WAM800

WAVE ANALYZER MEDICA

ESSILOR INSTRUMENTS

WAM800
WAVE ANALYZER MEDICA

User manual

CONTENTS

I. Introduction

The complete user manual is available on a web space.

To access other available languages, please scan the QR code at the end of this user manual > Chapter QR code *(☞ p.194)*.

The Wave Analyzer Medica 800 is a multifunctional eye diagnostic device. There are several operation modes combined in a single platform: aberrometer, autorefractometer keratometer, corneal topographer, tonometer, pachymeter and retro-illumination.

- The wavefront aberrometer uses the Shack-Hartmann principle and is used as an advanced autorefractometer that measures both lower and higher order aberrations of the refraction of the eye. The aberrometer principle can measure the maximum pupil size of the pupil or the default pupil size specified in the settings.
- The corneal topographer uses 24 Placido disks to measure the shape of the anterior surface of the cornea. It shows a detailed description of the shape of the cornea that can be presented as corneal aberrometry. The Placido rings also function as a keratometer.
- The Scheimpflug pachymeter analyzes the anterior chamber of the eye (thickness of the cornea, irido corneal angles, anterior chamber analysis and kappa angle) by illuminating it with a slit of light and a camera using the Scheimpflug technique.
- The air-puff non-contact tonometer measures the intraocular pressure.
- Retro-illumination imaging captures the light reflected from the eye to help identify dark spots on camera. It is designed to take images of eyes with pupils of a diameter of 2-8mm

The device is fully automated and a number of different measurements can be performed by a single command including alignment and focusing.

This guide explains how ophthalmologists, optometrists, and other eye-care professionals can use the Wave Analyzer Medica 800. It includes instructions on how to setup, operate and maintain the unit.

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

1. INDICATIONS FOR USE

The Wave Analyzer Medica 800 is a multi-function diagnostic device combining wavefront aberrometer, corneal topographer, retro-illuminator, tonometer and pachymeter, indicated for:

- Measuring the refraction of the eye giving both lower and higher order aberrations
- Measurement of the shape of the cornea
- Retro-illumination imaging of the eye
- Measuring the intraocular pressure without contacting the eye for glaucoma evaluation.
- Photographing the eye and taking images of the eye to evaluate the thickness of the central cornea.
- Anterior chamber imaging
- Pupil image
- Image of the cornea relative to the iris

2. Warning

This document contains confidential information that is the property of manufacturer. Any use, reproduction or divulging of this material, in part or in whole, is strictly forbidden. This document is provided for the exclusive use of manufacturer employees and other authorized users.

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II. Safety
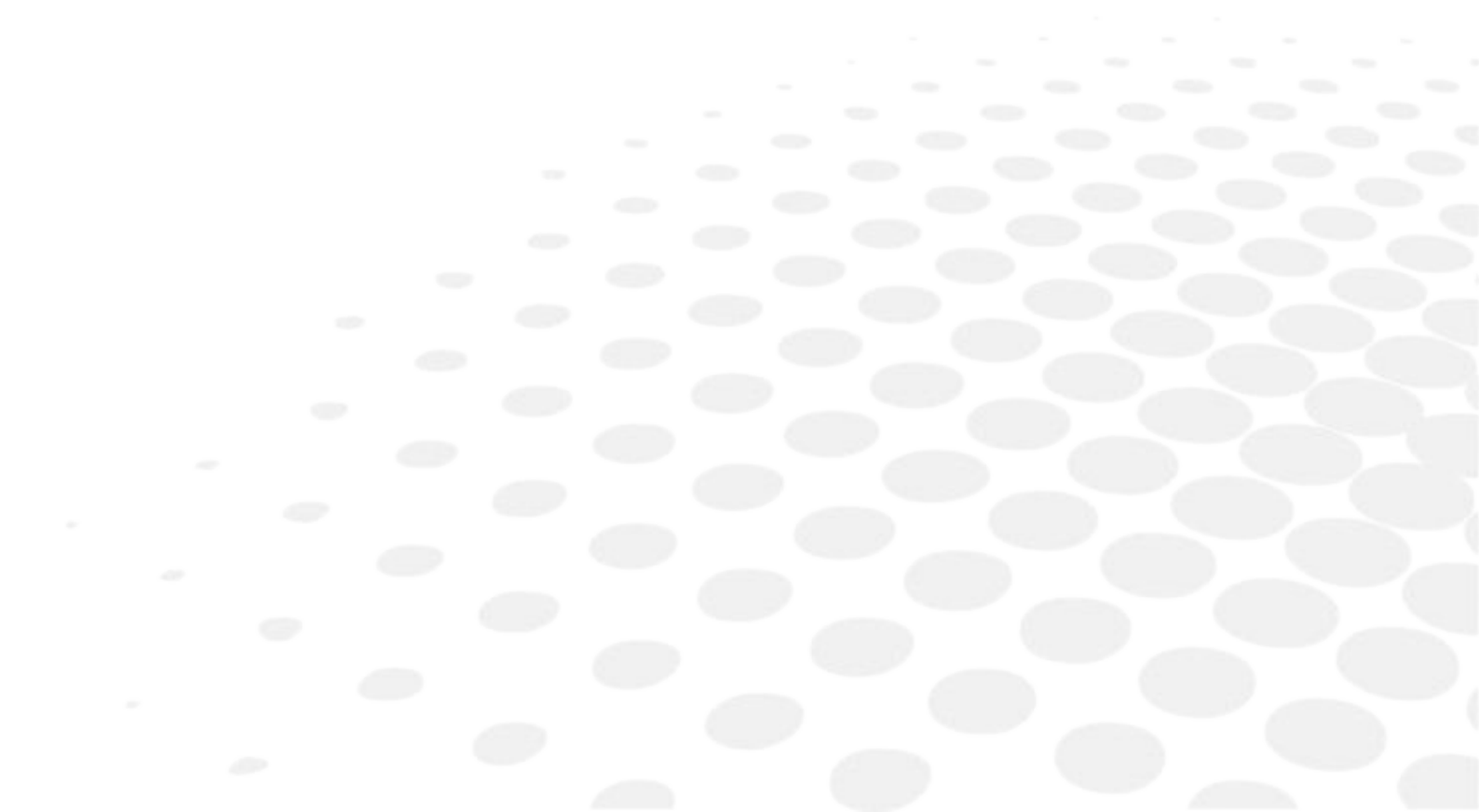
Manufacturer provides sufficient information to ensure patient safety, avoid system malfunctions, and prevent incorrect readings.

Manufacturer declines all responsibility for injury to patients or damage to equipment due to ignorance of its safety instructions or in the event that they are not followed.

The safety information appears in the form of warnings and alert messages.

Important

- Never attempt to disassemble or reassemble the equipment. There are no user serviceable parts in the device.
- Do not modify the equipment in any way.
- Repairs and maintenance must be carried out only by qualified service personnel.
- Do not perform any maintenance when used with a patient.
- Operators and patients should keep hands and body clear from moving parts on the device.
- This is a Class 1 laser product with an embedded Class 3R laser.

1. ELECTRICITY

Important

- Do not handle the electrical plugs with wet hands to avoid risk of electric shock or bodily injury.
- Make sure the Wave Analyzer Medica 800's power cord is not damaged before plugging it into electrical outlet to avoid risk of electricity.
- Make sure the power cord is fully inserted in an outlet equipped with a protective ground connection to avoid risk of electric shock.
- When connecting external devices such as a screen or printer, ensure that the device conforms to IEC 62368-1.
- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth

2. TRANSPORT, STORAGE AND HANDLING

Important

- Do not subject the Wave Analyzer Medica 800 to strong vibrations. Shocks or violent movements can cause malfunctions.
- Transport the Wave Analyzer Medica 800 in its specially designed case.
- Make sure the packing is firm and secure.

3. Precautions

Important

- Do not place or use the Wave Analyzer Medica 800 in direct sunlight.
- Do not expose the Wave Analyzer Medica 800 to excessive dust or humidity.
- Do not place the Wave Analyzer Medica 800 in a hot air current (e.g. above a heater).
- Do not obstruct the ventilation vents.
- Never place the Wave Analyzer Medica 800 close to the following types of equipment which can perturb the reception of commands from the remote control:
  ◦ Halogen lamp (direct or indirect)
  ◦ Fluocompact lamp
- Keep the screen surface clean. Protect it from dust, fingerprints, and shocks.
- When you switch OFF the Wave Analyzer Medica 800, wait at least 5 seconds before switching it on again.
- The use and operation of any accessory or cable other than those recommended in this manual could create a risk for the operators using the product and could lead to an increase in emissions or a reduction in device immunity.
- There is no contraindication known.

Warning

- Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.
- Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.
- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the [ME EQUIPMENT or ME SYSTEM], including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Note

- The emissions characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting.

4. SYMBOLS

	This equipment is a Class 1 laser product
	Invisible laser radiation
	Important: consult the documents supplied with the equipment
	Alternating current
	Type BF
	The equipment must be returned to the manufacturer for scrapping
	Manufacturer
	Year of manufacturing
SN	Serial Number
CE	Compliance with Medical Device Directive 93/42/EC
R$_X$ Only	Caution: Federal (U.S.) law restricts this device to sale by or on the order of a physician
	This way up
	Fragile
	Keep dry

5. NETWORK CONFIGURATIONS

The safety of the Wave Analyzer Medica 800 has not been verified when connected to IT-networks including other equipment and may result in previously unidentified risks to patients, operators or third parties. Therefore, we recommend that every user should identify, analyze, evaluate and control these risks. Changes to the IT-network may introduce additional analysis to confirm the safety of the device, such as changes including, but not limited to:

- Changes to network configuration
- Connection of additional items
- Disconnection of items
- Update of equipment
- Upgrade of equipment

III. EQUIPMENT AND INSTALLATION

1. LIST OF ACCESSORIES

	Device
	External Wifi dongle
	Printer paper (consumable)
	Rivet for chinrest tissue
	Chinrest tissue (consumable)
	Forehead rest
	Anti-fog spray
	Protective cover
	User manual

2. Description of the device

a. User side
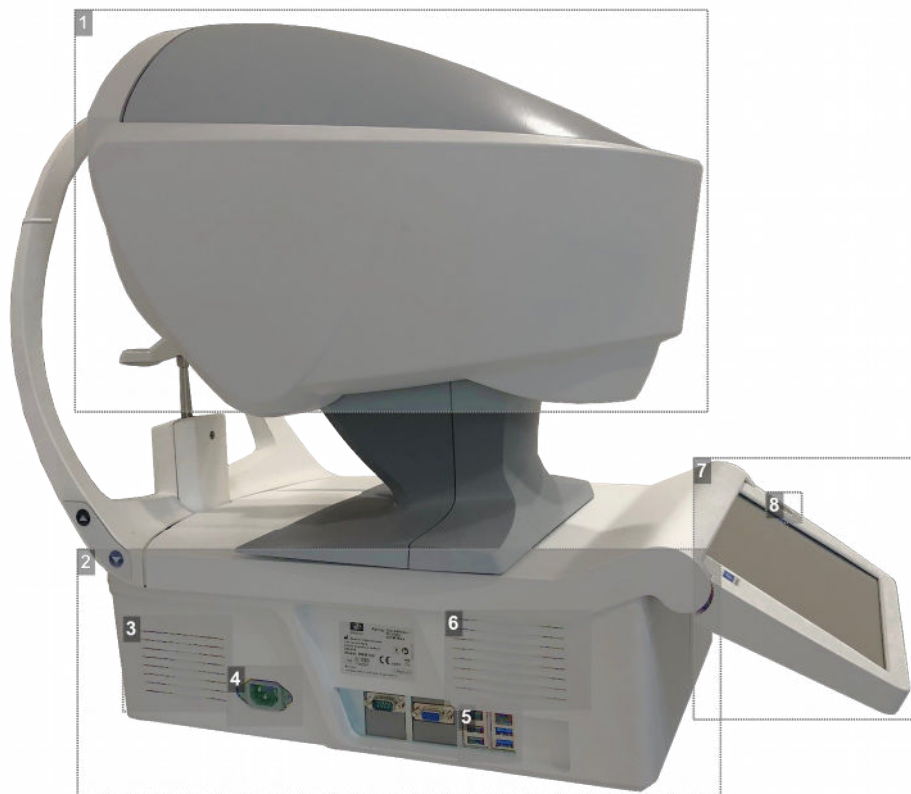
1. *Optical measurement head*

Contains the hardware used to perform all of the measurements during patient diagnostic exams.

2. *Base*

Contains the unit's computer and other electronics.

3. *Ventilation slots*

4. *Power cable connector*

Connect the supplied power cable to this connector; plug the other end of the cable into a standard electrical outlet.

5. *Connectors for external devices*

See the table below for a list of the available connectors

6. *Ventilation slots*

7. *LCD touch screen*

8. *ON/OFF switch*

Shuts down the machine.

The following connectors for external devices are available:

PORT TYPE	USES
USB (4 ports)	• Connect an external hard drive or flash drive to export data from the unit's database and/or to import data to the unit. • Connect a keyboard to use instead of or along with the virtual keyboard. • Connect a mouse to use instead of or along with the touch screen. • Connect a printer to print on standard printer paper.
Network (2 ports)	Connect a network cable to connect the unit to a LAN. You will then be able to export and import data to and from computers on the LAN.
Serial port (RS232)	Connect a compatible optometric device, such as a phoropter, to the unit
VGA port	Connect an external monitor to the unit

b. Patient side

1. *Headrest**

The patient should lean their forehead on the headrest during all diagnostic procedures.

2. *Chinrest*

The patient should lean their chin on the chinrest during all diagnostic procedures.

* Applied part

c. Side

1. *Ventilation slot*

2. *Printer LED*

Printer status indicator:

- LED OFF: Printer is turned off.

- LED ON (not flashing): Printer is turned on and ready to print.

- LED flashing: Printer is on, but either there is no paper or there is a malfunction.

3. *Printer paper-feed button*

Press to feed a small amount of paper through the paper slot.

4. *Paper slot*

Paper is fed through this slot when it is loaded.

5. *Paper-roll compartment*

3. INSTALLATION PROCEDURES

a. Site requirements

The Wave Analyzer Medica 800 unit should be placed on a clear table or desktop close to a power outlet. The unit should not exposed to direct light on the patient side. Better results will be obtained if the unit is located in a room with limited illumination.

b. Unpack the unit

1 Remove the straps around the box.

2 Open the carton with care.

3 Lift the protective top cover to uncover the accessories listed in the packing list.

4 Remove the accessories to uncover the Wave Analyzer Medica 800 unit, which is packed in a protective plastic bag.

5 Take the Wave Analyzer Medica 800 out of the box and put it on the table.

⚠ Do not grab or hold the screen when extracting the device from the box. Do not lift the device by the head as this may damage the motors.

6 Lift the protective plastic bag to uncover the device.

c. Connect the unit to an electric outlet

To connect the unit to an electric outlet:

1 Check that the power supply voltage corresponds to that required by the equipment.

📔 See the identification label on the back of the unit.

2 Insert the power connector of the power cord into the power cable connector on the unit.

3 Connect the power plug to a wall outlet.

d. Load paper into the printer

If the paper roll is used up, the printer LED indicator blinks.

1 Lift the handle in the middle of the paper compartment and pull the cover down.

2 If an empty paper roll is in the printer, remove it.

3 Insert the new roll with the end of the paper on the top of the roll.

4 Feed the paper into the slot at the top of the compartment.

5 Push the paper compartment door closed.

e. Turn the unit ON and OFF

Turn the unit ON

Press the ON/OFF switch.

Turn the unit OFF

1 From the software, in the [Home] screen, select the turn OFF button.

Or,

2 From the software, in the [Configuration] screen, select the turn OFF button.

Or,

3 On the unit, press the ON/OFF switch.

Regardless of which of these methods you use to turn off the unit, it shuts down. If you turn the unit off using the software, the head moves back to its default position. It is important to ensure that the head is in its default position before moving the unit.

If you intend to pack and/or move the device, you must turn it off using the software.

f. Set up the user name and password

The first time you turn on the device, you will get a request to set your username and password in order to keep your device secure from unauthorized persons. Subsequently, the device will require the username and password each time you turn on the unit.

Select the user diagnostic.

Enter this default password: [user]

The device will not be accessible if the username and password have not been supplied, or if they have been supplied uncorrectly. If you do not remember your username and password correctly, contact an authorized technician for assistance.

IV. Overview of the software

1. [HOME] SCREEN

The [Home] screen is the main menu of the Wave Analyzer Medica 800. It gives you access to all of the functional screens of the interface.

1. *[Add patient] button*

   Opens the [Patient] screen with the [Patient information] dialog box open so that you can begin entering patient information immediately.

2. *[Measurement] screen button*

   Opens the [Measurement] screen without a patient selected. The results will be saved temporarily with an automatically generated ID number.

3. *Open [Patient] screen button*

   Opens the [Patient] screen and displays the list of patients.

4. *[Configuration] screen button*

   Opens the [Configuration] screen.

5. *[Turn Off] button*

   Shuts the unit down.

6. *[Screen Saver] button*

   Turns on the screen saver.

2. [PATIENT] SCREEN

The [Patient] screen gives you access to the patient database. You can create new patient records, modify existing patient information, view stored test results, and initiate a new diagnostic procedure for a selected patient from this screen.
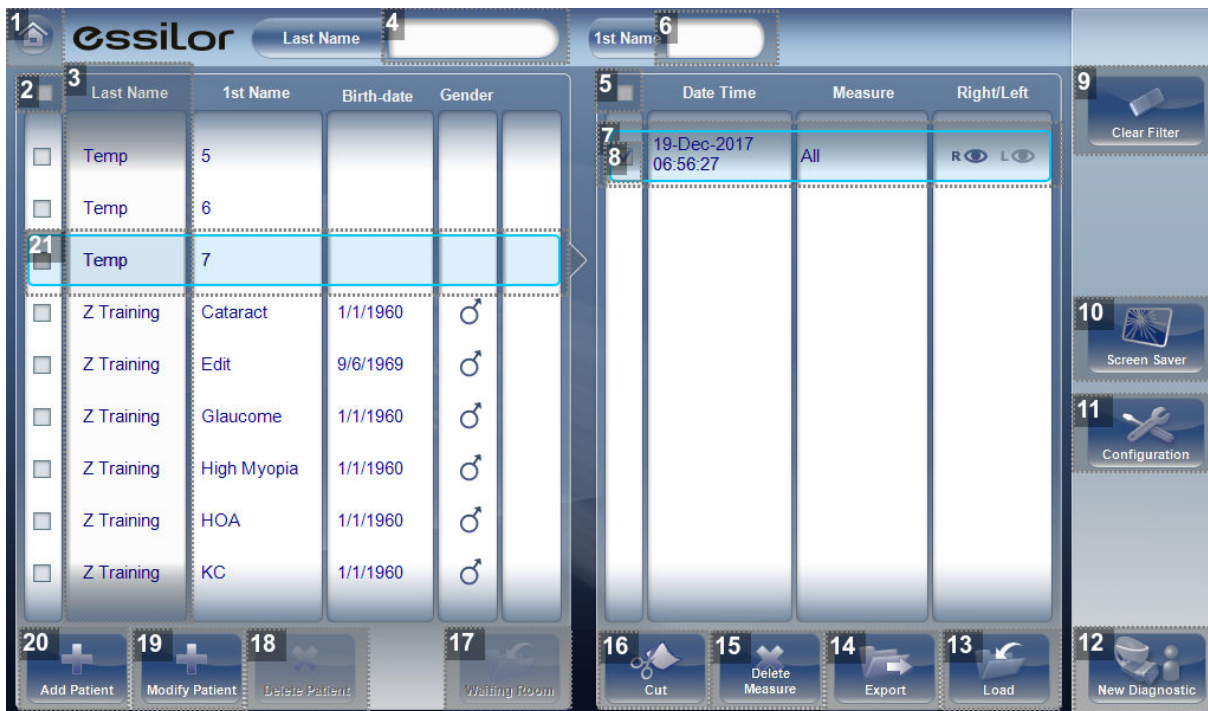
1. *[Home] button*

Opens the [Home] screen.

2. *Mark all patients*

Mark the check boxes of all the displayed patient records.

> [Delete Patient] is applied to all patients whose check boxes are marked.

3. *Patient list*

List of patients in the database. Drag your finger (or mouse) over the entries to scroll up or down.

4. *Surname filter*

Enter one or more letters. The list of patients is filtered and only displays patients whose last names begin with the specified sequence of letters.

5. *Mark all measures*

Mark the check boxes of all the displayed measures.

> [Cut] and [Delete Measure] are applied to all measures whose check boxes are marked.

6. *Name filter*

Enter one or more letters. The list of patients is filtered and only displays patients whose first names begin with the specified sequence of letters.

7. *Measure list*

List of test results for the selected patient. Drag your finger (or mouse) over the items to scroll up or down.

8. *Marked check box*

Example of a marked check box.

9. *[Clear Filter] button*

Clear all patient filters and display all the patient records in the database.

10. *[Screen Saver] button*

Turns on the screen saver.

11. *[Configuration] button*

Opens the [Configuration] screen.

12. *[New Diagnostic] button*

Initiates a new diagnostic procedure for the selected patient. The results of the diagnostic are automatically stored in the patient's record.

13. *[Load] button*

Opens the selected measure in the [Results] screen.

Note: This button is only available when a measure is selected.

14. *[Export] button*

Exports the selected measures to an external file and/or prints the measurement results or screenshot.

Note: This button is only available when a measure is selected.

15. *[Delete Measure] button*

Deletes all the measures whose check boxes are marked.

Note: This button is only available when the check boxes of one or more measures are selected.

16. *[Cut] button*

Removes all the measures whose check boxes are selected from the selected patient record, and saves them in the clipboard so that they can be pasted into a different patient record.

Note: This button is only available when the check boxes of one or more measures are selected.

Note: When [Cut] is selected, the button is replaced with a [Paste] button. Select the patient record in which you want to insert the cut measures and then select [Paste] to insert them.

17. *[Waiting Room] button*

This button displays all of the patients imported via XML.

18. *[Delete Patient] button*

Deletes all the patient records whose check boxes are marked.

Note: This button is only available when the check boxes of one or more patients are selected in the list.

19. *[Modify Patient] button*

Opens the patient data of the selected patient.

Note: This button is only available when a patient is selected in the list.

20. *[Add Patient] button*

Opens the [Patient Information] dialog box.

21. *Selected patient record*

Blue border indicates a patient record is selected. The measures in the measure list belong to the selected patient. In addition, [Modify Patient] opens the patient data for the selected patient.

When exporting (clicking on [Export] button) from the [Patient] screen the following pop-up will appear:
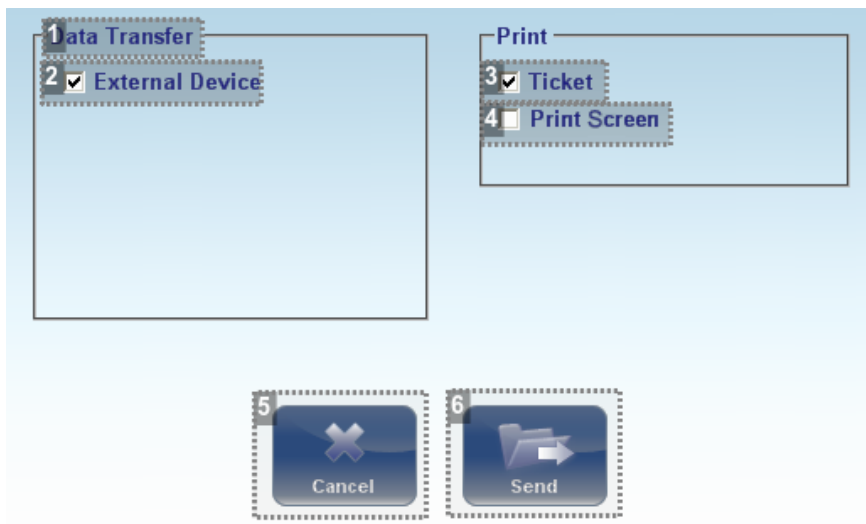
1. *[Data Transfer]*

Options for transferring data from the device to other devices.

2. *[External Device]*

Exporting data from the Wave Analyzer Medica 800 to another device.

3. *[Ticket]*

Allows printing the data on a ticket in the device's internal printer.

4. *[Print Screen]*

Select to print a screenshot of the [Summary] screen, this requires a connection to an external printer.

5. *[Cancel]*

Cancels your selection.

6. *[Send]*

Confirms the selection and performs the transfer.

The export popup from the [Patient] screen enables you to export data via an external device.

Select the checkbox next to external device, and then press [Send]. To print a screen capture of the screen you are viewing, select [Print] screen.

3. [MEASURE] SCREEN

The [Measure] screen is used to select, initiate, and follow the progress of diagnostic tests.

a. Before a measurement

When you first open the [Measure] screen, before you start running the diagnostic, the screen looks like this:
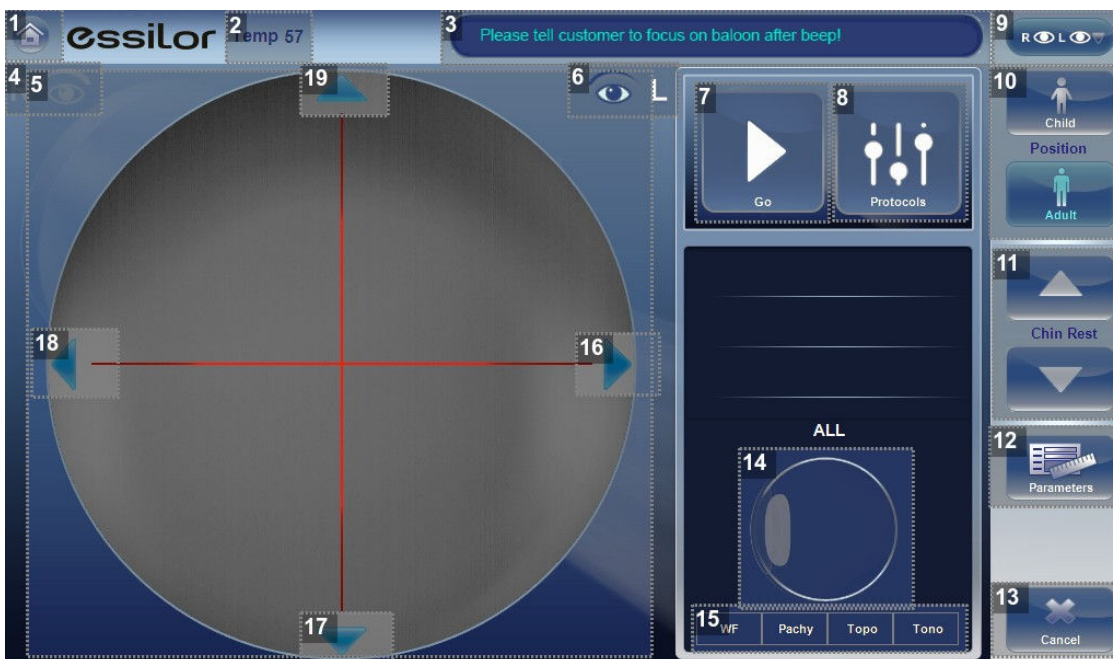
1. *[Home] button*

   Opens the [Home] screen.

2. *[Patient]*

   Name (or ID) of current patient.

   Note: If no patient was selected before the [Measure] screen was opened, a temporary name is generated by the system by combining "Temp" with a number (e.g., "Temp 57").

3. *Message field*

   A text field in which the system displays messages to you.

4. *Right-eye indicator*

   When active, indicates that the head is aligned with the patient's right eye.

   Note: In the illustration above, the left-eye indicator is active, and the right one is not.

5. *Camera view*

Shows the image that is visible through the camera.

Select any spot in the image to move the unit's head to align that spot with the cross hairs in the center of the image.

6. *Left-eye indicator*

When active, indicates that the head is aligned with the patient's left eye.

Note: In the illustration above, the left-eye indicator is active, and the right one is not.

7. *[Go] button*

Click on this button to start the measurement.

8. *Diagnostics available*

List of available diagnostic tests:

- All
- Adults
- Senior
- Children
- Myopia Control
- Eye Wellness
- Cataract
- REF/KER
- WF
- Topography
- Pachy

Click on this icon to open the dropdown menu of the posible drag up and down on the list to scroll it, if necessary, and select the type of test you want to perform.

9. *Eye selector*

Select the eye or eyes to be tested.

10. *[Position]*

Select:

- [Adult] to move the head and chinrest into the default positions for adults
- [Child] to move them into the default positions for children.

Once you have done this, you can fine-tune the head and chinrest positions using the chinrest controls, the arrows.

11. *[Chinrest]*

Press button to raise or lower the chinrest.

12. *[Parameters]*

Open a dialog box in which you can change the number of times WF and Tono test will be performed during this diagnostic.

Note: If the WF and Tono tests are not included in this diagnostic, changing the values in the dialog box will have no effect.

13. *[Cancel]*

Cancel the measurement procedure and return to the previous screen.

14. *Schematic eye*

The schematic eye indicates what part of the eye is being measured.

15. *Progress icons*

These progress icons will flash to indicate what step the measurement process is in. The icons are:

- ◦ WF
- ◦ Pachy
- ◦ Topo
- ◦ Tono
- ◦ Near Vision

16. *Right arrow*

Move the unit's head to the right so that it aligns better with the patient's eyes.

17. *Down arrow*

Lower the unit's head so that it aligns better with the patient's eyes.

18. *Left arrow*

Move the unit's head to the left so that it aligns better with the patient's eyes.

19. *Up arrow*

Raise the unit's head so that it aligns better with the patient's eyes.

Click on the diagnostics menu and the drop-down menu will open with the following measurements:
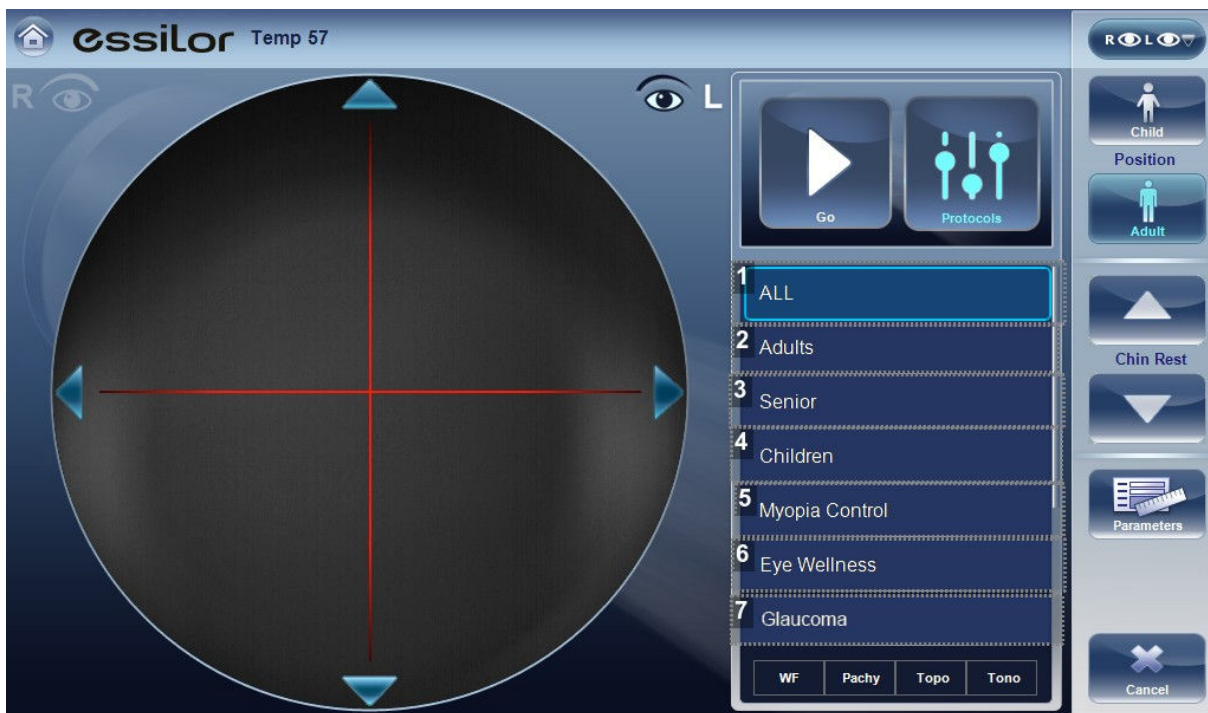
1. *[ALL]*

This measurement includes WF (x3), topography, pachy and tonometry (x1).

2. *[Adults]*

This measurement includes WF (x3), near vision, topography, pachy and tonometry (x1).

3. *[Senior]*

This measurement includes WF (x5), near vision, topography, pachy and tonometry (x2).

4. *[Children]*

This measurement includes WF (x3), topography and pachy (includes axial lenght).

When selecting this measurement, the chinrest of the device will be higher and will be set to measure closer-set eyes.

5. *[Myopia Control]*

This measurement includes WF (x5), topography and pachy (includes axial lenght).

6. *[Eye Wellness]*

This measurement includes WF (x2), topography, pachy and tonometry (x1).

7. *[Glaucoma]*

This measurement includes pachy and tonometry (x3).

Scroll dow the menu to view these additional measurements.
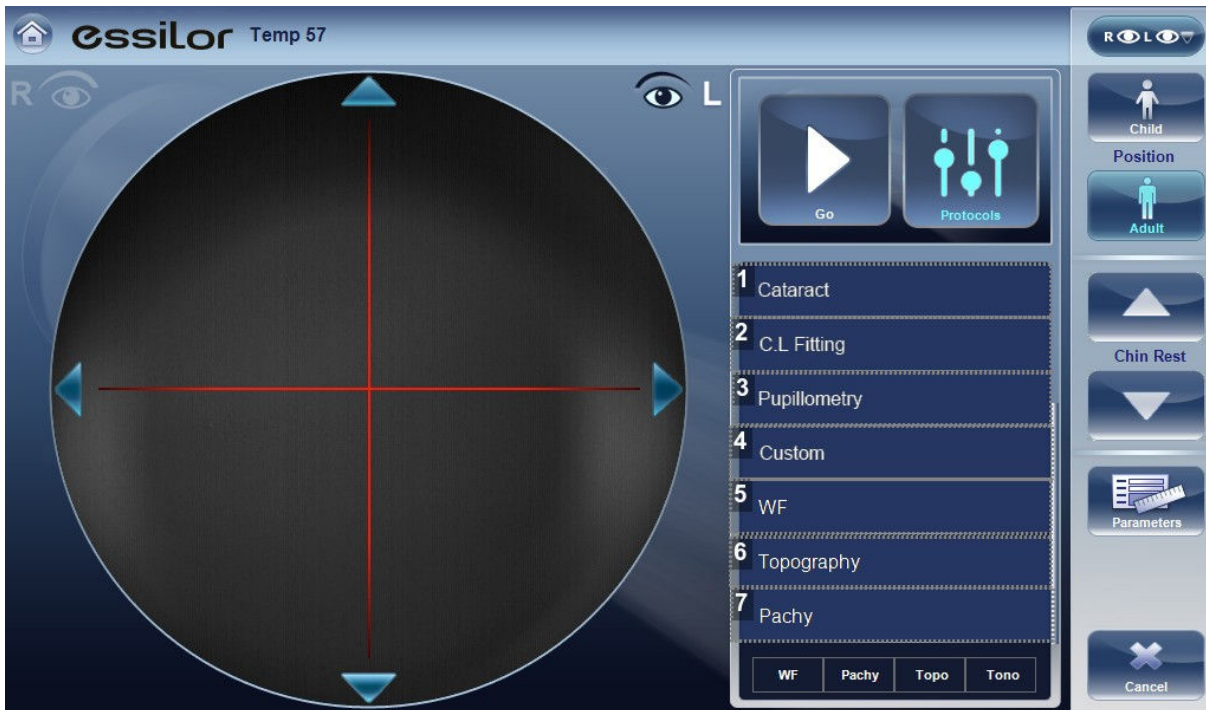
1. *[Cataract]*

This measurement includes WF (x3), topography and tonometry (x1).

2. *[C.L Fitting]*

This measurement includes WF (x3) and topography.

3. *[Pupillometry]*

This measurement includes pupil measurements in 4 different light settings.

4. *[Custom]*

This measurement may incude WF, topography, and pachy, or tono measurements depending on your selections in the settings menu.

5. *[WF]*

This measurement includes the Wavefront measurement (X3).

6. *[Topography]*

This measurement includes the topography measurement.

7. *[Pachy]*

This measurement includes the pachy measurement.

To change some of the measurement parameters, click on the [Parameters] button before the measurement, the following dialog box will displayed.

1. *[Add Measurement With WF]*

Select the checkbox to add a near vision measurement along with the wavefront.

2. *[WF Measurements]*

The number of Wavefront measurements to perform.

3. *[Tono Measurements]*

Select to modify number of tono measurements to perform.

4. *[Reading Distance]*

The distance to perform the near vision test, from 30-60cm.

5. *[Cancel]*

Closes the dialogue box without saving.

6. *[Save]*

Saves the user's preferences.

7. *[Demo Puff]*

Select to demonstrate tono air puff.

b. During a measurement

After you select [Go] to begin the selected measurement procedure, the [Measure] screen shows information about the measurement process. During the measurement process, you can adjust the unit's head and chinrest as you would before the process began. You can also speed the measurement process up, skip parts of the test, or stop the test.
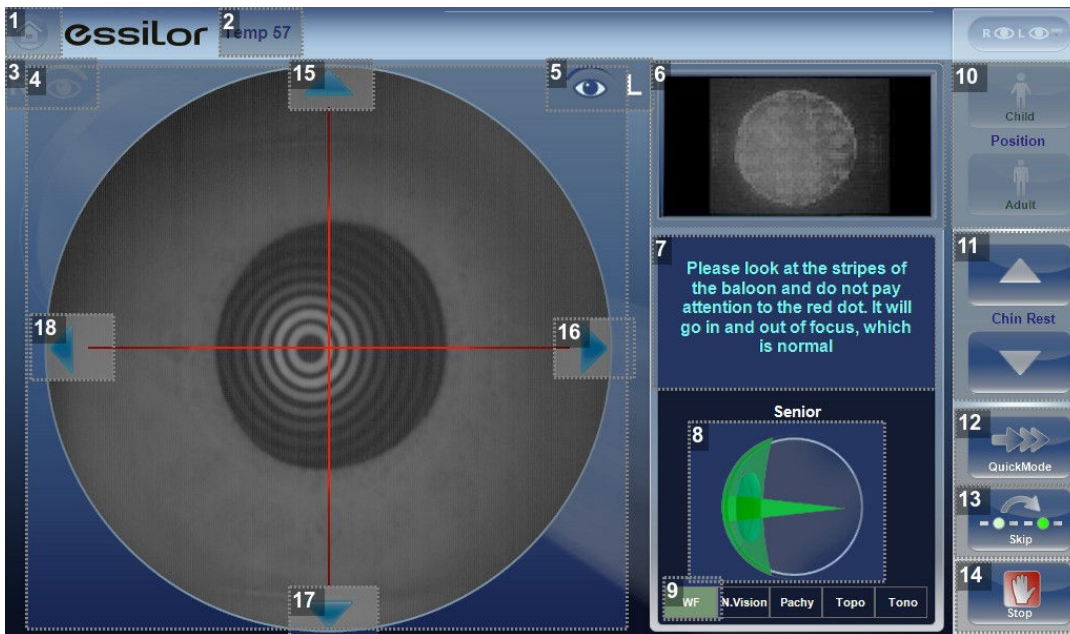
1. **[Home] button**

   Button not available when a diagnostic is in progress.

2. **[Patient]**

   Name (or ID) of current patient.

   Note: If no patient was selected before the [Measure] screen was opened, a temporary name is generated by the system by combining "Temp" with a number (e.g., "Temp 57").

3. **Right-eye indicator**

   When active, indicates that the head is aligned with the patient's right eye.

   Note: In the illustration above, the left-eye indicator is active, and the right one is not.

4. **Camera view**

   Shows the image that is visible through the camera.

   Note: To manually center the image, select the spot that should be in the center of the image. The unit's head moves so that that spot is aligned with the cross hairs in the center of the image.

5. **Left-eye indicator**

   When active, indicates that the head is aligned with the patient's left eye.

   Note: In the illustration above, the left-eye indicator is active, and the right one is not.

6. *Sensor view*

During WF measurement, the Shack-Hartmann image is displayed in this area.

7. *Message*

In this area messages instructions for the examiner are displayed to guide patient during the screening.

8. *Measurement status*

Indicates which measures are included in the current measurement procedure, and shows the status of those measures that have already been completed.

9. *Completed test*

Indicates that the measure was already performed.

10. *[Position]*

Select:

- ◦   [Adult] to move the head and chinrest into the default positions for adults
- ◦   [Child] to move them into the default positions for children.

The default PD is also set appropriately for adults or children when you select one of these options.

Once you have done this, you can fine-tune the head and chinrest positions using the chinrest controls, the arrows.

11. *[Chinrest]*

Select the arrows to raise or lower the chinrest.

12. *[QuickMode]*

Speed the measurement process up.

This option is only available during WF measurements. It is useful if the patient has trouble sitting still for a long period of time. The results of the measurement may be slightly less accurate than they would be in standard mode.

13. *[Skip]*

Cancel the current stage of the measurement procedure and proceed to the next stage.

For example, if a measurement is being performed on the patient's left eye, selecting this button would discontinue the measurement on that eye, and begin measuring the other eye.

14. *[Stop]*

Stop the entire measurement process. When this button is selected, the measurement procedure is aborted, and the pre-test measure screen is displayed.

15. *Up arrow*

Raise the unit's head so that it aligns better with the patient's eyes.

16. *Right arrow*

Move the unit's head to the right so that it aligns better with the patient's eyes.

17. *Down arrow*

Lower the unit's head so that it aligns better with the patient's eyes.

18. *Left arrow*

Move the unit's head to the left so that it aligns better with the patient's eyes.

Immediately after the measurement, the ringer edit screen will be displayed (only if a topography measurement has been made). In this screen, the user can edit the rings detected by the device and those rings that were wrongfully detected.
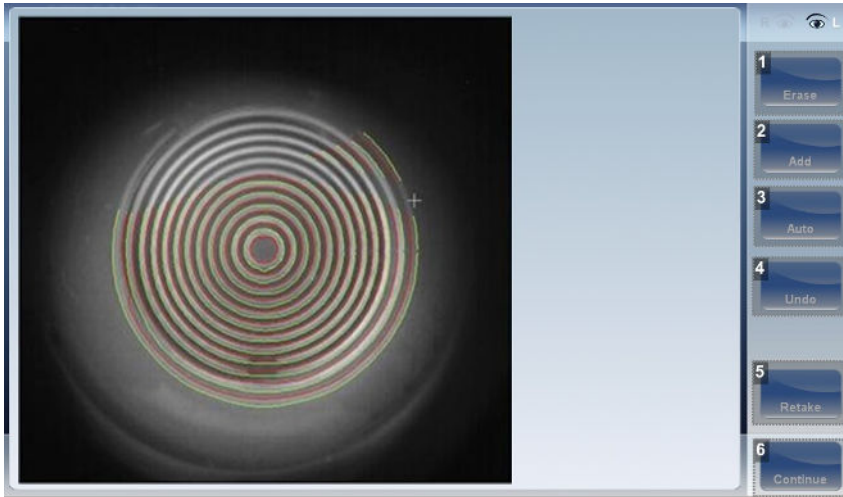
1. *[Erase]*

To erase individual rings in the topo map image select [Erase]. A list of ring positions opens. Select the position of the ring you would like to erase, and then move the cursor over it, and only ring in the selected position will be erased.

Note:

- ◦ The outer rings are in higher positions, from position 24 and downwards, while the inner ring is position 1.
- ◦ If you erase more than 10% of the topography rings, you may reduce the accuracy of the results.

2. *[Add]*

Select the position number of the ring (shown in blue), then trace the ring in that position, the device "draws" a new ring. Note, rings can only be drawn if the topo image is relatively clear.

3. *[Auto]*

Allows deleting rings by touching the screen. This is the default mode.

4. *[Undo]*

Undo the modifications.

5. *[Retake]*

Retakes the measurement.

6. *[Continue]*

Validates the modifications that were done and computes the topography map.

<u>Edit the ringer</u>

If you select [Add] or [Erase] from the menu above, the following screen appears:
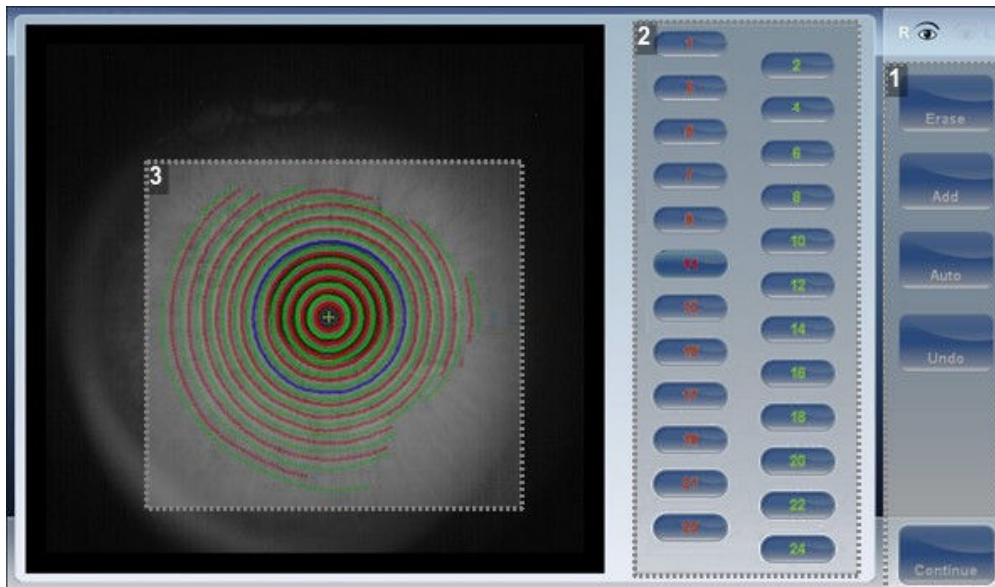
1. *Operation buttons*

Select these buttons to add, erase, undo, or continue.

2. *Ring positions*

Select the position of the ring that you would like to modify. Once selected the ring will appear blue.

3. *Selected ring*

Once you have selected a ring in (#2), it will appear blue and it can be erased/ added to. To erase the ring, move the cursor over the areas that you would like to be erased. To add to the ring, move the cursor over the area you would like to draw.

In the image above, the ringer selected is in position number 11.

To erase rings at will, select [Auto] and then slowly move the cursor over the rings you want erased. This action can erase several rings at a time. After modifying the rings, select [Continue], and the changes will be saved.

Only changes done immediately after the examination will be saved.

Repeat a measurement

After the results screen is displayed, it is possible to repeat the measurement by clicking the [Measure] button.

After clicking the [Measure] button, the following dialogue box is opened:

1. *Select measurements*

Below this message is a list of the measurements you can select to remeasure.

2. *Measurements*

Here is the list of measurements you can redo.

3. *[OK]*

Click on this button to redo the measurements selected.

Select the measurements that you want repeated, and continue with the measurement as normal.

Once a measurement is redone, the previous results will be erased (if redone). This is only possible if the measurement has not yet been saved. Once the measurement has been saved, only a new measurement is possible and no results will be erased.

4. [RESULTS] SCREEN

The [Results] screen displays the results of diagnostic measurements. It opens when a diagnostic test is completed or when stored test results are loaded from the [Patient] screen.

The [Results] screen initially displays the [Summary] tab, which gives a condensed view of the results. The other tabs of the [Results] screen show certain aspects of the results in greater detail.

a. Overview of the [Summary] screen

The [Results] screen is dynamic, and may have a different layout and data according to the diagnostic chosen. This is general an overview of a possible [Results] screen:

1. *[Home] button*

   Opens the [Home] screen.

2. *Patient name, date and time*

   The surname and first name of the patient, and the date and time of the measurement.

3. *Left eye indicator*

   Results displayed on this side of the screen are those of the left eye.

4. *[VD]*

   Vertex distance [VD], this button displays the distance of the refraction measurement, it allows you to toggle between the default and zero.

5. *[D/mm] button*

   This button allows you toggle between displaying the results in millimeters and diopters.

6. *[Measure] button*

   Opens the [Measure] screen, with the patient's name selected, so that you can perform additional tests that were not included in the current diagnostic.

7. *[Export] button*

   Exports the test results to a file on an external device and/or prints the test results. To view more export options, go to exporting from the [Results] screen.

8. *[Exit] button*

Closes the [Results] screen, and displays the default screen (which is selected in the configuration settings).

9. *Tabs*

This section may have fewer tabs, depending on the diagnostic chosen. Select a tab to display the topic in greater detail.

Dynamic summary tabs

The dynamic summary tab is displayed by a default opening of the [Result] screen. It gives a condensed view of the results.

> If results for a particular type of test are not available, the result fields are left blank. This chapter will show some of the various summary tabs and their descriptions.

[Summary] screen for senior or adult diagnostic

1. *Right-eye indicator*

Indicates that the test results on this side of the screen are for the right eye.

2. *[PD]*

Patient's pupillary distance (if available).

3. *[Refraction]*

Displays the photopic and mesopic refractions, with the pupil sizes.

The image shows the photopic (above) and mesopic (below) simulation of vision. The clarity of the [E] indicates how well the patient sees from the eye under photopic or mesopic conditions. Double-tap (or double-click) the [E] to open a visual acuity simulation for daytime / nighttime vision.

4. *[Eye Strain]*

This bar illustrates the patient's expected reading comfort at various reading distances (additional information available in [Eye Strain] tab).

5. *[Topography]*

Displays the topographic map of the eye as well as the keratometry values. Double-tap (or double-click) to open the topography map sub-tab for the eye.

6. *[Corneal Data]*

Displays a Scheimpflug image of the cornea as well as the thickness of the cornea at its center. Double-tap (or double-click) on image to open the [ACA] sub-tab for the eye.

7. *[Tonometry]*

Displays the glaucoma evaluation results which include: the tonometry test results in PO mm/Hg, the average of the tonometry test results, and the irideo angles and the anterior chamber depth results.

In addition it displays the adjusted tonometry results which is based on formulas selected in the [Settings] menu. Double-tap (or double-click) to open the [Tonometry] tab sub-tab.

[Summary] screen for C.L. fitting
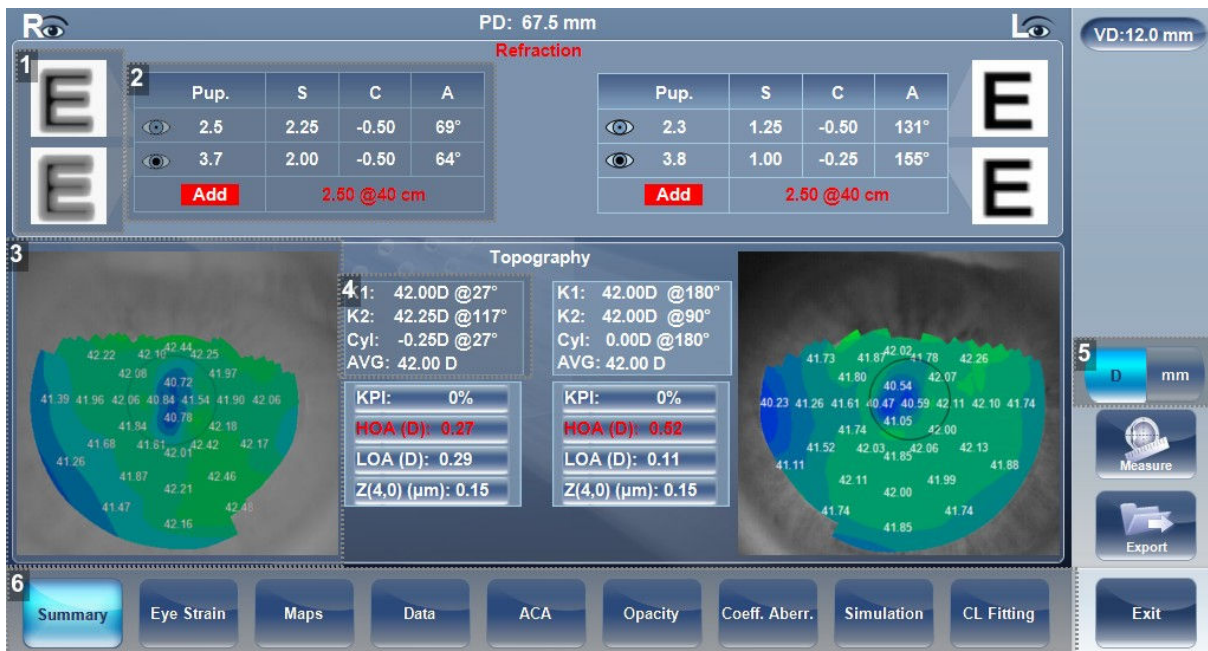
1. *E simulation*

The clarity of the [E] indicates how well the patient sees from the eye under photopic or mesopic conditions. Double-tap (or double-click) the [E] to open a visual acuity simulation for daytime/nighttime vision.

2. *Refraction*

Displays the photopic and mesopic refractions, with the pupil sizes.

3. *Topography*

Displays the topographic map of the eye. Double-tap (or double-click) to open the topography map sub-tab for the eye.

4. *Keratometry*

Displays the keratometry readings, KPI values (Keratoconus Index), and High Order (HOA) and Low Order aberrations (LOA).

5. *[D/mm]*

Select button to toggle between diopters and mm.

6. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for cataract/and myopia control diagnostic

1. *E simulation*

The clarity of the [E] indicates how well the patient sees from the eye under photopic or mesopic conditions. Double-tap (or double-click) the [E] to open a visual acuity simulation for daytime/nighttime vision.

2. *Refraction*

Displays the photopic and mesopic refractions, with the pupil sizes.

3. *Topography*

Displays the topographic map of the eye. Double-tap (or double-click) to open the topography map sub-tab for the eye.

4. *Keratometry*

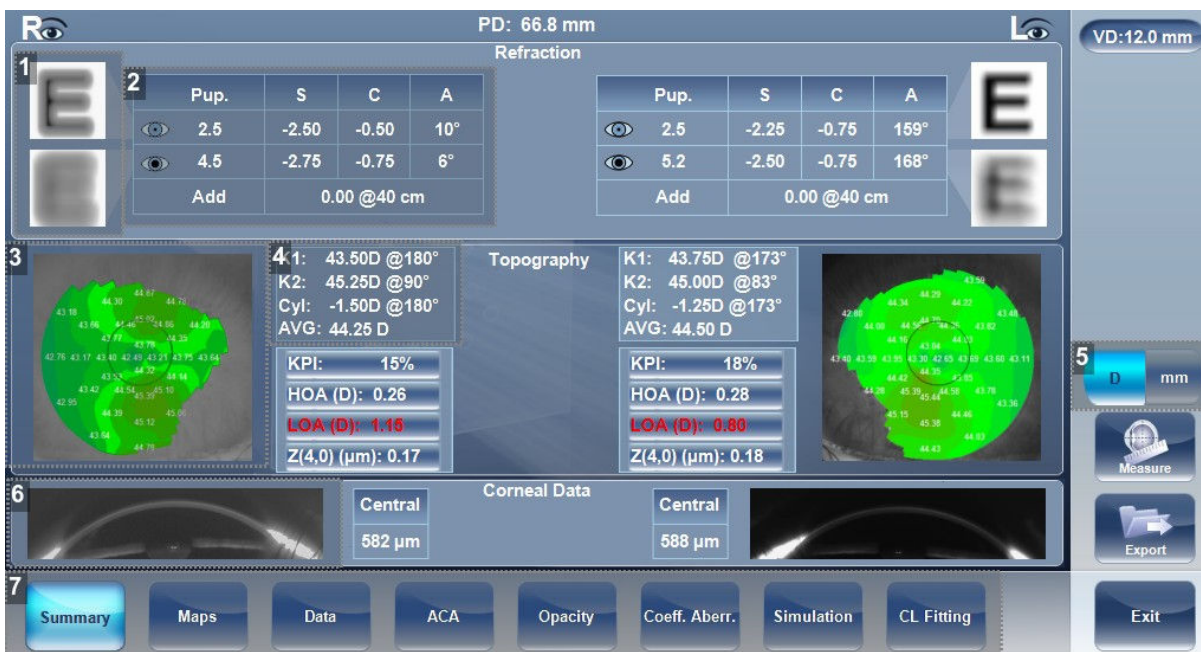Displays the keratometry readings, KPI values (Keratoconus Index), and High Order (HOA) and Low Order aberrations (LOA).

5. *[D/mm]*

Select button to toggle between diopters and mm.

6. *[Corneal Data]*

Displays a cross sectional view of the anterior chamber, as well as pachymetry for the cornea.

7. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for glaucoma evaluation diagnostic
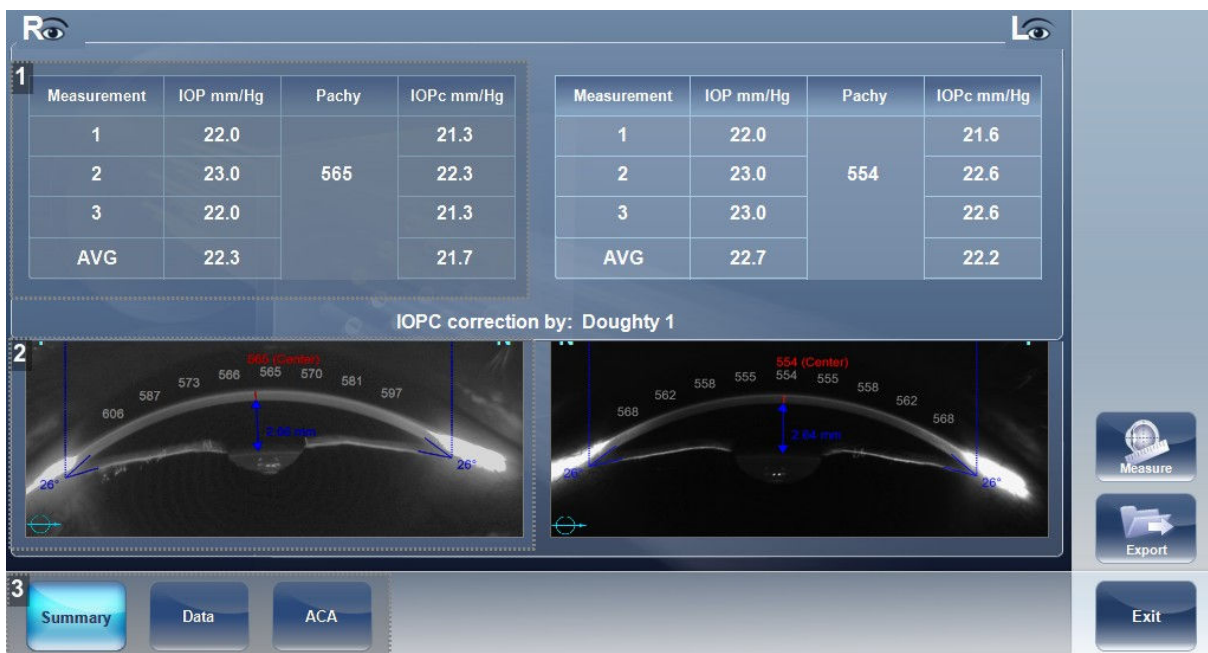
1. *Tonometry*

Displays the IOP reading, average IOP, and corrected IOP (according to formula chosen in settings).

2. *Pachymetry*

Displays the cross-sectional view of the corneal and pachymetry values.

3. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for WF

1. *E simulation*

   The clarity of the [E] indicates how well the patient sees from the eye under photopic or mesopic conditions. Double-tap (or double-click) the [E] to open a visual acuity simulation for daytime/nighttime vision.

2. *Refraction*

   Displays the photopic and mesopic refractions, with the pupil sizes.

3. *PSF*

   Displays the PSF, with no correction, and with LOA correction.

4. *Aberrations*

   Displays values for LOA and HOA under photopic and mesopic conditions.

5. *Sub-tabs*

   Select sub-tabs to view subject in greater detail.

[Summary] screen for topo
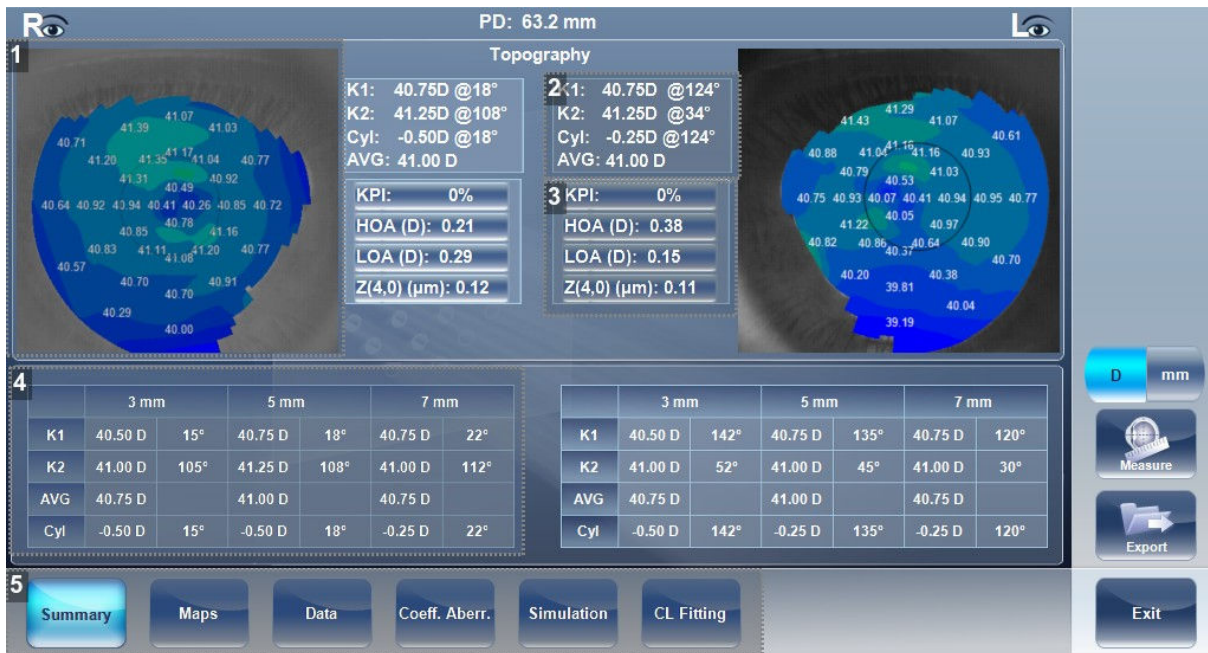
1. *Topography*

Displays the corneal topography map.

2. *Keratometry*

Displays the [K1] and [K2] values.

3. *Aberrations chart*

Displays the LOA and HOA as well as KPI (keratoconus index) values.

4. *K Readings*

Displays the keratometry values according to different pupil diameters (3,5,7mm).

5. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for pachymetry diagnostic
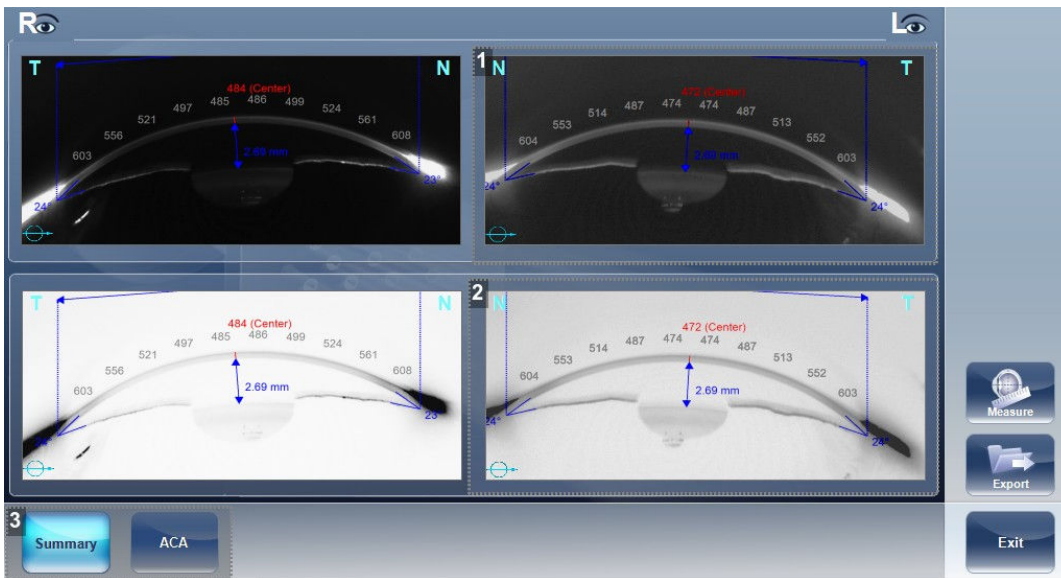
1. *Pachy image*

Image of corneal anterior chamber with pachymetry results.

2. *Negative pachy image*

A negative of the image of corneal anterior chamber with pachymetry results.

3. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for refraction diagnostic

1. *Refraction*

Displays the photopic and mesopic refractions, with the pupil sizes.

2. *[VD]*

Displays the vertex distance of the results.

3. *Keratometry*

Displays the keratometry readings, KPI values (Keratoconus Index), and High Order (HOA) and Low Order Aberrations (LOA).

4. *[D/mm]*

Select button to toggle between diopters and mm.

5. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for custom diagnostic

The custom diagnostic can contain many different measurements according to your preferences. To select which measurements will be included in custom diagnostic, go to custom Diagnostic. If [Topo], [Pachy], and [Tono] are selected, the summary screen will appear like this:
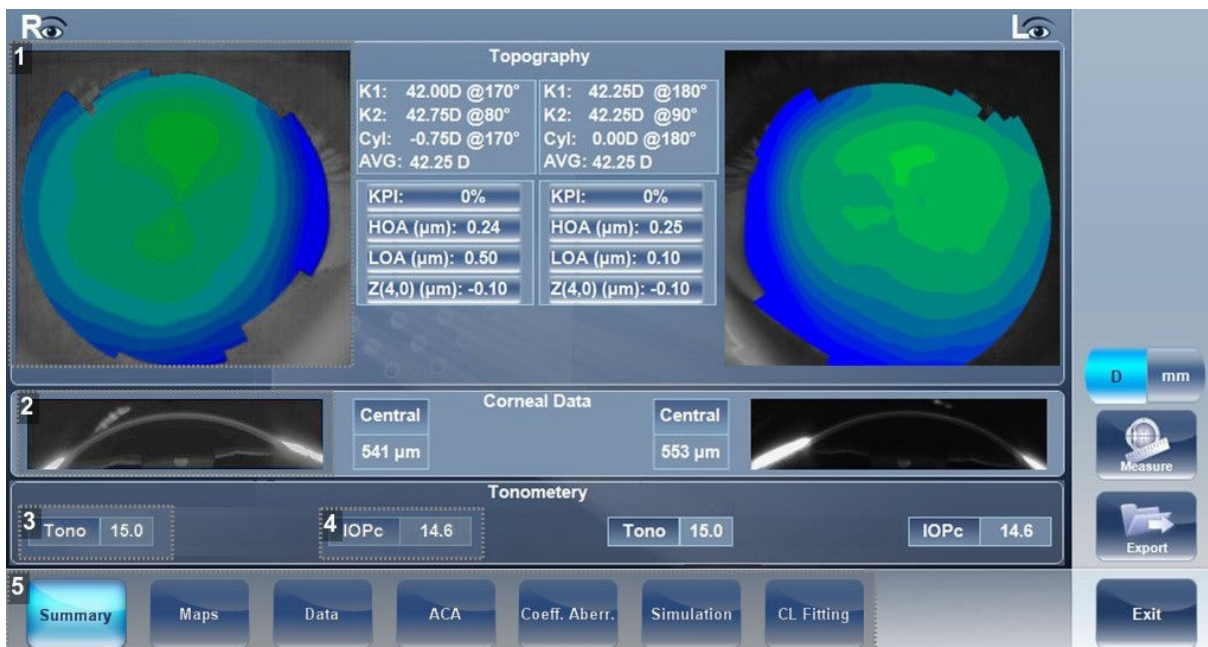
1. *Topography*

Displays the topographic map of the eye as well as the keratometry values. Double-tap (or double-click) to open the [Topography] map sub-tab for the eye.

2. *[Corneal Data]*

Displays a Scheimpflug image of the cornea as well as the thickness of the cornea at its center. Double-tap (or double-click) to open the [ACA] sub-tab for the eye.

3. *[Tonometry]*

Displays the glaucoma evaluation results which include: the tonometry test results in PO mm/Hg, the average of the tonometry test results. If results fall outside the average range, the irideo angles are displayed here as well.

4. *[IOPc]*

This is the adjusted tonometry results which is based on formulas selected in the settings menu. Double-tap (or double-click) to open the [Tonometry] tab sub-tab.

5. *Sub-tabs*

Select sub-tabs to view subject in greater detail.

[Summary] screen for pupillometry diagnostic
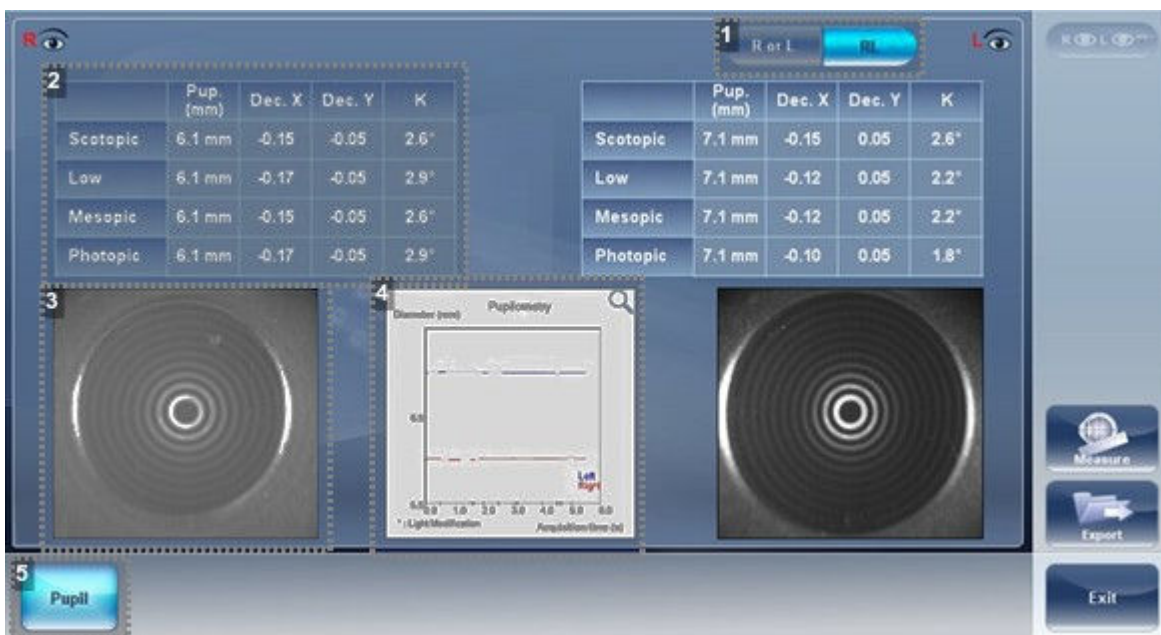
1. *[R or L / RL]*

Select view single eye or both eyes at once.

2. *Pupil measurements*

Displays the pupil measurement in different light conditions:

- Scotopic
- Low
- Mesopic
- Photopic

3. *Pupil image*

Displays the image of the pupil for each eye.

4. *Chart*

This chart displays the pupil size for each eye in the changing light conditions.

5. *[Pupil]*

Select to display the pupil sub-tab, including a short video of the eye's reaction to the changing light conditions.

If you toggle the [R or L] button the following screen appears:
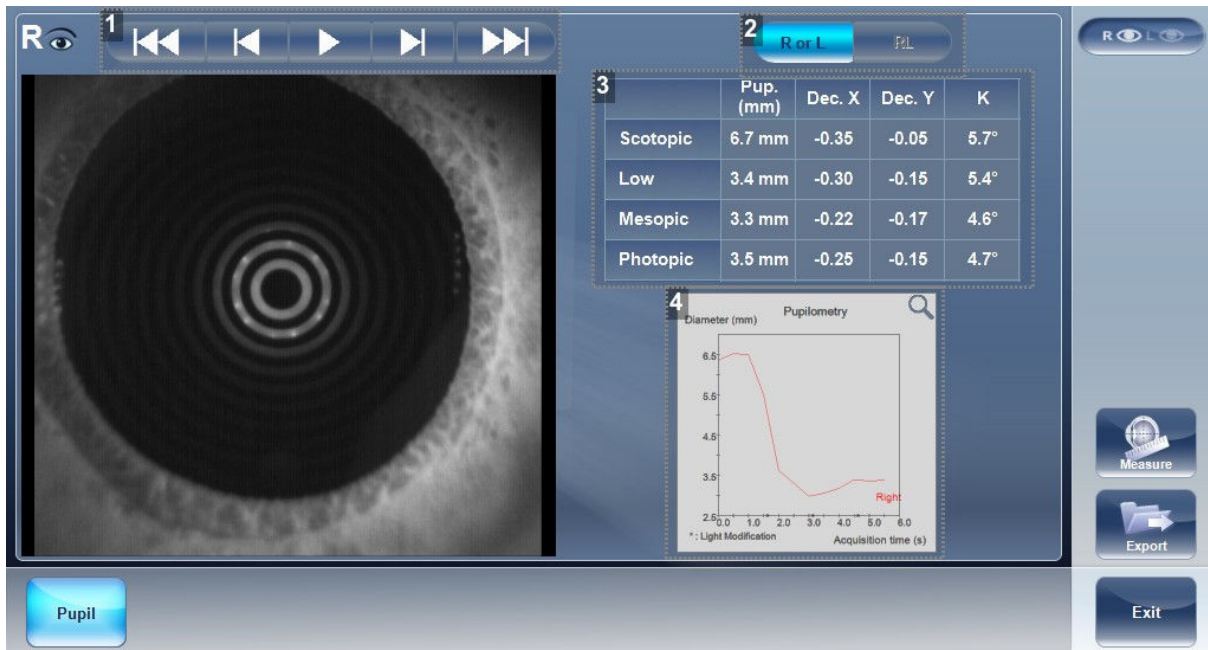
1. *Play/Pause buttons*

Select to play, pause, rewind, or fast forward the pupil video.

2. *[R or L / RL]*

Select view single eye or both eyes at once.

3. *Pupil measurements*

Displays the pupil measurement in different light conditions:

- ◦ Scotopic
- ◦ Low
- ◦ Mesopic
- ◦ Photopic

4. *Chart*

This chart displays the pupil size for each eye in the changing light conditions.

Special alerts

The summary tab will display alerts when results fall outside the expected range:

1. *[E] Simulation*

E simulation is outlined in red when:

- ◦ The delta between the night and day sphere is >1D and/or cylinder is greater than >0.75D
- ◦ The ocular HOA RMS equivalent sphere is larger than 0.5D in the right or left eye.

2. *Refraction*

Refraction is displayed in red:

- ◦ When there is a difference of more than 2D in the refraction between the eyes, or the cylinder difference between the eyes is more than 2D.
- ◦ If the difference in refraction of the same eye in mesopic and photopic light is a different of 1D sphere and 0.75D cylinder, the caution is also displayed.
- ◦ When sphere is above ± 20D or cylinder is more than ± 8D.
- ◦ When pupil diameter is less than 2.5 mm in at least one eye.
- ◦ When cylinder is greater than 4D in either eye.

3. *[Eye Strain] bar*

The orange section of the eye strain bar indicates the expected range that the patient will experience visual discomfort.

4. *[KPI]*

KPI result is displayed in red when its value is higher than 50%.

5. *[RMS]*

RMS is displayed in red when corneal or RMS equivalent sphere is greater than >4D or when corneal HOA RMS equivalent sphere is greater than 0.5D in either eye.

6. *[Corneal Data]*

Corneal data is displayed in red and irideo angles are displayed when the central corneal thickness is below 400μm or higher than the 700μm.

7. *[IOPc]*

The IOPc value is displayed in red when the corrected inter-ocular pressure is above 22mHg, irideo angles are displayed.

5. [Eye strain] screen

When accommodation measurement has been done, there is a screen called [Eye strain] that contains information about the accommodative process:

1. *[Amplitude]*

This number is the total accommodative amplitude that was measured for the patient.

2. *[Stimulus]*

This curve illustrates the accommodative demands at various distances during the measurement.

3. *Amplitude curve*

This curves illustrates the accommodation that the patient displayed at various instances.

Note, in this image, the accommodative curve does not match the accommodative stimulus. When the accommodative demands and the accommdative stimulus have a great difference, the software will indicate an addition (#7)

4. *Eye strain bar*

This bar shows the comfort level expected for the patient at various distances.

- ◦ Green indicates good comfort
- ◦ Yellow indicates acceptable comfort
- ◦ Orange indicates poor comfort levels.

In the example above on the left, we can see that the patient will have reasonable comfort up till 50 cm.

5. *Refraction*

This is the refraction table with the patient's distance refraction for both mesopic and photopic light.

6. [MAPS] TAB

The [Maps] tab displays wavefront maps of aberrations and topographic maps of the cornea.

a. Ocular

The [Ocular] sub-tab displays wavefront maps of the measured ocular aberrations of one or both eyes.

Display options allow you to view results for photopic and mesopic conditions, to view maps of both eyes at once or of each eye individually, to isolate lower- and higher-order aberrations, to change the step and central value of a map, and to superimpose guidelines of various types onto the maps.

Aberrations values and maps can be shown in OPD (optical Path Difference) mode or in WFE (WaveFront Error) mode, as defined in the settings screen.

The Optical Path Difference (OPD) is defined as the difference between the aberrated and the ideal unaberrated wavefronts. The OPD is positive if the aberrated wavefront leads the ideal unaberrated wavefront.

Also, if the aberrated wavefront curves in more than the unaberrated wavefront, the OPD is positive. Therefore, a negative focal shift will introduce a positive aberration.

The WaveFront Error (WFE) is defined as the difference between the ideal unaberrated wavefronts and the aberrated wavefronts. Essentially, WFE represents the required correction for achieving unaberrated vision.

OPD and WFE modes relate in the following way:

OPD(x,y)= -WFE(x,y)

The chosen mode will be marked on each map in the lower right corner of the map.
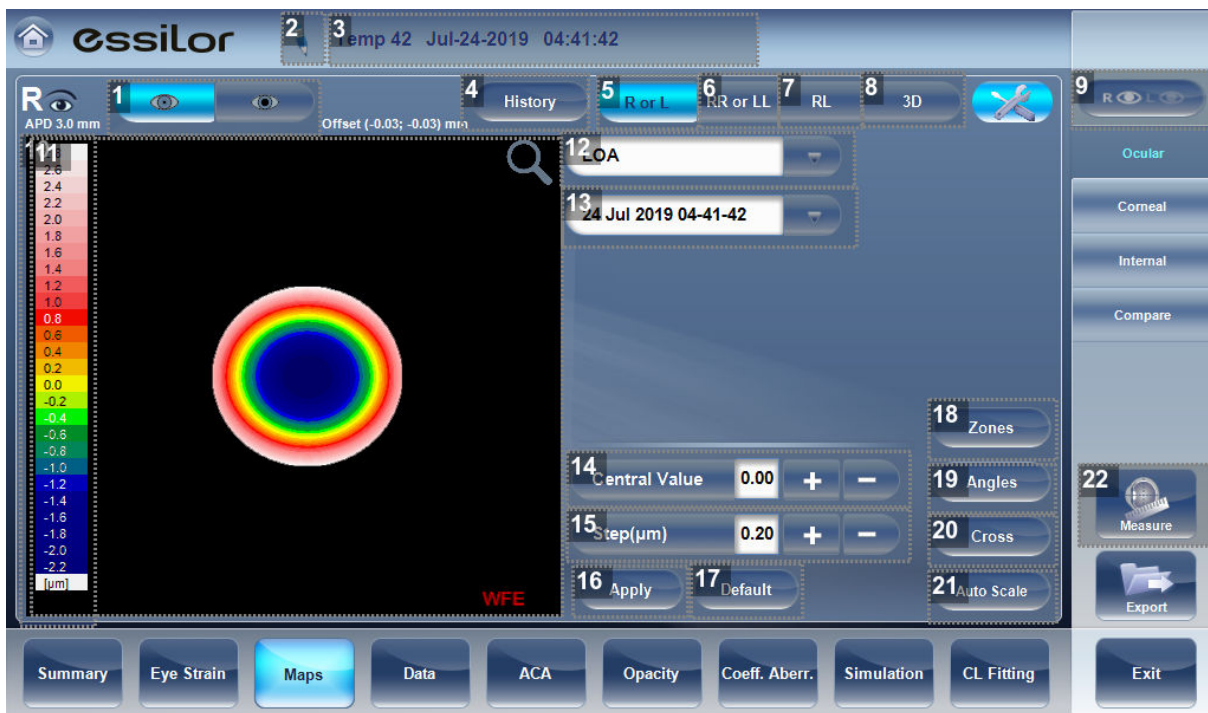
1. *Photopic/Mesopic selector*

Select:

- ◦ Day to display maps for daytime light conditions
- ◦ Night to display maps for nighttime light conditions
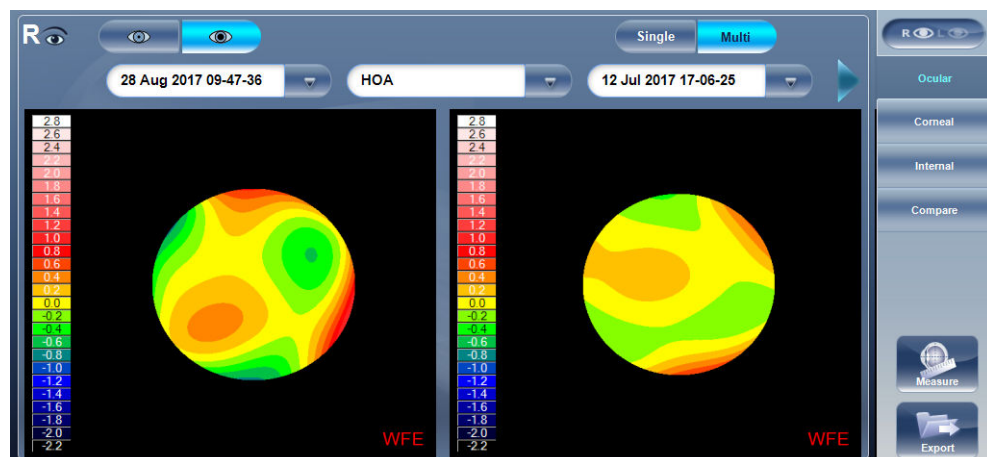
2. *Note*

Select this to view an existing note, or add a note in the patient file.

3. *Name and date*

Patient's name and date and time of the measurement.

4. *[History]*

Displays map results from previous and current topographic maps according to selected date.

5. *[R or L] mode*

Displays single map, for the eye selected in the eye selector.
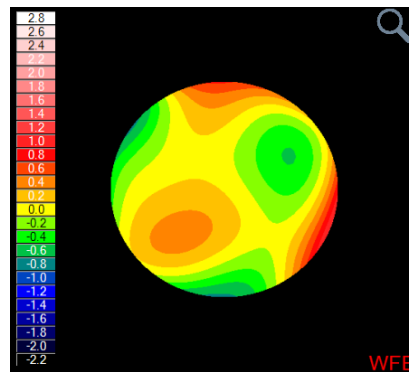
6. *[RR or LL] mode*

Display two maps, both for the same eye - namely, the eye selected in the eye selector; displaying two maps of the same eye allows you to compare two types of aberrations.

For example, you could display HOA data in one of the maps, and LOA data in the other.
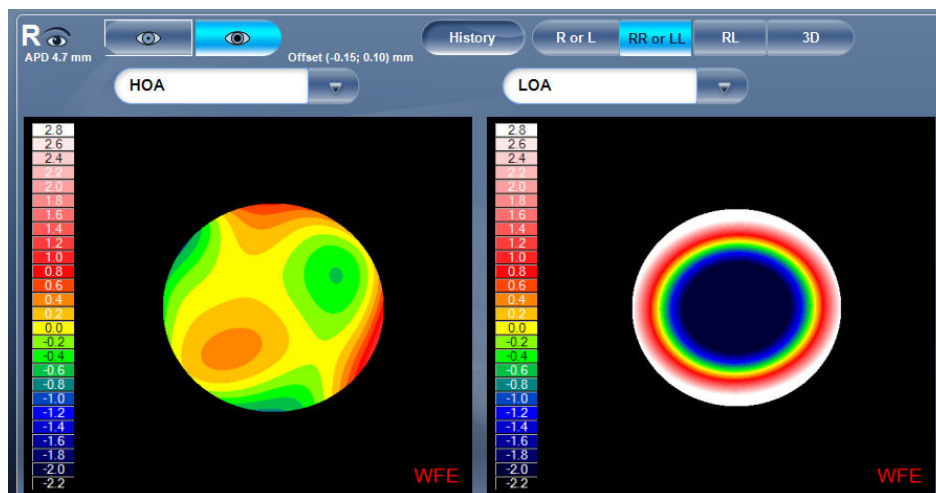
7. *[RL] mode*

Displays two maps, one for each eye. Both maps are displayed with the same display options.

8. *[3D] mode*

Displays one map, for the eye selected in the eye selector, in 3D mode.

Note: In 3D mode, you can change the orientation by dragging your finger (or the cursor, if a mouse is connected to the unit) on the image.
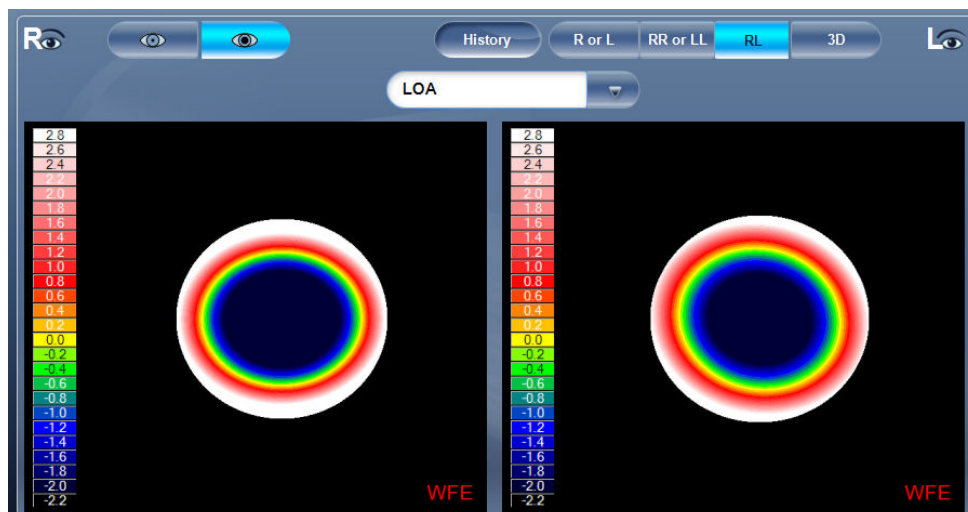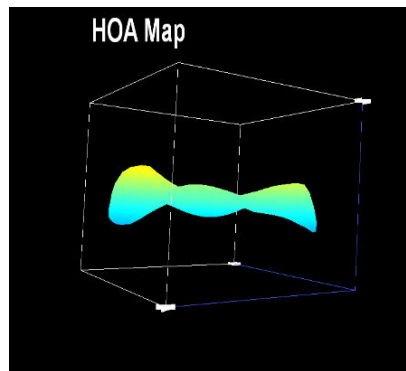
9. *Eye indicator*

Indicates and toggles between left and right eyes.

10. *Scale*

Shows the color-coding scale used in the map.

11. *Map*

Map of the aberrations.

12. *Map-type selector*

Select one of the following map types:

- ◦ Total: Display composite of all aberrations
- ◦ HOA: Display only high-level aberrations
- ◦ LOA: Display only low-level aberrations
- ◦ Sphere: Display only the sphere aberrations
- ◦ Cylinder: Display only the cylinder aberrations

13. *Date tab*

Opens a map from previous examinations. This is only available if the patient has previous examinations saved in the database.

14. *[Central Value] selector*

Select the middle value for the color scale. Select [+] to increase the value, or [−] to decrease it.

Changes you make to the central value are implemented when you select [Apply].

15. *[Step] selector*

Select the rate of change for the color scale: the range of values represented by each distinct color.

Select [+] to increase the step, or [−] to decrease it.

Changes you make to the step value are implemented when you select [Apply].

16. *[Apply] button*

Implements changes you make to the step and central values.

17. *[Default] button*

Resets the step and central value according to what is defined as default in the [Settings] menu.

18. *[Zones]*

Select this button to superimpose zone guidelines (3, 5, and 7mm) on the map display, or to remove them when they are displayed.
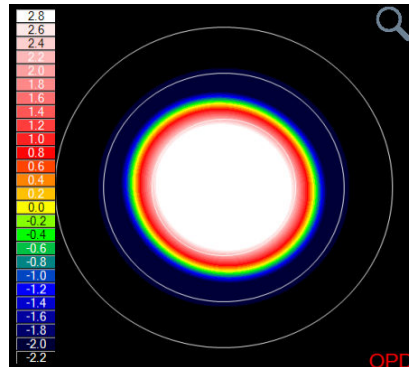
19. *[Angles]*

Superimpose angle guidelines on the map display, or to remove them when they are displayed.
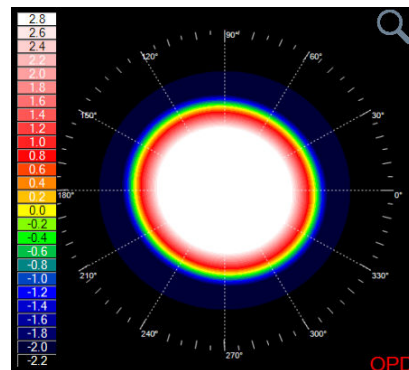
20. *[Cross]*

Superimpose cross-hair guidelines on the map display, or to remove them when they are displayed.
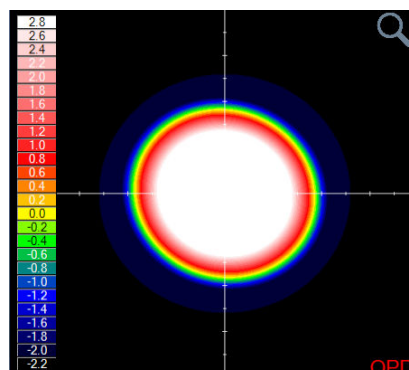
21. *[Auto Scale]*

Activate or deactivate auto-scaling. When auto-scaling is activated, the step and central value of the map are set automatically, and the step and central value selectors are disabled. When it is deactivated, the step and central value selectors are enabled.

22. *[Measure]*

Select to retake measurement. Warning, if selected prior to exiting and saving measurement first time, your previous results will be erased.

b. Corneal

The [Coneal] sub-tab displays topographic maps of the corneas of one or both eyes. Display options allow you to view maps of both eyes at once or of each eye individually, to view four different types of topographic maps, to change the step and central value of a map, and to superimpose data and guidelines of various types onto the maps.
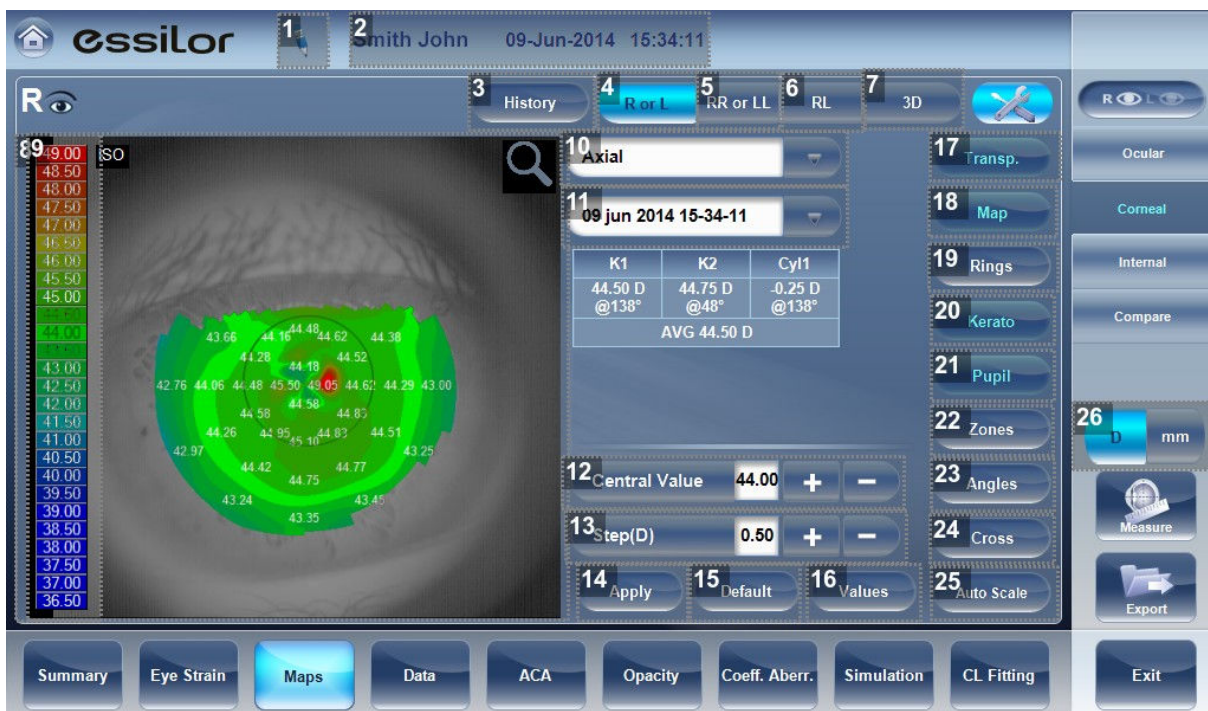
1. *Note*

Click to view an existing note, or add a note in the patient file.

2. *Name and date*

Patient's name and date and time of the measurement.

3. *[History]*

Displays map results from previous and current topographic maps according to selected dates.
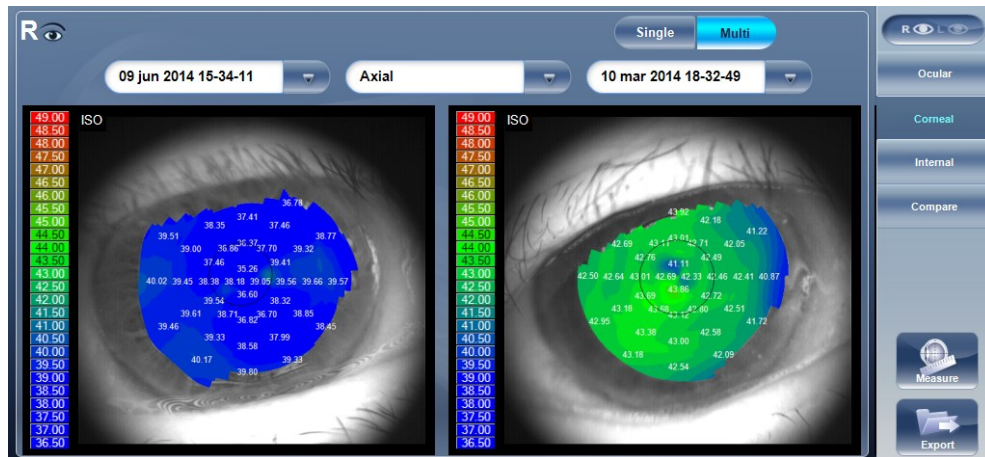
4. *[R or L]*

Displays one map, for the eye selected in the eye selector.
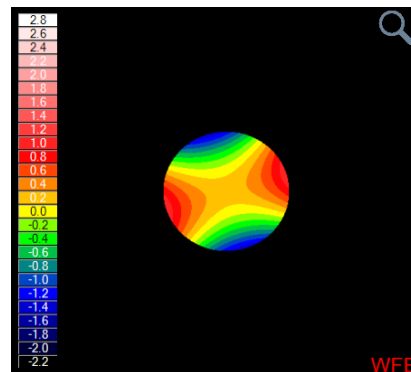
5. *[RR or LL]*

Displays two maps, both for the same eye - namely, the eye selected in the eye selector; displaying two maps of the same eye allows you to view the same data in different ways.

For example, you could display HOA data in one of the maps, and LOA data in the other.
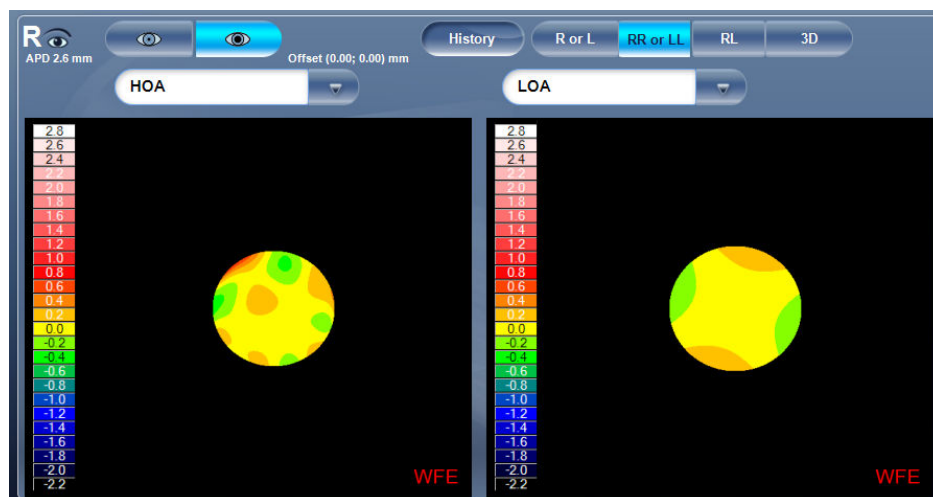
6. *[RL]*

Display two maps, one for each eye. Both maps are displayed with the same display options.
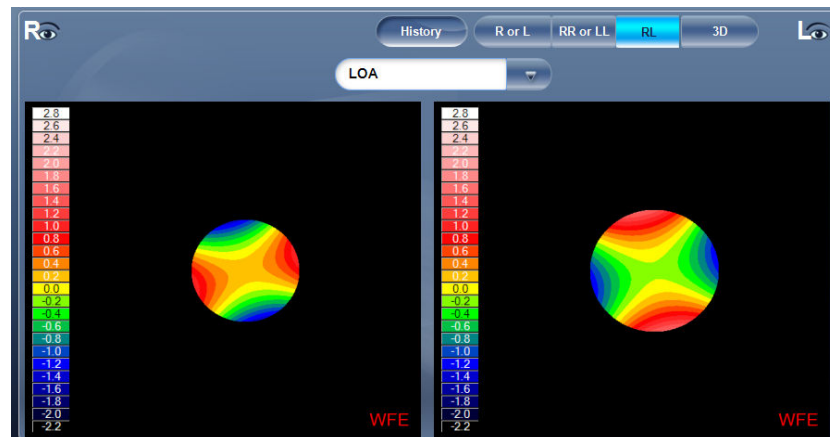
7. *[3D]*

Display one map, for the eye selected in the eye selector, in 3D mode.
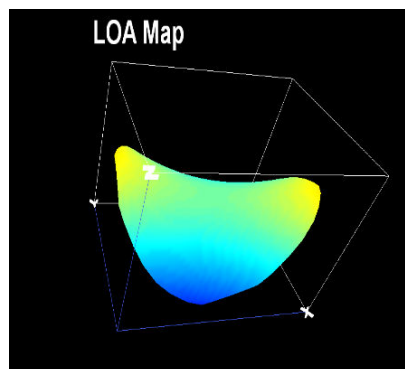
Note: In 3D mode, you can change the orientation by dragging your finger (or the cursor, if a mouse is connected to the unit) on the image.

8. *Scale*

Indicates the color-coding scale used in the map.

9. *Map*

Details of the chosen map (topographic, aberrometry or refraction).

10. *Map-type selector*

Select one of the following map types:

- ◦ Axial: Display an axial topographic map
- ◦ Instantaneous: Display a tangential topographic map
- ◦ Elevation: Display an elevation topographic map
- ◦ Refraction: Display a refractive topographic map

11. *Date tab*

If more than one measurement was performed for the current patient, this tab opens a drop-down menu with the dates of other measurements selected. To view a map of a different date, select it from this menu.

12. *[Central Value] selector*

Select the middle value for the color scale. Select ➕ to increase the value, or ➖ to decrease it.

Changes you make to the central value are implemented when you select [Apply].

13. *[Step] selector*

Select the rate of change for the color scale: the range of values represented by each distinct color.

Select ➕ to increase the step, or ➖ to decrease it.

Changes you make to the step value are implemented when you select [Apply].

14. *[Apply] button*

Apply changes you make to the step and central value values.

15. *[Default] button*

Reset the step and central value to their default values.

16. *[Value] button*

Shows or hides values on the maps.

17. *[Transp.]*

Transparent: Displays the photo of the eye in the background with the projection of the Placido rings

18. *[Map]*

Displays the topographic map of the cornea according to the map selected from the drop down menu.

19. *[Rings]*

Displays the image of the Placido rings that were projected onto the cornea. Select Rings to view ringer and make modifications.
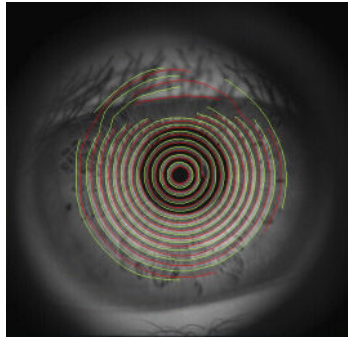
20. *[Kerato]*

Displays/hides the central keratometry values.

21. *[Pupil]*

Superpose a circular guideline on the map indicating where the pupil is or remove it when it is displayed.
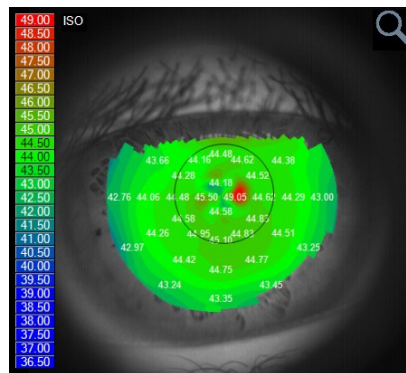
22. *[Zones]*

Superpose zone guidelines (3, 5, and 7mm) on the map display, or to remove them when they are displayed.

23. *[Angles]*

Superimpose angle guidelines on the map display, or to remove them when they are displayed.

24. *[Cross]*

Superpose cross-hair guidelines on the map display, or remove them when they are displayed. Each gap is of 1mm in size.

25. *[Auto Scale]*

Activate or deactivate auto-scaling. When auto-scaling is activated, the step and central value of the map are set automatically, and the Step and Central Value selectors are disabled. When it is deactivated, the Step and Central Value selectors are enabled.

26. *[Diopter/mm] button*

Toggles the display of values between diopters and millimeters.

To display the values at a particular location of the map, click on a point in the map, and a table with the value and location appears, as seen below.
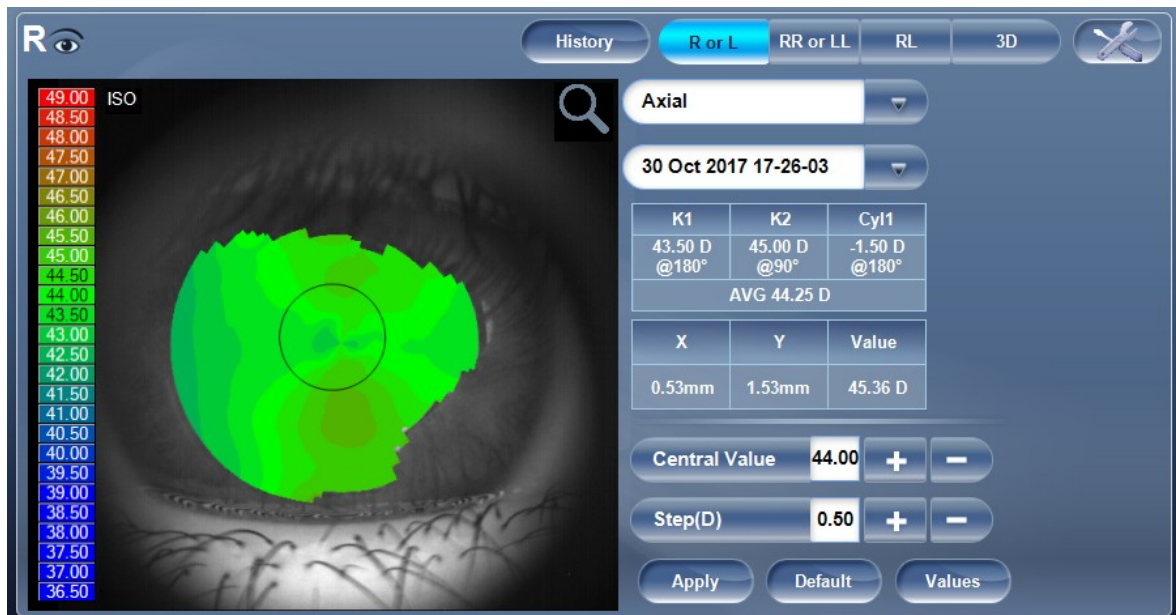
c. Internal

The [Internal aberrations] map represents the calculated differences between the corneal aberrations, and the ocular aberrations for each eye.

These aberrations can stem from anywhere along the optical system from posterior cornea to retina; most commonly from the crystalline lens.

The maps can be displayed both in photopic and mesopic conditions.
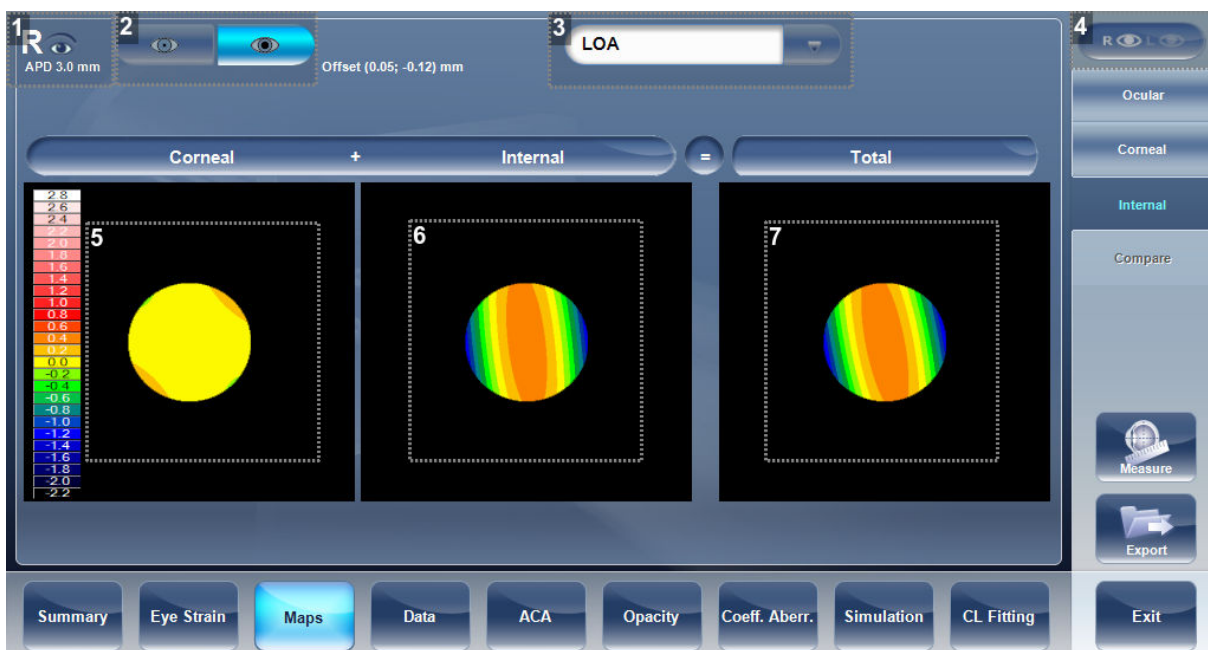
1. *Right eye indicator*

Results displayed on this side of the screen are those of the right eye.

2. *Photopic /Mesopic selector*

Select:

- ◦ Day to display maps for daytime light conditions
- ◦ Night to display maps for nighttime light conditions

3. *Map selection*

Select a map from this menu to be displayed. The maps available for selection are:

- ◦ Total
- ◦ LOA
- ◦ HOA
- ◦ Cylinder
- ◦ Coma

4. *Eye selector*

Select the eye you wish to be displayed.

5. *Corneal map*

This displays the corneal map that contains the corneal aberrations.

6. *Internal map*

This displays the internal map that contains the internal aberrations.

7. *Total map*

This displays the map that contains the total aberrations for the eye selected.

The internal maps are useful for indicating the location of the aberrations, for example in the map below:
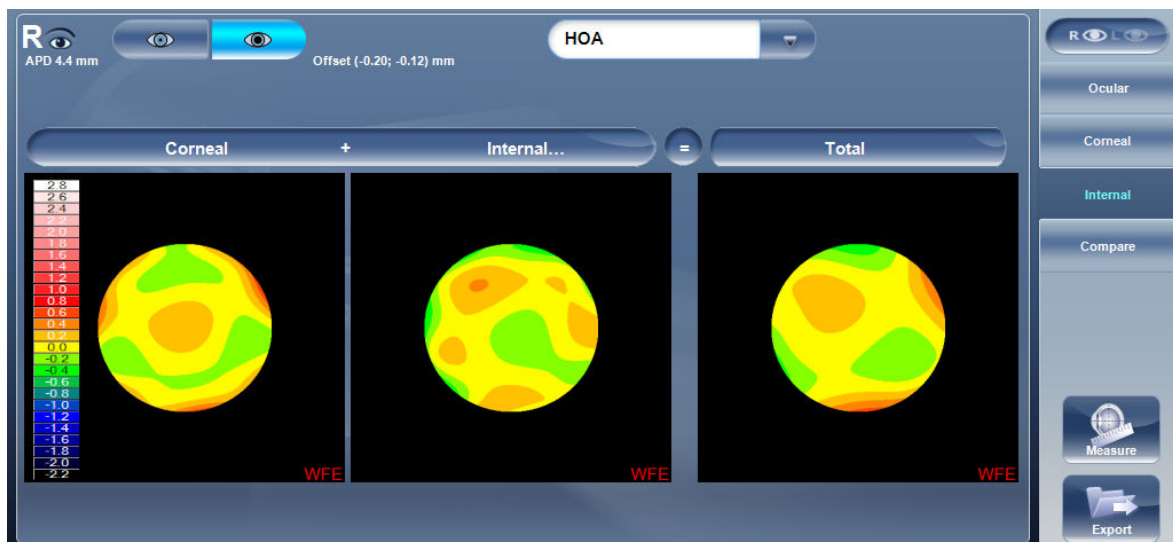
The internal map here, illustrates how most of the total aberrations are due to internal aberrations.
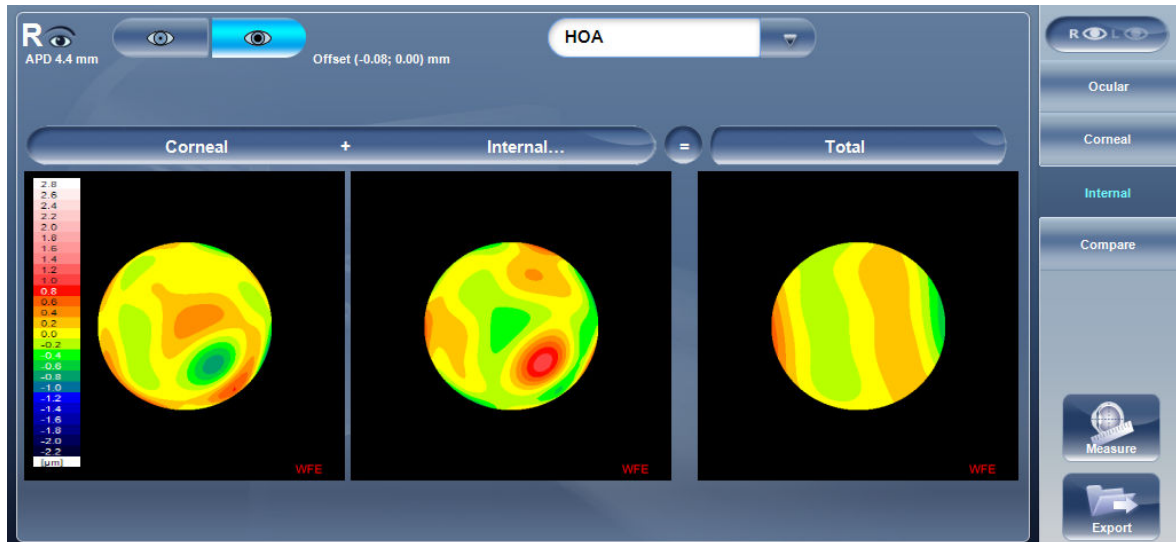
The Internal map here, illustrates how most of the total aberrations are due to Internal aberrations. This could be an indication of cataract, or an internal eye issue.

d. Compare

The [Compare] sub-tab feature compares two maps for the same patient and generates a delta map to illustrate changes over time. This map is available after retrieving a patient's measurement when the patient has more than one measurement in their file. Both corneal maps and ocular maps are available for comparing.

Corneal
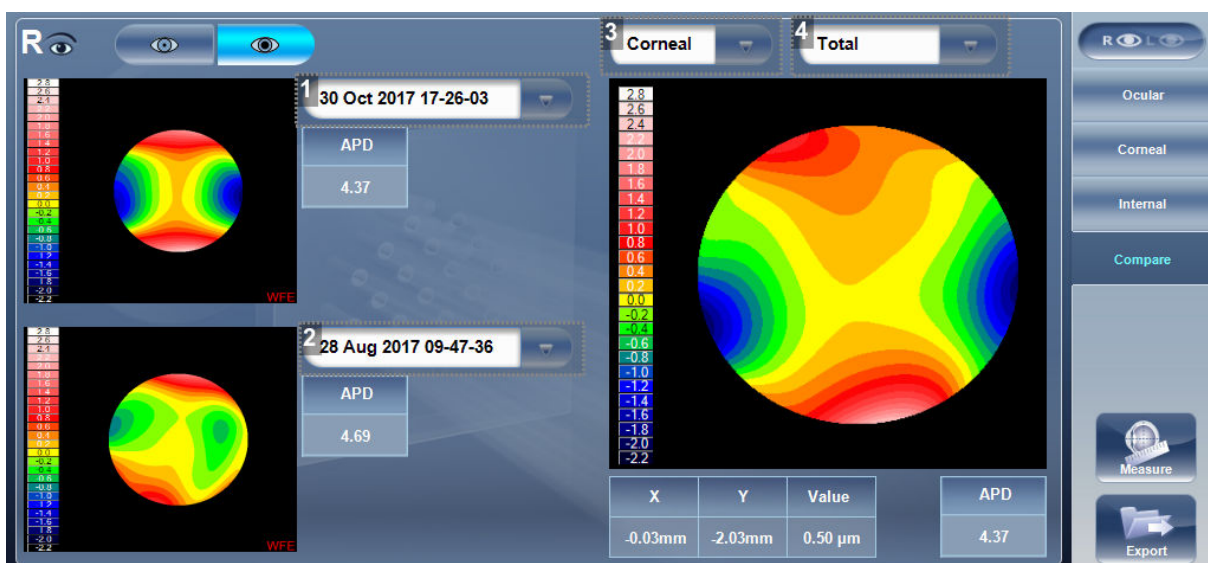
1. *Current date tab*

> By default, the date selected here will be for the current measurement. To select a different date, click on the arrow, and a list of previous measurements will become available for selection.

2. *Previous date tab*

Select the date of the map that you would like to have the current map compared to.

3. *Map selection*

Select a map type from this menu to be displayed, either ocular or corneal maps are available for selection.

4. *Map selection*

Select a map from this menu to be displayed. The maps available for selection for Corneal maps are:

- ◦ Axial
- ◦ Tangential
- ◦ Total
- ◦ HOA
- ◦ LOA

Ocular
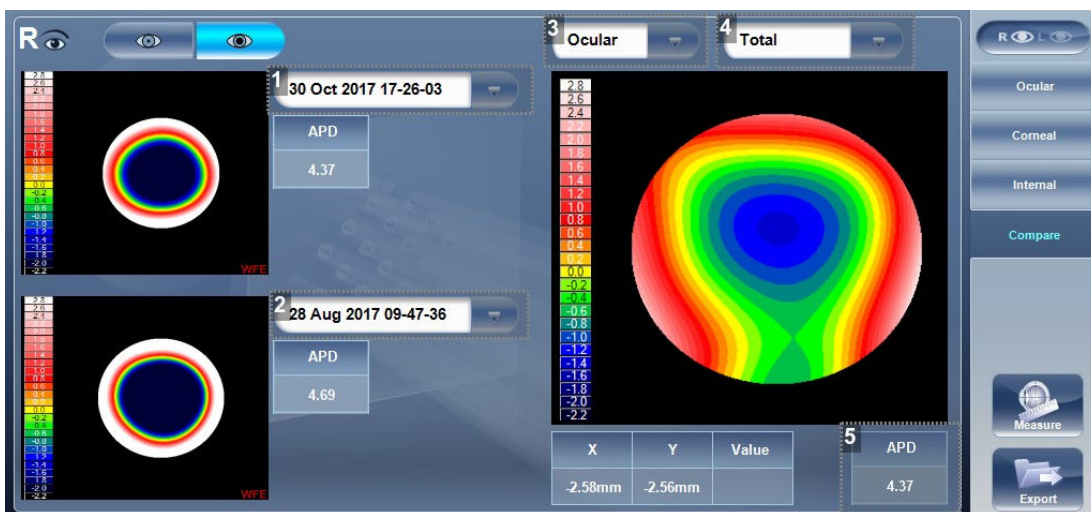
1. *Current date tab*

By default, the date selected here will be for the current measurement. To select a different date, click on the arrow, and a list of previous measurements will become available for selection.

2. *Previous date tab*

Select the date of the map that you would like to have the current map compared to.

3. *Map selection*

Select a map type from this menu to be displayed, either ocular or corneal maps are available for selection.

4. *Map selection*

Select a map from this menu to be displayed. The maps available for selection for Ocular maps are:

- ◦ Total
- ◦ LOA
- ◦ HOA

Corneal maps available for selection are:

- ◦ Axial
- ◦ Tangential
- ◦ Total
- ◦ HOA
- ◦ LOA

5. *Pupil diameter*

This is the maximum people diameter based on the pupil of the smaller map.

7. [DATA] TAB

The [Data] tab displays topographic information of the cornea.

a. Topo data

The [Topo Data] sub-tab of the [Data] tab displays information about the shape of the cornea. The sub-tab displays the results of the Topo test in three tables:

1. Eccentricity
2. Sagittal
3. Meridians

1. *Keratoconus probability index*

Keratoconus probability results.

2. *Geometry table*

Geometry of the cornea (P=1-e2) and (Q= P-1):

- ◦ [P]: Is a factor indicating how similar the shape of the cornea is to a perfect sphere, in the case of a perfect sphere, P=1
- ◦ [e]: This is a factor describing the eccentricity of the cornea,for a perfect sphere, e=0.
- ◦ [Q]: Is a factor indicating the asphericity of the cornea, for a sphere, Q=0

Note: An example of average corneal values: P=0.8, Q=-0.2, and e=0.45. These are not the values of a perfect sphere as average corneas are aspheric.

3. *Menu*

Select the geometrical data to be displayed:

- ◦ [Eccentricity]
- ◦ [Sagittal Radius]
- ◦ [Meridians]

4. *Eccentricity table*

Displays the local eccentricity values according by location on the cornea.

5. *SIM-K*

- ◦ [K1] & [K2]: Two orthogonal radii values where [K1] is the flattest meridian and [K2] is the steepest meridian
- ◦ [AVG]: Average of K1 and K2 - the mean curvature value between [K1] and [K2]
- ◦ [CYL]: Corneal toricity - the difference in diopters between curvatures of the principal meridians ([K1] and [K2]) and axis of the negative cylinder

Keratoconus table

Formulas

We use the following formula when P<1: (P=1-e2) and (Q= P-1).

When P>1 (the sphere is an oblate ellipse, the following equation foe "e" is used: e=- $\sqrt{(P-1)}$

Data taken from: "The Optical Quality of the Cornea", by Calossi A. (Fabiano Editore) Italy; 2002:1-13.

	p8 mm	e8 mm	e2 8 mm	Q 8 mm	p 4 .5 mm	e 4 .5 mm	e2 4 .5 mm	Q 4.5 mm
Mean	0.72	0.51	0.28	-0.28	0.86	0.31	0.14	-0.14
Std. Dev	0.13	0.14	0.13	0.13	0.12	0.24	0.12	0.12
Min	0.14	-0.22	-0.05	-0.96	0.47	-0.46	-0.21	-0.53
Max	1.05	0.93	0.86	0.05	1.21	0.73	0.53	0.21

Here is data taken from study sample of 1030 eyes. It includes the mean values, standard deviation, and range of asphericity. The data is relative to the anterior surface of the cornea on a diameter of 8mm and an optic zone of 4.5mm

The [Keratoconus] table displays the following data:

- [KPI]: Index of the probability of keratoconus

⚠️ Keratoconus indices are designed to be an adjunct to a clinical examination, and should never be used as a sole assessment tool in the diagnosis of keratoconus.

Results of a clinical trial of the Keratoconus Prediction Index (KPI) are described in reference 1 and more details of the mathematics are given in reference 2.

Reference 1. Calossi A. Le altimetrie corneali con sistemi a disco di Placido. In: Mularoni A, Tassinari G, eds. La Topografia Altitudinale. Canelli, Italy: Fabiano Editore; 2005:136-139.

Reference 2. Maeda N, Klyce SD, Smolek MK, Thompson HW. Automated keratoconus

- [SI]: Symmetry index, the difference between the mean power of two circular zones centered in the vertical axis
- [AGC]: Apical Gradient of Curvature, the mean variation per unit of length of the corneal power between the corneal apex and the periphery of the keratoconus
- [AK]: Apical Keratometry, the curvature of the corneal apex

📘 Values that are associated with a high probability of keratoconus are marked with an asterisk, like the SI and AGC values in this example:

Keratoconus	
KPI	0%
SI	1.26
AGC	1.04
AK	7.37

Eccentricity table

The Eccentricity table shows the eccentricity of the cornea (P, e, or q as selected in the settings menu) at various predefined positions. The positions are defined by the meridian and by the angle from the keratometric measurement axis.

> R0 is the apical position (corneal apex) and the angles are 10º, 15º, 20º, 25 º, and 30º.

The meridians used are the nasal, temporal, inferior, and superior semi-meridians and the horizontal and vertical meridians. The mean is the average of the horizontal and vertical meridians.

Eccentricity-Q	Mer.	R0	10°	15°	20°	25°	30°
Nasal	357°	44.92 D	0.25	-0.04	-0.15	-0.34	-0.46
Temporal	177°	44.97 D	-0.26	-0.27	-0.33	-0.43	-0.51
Inferior	267°	45.81 D	-0.25	-0.04	-0.24	-0.37	-0.47
Superior	87°	45.36 D	-0.95	-0.07	-0.61	-0.55	-0.55
Horizontal	177°	44.95 D	-0.01	-0.16	-0.24	-0.39	-0.48
Vertical	87°	45.58 D	-0.60	-0.05	-0.43	-0.46	-0.47
Medium	0°	45.26 D	-0.31	-0.11	-0.34	-0.42	-0.48

Sagittal radius table

The Sagittal radius table shows the radius of the curvature of the cornea at various predefined positions. The positions are defined by the meridian and by the angle from the keratometric measurement axis.

> R0 is the apical position (corneal apex) and the angles are 10º, 15º, 20º, 25 º, and 30º.

The meridians used are the nasal, temporal, inferior, and superior semi-meridians and the horizontal and vertical meridians. The mean is the average of the horizontal and vertical meridians.

Sagittal Radius

	Mer.	R0	10°	15°	20°	25°	30°
Nasal	357°	44.92 D	44.41 D	44.30 D	43.94 D	42.64 D	41.65 D
Temporal	177°	44.97 D	44.49 D	44.16 D	43.68 D	42.58 D	41.62 D
Inferior	267°	45.81 D	45.14 D	45.18 D	44.66 D	43.49 D	42.35 D
Superior	87°	45.36 D	44.63 D	44.94 D	43.30 D	43.47 D	
Horizontal	177°	44.95 D	44.45 D	44.23 D	43.81 D	42.61 D	41.64 D
Vertical	87°	45.58 D	44.88 D	45.06 D	43.97 D	43.48 D	42.35 D
Medium	0°	45.26 D	44.67 D	44.64 D	43.89 D	43.04 D	41.92 D

b. [Tonometry] tab

The [Tono] sub- tab displays the results of tonometry measures, and the results of pachymetry measures. For each eye, the results of the measures are displayed individually, and their average is also displayed, in the following columns.

1. *[Measurement]*

Notation of measurement number and average.

2. *[IOP mm/Hg]*

Displays the actual intraocular pressure that were measured.

3. *[Pachy]*

Displays the thickness of the cornea at its center, in microns.

4. *[IOPc mm/Hg]*

Displays corrected values for the intraocular pressure, taking the pachymeter readings into account.

5. *[ACD]*

Displays the anterior chamber depth.

6. *[ACV]*

Displays the anterior chamber volume.

7. *[Kappa Angle]*

Displays the kappa angle.

8. *[Decentration]*

Displays the decentration between the pupil apex and the visual point on the cornea.

9. *[IC Angles]*

Displays the interior chamber angles for each eye.

> The safety and efficacy of the Wave Analyzer Medica 800 in measuring intraocular pressures in patients with greater than 3 diopters of corneal astigmatism or greater than 33mmHg of intraocular pressure has not been evaluated.

8. Anterior Chamber Analysis (ACA)

This tab includes data on:

- the anterior chamber of the cornea
- the eye physiology

The [ACA] sub-tab of the cornea tab displays diagram and graph for the anterior chamber analysis (pachymetry, irido corneal angle, corneal thickness). The user can edit this diagram by re-positioning the measured points.

It is only possible to save the reposition of the points immediately after the measurements. When retrieving results, points that are repositioned will not be saved.
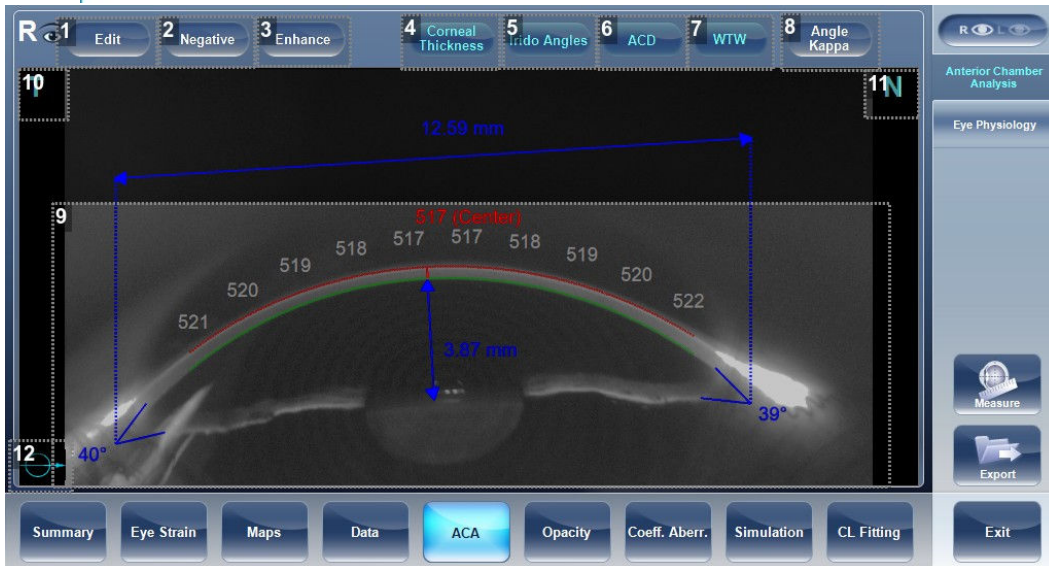
1. *[Edit]*

Displays the [Edit] screen. In this screen, the measured points can be repositioned by the user.

2. *[Negative]*

Displays a negative of the image of the cornea.

3. *[Enhance]*

Enhances the outlines of the image.

4. *[Corneal Thickness]*

Displays values of the corneal thickness in a few areas on the cornea image.

5. *[Irido Angles]*

Displays the Irido angles values and positions on the image.

6. *[ACD]*

Displays the Anterior Chamber Depth in millimeters.

7. *[WTW]*

Displays the White to White (in relation to the cornea) distance.

8. *[Angle Kappa]*

Displays the angle between the visual axis and the pupillary axis
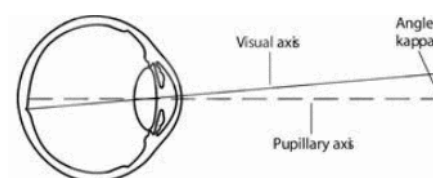
9. *Cornea*

Scheimpflug image of the cornea.

The anterior face of the cornea is marked in red while the posterior face of the cornea is marked in green.

The Central Corneal Thickness (CCT), in microns is displayed in red.

10. *[T]*

Temporal side of the eye.

11.

Nasal side of the eye

12. *Orientation*

Indicates the orientation of the pachymetry (in the example, a horizontal cut).

a. [Edit] screen

The [Edit] screen allows the user to relocate the measured points on the image in order to obtain better values.

Clicking on one of the three sections of the image will display a zoom-in of that image. It is then possible to drag each point to a new location.
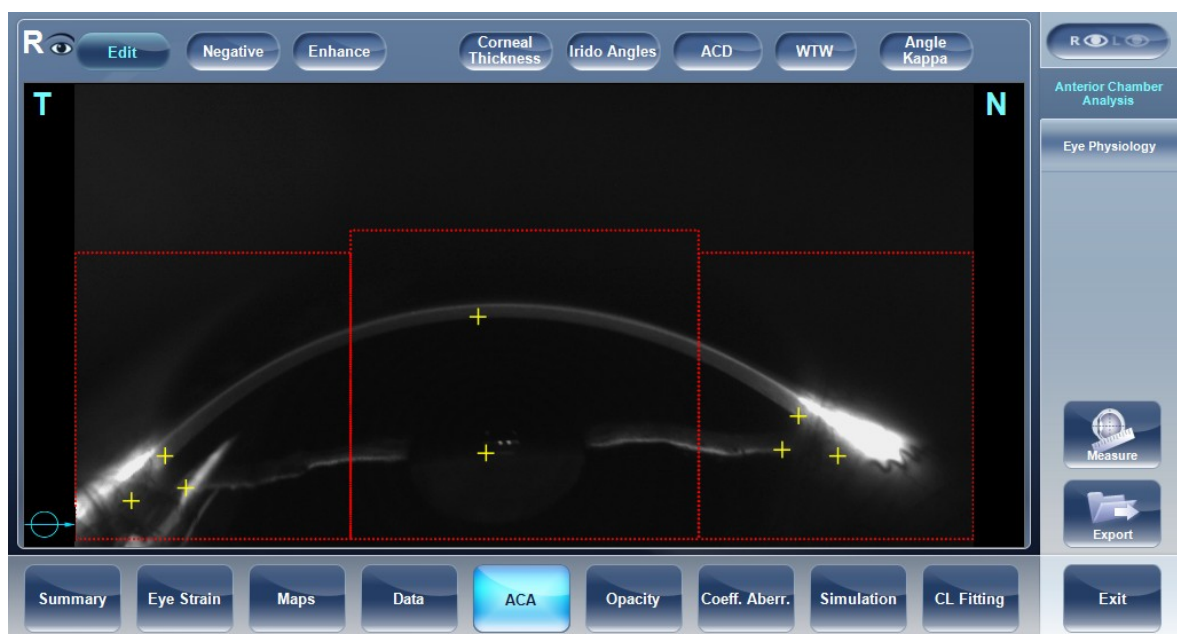
If the measured results are not within the following bounds, the [Edit] screen will be automatically displayed when entering the ACA results for that eye:

- 5° < Irido Angle < 60°
- 1.5mm < ACD < 4.5mm
- 8mm < WTW
- Irido points should be within their respective edit window
- -30° < Pupil Angle < +30°
- 200µ < Corneal Thickness < 800µ
- Corneal thickness values should be symmetrical respective to center

b. Edit central corneal thickness

Select the yellow cross and drag it to the outer border of the cornea.

This is only recommended if dissatisfied with the automatic corneal thickness recognition. This will change the values for central corneal thickness and display only the CCT, the other values along the periphery of the cornea will be erased.
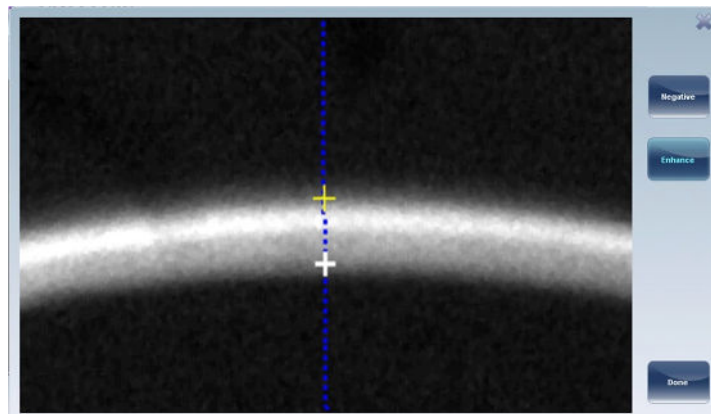
c. [Eye physiology]

The Eye Physiology screen will appear like this:
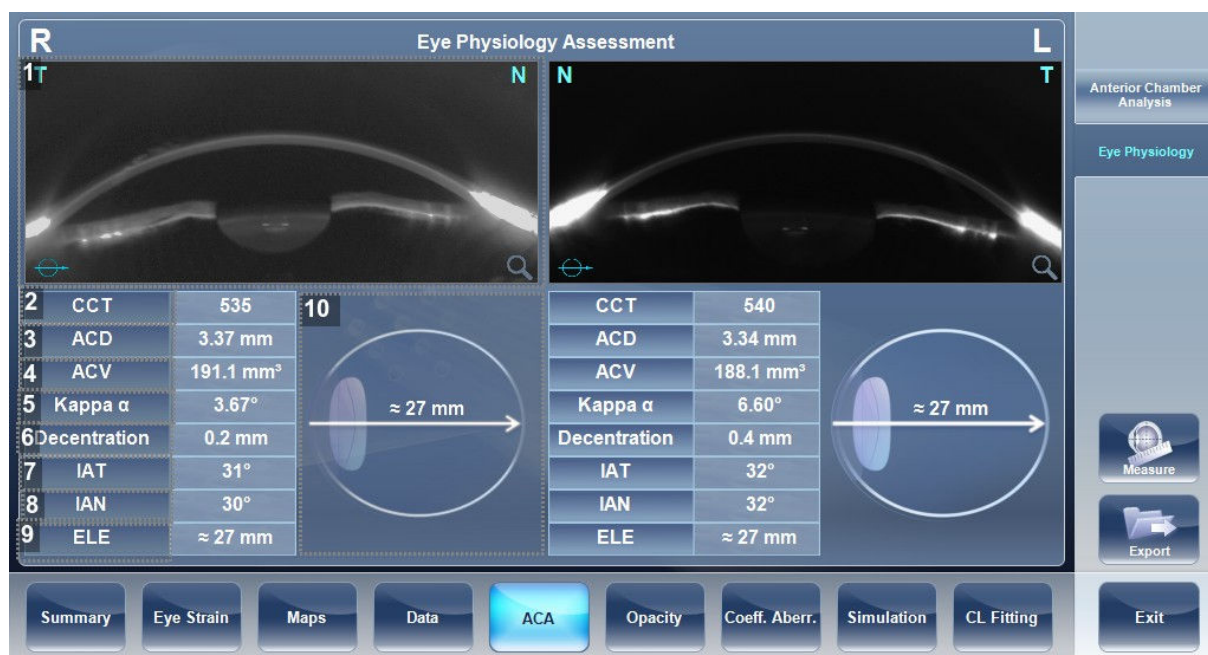
1. *Eye cross section*

This is a cross sectional image of the eye.

2. *[CCT]*

This value is the central corneal thickness.

3. *[ACD]*

This is the value of the anterior chamber depth.

4. *[ACV]*

This value is the anterior chamber volume.

5. *[Angle Kappa]*

This is the angle Kappa.

6. *[Decentration]*

This is the decentration of the cornea.

Click here to switch between the right and yeft eyes.

7. *[IAT]*

This is the temple side interior angle.

8. *[IAN]*

This is the nasal interior angle.

9. *[ELE]*

This value is an indication of the eye length evaluation.

10. *Schematic eye*

This is a dynamic schematic eye with the axial length displayed.

Once you have exited the [Results] screen all of the results are automatically saved.

If a patient has more than one saved axial length measurement, the [History] button will appear allowing you to view past and present refraction, keratometry and axial length data.

> Click on the [History] button and this screen will appear:

1. *Right eye*

All of the values on this side of the screen belong to the right eye.

2. *[History] button*

This button toggles between the current results and the history page.

3. *Left eye*

All of the values on this side of the screen belong to the left eye.

4. *[S]*

Sphere: in this column the patient's sphere values are listed.

5. *[C]*

Cylinder: in this column the patient's cylinder values are listed.

6. *[A]*

Axis: In this column the patient's axis values are listed.

7. *[K Avg(D)]average*

K average: in this column the average keratometry values are listed. This is an average of the K1 and K2 values.

8. *[Axial Length]*

This value is an indication of the axial length of the eye.

9. *[Date Time]*

This column displays the date of each measurement. All of the values in the same row correspond to the date shown.

9. [OPACITY] TAB

The [Opacity] tab graphically displays the results of several measures, ocular aberrations, corneal aberrations, retro-illumination, and pachymetry and Shack-Hartmann, to give a general overview of the anterior chamber.
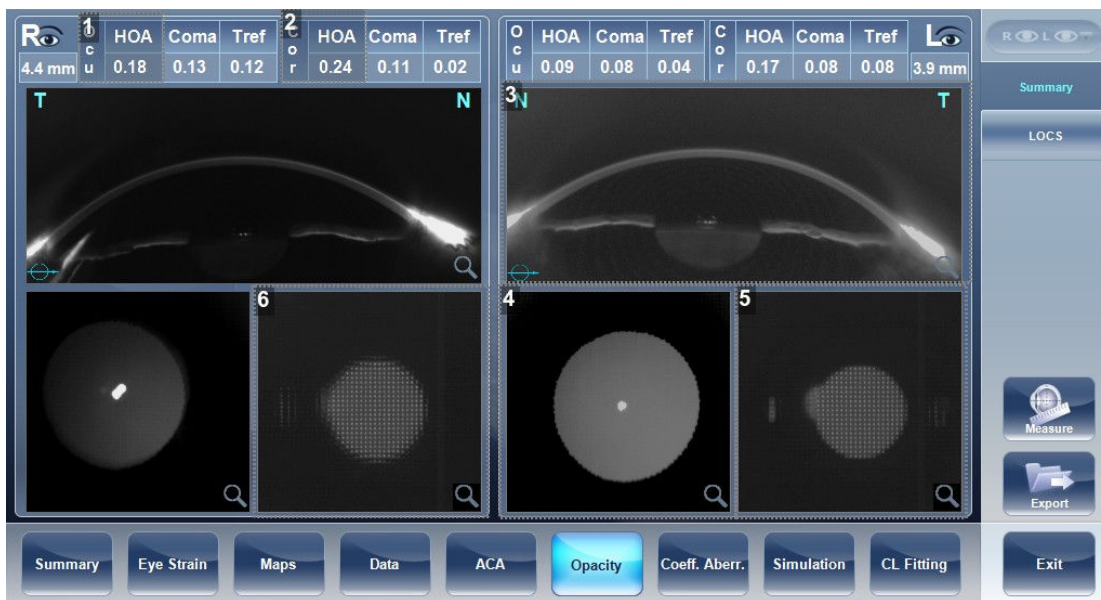
1. *Ocular aberrations*

Displays values for ocular high order aberrations.

2. *Corneal aberrations*

Displays values for corneal high order aberrations.

3. *LOCS*

This sub-tab contains a menu of retro-illumination images. After entering this sub-tab, select the image that most clearly resembles your patient's retro image.

4. *Lens*

Displays the retro-illumination image of the lens and opacities.

5. *Cross section*

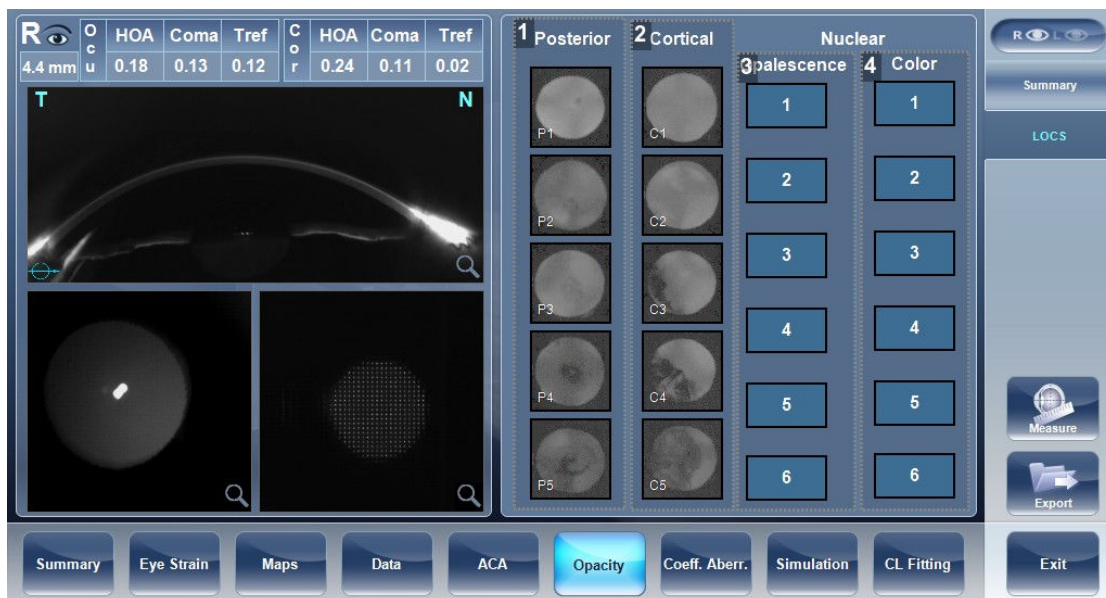Cross sectional image of the cornea and interior chamber.

6. *Shack-Hartmann*

Shack-Hartmann image.

To view a larger version of an image, double-click it.

a. [LOCS] screen

1. *[Posterior]*

Select the image that most clearly resembles the patient's retro-illumination image. The image on top represents the mildest posterior opacity, while the image on bottom represents the most severe posterior opacity.

2. *[Cortical]*

Select the image that most clearly resembles the patient's retro-illumination image.

The image on top represents the mildest cortical opacity, while the image on bottom represents the most severe cortical opacity.

3. *Opalescence*

Select the image that most clearly resembles the patient's retro-illumination image.

(#1) represents the least opacity, (#6) represents the most opacity.

4. *Color*

Select the image that most clearly resembles the patient's retro-illumination image.

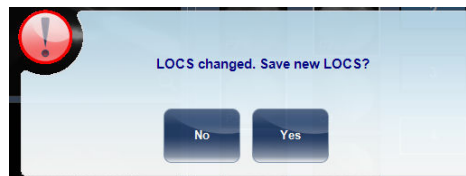(#1) represents the lightest color, (#6) represents the darkest color.

Select the image that best matches the cornea of the patient. There are 4 categories to choose from:

1. Posterior
2. Cortical
3. Opalescence
4. Color

Several options can be selected at once in the LOCS menu.

After exiting the results screen, you will see the message:

Click:

- [Yes] to save
- [No] to discard changes

10. Coefficients Aberration

The [Coeff. Aberr] tab shows the values of the Zernike coefficients in units of mm.

There are three options for the aberration coefficients to be displayed:

1. Main Values: Shows a selection of the most common aberrations; defocus, astigmatism, total lower order (LOA), total higher order (HOA), coma, spherical aberration, fourth order astigmatism, trefoil and tetrafoil. Aberrations are shown in value and axis form.
2. LOA: Shows the values of the lower order aberrations, total LOA, tilt, defocus and astigmatism.
3. HOA: Shows the values of the common higher order aberrations, total HOA, trefoil, coma, tetrafoil, fourth order astigmatism, spherical aberration, pentafoil, fifth order trefoil and fifth order coma.

Aberrations values and maps can be shown in OPD (Optical Path Difference) mode or in WFE (WaveFront Error) mode, as defined in the settings screen.

The Optical Path Difference (OPD) is defined as the difference between the aberrated and the ideal unaberrated wavefronts. The OPD is positive if the aberrated wavefront leads the ideal unaberrated wavefront.

Also, if the aberrated wavefront curves in more than the unaberrated wavefront, the OPD is positive. Therefore, a negative focal shift will introduce a positive aberration.

The WaveFront Error (WFE) is defined as the difference between the ideal unaberrated wavefronts and the aberrated wavefronts. Essentially, WFE represents the required correction for achieving unaberrated vision.

OPD and WFE modes relate in the following way:

$OPD(x,y) = -WFE(x,y)$

The chosen mode is marked on the left side of the coefficient chart above the table.

a. Ocular

The [Ocular] sub-tab shows the value of the Zernike coefficients of the entire eye from the wavefront measurement.

It is possible to display either day/night data or right/left data.

1. *Aberration coefficients*

Choose aberration coefficients to be displayed.

2. *[RL]*

Choose right/left display.

3. *Photopic / Mesopic display*

Choose day/night display.

4. *Convention*

This displays the Zernike convention, either WFE or OPD according to what was selected in the settings menu.

5. *Graphical representation*

Each of the bars represents either night/day aberrations, or right/left aberrations, depending on what is selected in (#2) and (#3).

6. *Scale*

Changes scale of graphical representation.

7. *Numerical representation*

These are the values for the coefficient of aberrations, they are listed by type and according to either night/day or R/L eyes.

b. Corneal

The [Corneal] sub-tab shows the values of the Zernike coefficients from the front corneal surface from the corneal topography measurement.

It is possible to display either day/night data or right/left data.

1. *Aberration coefficients*

Choose aberration coefficients to be displayed.

2. *[RL]*

Choose right/left display.

3. *[Photopic / Mesopic] display*

Choose day/night display.

4. *Convention*

This displays the Zernike convention, either WFE or OPD according to what was selected in the settings menu.

5. *Graphical representation*

Each of the bars represents either night/day aberrations, or right/left aberrations, depending on what is selected in (#2) and (#3).

6. *Scale*

Changes scale of graphical representation.

7. *Numerical representation*

These are the values for the coefficient of aberrations, they are listed by type and according to either night/day or R/L eyes.

c. Internal

The [Internal] coefficient of aberrations sub-tab represents the differences between the corneal aberrations, and the ocular aberrations for each eye. Zernike coefficients are displayed for corneal, internal and total aberrations.

For example, the graph below illustrates that most of the HOA, Defocus, and RMS are due to internal eye aberrations.

1. *[Photopic / Mesopic] display*

   Choose day/night display.

2. *Aberration coefficients*

   Choose aberration coefficients to be displayed.

3. *Left/Right display*

   Choose right/left display.

4. *Convention*

   This displays the Zernike convention, either WFE or OPD according to what was selected in the settings menu.

5. *Graphical representation*

   Each of the bars represents either night/day aberrations, or right/left aberrations, depending on what is selected in (#1) and (#3).

6. *Scale*

   Changes scale of graphical representation.

7. *Numerical representation*

   These are the values for the coefficient of aberrations, they are listed by type and according to either night/day or R/L eyes.

11. SIMULATION

Visual acuity measures the eye's ability to distinguish object details and shape using [HOA] (High Order Aberrations) and [LOA] (Low Order Aberrations).

Visual acuity measurement is applicable to topography (corneal) and to wavefront (ocular).

Results for both options are interpreted in the same manner.

a. Ocular
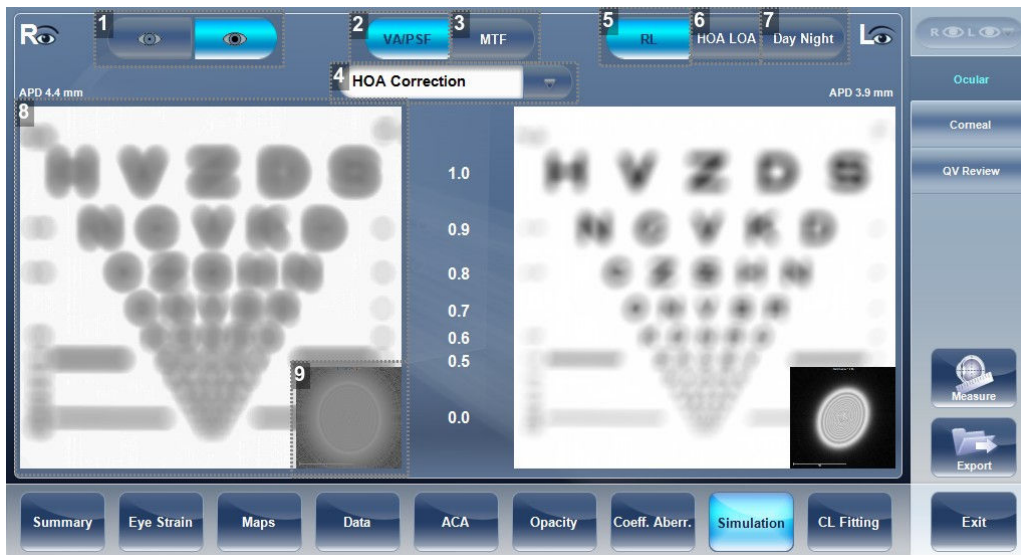
1. *Photopic/Mesopic selector*

Select:

- ◦ Day to display maps for daytime light conditions
- ◦ Night to display maps for nighttime light conditions

2. *[VA/PSF] selector*

Allows you to toggle between the visual acuity card display and the PSF (Point Spread Function) display.

3. *[MTF] selector*

Displays the MTF graph.

4. *Correction selector*

Select:

- ◦ HOA to access the same image with an HOA correction
- ◦ LOA to access the same image with a LOA correction.

It is possible to select no correction at all, or full correction.

5. *[R/L]*

Display two cards, one for each eye. Both cards are displayed with the same display options.

6. *[HOA/LOA]*

Displays two cards for each eye, one with HOA and one with LOA corrections.

7. *[Day Night]*

Display correction for day or night conditions for one eye.

8. *Visual acuity image*

Reflects the actual quality of patient eyesight.

9. *PSF*

Image of the corneal PSF (Point Spread Function).

b. Corneal

The [Corneal] sub-tab is identical to the [Ocular] one, since the visual acuity measurement is applicable to topography and to wavefront. Results for both options are interpreted in the same manner.
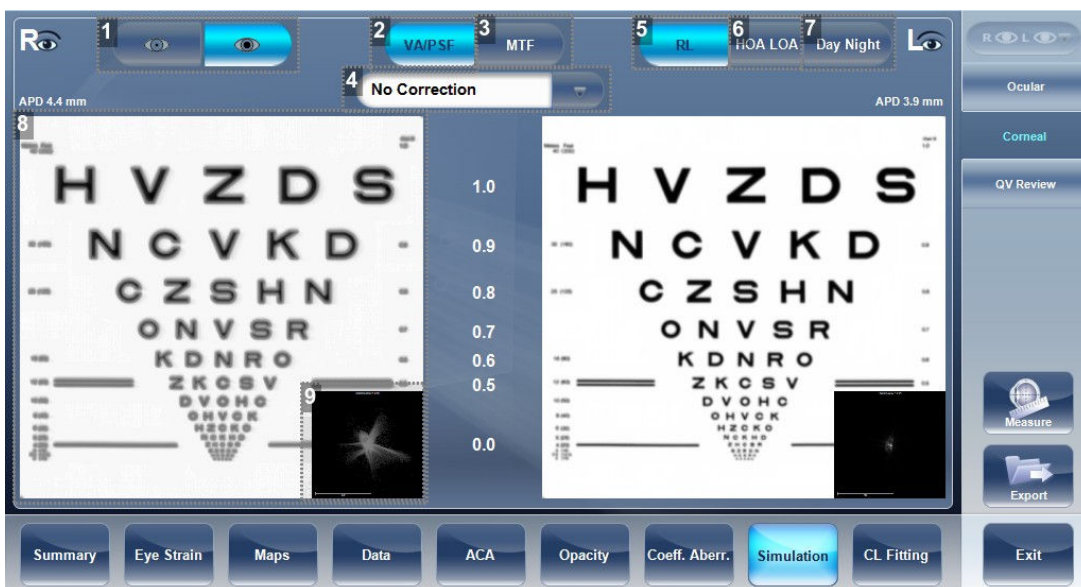
1. *Photopic/Mesopic selector*

Select:

- Day to display maps for daytime light conditions
- Night to display maps for nighttime light conditions

2. *VA/PSF selector*

Allows you to toggle between the visual acuity card display and the PSF display.

3. *[MTF] selector*

Displays the MTF graph.

4. *Correction selector*

Select:

- HOA to access the same image with an HOA correction
- LOA to access the same image with a LOA correction

It is possible to select no correction at all, or Full correction.

5. *[RL]*

Display two cards, one for each eye. Both cards are displayed with the same display options.

6. *[HOA LOA]*

Displays two cards for each eye, one with HOA and one with LOA corrections.

7. *[Day Night]*

Display correction for day or night conditions for one eye.

8. *Visual acuity image*

Reflects the actual quality of patient's eyesight.

9. *PSF*

Image of the corneal PSF (Point Spread Function).

c. Quality of Vision

The [QV] (Quality of Vision) sub-tab opens MTF (Modulation Transfer Function), displaying the LOA correction, displaying without any corrections, and displaying the 100% corrections function.

1. *Photopic/Mesopic selector*

Select:

- ◦ Day to display maps for daytime light conditions
- ◦ Night to display maps for nighttime light conditions

2. *[RL]*

Display two cards, one for each eye.

Both cards are displayed with the same display options.

3. *[History]*

Displays map results from previous and current topographic maps according to selected date.

4. *Photopic /Mesopic selector*

Select:

- ◦ day to display maps for daytime light conditions
- ◦ night to display maps for nighttime light conditions

5. *100%*

This line displays the MTF function with no aberrations present.

6. *LOA corrections*

The yellow line displays the MTF with all the LOA aberrations corrected, only HOA aberrations are present.

7. *No Correction*

This displays the MTF with no corrections, both HOA and LOA aberrations are present.

12. CL FITTING

In this tab you can fit contact lens to a patient according to the test results. There are several contact lens types listed according to their manufacturer as well as their dimensions in the dropdown menu of the [CL Fitting] tab. Choose a specific lens type and the software calculates the approximate fitting for you.

> It is possible that the contact lens dimensions listed in the software have changed since this version was updated. To avoid miscalculations, we recommend checking all the dimensions directly from contact lens manufacturer before prescribing contact lenses.

a. Lens

Choose a lens manufacturer and then select the most suitable lens from the given selection.

1. *Scale*

The scale used for the image in the display.

2. *Display*

Displays the contact lens image superimposed on the image of the eye.

3. *[TLT] (Tear Layer Thickness)*

Permits setting the value by which the lens is lifted at its center with respect to the cornea.

When the TLT is modified, a new model lens or a new manufacturer must be selected. The program "remembers" the variation in TLT settings and uses this criterion the next time, the contact lenses environment is accessed.

4. *[Fix Angle]*

The orientation of K1, allows selecting the direction of the flattest meridian of a toric lens. The default value is the direction of the flattest meridian of Sim K.

You can modify this parameter to simulate a lens rotation. This parameter need to be set before you choose the manufacturer.

5. *[Manufacturer]*

Select a contact lens manufacturer.

6. *[Design]*

Select the most suitable lens from the given selection.

7. *[Diameter]*

Choose the diameter of the lens.

8. *[Base Curve]*

Choose the base curve of the lens.

b. Values
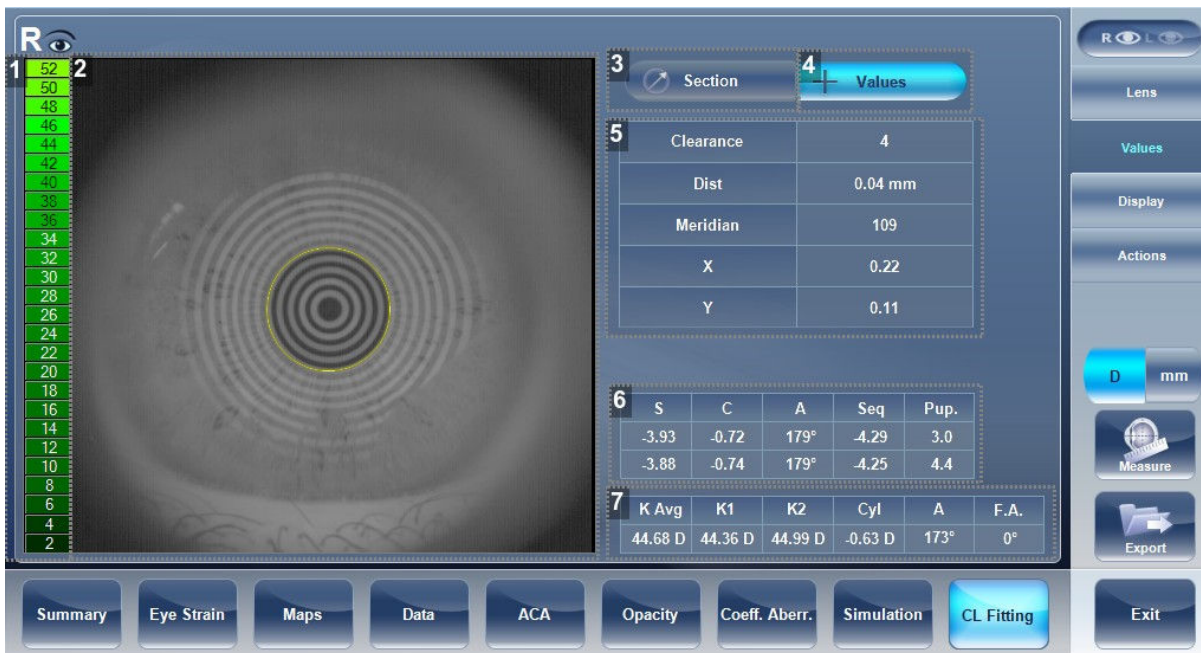
1. *Scale*

The scale used for the image in the display.

2. *Display*

Displays the contact lens image superimposed on the image of the eye.

3. *[Section]*

Displays a cross-section of the lens.

4. *[Values]*

Select the display of the values on the contact lens map.

5. *Values table*

Displays the values of the point where the user clicks on the image.

6. *Refraction values*

Displays the refraction values for the patient.

7. *Keratometry values*

Displays the keratometry values of the patient.

c. Display
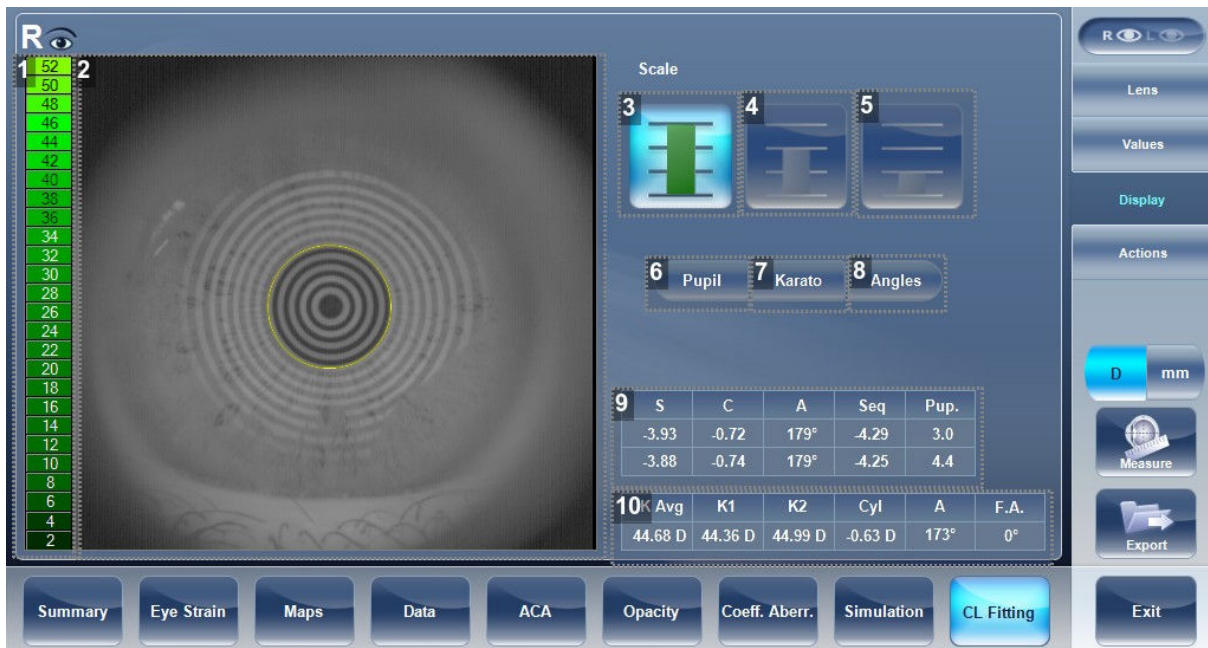
1. *Scale*

The scale used for the image in the display.

2. *Display*

Displays the contact lens image superimposed on the image of the eye.

3. *First scale selection*

4. *Second scale selection*

5. *Third scale selection*

6. *[Pupil]*

Displays the pupil on the map.

7. *[Kerato]*

Displays kerato values and cross on the map.

8. *[Angles]*

Displays angles on the map

9. *Refraction values*

Displays the refraction values for the patient.

10. *Keratometry values*

Displays the keratometry values of the patient.

d. Actions
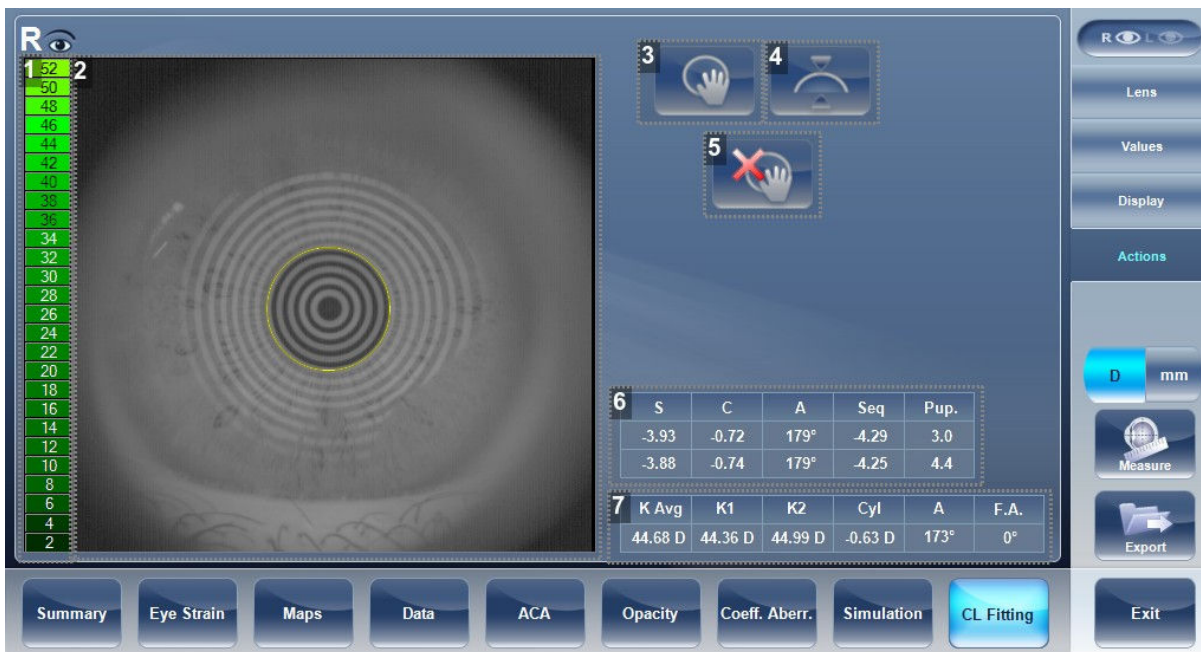
1. *Scale*

The scale used for the image in the display.

2. *Display*

Displays the contact lens image superimposed on the image of the eye.

3. *Move lens*

Moves the lens on the image of the eye.

4. *Tilt lens*

Tilts the lens.

5. *Reset move lens*

Undo all changes.

6. *Refraction values*

Displays the refraction values for the patient.

7. *Keratometry values*

Displays the keratometry values of the patient.

V. Manage patients
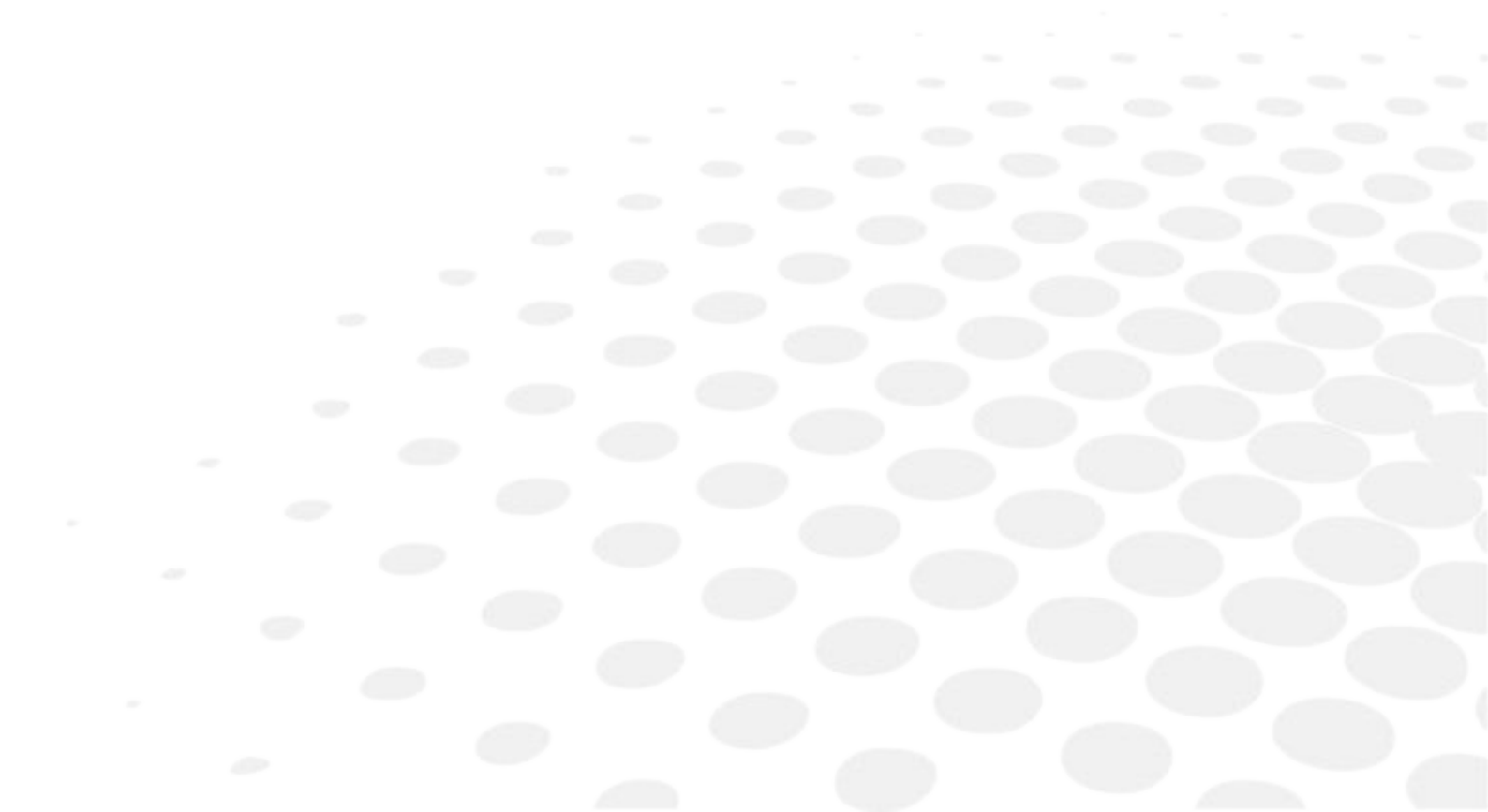
You can manage the patient database, add patients, modify patient information, search for patients, and delete patient records, in the [Patient] screen.

1. ADD NEW PATIENTS

You can add a new patient to the database either before or after you perform exams on them. You can also add a number of related patients to the database quickly by duplicating the current patient record and modifying those parts that are different.

a. Add a patient before performing an exam

In the:

- [Home] screen, select the [Add Patient] option or,
- [Patient] screen, select the [Add Patient] button.

The patient information dialog box is displayed on top of the [Patient] screen.

Then, fill in the fields.

1. *[Note]*

Select to add a note in the patient file. This note can be accessed by clicking on the symbol in the [Results] screen, in the [Measurement] screen, or in the [Patient] screen.

Once information has been added, the note will appear like this

2. *[Cancel]*

Cancels saving new patient.

3. *[Save]*

Save the new patient in the database, close the dialog box, and display the [Patient] screen.

4. *[Save & New]*

Save the new patient in the database and leave the dialog box open.

You can add an additional patient by modifying the fields as necessary and saving the additional patient's information.

Note: This is convenient if you want to create a number of new patient records at one time. For example, you could use this option to create new patient records for all of the members of a family.

5. *[Save & Diag]*

Save the new patient in the database, close the [Patient] screen, and open the [Measure] screen. This enables you to go directly from adding a new patient in the database to performing measurements on them.

b. Add a patient after performing an exam

You can perform an exam without first providing patient information. When the exam is completed, the exam results are saved in the database as temporary records under automatically generated names, with [Temp] as the surname, and a number as the first name. Temporary records remain in the database until you delete them manually or they are deleted by the system during routine maintenance. At any time before they are deleted, you can convert them into permanent patient records by adding patient information to them, or by cutting the results from the temporary patient record and pasting them into a permanent record.

c. Add related patients

In the [Patient Information] dialog box, fill in the fields for the first member of the family.

1. Select [Save & New].
   > The patient is saved in the database, but their information is still displayed in the dialog box.
2. Modify the information in the dialog box.
3. Select [Save & New] if you want to add additional family members to the database, or either [Save] or [Save & Diag] if there are no additional family members to add.

d. Add a patient from an XML database

The Wave Analyzer Medica 800 is XML enabled, allowing data import from compatible XML databases. To import the data to the device, click on the icon located at the top left of the [Measurement] screen.

Once you have imported the data, continue with the measurement. The measurement will be saved with the name and details from the database.

If the icon is grayed out it means that there is no data available for importing. Before beginning to import data, please make sure that your settings are configured properly in the export data configuration.

e. Add a patient from the waiting room

The waiting room feature allows you to import patients from an external XML database. First you must make sure to have the following configurations in the [Settings] menu:

1. *[XML Import]*

   Make sure that this checkbox is selected.

2. *[Path]*

   Click on this field to open a browser and select the path to import the XML data.

3. *[Clear After Import]*

   This button will erase all of the data in the waiting room popup once it has been imported.

   This erases the data found on the path the user selects and once it is erased it cannot be reassessed.

4. *[Save]*

   Click on [Save] to implement these changes.

Only patients' names and birthdates are imported from the XML database. Existing data will not be modified.

Once the settings menu is defined, provided that there is data in the external XML database the

button becomes selectable. Click on the button and the following popup appears:
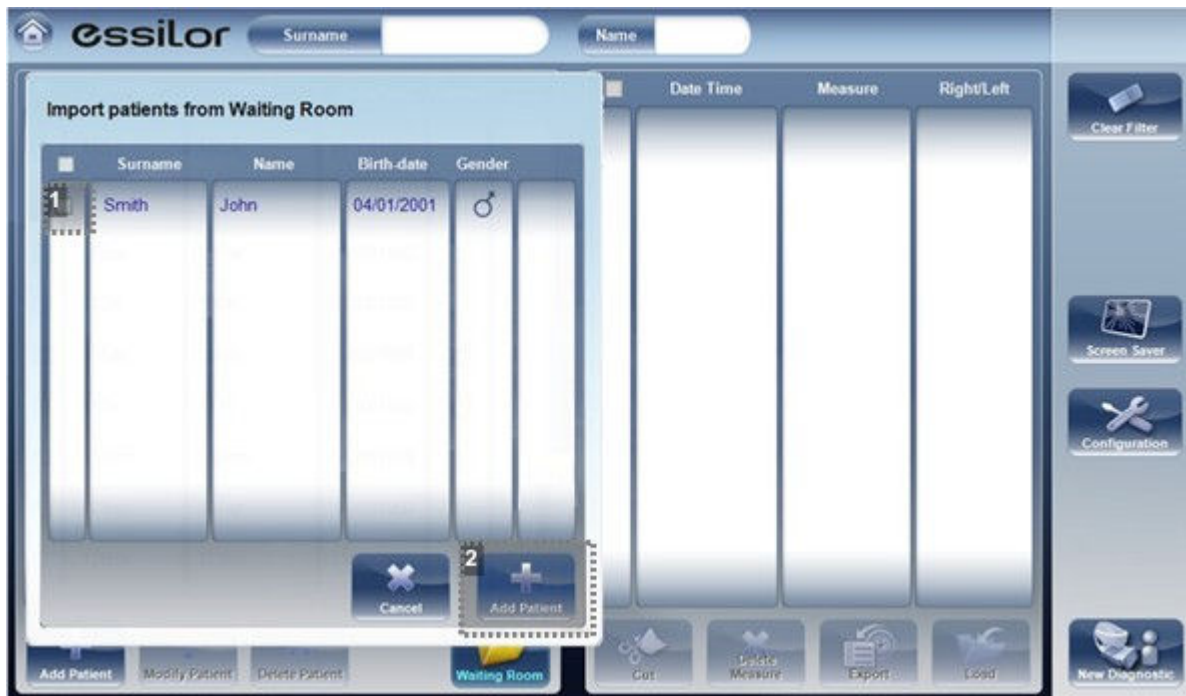
1. *Patient checkboxes*

Select the checkboxes of the patient/s you wish to import.

2. *[Add Patient]*

Click on the [Add Patient] button to import the patient/s. Now, the patients will appear along with the rest of the patients in the patients screen.

2. MODIFY PATIENT'S INFORMATION

1. In the [Patient] screen in the patient list, select the patient.
2. Below the patient list, select [Modify Patient].
   >The Patient Information dialog box opens.
3. Modify the fields as necessary.
4. Select [Save].
   > The changes are saved, and the dialog box closes.

3. SELECT PATIENT

There are two ways patients can be selected:

1. Individually
   Patients must be selected individually in order to see or modify their personal information and to view and manage their test results.
2. As part of a group.
   Patients can be selected as a group in order to delete their records from the database.

a. To select a single patient in order to see the patient's information and test results

In the [Patient] screen, in the patient list, select the patient. The patient's entry in the list is highlighted with a blue border.
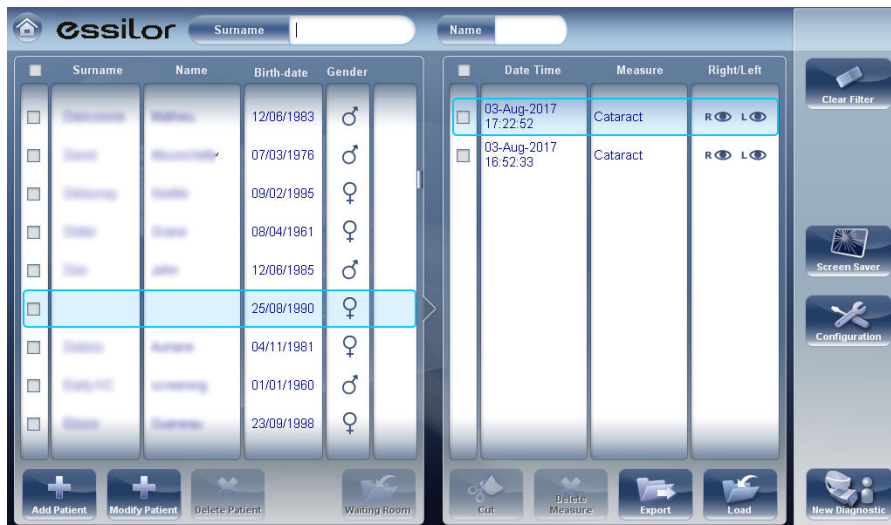
Here, patient selected (as an individual).

b. To select one or more patients in order to delete them

In the [Patient] screen, in the patient list, select the check box beside each patient you want to delete.
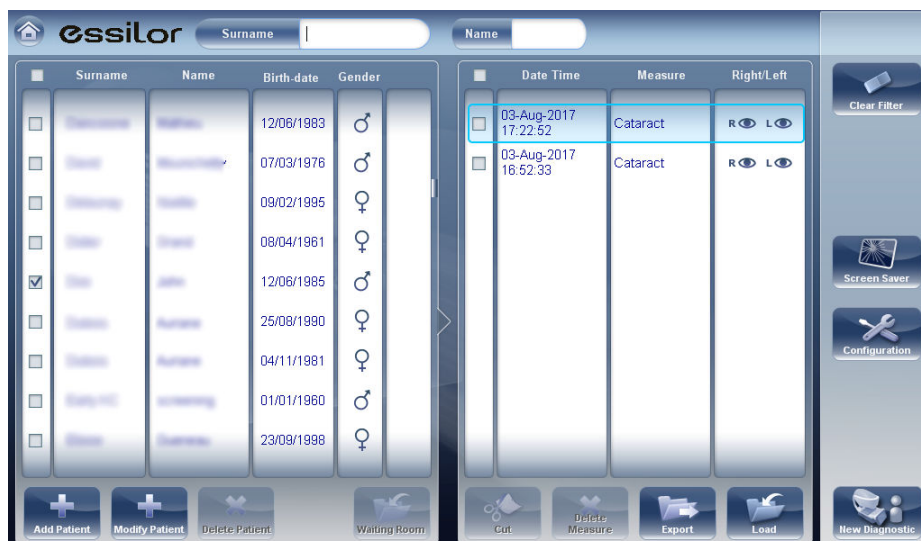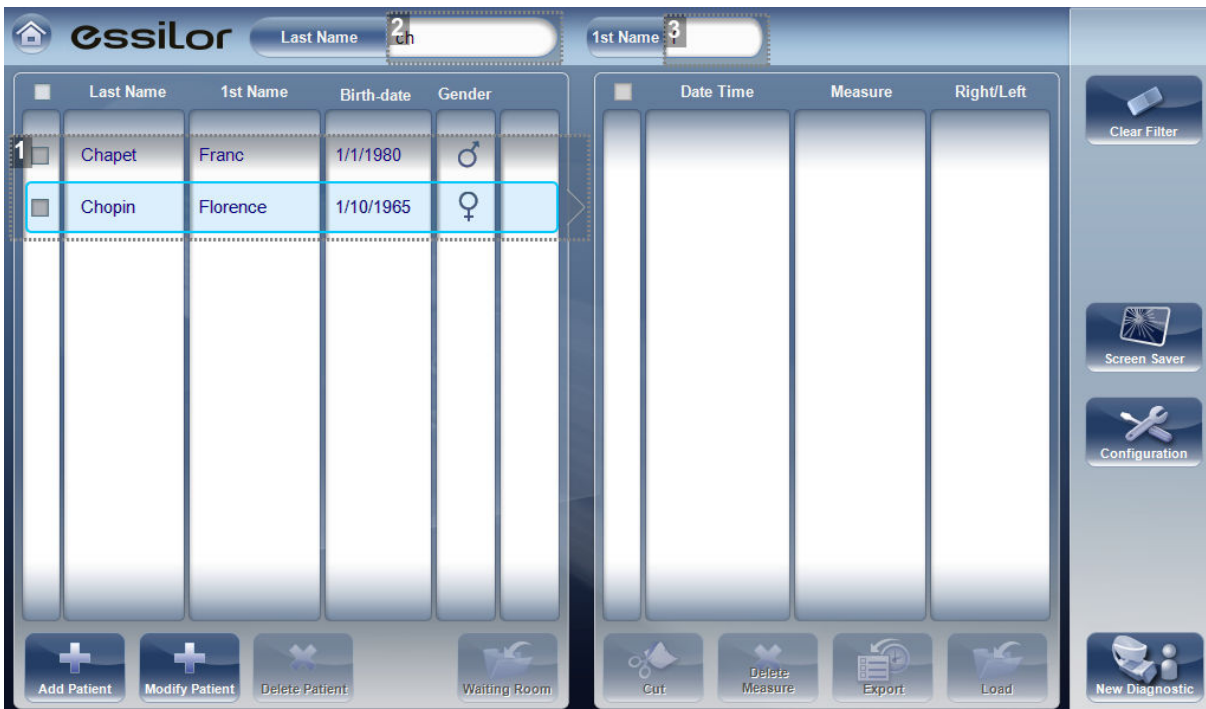

Here, check box selected (to select patients as a group).

Please note, only patients with their checkboxes selected will be deleted.

4. Search for a patient

You can search for a patient by filtering the display so that it only shows patients whose first and/or last names begin with a specified sequence of letters.

1. In the [Patient] screen, at the top of the screen, in the [Surname] field, enter one or more letters from the beginning of the surname you want to see.
   > Only those entries whose surnames begin with the sequence of characters you entered are displayed in the list.
2. In the [Name] field, enter one or more letters from the beginning of the given name you want to see.
   > Only those entries whose given names begin with the sequence of characters you entered are displayed in the list.
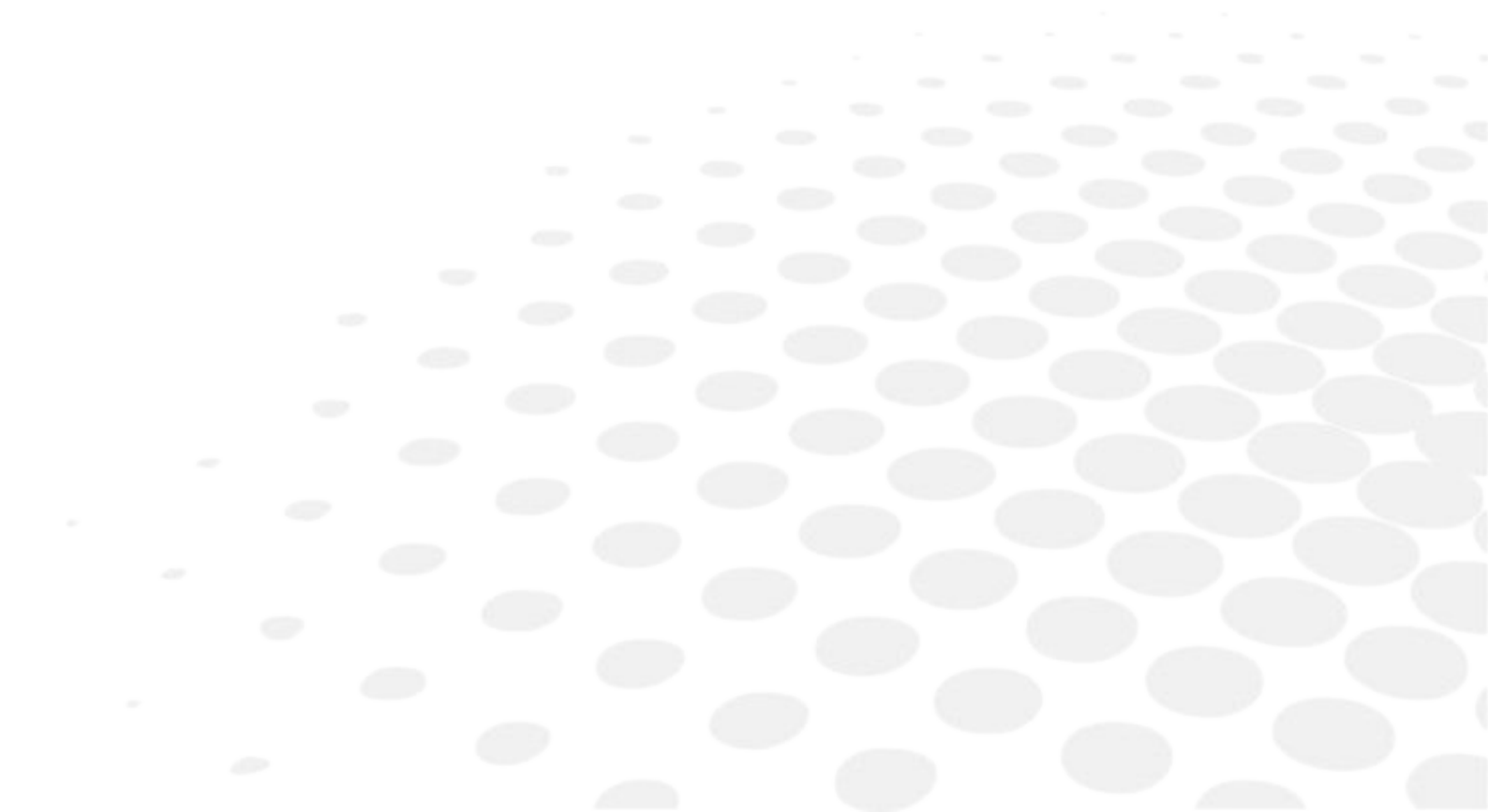

1. *Filtered list*

2. *[Surname] filter*

3. *[First name] filter*

5. DELETE PATIENT

1. In the [Patient] screen, select the check box beside each patient record you want to delete.
2. At the bottom of the screen, select [Delete Patient].
   > You are prompted to confirm that you want to delete the selected patients.
3. Select [Yes].
   > The patient records are deleted from the list.
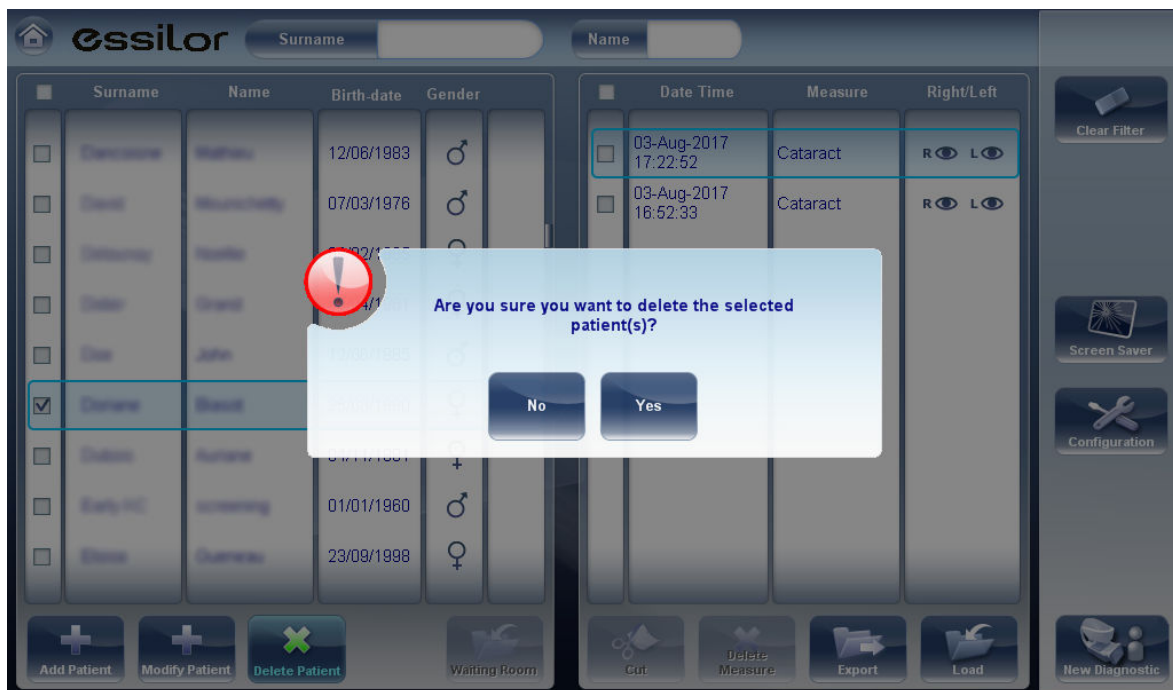
VI. Perform a diagnostic

1. Initiate a diagnostic ...

You can initiate a new diagnostic procedure by opening the [Measure] screen. The [Measure] screen can be opened from any of the following screens:

- [Home]
- [Patient]
- [Results]

Once the [Measure] screen is opened, you can prepare the patient and select the test options, as explained under, prepare to run a diagnostic, and then select [Go] to begin running the diagnostic tests.

a. ... From the [Home] screen

To initiate a new diagnostic procedure from the [Home] screen, you need only select the [Measure] screen option.

Note that if you open the [Measure] screen directly from the [Home] screen, no patient is selected. The system automatically generates a patient name for the results, with [Temp] as the surname and a number as the first name (e.g., [Temp 1184"]. Temporary records remain in the database until you delete them manually or they are deleted by the system during routine maintenance. At any time before they are deleted, you can convert them into permanent patient records by adding patient information to them, or by cutting the results from the temporary patient record and pasting them into a permanent record.

b. ... From the [Patient] screen

In the [Patient] screen, you can initiate a new diagnostic procedure in a number of ways:

1. Select [New Diagnostic] with no patient record selected.
   > The [Measure] screen opens with a temporary patient name [Temp] + a number.
2. Select a patient record and then select [New Diagnostic].
   > The [Measure] screen opens for the selected patient.
   > After you run the diagnostic procedure, the results are automatically saved in the selected patient's record.
3. For a new patient, in the [Add Patient] dialog box, fill in the patient's information, and then select [Save & Diag].
   > The patient record is added to the database, and the [Measure] screen opens for the new patient.
   > After you run the diagnostic procedure, the results are automatically saved in the new patient's record.

c. ... From the [Results] screen

When the [Results screen] is open, either immediately after a diagnostic procedure was completed, or when the results were loaded from the patient's record, select [Measure] to open the [Measure] screen for the patient. You can then run some or all of the tests over again or run additional tests.

2. Prepare to run a diagnostic

After you open the [Measure] screen, there are a number of things you should do before you start running the diagnostics:

- Clean the headrest. Make sure the pachy filter is clean and use the anti-fog spray on a weekly basis.
- Place a new sheet of protective paper over the chinrest, or clean the chinrest.
- In the [Measure] screen, in the list of available measures, select the diagnostic you want to perform. The tests needed to perform the selected diagnostic are highlighted in the list of tests.
- In the upper-right corner, select whether you want to perform the diagnostics on the right eye, the left eye, or both.
- Under position, select [Adult] if the patient is an adult, or [Child] if the patient is a child. The unit's head and chinrest move to the default positions for the selected type of patient.
- If you are performing the WF test and/or the tonometer test, and you want to modify the parameters of these tests (the number of measures to take), in the [Measure] screen, select parameters. In the dialog box that opens, modify the parameters as required, and then select [OK] to save the changes.
- Instruct the patient to sit down, place their chin on the chinrest, and lean their forehead on the headrest.
- If you need to fine-tune the position of the chinrest, select the chinrest up and down arrows as necessary to move the chinrest up or down.
- If you need to adjust the position of the unit's head, select the up, down, right, and left arrows on the edge of the lens view as necessary to move the head up, down, right, or left.
- Instruct the patient to look at the target (balloon). You should see their eye in the image of the lens view in the [Measure] screen.
- Align the patient's pupil with the center of the target.

Once you have done all of these things, select [Go] to begin the diagnostic.

3. Manage the diagnostic procedure

The diagnostic procedure is managed in the [Measure] screen. In this screen, you can select the diagnostic you want to perform, position the unit head and chinrest so that the patient's eye is centered in the camera view, modify default test settings, start the diagnostic procedure, and monitor its progress.

a. Center the patient's eye

Before beginning a measurement, make sure that the patient's eye is centered in front of the camera view.
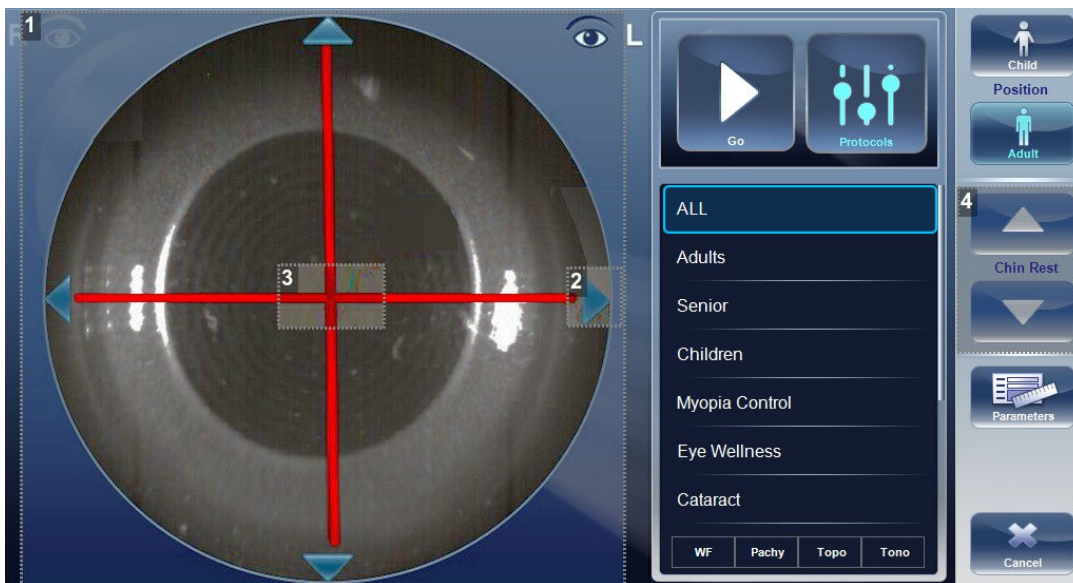
1. *Camera view*

   Shows image of patient's eye as it appears in front of the camera.

2. *Direction arrows*

   Press on arrows to center patient's eye in the camera view.

3. *Camera cross*

   The patient's eye should be in the center of the camera cross.

4. *Chinrest arrows*

   Use the arrows to raise or lower the chinrest.

In the [Measure] screen, you can see the camera view (#1), make sure that the patient's eye is in the center of the cross (#2). To center the eye use the arrows located on the sides of the camera view (#3) to move up, down, left or right. If you don't see the patient's eye in the camera view, you may also need to raise or lower the chinrest by pressing the arrows located on the right side of the measurement screen (#4).

If the eye is visible in the camera view, but not quite centered:
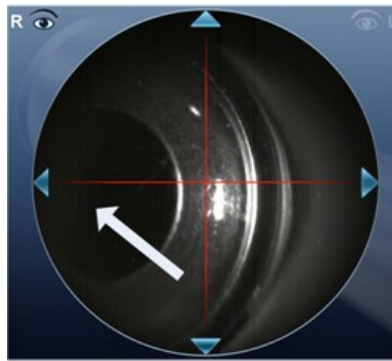
Tap on the center of pupil (from camera view- white arrow), the device will automatically recenter itself around the pupil.

To ensure maximum accuracy, if the examiner accidentally moves the head of the Wave Analyzer Medica 800 so that the patient's eye is not centered in front of the camera view, the device will reposition itself so that it is re-centered in front of the eye.

b. Enhance the wavefront measurement

If the device encounters difficulties while measuring wavefront, a popup window appears allowing the examiner to enhance the wavefront measurement:
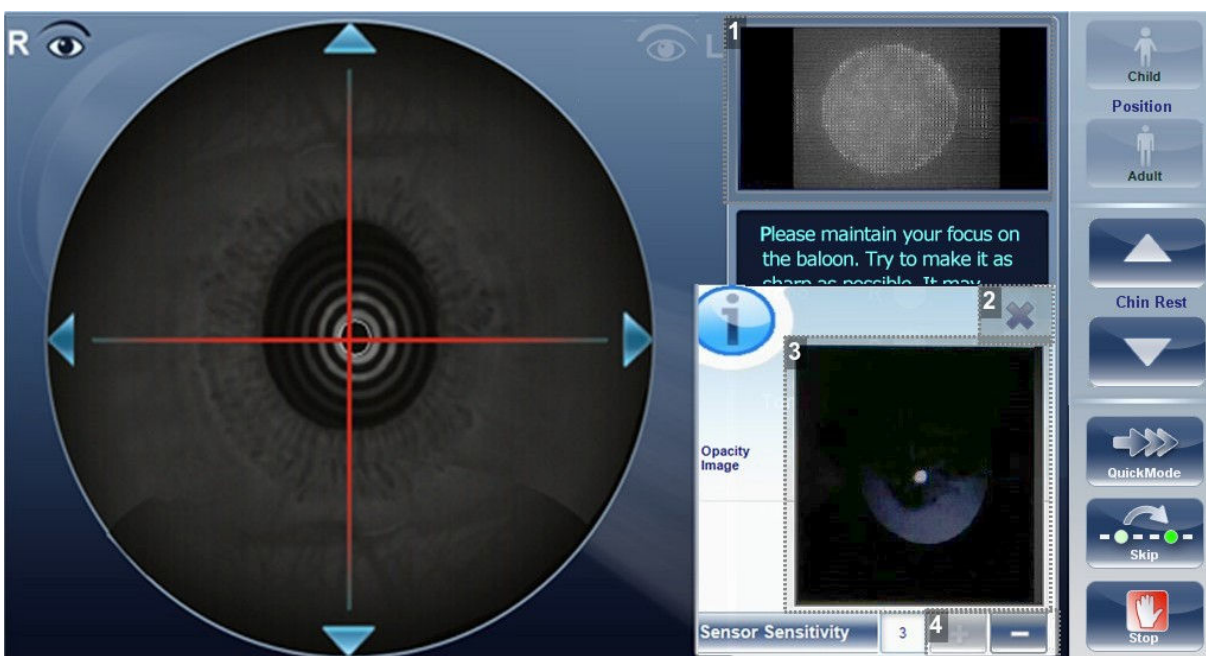
1. *Shack-Hartmann*

Displays the Shack-Hartmann image from the patient's eyes. This image will become brighter or dimmer when the plus/minus buttons are pressed.

2. *Cancel button*

Click cancel to close this popup window and continue with the measurement.

3. *Retro-illumination image*

This shows the retro-illumination image of the patient's eyes and may be an indication of opacities.

4. *Plus/Minus buttons*

To improve the measurement click on the [+] button and the Shack-Hartmann image will be enhanced. If the measurement is still unsuccessful click on the [−] button (the Shack-Hartmann image will become dimmer).

c. Skip a measure during diagnostic

During a diagnostic, a [Skip] button is located at the lower-right side of the screen. Select the button to skip the current test and begin the next test, if any more tests remain, or end the diagnostic and display the results in the [Results] screen.

If a test is skipped during a diagnostic procedure, the circle representing it is marked with a red X ( ).
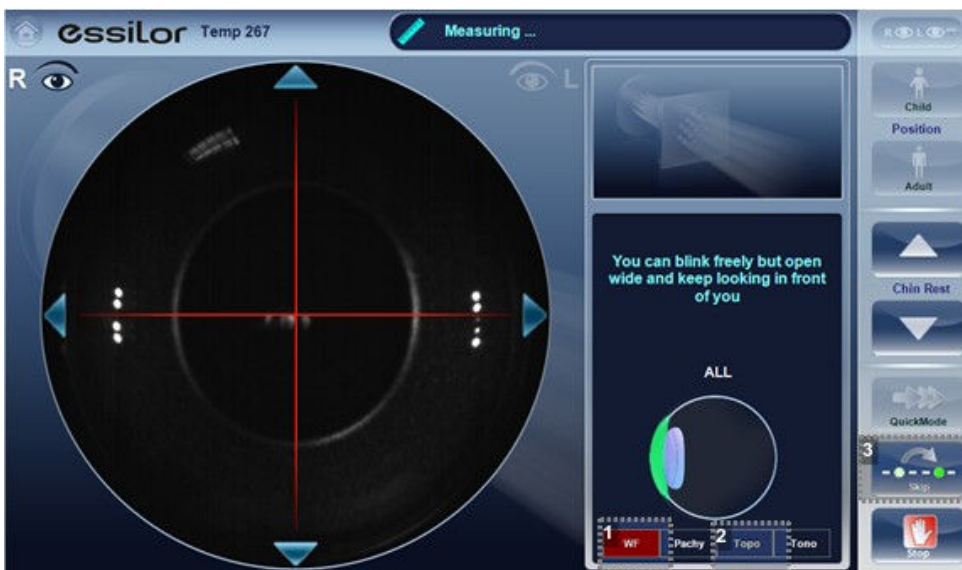
1. *Test skipped*

2. *Next test underway*

3. *[Skip] button*

d. Speed the measure process up

Once you have started running a diagnostic, you can choose to make the measurement process faster if necessary.

In the [Measurement] screen, select [Quick Mode].

> This only works for the wavefront measurement.
> In the [Measurement] screen, select [Stop].

### e. Stop a diagnostic before is completed

When a diagnostic is running, you can choose to stop it at any point.

f. Glaucoma evaluation

The Wave Analyzer Medica 800 provides glaucoma evaluation by measuring both intraocular pressure (IOP) via air-puff tonometry, as well as pachymeter measurement to evaluate anterior chamber depth and irideo angles. You can run the glaucoma evaluation as a stand alone measurement, or select the all measurement, where it is automatically included.

After the unit completes the pachy measurement, it descends to the tonometer mode. It uses the centering and focusing acquired from the pachy measurement to center and focus the tonometer measurement.

The following screen will appear after the measurement completes two scans without taking a measurement.
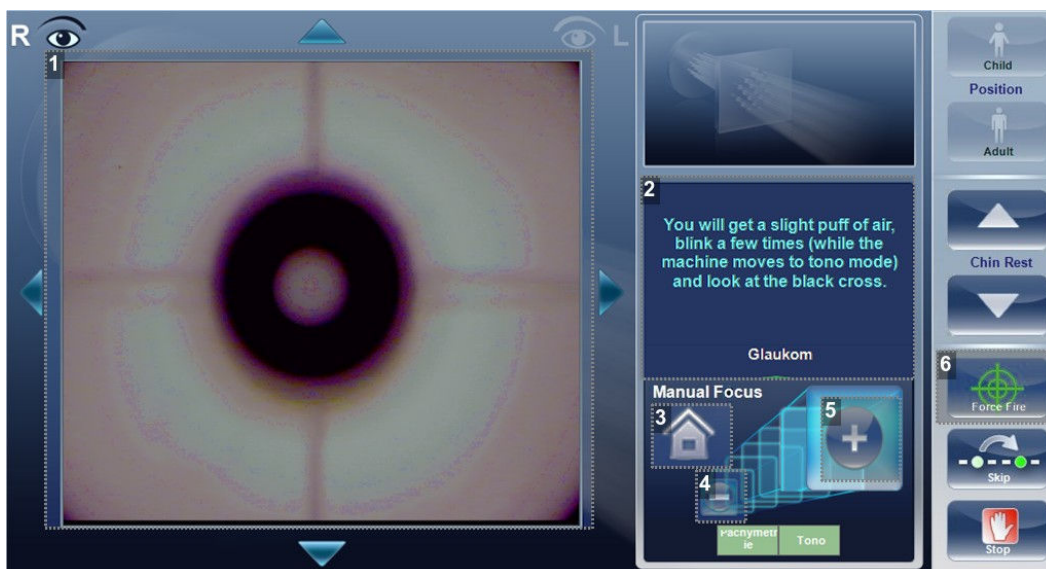
1. *Focus of corneal cross*

Once focused, the cross appears like this.

2. *Message*

To help the measurement along, ou can use the plus/minus focus button.

3. *Home*

Click this button to move he head to home position. This position is farther away from the patient than the initial focus point.

4. *Minus*

Select the [—] button to move the focus further from the eye.

5. *Plus*

Select the [+] button to move the focus closer to the eye.

6. *[Force Fire]*

When you are satisfied with the focus, you can select [Force Fire] to take a measurement, or wait for the device to take a measurement.

Ask the patient to focus on the black dot. To automatically get the measurement the Wave Analyzer Medica 800 needs to be centered and focused. The cross should be focused and clear behind the black large dot. By default, the tonometer will usually do the measurement automatically, but if it fails to autofocus after several tries, it allows you to make changes with the manual focus buttons.
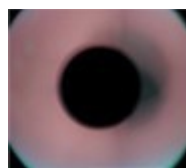
How to help the tonometer focus

If one circle is around the other, click on the grey circle to align both circles. Once centered, the tono will fire the puff automatically.
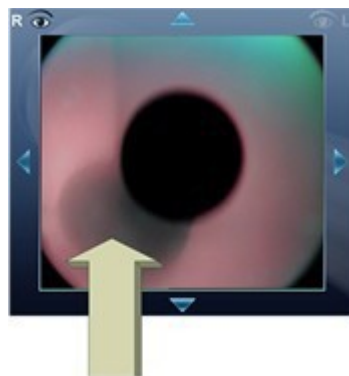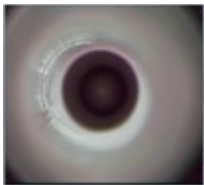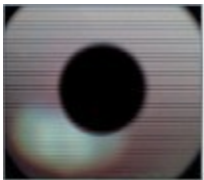

If the grey circle is blurry.

Press on the [+] button continuously until satisfied with the focus, and then the tono will fire the puff automatically.

Troubleshooting

If your camera view looks like this	What to do
	The cross is not focused, the cross is not visible, only one white circle is visible. Press on the continuously until the cross becomes focused. If the cross becomes blurry again, you passed the focus, press on the button until it becomes clear again. When if focus, the tono will fire the puff automatically.
	The circle is centered, the patient moved. Push the house icon to get back to your initial point and then continue to focus and center the cross and circle.
	The cross is not focused, press the continuously until the cross becomes better focused. If the cross becomes blurry again, you passed the focus, press the button until satisfied with the focus. The tono will fire automatically at the correct focus.

Focused and centered but no measurement taken

If the circles and cross are focused and clear, but the device has not taken a measurement, you can force the device to take a measurement by pressing [Force Fire] .

If the device remains in one location, and does not seem to be autofocusing, check tono automation to see if the device is set to semi mode.

Semi mode

By default, the device has an auto focus which is fast and accurate. However, another focusing mode available is semi mode. In this mode, the tonometer will remain at the focal point found by the pachymeter, and correction of the focus must be done by the examiner. To adjust the focus, follow the steps listed above.

Please note, in this mode, the device will remain at a set focus point, and all the focusing will be done by the examiner, no tono measurements will be taken if the device is not in focus.

Demo Puff/Modify number of measurements

If you would like to demonstrate the tono puff for your patient, select the Parameters button and then press [Demo Puff].

This popup menu also allows you to modify the number of times each eye is measured by the tonometer:

g. Manual focus

Manual focus will automatically be activated if the device is unable to get a good focus, enabling the examiner to correct the focus manually using the and buttons. It may be activated in the following modes:

1. Topo measurement
2. Pachy
3. Tono

How do you know if you are in manual focus?

There is an indicator when the device was is not able to autofocus. The topo measurement and the pachy and tono measurements have an indicator: .

Pachy manual focus indicator

During the pachy manual focus, you will see two indicators, the image above (with the house icon), as well as the warning message, "Step 1: Center and Focus the rings and select Acquire".

Tono manual focus

For instructions on improving the tono focus, go to Glaucoma evaluation.

Topo manual focus

During the topo measurement, if device is unable to focus automatically, it will switch to manual focus.

The following screen will appear:
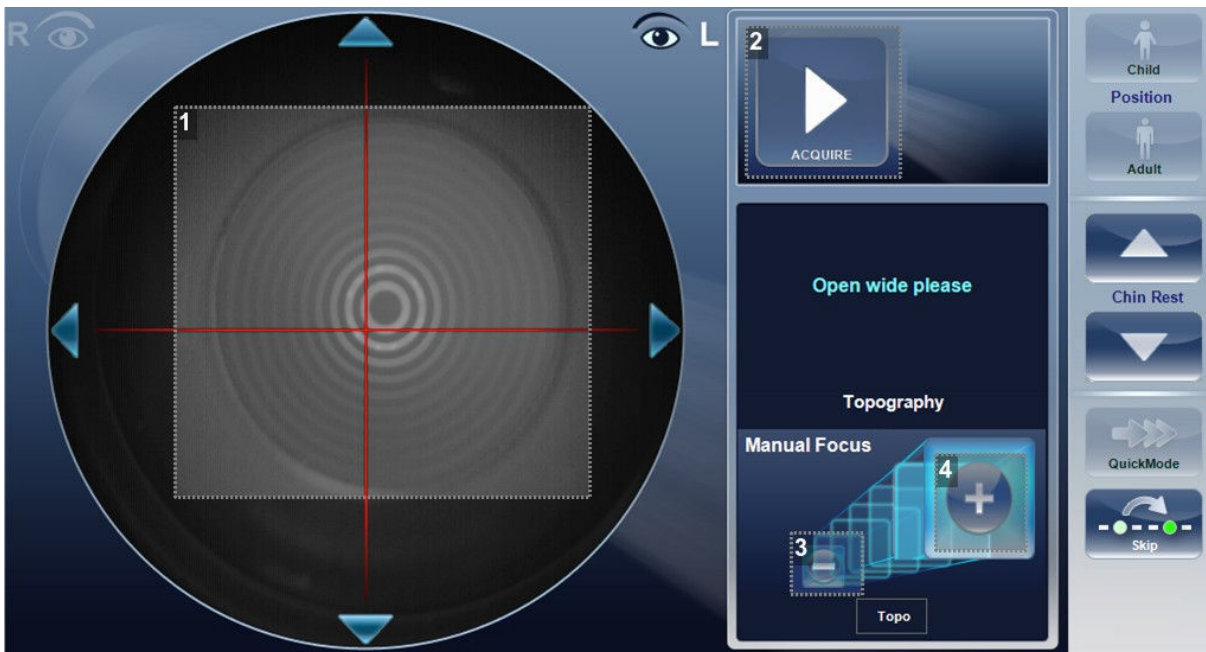
1. *Corneal rings*

These rings should be as sharp and as dark as possible.

2. *[Acquire]*

Press this button once you are satisfied with the focus of the corneal rings.

3. *Minus*

Select the [−] button to move the focus further from the eye.

4. *Plus*

Select the [+] button to move the focus closer to the eye.

This is also the first step to pachy manual focus.

Pachy manual focus

Immediately before the device switches to pachy manual focus, a message appears, "Step 1: Center and Focus the rings and select ACQUIRE".

Select [OK], and complete the steps listed in topo manual focus.

Once that step is completed, you will see a message, "Step 2: Use the focus buttons to align the cornea Apex and then select Acquire."

After selecting, "OK", you will see the following screen:
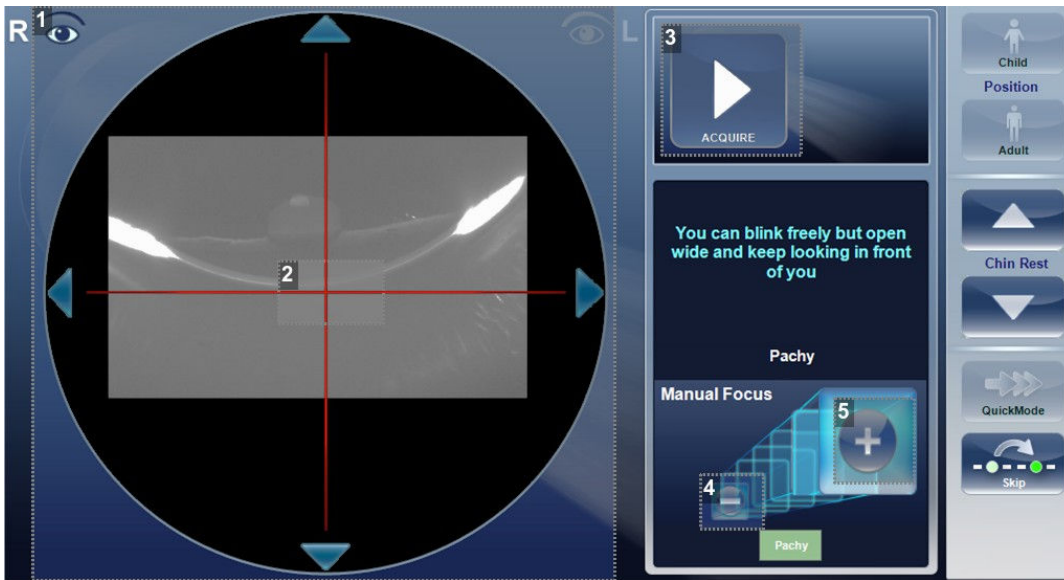
1. *Corneal Apex*

The corneal apex should be aligned in the center of the cross horizontally, vertically it should be slightly above the red cross (as seen in the image above).

2. *Cross*

The cross is used to center the corneal apex vertically and horizontally.

3. *[Acquire]*

Completes measurement

4. *Minus*

Select the ▬ button to lower the corneal apex.

5. *Plus*

Select the ✚ button to move the raise the corneal apex.

Sometimes, the cornea is not centered above the cross accurately, and may appear below it or above it. For example, if it appears like this:

IMAGE OF THE CAMERA VIEW	HOW TO FIX IT
Cornea is too low- illustration	Use the [+] and [−] buttons to lower or raise it until it is centered.
Cornea is centered- illustration	Cornea is centered properly, you can continue with measurement, press [Acquire].
Centered corneal image	This is a properly centered corneal image.

After completing this step, select [Acquire].

h. Near vision testing

Add near vision testing to the wavefront diagnostic

In the [Measurement] screen, select the [Parameters] button:

1. *Add near vision*

   Select the checkbox to add a near vision measurement along with the wavefront.

2. *[WF Measurements]*

   The number of wavefront measurements to perform.

3. *[Tono Measurements]*

Select to modify number of tono measurements to perform.

4. *[Reading Distance]*

The distance to perform the near vision test, from 30-60cm.

5. *[Cancel]*

Closes the dialogue box without saving.

6. *[Save]*

Saves the user's preferences.

7. *[Demo Puff]*

Select to demonstrate tono air puff.

4. Work with the test results

The test results are displayed automatically in the [Results] screen as soon as the diagnostic procedures are finished. You can choose from a variety of ways to display the results in the [Results] screen. In addition, you can print the results, export them to a file on an external device, or initiate additional diagnostics from within the [Results] screen. The test results are also automatically saved in the patient database, so you can see them again at any time.

Please note, if automatic export is selected, the exports will be performed after exiting the results.

a. Retake/Add a measurement

Retake

If for some reason, you are dissatisfied with the results of your examination, there is an option of retaking the measurement before exiting the results menu. Immediately after completing the measurement, select

the [Measure] button .

After selecting the diagnostic you wish to perform, the following screen opens:
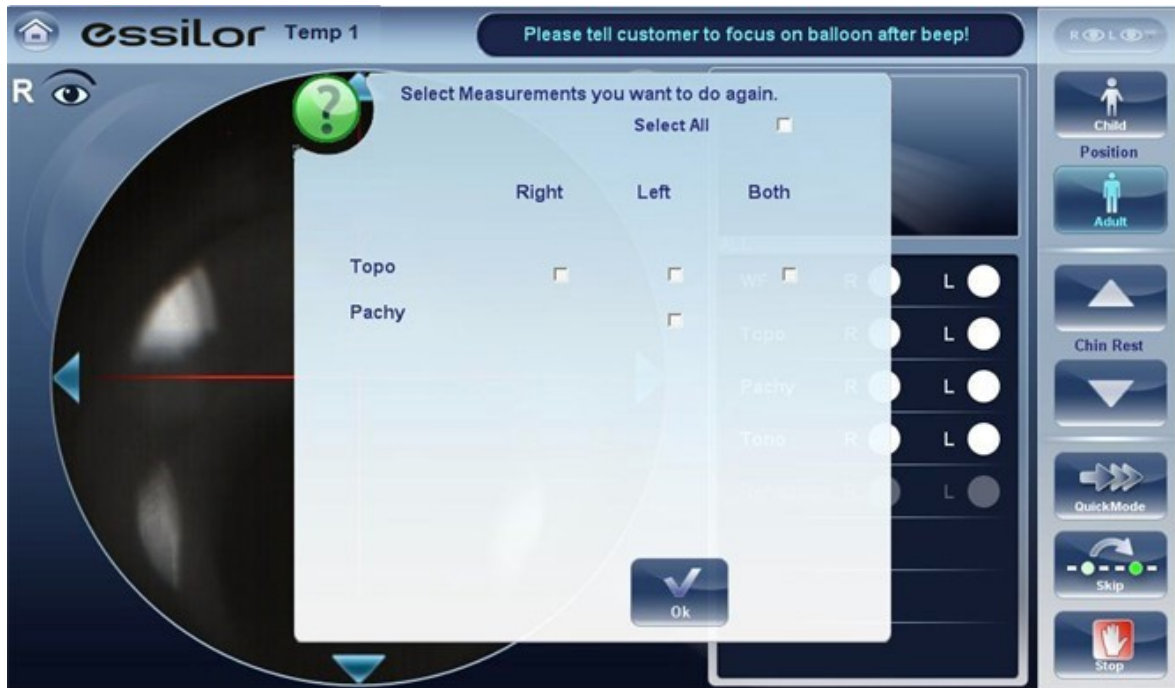
If the new diagnostic selected, contains measurements that were already performed, the device will ask you if you wish to repeat them. Select the measurements you wish to be repeated, and then select, [OK].

Continue on with the measurement as normal.

Add

To add measurements to your results screen, select the [Measure] button immediately after completing the measurement. If no measurements are to be repeated, this popup menu will not open. Select a diagnostic and continue with the examination. The additional will appear in your results screen along with your previous measurements.

When you repeat a measurement via the [Measure] button, the previous results are erased.

b. Export the results to a phoropter

From the [Results] screen, you can export test results to a phoropter that is either connected directly to the unit through its serial port or its USB port, or can be accessed over the network to which the unit is connected.

1   In the [Results] screen, select the [Export] button .

2 Under [Data Transfer], select [External Device].
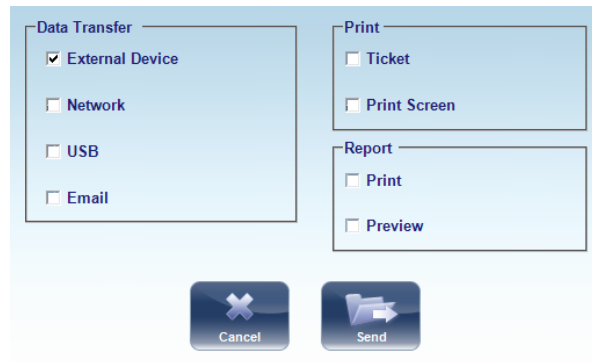
3 Select [Send] .

> The test results are sent to the phoropter.

Make sure that the phoropter is selected in the [Export settings] menu and that it is properly connected to the Wave Analyzer Medica 800.

c. Export the results to a computer or USB storage medium

From the [Results] screen, you can export test results to a computer that can be accessed by the Wave Analyzer Medica 800 via the local network, or to a USB storage medium (such as an external hard disk, a flash drive, or a memory card in a card reader connected to the unit's USB port) connected to the unit, from the [Export] dialog box.

1 In the [Results] screen, select the [Export] button .

2 Under [Data Transfer], select [Network] or [USB].
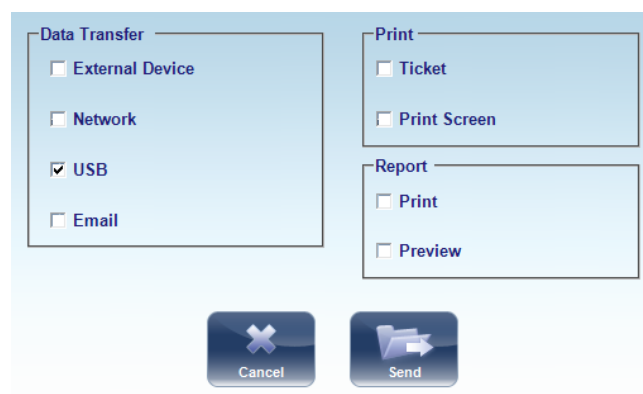
3 Select [Send] .

4 Browse for your preferred location and select [OK].

Make sure that the devices are connected to the Wave Analyzer Medica 800.

Before connect a USB memory stick, please check that them to ensure it is virus free.

d. Export the results to an external device

1 In the [Results] screen, select the [Export] button .

2 Under [Data Transfer], select [External Device].
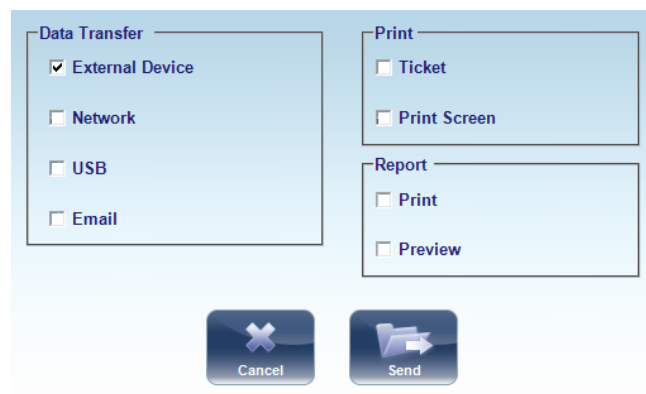
3 Select [Send] .

Make sure that the devices are connected to the Wave Analyzer Medica 800 and that external device is configured properly in the [Export settings] menu.

e. Export the results to an Email

From the [Results] screen, you can export test results to an email message to a default recipient, or to a new recipient.

1 In the [Results] screen, select the [Export] button .

2 Under [Data Transfer], select [Email].
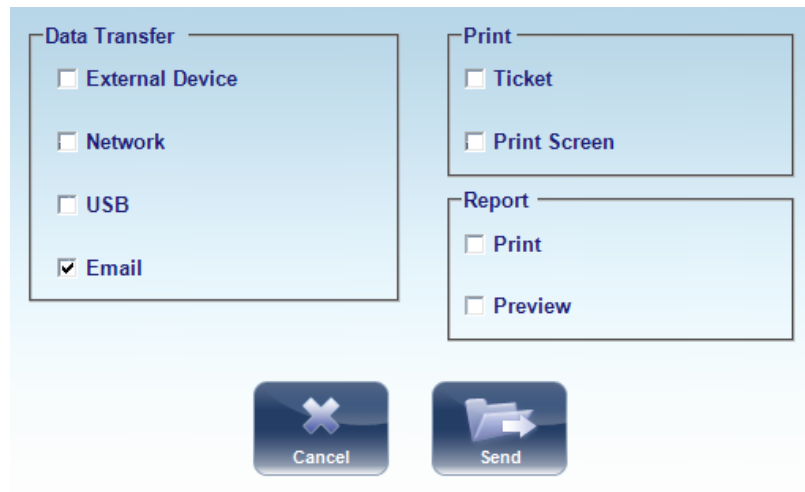
3 Select [Send] .

> The following screen will appear:
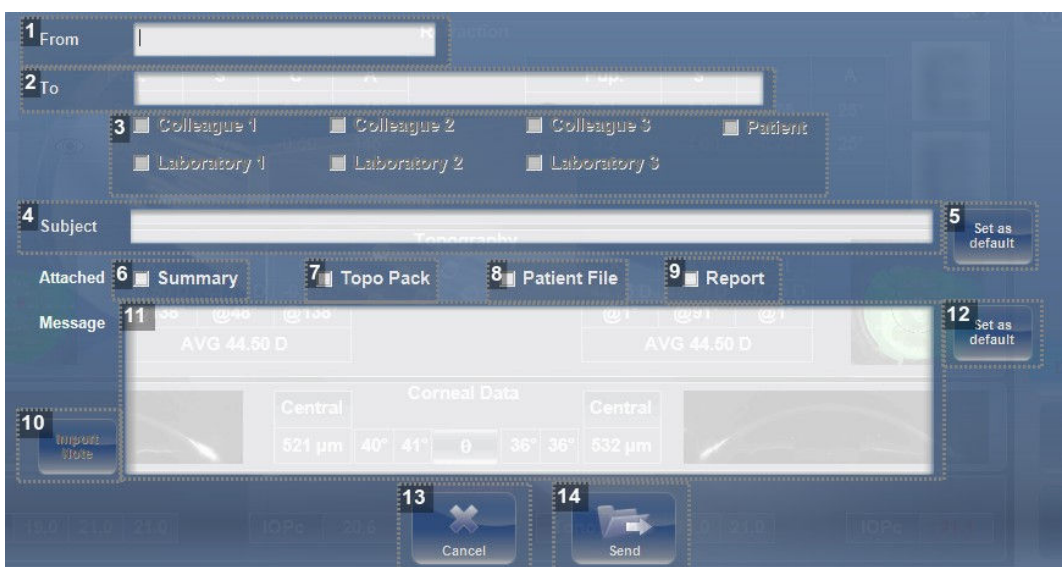
1. *[From]*

This displays by default the name of the sender from the settings menu.

2. *[To]*

Type the email address you want the information sent to in this field or go to (#3) to select the default recipient.

3. *Default recipients*

The default recipients are displayed here. To send an email, select the checkboxes next to the names you want the email sent to. Both colleagues and laboratories are available for selection.

4. *[Subject]*

This can be free text or a default subject. To select the current subject as default, click on (#5), [Set as default] button.

5. *[Set as default]*

Sets the message as default message.

6. *[Summary]*

Select to add summary screen to the message.

7. *[Topo Pack]*

Includes the elevation maps.

8. *[Patient File]*

This is the patient's data in a zip file.

9. *[Report]*

This is the pdf file of the patient's report.

10. *[Import Note]*

Includes the note from the patient file in the body of the message.

11. *Message box*

Add your message here.

12. *[Set as default]*

Sets the message as default message.

13. *[Cancel]*

Cancels the message.

14. *[Send]*

Click to send the message.

> To send an email, the email settings must first be configured in the [Printing/Email] settings menu.

f. Export to Remote Access

Data is automatically exported to remote access immediately after taking a measurement (by default). However, if for some reason, you wish to retroactively export the data, it is possible to do so, via the [Rebuild Remote Access] button in the [Settings] menu.

g. Print the test results

From the [Results] screen, you can print the test results by exporting them to the built-in printer.

1 In the [Results] screen, select the [Export] button .

2 Under [Print], select [Ticket].
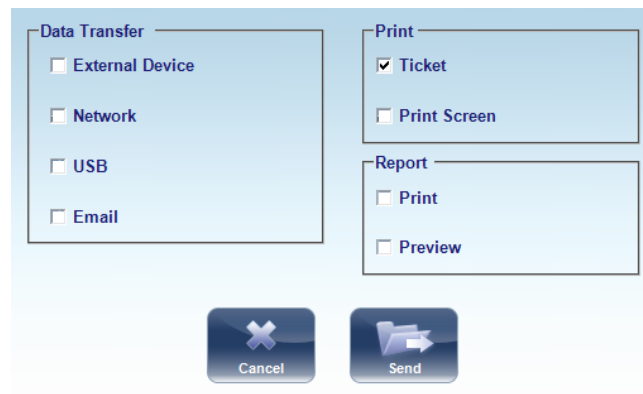
3 Select [Send] .

Print a screen capture of your results

1 In the [Results] screen, select the [Export] button .

2 Under [Print], select [Print Screen].
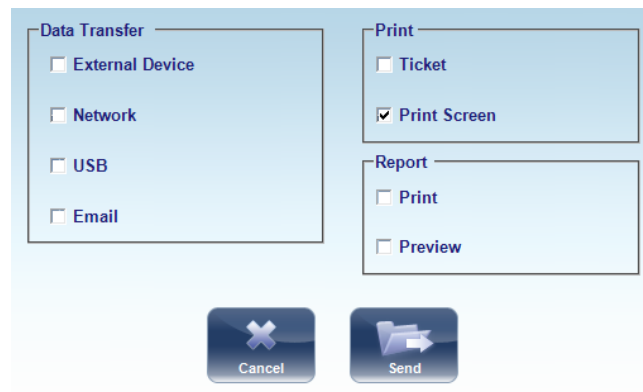
3 Select [Send] .

To print to an external printer, you must have it selected in the [Export Print] settings menu.
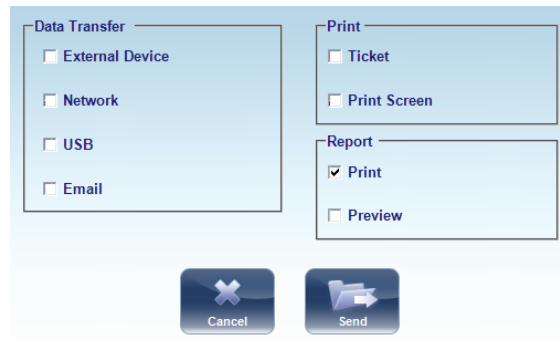
h. Generate a report

1 In the [Results] screen, select the [Export] button .

2 Under [Report], select [Print].

3 Select [Send] .

> The report viewer window opens:
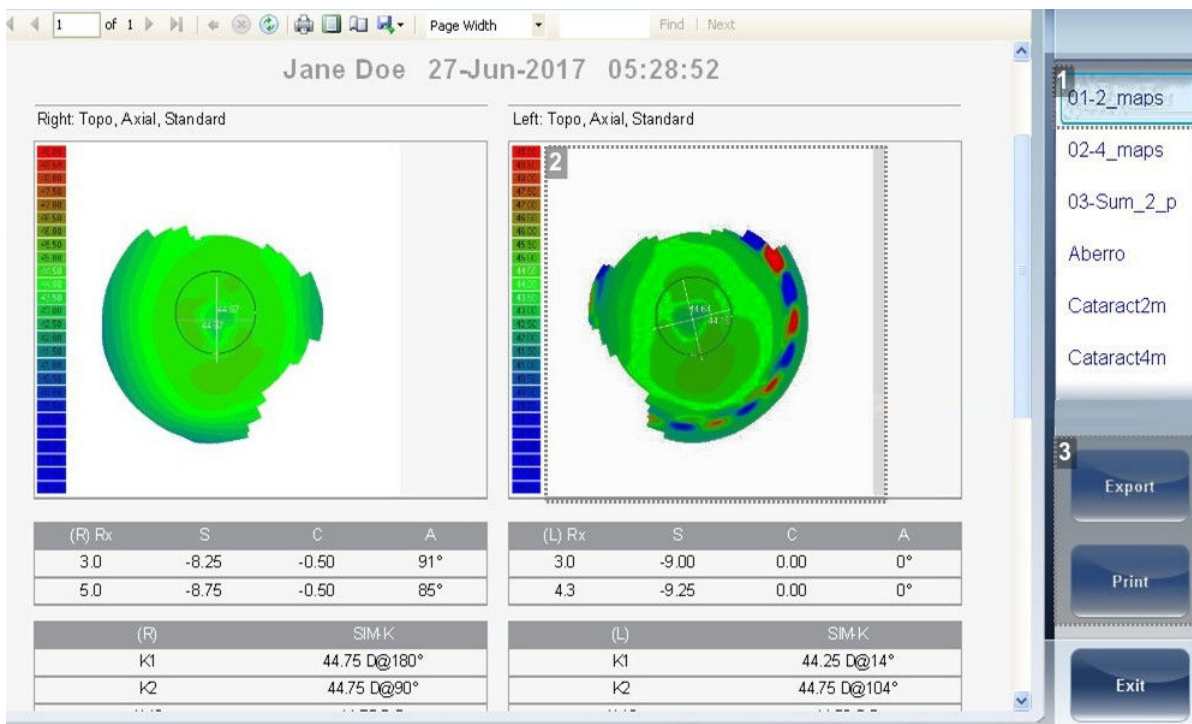
1. *Template menu*

Select the report template according to your preferences.

2. *Maps*

This shows a preview of the maps and data available in the report.

3. *[Export] / [Print]*

Select [Print] to print the report, or [Export] to send it to another device.

i. Save the test results

The test results are automatically saved in the database. If a patient was selected before the diagnostic was initiated, the test results are saved under the patient's name. If no patient was selected when the diagnostic was initiated, the system generates a temporary name, with surname [Temp], and a number for the first name (e.g., [Temp 1185]).

Temporary test results are automatically deleted from the system at given intervals (once a day, week, or month, depending on the configuration setting).

If you want to save a temporary test result permanently, you must either cut the results from the temporary record and paste them into a normal patient record, or add the correct patient information to the temporary record. Both of these actions can be performed in the [Patient] screen.

VII. Manage the list of test results

Stored test results are managed in the [Patient] screen. The results are stored under the patient's name.

To see the list of test results for a patient:

In the [Patient] screen, on the left side of the screen, select the patient's entry. The patient's entry is highlighted with a blue border, and their test results are listed on the right side of the screen.

1. SELECT TEST RESULTS

There are two ways test results that are stored in the database can be selected:

1. Individually.
   Select the result you wish to modify, and then you can view, print, or export it.
2. As part of a group.
   In order to move them from one patient record to another, or to delete them from the database.

To select one or more test results in order to move or delete them: In the [Patient] screen, in the result list, select the check box beside each result you want to delete.
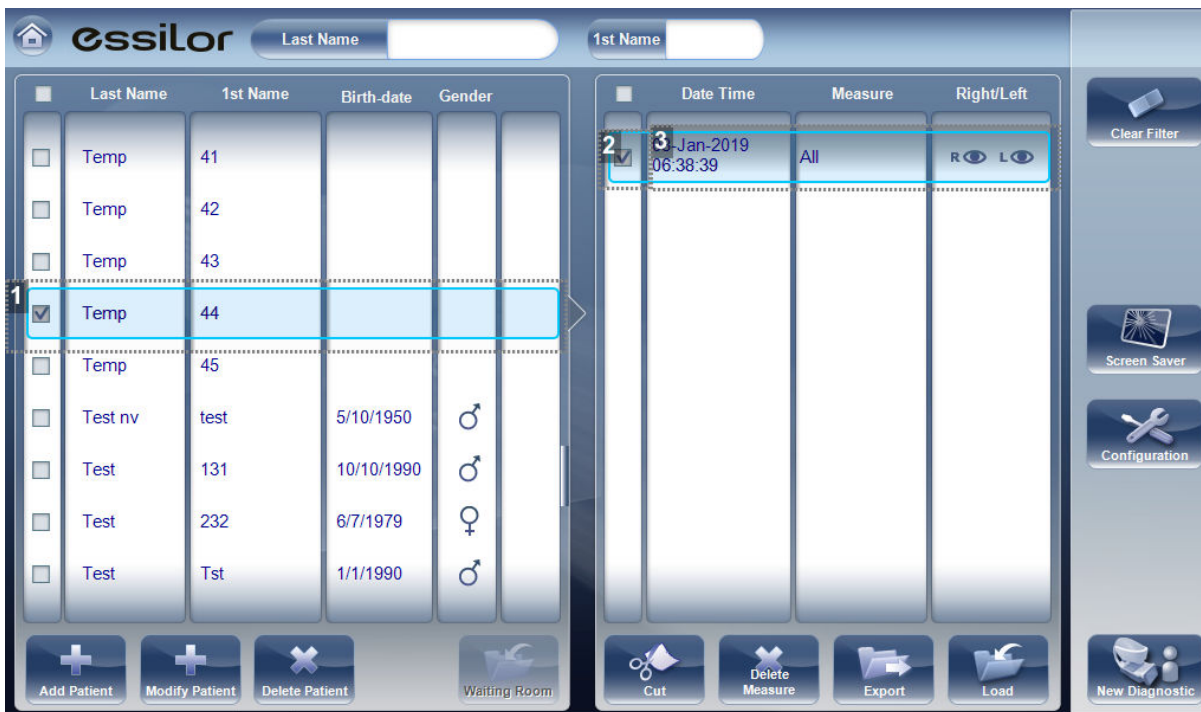
1. *Selected patient*

2. *Check box selected*

   To select results as a group.

3. *Result selected*

   As an individual.

2. LOAD TEST RESULTS

In the [Patient] screen, in the result list, select the result. The result is highlighted with a blue border.

At the bottom of the list, select [Load]   .

The selected test result is opened in the [Results] screen.

3. EXPORT TEST RESULTS FROM THE [PATIENT] SCREEN

Test results can be exported from the [Patient] screen to the built-in printer for printing as a ticket or to a file on an external device connected to the unit.

1   In the measures list, select the measure you want to export.

>   The measure is highlighted with a blue border.

2   Select the [Export] button   .

>   The [Export] dialog box opens.
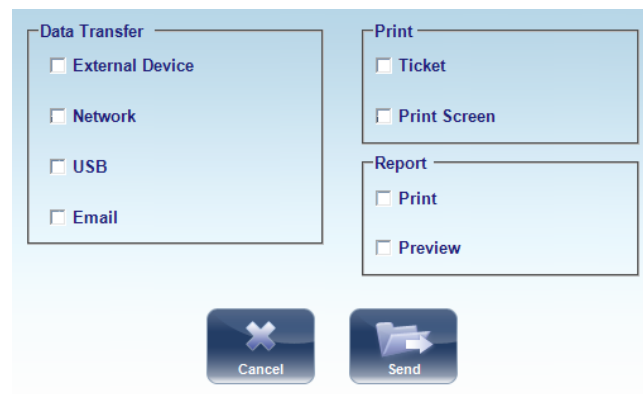
3   To print the test results on the built-in printer, under [Print], select [Ticket].
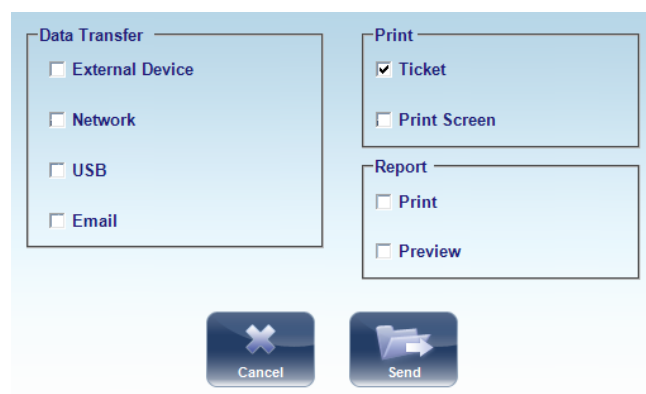
4 Select [Send] .

> The ticket is printed.

Or,

5 To export the test results to an external file, under [Data Transfer], select [External Device].
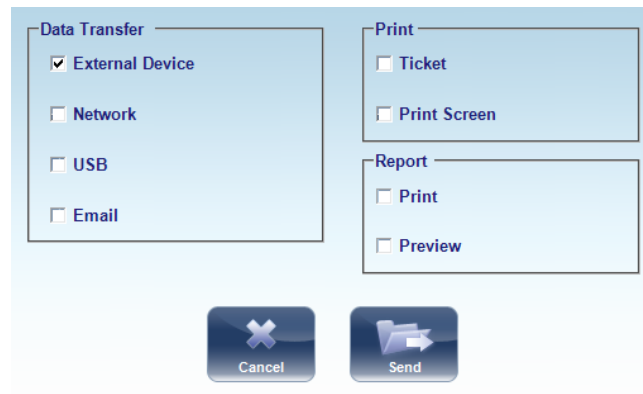
6 Select [Send] .

> A file saver dialog box opens.

Navigate to the folder in which you want to save the file, enter a name for the file, and select [Save]

 .

4. Export test results from the [Results] screen

Test results can be exported from the [Results] screen to the built-in printer for printing as a ticket or to a file on an external device connected to the unit.

1 In the [Results] screen, select the [Export] button .

> The [Export] dialog box opens.
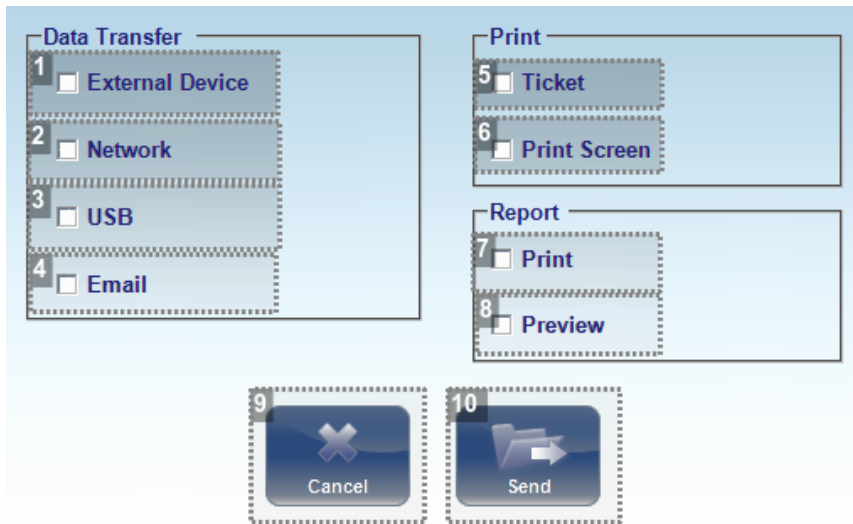
1. *[External Device]*

Select to transfer data from the device to an external device.

For example, XML data (and XML databases), or data to a phoropter head. To view external device options, go to the [Export] settings configuration menu.

2. *[Network]*

Select to transfer data from the device to the network. To view data options and configure an export path, go to the [Export] settings configuration menu.

3. *[USB]*

Select to transfer data from the device to a USB. To view data export options go to the [Export] settings configuration menu.

Warning: before connecting a USB to the device, please make sure that it has been first screened for viruses.

4. *[Email]*

Select to transfer data to email to recipients. Go to [Email] settings, to configure host and recipient options.

5. *[Ticket]*

Allows printing the data on a ticket in the device's internal printer.

6. *[Print Screen]*

Select to print a screenshot of the [Summary] screen, this requires a connection to an external printer.

7. *[Print]*

Prints the report selected as default in the [Printing] menu, this requires a connection to an external printer.

8. *[Preview]*

Opens a report preview of the measurement results.

9. *[Cancel]*

Cancel the selection and the transfer.

10. *[Send]*

Confirms the selection and performs the transfer.

2 To print the test results on the built-in printer, under [Print], select [Ticket].
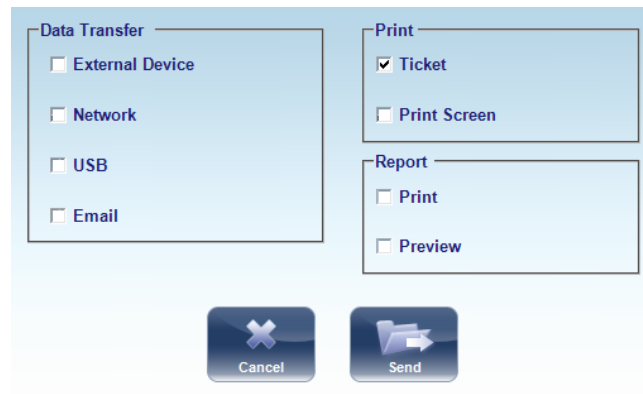
3 Select [Send] .

> The ticket is printed.

Or,

4 To export the test results to an external file, under [Data Transfer], select [External Device].
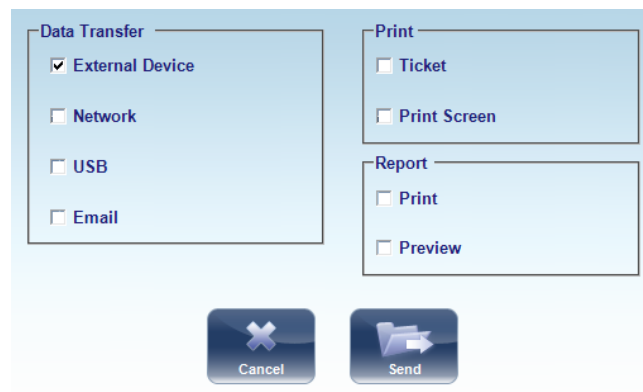
5 Select [Send] .

> A file saver dialog box opens.

Navigate to the folder in which you want to save the file, enter a name for the file, and select [Save]

.

If [Automatic Export] is selected, the results will be exported to the location specified in the

settings menu after clicking [Exit] .

5. MOVE TEST RESULTS TO A DIFFERENT PATIENT

1 In the [Patient] screen, in the results list, select the result.

> The result is highlighted with a blue border.
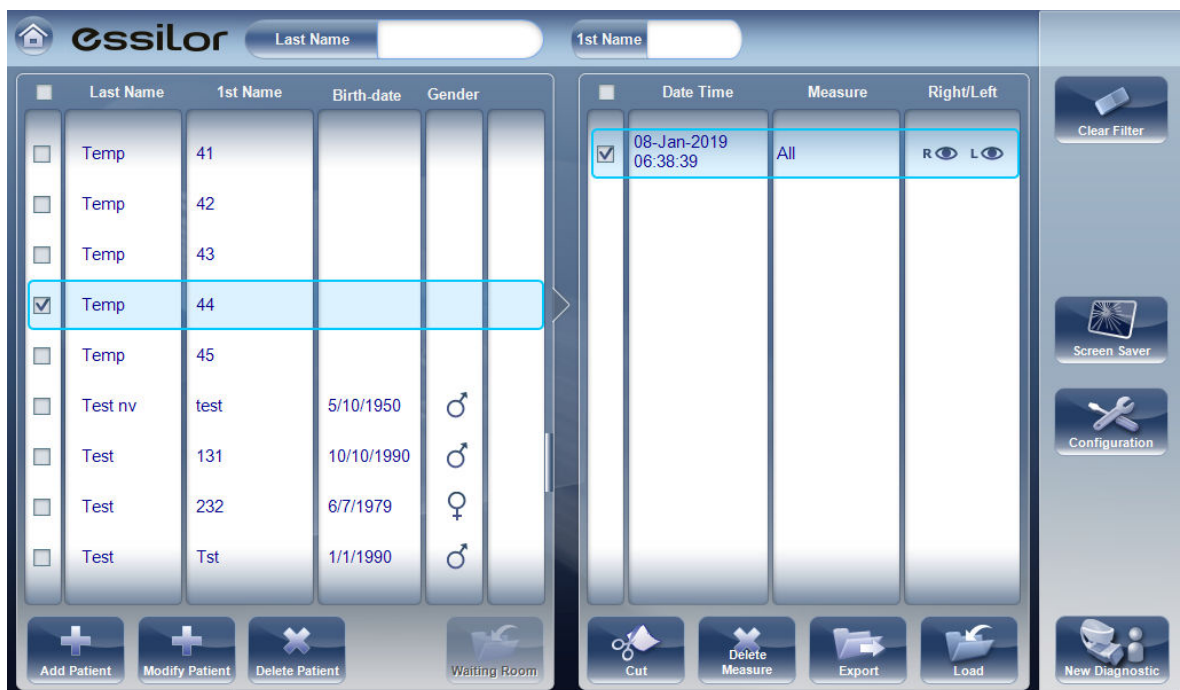
2 Select [Cut] .

> The selected test result is removed from the current patient record. The patient selection is cleared, and, as a result, no patient is selected and no test results are listed in the results list.

3 Select the patient entry to which you want to move the test results.

> The patient entry is highlighted with a blue border.

> The [Cut] button is replaced with a [Paste] button .

4 Select [Paste] .

> You are prompted to confirm that you want to paste the selected test results into this entry.

5 Select [Yes] .

> The test results are added to the selected patient record, and appear in the list of test results on the right side of the screen.

6. DELETE TEST RESULTS

1 In the [Patient] screen, select the check box beside each test result you want to delete .

2 Select [Delete Measure] button .

> You are prompted to confirm that you want to delete the selected measures.

3 Select [Yes] .

> The test results are deleted from the patient record.

VIII. MANAGE THE DATABASE
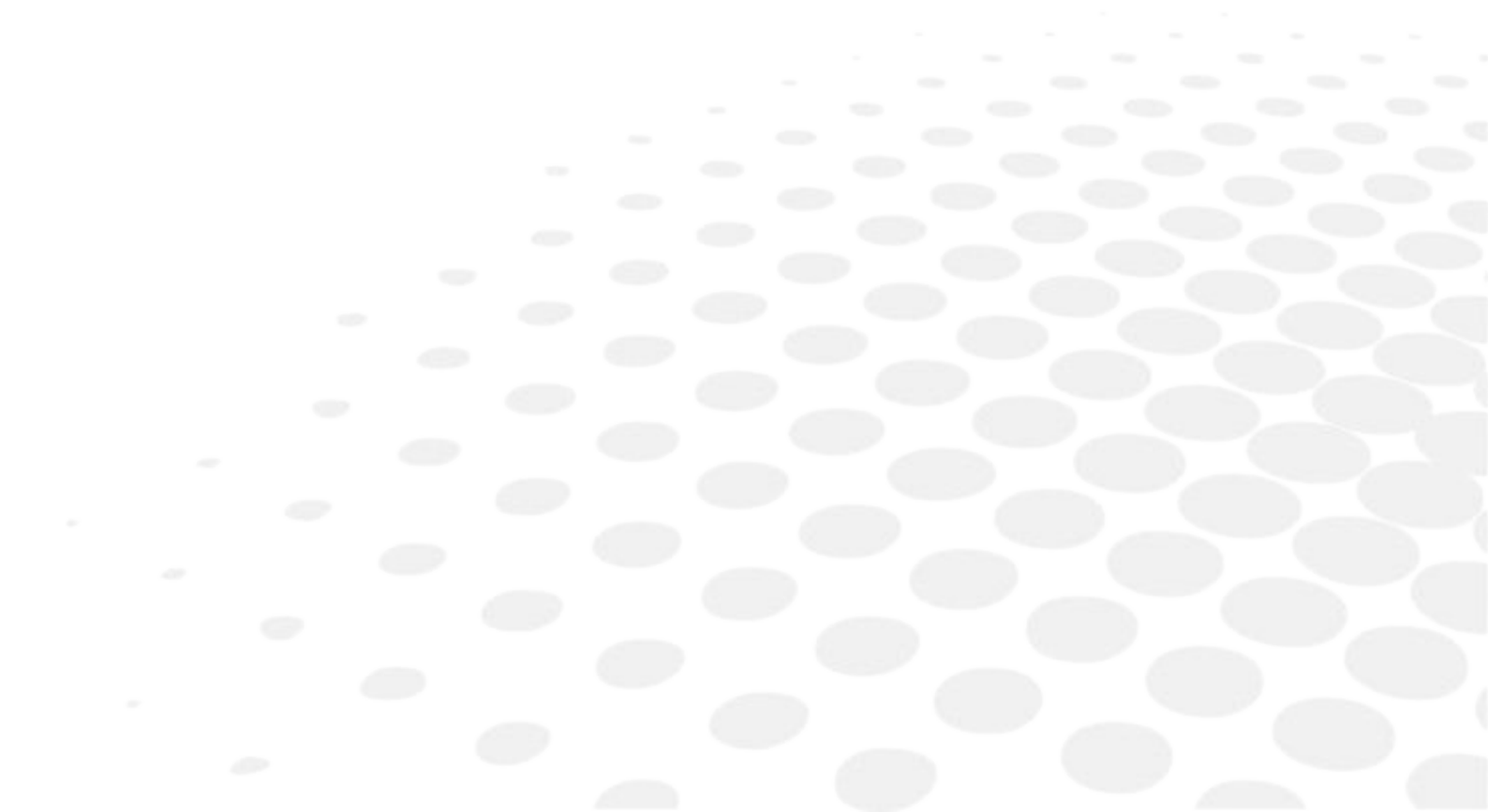
The patient database contains all the patient information stored by the system. All test results are associated with specific patient records; even if you preformed diagnostic tests without inputting any patient information, the results are stored in the patient database under automatically generated temporary patient records.

You can also:

- Export the entire contents of the database to an external file as a backup
- Import patient records that were previously exported
- Delete all of the patient records, or all of the temporary patient records, from the database.

1. EXPORT AND IMPORT THE DATABASE

You can export the entire database to a folder that is stored on an external device, such as a USB hard drive or flash drive, or a PC that is on the same LAN as the Wave Analyzer Medica 800. You can also import the data from any the manufacturer database. It is possible to either import an entire database or just the data for a single patient.

a. Export your database to an external device

1 Select [Maintenance].

> The following screen opens:

2 In the [Database] section on the right, select the [Backup] button .

> A browse for folder dialog box opens.

3 Navigate to the device on which you want to save the exported database data, and select (or create and select) the folder in which you want to save the data.

4 Select [OK].

> The backup begins.

A folder called ClientDB is created in the folder you selected, and the data from the database is saved in it. A copying dialog box opens and shows the progress of the backup, and a database backup in progress message is displayed.
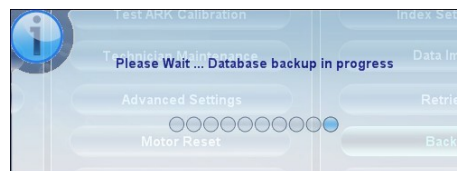
> When the backup is completed, a new message appears asking if you want to clean the data from the Wave Analyzer Medica 800 database.
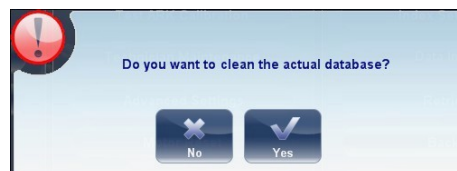
5 If you want to delete all of the data from the database on the Wave Analyzer Medica 800 unit, select [Yes]. Otherwise, select [No].

b. Import data from an exported database

1 Select [Maintenance].

> The following screen opens:

2 In the [Database] section on the right, select the [Data Import] button ![Data Import].

> A browse for folder dialog box opens.

3 Navigate to the device on which the database data is located, and select the ClientDB folder in which it is stored.

> If you wish, you can import the data for a single patient rather than all the data in the database. To do so, in the ClientDB folder, select the patient's folder.
>
> The name of the folder contains the patient's full name, birth date, and gender.
>
> For example, the folder called Melodie#Emma#12-03-65#f contains the data for Emma Melodie, whose birthday is 12.3.65 and whose gender is female.

4 Select [OK].

> The data import process begins. A copying dialog box opens and shows the progress of the import, and a retrieve database in progress message is displayed.

During the import process, you may be prompted to confirm that you want to overwrite an existing folder with an imported one if they both have the same name. Data for new patients will be added to the existing database, and will not be overwritten in your database. Select [Yes] to overwrite the existing data.

2. Delete all temporary patient records

Temporary patient data is automatically deleted from the database either every day, week, or month, or never depending on the configuration settings addition, you can manually delete all temporary data at any time.

1 In the [Patient] screen, in the surname filter, type [Temp].

> Only patient records whose surname field begins with [Temp] are displayed. This includes all of the temporary patient records in the database.

2 In the title bar of the [Patient] list, select the check box.

Ensure that there are no patient records displayed that are not temporary records (that is, records of patients whose surnames begin with "Temp"). If there are any, clear the check boxes beside their names.

3 Below the [Patient] list, select [Delete Patient].

> You are prompted to confirm that you want to delete the selected patient records.

4 Select [Yes].

> The selected patient records are deleted.

3. DELETE ALL PATIENT RECORDS

If necessary, you can delete the entire patient database.

1 Select [Maintenance].

> The following screen opens:

2 In the [Database] section on the right, select the [Data Deletion] button .
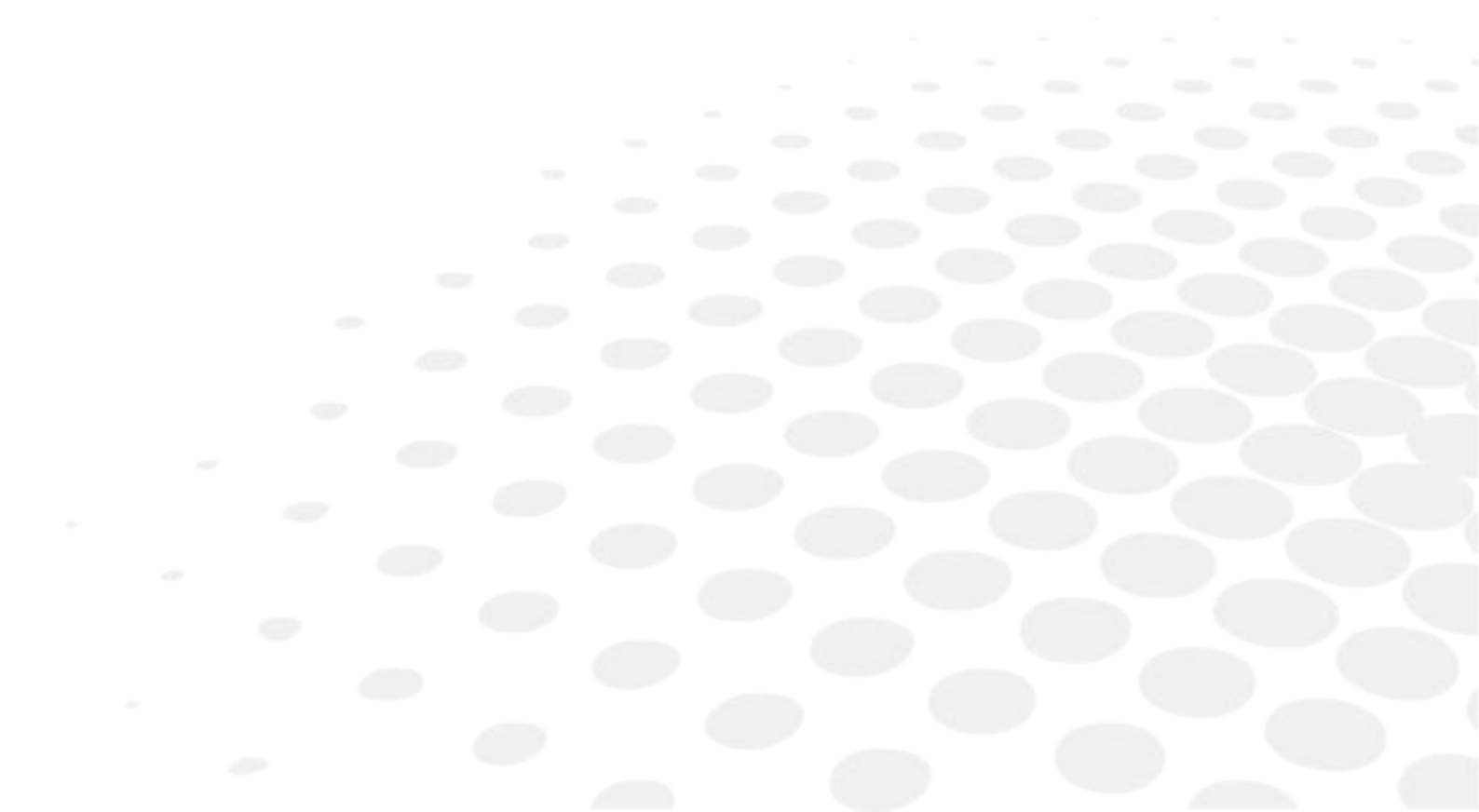
> A message appears.
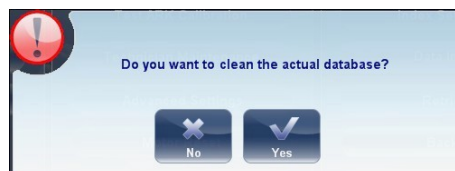
3 Select [Yes].

> You are prompted to confirm that you want to delete all of the records in the database.

> A deleting dialog box opens, and shows the progress of the deletion process. When the process is completed, the dialog disappears.

IX. GENERAL ACTIONS AND FEATURES

This chapter provides additional information about the Wave Analyzer Medica 800 and how to work with it: using the screensaver and securing the screen with a password, entering text into text fields, connecting a keyboard and mouse to the unit, updating the software, and getting assistance.

1. LAUNCH THE SCREEN SAVER

You can launch the screen saver from either the [Home] screen.

To launch the screen saver, select the [Screen Saver] button .

> The unit can also be configured to launch the screen saver automatically after a specified number of minutes have passed without any user actions.

> We recommend activating and modifying the default password to the screensaver to prevent access by unauthorized people.

2. SECURE THE SCREEN

You can secure the system by requiring a password to deactivate the screen saver. Ideally, you should also configure the screen saver to start automatically after a few minutes with no user activity.

> The default screensaver password is: **frame**

> We recommend changing the screensaver password upon installation. If you are having trouble changing the screensaver, or do not remember it, please contact our technical support team.

3. Enter text

Whenever you select a text field, such as the field in which you enter a patient's name, either a virtual keyboard opens on the screen to enable you to enter characters, or the Windows keyboard opens (if enabled in the [Settings] menu).

In addition, if you wish, you can connect a mouse and/or a keyboard to the unit's USB ports. If you connect a keyboard, you can enter characters into text fields with either the virtual keyboard or the physical keyboard. Similarly, if you connect a mouse, you can select characters in the virtual keyboard either by tapping them on the touch screen or by clicking them with the mouse.

To close the virtual keyboard, select .

Once the Windows keyboard has been selected in the [Settings] menu, it will appear like this:
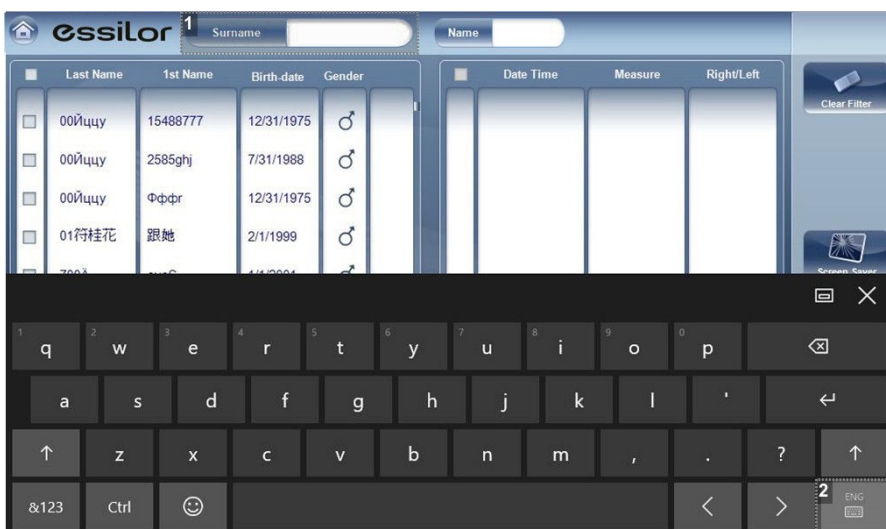
1. *Input fields*

Click on any input field for entering text, such as:

- ◦ Last name
- ◦ First name
- ◦ New patient

> The windows keyboard appears like shown above.

2. *Language button*

Click on this button to select the language options available. Once a language has been added, is it possible to add text in all of the languages in the Windows keyboard menu.

4. UPDATE THE SOFTWARE

When the manufacturer releases a software update, you can use it to update the software on the Wave Analyzer Medica 800 unit.

After receiving the update file from the manufacturer and save it either on the Wave Analyzer Medica 800 itself or on a device to which it can connect.

(For example, download the update file to a USB flash drive and then plug the flash drive into the unit's USB port.)

1 From either the [Home] screen, or the [Patient] screen open the [Configuration] screen.

2 Select the [Maintenance] button.

> The [Maintenance] tab opens.

3 On the left side of the screen, under [Software Maintenance], select [Software Upgrade]

> Software Upgrade .

> **>** A file selector dialog box opens.
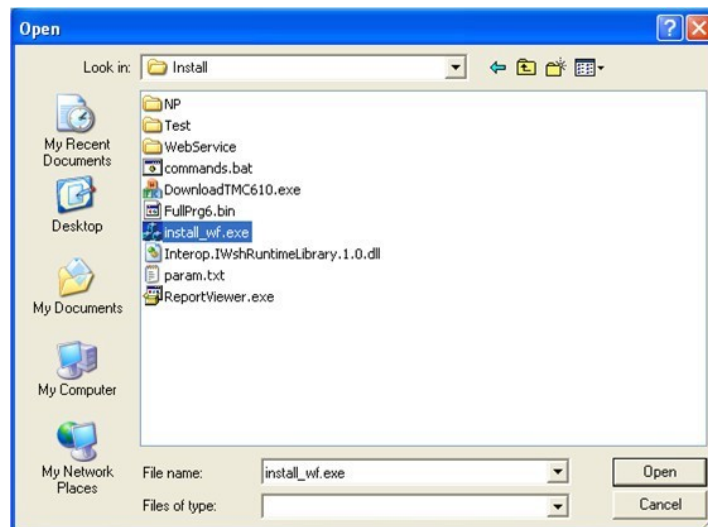
4 Navigate to the update file.

5 Select [OK].

5. INTEGRATED HELP

The Wave Analyzer Medica 800's help manual can be accessed directly from the software.

To access the help files, click on the icon [?] .

To close the help files, click on the "X" located at the top left of the screen.

6. GET ASSISTANCE

If your Wave Analyzer Medica 800 is connected to the internet, technical support staff can connect to the unit on-line if necessary to give guidance and troubleshoot problems. This feature makes use of [Teamviewer], a software package that enables remote control and desktop sharing of PCs.

You can activate [Teamviewer] in the [Configuration] screen, in the [Maintenance] tab.

For additional information about this option, please contact your technical support team.

X. CONFIGURE THE UNIT
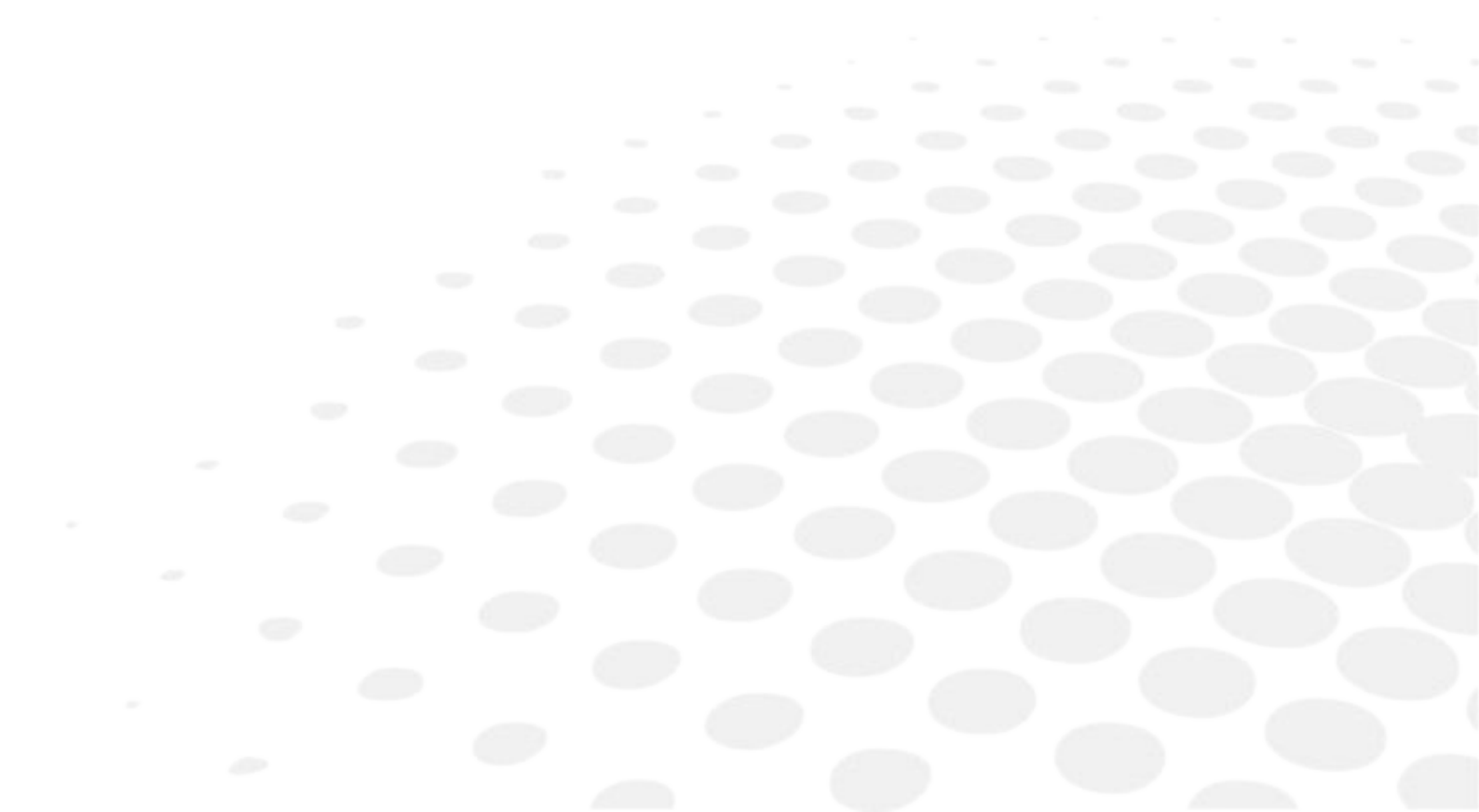
1. ACCESS THE CONFIGURATION SETTINGS

To open the [Configuration] screen from:

- The [Home] screen:

  > Select the [Configuration] screen button

- The [Patient] screen:

  > Select the [Configuration] button .

2. OVERVIEW OF THE [CONFIGURATION] SCREEN

The [Configuration] screen gives you access to the Wave Analyzer Medica 800's settings and system maintenance functions.

1. *Tab buttons*

Select a button to display the tab containing the configuration settings for the category, or select the [Maintenance] tab to access system maintenance functions, such as upgrading the software and calibrating the hardware.

2. *Sub-tab buttons*

Some of the tabs are divided into sub-tabs. Select a button to display the sub-tab.

3. *Functional buttons*

Standard buttons that are available in all the [Configuration] screen tabs:

- ◦ [Turn Off]: Turn off the machine.
- ◦ [Eject USB]: Safely eject hardware device connected to the unit's USB port.
- ◦ [Factory]: Restore the factory settings.
  Note: This does not delete any data.
- ◦ [Cancel]: Cancel all changes that were made to the configuration settings.
- ◦ [Save]: Save all changes that were made to the configuration settings, close the [Configuration] screen, and display the [Home] screen.

3. MODIFY CONFIGURATION SETTINGS

You can modify any of the configuration settings that appear in the various tabs of the [Configuration] screen.

1 Modify the settings you want to change.

You can modify settings in more than one tab without saving the changes, as long as you do not close the [Configuration] screen before you save them.

2 When you have changed everything you wanted to change, select [Save] .

> The changes are implemented, and the previous screen is displayed.

4. GENERAL SETTINGS

The [General] tab of the [Configuration] screen is divided into three sections:

1. Regional Parameters
2. Device Parameters
3. Security

1. *[Regional Parameters]*

Date, time, and language settings.

2. *[Device Parameters]*

Selecting the default screen, and scheduling how often temporary data is cleared from the database.

3. *[Security]*

Screen-saver settings.

4. *[Date]*

Select the current date.

5. *[Format Date]*

Select the format for displaying the date in the interface:

◦ dd/mm/yyyy: European standard, e.g., June 26, 2013 would be displayed as 26/06/2013
◦ mm/dd/yyyy: American standard, e.g., June 26, 2013 would be displayed as 06/26/2013

6. *[Language]*

Select the interface language.

7. *[Use Windows Touch Screen Keyboard]*

Select this to enable the Windows touch screen keyboard (instead of the virtual keyboard). After clicking [Save], you must restart in order for this feature to be implemented.

Note: to change languages, you must add them via the [Language] button.

8. *[Hours]*

Displays the current hour. Select the ➕ and ➖ buttons to reset the current hour.

9. *[Minutes]*

Displays the current minutes past the hour. Select the ➕ and ➖ buttons to reset the current minute.

10. *[Format Time]*

Select the type of hour display to use in the rest of the interface:

- ◦ 12 Hours: The 12-hour clock, with AM and PM to indicate which half of the day is intended
- ◦ 24 Hours: The 24-hour clock

11. *[Default Screen]*

Select the screen you want to use as the default screen. The screen that is displayed when you first turn on the Wave Analyzer Medica 800, and when you select [Exit] to close the [Results] screen.

The default screen can be the:

- ◦ [Home] screen
- ◦ [Patient] screen
- ◦ [Measure] screen

12. *[Warning Beep]*

Select whether or not you would like a beep to sound when a warning message is displayed.

13. *[Clear Data History Every]*

Select how often you want the system to delete temporary patient records from the database.

Note: Temporary patient records are the results of measurements that were performed without being associated with a patient record. They have the surname "Temp" and a number for the first name.

14. *[Screen Saver]*

Select the check box to configure the screen saver to be activated automatically when there has been no user activity for the number of minutes selected under [Wait] (below).

15. *[Wait (min)]*

Displays the number of minutes of inactivity that will cause the screen saver to be activated. Select the ➕ and ➖ button to modify the number.

16. *[Password Protection]*

Select the check box to require a password to deactivate the screen saver.

17. *[Change Password]*

Select this button to change the password.

In the dialog box that opens, under old password, enter the current password.

Note: the default password of the software is "frame" . Please make sure to change this password upon installation.

Under new password, and under confirm password, enter the new password. Select [OK] to close the dialog box.

18. *[Automatic Return to Default Interface]*

Allows the user to quit the [Results] screen and return to the default screen automatically after the selected amount of time. Select this button to modify the time, according to your preference (for example 2 min, 3 min, Never).

5. MEASUREMENT SETTINGS

a. Diagnostic

The [Diagnostic] sub-tab of the [Measure] tab allows you to choose which diagnostics will be available in the list of diagnostics in the [Measure] screen. You can also select which of the diagnostics will be the default test, the diagnostic that will be selected when you first open the [Measure] screen.

1. *[Display]*

Select the diagnostic you wish to display in the menu from the [Measurement] screen.

2. *[Default]*

Select the default measurement, only one measurement may be selected.

3. *[Custom Diagnostic]*

Select the measurements to be included in the [Custom diagnostic].

4. *[Topo/Kerato]*

Select either [Topo], or [Kerato] measurement. Both measurements give K readings, but only the [Topo] generates topography maps.

5. *[Name]*

In this field you can customize the name of the custom measurement.

Configure the list of diagnostics

In the:

- [Display] (#1) column, select the check box of every diagnostic test you want to have available in the [Measure] screen.
- [Default] (#2) column, select the default diagnostic, the diagnostic that will be selected when you open the [Measure] screen.

Scroll down to view additional diagnostics
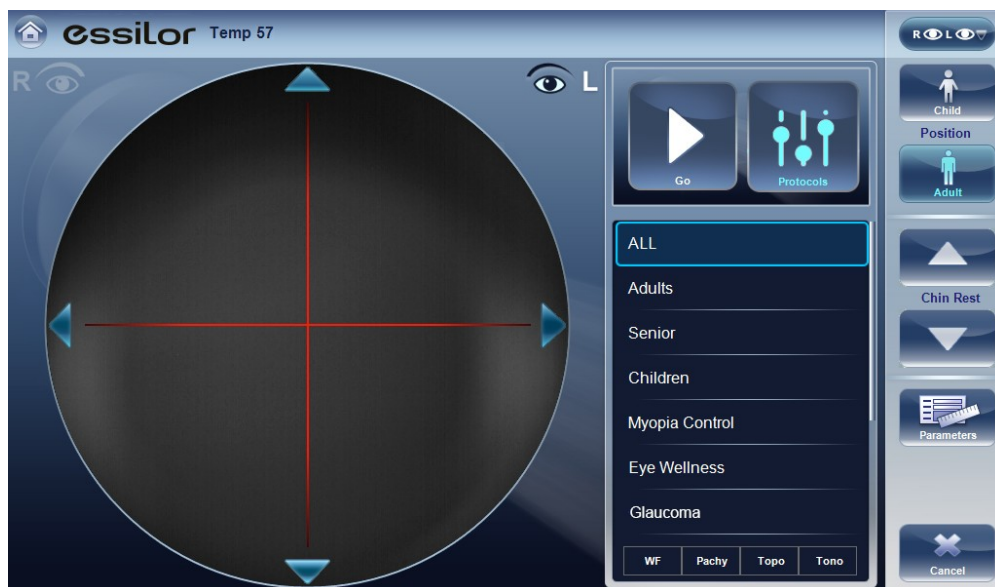
Diagnostic	Description
[All]	Includes wavefront, topo, tono, keratometry, pachy and refraction
[Glaucoma]	Includes pachy and tono measurements
[Refraction]	Includes refraction measurements
[Wavefront]	Includes wavefront, aberrations, and refraction measurements
[Topography]	Includes topography measurements
[Pachy]	Includes pachy measurements
[Cataract]	Includes wavefront, topography and pachy measurements
[Corneal App.]	Includes wavefront, topography and pachy measurements

[C.L. Fitting)	Includes wavefront and topo measurements
[Pupillo]	This measurement displays pupil size and reaction time according to different light conditions.
[Custom]	This measurement can be tailored according to your preferences and may include all of the measurements in the device except for pupillo. Please note: kerato is not available with multi pachy.

To choose a measurement, select it from the list above. Only measurements selected in the [Default] menu will appear in the measurement menu.

b. Default

The [Default] sub-tab of the [Measure] tab has two sections.

1. [Default Device Settings] where you can set default sound and luminosity settings, and choose whether the default head rest and chinrest positions will be for adults or children
2. [Measurement Default Settings] where you can select the default number of times the wavefront and tonometry tests should be performed and whether to include near vision in your wavefront measurements.

You can change the position setting and the number of times the tests should be performed on the fly in the [Measure] screen before you start a measurement.

1. *[Beep]*

Select the volume of the beep sounds that the unit emits during the measurements.

2. *[Target Luminosity]*

Select the luminosity level of the fixation target.

3. *[Position]*

Select whether the default position of the head rest and chinrest should be appropriate for adults or for children.

4. *[Add Measurement with WF]*

Select to add near vision in the wavefront test. Select the and to change the default distance for near vision testing.

Note: this will add near vision testing to every wavefront test.

5. *[Reading Distance]*

Set the reading distance for the near measurement, from 30-70cm.

6. *[WF Measurements]*

Select the number of wavefront measurements for each wavefront exam. Only measurements that include wavefront will be effected.

7. *[Tono Measurements]*

Displays the default number of times the tonometry test should be repeated. Select the ➕ and ➖ buttons to change this value. Only examinations that include tono will be effected.

8. *[Tono Automation]*

Two types of focusing are available for the tonometer, [Auto] and [Semi].

By default, the tono measurement is in auto focusing mode, where the device can take a measurement with little intervention by the examiner. In semi mode, the tonometer remains at the centering point found in the pachymeter measurement and all of the focusing is done by the examiner.

9. *[Topo with Ringer]*

By default the ringer is available for editing. To remove the ringer display shown immediately after topo measurements, unselect this checkbox.

c. Pupillo

We recommend using default pupillo illumination settings, although they can be modified in this screen:

1. *[Illumination Level]*

   Use the [+] and [–] buttons to adjust the illumination levels.

2. *[Waiting Time]*

   Use the [+] and [–] buttons to adjust the waiting time between illumination levels.

3. *[Save]*

   Select to save your changes.

6. RESULTS SETTINGS

a. General settings

The [General] sub-tab of the [Results] tab contains the default display settings for refraction and aberration data of the [Results] screen.

1. *[Terminology]*

It is possible to set the terminology for the map and scale to [Tangential] or [Instantaneous] (for the map) and to [Standard] or [Absolute], [Auto] or [Normalized] (for the scale).

2. *[Refraction]*

Default settings for refraction and ocular wavefront.

3. *[Step]*

Select the measurement display increments.

4. *[Cylinder]*

Select negative or positive cylinder convention, or select [Auto] to set the sign of the cylinder to match the sign of the sphere equivalent.

5. *[Vertex Distance]*

Select the default vertex distance. (You can change this value on the fly in the [Results] screen).

6. *[Aberrations]*

Default settings for the corneal and ocular aberrometry.

7. *[WF Convention]*

Selects how to present aberrations.

Choose between [OPD] (Optical Path Difference) and [WFE] (WaveFront Correction) modes.

- ◦ The Optical Path Difference (OPD) is defined as the difference between the aberrated and the ideal unaberrated wavefronts. The OPD is positive if the aberrated wavefront leads the ideal unaberrated wavefront. Also, if the aberrated wavefront curves in more than the unaberrated wavefront, the OPD is positive. Therefore, a negative focal shift will introduce a positive aberration.
- ◦ The WaveFront Error (WFE) is defined as the difference between the ideal unaberrated wavefronts and the aberrated wavefronts. Essentially, WFE represents the required correction for achieving unaberrated vision.

OPD and WFE modes relate in the following way: $OPD(x,y) = -WFE(x,y)$

8. *[Zernike Unit]*

Select the units (microns or diopters) for displayed measurements.

9. *[WF Presentation]*

Select day/night to present the refractometry measurements as photopic and mesopic values, or 3/5 to present the refractometry measurements as values for 3 mm and 5 mm pupil apertures.

10. *[Aberrations Aperture]*

If you selected [Day/Night] for [WF Presentation] (above), choose [Day] to present measurements by default in terms of the photopic pupil aperture, or [Night] to present them in terms of the mesopic pupil aperture.

If you selected [3/5] for [WF Presentation] (above), choose whether measurements should be presented by default in terms of a 3mm pupil aperture or a 5mm pupil aperture.

11. *[Tonometer Corrections]*

Select the formula to use for the corneal thickness Tonometry calculation. Correction formulas are given below.

Tonometer corrections formulas:

Ehlers 1

Formula: Corrected IOP = Measured IOP – (CCT-520) × 5/70

CCT is the central corneal thickness in mm

Reference: Ehlers N, Bramsen T, Sperling S. Applanation tonometry and central corneal thickness. Acta Ophthalmol (Copenh) 1975; 53: 34–43

Whitacre

Formula: Corrected IOP = Measured IOP – (CCT-560) × 2/100

Reference: Whitacre MM, Stein RA, Hassanein K. The effect of corneal thickness on applanation tonometry. Am J Ophthalmol 1993; 115: 592 – 596

Doughty 1 (for normal eyes)

Formula: Corrected IOP = Measured IOP – (CCT-535) × 1.1/50

Reference: Doughty MJ, Zaman ML. Human corneal thickness and its impact on intraocular pressure measures: a review and meta-analysis approach. Surv Ophthalmol 2000; 44: 367–408

Doughty 2 (for glaucomatous eyes)

Formula: Corrected IOP = Measured IOP – (CCT-535) × 2.5/50

Reference: Doughty MJ, Zaman ML. Human corneal thickness and its impact on intraocular pressure measures: a review and meta-analysis approach. Surv Ophthalmol 2000; 44: 367–408

Ehlers 2

Formula: IOP correction = -0.0706 × CCT + 38.504

Reference: Ashish A Patwardhan, Mohammad Khan, Susan P Mollan, Paul Haigh The importance of central corneal thickness measurements and decision making in general ophthalmology clinics: a masked observational study BMC Ophthalmology 2008, 8:1

Dresdner

Formula: IOP correction = -0.0423 × CCT + 23.28

Reference: Markus Kohlhaas, Andreas G. Boehm, Eberhard Spoerl, Antje Pursten, Hans J. Grein, Lutz E. Pillunat Effect of central corneal thickness, corneal curvature, and axial length on applanation tonometry Arch Ophthalmol. 2006; 124:471-476

Herndon

Formula: IOP correction = -0.05 × CCT + 27.25

Reference: Leon Herndon, Review of Ophthalmology, July 2002 88-90

b. WF

1. *[Default Map]*

Select which maps to display in the [Results] screen as default.

2. *[Step]*

Select the default rate of change for the color scale: the range of values represented by each distinct color. Select the ➕ and ➖ buttons to increase or decrease the step.

Note: You can manually change the step in the [Results] screen as necessary.

Note: When ANSI is selected under [Map], the step is automatically set to 1.0, and the selection cannot be changed.

3. *[Central Value]*

Select the default middle value for the color scale. Select the ➕ and ➖ buttons to increase or decrease the value.

Note: You can manually change the central value in the [Results] screen as necessary. This setting only defines the initial value.

Note: When either ANSI or ISO are selected under [Map], the central value is automatically set to 44.00, and the selection cannot be changed.

4. *[Display by Default]*

Selection of the parameters to display in the [Results] screen.

c. Topography

The [Topography] sub-tab of the [Results] tab has two sections. The upper section contains general settings. The palette topography section contains settings that define how the color-coding of topographic maps will be implemented.

The color palette on the left side of the screen changes dynamically as you change the settings in the palette topography section. In addition, when certain settings are selected, other settings in this section are automatically set, and their fields become unavailable. For example, if, under [Map], you select ANSI, all of the other settings in the section are set automatically and cannot be changed.

1. *[Default Map]*

Select which maps to display in the [Results] screen as default.

2. *[Unit]*

Select the default display units - mm or Diopter units.

Note: You can change the units in the [Results] screen as necessary. This setting only defines the initial units used.

Note: When ANSI is selected under [Map], diopter is automatically selected in this field, and the selection cannot be changed.

3. *[Eccentricity]*

Select the shape format you wish to display: Eccentricity, P, or Q.

4. *[Standard Scale]*

In this scale, colors correspond to values to ensure uniformity when comparing between maps. There are a few possible standard scales: ANSI, ISO, Klyve/Wilson and Maguire/Waring. It is possible to set a custom standard scale by setting the central value and the step. The maximum and minimum values are then automatically determined.

Select the default color-coding convention:

- ◦ [ANSI]: Use the ANSI color-coding convention. All of the other settings in the Palette Topography section are set automatically as required by this convention and cannot be changed. The middle value will be set to 44D and step to 1D.
- ◦ [ISO]: Use the ISO color-coding convention. The scale, central value, and color of the central value, are set automatically as required by this convention and cannot be changed. The middle value is set to 44D and the step can be modified 0.5, 1.0 or 1.5D.
- ◦ [Custom]: Allows you to set up the palette as you wish; all of the other settings are available.

Note: These settings define the default settings that are used in topographic maps in the [Results] screen. You can always change the units, step, and central value in the [Maps] tab.

5. *[Step]*

Select the default rate of change for the color scale: the range of values represented by each distinct

color. Select the [+] and [—] button to increase or decrease the step.

Note: You can manually change the step in the [Results] screen as necessary.

Note: When ANSI is selected under [Map], the step is automatically set to 1.0, and the selection cannot be changed.

6. *[Central Value]*

Select the default middle value for the color scale. Select the [+] and [—] button to increase or

decrease the value.

Note: You can manually change the central value in the [Results] screen as necessary. This setting only defines the initial value.

Note: When either ANSI or ISO are selected under [Map], the central value is automatically set to 44.00, and the selection cannot be changed.

7. *[Color palette]*

The colors for max and min curvature are always the same in the color palette. The size of the interval defines the remaining colors.

- ◦ ANSI has 21 to 25 steps from red to blue. Specifically for ANSI Z80.23 red, orange, and yellow show the steeper areas of the cornea. Green is an "intermediate" color. Light and dark blue show the flattest areas.
- ◦ ISO has 26 steps from red to blue
- ◦ Custom palette has 26 steps from white to blue. The central value is yellow. In the settings you can choose this color palette and apply green as the central value.

Note: In case some value is greater than the highest interval or smaller than the lowest interval, those areas will be as the color assigned to highest interval or the lowest interval respectively.

8. *[Green in the middle]*

Select this option to orient the palette so that the central value is displayed in green rather than the default yellow.

Note: When either ANSI or ISO are selected under [Map], this option cannot be selected.

9. *[Display by Default]*

Selection of the parameters to display in the [Results] screen.

10. *[Help]*

Click on the help button to open the help manual.

> To ensure maximum accuracy, if the examiner accidentally moves the head of the Wave Analyzer Medica 800 so that the patient's eye is not centered in front of the camera view, the device will reposition itself so that it is re-centered in front of the eye.
>
> If a maximum decenter tolerance is not met the device will not take a measurement.

7. EXPORT SETTINGS

The export settings define the settings that control how the results of the selected (or current) diagnostic can be exported to other devices or printed.

> These settings relate to the handling of individual test results. For information about exporting the entire patient database, see [Exporting and importing the database].

a. [Export data]

The [Export data] sub-tab of the [Export] tab contains settings that control what happens when you export the current test results to an external storage device or optometric instrument.

1. *[USB]*

Several file options are available for exporting via USB according to your preferences, fill in the checkboxes of the data you want exported.

2. *[Network]*

Several file options are available for exporting via Network according to your preferences, fill in the checkboxes of the data you want exported.

3. *[Export directory]*

Choose the path to the directory you wish to export to.

4. *[External device]*

Check this box if you would like to export to an external device. External devices are connected with LANBOX and XML protocols to create XML files sent via the network. This allows file transfer to EMR and other equipment such as APH400, a phoropter, and Remote Access. The test results will be transmitted to the device in the selected format. Remote Access may be accessed via the URL path specified in the XML data per patient. Once configured, any computer on the Intranet may view the patient file remotely.

Choose the protocol according to the external device - for help please contact a support representative.

5. *[Protocols]*

There are two types of XML data formats available for export, Unicode and UTF-8. Select the format that is compatible with your systems.

6. *[Data Aperture for Output]*

May select mesopic or photopic pupils depending on the protocol selected. Also may select pachy and IOPC data (depending on the protocol selected, not all protocols contain this data).

7. *[WF Convention]*

After checking [External Device], select this field to specify the data convention to be sent via XML, two types of conventions are possible:

- ◦ Previous Versions: This exports WF values according previous versions' conventions (to keep backwards compatibility with external devices that were already mapped). In this format, the Ocular Zernike data is in WFE format, whereas the Corneal Zernike data is in OPD format.
- ◦ User Current Settings: This setting will export XML data with same convention that is displayed on the screen, either OPD or WFE conventions.

8. *[XML Export]*

Select to export XML data (patient name and information) from your specified data path. Double click on the box to choose the location of the data to be exported, the press [Save]. After configuring the XML export, data will become available for export in the [Measurement] screen.

9. *[XML Import]*

Select to import XML data (patient name and information) from your specified data path. Double click on the box to choose the location of the data to be imported, the press [Save]. After configuring the XML import, data will become available for import in the [Measurement] screen.

10. *[Clear After Import]*

If this option is selected, after the data has been imported it will be erased from the external source.

b. Settings for export to a file

The settings in the first section define the destination of exported files, their format, and the patient information they should contain.

The first row defines the settings for exports to devices connected to the Wave Analyzer Medica 800's USB port. (When you export a file to a USB device, a Windows save as dialog box opens, allowing you to navigate to a folder and specify a file name for the file).

The second row defines the settings for exporting to devices to which the Wave Analyzer Medica 800 connects via the local network. You can specify the path of the device and the folder on the device in which the files should be saved.

Configure the file export options

- To enable exporting to the device connected to the USB port, select the first check box in the USB row (i.e., the check box immediately to the right USB).
- To enable exporting to a device that can be accessed through the local network, select the first check box in the Network row.
- For each option you selected (USB and/or Network), select the options as follows:

OPTION	DESCRIPTION
Screenshot (JPG)	Select this option to export the data as a JPG image file.
Patient file	Select this option to export the data as a Wave Analyzer Medica 800 patient file. This creates an XPS file containing the test results and the patient's information (as specified under Naming Patient Info) in the format used by the Wave Analyzer Medica 800 database. The test results and patient information can be imported from this file to another database.
Surname	Select this option to include the patient's surname in the exported data.
1st Name	Select this option to include the patient's first name in the exported data.
ID	Select this option to include the patient's ID number in the exported data.

- If you select more than one option, all of the options you select are activated.
  For example, if you select both [Screenshot] and [Patient file], both a JPG image of the result's [Summary] tab and a patient file will be exported.
- If you activated the [Network] option, under [Export] directory, enter the path of the folder in which you want to save exported data. To expedite exporting to a network, we recommend mapping the network drive.

[Printing/Email]

The [Printing/Email] sub-tab of the [Export] tab contains settings that control what happens when you choose to export test results to a printer for printing. The left section of the screen configures the printing of tickets, printouts from the Wave Analyzer Medica 800's built-in printer. The right section configures printing that is performed by an external printer connected to the unit's RS232 serial port or to one of its USB ports.

In order to set an external printer please call technical support or your agent.

1. *[Ticket]*

Check this box if you would like to print a ticket with the device's printer.

2. *[Ticket Header]*

If you want to include a standard text at the top of each ticket, select the [Ticket Header] check box, and then enter the text in the lines below it. For example, you could enter your name and address in the lines.

3. *[Header text]*

Enter the text of the header here.

4. *[Format]*

Select the type of printout you want.

5. *[Character Size]*

Select either large print or small print.

6. *[Print]*

Check this box to print using an external printer. You can select to print a screenshot (of the [Summary] tab) and/or Report.

7. *[Printer]*

Select a default printer (only if you are connected to an external printer).

8. *[Email]*

Select checkbox to add email options.

9. *[Test Email]*

Select this button to send a test email. A confirmation message will appear.

10. *[From]*

Type your email address in this field.

11. *[Host]*

Include the host name here, for samples of host names and configurations, SMTP.

12. *[Host configuration]*

This popup shows possible host configurations, such as SMTP configurations, port settings.

13. *[Password]*

Type your email password in this field.

14. *[Port]*

This is a field which is sometimes required according to your server configurations.

15. *[Colleagues]*

Type the colleague's name and email address here. Up to 3 colleagues can be included as the default recipient. To add additional colleagues, click buttons 2 & 3.

16. *[Laboratory]*

Type the laboratory's name and email address here. Up to 3 laboratories can be included as the default recipient. To add additional laboratories, click buttons 2 & 3.

Email

To configure the email feature, type in your email address, password, and host and port specifications listed above. These specifications are liable to vary depending on your particular email service. Some common email specifications are list here, but may differ than listed here. We recommend using the [Test Email] button to confirm your email is configured properly. In addition, please make sure that your device is connected to the internet.

Emails cannot be sent automatically to ensure patient privacy. All emails can only be sent via the export popup from the patient results.

Configure the automatic actions settings

The [Automatic Actions] sub-tab of the [Export] tab specifies which export options will be performed automatically when a measure is completed, and which options will appear in the export dialog box.

1. *[Automatic Actions]*

Select the options that should be performed automatically after a measure is finished.

2. *[Export data]*

You can choose between:

- ◦ Network
- ◦ USB
- ◦ External device

3. *[Printing]*

You can choose between:

- ◦ Ticket
- ◦ Print screen
- ◦ Report

4. *[Selected Items for Export Popup]*

Select the options that should appear in the export dialog box.

5. *[Export data]*

You can choose between:

- ◦ Network
- ◦ USB
- ◦ External device

6. *[Printing]*

You can choose between:

- Ticket
- Print screen
- Report
- Report preview

7. *[Popup Always Open]*

Select [Popup Always Open] to always open the export dialog box when export is selected. Clear this option to automatically perform the actions selected in the [Selected Items for Export Popup] section when export is selected.

To configure the automatic-actions settings:

In the [Automatic Actions] section, select the options that should be performed automatically after a measure is finished [Exporting data] or [Printing].

In the selected items for export popup section, select the options that should appear in the export dialog box (the options available are either for [Exporting data] or [Printing].

Select popup always open to always open the Export dialog box when export is selected.

Clear this option to automatically perform the actions selected in the selected items for export popup section when export is selected.

c. **[Remote Access]**

[Remote Access] allows users on the same network to see the results remotely by using the device's IP in the browser. In the browser, you can see the patients list in chronological order, and for each patient, their tests results. All security standards in your intranet may be applied to the Wave Analyzer Medica 800.

You must first define a login name and password before opening the [Remote Access], and enter them into the site, otherwise it will not load the data.

To select the data for viewing in the [Remote Access] site:

1. *[Access Remote Active]*

When checkbox is selected, remote access data will be created automatically, after every measurement. To remove this option, unselect checkbox.

2. *IP Address*

Displays IP address of remote access data site.

3. *[Change Login and Password]*

To view [Remote Access] data in your browser, click on this button to save your login and password. You will be required to enter this information when viewing the webservice data.

4. *[Rebuild Remote Access Data]*

Click this button to add previously taken measurements to the remote access site.

5. *[Save]*

Allows the user to save the selected preferences.

If the [Access Remote Access] checkbox is selected, data will be automatically exported after every measurement. It may take a few moments for the measurement to appear in the remote access site. If you have data in the Wave Analyzer Medica 800 that is not already in the remote access site, either imported data, or old data that was not exported after the measurement, you have the option of exporting it retroactively.

There are two methods of exporting data retroactively:

1. Exporting just the missing measurements
2. Exporting the entire database

Please note, option (#2) will take a while and may slow down the device. Therefore, we recommend these steps are done while the device is idle.

To export data retroactively, click on the [Rebuild Remote Access Data] button and the following screen appears:
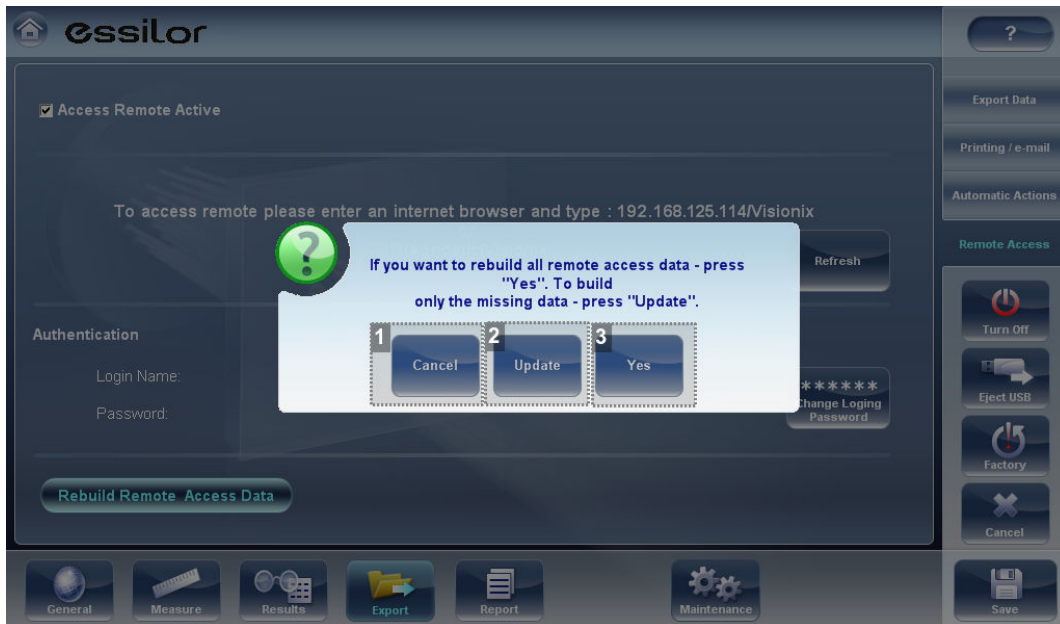
1. *[Cancel]*

   Cancels selection.

2. *[Update]*

   Once selected, only missing data will be added to the remote access site. Any data already saved in the remote access site, will remain.

3. *[Yes]*

   This option will save the entire database in the remote access site, new data and as well as previously existing data.

Remote access (from intranet) allows viewing images only; data modification, such as replacing data, deleting data, and making other changes are not possible via remote access.

Viewing in your browser

Once you have completed the configuration, you can see the maps and data in the browser or your PC, MAC, or tablet with any OS.

To view [Remote Access] in your browser:

1 Open your browser and enter the IP address listed in the [Remote Access] menu.

2 Enter the username and password configured in the [Remote Access] settings menu.

1. *[User Name]*

Enter the user name selected in the settings menu here

2. *[Password]*

Enter the password selected in the settings menu here

3. *[Login]*

Click here to enter the webservice

You need to enter the user name and password to view the webservice. Without entering these fields, it will not be possible to view.

> The following screen opens up:

1. *IP address*

Type in the IP address listed in the [Remote Access] menu, may vary from time to time

2. *[Patient]*

Name of patients, including birthday, gender, and email preference.

3. *[Diagnostic]*

List of diagnostics and dates measurements were taken.

4. *IP address*

Identical address as listed in browser, is indication you are connected to site properly.

5. *[Show Names Images]*

Select checkbox to view the names of the image files listed in the results.

6. *[Load]*

Select to load patient's data.

The first time it may take longer to load the database.

If your login and password are incorrect, the remote access screen will not load.

If you choose the option [Show name images], you will see in red on each map and data the original file.

Select the patient name, select the measurement you want to load and press [Load].

3 In cases where images are not selected in the settings, they will not appear in the browser. It may take a few minutes before the images appear in the browser. If they do not appear, and they are selected in the settings menu, wait a few minutes and refresh the browser.

4 Click [Exit] to go back to the database.

d. Reports

The Wave Analyzer Medica 800 comes with a report feature, which enables you to view your patient's test results in a clear, concise manner. You can choose the layout and data to be included in a report from over 6 predefined templates, or define your own, custom template.

The report templates included in the Wave Analyzer Medica 800 cover topics:

- Cataract
- Aberrations
- Topography
- Glaucoma
- Mixed/All Diagnostics
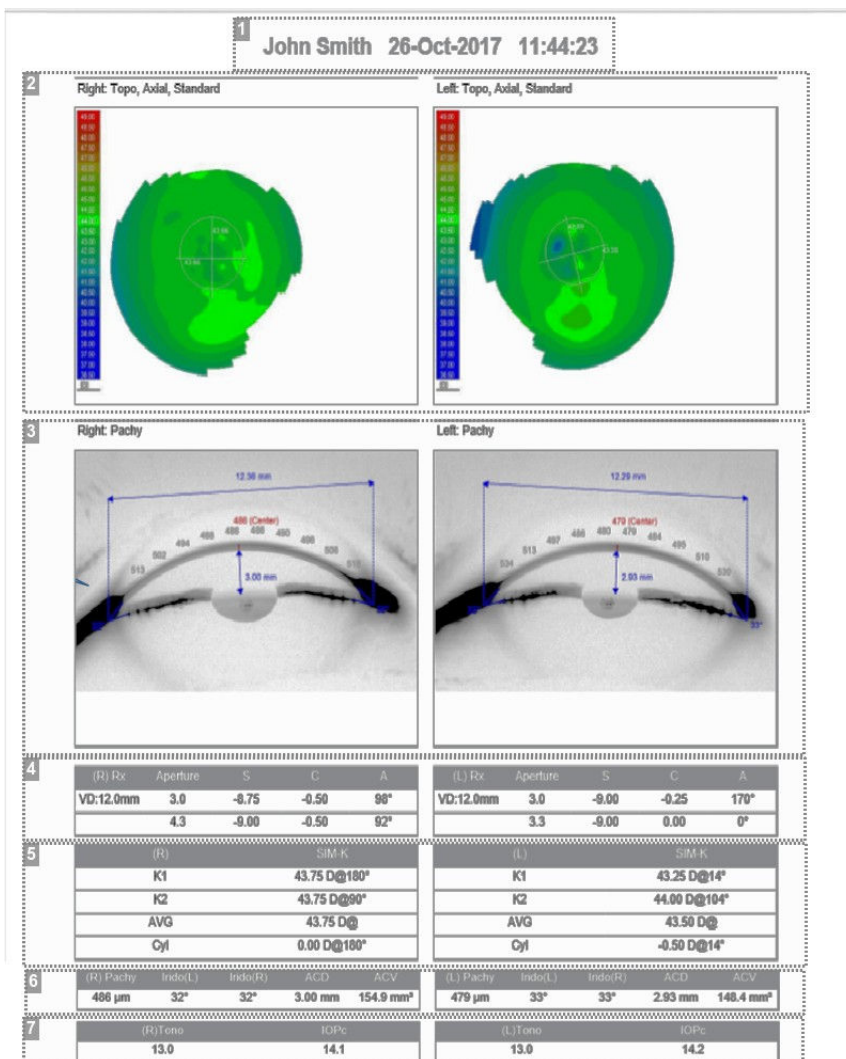
1. *Patient info*

   Includes patient's name or ID, date, and time of examination.

2. *Map*

   Displays the topo map.

3. *Pachy image*

Displays the image of the pachy cross section.

4. *Refraction*

Displays the refraction data table.

5. *Sim K*

Displays Sim K data table.

6. *Pachy*

Displays the pachy data tables: pachy thickness, irideo angle value and anterior chamber depth.

7. *Tono*

Displays the tono data table along with IOPc correction.

In order for a report to be available in the Export popup from the [Results] screen, it needs to be selected in Settings>Export>Print: Report

Configure a report

The Wave Analyzer Medica 800 comes with an option to define a custom report. There are 3 screens that you will need to configure in order to complete the report configuration:

1. The title & logo configuration
2. The maps configuration
3. The data table configuration

[Report] menu

In the [Settings] menu, select [Report]:

1. *[Report Templates]*

Here are several report templates that can be selected. Select the checkbox next to the template you wish to save as default and click [Save].

2. *[Update]*

This options allows you to edit an existing template. Click on the checkbox next to the template and then select the [Update] button.

3. *[New]*

Click on this button to create a new template for reports.

4. *[Personalize]*

This button allows you to change the general layout of all of the report templates including the: logo, report title, paper size, and font size.

5. *[Delete]*

Select the checkbox of the template you wish to erase and click [Delete].

Edit an existing report
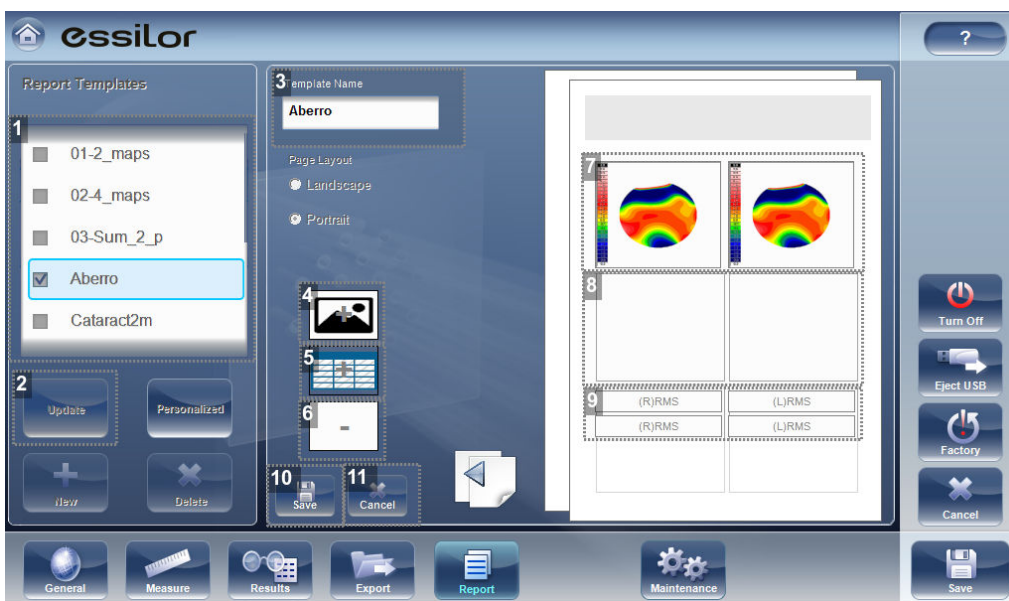
1. *Name*

Select the checkbox next to the report you wish to edit.

2. *[Update]*

Click on the [Update] button.

3. *[Template Name]*

Displays the name of the template.

4. *Add map*

Click on this image to add a map to the template. Next, click on any available space on the page to save the map there.

5. *Add table*

Click on this image to add a table to the template. Next, click on any available space on the page to save the table there.

6. *Erase*

Select a map or table and then click on this button to erase them.

7. *Map*

This is how maps are displayed in the template. To view the map's type, click on it.

8. *Available space*

Click on the available space to add a map or a table. Once the space is filled up, it will appear.

9. *Tables*

This is how tables are displayed in the template. To view the table's type, click on it.

10. *[Save]*

Click on the [Save] button to save your changes and return to the report menu.

11. *[Cancel]*

Click on [Cancel] to cancel any changes you made and to return back to report the menu.

Click on the [Update] button and select the maps or tables you wish to update. You may add, or erase the maps and tables.

To erase first click on the object and then click the [Erase] button. To add a map or table, click on the [Add] button and then click on the available space. Once you are finished, click [Save].

Create a new template

1. *[Template Name]*

Type the name of your new template here.

2. *[Page Layout]*

Select your preferred page layout:

- ◦ Landscape
- ◦ Portrait

3. *Add map*

Click on this image to add a map to the template.

Next, click on any available space on the page to save the map there.

4. *Add table*

Click on this image to add a table to the template.

Next, click on any available space on the page to save the table there.

5. *Erase*

Select a map or table and then click on this button to erase them.

6. *[Save]*

Click on the Save button to save your changes and return to the [Report] menu.

7. *[Cancel]*

Click on cancel to cancel any changes you made and to return back to the [Report] menu.

8. *Available space*

Click on the available space to add a map or a table.

After making your selections of template name, page layout, click on button (#3) to add a map:
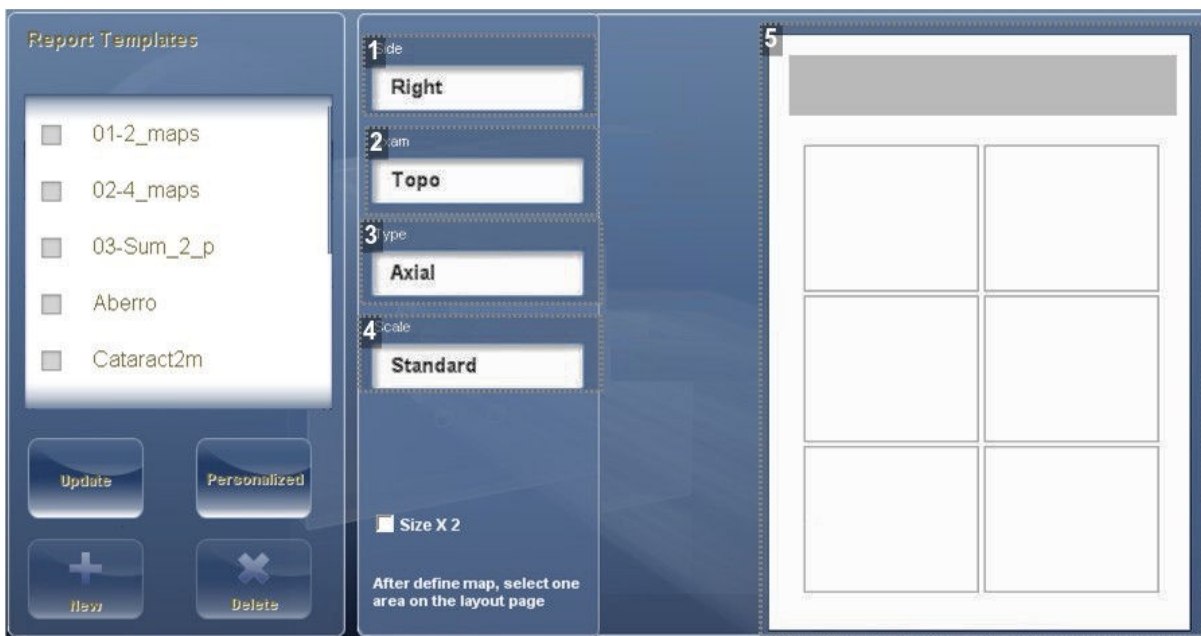
1. *[Side]*

Select the eye for the map to be displayed.

2. *[Exam]*

Select the exam for the map:

- ◦ Topo
- ◦ WF
- ◦ Internal
- ◦ Pachy
- ◦ Multi Slits
- ◦ Retro
- ◦ Pupillo

3. *[Type]*

Select the map type you wish to display.

4. *[Scale]*

This scale is either:

- ◦ Auto
- ◦ Standard

5. *Available space*

Click on the available space to add a map or a table. Once the space is filled up, it will appear as below.
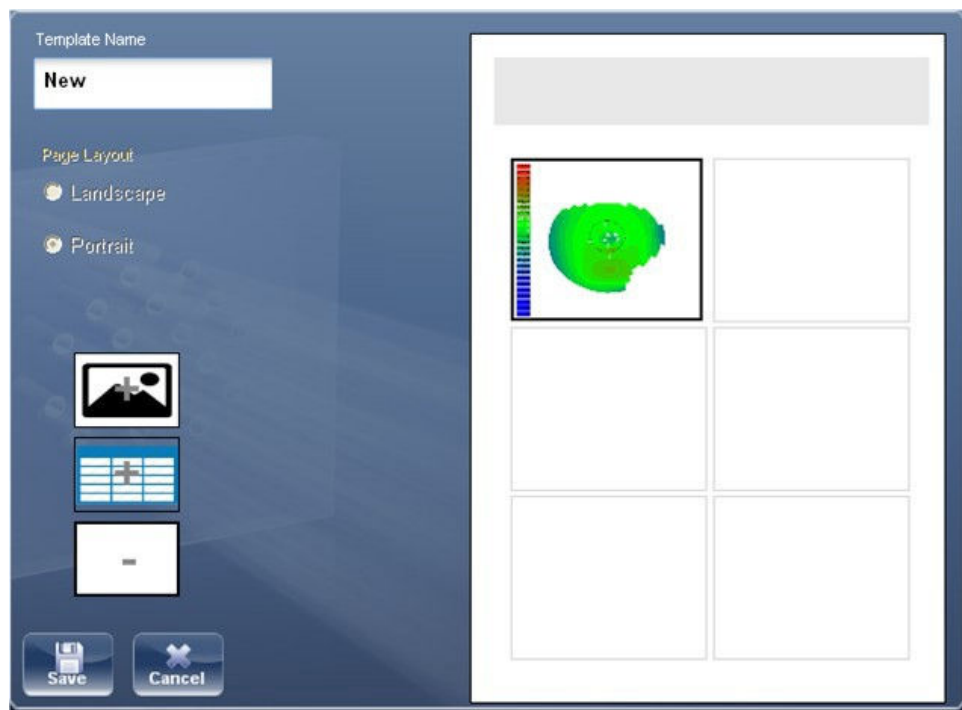
To add tables to the report, click on the table button and follow the same method used for adding maps.

At the end of the configuration, click on [Save] or [Cancel].

Before generating a report please confirm it is selected in the [Settings] menu.

Once you have defined your custom template according to your preferences, it will automatically appear in the report viewer menu shown here on the right of the dialog box:
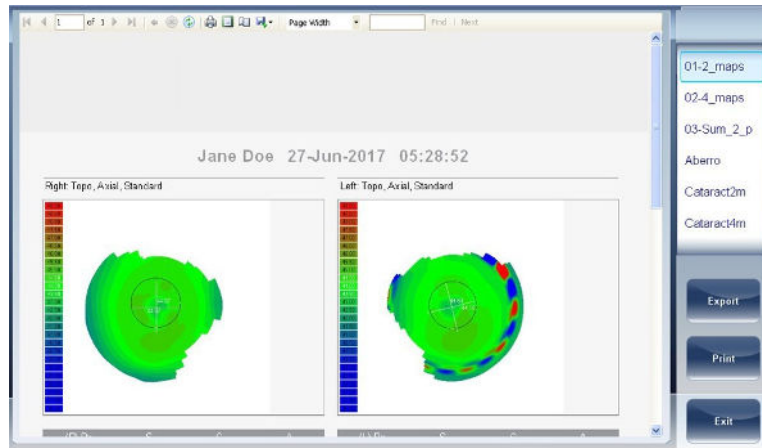
Select the template of your choice from the menu, a preview of the report will appear in window.

Select [Export] to export to external source or [Print] according to your preference.

8. RESTORE THE FACTORY SETTINGS

You can return all the configuration settings to their factory-default values.

1 In the [Configuration] screen, select [Factory] .

> You are prompted to confirm that you want to restore all the factory settings.
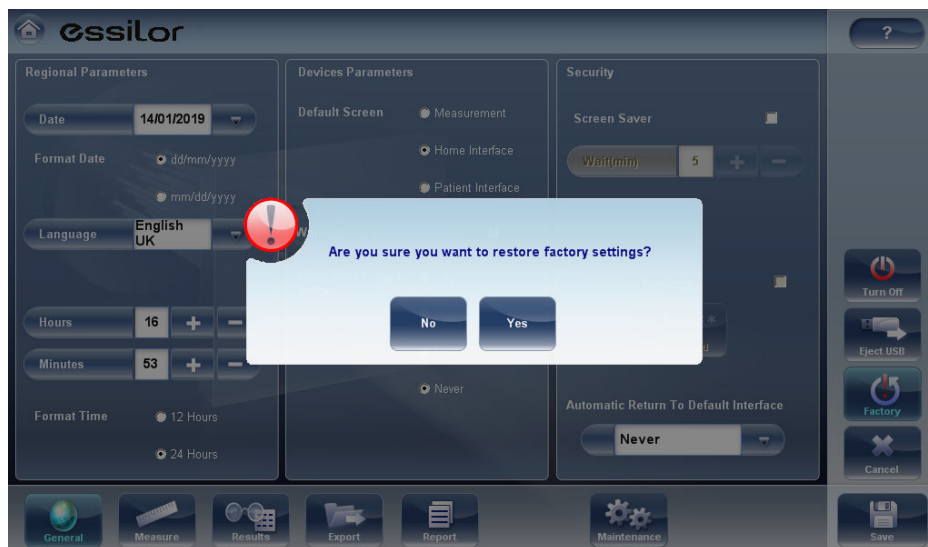
2 Select [Yes] .

> The factory settings are restored for all of the configuration settings.

9. [MAINTENANCE] SCREEN

The [Maintenance] screen has many tabs that you can access in order to change settings in the overall maintenance of the device.

1. *[Get Assistance]*

Select to open Teamviewer and get assistance.

2. *[Software Upgrade]*

Selecting this option allows you to upgrade software.

3. *[System Information]*

Displayed here is the computer name, IP address, version, and serial number of the unit.

4. *[Technical Maintenance]*

This is the technical menu and is password protected to ensure that only an authorized technician has access.

5. *[Close Application]*

Select this button to close the application without restarting the device.

6. *[Set As Adult Default]*

Select this button and use the arrows to adjust the height. This will set the default position for patients over age 14.

7. *[Set As Child Default]*

Select this button and use the arrows to adjust the height. This will set the default position for patients under age 14.

8. *[Default PD Position]*

Use the arrows to adjust the default PD for patients.

9. *[Patient Reference]*

This allows you to display patients by first name or ID number in the database.

10. *[Database path]*

This displays the path that the database is located.

11. *[Index Setting up]*

This button updates the index of the patient screen. This is recommended after deleting/importing patient records.

12. *[Data Import]*

Select this button to import data from USB or Network.

13. *[Retrieval]*

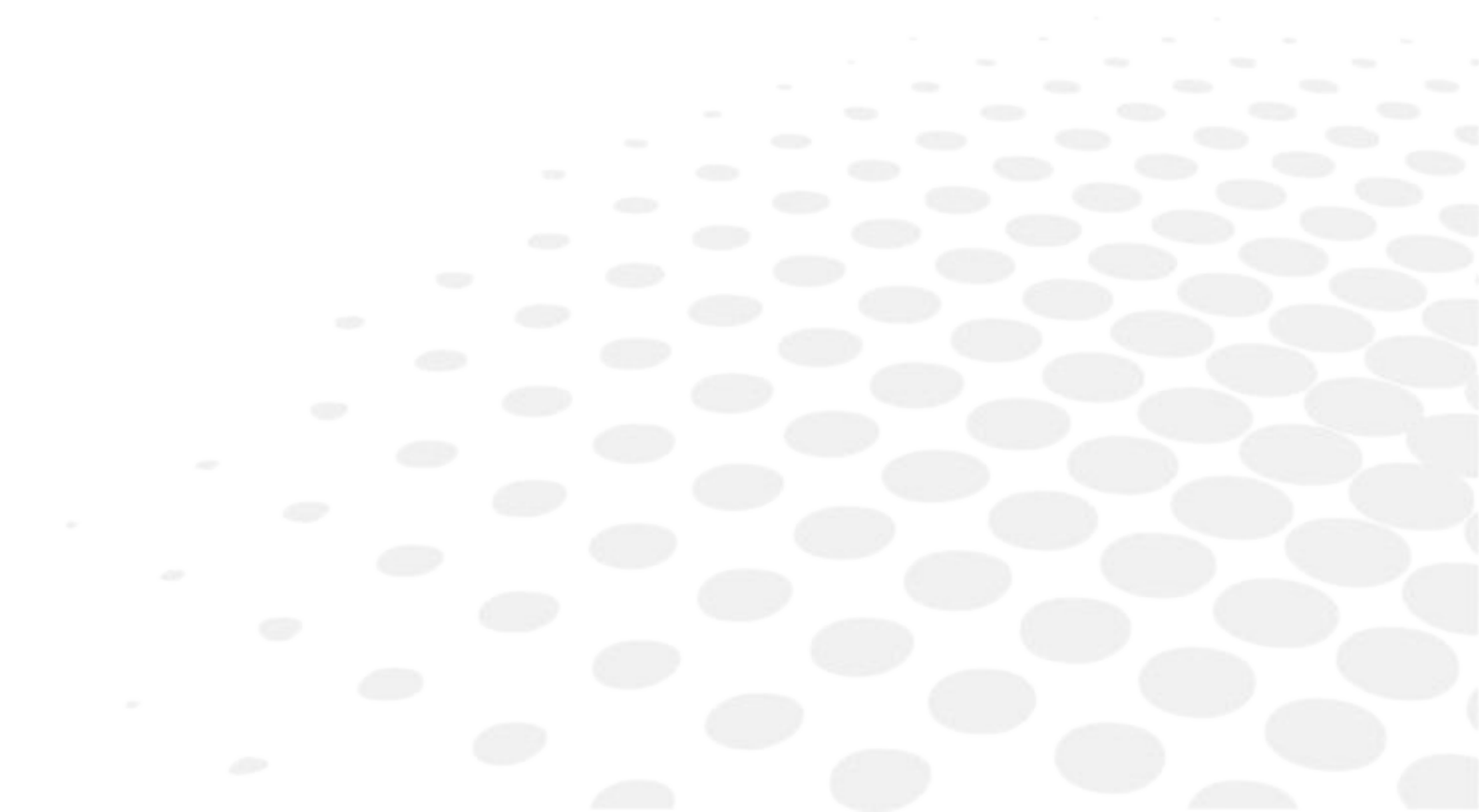Select to retrieve data from a USB or Network.

14. *[Backup]*

Select this button to backup your database, settings menu, or FTP files.

15. *[Data Deletion]*

Select to delete your database.

XI. TROUBLESHOOTING

You may encounter some of the following common problems while working with the Wave Analyzer Medica 800.

If you do, try following the suggested solutions listed below. If the problem persists and the suggested solution does not remedy it, contact a qualified service representative or your local distributor.

Problem	Possible cause	Suggested solutions
Images are not properly centered	• External lights or windows near the unit • Large patches of light near the unit	• Ensure that there no bright lights or windows near the unit or the patient • Ensure that there are no large irregular patches of light on the patient or on the unit
Measured pupil size is different from the expected or actual pupil size	• External lights or windows near the unit • Large patches of light near the unit	• Ensure that there no bright lights or windows near the unit or the patient • Ensure that there are no large irregular patches of light on the patient or on the unit.
High-order aberrations that differ from what is expected	Direct light falling on the unit or on the patient.	• Ensure that there no bright lights or windows near the unit or the patient. • Ensure that there are no large irregular patches of light on the patient or on the unit
The pachy measurement always goes to manual mode	The pachy filter is foggy due to the cold	Use the anti-fog spray at least once a week, and when the pachy consistently goes to manual mode
Tickets do not print	• Paper jam • Out of paper	• Open the print paper door and release the paper • Replace the paper roll

XII. Maintenance
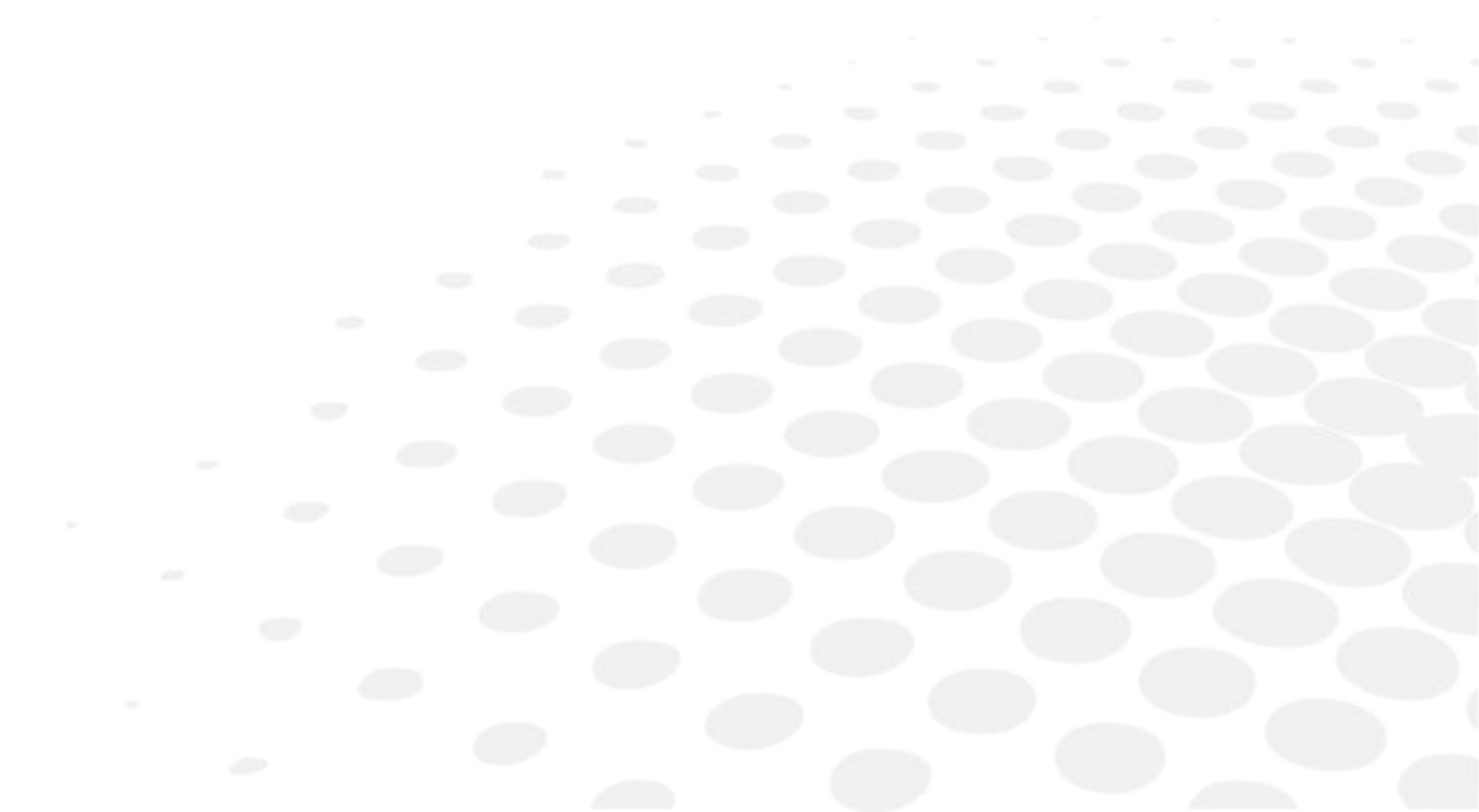
This chapter explains how to clean the Wave Analyzer Medica 800 unit and how to perform routine maintenance tasks.

1. CLEAN THE UNIT

Before cleaning the unit, turn it off and unplug it from the electric outlet.

To clean the plastic surface of the Wave Analyzer Medica 800, dampen a cloth with a commercial, non-abrasive cleaner and gently wipe the top, bottom, and front surfaces.

Do not spray or pour any liquid directly on the device.

Do not use caustic or abrasive cleaners.

a. Chinrest

Regular cleaning of the chinrest with a soft cloth and alcohol is strongly recommended.

Chinrest paper coverings are supplied with the device.

Use the paper to cover the chinrest after each patient use.

b. Headrest

Regular cleaning of the forehead rest with a soft cloth and alcohol is strongly recommended.

The forehead rest is the only part of the machine that comes into contact with the patient.

2. REPLACE THE PRINTER PAPER

The printer is mounted on the right side of the Wave Analyzer Medica 800 unit. If the paper roll is used up, the printer LED indicator blinks.

1 Lift the handle in the middle of the paper compartment and pull the cover down.

    If an empty paper roll is in the printer, remove it.

2 Insert the new roll with the end of the paper at the top of the roll.

3 Feed the paper into the slot at the top of the compartment.

4 Push the paper-compartment door closed.

3. PACK THE SYSTEM

1 Click on the [Home] button .

> This screen appears:

2 Click on the [Turn Off] button .

> This screen appears:
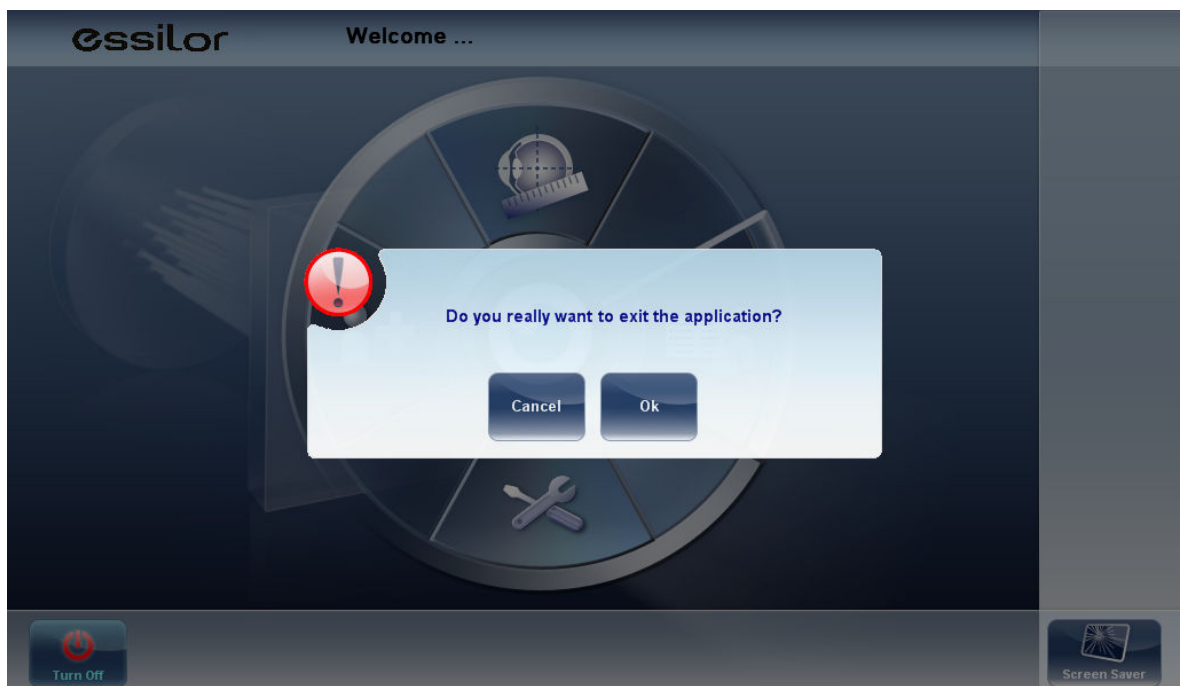
3 Then, click on [Ok] Ok .

> The device is now in parking position.

> Head and chinrest are lowered.

4 Pack the WAM800 in its plastic packaging with, ideally, a desiccant bag.

5 Place the foam pieces around the product.

	>	
	>	
	>	
	>	
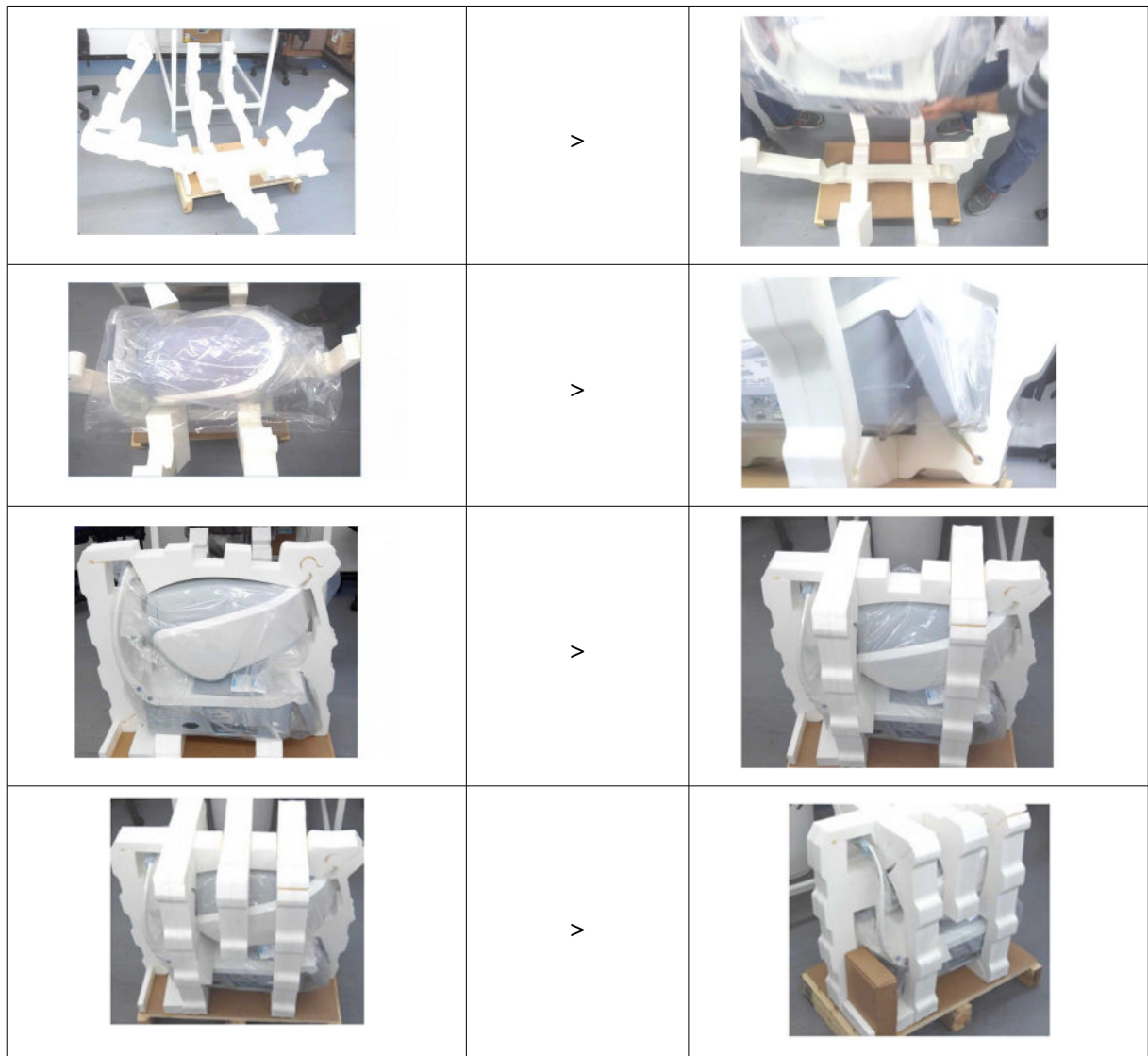
6 Finally, put the upper box on the product using the lateral straps of the box.

XIII. Appendices

1. TECHNICAL SPECIFICATIONS

a. Device

Power supply	100-240 V AC, 50/60 Hz, 300 W
Type of protection against electric shocks	Class 1
Degree of protection against electric shocks	Type BF
IP classification	IPXo
Size (W×L×H)	312mm × 530mm × 570mm
Weight	25 kg

	Temperature	Humidity	Atmospheric pressure
Use	[10°C ; 35°C]	[30% ; 90%]	[800hPa ; 1060hPa]
Storage	[-10°C ; 55°C]	[10% ; 95%]	[700hPa ; 1060hPa]
Transportation	[-40°C ; 70°C]	[10% ; 95%]	[500hPa ; 1060hPa]

b. AR and power mapping specifications

Spherical power range	-20D to +20D for vertex distance 12 mm
Cylinder power range	0D to 8D
Axis	0 - 180°
Measuring area	2.0 mm - 7.0 mm pupil (3 zones)
Number of measuring points	1400 points for 7 mm pupil
Working distance	94 mm
Method	Shack-Hartmann

c. Corneal topography specifications

Number of rings	24
Number of measuring points	6144
Number of analyzed points	> 100,000
Diameter of covered corneal area at 43D	From 0.75 mm to > 10 mm
Diopters	37.5D to 56D
Repeatability	0.03 mm
Method	Placido Disk

d. Pachymeter specifications

Measurement wavelength	455nm no UV
Measurement range	150µm - 1300µm
Accuracy	< 5µm
Method	Static Scheimpflug

e. Tonometer specifications

Calibrated range	7mmHg – 44mmHg
Accuracy	+/-2 mmHg
Method	Non-contact air puff applanation tonometry

f. Retro-illumination specifications

Measurement wavelength	850nm
Method	Retro led

g. LCD screen specifications

Screen type	TFT LCD
Touchscreen type	Capacitance type
Size	10" WSVGA resolution (1024 × 600 pixels)
Contrast ratio	500
Typical luminosity	250 Cd/m2

In a clinical comparison with a Goldmann tonometer on 231 eyes covering the range 7 – 33 mmHg, 95% of measurements with the Wave Analyzer Medica 800 tonometer were within ±5mmHg of the Goldmann tonometer measurements.

2. Clinical studies

a. Pachymetry Study

A clinical study was performed including 68 normal eyes that compared the Wave Analyzer Medica 800 pachymeter function with the Pentacam rotating Scheimpflug camera.

Measurements of central corneal thickness (CCT) were recorded. The mean CCT on the Wave Analyzer Medica 800 was 541.74 ±39.76µm (std dev) and on the Pentacam was 535.72 ± 37.93µm. The Wave Analyzer Medica 800 measures 6.02µm thicker than the Pentacam. A Bland Altmann graph showing the average and standard deviations of the measurement differences as well as the 95% confidence levels (std dev × 1.96) and the 99% confidence levels (std dev × 2.58) is shown in figure below. The 95% confidence levels for the measurement were from 24.54µm to -16.80µm and 99% confidence levels for the measurement were from 31.08µm to -23.34µm.

Bland Altmann graph for the pachymeter comparison showing the difference between the reference and test pachymeters, the average difference and 95% (red) and 99% (green) confidence levels.
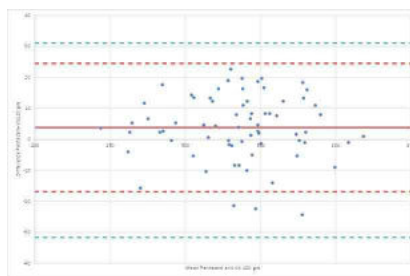
b. Tonometry study

In a clinical comparison with a Goldmann tonometer on 231 eyes covering the range 7 – 33 mmHg, 96% of measurements with the Wave Analyzer Medica 800 tonometer were within ±5mmHg of the Goldmann tonometer measurements.

3. Conformity to international standards

The Wave Analyzer Medica 800 conforms to the international standards described below.

a. Directives and standards

The Wave Analyzer Medica 800 complies with the Medical Device Directive 93/42/EEC amended by Directive 2007/47/EC and is in Class IIa (rule 10).

CE 0459

Laser class: Class 1 Product

Lifetime of the product: 7 years

First CE marking : October 2019

Product regulatory reference : WAM800

b. Electromagnetic emissions

Guidance and manufacturer's declaration – electromagnetic emissions		
The Wave Analyzer Medica 800 is intended for use in the electromagnetic environment specified below. The customer or the user of the Wave Analyzer Medica 800 should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	Wave Analyzer Medica 800 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	Wave Analyzer Medica 800 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purpose.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

c. Electromagnetic immunity

Guidance and manufacturer's declaration – electromagnetic immunity			
The Wave Analyzer Medica 800 is intended for use in the electromagnetic environment specified below. The customer or the user of Wave Analyzer Medica 800 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	Complies	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ±1 kV for input/output lines	Complies	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	Complies	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	Complies	Mains power quality should be that of a typical commercial or hospital environment. Mains power quality should that of a typical commercial or hospital environment. If the user of the Wave Analyzer Medica 800 requires continued operation during power mains interruptions, it is recommended that the Wave Analyzer Medica 800 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Complies	Power magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – electromagnetic immunity			
The Wave Analyzer Medica 800 is intended for use in the electromagnetic environment specified below. The customer or the user of Wave Analyzer Medica 800 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of Wave Analyzer Medica 800, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d= 1.2 \sqrt{P}$ $d= 1.2 \sqrt{P}$ 80 MHz to 800 MHz $d= 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and (d) is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range [b]. Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which Wave Analyzer Medica 800 is used exceeds the applicable RF compliance level above, Wave Analyzer Medica 800 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating Wave Analyzer Medica 800.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

d. Manufacturer

	Essilor International 147 rue de Paris 94220 Charenton-Le-Pont FRANCE

e. Waste Electrical and Electronic Equipment (WEEE) directive

	This symbol indicates that the equipment incorporates electronic assemblies and other components that are subject to the Waste Electrical and Electronic Equipment Directive which advise that such electronic and electrical devices should not be scrapped as ordinary domestic waste. To avoid environmental risks or other dangers caused by irresponsible scrapping, this product and all its accessories must be disposed of separately in accordance with the practices indicated in the WEEE Directive for EU member countries and in local regulations for other countries. For further information on disposal of this product, please contact your local dealer or the manufacturer.

f. Contact information

Essilor Instruments USA
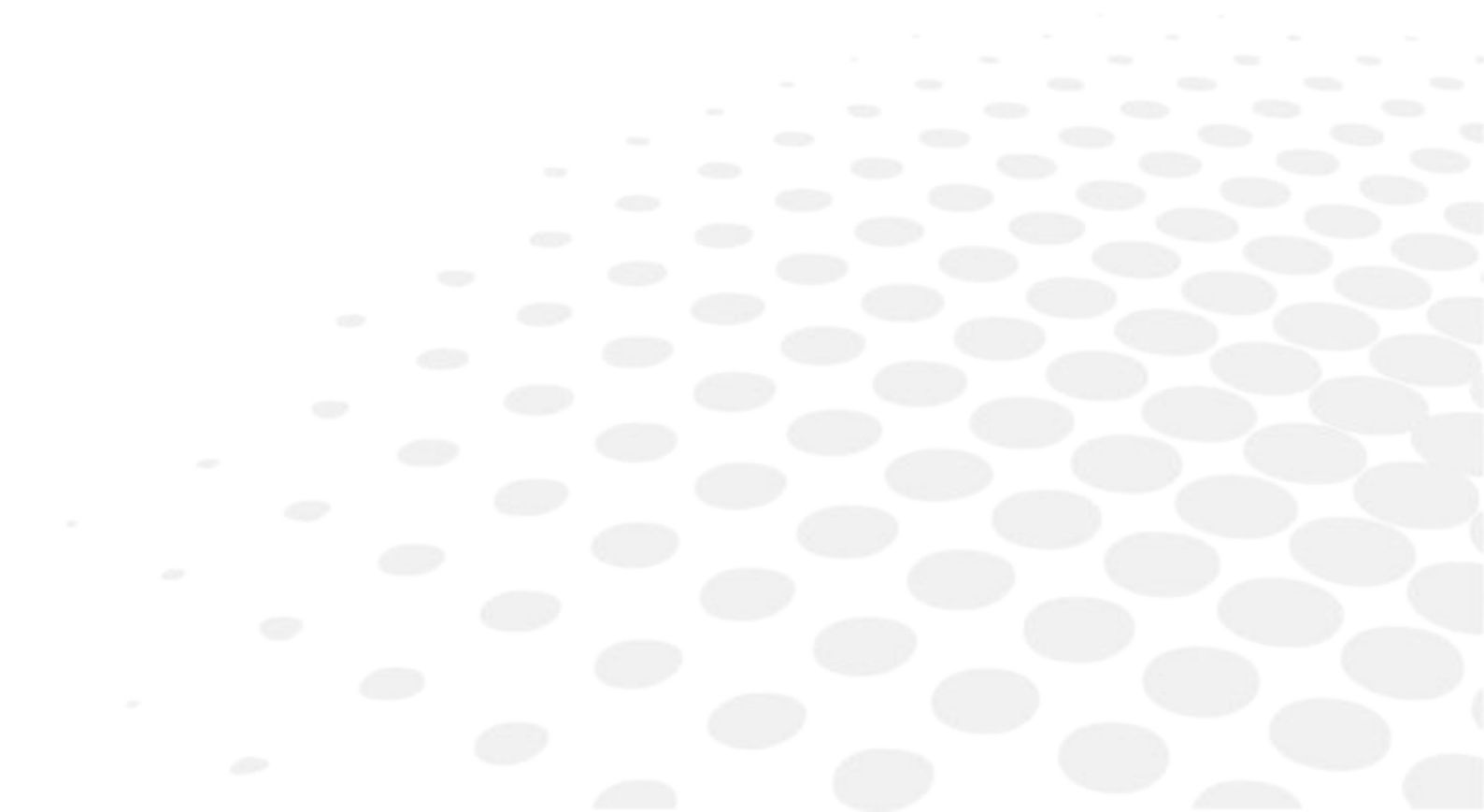8600 W. Catalpa Avenue, Suite 703
Chicago, IL 60656
Phone: 855.393.4647
Email: info@essilorinstrumentsusa.com
www.essilorinstrumentsusa.com

XIV. QR Code

The complete user manual is available on a web space. To access it, please scan the QR code below using a dedicated application.

Le manuel utilisateur complet est disponible sur un espace web. Pour y accéder veuillez scanner le QR code ci-dessous à l'aide d'une application dédiée.

Die vollständige Bedienungsanleitung ist auf einem Speicherplatz verfügbar: Für den Zugriff darauf scannen Sie bitte untenstehenden QR-Code mittels einer dafür vorgesehenen Anwendung.

الأدبية العربية إن ليل لكامللمستخدم متاح على لنصفة وب.ليتمكن منللوصول ليهورجيمسح رمز الستجلةلسيعة أنامبلستخدامطبيق مخصص لللك

O manual do usuário completo está disponível na área web do cliente. Para acessar, escaneie o código QR abaixo usando o aplicativo respectivo.

Пълното ръководство за потребителя е достъпно на уеб пространство. За достъп, моля, сканирайте QR кода по-долу с помощта на специално предназначено приложение.

可通过网络空间访问操作手册全文。如需访问该空间，请使用专用应用程序扫描 QR 码。

완전한 사용자 매뉴얼이 웹사이트에 있습니다. 전용 앱을 사용해 아래의 QR 코드를 스캔하면 접근할 수 있습니다.

Potpuni korisnički priručnik dostupan je na webu. Da biste mu pristupili, skenirajte QR-kod u nastavku namjenskom aplikacijom.

Den komplette brugermanual findes på et websted. Du får adgang til den ved at scanne QR-koden nedenfor ved hjælp af en dertil beregnet applikation.

El manual de uso completo está disponible en la web. Para acceder, escanee el código QR que se encuentra a continuación con la ayuda de una aplicación.

Täielik kasutusjuhend on saadaval veebis. Juurdepääsuks palun skannige allolevat QR-koodi, kasutades selleks spetsiaalset rakendust.

Täydellinen käyttöohje on käytettävissä verkossa. Avaa käyttöohje skannaamalla QR-koodi asianmukaisella sovelluksella.

Το πλήρες εγχειρίδιο χρήσης διατίθεται σε έναν ιστοχώρο. Για να μεταβείτε σε αυτόν, σαρώστε τον παρακάτω κωδικό QR μέσω μιας ειδικής εφαρμογής.

A teljes használati útmutató megtalálható a webes felületen. A hozzáféréshez, kérjük, olvassa le a lenti QR-kódot a megfelelő alkalmazás használatával.

Panduan pengguna yang lengkap tersedia di halaman web. Untuk mengaksesnya, silakan pindai kode QR berikut menggunakan aplikasi khusus.

Il manuale utente completo è disponibile su uno spazio Web. Per accedervi, scansionare il codice QR seguente mediante un'applicazione dedicata.

ユーザーマニュアル完全版はウェブサイト内で閲覧いただけます。そちらにアクセスするには、専用アプリケーションを使用して以下の QR コードをスキャンしてください。

Pilnā lietotāja instrukcija ir pieejama tīmeklī. Lai tai piekļūtu, lūdzu, noskenējiet tālāk redzamo QR kodu, izmantojot tam paredzētu lietojumprogrammu.

Išsamaus naudotojo vadovo ieškokite interneto svetainėje. Kad jį atvertumėte, specialia programėle nuskaitykite toliau pateiktą QR kodą.

Manual pengguna yang lengkap boleh didapati di ruangan web. Untuk akses, sila imbas kod QR di bawah menggunakan aplikasi yang berkenaan.

Den komplette brukerhåndboken er tilgjengelig på et webområde. For å få tilgang, må du skanne QR-koden nedenfor ved hjelp av en dedikert applikasjon.

De volledige gebruikershandleiding is beschikbaar op een website. U kunt de handleiding bereiken door de QR-code hiernaast te scannen met een geschikte applicatie.

Kompletna instrukcja użytkownika jest dostępna na stronie internetowej. Aby uzyskać do niej dostęp, zeskanuj poniższy kod QR przy użyciu dedykowanej aplikacji.

O manual do utilizador completo está disponível num espaço web. Para aceder, queira digitalizar o QR code seguinte com a ajuda de uma aplicação dedicada.

Celá uživatelská příručka je k dispozici na webu. Pro přístup k ní oskenujte níže uvedený QR kód pomocí specializované aplikace.

Versiunea integrală a manualului de utilizare este disponibilă pe un site web. Pentru a-l accesa, scanați codul QR de mai jos cu ajutorul unei aplicații dedicate.

Полное руководство пользователя доступно в Интернете. Для доступа просканируйте приведенный ниже QR-код с помощью специального приложения.

Potpuno korisničko uputstvo je dostupno na vebu. Da biste mu pristupili, skenirajte QR kôd u nastavku pomoću namenske aplikacije.

Celý používateľský manuál je dostupný na internete. Aby ste sa k nemu dostali, naskenujte QR kód nižšie pomocou na to určenej aplikácie.

Celoten uporabniški priročnik je na voljo na spletnem mestu. Za dostop do njega skenirajte spodnjo kodo QR z uporabo namenske aplikacije.

Den fullständiga handboken finns på en plats på Internet. Skanna QR-koden nedan med en lämplig app för att få åtkomst till den.

มีคู่มือผู้ใช้ฉบับสมบูรณ์อยู่ในพื้นที่เว็บ เพื่อเข้าถึงข้อมูล กรุณาสแกนรหัส QR ด้านล่างนี้โดยใช้แอปพลิเคชั่นเฉพาะงาน

Kullanma kılavuzunun tamamı internette bulunmaktadır. Kılavuza erişmek için, QR kodunu uygun bir uygulama kullanarak taratınız.

Повне керівництво користувача доступно в Інтернеті. Для доступу проскануйте наведений нижче QR-код за допомогою спеціального додатку.

Câm nang hương dân sử dung hoan chinh hiên có trên không gian web. Để truy câp, vui long quet mã QR bên dưới bằng ưng dung chuyên dung.

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