OphthoSim™

Installation and User Guide

OphthoSim™

Installation and User Guide   **Page**

1. Overview

Thank you for purchasing the OphthoSim™ Training and Simulation System.

OtoSim Inc has worked hard to develop an integrated and interactive simulation system that will significantly improve the effectiveness of retinal diagnosis. OphthoSim™ provides the opportunity to effectively learn retinal examination techniques through hands-on experience in a simulated eye. It allows students to practice their technique while reviewing clinical scenarios, with hundreds of high-fidelity images equipped with direct and immediate feedback.

This manual has a number of sections. Please review the entire manual before installing the software. ***In addition, please run a single OtoSim™ Base Unit before attempting to run multiple units.***

The intent of this manual is to allow a person with basic computer knowledge to install the software. A computer with the OphthoSim™ software preloaded and hardware preconfigured can be purchased from us. ***If you work in a networked hospital environment, you may require assistance from your IT staff.*** Alternatively, OphthoSim™ can be run off of a stand-alone laptop to avoid network issues.

The actual instructions and screenshots may vary slightly from what is displayed on your screen, as there are many versions of operating systems.

The OphthoSim™ unit has no on/off switch or independent power. The images and the power supply are provided via the single USB cable.

For those with more advanced computer knowledge, the OtoSim™ Base Units are essentially an extension of the desktop monitor via a USB video feed. The OphthoSim™ installation package will load drivers that enable this USB video. When multiplexing (running more than one OtoSim™ Base Units at the same time), connect the Base Units one at a time and allow the computer to recognize them (show them as extended units from the desktop). Your computer screen may resize or flash black multiple times during the initial setup. It has been our experience that most computers can multiplex up to 6 OtoSim™ Units when used with a computer that meets our required

specifications. (Please contact us if you want to multiplex more than 6 OtoSim™ Base Units.) You can multiplex by connecting to the USB outlets on your computer or by using a powered external USB hub. Please refer to *Section 5* for suggested configurations.

If you experience difficulty in setting up your OphthoSim™ Upgrade Kit or software, feel free to send us an email (info@otosim.com) and set-up an appointment for technical support. We will typically respond within 24 hours, Monday to Friday.

We welcome your feedback on improving OphthoSim™ and features you would like to see in future versions. Please do not hesitate to contact us via www.OtoSim.com.

2. Components

Your OphthoSim™ Full System consists of OtoSim™ Base Unit package and an OphthoSim™ Upgrade Kit. If you did not receive all of the items pictured below, please contact us immediately. Please note that you will need an OtoSim™ Base Unit to run the OphthoSim™ Upgrade Kit.

OtoSim™ Base Unit package includes:

a) OtoSim™ Base Unit

b) USB Cable (Type Mini-B to Type A)

c) Pelican 1300 Protective Case

a)   b)   c)

OphthoSim™ Upgrade Kit includes:

1) Sensor Box

2) OphthoSim™ Eye Piece (lens that is placed on top of the OtoSim™ Base Unit)

3) USB Key with OphthoSim™ Software and Manual

4) USB Cable (Type B to Type A)

5) Ophthalmoscope cable

6) OphthoSim™ Ophthalmoscope (with built-in tracking circuitry)

7) Protective Case

Note: A computer (desktop or laptop) is required to run the OphthoSim™ but is not provided. Please refer to *Section 3: System Requirements* to identify a suitable computer to operate this simulation system.

3. System Requirements

The minimum requirements for the computer driving the OphthoSim™ are listed below. Any recent laptop will likely meet the requirements. You may choose to assign a dedicated unit or use your personal computer. *For software installations onto networked-computers, it is recommended to seek assistance from your IT department.*

- 250 megabytes (MB) of disk space for OphthoSim™software and DisplayLink driver software.

- Two available USB 2.0 ports, or one USB 2.0 and a powered external USB hub (sold separately).

- The DisplayLink driver will run on processors ranging from basic single Core CPUs, Dual, Quad Core and Core i3/i5/i7 CPUs. 1.2 GHz or above, with 512 MB RAM or more.

  - Please note that the processor speed, RAM capacity, and USB controller of your computer may affect multiplexing capabilities based on the following guidelines:

    - 1-2 Base Units: 1.2 GHz CPU / 512 MB RAM

    - 2-5 Base Units: 1.8 GHz CPU / 1 GB RAM

    - 6 Base Units: 1.6 GHz Dual-Core CPU/ 2 GB RAM

    - 6+ Base Units: please contact us for available options

  - For multiplexing, please use USB hubs defined as USB 2.0, with transfer rates of 480 MBPS (megabytes per second) and with an additional power source of 2.5 Amps or higher. Please refer to *Section 5* for suggested configurations.

- Any of the following operating systems: Mac OS X 10.7 (Lion), 10.8 (Mountain Lion), 10.9 (Mavericks), 10.10 (Yosemite); Windows 8, Windows 7 (32-bit or 64-bit), Windows Vista with Service Pack 1 or 2 (32-

bit or 64-bit), Windows XP Home or Professional (including Tablet edition) with Service Pack 2 or 3.

> *Note:* Microsoft is no longer supporting Windows XP. Although the OtoSim 2™ software is compatible to Windows XP, we don't recommend it.

- Minimum WEI score of 3 in "Graphics; Desktop performance for Windows Aero".

4. Base Unit Initial Setup

1) Before using the Base Unit, you should remove the retaining ring from your OtoSim™ Base Unit by turning it counter-clockwise.

2) The OphthoSim™ Eye Piece is secured in a plastic case to protect it during transit. Remove the Eye Piece from the case. The OphthoSim™ Eye Piece was designed to fit into all existing OtoSim™ Base Units.

3) Place the OphthoSim™ Eye Piece into the cavity and secure it by tightening the retaining ring. Ensure that the built-in slider (circled) is installed facing up.

4) The pupil size of the Eye can be adjusted at any time by moving the slider up or down. Adjusting the pupil size will create different levels of difficulty for simulating eye examinations.

5. Base Unit Hardware Configurations

Below are the schematics of the OtoSim™ Base Unit hardware. Remember that there is no on/off switch; the electric power and digital images are supplied through the USB cable.

It is recommended you become familiar with the single-unit configuration use before attempting to mulitplex OtoSim™ Base Unit (connect multiple units at the same time).

5.1 Location to Plug USB Cable Into Base Unit

The USB port is located on the backside of the Base Unit. Insert the Type Mini B (smaller) end of the USB cable into the port on the Base Unit.

Be sure to align the USB cable plug and USB port on the Base Unit properly, to prevent damage to the port.

Be sure to loop the USB cable around the strain relief hook on the back of the Base Unit, to prevent pressure and damage to the port.

5.2 Connecting One Base Unit to the Computer

The OtoSim™ Base Unit can be connected to a desktop computer or a laptop by inserting the Type A (larger) end of the USB cable into the port on the computer.

Refer to *Section 3* for system requirements to run the OphthoSim™. ***When connecting to networked-computers, it is recommended to seek assistance from your IT department.***

5.3 Multiplexing – Connecting Multiple Base Units to the Computer

Fourteen Base Units are capable of running off of a single PC computer when all 14 Base Units are connected to OtoSim-supplied USB hubs. Due to factory settings, only 4 Base Units can run simultaneously from a Mac computer, when the units are connected to an OtoSim-supplied USB hub. OtoSim has tested a variety of USB hubs and highly recommend the use of the OtoSim-supplied hub for safe operation. Please ensure the following when multiplexing Base Units:

• OtoSim recommends a maximum of 6 Base Units multiplexed to a single OtoSim-supplied USB hub for PC with Windows 8 (multiple USB hubs required for more than 6 units); 6 Base Units for PC with Windows 7, Vista or XP; and 4 Base Units for Mac.

- The USB hub is kept exposed in an area with good air circulation during use (i.e. not covered up).

- When not in use, disconnect the USB hub and the Base Units (i.e. **do not leave** any OtoSim™ Unit running overnight).

- We do not recommend more than 8 hours of continuous use.

- Do not connect other high-current draw USB devices to the hub when OtoSim™ Base Units are connected to the hub, even if there are available USB ports on the hub.
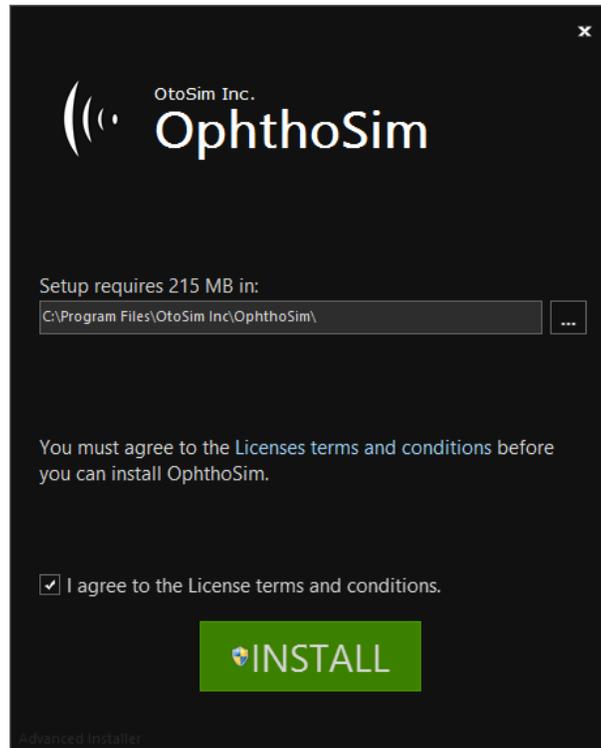
6. Windows: Software Installation

These instructions will guide you through the setup of your OphthoSim™ software on a Windows PC. The following steps only need to be done once to load the software onto your computer.

Note: For software installations onto networked-computers, please request assistance from your IT department.

DO NOT PLUG IN THE BASE UNIT OR OphthoSim™ SENSOR BOX UNTIL THE SOFTWARE INSTALLATION IS COMPLETE.
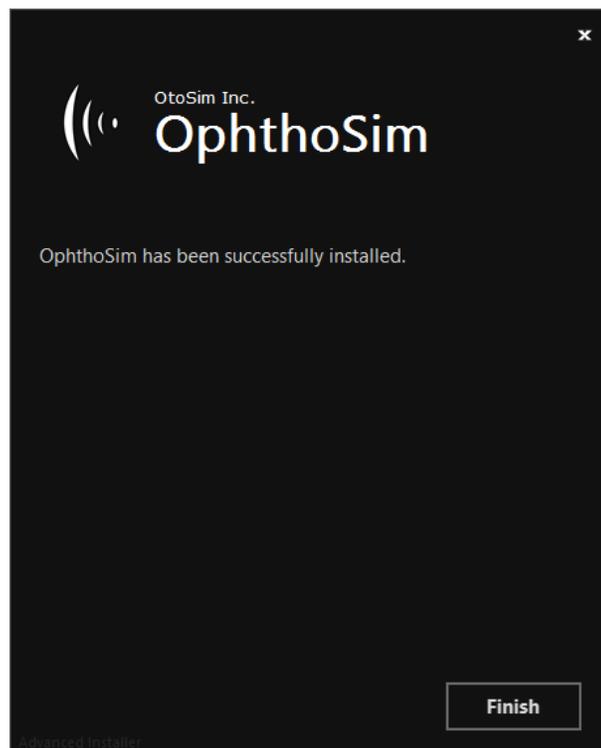
6.1 OphthoSim™ Software Installation

1) Insert the provided USB Key with the software into your computer. Double-click on the installation file.

2) Select the appropriate install directory or leave the default (recommended) setting. Please read the "Licenses terms and conditions". If you agree, check "I agree to the License terms and conditions" and click "Install" to continue.

3) Before copying the OphthoSim™ software to the computer, the installation package will install the pre-requisite software – DisplayLink. While the DisplayLink drivers install, the following screen will appear. (Do not change any settings or plug in any Base Units while the installation progresses. The computer's display may flash or turn off temporarily during this process.)
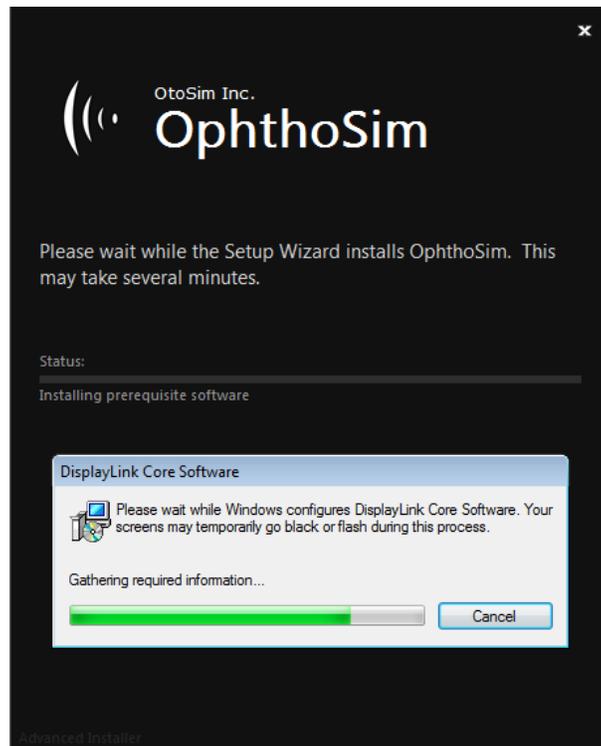
4) Wait for the installation to complete. This may take several minutes. Once the installation is complete, follow the prompts to restart the computer.

Note: The Base Unit should remain disconnected from the computer during the rebooting process.

5) Congratulations, you have successfully installed the OphthoSim™ software and DisplayLink drivers!! Go to *Section 6.2.1* if you are using Windows XP, or *Section 6.3.1* if you are using Windows Vista, Windows 7 or Windows 8 to setup the Base Unit.

6.2 Windows XP Display Setup

6.2.1 Windows XP: Verifying the Display Setup

1) Please connect the OtoSim™ Base Unit to an available USB port (see *Section 5* for supported configurations)

2) Go to "Display Properties" by either a) going through the Control Panel and selecting the "Display Properties" icon; or b) right-clicking on the desktop and selecting "Properties" from the pop-up menu.

3) Select the "Settings" tab and verify that the secondary monitor (OtoSim™ Base Unit) appears as monitor #2. It should appear to the right of the main monitor (monitor #1) and the **top edges** of the two monitors should be aligned (see diagram below).
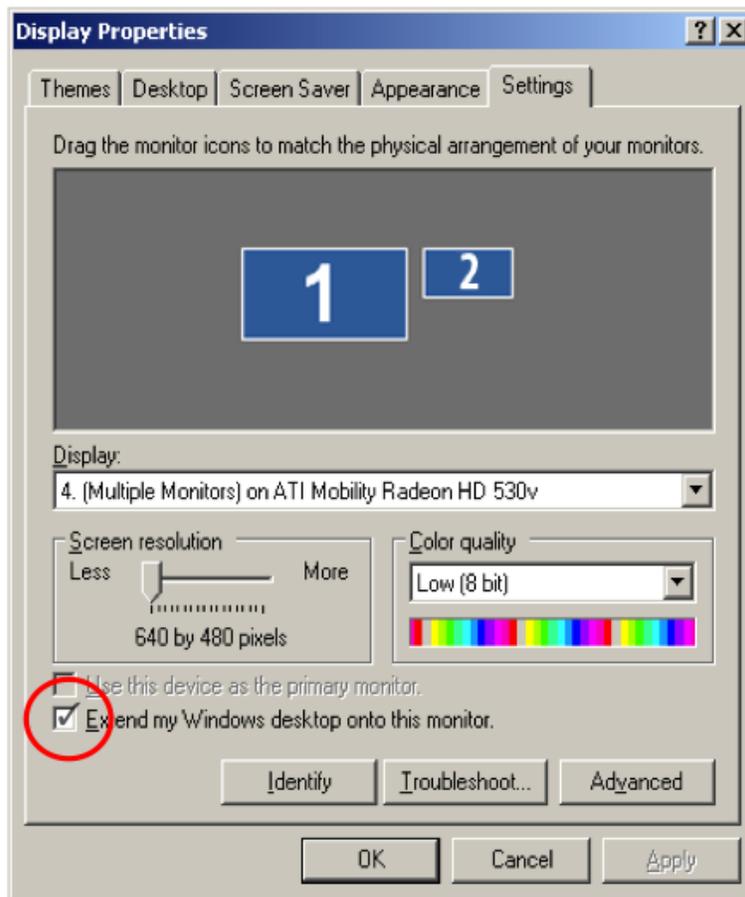
4) Ensure that the "Extend my Windows desktop onto this monitor" option is checked under the Settings tab of the Display Properties Panel (see diagram above).

5) To ensure connectivity, please click the "Identify" button and the number corresponding to the monitor will appear for several seconds. This can be seen through the Eye Piece on the OtoSim™ Base Unit.

Note: The main monitor and Base Units may flicker on and off for several seconds at a time. This is an indication that the computer is in the process of detecting the connected Base Unit.

6.2.2 Windows XP: Connecting Multiple Base Units

Note: We recommend you operate the system with a single unit before using multiple Base Units at once.

To connect multiple Base Units, please follow either A) or B) depending on your situation:

A) Direct Connection to Computer

Multiple Base Units can be individually connected to the available built-in USB ports of your computer. However, you will be limited to the number of available USB ports. Repeat the steps in *Section 6.2.1* above, for each Base Unit to be connected, up to a maximum of 6 units (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

OR

B) Connection to Computer via USB Hub

Multiple Base Units can be connected via a USB hub with the following instructions. We highly recommend using an OtoSim-supplied USB hub to multiplex Base Units. Refer to *Section 5* for safe operation procedures when using a USB hub.

  i.   Connect the USB hub first and allow the associated hub drivers to install.

  ii. Plug in the first Base Unit into the USB hub and allow time for the computer to detect this monitor.

  iii. Repeat the steps in *Section 6.2.1* above, for each Base Unit to be connected, up to a maximum of 6 units (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

Congratulations, you have completed the Display setup. Please close the "Display Properties" window and proceed to use the software!

6.3 Windows Vista/7/8: Display Setup

6.3.1 Windows Vista/7/8: Verifying the Display Setup

1) Please connect your OtoSim™ Base Unit to an available USB port (see *Section 5* for supported configurations)

2) Go to "Display Properties" by either a) going through the Control Panel, selecting the "Display Properties" icon and selecting the "Screen resolution" side menu; or b) right-clicking on the desktop and selecting "Screen Resolution" from the pop-up menu.

3) Verify that the secondary monitor (OtoSim™ Base Unit) appears as monitor #2. It should appear to the right of the main monitor (monitor #1) and the **top edges** of the two monitors should be aligned (see diagram below).
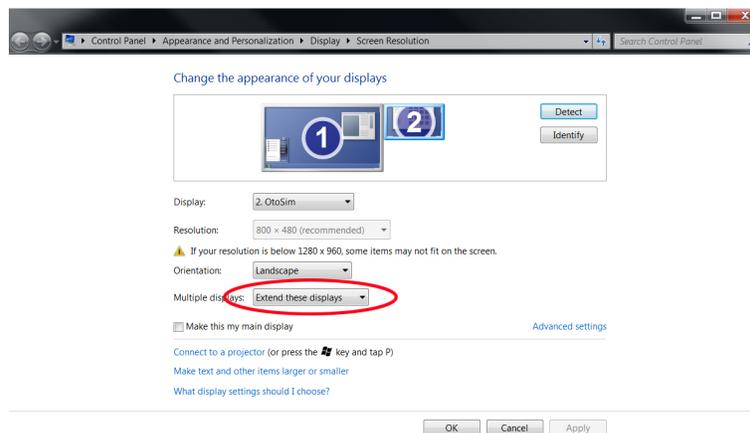
4) Ensure that "Extend desktop this display" is selected under the "Multiple Displays" category (see diagram above).

5) Ensure that the "Extend" option is selected under the "Connect to a Projector" link found in the bottom area of the window (see diagram below).
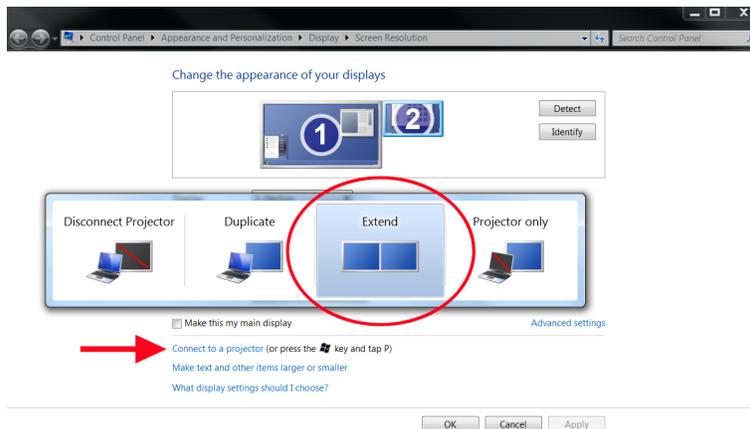
6) To ensure connectivity, please click the "Detect" button and then click the "Identify" button. The number corresponding to the monitor will appear for several seconds. This can be seen through the Eye Piece on the OtoSim™ Base Unit.

Note: The main monitor and the Base Units may flicker on and off for several seconds at a time. This is an indication that the computer is in the process of detecting the connected Base Unit.

6.3.2 Windows Vista/7/8: Connecting Multiple Base Units

Note: We recommend you operate the system with a single unit before using multiple Base Units at once.

To connect multiple Units, please follow either A) or B) depending on your situation:

A) Direct Connection to Computer

Multiple Base Units can be individually connected to the available built-in USB ports of your computer. However, you will be limited to the number of available USB ports. Repeat the steps in *Section 6.3.1* above, for each Base Unit to be connected, up to a maximum of 6 units (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

OR

B) Connection to Computer via USB Hub

Multiple Base Units can be connected via a USB hub with the following instructions. We highly recommend using an OtoSim-supplied USB hub to multiplex Base Units. Refer to *Section 5* for safe operation procedures when using a USB hub.

    i. Connect the USB hub first and allow the associated hub drivers to install.

    ii. Plug in the first Base Unit into the USB hub and allow time for the computer to detect this monitor.

       Repeat the steps in *Section 6.3.1* above, for each Base Unit to be connected, up to a maximum of 6 Base Units with Windows 7, Vista or a maximum of 14 Base Units with Windows 8 (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

Note: The image below is representative of 6 Base Units attached to the computer via a USB hub. The 7th monitor is the 6th Base Unit. The 1st monitor represents the main monitor of the computer.
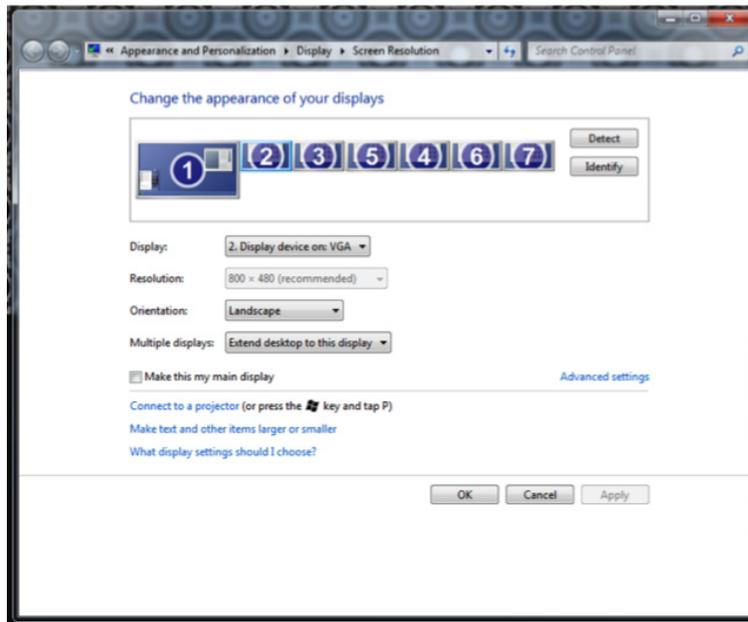
Congratulations, you have completed the Display Setup. Please close the "Screen Resolution" window and proceed to use the software!

7. Mac OS X: Software Installation

These instructions will guide you through the setup of your OphthoSim™ software on a Macintosh computer. The following steps only need to be done once to load the software onto your computer.

Note: For software installations onto networked-computers, please request assistance from your IT department.

DO NOT PLUG IN THE BASE UNIT OR OphthoSim™ SENSOR BOX UNTIL THE SOFTWARE INSTALLATION IS COMPLETE.

7.1 OphthoSim™ Software Installation

1) Insert the provided USB key with the software into your computer. Double click the installation file to install OphthoSim™ on your computer.

2) Double click the "DisplayLink Software Installer.pkg" file. (The DisplayLink drivers are required for the OtoSim™ Base Unit to function.)
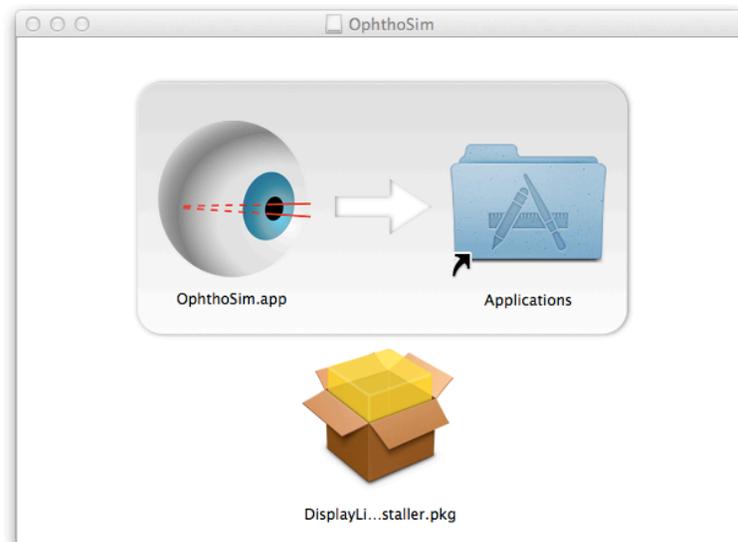
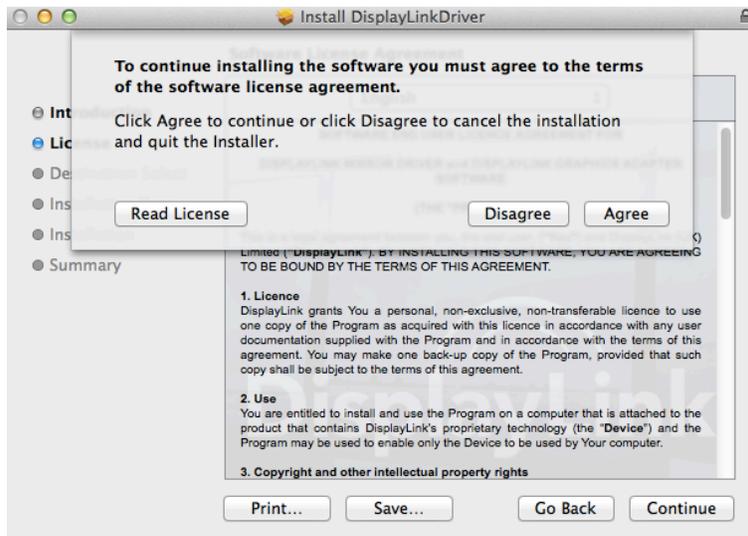

3) Press "Continue" to proceed.

4) You must accept the DisplayLink license agreement to proceed with the installation. If you accept the license agreement, press "Continue" and then "Agree" to proceed with the installation.
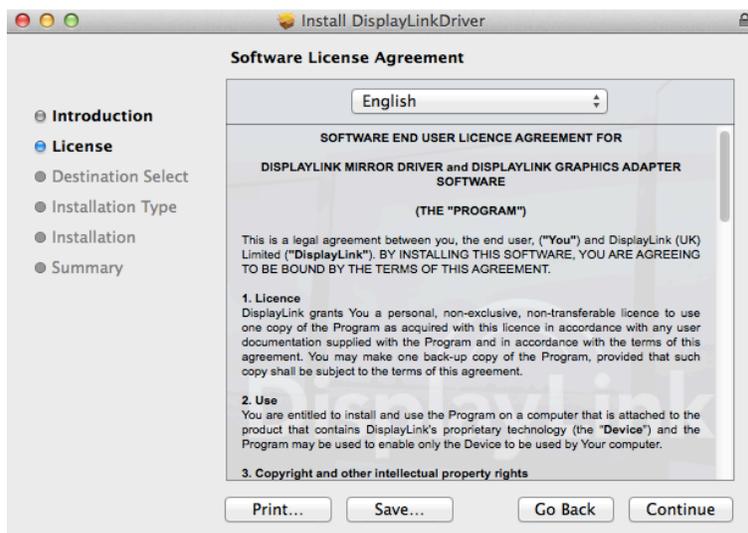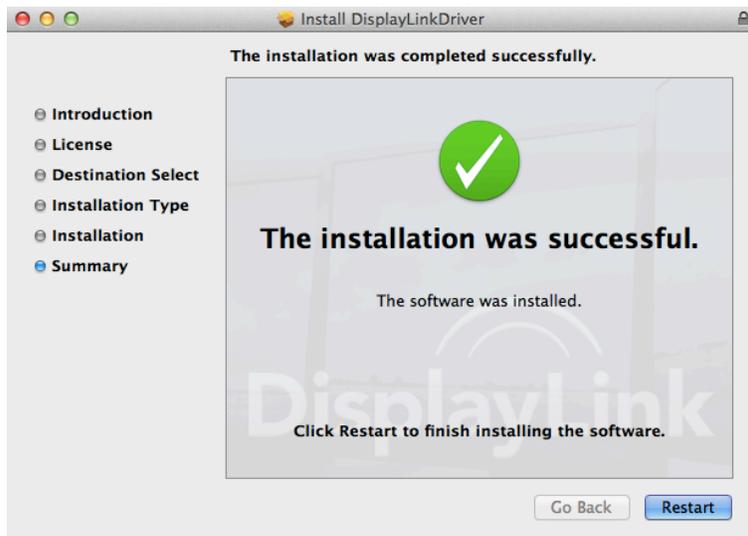
5) Press "Install" to continue with the installation. You will need to enter an administrator's password to proceed.

6) When the DisplayLink software has been installed, you will be required to restart your computer. Press "Restart" to continue. (Do not change any settings or plug in any OtoSim™ Base Units while the installation progresses.)

7) Congratulations, you have successfully installed the OphthoSim™ software and DisplayLink drivers! Go to next section to set up the Base Unit.

7.2 Mac OS X Display Setup

7.2.1 Mac OS X: Verifying the Display Setup

1) Connect the OtoSim™ Base Unit to an available USB port on the computer (see *Section 5* for supported configurations). Allow a few seconds for the computer to detect the Base Unit.

Note: The main monitor and the screen on the OtoSim™ Base Unit may flicker on and off for several seconds at a time. This is an indication that the computer is in the process of detecting the connected Base Unit.

2) Click on the monitor icon at the top right of the menu bar, and select "Display Preferences". Or, you can access "Display Preferences" by clicking on the icon on the top left of the computer, selecting "System Preferences", and double-clicking on the "Displays" icon.
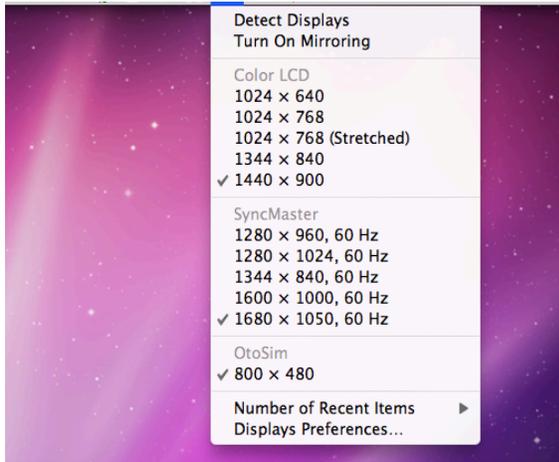
3) In "Display Preferences", click on the "Arrangement" tab and ensure that the secondary monitor (OtoSim™ Base Unit) is placed to the right of the main monitor and the **top edges** are aligned (see diagram below).
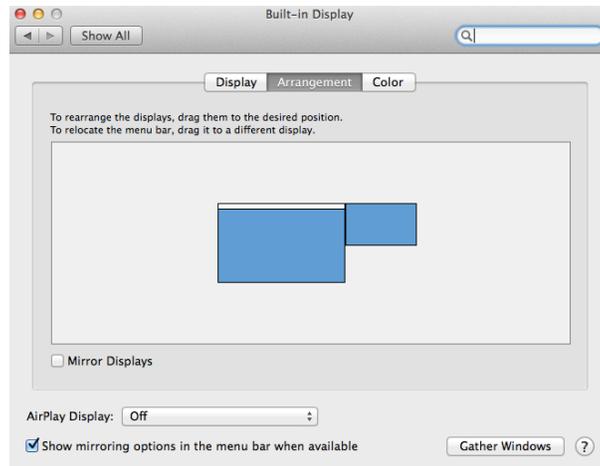
Note: Click on the "Gather Windows" button to move the Display Preferences windows onto the main monitor.

7.2.2 Mac OS X: Connecting Multiple Base Units

Note: We recommend you operate the system with a single unit before using multiple Base Units at once.

To connect multiple Base Units, please follow either A) or B) depending on your situation:
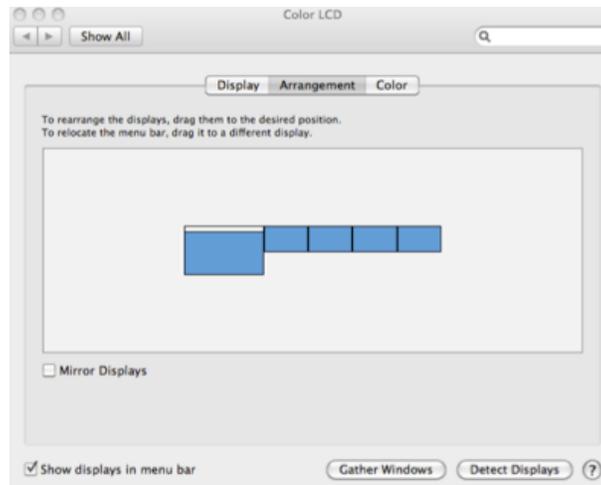
A) Direct Connection to Computer

Multiple Base Units can be individually connected to the available built-in USB ports of your computer. However, you will be limited to the number of available USB ports. Repeat the steps in *Section 7.2.1* above, for each Base Unit to be connected, up to a maximum of 4 Base Units (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

OR

B) Connection to Computer via USB Hub

Multiple Base Units can be connected via a USB hub with the following instructions. We highly recommend using an OtoSim-supplied USB hub to multiplex Base Units. Refer to *Section 5* for safe operation procedures when using a USB hub.

    i.   Connect the USB hub first and allow the associated hub drivers to install.

    ii. Plug in the first Base Unit into the USB hub and allow time for the computer to detect this monitor.

    iii. Repeat the steps in *Section 7.2.1* above, for each Base Unit to be connected, up to a maximum of 4 Base Units (depending on computer performance, as stated in *Section 3*). It is recommended to connect each Base Unit one at a time, and not all at once.

Note: The image above is representative of 4 Base Units attached to the computer via a USB hub.

Congratulations, you have completed the Display Setup. Please close the "Display Preferences" window and proceed to use the software!

8. OphthoSim™ Sensor Box and Ophthalmoscope Hardware Configurations

8.1 Setting up the OphthoSim™ Sensor Box

The OphthoSim™ Sensor Box is designed to be used only with the OphthoSim™ provided ophthalmoscope.

1) To connect the Sensor Box to the provided ophthalmoscope, first connect the four-pronged circular cable to the bottom of the ophthalmoscope.

2) Connect the other end of the cable to the hole at the top of the Sensor Box, as shown below. Now the Sensor Box and the Ophthalmoscope are connected.

3) Connect the Sensor Box to the computer, using the USB Cable. When powered up, the Sensor Box will display a green graph with the motion of the ophthalmoscope. (You may have to restart the OphthoSim™ Sensor by unplugging the USB cable and plugging it back in before you see the green motion graph.)

Note: The two graphs at the bottom of the screen are intended solely as a diagnostic to verify that all the tracking circuitry is functioning correctly. If you do not see any motion when you move the ophthalmoscope, your unit may be malfunctioning. If your unit displays "Not connected", then you should ensure the cable between the Sensor Box and Ophthalmoscope is snugly connected and undamaged.

8.2 Using the Ophthalmoscope

8.2.1 Holding the Ophthalmoscope

The Ophthalmoscope should be held vertical when in use, and should be supported by a single finger near the tip. This ensures the most accurate tracking, and is also consistent with medical best practices. The unit **will not** function correctly if held sideways.

You should hold the ophthalmoscope in the same hand as the eye you are examining.

8.2.2 Moving the Ophthalmoscope

While using the ophthalmoscope, imagine that there is a ½ marble in front of the Eye Piece that the ophthalmoscope must move around. Always point the ophthalmoscope towards the center of the Eye Piece. This will ensure the most accurate tracking and the greatest ease of use.

If necessary, the pupil size can be adjusted to mimic a real eye. A larger pupil size will increase the amount of light entering the unit and make it easier to view the retina. For this reason, OtoSim recommends using the largest pupil size when first starting out.

8.3 Storing the Ophthalmoscope

The ophthalmoscope may be stored when not in use by attaching it to the side of the unit as pictured below:

9. OphthoSim™ Software Use and Navigation

The following section will describe the major features of the OphthoSim™ software package and the contents of each section.

Please use only the Ophthalmoscope provided with your OphthoSim™ unit when using the OphthoSim™ software. Only the provided Ophthalmoscope has the required tracking circuitry to connect with the OphthoSim™ software.

9.1 Navigating through the OphthoSim™ Software

9.1.1 Main Menu

When OphthoSim™ starts up, you will see the Main Menu screen below.
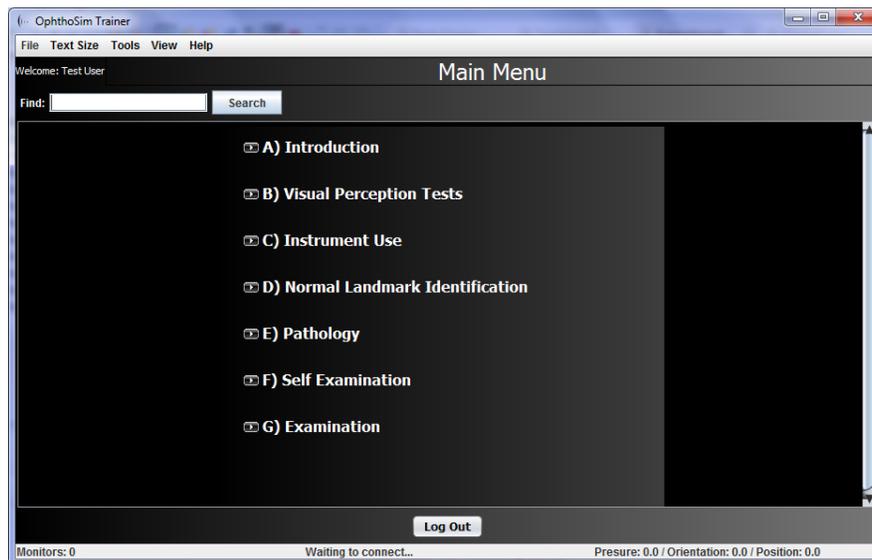
On this page, you can click on each Module Header to expand the contents of that module and to explore the program. *Sections 9.4* through *9.9* summarize the content of the various modules.

Viewed sections will be highlighted red. However you may still revisit any of these sections at any time.

9.1.2 Searching

If you are searching for a specific section, you can type into the search box at the top. Suggestions will be highlighted in yellow as you type. To clear the search suggestions, simply press the "Clear" button.
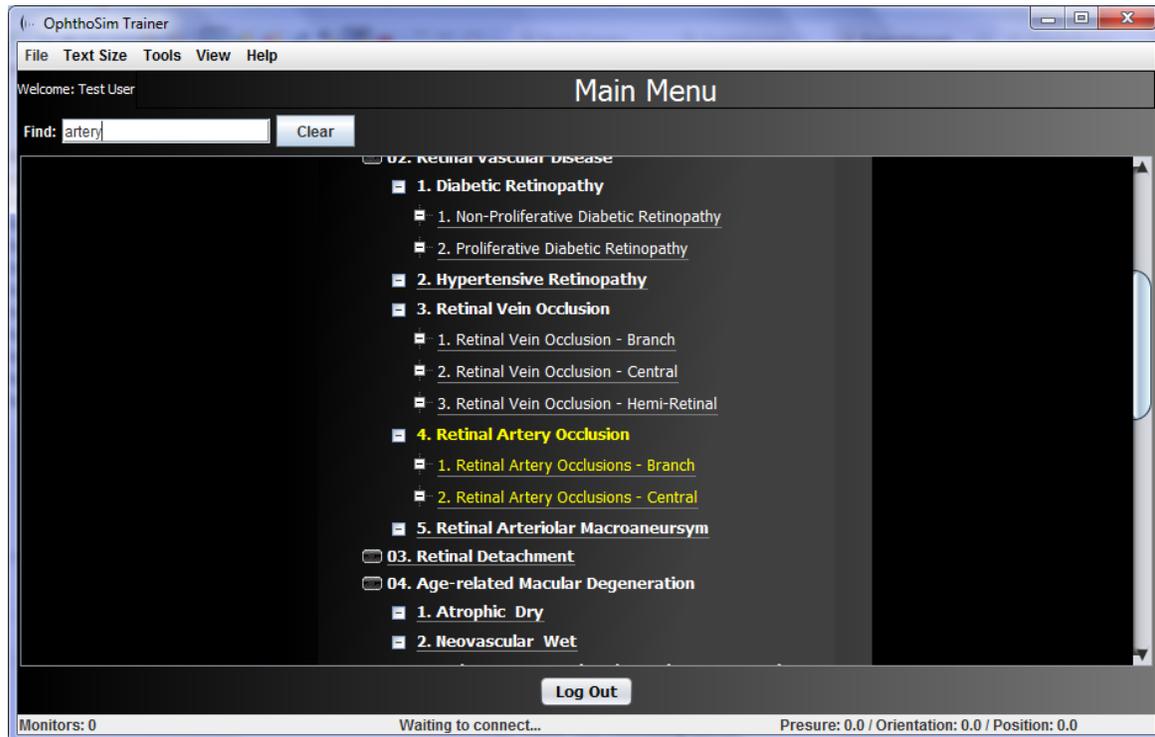
9.2 The Main Interface

Clicking on a module will bring to a screen with an interface similar to the one below, which displays all of the available functionality of the application. Each of these functions will be described in detail below.
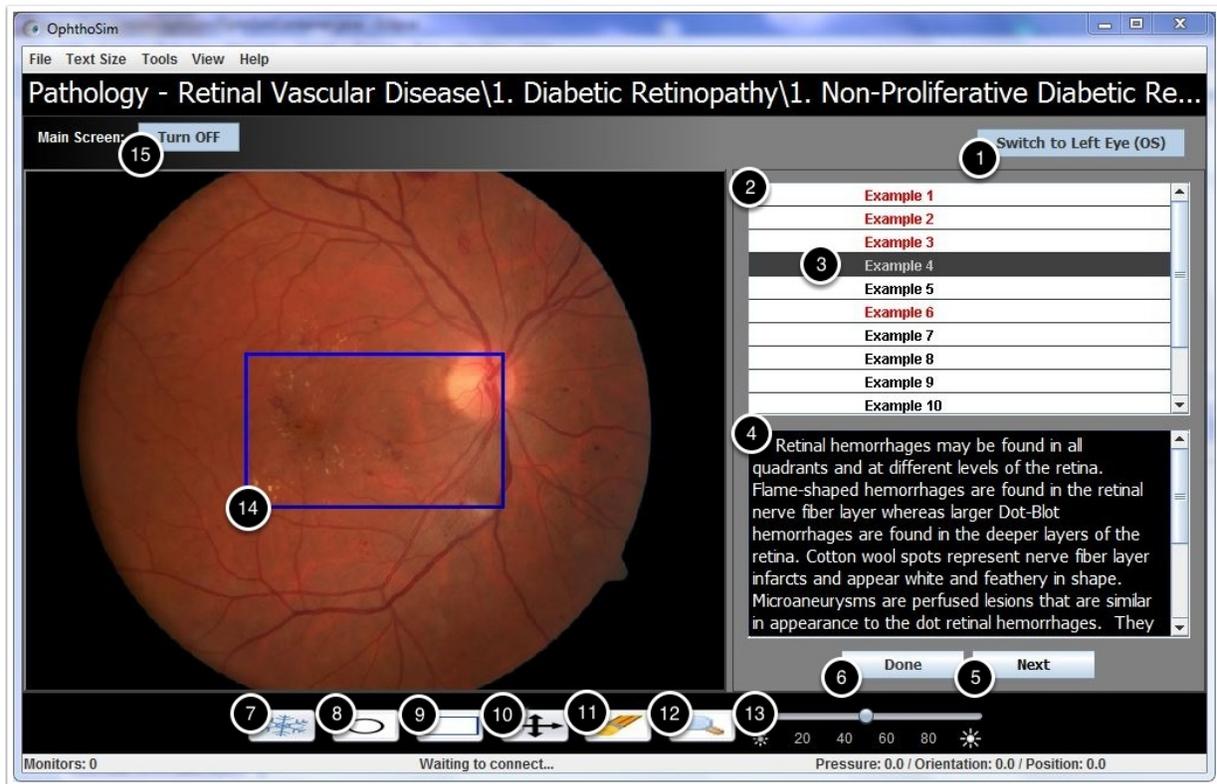
1. **Switch to Left Eye (OS)/Right Eye (OD)** – The button on the top-right allows you to switch between viewing a Left Eye (OS) or a Right Eye (OD). This change is also reflected in the OphthoSim™ unit when viewed through the OphthoSim™ Ophthalmoscope.

2. **List of Images** – The list on the right of the screen displays the available images. Images you have viewed are displayed in red, while un-viewed images are displayed in black. You can always return to viewed images at any time.

3. The image that is currently selected is denoted by a gray band.

4. **Description of Image** – Below the list of images, there is a description of the set of images. In this case, an example of Non-Proliferative Diabetic Retinopathy is shown.

5. **Next** – The "Next" button will take you to the next un-viewed image. To return to a previously viewed image, you must select it from the list of images, as described in *Function 2* above.

6. **Done** – The "Done" button will return to the Main Menu.

Functions 7 to 15 are intended for Instructor Use

7. **Freeze** – At the bottom left, the "Freeze" button allows the instructor to disable movement for all attached OphthoSim™ units. This can be used to focus the trainee's attention on a specific area.

8. **Circle** – The "Circle" button allows the instructor to draw a circle or ellipse around an area of interest. This annotation will be drawn both in the instructor (main) window, and in all attached OphthoSim™ units. This allows the creation of targets or can be used to highlight a particular area.

9. **Rectangle** – The "Rectangle" button allows the instructor to draw a rectangle around an area of interest. This annotation will be drawn both in the instructor (main) window, and in all attached OphthoSim™ units. This allows the creation of targets or can be used to highlight a particular area on the retinal surface.

10. **Cursor** – The "Cursor" button allows the instructor to change what is displayed in the OphthoSim™ unit by clicking and dragging the blue square with your mouse. This can be useful in helping a trainee who has gotten lost. Using this function will freeze the image in the OphthoSim™ units. To resume normal tracking, press the "Freeze" button again to unfreeze movement, as described in *Function 7* above.

11. **Erase** – The "Erase" button allows the instructor to clear any annotations on the screen and return to the default state. This button will also reset the zoom functionality, as described in *Function 12* below.

12. **Zoom** – The "Zoom" button denoted by the magnifying glass allows the instructor to zoom in onto a specific area of interest. After clicking this button, it is possible to increase or decrease the zoom level by **right-clicking** on the image. Furthermore, the area zoomed in can be moved around by clicking and dragging with the mouse. You can return to the default state by clicking the zoom button again.

    Note: The zoomed image will **not** be reflected in the OphthoSim™ unit.
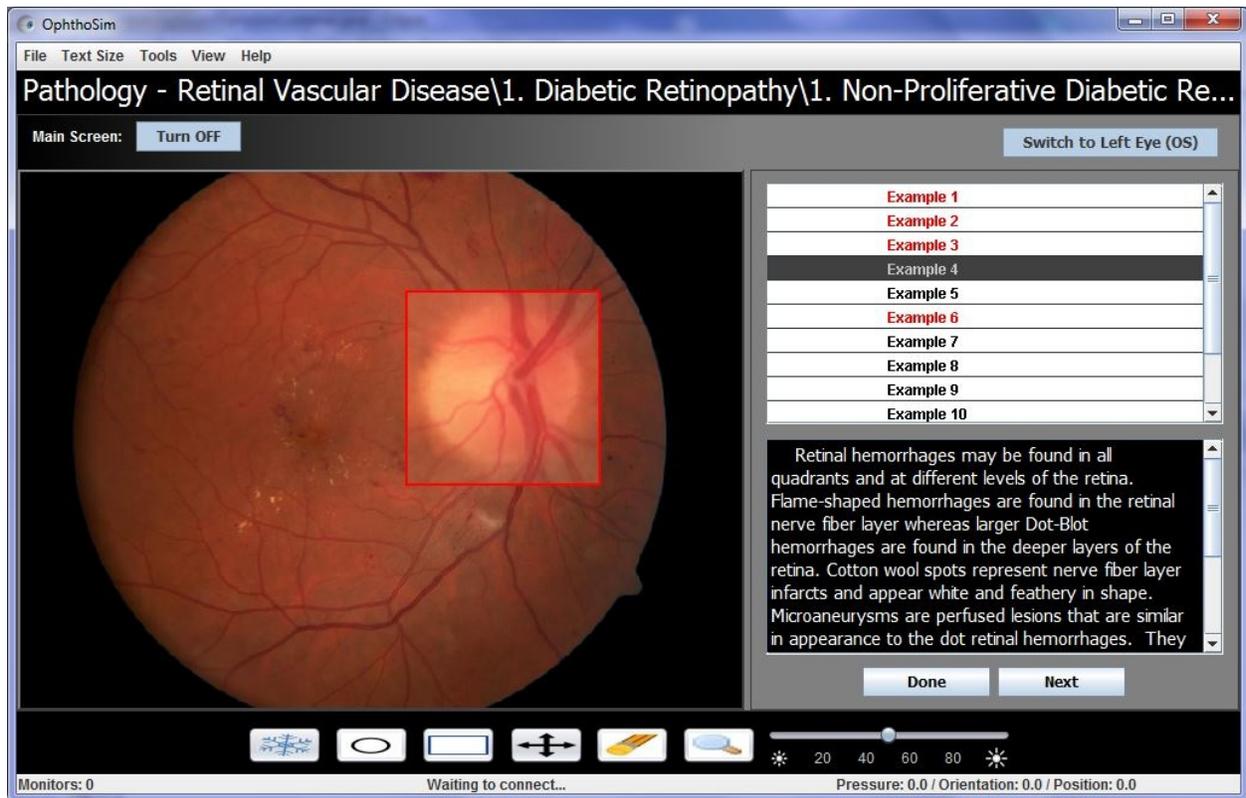
13. **Levels of Brightness** – At the bottom right, there is a slider that allows you to adjust the image brightness.

   Note: All OphthoSim™ images have been carefully calibrated to be as realistic as possible. If an image appears very dark, that's likely because a real eye with that disorder would be very dark as well.

14. **Blue Square** – The blue square will display what is shown in the OphthoSim™ unit. The inner green cross will display what should be the focal point based on the angle of the Ophthalmoscope to the OphthoSim™ unit.

   Note: The green cross may not be displayed at all times. The "View" menu on the top Menu Bar controls when the cross is displayed and by default, will only show a cross if it is required (such as during the tool use tests). However, a cross can be displayed to aid a trainee in orientating themselves by selecting the appropriate option under the "View" menu. Proceed to *Section 9.3.2* for more information.

15. **Turn OFF** – The "Turn OFF" button allows you to cover up the main screen so that a trainee must look through the OphthoSim™ unit to orient themselves or examine the image. This can be helpful for self-directed learning.

9.3 Menu Bar Options

At the top of every page, there is a Menu Bar that contains many useful options. To access these options, click on the menus at the top of the screen.
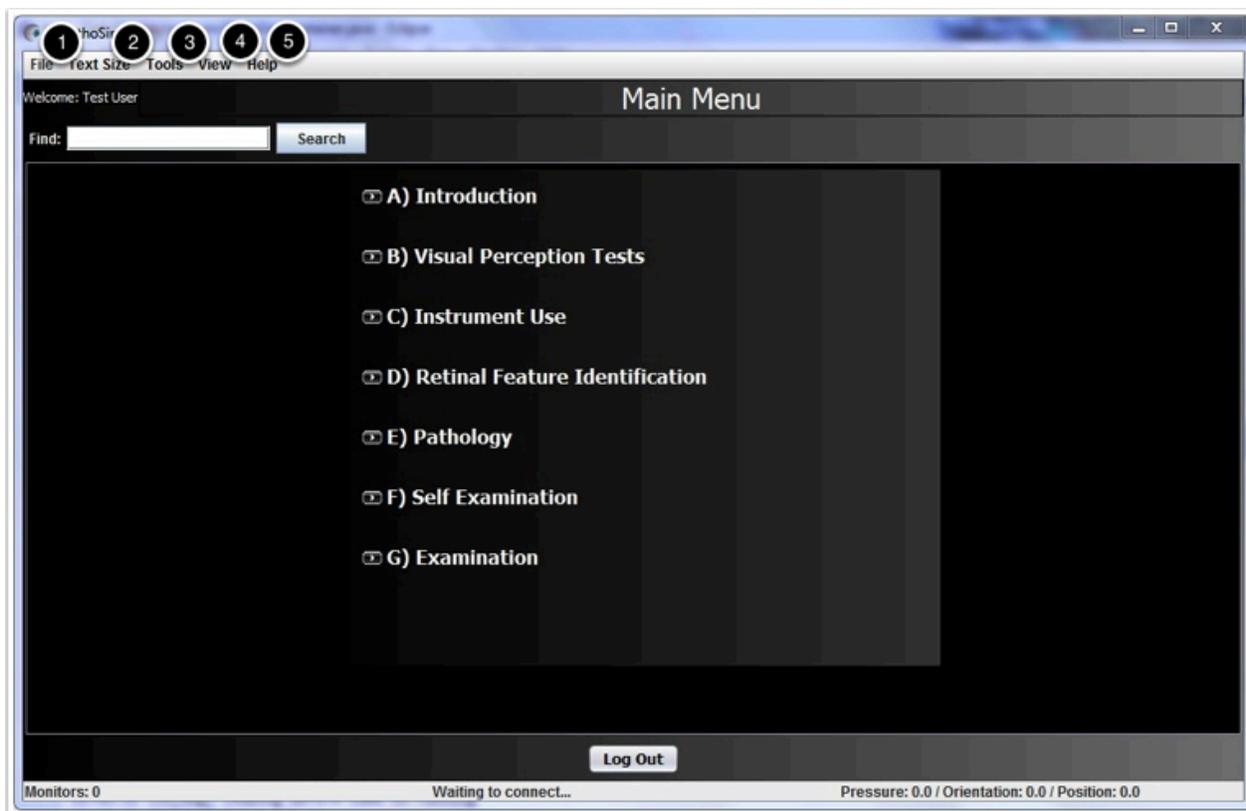
1. **File** – This menu allows you to exit the program. Alternatively, you can use the "X" button on the top right corner (top left on Mac OSX).

2. **Text Size** – This menu allows you to make text larger throughout the program.

3. **Tools** – This menu contains a variety of functions such as calibrating your Ophthalmoscope or printing a summary of your progress. *Section 9.3.1* explains the Tools Menu in more detail.

4. **View** – This menu allows you to change how the cross displayed in the OphthoSim™ unit and on the instructor window is drawn. *Section 9.3.2* explains the View Menu in more detail.

5. **Help** – This menu allows you to view this manual again and learn about the people who helped make OphthoSim™ a reality.

9.3.1 Tools Menu
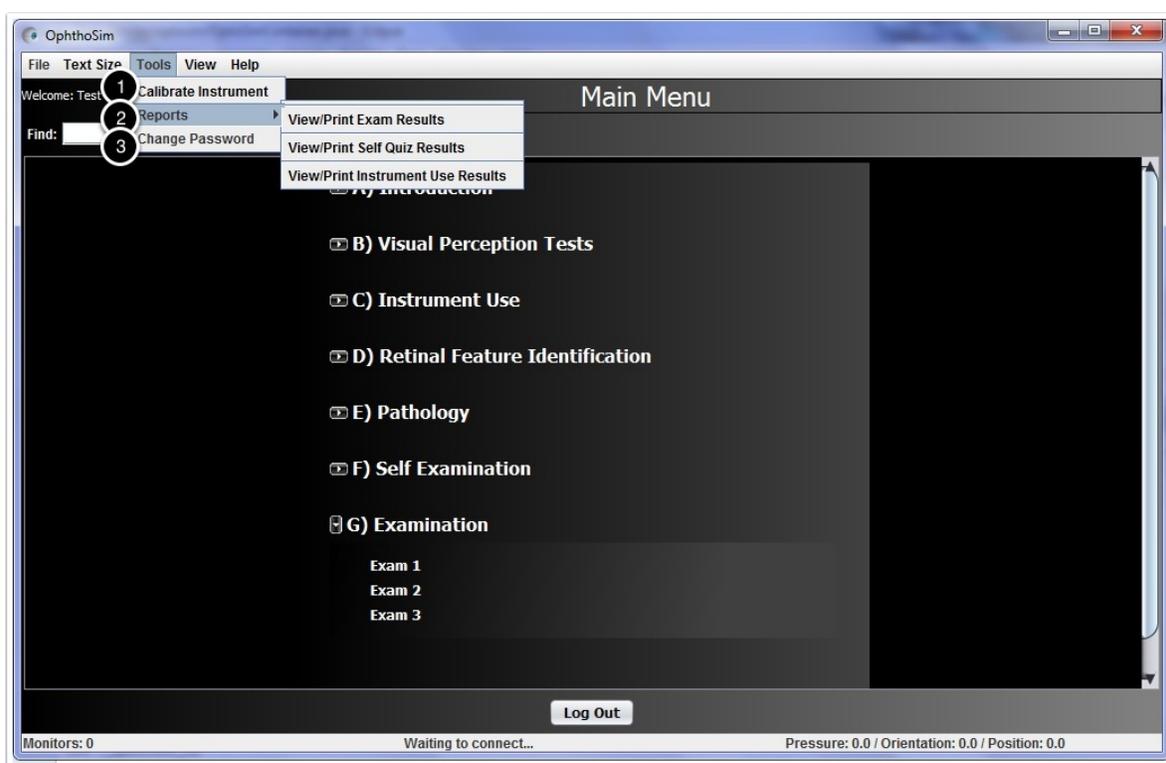
1. **Calibrate Instrument** – This button can be pressed to calibrate your Ophthalmoscope to ensure better tracking. Once pressed, simply follow the onscreen instructions to recalibrate the OphthoSim™ Ophthalmoscope.

Note: The Ophthalmoscope provided with your OphthoSim™ unit has already been calibrated and should not require further adjustment. However, if your OphthoSim™ unit is not set on a flat surface, or is set at an angle, it may be necessary to calibrate again.

2. **Reports** – This menu allows you to view a variety of reports about your progress.

9.3.2 View Menu
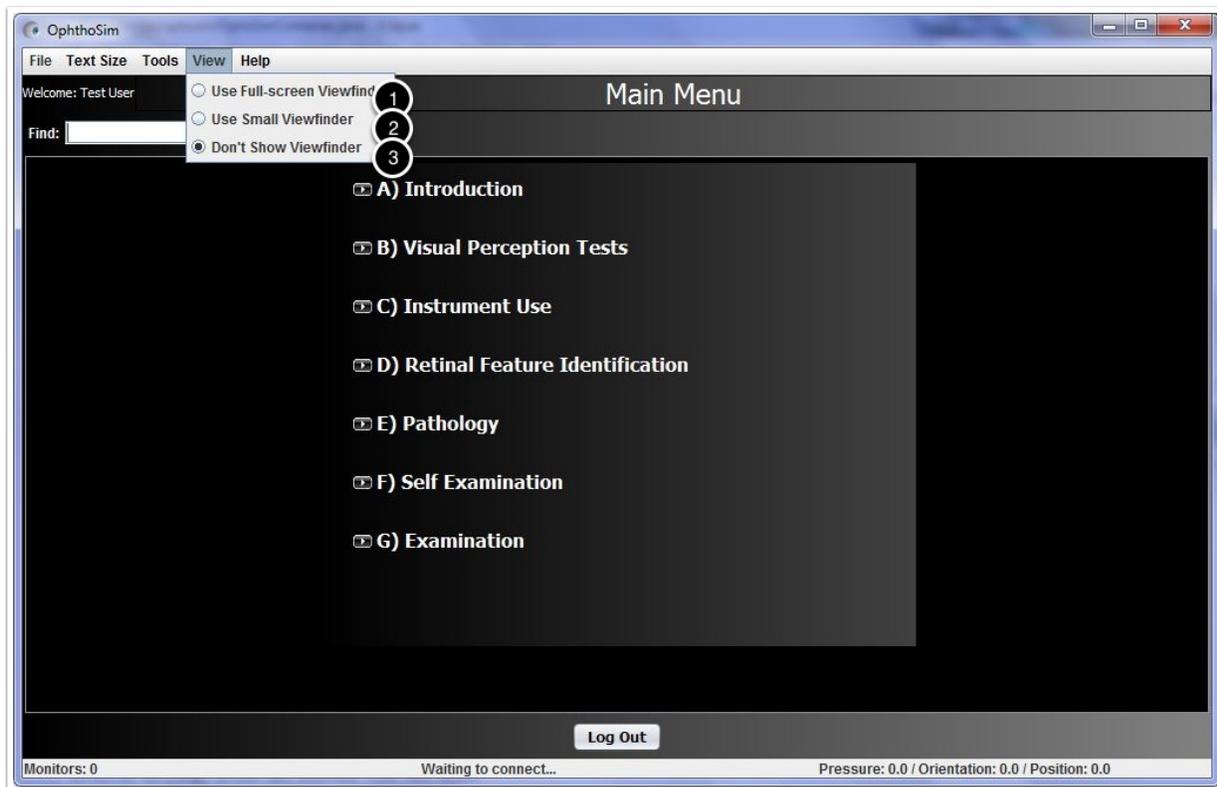
1. **Use Full-screen Viewfinder** – This option will use a cross that spans the entire screen. This is recommended for beginners who often find themselves disoriented in the OphthoSim™ unit.

2. **Use Small Viewfinder** – This option will only draw a small cross at the focal point of the screen. This may be useful for moderately advanced users.

3. **Don't Show Viewfinder** – This option will not draw any cross. This is the default option as it presents the most realistic view of the eye. In situations where a cross is required, such as in *Section 9.6 Instrument Use*, a small cross is displayed.

The next sections will go through the modules in the Main Menu.

9.4 Introduction

This module contains a brief introduction that describes the history of Ophthalmoscopy, the normal anatomy of the ocular fundus and some examination principles and techniques. When you have read each section press "Done" to return to the Main Menu.

9.5 Visual Perception Tests

Through years of experience, the inventors of OphthoSim™ encountered many trainees with visual challenges. One important criterion in an effective diagnosis is the use of monocular vision through an ophthalmoscope.

To ensure that practitioners have adequate visual acuity, OphthoSim™ includes standard visual perception tests to be used with an Ophthalmoscope, which are designed to test monocular vision. It is recommended that before reviewing the content of the program, each user tests their vision using an ophthalmoscope, and takes necessary actions to adjust one's vision.
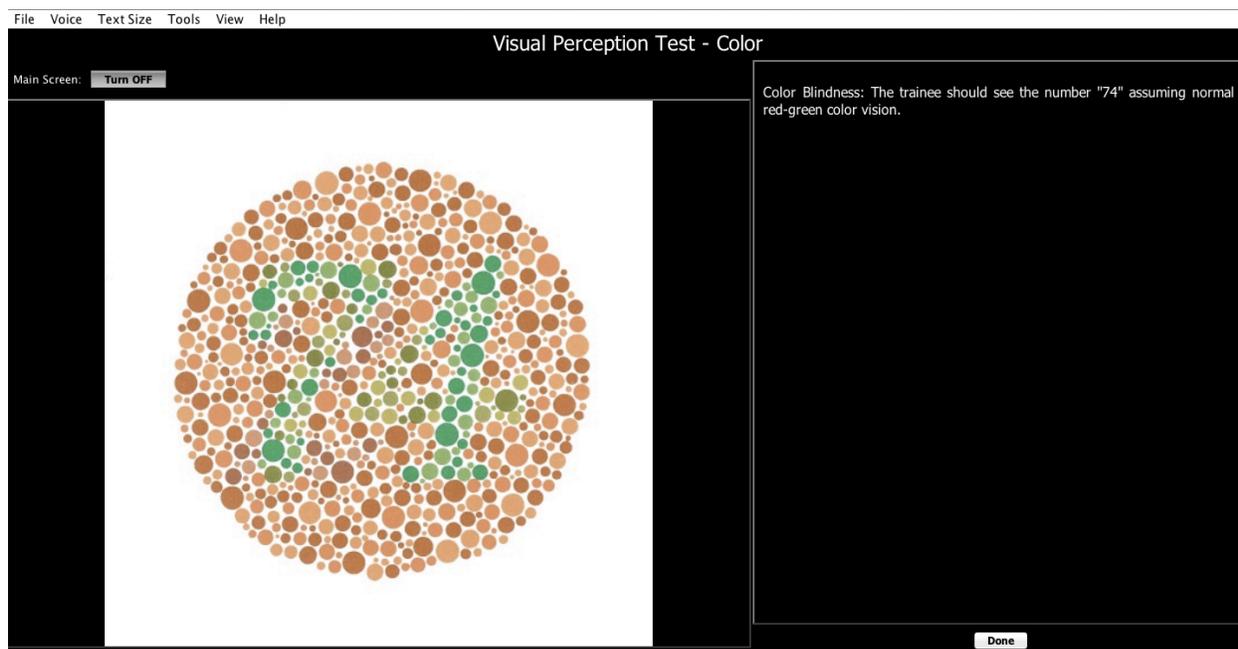
9.5.1 Visual Acuity

The first page is to test visual acuity. If the trainee cannot read the first 4 or 5 lines, they will not be able to diagnose effectively until their vision is corrected. Any vision correction should be prescribed by a licensed professional only.
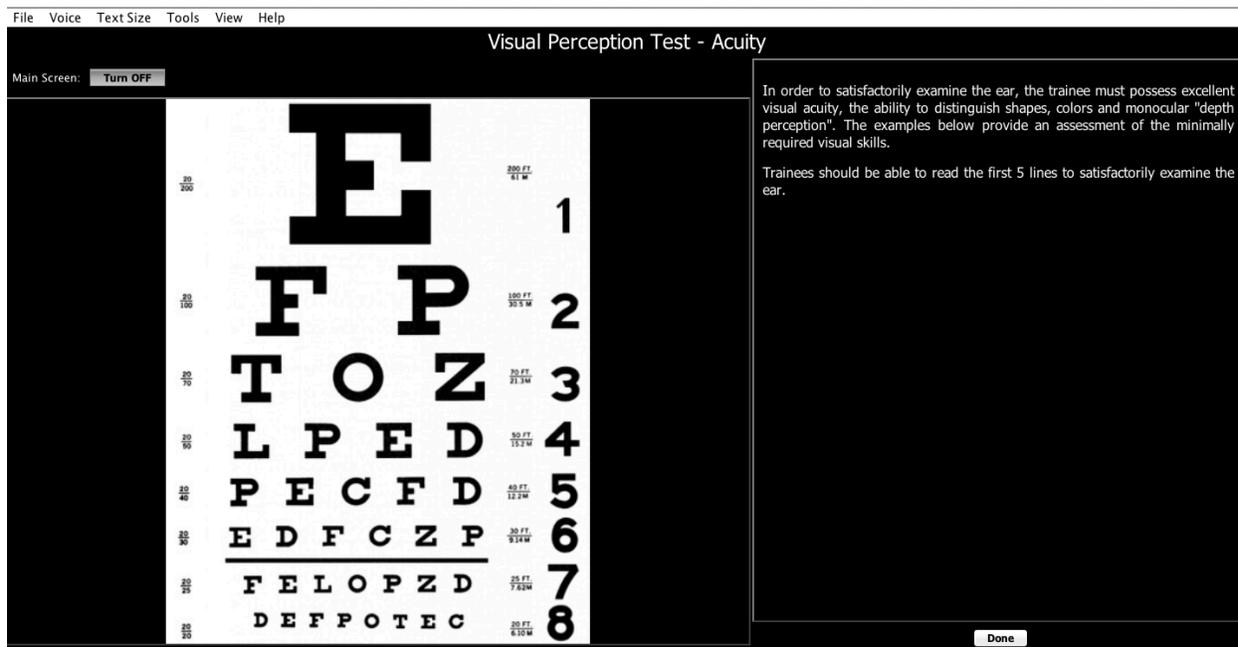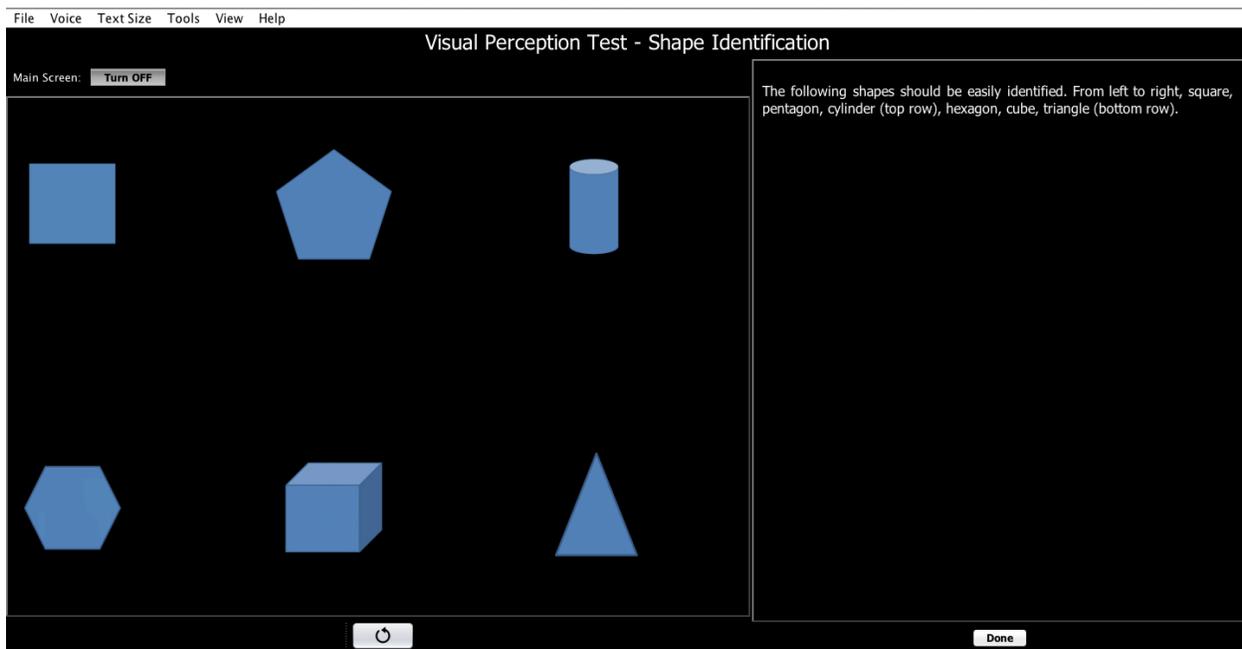
9.5.2 Colour Blindness

A colour blindness image will be displayed. The trainee should see the number 74.

9.5.3 Shape Recognition

There are 6 shapes. By clicking on one, you can display it on the Base Unit and get the trainee to confirm that they can see it, and whether it is a representation of a 2D or 3D object.

To return to the panel of shapes, press the "Back" button.

9.5.4 Depth Perception

While the images are 2-dimensional, with shading, trainees should perceive the images to be 3-dimensional (concave or convex bumps). This image tests if they can extrapolate to 3D based on shading. The bumps on the left should be perceived as coming out, while the bumps on the right as going in.
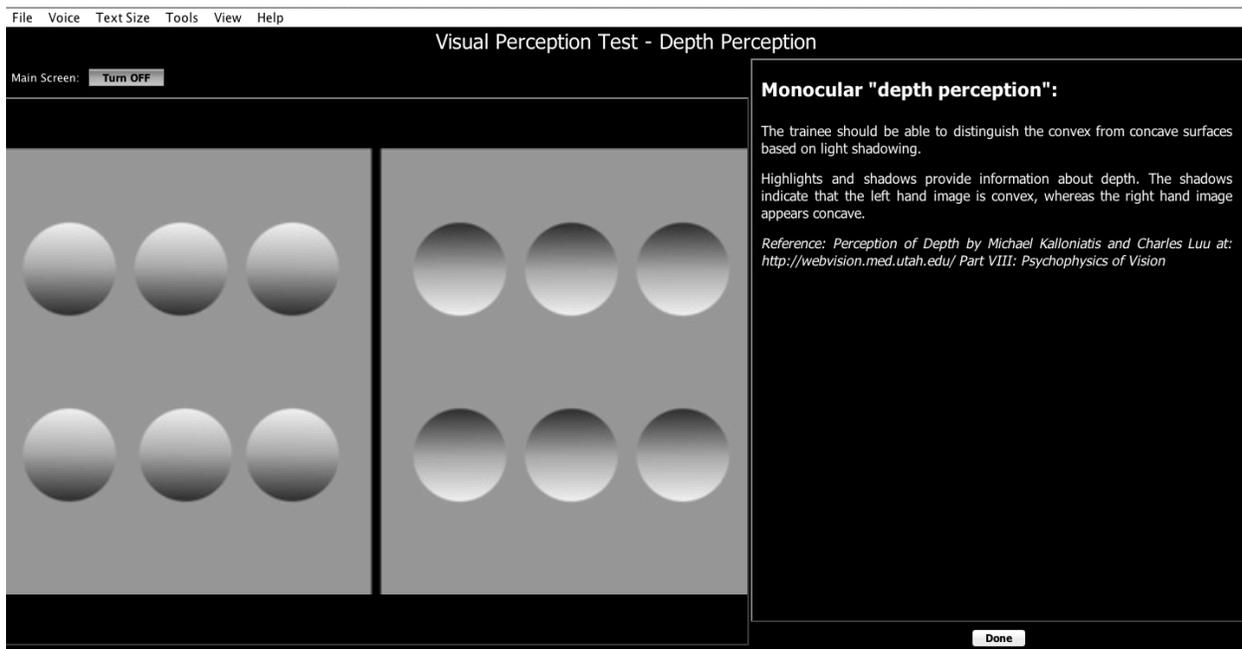
9.5.5 Interposition

The blue circle should be perceived as being in front of the red one.
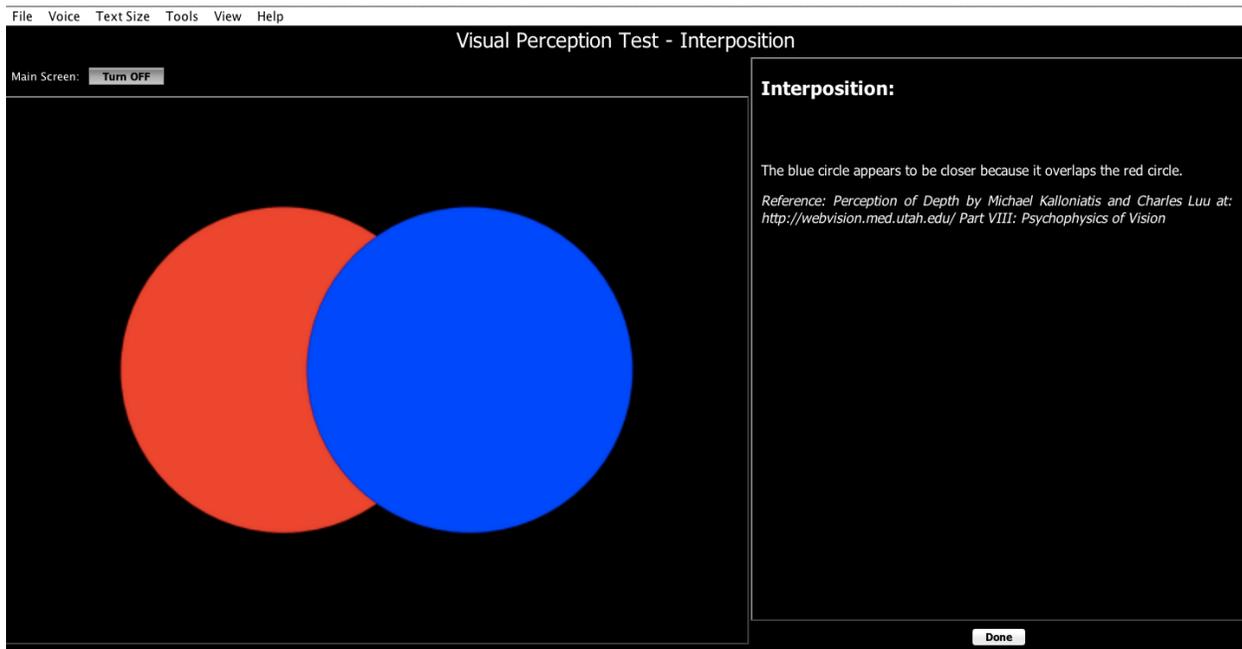
9.6 Instrument Use

This module contains tests designed to familiarize trainees with using an Ophthalmoscope with the OphthoSim™ unit. Each test will consist of a series of targets that trainees must find. They must then stay within each target for several seconds. The timer starts once the trainee has completed the first target.

As the difficulty of each test increases, targets will decrease in size and their locations will vary. Each test will be timed. The lower the time taken to complete the test, the greater the efficiency of the student. To achieve proficiency, a trainee should practice regularly and aim to complete each test as quickly and efficiently as possible.

Each test is only considered complete once every target has been viewed. It will then turn red in the main menu. However, each test can be taken multiple times to improve your score.

9.7 Retinal Feature Identification

This module contains tests designed to help trainees identify major landmarks in a normal eye. The list on the side allows the user to choose between the various landmarks, which are reflected in the OphthoSim™ unit.

Each section is only considered complete once every landmark has been viewed. It will then turn red in the main menu. However, each section can still be revisited.

9.8 Pathology

This module contains the majority of the OphthoSim™ content, with multiple images for each available condition. This section is divided into various sections and sub-sections, which characterize each condition. The viewable subheadings are underlined and will turn blue when the mouse passes over them.

Once a condition is selected, the trainee is free to examine it freely. However, annotations or other mark-up may be added by the instructor using the functions detailed in *Section 9.2*.

Each section is only considered complete once every image in a section has been viewed. It will then turn red in the main menu. However, each section can still be revisited.

9.9 Self Examination

This module contains a variety of quizzes designed to prepare trainees for the examination. They are timed, but trainees are free to continue after the timer has expired. In addition, they will get as many attempts to answer each question as required. Questions do not have to be answered in order. Each quiz is considered complete only once all of the questions have been answered correctly.

The goal of this module is to be a learning aid, not a rigorous examination, so trainees are free to attempt each quiz multiple times to track their progress.

1) The following screen is shown before a quiz starts:
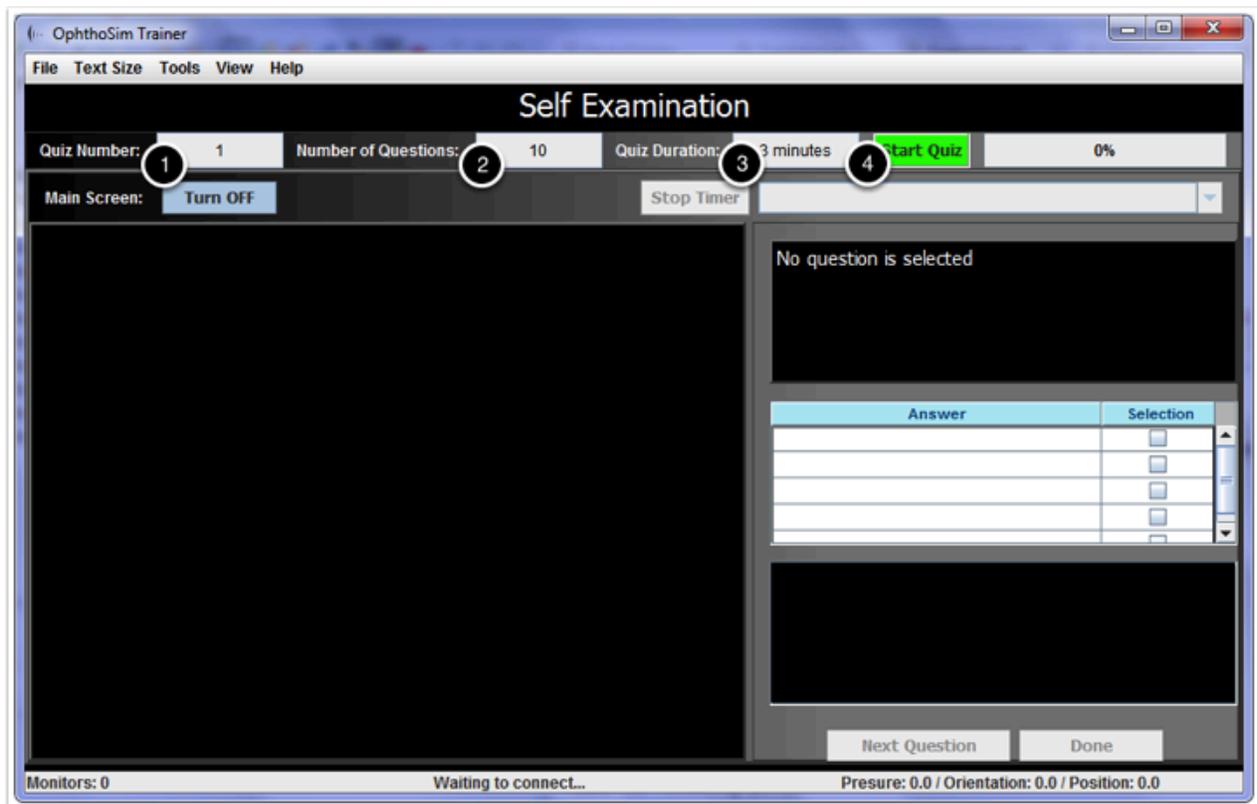
1. This area shows the number of the quiz.

2. This shows the total number of questions in the quiz.

3. This shows the suggested amount of time to complete the quiz.

4. The "Start Quiz" button will start the timer and reveal the first question.

2) The following screen is shown after the quiz starts:
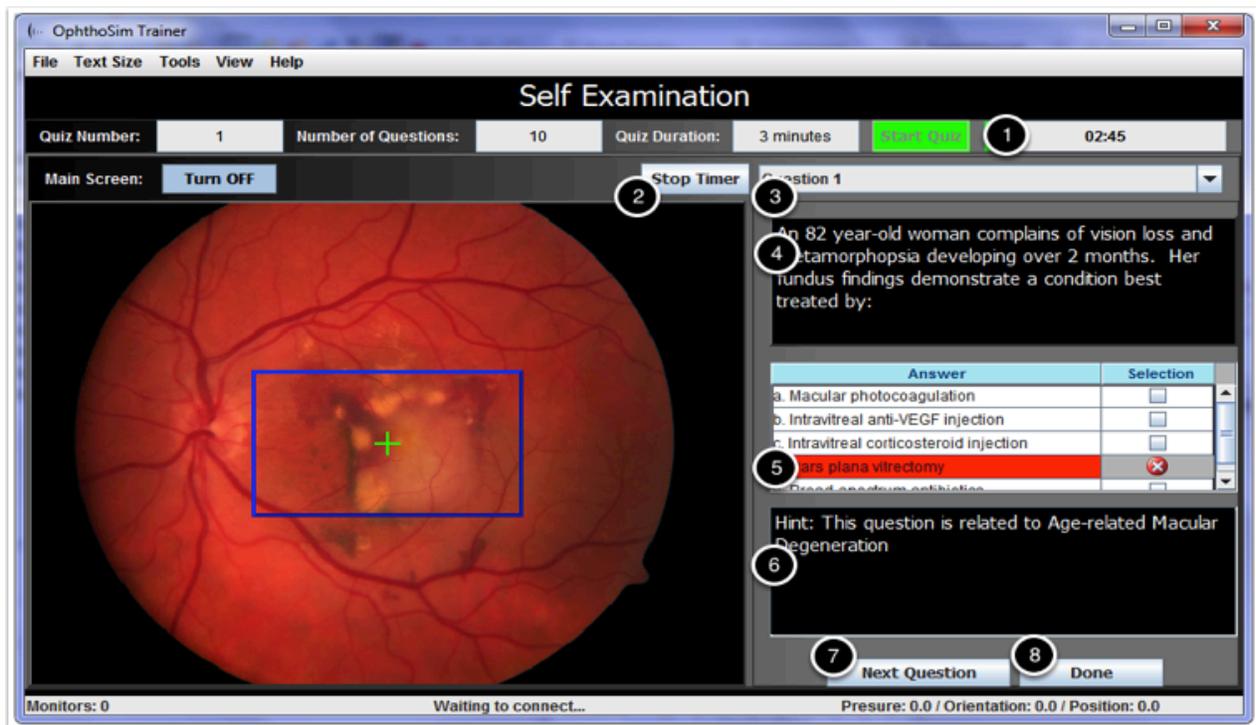
1. The box in the top left displays the amount of time remaining. It will slowly fill up as time passes. When the time is up, an alert will sound, but the trainee can continue answering questions.

2. If required, a trainee can pause the timer to take a break by clicking on "Stop Timer".

3. The dropdown menu lists out all of the questions, and allows trainees to jump to any other question in the quiz

4. The full question is displayed in the box underneath the dropdown menu.

5. A list of possible answers are displayed here. The trainee will choose their response by clicking in the area marked "Selection", where they will get instant feedback telling them if they were correct or not.

6. If the trainee is incorrect, a hint is displayed in this box to help them get the correct answer.

7. The "Next Question" button will take the trainee to the next unanswered or incorrect question.

8. The "Done" button allows the trainee to return to the main menu. If every question is answered correctly, the quiz will be marked red in the main menu. However, the trainee is free to return to the quiz and reattempt it to refresh their knowledge.

10. Troubleshooting

- There is no on/off switch for the OtoSim™ Base Unit. It is fully powered by the USB cable when connected to the computer.

- Make sure the hub you choose to use has an external power supply (AC adapter), is rated 480 MBPS, and is classified as USB 2.0.

- Ensure your operating system is fully up-to-date.

- Windows and its various updates may cause complications.

- When in doubt, reboot the computer. Repeat *Section 6 for PC; Section 7 for Mac.*

  o Please disconnect all OtoSim™ Base Units and USB hubs before you restart your computer.

  o Once the computer reboots, give your computer time to load properly.

- Check for any Windows updates and download them if there are any.

- Without any OtoSim™ Base Units connected, attach the USB hub first. Make sure the AC adapter for the USB hub is connected to a power source. Please refer to *Section 5* for safe operation procedures.

  o Individually connect each OtoSim™ Base Unit one-by-one. After plugging the first unit in, give time for the computer to process the connection. Your screen will flicker on/off, and your computer will emit a "USB-connected" sound. Wait several moments for the computer to process.

  o Insert the next OtoSim™ Base Unit into the next port in the USB hub.

- Ensure that the DisplayLink Drivers are fully up to date.

- If your laptop is attached to a docking station, you may encounter some display driver compatibility issues. As such, please disconnect the laptop from the docking station and proceed with normal installation and usage of the OphthoSim™ unit, as described in this manual.

- If you are using dual monitors and the computer cannot detect the OtoSim™ Base Unit, make sure that the monitor is placed to the right of the main monitor with the **top edges** aligned (see diagrams in *Sections 6.2 and 6.3 for PC; Section 7.2 for Mac*).

- To uninstall the OphthoSim™ software, please utilize your computer's standard uninstallation procedure.

If you are still having trouble, or need someone to vent to, feel free to send us an email (info@otosim.com) and set-up an appointment for technical support. We will typically respond within 24 hours, Monday to Friday. Thank you for your continued support for our medical training and simulation products.

OtoSim

BETTER EAR AND EYE TRAINING, BETTER OUTCOMES

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