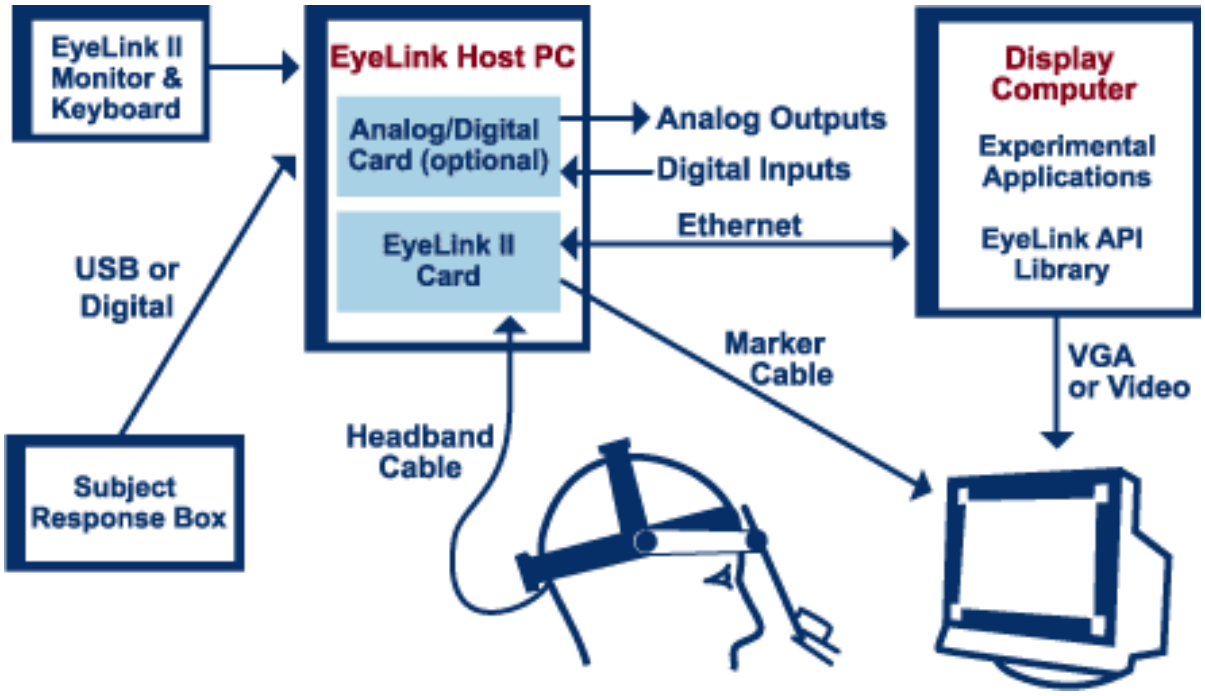
EyeLink® II Installation Guide

Version 3.0.3



Read instructions before use.

Type BF equipment (applied parts):
Metal parts connected to chassis of computer may contact user. Compliance with 601-1 medical equipment standards requires use of a medical grade power supply.
Entela Safety Mark: Compliance of this product with UL 2601-1, CSA C22.2 N0.601.1 and IEC 60601-1 is certified by Entela, an independent testing body.

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1. Introduction

Congratulations on your purchase of an EyeLink II!

The basic steps in installing the EyeLink II system are:

1) Unpacking and Installing the EyeLink II Hardware. This includes placement of all of the EyeLink II components, setting up the Host PC, Display PC (optionally purchased through SR Research) and connecting them together via an Ethernet cable.

2) Installing the EyeLink II Display Software (API and example experiments) on the Display PC and configuring it for use (if not purchased through SR Research).

3) Installing the necessary Operating System and EyeLink II Host Application software on your Host PC if this has not already been done.

4) Testing the installation.

Most new acquisitions of the EyeLink II include a preconfigured Host PC requiring simple setup and the attaching of cables (Steps 1, 2 and 4). This would take about 1 hour to set up. If you need to perform Step 3 as well then expect about 2 hours of work.

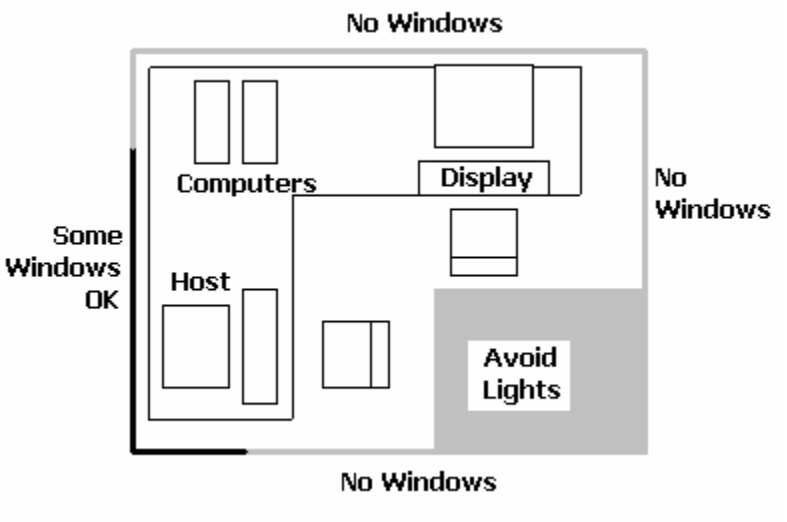


Figure 1-1: Suggested EyeLink II System Layout

1.1 Suggested Equipment Layout

The layout of the EyeLink II equipment is important if participant setup is to be convenient, and lighting problems are to be avoided. Before setting up equipment, check the arrangement of the room to be used against these suggestions. These will aid in the production of good experimental data.

- Set up the Host and Display PC monitors on tables arranged in an 'L' shape, as in Figure 1-1. This configuration allows the experimenter to set up the headband and the participant's left eye camera, while having access to both computer keyboards and monitors.
- Avoid windows or other bright light sources that could cause reflections on the host and display monitors. Windows or incandescent lights on the walls behind or near the display monitor may interfere with the head-tracking camera. The grey walls highlighted in Figure 1-1 are locations where bright light sources will cause reflections.
- Supply sufficient light in the room. Dim rooms cause participant's pupils to dilate, which can cause setup problems with some participants. The best way to light the room is with ceiling-mounted fluorescent lights, above and no more than 2 meters behind the computer monitors. Painting the walls light colors or white will maximize ambient light as well.
- Avoid environmental distractions. Be sure the room can be kept quiet, that no posters or other items are on the wall seen by the participant, and so on. It is also a good idea to make sure the participant cannot see the host monitor, without turning their head (discourage this).
- Supply a comfortable, stable chair for the participants. It should not wobble or move when sat in, and the back should be firmly attached to the seat--springiness encourages some subjects to rock forwards and back. A chair with a concave back and seat also discourages shifting of the body, as does a high back. The top of the chair back should be just below the shoulders on an average participant. Finally, make sure participants can enter and leave the chair easily, as the chair will be close to the table with the Display PC monitor. A fixed base reclining dental chair has proven to be an ideal participant and EyeLink II friendly chair.
- Set up the Display PC monitor and chair so that the participant's eyes will be at a distance from the monitor of about twice the width of the display area of the Display monitor. This distance gives a display area of 28° by 22°. This standard distance is assumed in all EyeLink II documentation: while the EyeLink II system can measure and compensate for the eye-to-display distance, this is the ideal distance for both calibration accuracy and head-motion compensation.

1.2 Host PC Installation

After setting up the Host and Display PCs at the desired locations (see Section and Figure 1-1 for a suggested layout) you are now ready to start assembling the EyeLink II components and installing software on the Host and Display computers.

You should have the following components on hand:

1. EyeLink II PCI card
2. EyeLink II Headband
3. EyeLink II infrared markers plus cabling
4. crossover Ethernet cable to connect Host and Display PC together
5. EyeLink Button Box
6. optional Analog Card if purchased (if purchased)

If your EyeLink II has a preconfigured Host PC then continue to Section 1.3 Host PC Hardware Installation to begin attaching cables.

1.2.1 Host PC Hardware

This section discusses Host PC hardware for users who did not receive a preconfigured system or who need to replace the Host PC computer.

The PC that hosts the EyeLink hardware and software must meet certain specifications due to the nature of the operating system that the EyeLink Host application runs under. As computer technology is rapidly changing, only systems tested and approved by SR Research Ltd. can be guaranteed to work.

In the interest of not instructing our customers to purchase computer equipment only to encounter difficulties with their installation, the reader is directed to consult the web page http://www.sr-research.com/compatibleHostPCs.html for a list of systems known to be compatible and accurate when running the EyeLink hardware and software.

If your EyeLink II system did not come with a preconfigured Host PC, or if you are upgrading or replacing your original Host PC, you should have the following additional components on hand. The software components were supplied with your original EyeLink purchase:

1. any tools required for accessing your Host PC's case (usually a Phillips screwdriver will do)
2. "SR Research EyeLink II" CD
3. "ROM-DOS Boot CD"

Depending on the operating system that is to be used on your Host PC's non-EyeLink partition, you may require the following:

4. "System Commander Boot CD" – originally supplied for customers using Windows NT/2000/XP on their Host PCs; not required for Windows Vista (see Appendix B).

1.3 Host PC Hardware Installation

> IMPORTANT: Switch off the PCs before connecting or disconnecting any cables, especially the headband connection! Ensure that the headband cable is properly connected and connectors are properly secured to the Host PC and the headband before use.
>
> **Ensure that the power supply setting on the back of the PC (Near the power jack) matches your local supply voltage!**

Open the shipping case. If the system has been stored or transported at a temperature below 10°C, allow all parts to warm to room temperature before proceeding.

Please save the shipping and packing material for storage or in case the unit needs to be returned for repair.

1.3.1 Insert EyeLink II PCI Card(s)

If you did not receive a preconfigured Host PC, you will have an EyeLink II PCI card (and possibly an optional Analog Card) that needs to be inserted into the Host PC. If you see the card pictured in Figure 1-2 installed in the back of your Host PC then continue to Section 1.3.3 Headband Installation.

Open the EyeLink II Host PC, and insert the EyeLink II card (pictured below) into a free PCI slot. It is recommended that an open slot be left on one side of the card (preferably on the side with the large space). Ensure the bracket is firmly attached to the PC with a screw.

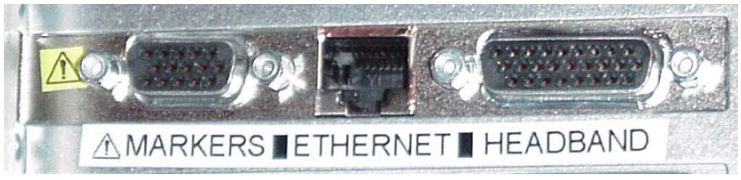


Figure 1-2 EyeLink II PCI Card Connectors

> IMPORTANT: Do not insert VGA monitor cable into Marker connector.

1.3.2 Installing the Data Translation Analog Card (Optional)

If the Analog Output option was purchased with your system, then open the EyeLink II Host PC, and insert the insert the Data Translation Analog Card into a free PCI slot. Ensure the card's bracket is firmly attached to the PC.

Figure 1-3 Analog Card

1.3.3 Headband Installation

> IMPORTANT: Do not let the headband 26-pin connector receive an electro-static shock from a carpeted floor or similar surface.

Remove the EyeLink II headband and cable from the case. Remove the cable tie from the headband cable. Hold the headband by the top clamp while gently letting the cable fall free, and allowing any twists in the cable to straighten. It is very important to avoid twists in this cable, as these will stiffen it and may shorten its lifespan. Plug the headband cable into the large connector on the EyeLink II card (see Figure 1-2), and secure with the screw posts (do not over-tighten, this is just to prevent connector from coming loose). Ensure the cable is laid out where it will not be twisted, stood on or rolled over by chairs, etc.

1.3.4 Marker Cable installation

Unpack and straighten the marker cable. Attach the 4 supplied Velcro patches to the corners of the Display monitor as illustrated in Figure 1-4. Route the marker cable behind the monitor, and run the 4 separate wires along the sides of the monitor. Attach the 4 markers to the Velcro patches, and dress wires as desired. Plug the marker cable into the second connector on the back of the EyeLink II card, and secure with the screw posts (do not over-tighten, this is just to prevent connector from coming loose).

1.3.5 Ethernet Cable

Unpack the supplied Ethernet cable, and plug the end with the black box into the Ethernet jack (between the two cables) on the back of the EyeLink II card. The supplied cable should connect directly to an Ethernet card in the display PC without using a hub. You will need a different cable and a low-speed hub to connect the EyeLink II card to multiple display computers. It is not recommended to use a high-speed or multi-speed hub, as this will cause dropped packets.

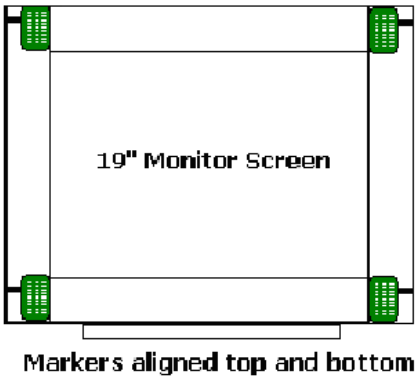


Figure 1-4: Marker Set-up on EyeLink II Display Monitor

1.3.6 EyeLink II System Cabling

For system set-up, please follow the wiring diagram in Figure 1-5.

The basic cabling steps are:

1. Plug the cable from the monitor markers into the 9-pin connector on the back of the EyeLink II card.
2. Attach one end of the Ethernet crossover cable to the Ethernet port on the Display PC that is to be configured and used with the EyeLink II. Plug the other end of the Ethernet cable into the Ethernet port of the EyeLink II card of the Host PC.
3. Plug the EyeLink II headband cable directly into the EyeLink II adapter connector on the back of the PC.
4. Plug the supplied USB Button Box into a USB port on the back of the Host PC as indicated by a label. If no label is present use any open USB port. On the Dell Optiplex, use a USB port on the front of the computer. An optional USB extender cable is included if the Button Box needs to be further than three feet from the Host PC.

NOTE: The USB Button Box must be directly connected to a USB port on the Host computer and cannot be connected through a USB hub.
IMPORTANT: Please be sure to use the PS/2 keyboard and mouse supplied with your Host PC.

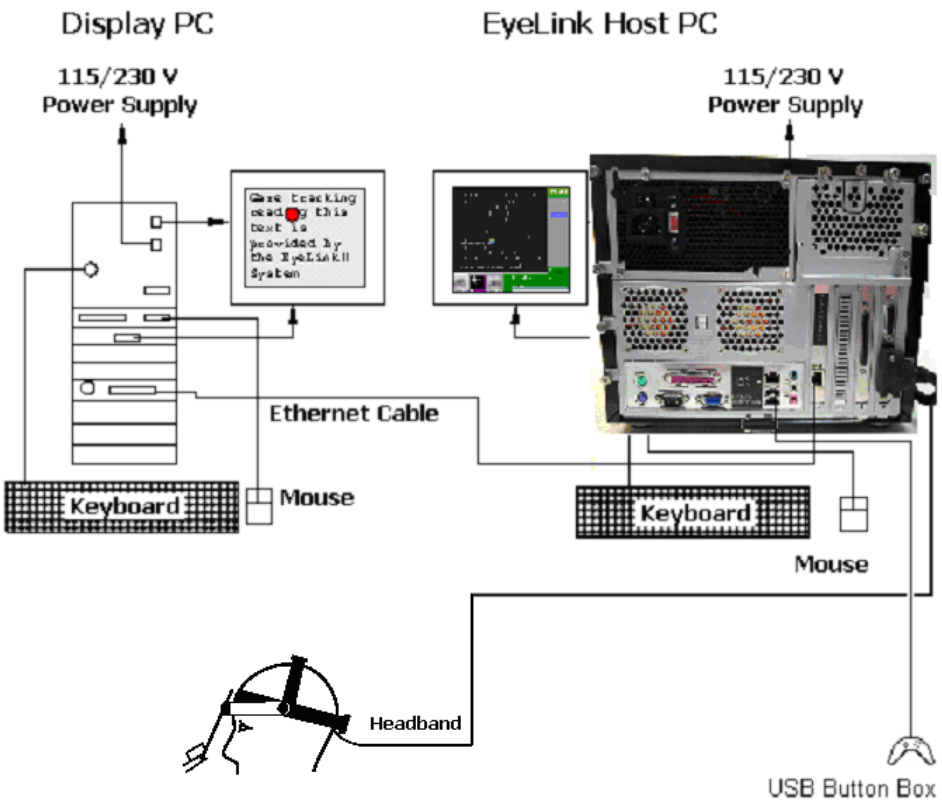


Figure 1-5: System Set-up and Cabling

1.4 Host PC Software Installation

Both the Host PC and Display PC need to be configured for use with the EyeLink II system. Host PC software installation

If you received a preconfigured Host PC then the Host PC is already installed and you may skip this section.

If you need to install the Host PC software, the first step in preparing your Host PC for the EyeLink II is to install the ROMDOS operating system that the EyeLink II system runs on. Once you have installed ROMDOS on its own partition along with Windows, you can access the EyeLink partition through Windows Explorer.

For the following operating systems please consult the appropriate appendix for installation instructions:

- Windows XP - see Appendix A

- Windows Vista – see Appendix B
  Note that for Vista, a clean installation of Vista is required

1.4.1 Testing the Host PC installation

The Host PC is now ready to test. Start the EyeLink II Tracker application by typing

T [Enter]

OR

CD C:\EYELINK2\EXE [ENTER]
EYELINK2 [ENTER]

The EyeLink II Host application should start and you should see the EyeLink II Offline screen illustrated in Figure 1-6 (left). If you see solid, darkly colored images, be sure to remove the camera covers from the eye cameras on the headband.

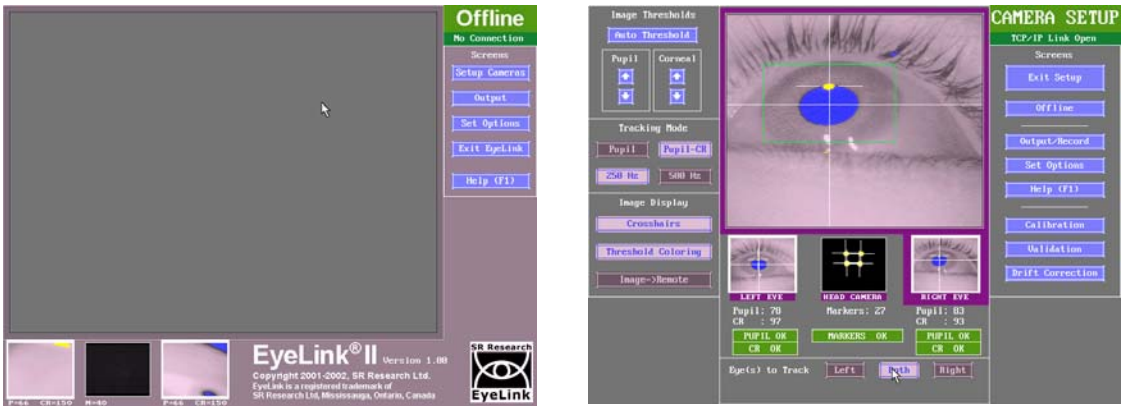


Figure 1-6: ***Offline Mode (left) and Camera Setup (right)***

Press [Enter] and you should be taken to the Camera Setup screen where you can see the three EyeLink camera images.

1. Put the headband in front of the head camera markers and see that the head camera is picking up the markers.
2. Put on the headband and see that the eye cameras are picking up image as illustrated in Figure 1-6: .

1.4.2 Host PC Maintenance

All EDF files that have been created during the recording phase of each experiment will be saved to C:\EYELINK2\DATA and log files documenting tracker activity will be saved in C:\EYELINK2\EXE. If the hard disk partition becomes too full, the Host software will print a warning on startup. It is a good idea to periodically boot into your Windows operating system to back up your data periodically and delete unwanted LOG files to maintain ample free space for data recording.

1.5 Display PC Software Installation and Configuration

The Display PC is used to run experiment application software for control of the EyeLinkII tracker and stimulus presentation through the EyeLinkII API. This API is available on Windows, MacOS and Linux platforms. The Display PC installation process is much less complicated than the Host PC installation and should not take more than 15 minutes. Installation instructions for Windows and MacOS X are detailed below.

1.5.1 Windows Installation

To use a Windows Display computer with the EyeLink II system, various EyeLink software components should be installed. The installation process consists of the following basic steps:

- Install the EyeLink Experiment Programming Kit.
- Install the supplied IO Port Access Driver if planning to use TTL.
- Install the EyeLink Data Viewer and / or Experiment Builder software (if purchased).
- Install the USB Key drivers for EyeLink Data Viewer and / or Experiment Builder software (if purchased).
- Configure the network connection to the EyeLink II Host PC.

1.5.1.1 Installing the EyeLink Experiment Programming Kit

The Windows toolkit (API and example files) is available on the "EyeLink II Software" CD in the "Display PC Installation" directory. To install the toolkit:

1. Insert the "EyeLink II Software" CD.
2. Open the "Display PC Installation → Windows" folder.
3. Run the EyeLinkDevKit_*.exe program by double clicking the icon.
4. Follow the instructions from the InstallShield Wizard to install the display software.
5. Wait for the InstallShield Wizard to finish, and click FINISH to complete installation.

1.5.1.2 Installing the IO Port Access Driver

For proper access to IO ports (i.e. for TTL signaling) on the Display PC, an access driver must be installed. Note that this PORT95NT installer doesn't run on any 64-bit versions of Windows XP or Vista.

1. To install the driver, click Start → Programs → SR Research → EyeLink → Utilities → PORT95NT.
2. Follow the on screen instructions.
3. Reboot your computer when prompted.

1.5.1.3 Installing the EyeLink Data Viewer and Experiment Builder Software

The EyeLink Data Viewer and Experiment Builder software are optional Windows applications for the EyeLink eye tracker. If you did not purchase these options this section may be skipped, or you may install the software for evaluation in demo mode.

1. Insert the "EyeLink II Software" CD.
2. Open the "Display PC Installation → Windows-> EyeLink Data Viewer" folder.
3. Run the EyeLinkDV_*.exe program by double clicking the icon.
4. Follow the instructions from the InstallShield Wizard to install the software.
5. Wait for the InstallShield Wizard to finish, and click FINISH to complete installation.
6. Open the "Display PC Installation → Windows-> SR Research Experiment Builder" folder.
7. Run the SREB_*.exe program by double clicking the icon.
8. Follow the instructions from the InstallShield Wizard to install the software.
9. Wait for the InstallShield Wizard to finish, and click FINISH to complete installation.

1.5.1.4 USB License Key Installation

If you purchased either the Data Viewer or Experiment Builder software, you will have been provided with a USB license key with your order. To install the software driver for the USB license key follow these steps:

1. From the Windows Start menu select "Start->All Programs -> SR Research -> Install HASP Driver". You may also try running both "HASPUserSetup.exe" and

"hdd32.exe" installers contained in the "C:\Program Files\SR Research\Common" folder of the display computer.

2. Follow the instructions from the InstallShield Wizard to install the software.
3. Wait for the InstallShield Wizard to finish, and click FINISH to complete installation.
4. Insert the USB Key into an available USB port on the Display computer. The USB key should start to glow red, indicating that the key has been recognized by the system.

1.5.1.5 Setting up EyeLink II Network Connection

You must have an Ethernet port in your Display Computer. Allow Windows to install drivers for it (if it is new hardware), then follow these instructions to install and configure the TCP/IP network protocol. These instructions are based on Windows XP; other Windows operating systems may vary slightly.

1. From the Start menu select the Control Panel.
2. Click on the Network and Internet Connections icon, and then select the Network Connections icon. Check the list of installed components to make sure a network card is installed. If not, install a driver for the card.
3. Double click on the network card icon that represents the network card that will be connected to the EyeLink II Host PC.
4. Select the properties button.
5. Check that "TCP/IP" is displayed in the list of components and that it is checked. If not, press the checkmark beside the option.
6. Select the "TCP/IP" component for the Ethernet card connected to the eye tracker PC, then click on the "Properties" button.
7. Select the "Use the following IP address" radio button. Enter the IP address of "`100.1.1.2`". The last digit of the IP address can increase for other computers on the EyeLink network. Enter the subnet mask of "`255.255.255.0`". Leave the default gateway and other settings blank.
8. Click on "OK" to return to the Properties dialog. Click "OK" again to save your changes. Click "Close" to exit from the network card dialog.

If connectivity error messages appear ensure the supplied Ethernet crossover cable connects the configured Ethernet port of the Display PC to the EyeLink II card of the Host PC. Alternatively, you may need to reinstall the network card drivers. To be safe,

open the Network dialog and remove all components, restart Windows, then install the network card driver and the TCP/IP protocol again.

To test the network, start the EyeLink II tracker and start the "Track" application from "Start -> Programs -> SR Research -> EyeLink -> Track". The link should connect, and the screen will display instructions. This application allows you to practice participant setup and test the system, as described in the EyeLink II Installation Guide.

If the message "Cannot initialize link" appears, the TCP/IP protocol or crossover cable is/are not properly configured. If the connection times out, it is probably due to the network card being improperly configured or because the network cable is not connected to both PCs. On the Host PC, the Ethernet cable should be connected to the EyeLink II card (not to any other Ethernet ports!).

1.5.1.6 System and Programming Tools Required

The C experiment templates in Windows Display Software package were developed using Microsoft Visual C 6.0. Other 32-bit C and C++ compilers may be used, but you will have to translate the included make files to rebuild the experiments. This release of the Windows Display Software does not supply examples for C++ programming.

1.5.2 Mac OSX Installation

To use Mac OSX as a Display computer with the EyeLink II system, various EyeLink software components should be installed on the computer. The installation process consists of the following basic steps:

- Install the "Mac OSX Display Software". The installer disk image is located in the "Display PC Installation/Mac OSX" folder of the "EyeLink II Software" CD – the latest version of the software can be downloaded from SR Research Support website (https://www.sr-support.com/forums/showthread.php?t=15).

  Mount and open the disk image under MacOS, then click on the installer and follow the instructions, using the default settings as prompted. The EyeLink libraries, documentation and source code examples are installed in the Applications:EyeLink folder.

- Install the EyeLink Data Viewer. The installer disk image is located in the "Display PC Installation/Mac OSX" folder of the "EyeLink II Software" CD – the latest version of the software can be downloaded from SR Research Support website (https://www.sr-support.com/forums/showthread.php?t=10).

Mount and open the disk image under MacOS, then click on the installer and follow the instructions, using the default settings as prompted. Data Viewer is installed in the Applications:EyeLink DataViewer directory.

- Install the USB HASP Key driver for EyeLink Data Viewer. Mount the "Hdd_MacOSX.dmg" disk image to get access to the HASP driver installer. Double click on the installer made available by the disk image and follow the instructions, using the default settings as prompted.
- Configure the network connection to the EyeLink II Host PC. Set the IP address to 100.1.1.2 and subnet mask to 255.255.255.0. You can do this by opening the System Preferences (Apple menu item, then select 'System Preferences…') and click on the Network Icon. Next go to your computer's Built-In Ethernet device, select Manually on the Configure pop-up menu, and enter the above IP address and subnet mask. Click Apply to apply these new settings.

If you plan to program your experiments in MatLab, install the latest version of the PsychToolBox and reboot the computer. Some demo examples can be found in the Psychtoolbox directory which is in the Applications folder at: "Applications/Psychtoolbox/PsychHardware/EyelinkToolbox/EyelinkDemos/GazeContingentDemos".

2. Final Installation Steps

This section lists the final installation steps to fine tune your EyeLink II installation. These steps are important and should be repeated any time that the physical configuration is changed.

2.1 Configuring the PHYSICAL.INI file for standard display monitors

The EyelinkII PHYSICAL.INI file contains settings that tell the system about the physical size of the display monitor. By default the PHYSICAL.INI file is setup to work with a 19" display monitor, and no adjustments are required to this file if the target system matches this setup. The settings for 17" and 21" monitors are also contained within the PHYSICAL.INI file.

The parameters in the PHYSICAL.INI file that change depending on the size of the display monitor are:

marker_phys_coord – specifies the physical coordinates of the IR markers, relative to the center of the screen. The order of these coordinates is top-left, bottom-left, top-right, bottom-right and are specified in millimeters. For the default case of a 19" monitor this parameter will read.

```
marker_phys_coords = -210,140, -210,-140, 210,140, 210,-140
```

screen_phys_coord – specifies the physical distance of the four edges of the presentation surface, to the center of the screen. The order of these measurements is left, top, right, bottom and are specified in millimeters. For the default case of a 19" monitor this parameter will read.

```
screen_phys_coords = -178.0, 135.0, 178.0, -135.0
```

screen_pixel_coord – specifies the resolution of the display surface. Normally this is programmatically adjusted by the EyeLink II API at the start of an experiment. If the EyeLink II API is not being used, then default value for this parameter will apply. The default value reads.

```
screen_pixel_coords = 0.0, 0.0, 640.0, 480.0
```

To determine the display screen resolution, click anywhere on the Windows Desktop and press the mouse right button and select "properties". Select Display Properties> Settings and make a note of the 'Screen Area'.

Should the target system differ from the default of 19" monitor and 640x480 pixels, the PHYSICAL.INI file must be changed. To do this, open the EyeLink II application PHYSICAL.INI file by typing the following at the command prompt

```
cd c:\eyelink2\exe
attrib –R physical.ini
edit physical.ini
```

The settings for ***marker_phys_coords*** and ***screen_phys_coords*** for 17" and 21" monitors are already specified in the PHYSICAL.INI file. The user needs only to remove the comment from the parameter required for the new setup. To do this.

1. Go to the ***marker_phys_coords*** parameter
2. Remove the comment by deleting the two semi-colons that precede the required parameter
3. Insert two semi-colons before the old parameter
4. Repeat steps 1-3 for ***screen_phys_coords***
5. Repeat steps 1-3 for ***screen_pixel_coords***
6. Save changes and exit the file

Finish by typing the following at the command type

```
attrib +R physical.ini
```

2.2 Configuring PHYSICAL.INI for non-standard display monitors.

This section details the changes that are required to the PHYSICAL.INI file, should the dimensions of the display monitor be non-standard.

All screen marker measurements are in millimeters. It is recommended that a straight ruler and a sharp pencil be used to mark a reference line, half-way between the IR markers, on either side of the plastic surface of the monitor outer casing. These marks are required for accurate display screen measurement, and should be removed after the PHYSICAL.INI file has been successfully amended.

> IMPORTANT: If a display computer is not being used, then non-permanently mark the middle of the Display and follow the steps within this section of the manual. Use the pencil marked point as if it was the drift dot generated by the Display PC in track.exe.

Turn on both the EyeLink II Host and Display PC and run track.exe on the Display PC. Type in "123" for the saved EDF file name and click the OK box. Press "Enter" on either keyboard twice.

On the Host PC go to "Set Options" on the screen and select "mouse simulation" mode. This will now let you use the Host PC mouse to simulate eye movements. Check that the Calibration Type is set to a nine-point pattern. Press "Previous Screen" button to return to the camera setup screen.

Now press "C" or the calibration button. A calibration dot should appear on the middle of the display monitor. Use this dot as the central reference point for all horizontal and vertical PHYSICAL.INI measurements.

2.2.1 Measuring the marker_phys_coords

Ideally the IR markers should be placed on the screen as illustrated in Figure 2-1. Obtain the measurements as described in the following steps and record these values for inclusion into the PHYSICAL.INI file.

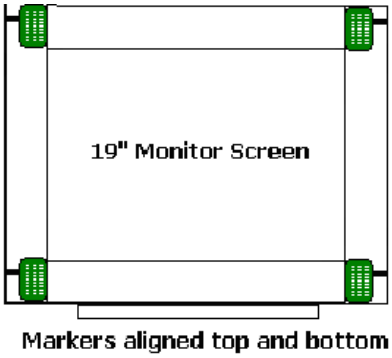


Figure 2-1: Marker Set-up on EyeLink II Display Monitor

Step 1:
Measure the distance from the calibration dot, to the reference line in the middle of the IR markers(1). Also, record half the distance between the IR markers(2) This is illustrated in Figure 2-2.

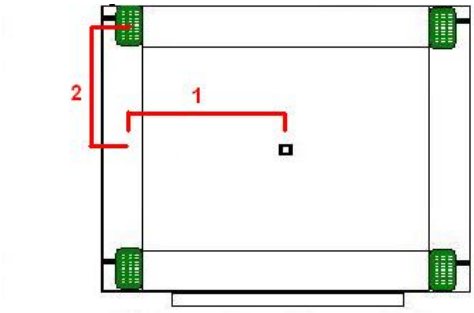


Figure 2-2: Marker_Phys_coords 1,2

Step 2:
Measure the distance from the calibration dot, to the reference line in the middle of the IR markers(3). Also, record half the distance between the IR markers(4) This is illustrated in Figure 2-3

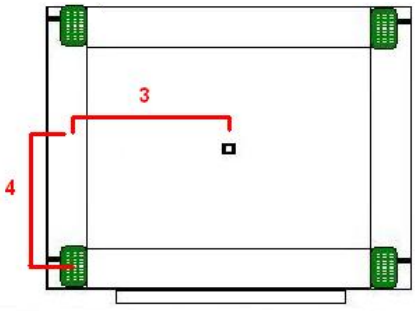


Figure 2-3: Marker_Phys_coords 3,4

Step 3:

Measure the distance from the calibration dot, to the reference line in the middle of the IR markers(5). Also, record half the distance between the IR markers(6) This is illustrated in Figure 2-4.

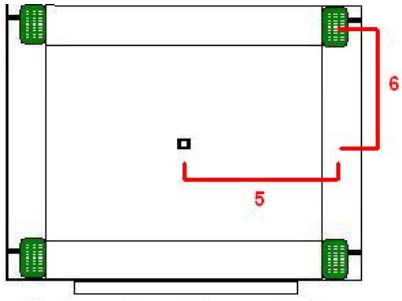


Figure 2-4: Marker_Phys_coords 5,6

Step 4:
Measure the distance from the calibration dot, to the reference line in the middle of the IR markers(7). Also, record half the distance between the IR markers(8) This is illustrated in Figure 2-5.

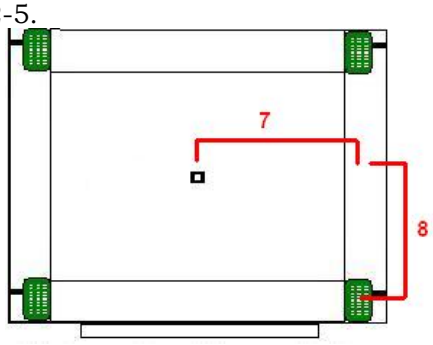


Figure 2-5: Marker_Phys_coords 7,8

The new settings for the ***marker_phys_coords*** in the PHYSICAL.INI file are determined by

```
marker_phys_coords = -1,2, -3,-4, 5,6, 7,-8
```

2.2.2 Measuring screen_phys_coords

In the ***screen_phys_coors***, measure the distance from the center of the dot to the end of the active part of the monitor screen. Start on the left side(S1) and follow round to the top(S2), right(S3) and bottom(S4). This is illustrated in Figure 2-6.

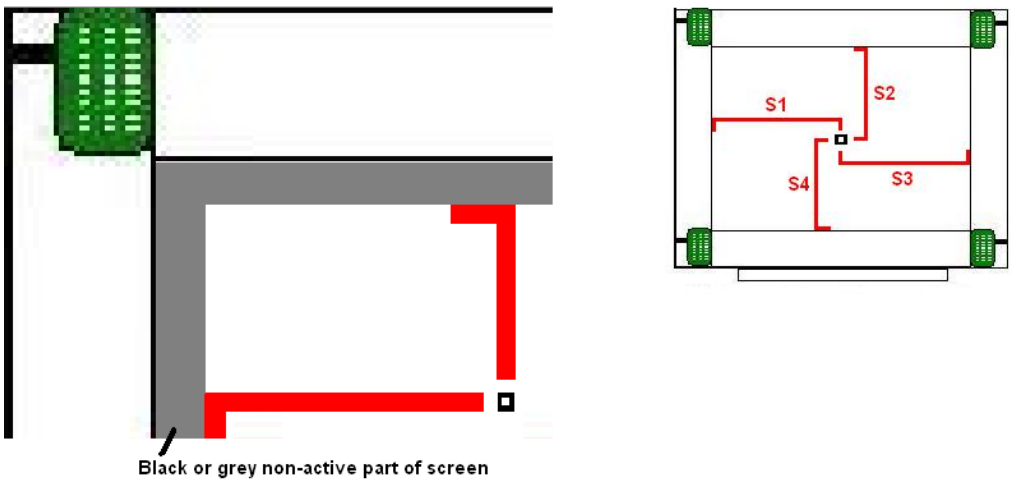


Figure 2-6: Measuring screen_phys_coords

The new settings for the ***screen_phys_coords*** in the PHYSICAL.INI file are determined by

```
screen_phys_coords = -1, 2, 3, -4
```

2.2.3 Entering values into *PHYSICAL.INI*

The newly acquired values for ***marker_phys_coords*** and ***screen_phys_coords*** must now be entered into the PHYSICAL.INI located on the Host PC. Re-boot the Host PC and do not press "T" when in MS-Dos before running the EyeLink II GUI. If you are in the EyeLink II GUI press "Ctrl + Alt + Q" or the 'Exit EyeLink' Button.

From the command prompt type the following

```
cd c:\eyelink2\exe
attrib –R physical.ini
edit physical.ini
```

To enter the new values, follow these steps

1. Go to the ***marker_phys_coords*** parameter
2. Remove the comment by deleting the two semi-colons that precede the 'for non-standard monitor' parameter
3. Enter new values
4. Insert two semi-colons before the old parameter
5. Repeat steps 1-3 for ***screen_phys_coords***
6. Save changes and exit the file

Finish by typing the following at the command type

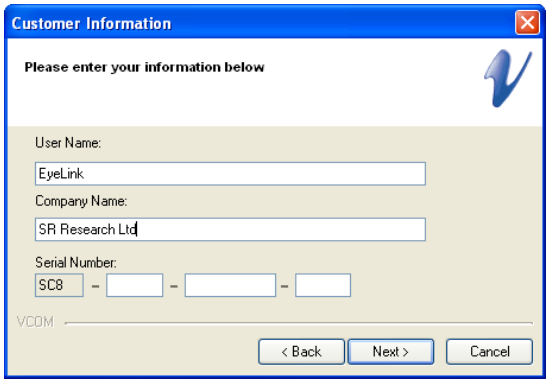
```
attrib +R physical.ini
```

3. Appendix A: Windows 2000/XP Host PC Installation

Please follow the instructions here to install or reinstall the host software.

> IMPORTANT: Before proceeding with the EyeLink II Host software installation ensure you have backed up all important data on your Host PC.

The first step in preparing your Host PC for the EyeLink II is to install the ROM-DOS operating system that the EyeLink II system runs on. This allows you to perform subject setup, monitor performance, record data, and control experiments running on the Display PC. At the same time, you will want to keep your existing operating system accessible so that you can access your CD-RW drive etc. when required. To achieve this, you will create a FAT32 partition on your hard drive using System Commander that will host the ROM-DOS OS provided with your EyeLink II system. System Commander will also be used to allow you to choose which operating system you wish to launch when you start the Host PC.



Important: If you have a floppy disk drive, create the System Commander rescue disks when prompted during installation. These may help you recover the drive partitions in the future, in the event of file system corruption on the drive.

Your System Commander license is registered through SR Research Ltd.

Figure 3-1: License Code Entry

Install System Commander

Install the System Commander application that came with your EyeLink II. This application allows the user to manage multiple Operating Systems on one computer.

1. Boot into Windows as normal. Insert the "EyeLink II Software" CD into your CD drive.

2. Access the CD-ROM contents by double-clicking on "My Computer" and selecting the CD-ROM drive. Open the 'Host PC Installation\Utilities' folder and run the SystemCommander811.exe file to install the System Commander software.

3. Click the INSTALL button on the opening screen and follow the instructions to install the System Commander software. The license number will be on the front of the EyeLink II Software CD case – enter it when you see the screen illustrated in Figure 3-1. You are only licensed for 1 copy of this software for use on the EyeLink II Host PC. The installer will prompt you to create 'Rescue Disks', to register, to check for updates from the web, etc. None of these steps is critical, so they may be skipped.

4. After installation, run the System Commander program by going to the Windows "Start Menu" and selecting the "System Commander" entry.

5. A "Utility Wizard" dialog box will automatically be displayed (see Figure 3-2) select the "Enable System Commander" entry, click on "Next", exit the System Commander program and restart the computer, booting from the System Commander Boot CD supplied.

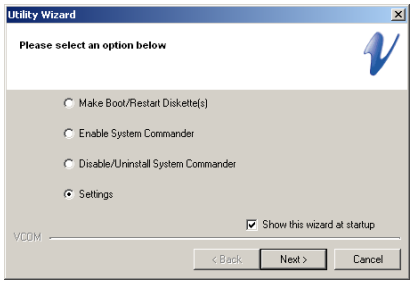


Figure 3-2: Enable System Commander

Resize Existing Disk Partition

The next step is to resize the existing partition to make space for a 5GB EyeLink Host Application partition.

Insert the supplied "System Commander Boot CD" into the CD drive and restart the computer, booting from the CD. You may need to configure your BIOS boot order so that the CD is first in the Boot Priority. On Dell PCs, Press F12 to get the Boot Menu and the select Internal CD as the boot device.

Once you have booted from the CD, select "Partition Commander or Restart", and then select 'Manual Partitioning' as illustrated in Figure 3-3.

Figure 3-3: Select Partitioning then Manual Partitioning

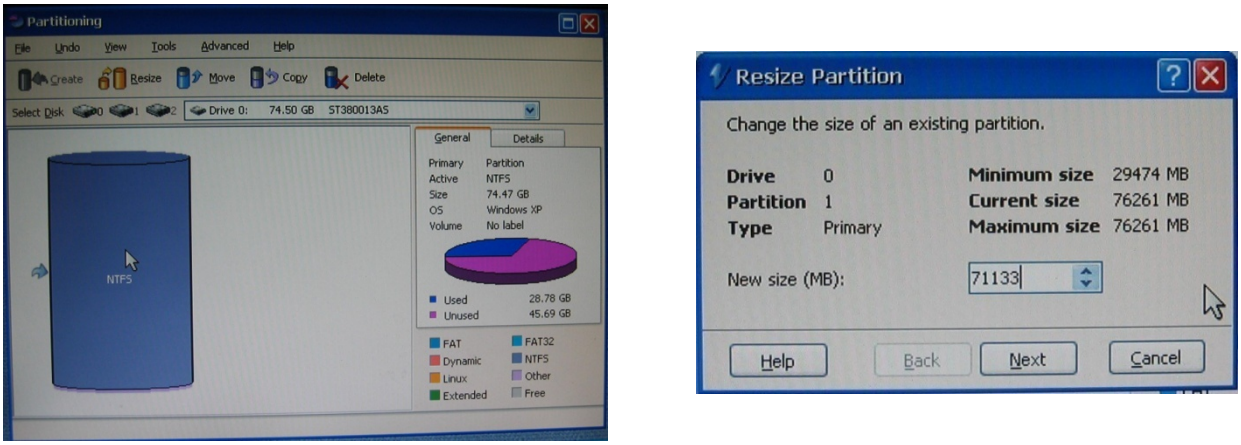


Figure 3-4: Partition Selection and Resizing

1. From the 'Partitioning' window (left side of Figure 3-4) select the disk and the partition to resize. In System Commander, each disk is represented as a cylinder. Within these cylinders are differently colored partitions. The partition (typically, this will be in the primary disk) that should be resized to make a new partition will normally be the largest chunk within the selected disk. Highlight this partition as illustrated in left, and then click on the "Resize" icon.

2. In the "New size (MB)" field of the Resize Partition dialog box (Figure 3-4 right), enter a value that is 5120MB less than the indicated 'Current Size'. For example, if the original disk size is 76253 MB, you should put 71133 MB in the new size field.

3. Press 'Next' to do the resizing of the drive. System Commander may adjust the partition size you entered slightly. This is expected and is not an issue.

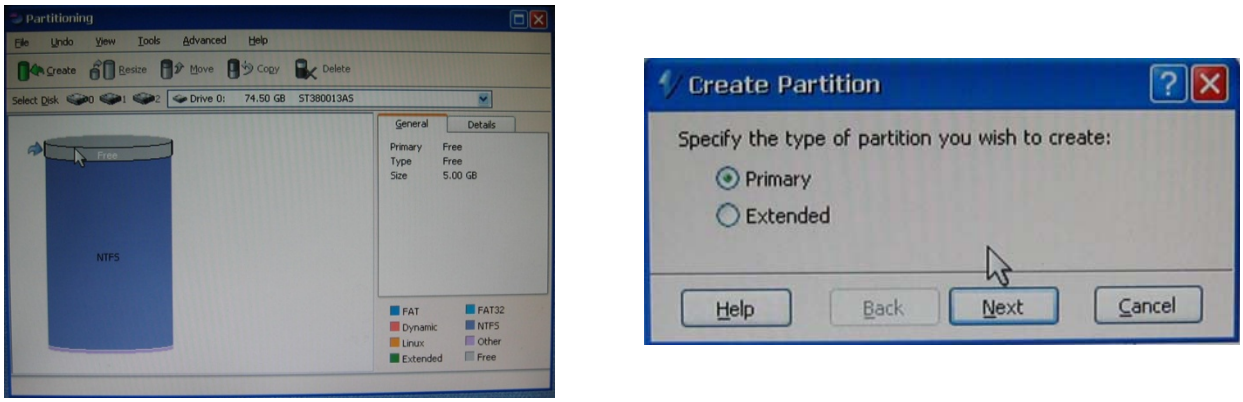


Figure 3-5: Partition and Partition Type Selection

Create the EyeLink II Host Application partition

1. From the 'Partitioning' window select the newly formed 'Free' space (highlighted in gray) which will appear on the top of the cylindrical drive diagram as illustrated in the left side of Figure 3-5. Click the 'Create' icon which will bring up the 'Create Partition' window.

2. Select 'Primary' and click 'Next' which will bring up the 'Create Primary Partition' window as illustrated in the left side of Figure 3-6. In the 'Volume label' field type EYELINK and **ensure that the 'Custom Partition Type' box is checked**. Click 'Next' to bring up the 'Custom Partition Type' window as illustrated in Figure 3-6, right, and select 'FAT-32' then click 'Next'. In the following 'Warning!' window, click 'Proceed'.

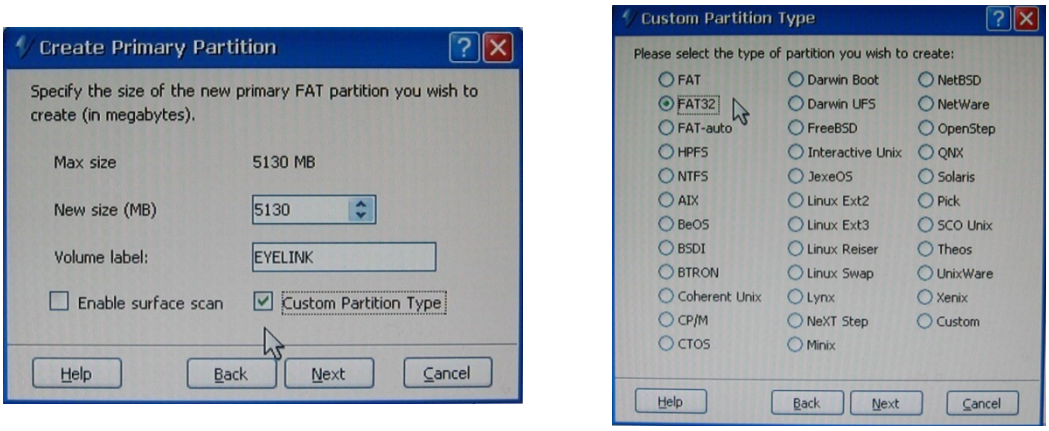


Figure 3-6: Create a Custom FAT 32 Partition

3. Close the 'Partitioning' window by selecting the red "X" in the top right corner of the window and exit System Commander by clicking "Start" at the bottom-left corner of the screen selecting the "Exit" option. Eject the CD before the computer reboots.

4. Upon restart the computer will once again run the System Commander application. The new EyeLink partition will appear as the icon with two question marks and will be labeled 'FAT-32 OS' as illustrated in Figure 3-8. We will return to deal with this later. For now, we wish to boot into Windows once again.

5. Select the Windows XP partition. Windows XP should immediately determine that the disk partitioning has changed and perform a number of system tests to validate the hard drive. This is expected and should not be interrupted.

6. Windows will reboot once its validation checks have been performed. From the System commander menu select Windows XP a second time and boot into the Windows operating system.

Copy the Host Application files to the New Partition

The next required step is to copy the Host PC application files from the supplied "EyeLink II Software" CD onto the newly created EyeLink partition.

1. From Windows, start Windows Explorer. If you have removed the "EyeLink II Software" CD from your CD drive, reinsert it. Navigate to the "Host PC Installation \ Host Partition" folder.

2. Copy all of the files in this folder to the top level of the newly created EyeLink FAT-32 drive (often E:\). The EyeLink CD has copy of all the files required for the Host partition, including a required camera-specific .SCD file. Hence the CD is required, and it is a good idea to keep the EyeLink II Installation CD in a safe place.

   In some cases, Windows may hide certain operating system files (i.e., files ending in .INI or .BAT). If you do not see a .BAT file when you view the contents of the Host Partition folder, you can set Windows to 'see' these files using the following steps:

   i. Select the Tools → Folder Options… menu in Windows Explorer.

   ii. Select the View tab.

   iii. Select the "Show hidden files and folders" option under Hidden files and folders.

iv. Ensure “Hide extensions for known file types” is not selected.

v. Uncheck the “Hide protected Operating system files….” as illustrated in Figure 3-7.

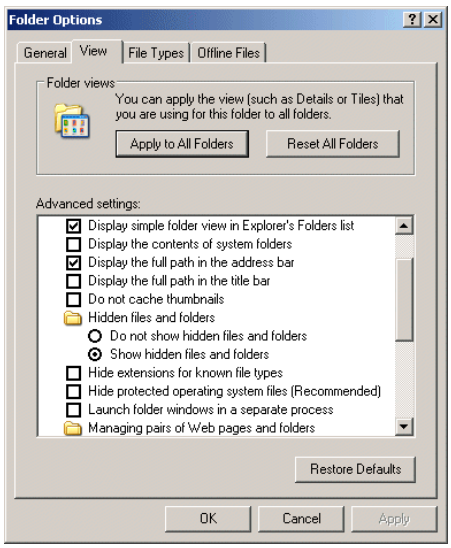


Figure 3-7: Windows Explorer Tools Folder Options… Dialog

vi. Press OK.

vii. Select all files in the “Host Partition” folder of the CD.

viii. Copy these files to the root directory of the EyeLink II drive on your computer.

3. To return Windows so that it hides operating system files complete the following steps:

i. Select the Tools → Folder Options… menu in Windows Explorer.

ii. Select the View tab.

iii. Deselect the “Show hidden files and folders” option under Hidden files and folders.

iv. Check the “Hide protected Operating system files….”

Configuring the Keyboard

The PS/2 keyboard is the default driver setup within the EyeLink Host directory, and is the only keyboard hardware recommended for the latest versions of the Host Application.

Transfer the System to make the EyeLink Partition Bootable

1. Insert the CD labeled "ROM-DOS Boot Disk" that came with the EyeLink II system, and restart the system as you normally would via Windows. The next step is to boot off of the CD. You may need to press F12 before System Commander is run to boot off of the CD-ROM device. With some newer types of hardware choosing to boot from the CD-ROM from within System Commander does not work as desired.

2. You will know that you have successfully booted from the CD-ROM of you are given a ROM-DOS command prompt.

> IMPORTANT: The following step requires you to determine the correct drive letter (c:, d:, etc) for the EyeLink II partition you created above after booting with the ROM-DOS Boot Disk. Determine this by using the `dir` command (e.g. `dir c:`) for each drive to find the EyeLink drive label and substitute that drive letter (c:, d:, etc) in place of {EYELINK DRIVE} below. It is likely that the drive letter will be either c: or d:

3. At the command prompt `'A:\>'` type the following command:

   ```
   sys {EYELINK DRIVE} [ENTER]
   ```

   For example if your EyeLink partition is drive c: you will enter:

   ```
   sys c:
   ```

   and then press the enter key.

4. Reboot the computer. Once System Commander runs, you should see something like the screen pictured in Figure 3-8 with ?? and FAT-32 describing the EyeLink Host partition.

Figure 3-8: Select Partition to Rename

Organize System Commander's 'OS Selection Menu'

1. When System Commander starts up, you will see a screen similar to Figure 3-8. Click on the 'Settings' icon.
2. From the 'Settings' window, select 'Descriptions and Icons' as illustrated in the left side of Figure 3-9.
3. From the screen in the right side of Figure 3-9, click on the arrow buttons of the 'Current Selection' box to select the 'FAT-32 OS'. In the 'EDIT DESCRIPTION' box type *EyeLink*. Under 'SELECT ICONS', use the '+' and '-' buttons to change both large and small icons to 'OS'.
4. Click 'OK' to finish. Then from the 'Settings' window, select 'Order Add and Remove' as illustrated in Figure 3-10.
5. From the 'Order Add and Remove' window, remove all icons except for the Windows XP and EyeLink by highlighting each one and clicking the 'Remove' button as in the right side of Figure 3-10.
6. Highlight the EyeLink OS and click the 'Top' button to make EyeLink the default partition.
7. Click 'OK' to finish and close the 'Order and Remove' window.

Figure 3-9: Select Description and Icons

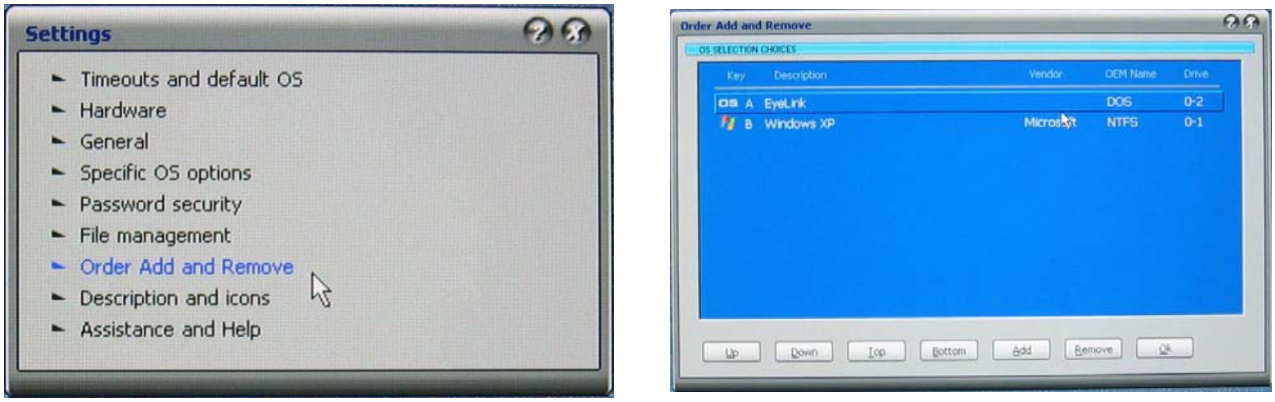


Figure 3-10: Order Add and Remove

Automated boot into the EyeLink II Operating System

1. If you would like System Commander to automatically boot into the EyeLink partition, click on 'Timeouts and default OS' from the 'Settings' window.
2. Check the box beside 'Auto-select timeout' and set the number of seconds for System Commander to wait before booting the default operating system. Indicate the default OS in the 'Default OS selection'. If you followed the earlier instruction, EyeLink will be the first OS and can be selected by choosing 'A'.
3. Once you have completed this step, close the windows by clicking the X in the top right corner. You will be returned to the main System Commander window and are now ready to test the installation.

Appendix B: Windows Vista Host PC Software Installation

Please follow the instructions here to install the Host software in conjunction with Windows Vista.

> IMPORTANT: Before proceeding with the EyeLink II Host software installation ensure you have backed up all important data on your Host PC.
>
> A new Windows Vista installation is required and this WILL erase everything on the hard drive. We do not have the ability to separately create the Host partition with an already existing Vista installation.
>
> **WARNING: ALL DATA ON THE DISK WILL BE ERASED**

Due to the nature of Windows Vista's boot loader, a full installation of Windows Vista must be performed. This means that the hard drive will be formatted and any information on the hard drive will be erased.

We will first format the hard drive using ROM-DOS and create a FAT32 partition for the EyeLink Host software. Next, Windows Vista will be installed on the unused portion of the drive. Finally, under Vista, we will configure the boot loader so that the system can be booted into either ROM-DOS or Windows Vista.

You will require:

- a ROM-DOS Boot CD (supplied with your EyeLink or disk image available via support@sr-research.com)
- a copy of your EyeLink II CD-ROM (or "EyeLink CL" CD-ROM) containing the Host PC application software and your .SCD file (supplied with your EyeLink)
- a copy of your Vista installation disk and Vista License

Formatting the Hard Drive under ROM-DOS

The first step in preparing your Host PC for the EyeLink II and Vista is to format your hard drive using the ROM-DOS operating system, and creating a partition for the EyeLink Host software.

1. Boot the computer with the ROM-DOS Boot CD. If you are using a Dell computer, place the CD in the CD-ROM drive and press F12 for booting options, and boot from the Internal or USB CD-ROM drive. For other motherboards and systems, you may need to enter the BIOS and change the Boot Priority of the different drive components, in order to make the CD-ROM have the highest boot priority.

2. At the command line prompt type "FDISK" without quotes.

3. While running FDISK:

   i. type 'A' and delete all partitions

   ii. type 'M' and write the Master Boot Record

   iii. Create a DOS partition that is about 10 GB

   iv. Save and exit

4. Reboot the computer with the ROM-DOS CD.

5. At the command line prompt type "FORMAT C:" to format the disk, and label the disk “EyeLink” if asked.

6. At the command line prompt type "SYS C:" to install the ROM-DOS system files and make the partition bootable.

7. Eject the CD from the CD-ROM drive and reboot the computer. If all goes well, the system should boot from the hard disk and present a ROM-DOS command line prompt.

The next step is to install Windows Vista on the remainder of the hard drive, and then to configure the Boot Loader so that Vista will give the option to boot from the ROM-DOS partition or Vista when you start your computer. We will also copy the Host PC directory and software to the EyeLink partition.

8. Reboot the computer from the Vista install DVD.

9. Install Vista on the second partition or if no second partition is shown, on the remainder of the drive.

10. Enter User Names and Passwords as desired and once the Vista installation is complete, reboot into the Vista operating system.

11. Go to the Start / All Programs -> Accessories -> Cmd.exe menu and right click on the Cmd.exe icon and select the “Run as Administrator” contextual menu item. Issue the following commands from the command prompt:

    i. bcdedit /copy {legacy} /d "EyeLink"

This will return a “<GUID>” – a string of characters that looks something like {xxxxxxxxxxxxxxxxx….xxxx}. Select all of the text in the CMD window and copy it to the clipboard by going to the Edit menu and selecting “Copy” – open Notepad in Windows which is a simple text editor located at Start /All Programs -> Accessories -> Notepad, and paste the text from CMD into the empty document. You can now

highlight and copy just the <GUID> text so that it can be easily pasted in the following steps, wherever <GUID> appears.

ii. bcdedit /set <GUID> device partition=D:

iii. bcdedit /set <GUID> path \bootsect.bak

iv. bcdedit /displayorder <GUID> /addfirst

v. bcdedit /default <guid>

12. Reboot the computer and select "Eyelink" on the menu to go into the EyeLink partition or select Windows Vista to boot into Vista. You can now copy the EyeLink Host Partition files from your EyeLink II (or EyeLink CL) distribution disk to put the host software on the EyeLink partition. See Section 11.4 "Copy the Host Application files to the New Partition" for instructions.