Ocular Response Analyzer® G3

Computer Interface Guide



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Setup and PC Connection



The Ocular Response Analyzer must be set on an adjustable height instrument stand and connected to a PC. The system is sold in various configurations, so these items may need to be obtained independently if they were not provided with the instrument.

Note: In order to enable customers to collect ORA G3 data for export and data analysis, we have released the optional ORA G3 PC software (16175). It is important to note that the PC software must be used to operate the instrument if collection and analysis of the data is needed. If the instrument screen commands are used when the PC software is operational and connected, any measurement data taken by screen commands will not be transferred to the PC software.

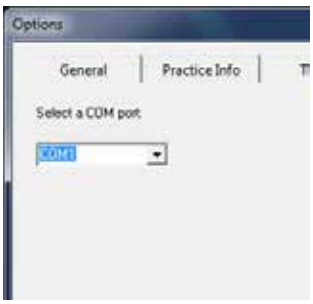
1. The ORA G3 and Laptop need to be set up on an adjustable height instrument table.
2. Connect a Serial to USB adapter to a USB port on the computer if a serial port is not available on the laptop. If using a Serial to USB adapter, device Drivers will need to be installed. You can purchase the cables and adapter at any electronic or computer supply store, or purchase them from Reichert using of the part numbers below:
   - 13207112, USB to Serial Adapter
   - 13880-409, (6 FT) Serial Cable



3. Connect the female end of the RS232 cable to the USB to serial adapter.
4. Connect the male end of the RS232 cable to the ORA.
5. Download and install the 16175 ORA G3 PC software.
6. Boot up the laptop. Start the ORA G3 software using the icon on the desktop.

Note: You may get a communication error message when starting the ORA G3 laptop software. This is because the USB to serial adapter is not fully configured yet. You will resolve this in the steps that follow.

Note: You may get a reminder message informing you to clean the windows and air tube. You can click “OK” to bypass this since the unit is new.



7. Click on the “Options” menu.
8. Click on the “setup COM port” tab.
9. Select the COM port that the serial to USB adapter installed on (likely the only COM port available).
10. Click “Apply”, “OK”, and then Restart the software.
11. Once again, click on the “Options” menu.
12. On the “General” tab, click the “License” button. This will unveil an installation ID code.
13. Contact Reichert as indicated below to activate the software. You will need to order part number 16175, which will provide you the unlock code for the software.
    - Customer Service - 1-888-849-8955
    - E-mail: reichert.information@ametek.com

Note: If, for some reason, you are unable to successfully obtain an unlock code to activate the software, please contact us so we can provide instructions at another time to activate your software.

14. Once the unlock code is entered, click OK. The software is now activated.

Using the Software

The Ocular Response Analyzer PC software package controls the functions of the measurement head and allows for archiving of measurement data.

Note: When using this PC software, the buttons on the screen of the instrument should not be used or data will not be sent to the PC.

Note: If the instrument does not respond to commands by the PC, check the instrument screen for messages and follow the instructions.

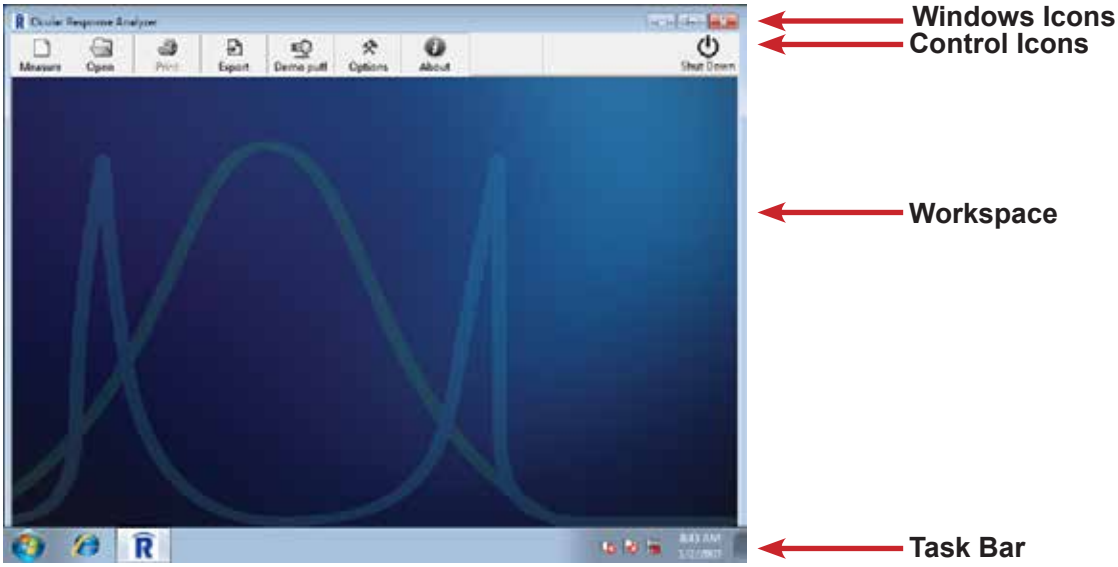
Note: After the Computer Interface software is installed and before measurements can be taken with this instrument a license code must be obtained from Reichert. Please contact customer service as indicated below:

- Customer Service - 1-888-849-8955
- E-mail: reichert.information@ametek.com

Initial Screen

Control Icon Buttons

The control buttons initiate the main functions of the software.



Windows Icons	Icons that minimize, maximize, or close the program.
Control Icons	Menu options for initiating main tasks and options in the ORA software.
Workspace	Display area for waveform and measurement data.
Task Bar	Tray displaying Windows operating software and options.

Control Icon Functions



Measure

The Measure function has two options, the normal mode and the quick mode.

Measure: This mode requires operators to enter patient information before proceeding to the measure screen. All measurement data taken in Normal mode will be archived into the database.

Quick Measure: This mode immediately goes to the measure mode for quick measurements without patient data required.

Open

When the Open function is selected, a window is displayed to Open Patient Data where prior patient data records are stored.

Print

This option is only active when data is displayed to allow printing the data. An external printer is required with the printer drivers installed.

Export

Displays a window to enable exporting patient records.

Demo Puff

Enables operators to demonstrate the air-puff to patients before beginning an exam.

Options

Enables operators to modify various system settings:

- **General** - Maximum # of measures per eye, file locations, and database backup options.
- **Practice Info** - Doctor's name and Practice name information.
- **Tables** - Enables operators to edit database groups and races.
- **Views Layout** - Enables/disables selection of information on the patient database window.
- **Setup COM Port** - Enter parameters for the setup of COM port.

About

Contains information about the Ocular Response Analyzer software package and has an option to view System Information about the computer system.

Measure

The Measure mode has two methods of measuring, the normal Measure mode and the Quick Measure mode.

Selected Group: Displays the patient names within an associated group.

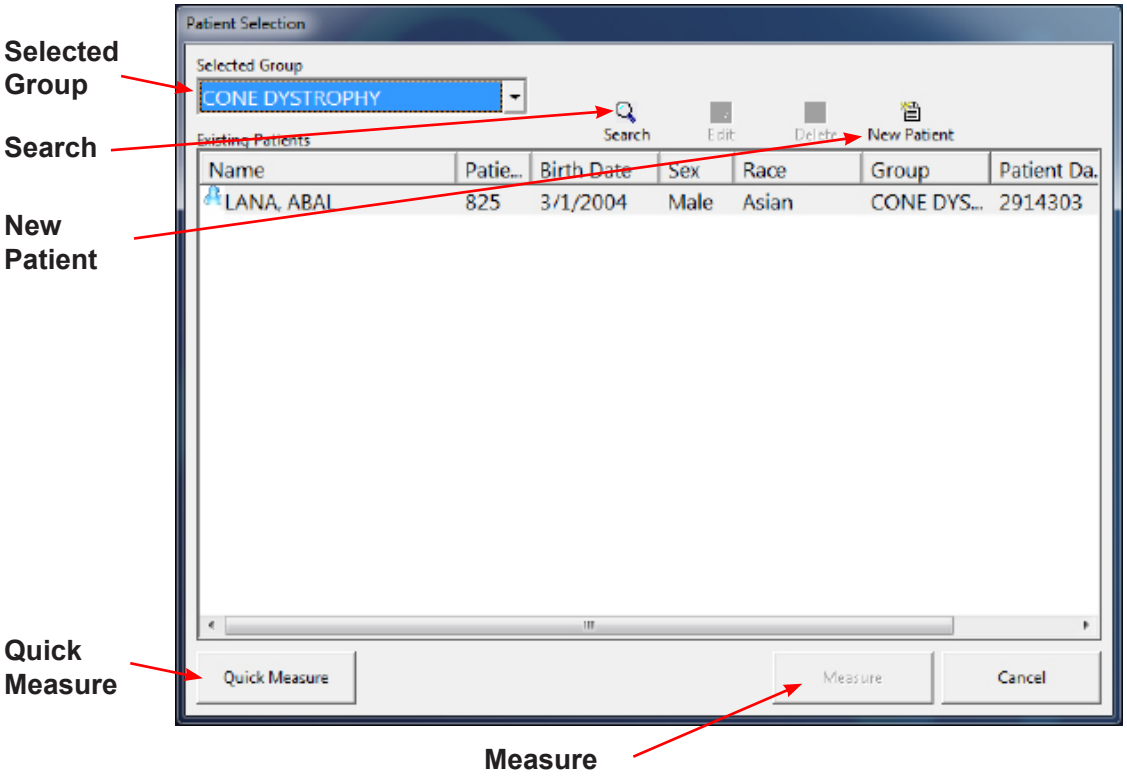
Note: New groups can be added in the main Options menu.

New Patient: Displays a new patient window to enter the new patient information.
Note: Fields with an asterisk (*) require data input.

Search: Enables searching for patient data by the patient name. When Search is activated, type a name in the highlighted search field and the patient record will be displayed.

Quick Measure: This button skips past the request for patient information and goes directly to the measurement screen. Measurement data save option is available before exiting.

Measure: Enables a measurement by selecting an existing patient before progressing to the measurement screen. Existing Patients are displayed by Selected Group and new patients can be added by selecting the New Patient icon.



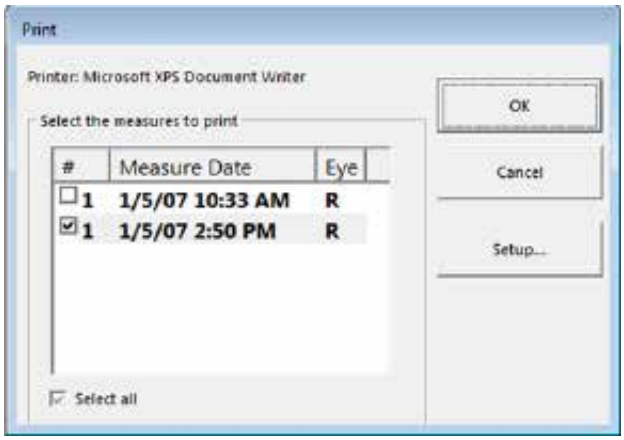
Measure (continued)

Open

The Open window shows a list of previous patient exams and the option to view prior data or allow new measurements to be taken. (Refer to the illustration of the Patient Selection Menu on the previous page.)

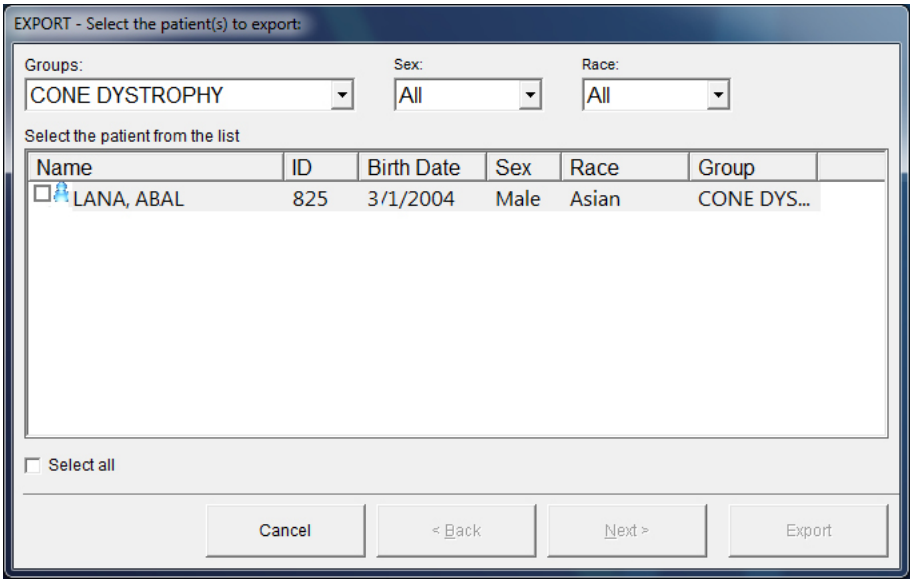
Print

Patient data can be printed from the main window when viewing patient records. To print a record, select the box next to the record and press OK.



Export

Allows exporting of of previously saved patient data.

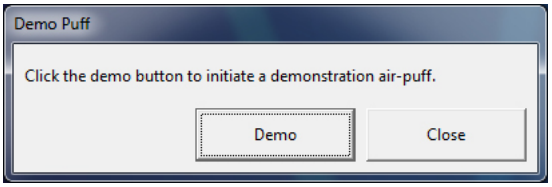


Demo Puff

Before measuring a patient it may be helpful for operators to demonstrate the air puff so that the patient will know what to expect. With the patient seated comfortably in front of the instrument the operator should instruct the patient to hold a hand a few inches in front of the air tube, where the red fixation lights are visible.

Initiating the Demo Puff

1. Select Demo Puff to bring up the Demo Puff Dialog Window.
2. Click the Demo button to initiate the air puff.



Note: The button can be pressed as many times as desired.

Click the Close button when finished.

Options

To modify system settings, click on the Options button. There are five tabs containing various system setting options. The Options window provides settings for features in the ORA software:

General

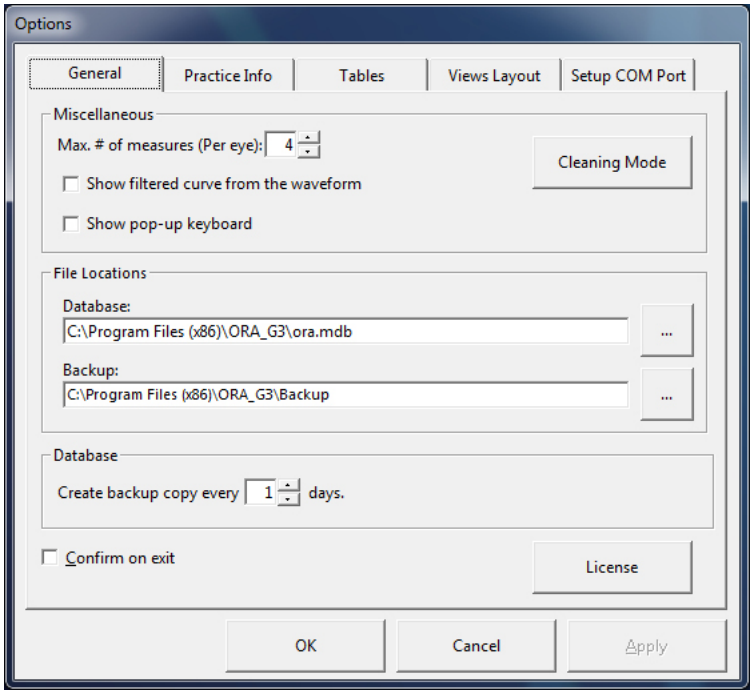
- The maximum number of measurements per eye can be set (maximum of four).
- The Ocular Response Analyzer uses a mathematical signal filter to calculate IOPg, IOPcc, CH, and CRF values from the raw measurement signal. Turn the Filtered Signal on or off by clicking the check box “Show filtered curve from waveform.”
  Note: Setting the Filtered Signal to Off, does not affect the measurement results.
- The Cleaning mode button moves the airtube assembly forward so that you can clean the parts of the optical path as indicated in the Appendix A section of this manual.
- The default database is located at:
  C:\Users\Public\Documents\Reichert\ORAG3\ora.mdb;
  and the Backup Database location is located at:
  C:\Users\Public\Documents\Reichert\ORAG3\

  Note: Databases can be stored on a shared network drive and accessed from any PC with the software installed and users can rename the database, create multiple databases, or change the location of databases if desired. Click the button to the right of the database path to select the desired database.

  Note: A backup location for the ORA G3 database and can be set with the option to create the backup at a specified frequency (“Create backup every x days”).

Options (continued)

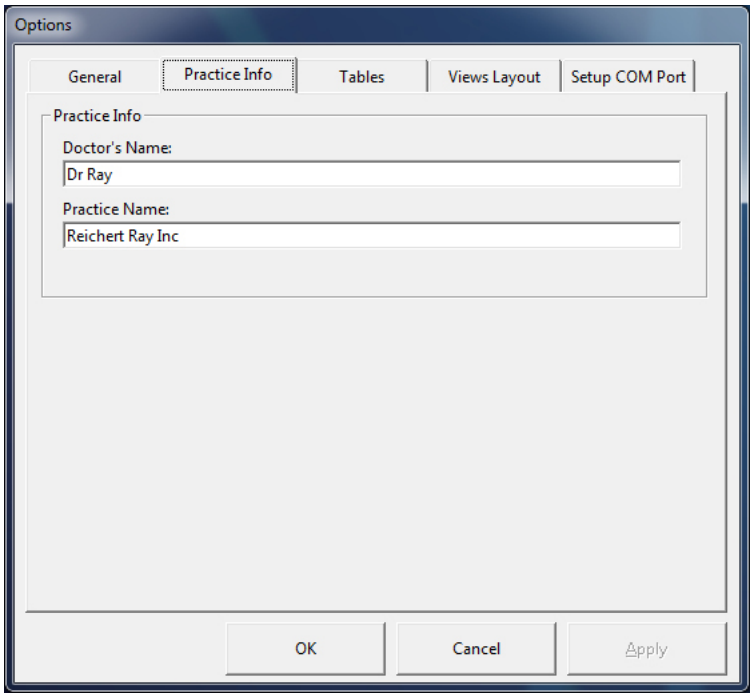
License: The License button is in the lower right corner of the General tab of the Options screen. Before measurements can be taken with this instrument, a license code must be obtained from Reichert. Please contact customer service as indicated in the ORA G3 User Guide to obtain the code.



Practice Information

The Information tab enables users to modify the Doctor's Name and Practice name. This information is stored in the database and appears on the printout.

- Enter the Doctor's name (or the clinician's name if applicable)
- Enter the Practice Name.



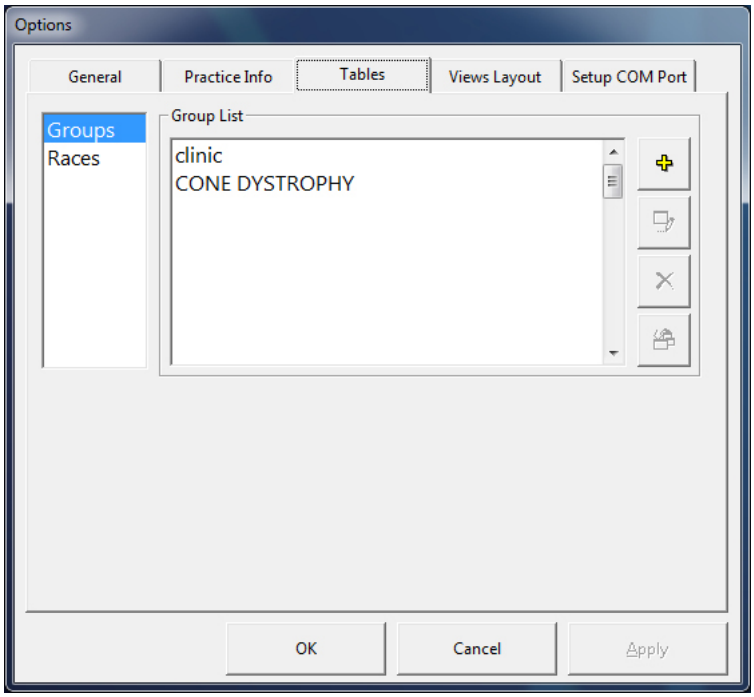
Options (continued)

Tables

The Tables tab allows users to select the category patient data is stored. The default options are Groups and Race.

- To Add a categories, press the add (+) button (top button).
- To Edit a category, select the button with the pencil (second from the top button).
- To Delete a category, highlight the category and then press the Delete (x) button (Second from the bottom button).
- To Reassign a category, highlight the category and then press the Reassign button (bottom button).

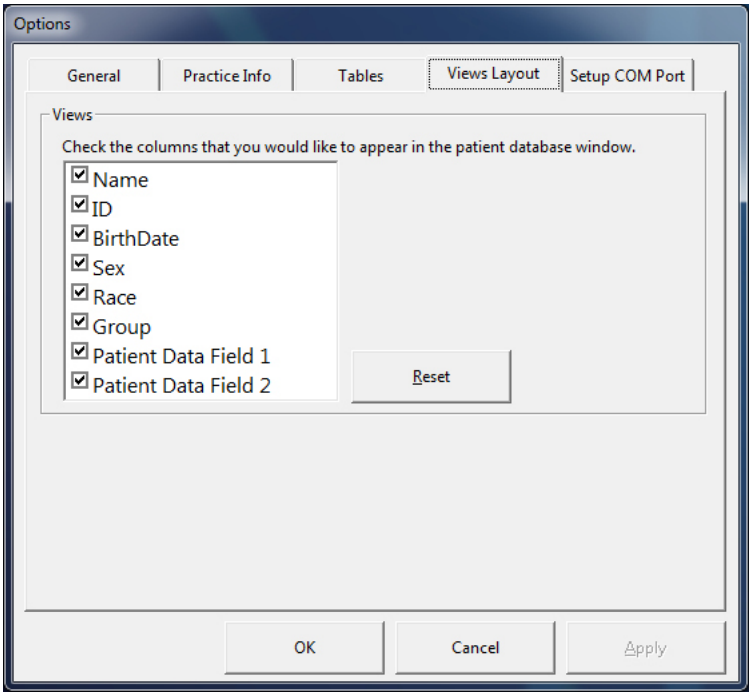
Note: Once the categories are created, the patient data can be moved from one category to another in the edit patient data screen.



Views Layout

The Views Layout tab enables users to configure the categories that will be visible in the patient data window. Users should check the options that they wish to see when they are viewing, sorting, or searching the patient database.

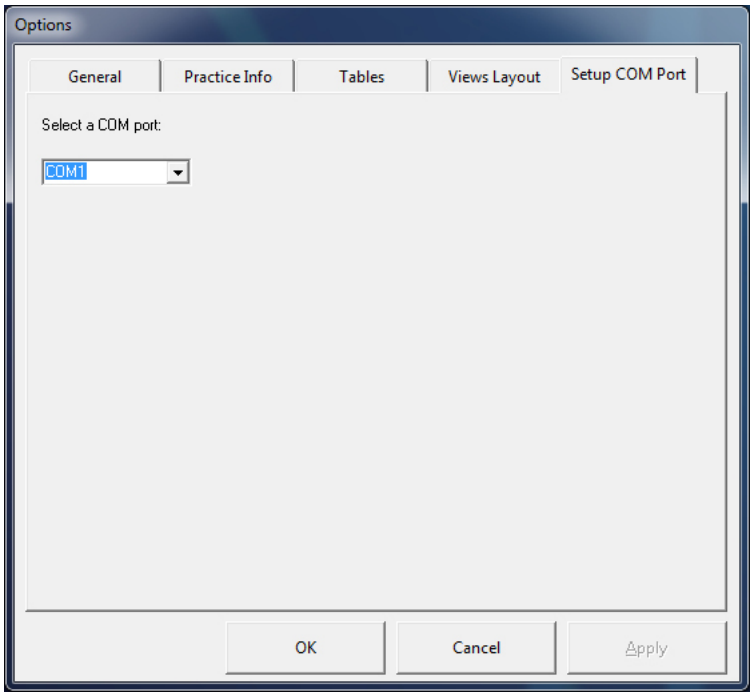
Note: Patient Data Field 1 and Patient Data Field 2 are comment related fields available to notate information about the patient, history, or miscellaneous other information as needed for the patient file. The fields are capable of 256 alpha-numeric characters and can be edited in the edit patient data screen.



Options (Continued)

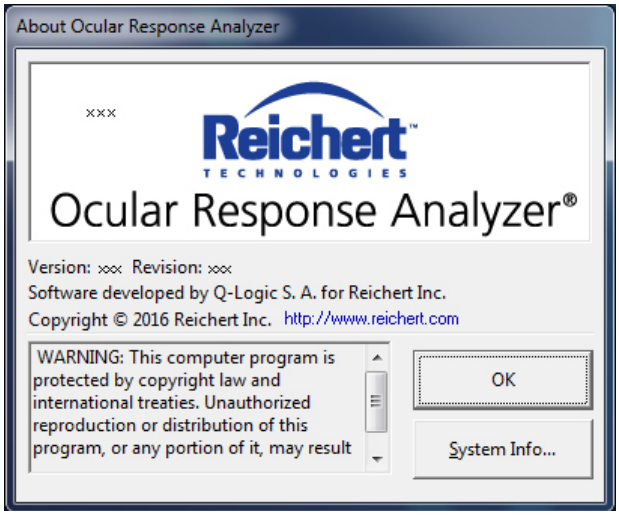
Setup *COM Port*

Allows selection of the COM port used to communicate from the computer to the instrument.



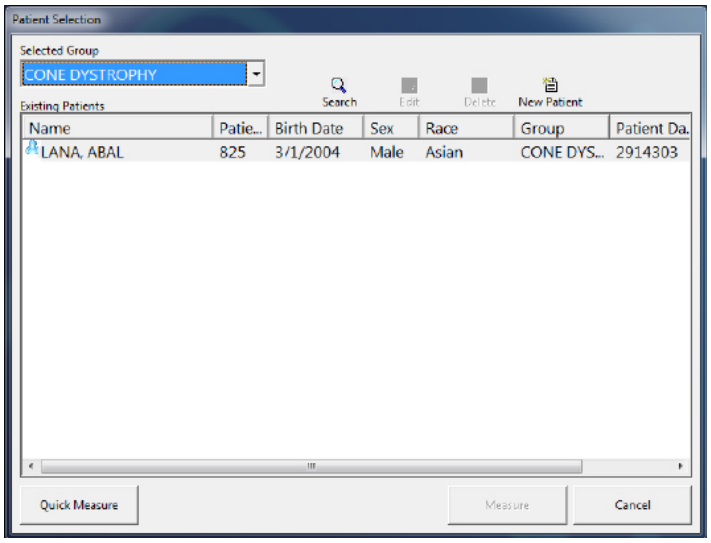
About

The About screen located on the main menu contains information about the Ocular Response Analyzer software package and has an option to view the System Information and its properties.



Patient Data Entry/Patient Selection

1. Click on the Measure icon and the Patient Selection window will appear.



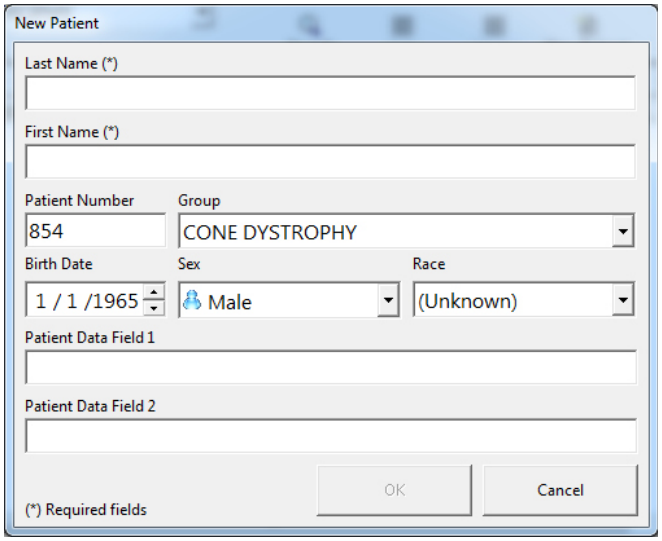
Note: If you already have existing Patients, the Patient Selection Window will display the list.

2. Click the New Patient button to enter a new patient into the database.
3. The New Patient window will appear.

Note: All fields indicated by an asterisk (*) are required.

Note: The Patient Number field automatically generates a sequential Patient Number.

Note: Patient Data Field 1 and Patient Data Field 2 are open text fields for additional identification information.



4. When all the information is entered, click OK to save it.
5. The Patient Selection window will appear again, now with the new patient added to the list.
6. Double click the patient name or click the Measure button to proceed to the Measure Screen.

Note: Operators can sort the list in ascending or descending order by clicking on the category header. The categories can be selected to be displayed or not displayed in the Views Layout Tab.

All patient names are displayed when “All” is chosen in “Selected Groups,” else a specific Group can be viewed. The Group Function is used to create separate patient data archives. New Group names can be added by clicking the down arrow next to the Selected Group list and then choosing “Add new...”

Quick Measurement Mode

Click the Quick Measure button at the lower left of the Patient Selection screen.

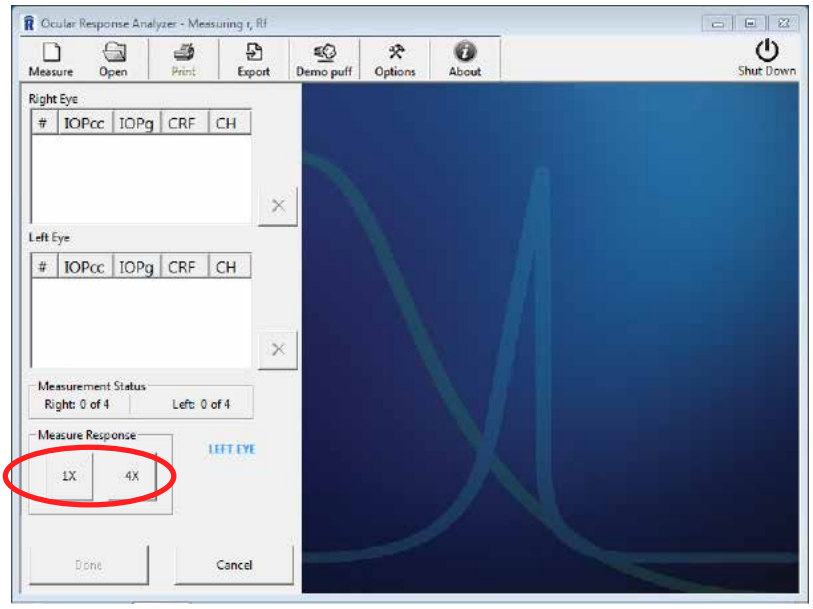
Measurements made in Quick Mode cannot be printed. However, patient information and results can be saved afterwards, allowing the device to be used as a screening instrument, but providing the flexibility to save the patient data if remarkable results are discovered.

Note: This immediately brings up the Measurement Window, bypassing the entry of patient information.

Initiating a Measurement

1. Enter a new Patient or select an existing Patient from the Patient Selection Window.
2. Click the Measure Icon.
3. The instrument will prepare for a measurement.
4. Slide the headrest to one side and then ask the patient to put their head against the headrest and look at the green light. Refer to *Patient Positioning* in the ORA G3 User Guide.
5. Click one of the Measure Response buttons and the ORA will take a measurement.

Note: Refer to the Measurement Data section in this manual for more information about how to determine if the measurement is a reliable reading.



Taking Multiple Measurements on the Same Eye

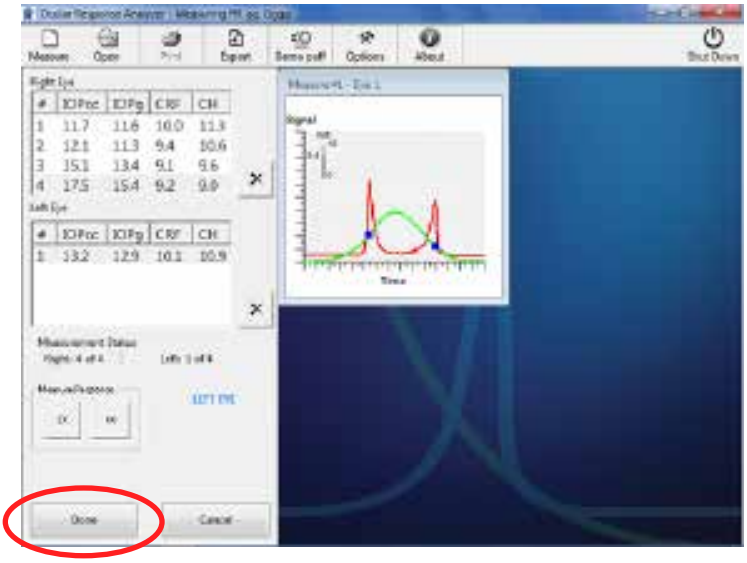


It is recommended that operators take multiple measurements on each eye so that the signals can be evaluated for consistency to ensure accurate results. A maximum of four signals and measurement result lines can be displayed at once.

Operators may need to take additional measurements, deleting unacceptable signals, until acceptable results are obtained.

Eyes with irregular corneas or pathology may make obtaining a reliable signal more difficult. Some eyes may never produce “normal” signals.

Measuring the Second Eye



After completing the number of desired measurements on the first eye, operators should slide the headrest fully to the other side and reposition the patient for measurements on the second eye.

Once the patient is repositioned, simply click one of the Measure Response buttons again. When the first measurement for the second eye is taken, the measurement signal will appear on the screen.

Operators can click on the left or right eye data windows to switch back and forth between the signals from either eye.

When the desired number of measurements has been obtained for both eyes, the operator can click the Done button to proceed to the Results Window.

Open Icon

The **Open** button displays a list of measured patients. When the patient is selected, the measurement data is displayed in the Results tab window.

This window automatically appears after taking patient measurements and clicking the **Done** button. Operators can also access this mode by clicking the **Open Icon** or selecting **Open** from the **File Menu** and then choosing the patient to be reviewed.

Measurement Data

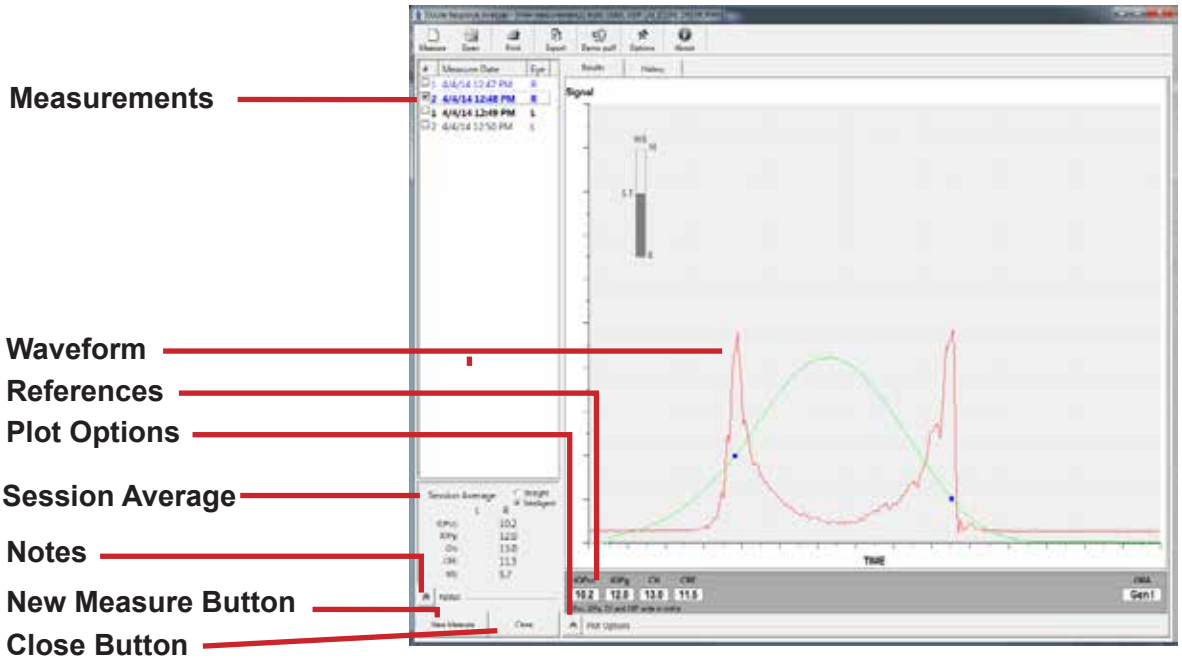
This screen displays patient data in a number of formats. Detailed descriptions of the features, functions, and buttons are provided below.

Measurements
The measurement section displays the historical measurements recorded for the patient. The date, time, and eye are displayed for each measurement. To display the graph of the measurement, select the record.

The left side of the screen provides a list of the measurements taken. The measurement for each eye (left or right) displayed in **bold** is the measurement with the highest measurement session waveform score. The remaining measurements are displayed in non-bold format.

Note: The waveform for the selected measurement is displayed and measurement data corresponding to a specific measurement is displayed below the waveform. Operators can click on any line in the list of measurements to view the numerical data for that measurement.

Notes
Notes of a record can be edited by selecting the Notes icon. When this icon is selected a drop-down menu is displayed for the Medications, Conditions, and Exam Notes 1 and 2 fields that will allow modification of the information in any of these field.



Measurement Data (continued)

Session Averaging

Averaging of the readings is perfomed either by intelligent averaging or by straignt averaging.

Intelligent Averaging

The Ocular Response Analyzer G3 features an intelligent averaging system, based on the waveform score, to help ensure the most reliable measurements are displayed. Refer to the ORA G3 User Guide for details of this option.

Straight Averaging

The straight averaging is a standard method of averaging. The sum of the readings are divided by the number of readings.

Export

If an export of the measurements is desired, before pressing “Done” the export function will export the current patient session.

Plot Options

In this window, operators can select Waveform, Overlay, or Sequential mode.

Waveform

This is the default view, showing the waveform from the selected measurement and the CH, CRF, IOPg and IOPcc data for this measurement in the references window.

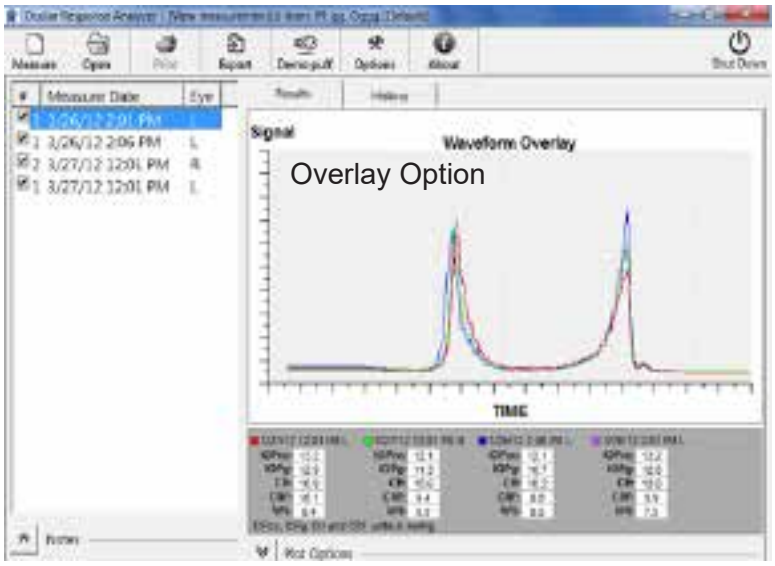
Overlay

Operators can view up to four signals from the same subject simultaneously superimposed over one another.

Operators must manually select signals by clicking on the desired check boxes in the measurement history list.

Each signal appears in a different color. The colors are automatically assigned by the software in a sequential manner, depending on the order of the selection of signals.

The measure date and time are displayed above the waveform data below the waveform window.



Measurement Data (continued)

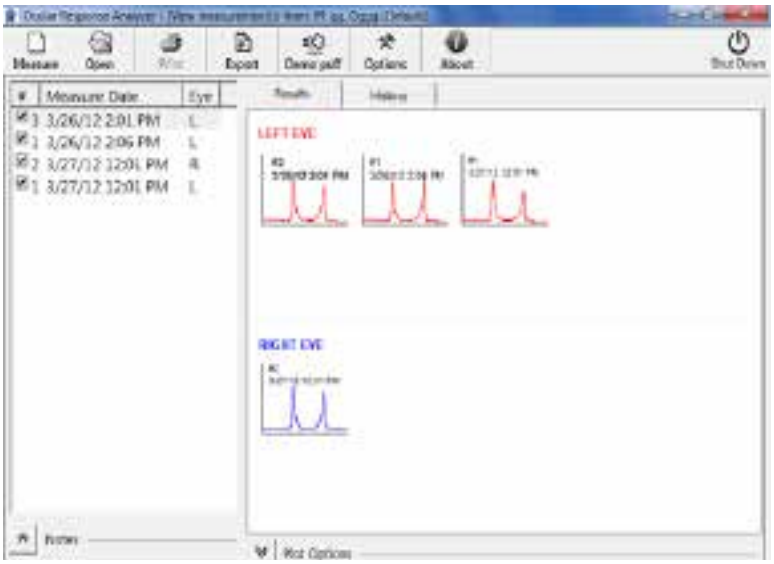
Plot Options (continued)

Sequential
Operators can select up to 10 signals for each eye on the same subject and display them in date/time sequential order.

Operators must manually select signals by clicking on the desired check boxes in the measurement history list.

Left eye signals appear in red. Right eye signals appear in blue.

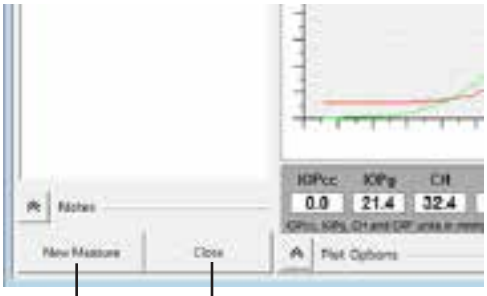
The signals will be displayed in date/time sequential order, regardless of the order they are selected.



Sequential Option

New Measure Button
Click to begin a new measurement session on the patient whose data is being reviewed.

Close Button
Click to close the View Measurement Window.



New Measure Close

Print Icon

Measurement data can also be printed using the **Print** button, accessible from this screen. See the Printing Patient Data section of this guide for details.

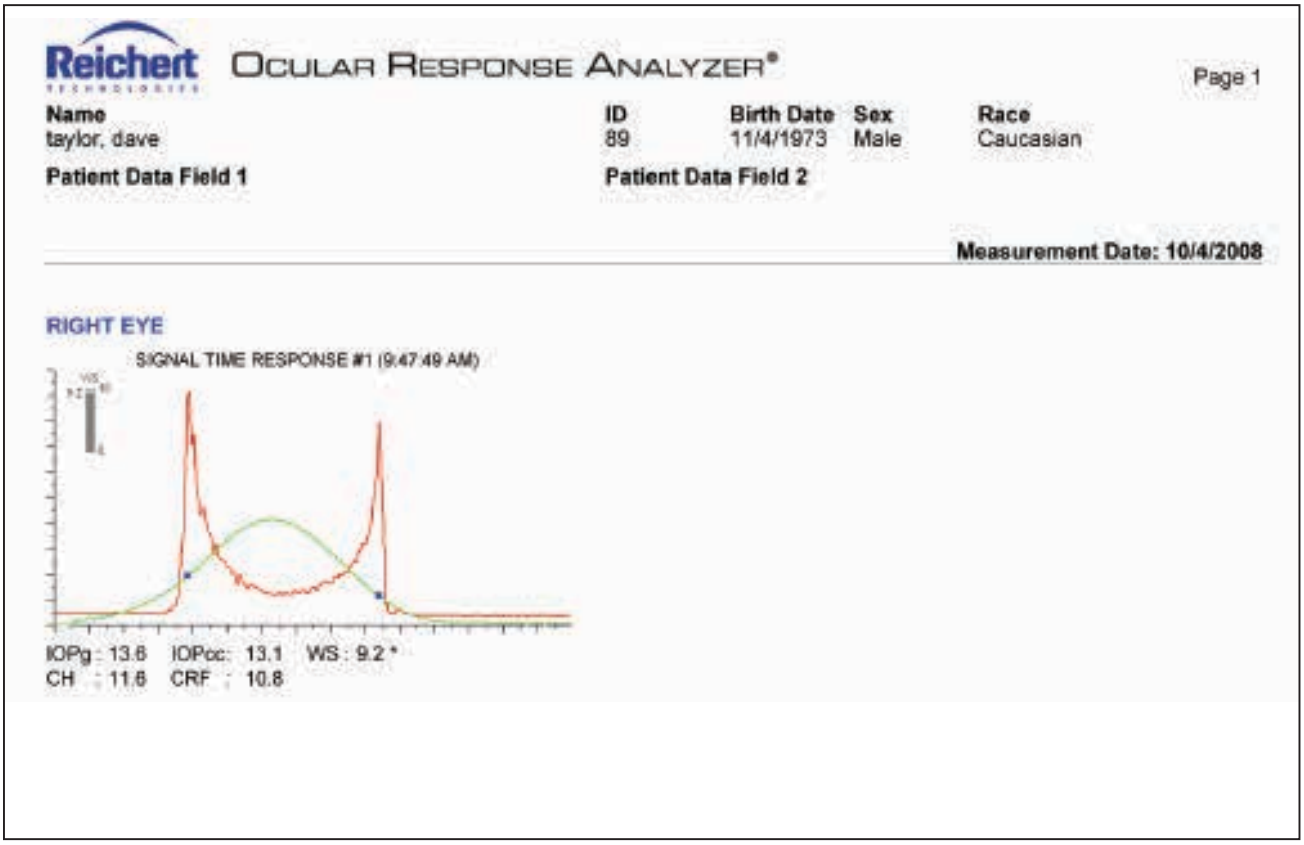
Printing Measurement Data

Operators can print patient data by pressing the Print button or selecting Print from the File Menu, after which, the print dialog box will appear.

Review Window with Print Dialog Box

Operators can click the print icon to print data from the Results, History, or Analysis tabs. An example of a printout from the Results tab for one right eye measurement is shown below. To Print the data, select the record and then OK.

Sample Print Out



Export Data Function

Operators may desire to export data from the database in order to manipulate it in other programs such as spreadsheets or statistical packages. This can be accomplished quickly and easily using the Export function.

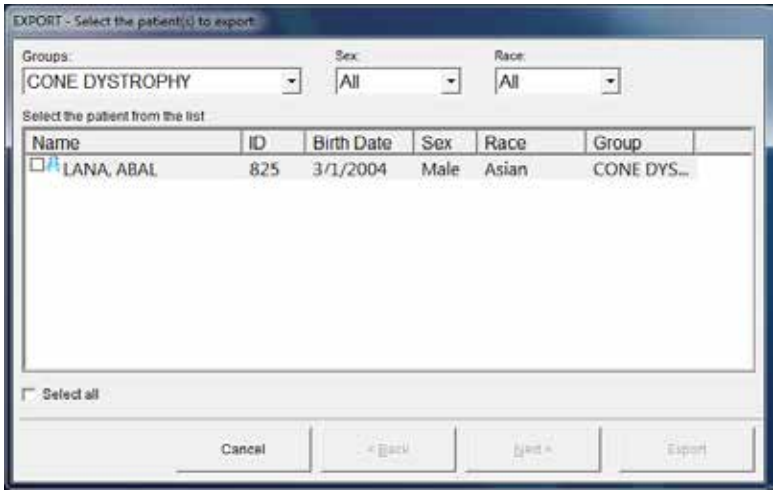
Export

The Export function can be accessed by selecting Export from the main menu screen.

Select Patient

Operators can select the Group, Sex, and Race of the patient data to be exported. Individual patients can be included or excluded from the export by clicking on the check boxes next to the names. All patient data for the selected Group, Sex, and Race can be included by clicking the Select All check box.

Click the Next button to continue.

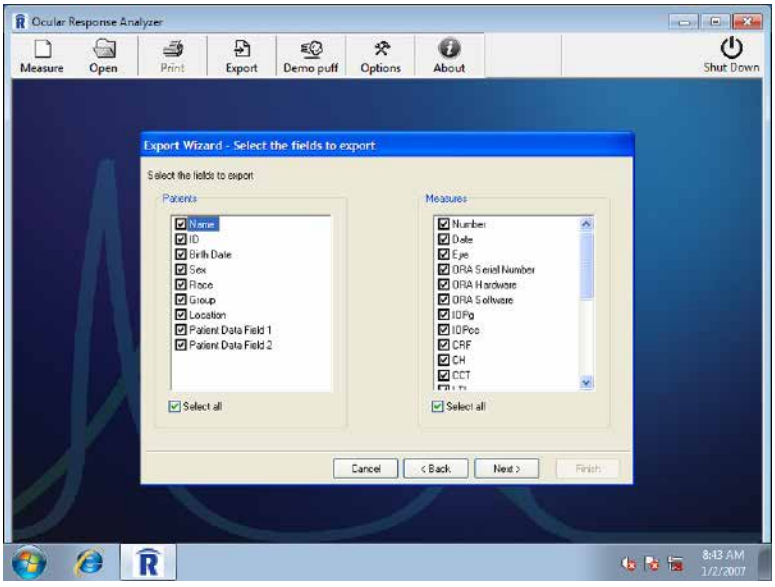


Field Data & Export Values

Operators can now choose which fields are to be included in the export by checking or unchecking the boxes next to each field name. There is a box for each piece of data that the software archives with each measurement.

Click the Next button to continue.

NOT shown here, operators will have the option to export All Values or only the Best Signal Values. Even when All Values are exported, the Best Signal Values for each eye, for each measurement session, are identified in the export file.



Select the option in the lower right for the type of values (Best waveform scores or All).

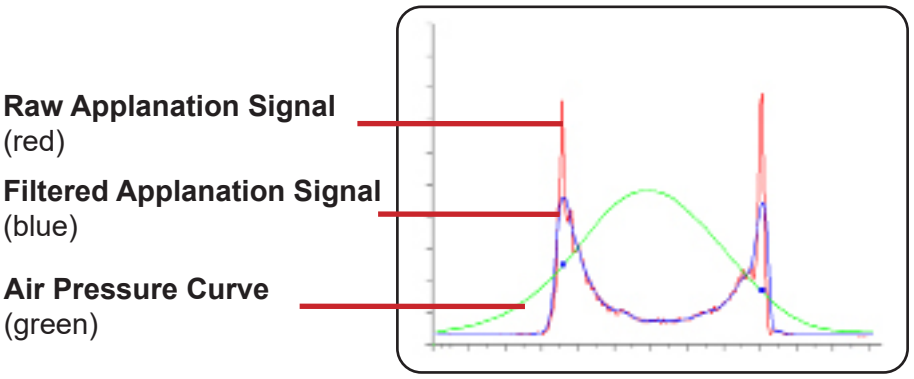
Destination

Select the location of the export file. The General tab will show the location of where the files will be saved.

This location can be changed by clicking the Browse button next to the path field and browsing the computer for the desired location. Once the desired location has been identified click the Next button.

Ocular Response Analyzer Waveforms

The Ocular Response Analyzer makes measurements by applanating the cornea with a puff of air and monitoring the shape of the cornea with an electro-optical detection system. The waveform that is produced as a result of the measurement process is displayed, and should be analyzed by the operator, after each measurement. Operators should understand the waveform in order to ensure reliable results when making patient measurements.



The above curves are the following:

- The green curve represents the pressure of the air on the cornea.
- The red curve indicates the raw signal of the applanation detection system.
- The blue curve is a filtered version of the red curve, designed to identify the “optimum point of applanation” in less than ideal signals.
- The filtered curve can be turned on or off in the **Tools / Options** menu. The default setting is off.

The optical signal collected during the inward and outward applanation events causes the two “spikes” on either side of the pressure curve. The applanation pressure is determined by drawing a line down from the peak of each applanation spike to the intersection of the green pressure curve. These points are graphically indicated in the Ocular Response Analyzer software by blue squares. The outward applanation pressure will always occur at a lower position on the pressure curve than the inward applanation pressure due to Corneal Hysteresis (CH). Corneas with higher hysteresis will cause a greater discrepancy in the vertical offset of these two pressure points.

The pressure curve will always be fairly symmetrical. The height of the curve will vary depending on the amount of pressure required to applanate a particular eye. Eyes with high intraocular pressure will cause a higher curve.

The applanation signal curves, particularly the raw signal curve, may vary significantly in appearance from measurement to measurement. Ideally, the peak-amplitude (height) of the applanation signals (spikes) will be above the green curve. Both spikes should have a clearly defined and relatively well-centered high point (peak). The spikes should be similar in amplitude (they will rarely be identical). In normal eyes, the signals will be symmetrical and relatively free of “noise.”

Appendix A - Cleaning Procedure

Positioning Windows and Airtube Cleaning

WARNING: TO REDUCE THE RISK OF INJURY, BE SURE THERE IS NO PATIENT OR OTHER PERSON LOOKING INTO THE AIRTUBE DURING THIS CLEANING PROCEDURE.

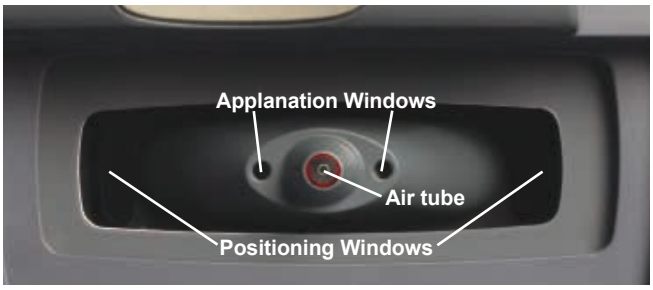
CAUTION: DO NOT USE SOLVENTS OR STRONG CLEANING SOLUTIONS ON THE ALIGNMENT WINDOWS OR DAMAGE TO THE WINDOWS WILL OCCUR.

When the Positioning Windows or the Applanation Windows become occluded with contaminants, degradation of the positioning signal occurs. When signal degradation occurs, the system may not recognize or position at the center of the eye. Consequently, the instrument will not find the center of the eye or align off center, which may prevent the unit from taking a measurement or can cause low waveform score readings.

Every 30 days, the instrument screen display will remind the user to clean the optics and airtube and may not allow operation of the PC software until the cleaning procedure is completed.

1. To allow easier cleaning of the optics on the tonometer, touch the SETUP icon (to Enter Main Menu screen) then touch the Cleaning Procedure option to move the airtube out as far as it will go.

Note: If the cleaning mode is not entered after the 30 day reminder by the user pressing the BACK icon, then the 30 day reminder counter will be reset.



Positioning Windows

2. Locate the Positioning Windows and the Applanation Windows and wipe the outside surfaces with a clean, long handle cotton-tip swab moistened with a lens cleaner or alcohol (isopropyl or ethanol).
3. Remove any remaining dust or foreign particles using only clean, dry, compressed air at less than 90 psig (620 kPa).
4. Using a Pipe Cleaner, slide it in and out of the Airtube a few times to remove any contaminants inside the Airtube.

CAUTION: BE SURE THERE IS NO PIPE CLEANER OR OTHER OBJECT IN THE AIRTUBE BEFORE PUFFING THE INSTRUMENT.

5. When cleaning is completed, press the SELECT icon and the Ocular Response Analyzer G3 will initiate a series of puffs to clear potential contaminants from the airtube and the nosepiece will return to normal position.



Pipe Cleaners

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