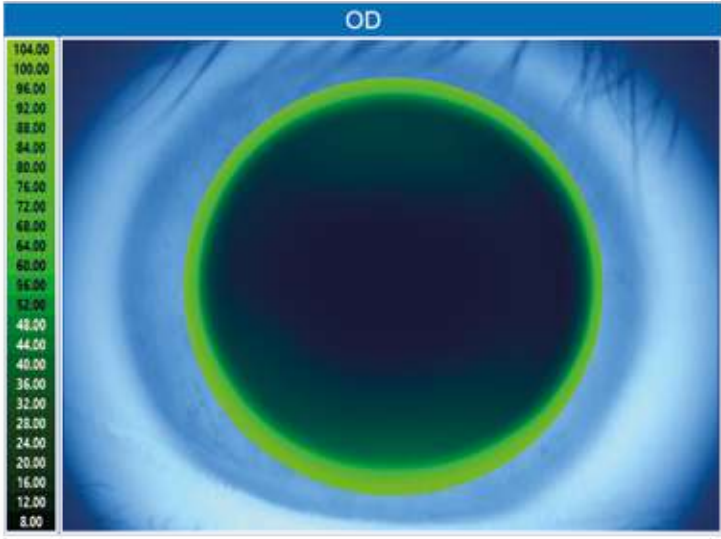


# Reports Contact lens fitting


TOPCON

Patient Information			
Patient	CORNEAL ANALYZER	Gender	M
Patient ID	12345678	Exam Date	17/02/2015 13:37:29
Date of Birth	01/01/2000	Surgeon	

CONTACT LENSES



OD

µm


Sim-K		
K1	K2	CYL
44.84 @ 180°	46.27 @ 90°	-1.43D ax180°

Refraction			
Sphere	Cylinder	Axis	VD
1.25	-0.50	110	12.00

Cornea Data	
Cornea Decentralization X - Y	---
Diameter	12.28 mm

Lens Data		
Brand	Model	Base Curve
Generic	Tricurve	7.6
Diameter	Power	Toricity
9.8		

Notes

CA800 V.1.0.7


# Reports Tear film breakup time

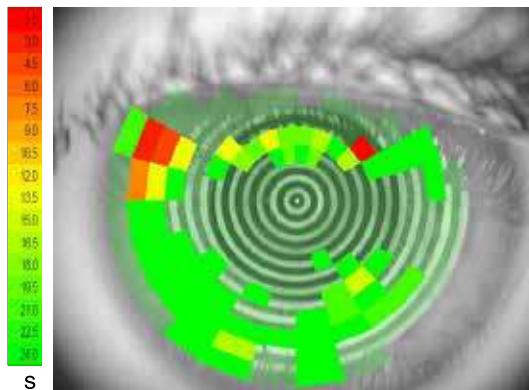


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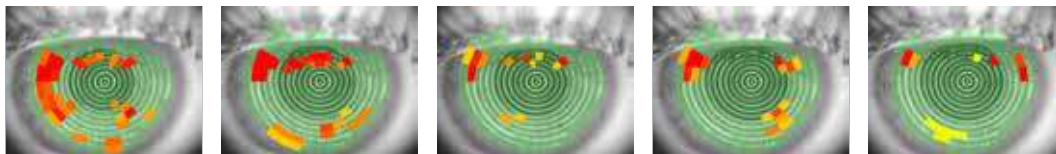
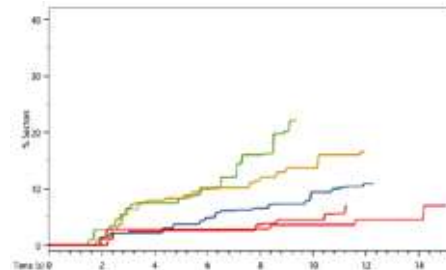
## Patient Information

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Patient ID	123456789	Exam Date	15/08/2017 10:26:53
Date of Birth	01/01/1900	Surgeon	

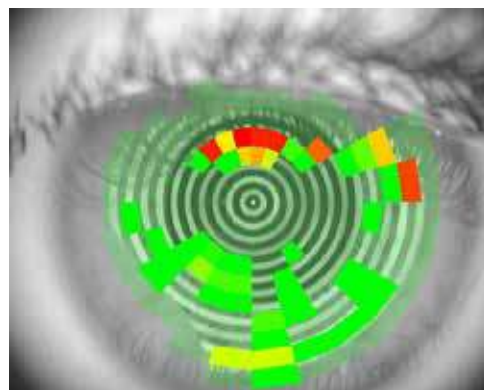
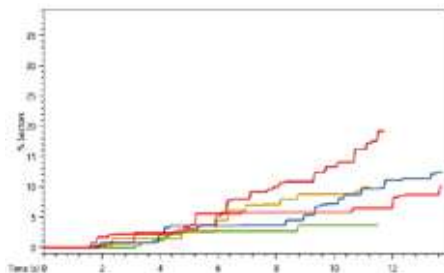
**OD**



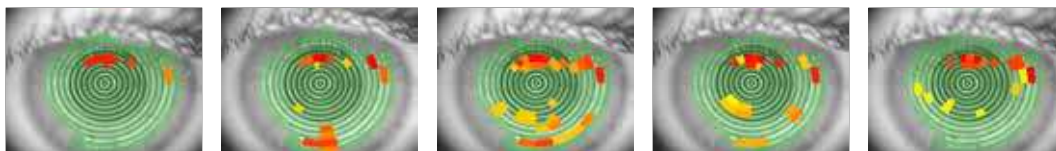
Average 5% Level TBT: **7.3 s**  
 Average IBI: **2.6 s**  
 Average OPI index: **2.8**



Average 5% Level TBT: **6.6 s**  
 Average IBI: **2.6 s**  
 Average OPI index: **2.6**



**OS**



## Notes

CA-800 TBT (v1.3.2) 2017/08/15 10:43:15



## Specifications

<b>Keratoscope cone</b>	24 rings equally distributed on a 43D sphere
<b>Analysed points</b>	Over 100,000
<b>Measured points</b>	Over 6,200
<b>Corneal coverage</b>	Up to 9,8mm on a sphere of radius 8,00mm (42,2 diopters with N=1.3375)
<b>Diopter power range</b>	From 1D to 120D
<b>Resolution</b>	± 0.01D, 1 micron
<b>Accuracy / Precision axial radius</b>	± 0.03mm altimetric data +/- 2µm at 4mm
<b>Capture system</b>	Auto-focus with auto-capture
<b>Output ports</b>	USB, LAN
<b>Monitor</b>	LCD 10,1 inch capacitive touch screen
<b>Database</b>	Internal
<b>Pupillometry</b>	Dynamic, Photopic, Mesopic, Scotopic
<b>Fluorescein</b>	Image, Video
<b>Report</b>	Corneal map, Comparison map, Contact lens, Height map, Zernike analysis, Pupillometry, Toric IOL, Screenshot, Meibomian glands, Tear Film Breakup Time
<b>Working environment</b>	10°-40°C, Relative humidity 30-75% (no dewing), Atmospheric pressure 700-1060hPa
<b>Power source</b>	AC 100-240V 47-63 Hz
<b>Power consumption</b>	<100VA
<b>Dimensions</b>	320mm (W) x 490mm (H) x 470mm (L), 15 Kg
<b>Connections</b>	Wi-Fi Optional, LAN integrated
<b>Printing options</b>	USB printer, Network printer, PDF on network shared folder, PDF on USB
<b>Operating System</b>	Windows 7 Embedded
<b>RAM</b>	2 GB
<b>Hard Disk</b>	320 GB

### IMPORTANT

Subject to change in design and/or specifications without advanced notice.  
In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.  
Medical device Class IIa. Manufacturer: VISIA imaging S.r.l.



VISIA Imaging S.r.l.

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