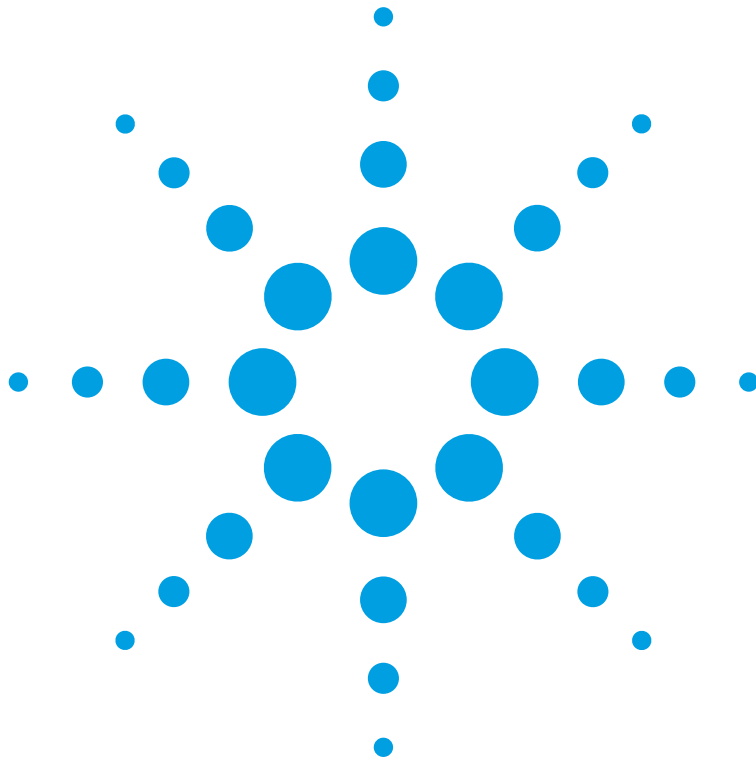

Agilent 86140 Series Optical Spectrum Analyzers

Firmware Upgrade Instructions



Agilent Technologies

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ISM1-A

This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

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Upgrade Overview

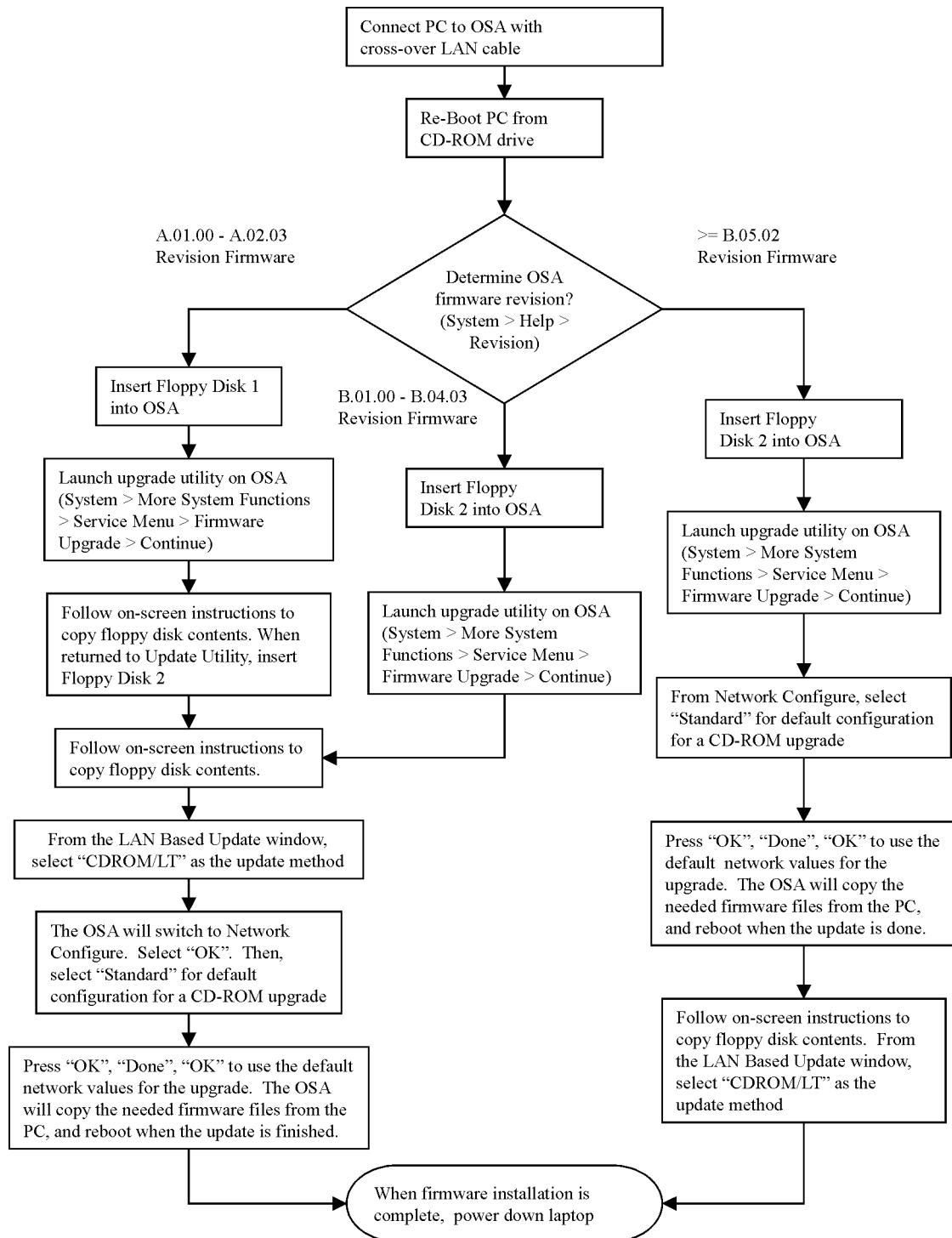
The upgrade procedure works by transferring new firmware files from the Linux CD-ROM in your PC to the OSA via a LAN connection. The PC and the OSA may be connected directly with the crossover LAN cable provided, or they may be connected over a network.

A networked connection offers greater flexibility, and may be preferable for upgrading multiple instruments. If you wish to connect over a network, please refer to “Network_Upgrade_Instructions.pdf” on the CD-ROM. When viewed in “Windows”, manuals and additional instructions are available on the upgrade CD-ROM. The most straightforward upgrade method, however, is via direct connection. The direct connect method is described in this document.

CD-ROM Upgrade Kit Contents

- Bootable Linux CD-ROM – a file server that holds firmware files
- Two Floppy disks
 - Floppy Disk 1. Only needed in OSAs with A revision firmware.
 - Floppy Disk 2, B.06.02 Firmware. Used by the OSA to identify which files to ftp (copy) from the CD-ROM
- Cross-over LAN cable to connect the PC to the OSA
- Firmware Upgrade Instructions (part number 86140-90085)

Upgrade Process Flowchart



Direct Connect Upgrade Instruction Overview

Connect PC to OSA

- With the provided Cross-over cable, connect the LAN port on your PC to the LAN port on the rear panel of the OSA.

Re-boot PC from Linux CD-ROM

- 1** Insert the CD-ROM into the PC, and boot your PC from the CD-ROM drive. (If this does not happen automatically, the BIOS of the PC will need to be modified. Refer to “Appendix A. Resetting the boot device priority in your PC’s BIOS.” on page 1-10 for more information). The BIOS change that you may perform is the only change made to your PC. The CD loads a separate Linux Operating System from the CD. It will not change any PC operating system settings.
- 2** On some systems, the user will be prompted to enter a video mode. If this happens, select the lowest resolution, generally 640 x 480.
- 3** A message will appear, “Attempting to get IP address from DHCP server”. The attempt will timeout after 1 minute, please wait. The PC will then boot up to a window that displays the message “Configured for direct connection”. No selection from this window is necessary.

Continue Upgrade on OSA

- 1** Check the current firmware revision on the OSA (System > Help > Revision).

For A.01.00 – A.02.03 revision firmware

- a** Insert Floppy Disk 1 into the OSA floppy disk drive.
- b** Launch the update utility on the OSA. The OSA will reboot. (*System > More System Functions > Service Menu > Firmware Upgrade*)
- c** Follow the on-screen instructions for the OSA to read the floppy disk contents. You will be returned to the Update Utility screen.
- d** Insert Floppy Disk 2 and again follow the on-screen instructions for the OSA to read the floppy disk and continue the upgrade process.
- e** From the LAN Based Update window, select “CDROM/LT” as the update method.
- f** The OSA will display the message “Network is not UP – Switching to Network Configure”. Press “OK”. Select “Standard” for default parameters used for a CD-ROM Upgrade. Press “OK”, “Done”, “OK” to use these parameters.

Direct Connect Upgrade Instruction Overview

For B.01.00 – B.04.02 revision firmware

- a** Insert Floppy Disk 2 into the OSA floppy disk drive.
- b** Launch the update utility on the OSA. The OSA will reboot. (System > More System Functions > Service Menu > Firmware Upgrade)
- c** Follow the on-screen instructions to read the floppy disk contents and continue the upgrade process.
- d** From the LAN Based Update window, select “CDROM/LT” as the update method.
- e** The OSA will display the message “Network is not UP – Switching to Network Configuration”. Press “OK”. Select “Standard” for default parameters used for a CD-ROM Upgrade. Press “OK”, “Done”, “OK” to use these parameters.

For B.05.02 and higher revision firmware

- a** Insert Floppy Disk 2 into the OSA floppy disk drive.
 - b** Launch the update utility on the OSA. The OSA will reboot. (*System > More System Functions > Service Menu > Firmware Upgrade*)
 - c** From the Network Configure Utility, select “Standard” for default parameters used for a CD-ROM Upgrade. Press “OK”, “Done”, “OK” to use these parameters.
 - d** Follow the on-screen instructions to read the floppy disk contents and continue the upgrade process.
 - e** From the LAN Based Update window, select “CDROM/LT” as the update method.
- 2** At this point the OSA will copy the firmware files from the Linux server, and install the new firmware. When the OSA firmware has been installed, select “Quit” on the PC to shut down.

Detailed Direct Connect Upgrade Instructions

Requirements:

- 1 The Firmware on the OSA must be at revision A.01.00 or higher.

NOTE

Demo units with A.00.111 cannot be upgraded using this process. They must be returned to the factory for hardware upgrade. Please contact your Agilent Technologies representative, or call the Agilent Call Center at (800) 452-4844 to make the necessary arrangements.

- 2 PC Requirements

- a Most computer systems will be capable of booting from the CD and acting as a server for your OSA. Some configurations will not be compatible. In general, the more 'standard' the system configuration, the more likely the CD will have the necessary drivers needed to boot and use the LAN connection. Try to boot from your PC, and when you reach the "Network Configured" screen, you are successful. If you run into errors, refer to the matrix in Appendix D. PC Hardware Compatibility Matrix for compatible PCs.

Known compatibility problems are:

- Toshiba® Laptops – will not boot the CD-ROM
- Embedded LAN Cards – mixed success
- Recently released LAN Cards
- ISA LAN Cards

- b If your PC has more than one CD-ROM drive, use the primary drive to boot the Linux CD.
 - c "Appendix D. PC Hardware Compatibility Matrix" contains a matrix of PCs that have successfully booted the Linux CD, and whose LAN cards have been recognized. If the Linux CD-ROM does not boot on your PC, or is unable to recognize your LAN card, please refer to this matrix for compatible hardware. Locate another PC or LAN card that is supported. If you do not have a PC available, please contact your Agilent Technologies representative, or call the Agilent Call Center at (800) 452-4844.
- 3 Upgrade Kit consisting of
 - Crossover LAN Cable
 - Linux Firmware Upgrade CD
 - Two Firmware Upgrade Disks
 - Floppy Disk 1. Needed in OSAs with A revision firmware.
 - Floppy Disk 2, B.06.02 Firmware. Identifies which files to ftp from the CD-ROM

Procedure

Connect PC to OSA

Connect the Crossover LAN Cable between the LAN port on the laptop and the 10BaseT LAN connector on the rear panel of the OSA.

Reboot PC from Linux CD-ROM

- 1 Insert the Upgrade CD-ROM into CD-ROM drive.
- 2 Reboot the PC. If necessary, reset boot device priority in your BIOS to boot from the CD-ROM drive.
- 3 The BIOS change is the only change made to your PC. The CD loads a separate Linux Operating System from the CD, none of the PC Operating System settings will be affected by the Linux CD-ROM.
- 4 When booting on some systems, the user will be prompted to enter a video mode. If this happens, select the lowest resolution, generally 640 x 480.
- 5 The laptop will now boot into a Linux operating system.

If “LAN CARD DETECTION ERROR” screen appears, please check that the LAN interface available in the laptop is on the list of supported hardware in “Appendix D. PC Hardware Compatibility Matrix” . Locate another LAN card or PC that is supported for the upgrade.

- 6 The PC will attempt to contact a DHCP Server for networking configuration. Ignore this message for direct connection. This will be used if you wish to upgrade instruments over a network. Please refer to Network_Upgrade_Instructions.pdf on the upgrade CD-ROM.
- 7 The CD will boot up to a window that displays the message “Configured for direct connection”. No selection from this window is necessary. Leave the laptop in this state and continue the upgrade process.

Continue with the upgrade on the OSA

- 1 Check the current firmware revision of the OSA
 - a On the OSA front panel, press **System > Help > Revision**.
 - b The firmware revision information is displayed. The first line shows the OSA name and model number. The second line shows the current firmware version. (For revisions p.01.38 and higher, follow the instructions for B.01.00 revision firmware. For revisions earlier than p.01.38, follow the instructions for A.02.03 revision firmware.)

For A.01.00 – A.02.03 revision firmware

- 1 **Insert Floppy Disk 1** into the OSA floppy drive. If necessary, it is possible to make new floppy disks. Please see “Appendix B. Creating New Floppy Disks” for instructions.
- 2 On the OSA front panel, press **System > More System Functions > Service Menu > Firmware Upgrade**, and press **Continue**. The OSA will now restart the operating system and load the update utility.
- 3 When the message “Update-Will install a new release of the OSA Firmware into the OSA from the update floppy(s)” is displayed, press **Update** to continue.
- 4 From the OSA Update Utility window, press **Continue**. The system will read the information from the floppy disk.

- 5 When the message “Update unloaded from Floppy” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
- 6 When the message “The OSA will now be restarted” is displayed, press **OK** to restart the operating system.
- 7 After the OSA has been restarted, the OSA Update Utility window will be displayed. Remove Floppy Disk 1 and **insert Floppy Disk 2** into the OSA floppy disk drive.
- 8 When the message “Update will install a new release of the OSA Firmware into the OSA from the update floppy(s)...” will be displayed. Press **Update**.
- 9 When the message “OSA LAN Based Update B.06.02” is displayed, press **Continue** to proceed with the firmware installation. If you do not wish to continue the upgrade process, press Cancel to return the OSA to the previous version of firmware and exit the update process.
- 10 “Updating System from Floppy” will be displayed briefly on the screen and a task bar will indicate the progress. When the message, “Update unloaded from Floppy. About to install. This will take a few minutes” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
- 11 From the LAN Based Update window, select “**CDROM/LT**” as your upgrade method.
- 12 Next, you will see a message “Network is not UP – Switching to Network Configure”. Press “**OK**”.
- 13 The OSA will launch the Network Configuration Utility. Chose the “**Standard**” configuration for use with the upgrade CD-ROM.
- 14 Press “**OK**” to approve the configuration, “**Done**” to finish the Network Configuration, and “**OK**” to approve the final check.

You will see messages indicating that the OSA is “Attaching to the LAN” and “Update getting Archive Files from Server”, followed by installation messages. When the first installation message “Installing OSA Firmware” appears, the OSA has received the files that it needs from the PC. At this time, the cross-over LAN cable can be removed from the OSA, and plugged into another OSA for additional upgrades. Please allow the current OSA to complete its upgrade cycle. Turning an OSA off while it is installing new firmware will abort the firmware upgrade, and return the unit to its previous firmware revision.

- 15 The message “Update Completed. The OSA will now be restarted” will appear, press **OK**. The system will restart using the new firmware.
- 16 To update another OSA, repeat from the beginning of “Continue with the upgrade on the OSA” on page 1-6, remembering to connect the cross-over LAN cable to the next OSA.
- 17 When all upgrades are complete, select “**Quit**” on the PC to shut down. When the laptop reboots, re-enter the BIOS and reset the boot priority to its original configuration.

Detailed Direct Connect Upgrade Instructions

For B.01.00 – B.04.02 revision firmware

- 1** **Insert Floppy Disk 2** into the OSA floppy drive. If necessary, it is possible to make new floppy disks. Please see “Appendix B. Creating New Floppy Disks” for instructions.
- 2** On the OSA front panel, press **System > More System Functions > Service Menu > Firmware Upgrade**, and press **Continue**. The OSA will now restart the operating system and load the update utility.
- 3** When the message, “Update-Will install a new release of the OSA Firmware into the OSA from the update floppy(s)” is displayed, press **Update** to continue.
- 4** When the message “OSA LAN Based Update B.06.02” is displayed, press **Continue** to proceed with the firmware installation. If you do not wish to continue the upgrade process, press **Cancel** to return the OSA to the previous version of firmware and exit the update process.
- 5** “Updating System from Floppy” will be displayed briefly on the screen and a task bar will indicate the progress. When the message, “Update unloaded from Floppy. About to install. This will take a few minutes” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
- 6** From the LAN Based Update window, select “**CDROM/LT**” as your upgrade method.
- 7** “Updating System from Floppy” will be displayed briefly on the screen and a task bar will indicate the progress. When the message, “Update unloaded from Floppy. About to install. This will take a few minutes” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
- 8** Next, you will see a message “Network is not UP – Switching to Network Configure”. Press “**OK**”.
- 9** The OSA will launch the Network Configuration Utility. Chose the “**Standard**” configuration for use with the upgrade CD-ROM.
- 10** Press “**OK**” to approve the configuration, “**Done**” to finish the Network Configuration, and “**OK**” to approve the final check.

You will see messages that the OSA is “Attaching to the LAN”, and “Update getting Archive Files from Server”, followed by installation messages. When the first installation message “Installing OSA Firmware” appears, the OSA has received the files that it needs from the PC. At this time, the cross-over LAN cable can be removed from the OSA, and plugged in to another OSA for additional upgrades. Please allow the current OSA to complete its upgrade cycle. Turning an OSA off while it is installing new firmware will abort the firmware upgrade, and return the unit to its previous firmware revision.

- 11** The message “Update Completed. The OSA will now be restarted” will appear, press **OK**. The system will restart using the new firmware.
- 12** To update another OSA, repeat from the beginning of “Continue with the upgrade on the OSA” on page 1-6, remembering to connect the cross-over LAN cable to the next OSA.
- 13** When all upgrades are complete, select “**Quit**” on the PC to shut down. When the laptop reboots, re-enter the BIOS and reset the boot priority to its original configuration.

For B.05.02 and higher revision firmware

- 1** **Insert Floppy Disk 2** into the OSA floppy drive. If necessary, it is possible to make new floppy disks. Please see “Appendix B. Creating New Floppy Disks” for instructions.
 - 2** On the OSA front panel, press **System > More System Functions > Service Menu > Firmware Upgrade**, and press **Continue**. The OSA will now restart the operating system.
 - 3** The OSA will launch the Network Configuration Utility. Chose the “**Standard**” configuration for use with the upgrade CD-ROM.
 - 4** Press “**OK**” to approve the configuration, “**Done**” to finish the Network Configuration, and “**OK**” to approve the final check.
 - 5** When the message, “Update-Will install a new release of the OSA Firmware into the OSA from the update floppy(s)” is displayed, press **Update** to continue.
 - 6** When the message “OSA LAN Based Update B.06.02” is displayed, press **Continue** to proceed with the firmware installation. If you do not wish to continue the upgrade process, press Cancel to return the OSA to the previous version of firmware and exit the update process.
 - 7** “Updating System from Floppy” will be displayed briefly on the screen and a task bar will indicate the progress. When the message, “Update unloaded from Floppy. About to install. This will take a few minutes” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
 - 8** From the LAN Based Update window, select “**CDROM/LT**” as your upgrade method.
 - 9** “Updating System from Floppy” will be displayed briefly on the screen and a task bar will indicate the progress. When the message, “Update unloaded from Floppy. About to install. This will take a few minutes” is displayed, press **Continue Update**. At this point, you may remove the floppy disk to begin the upgrade procedure on another OSA.
- You will see messages that the OSA is “Attaching to the LAN”, and “Update getting Archive Files from Server”, followed by installation messages. When the first installation message “Installing OSA Firmware” appears, the OSA has the files that it needs from the PC. At this time, the cross-over LAN cable can be removed from the OSA, and used with another OSA for additional upgrades. Allow the current OSA to complete its upgrade cycle. Turning it off while it is installing new firmware will abort the firmware upgrade, and return the unit to its previous firmware revision.
- 10** The message “Update Completed. The OSA will now be restarted” will appear, press **OK**. The system will restart using the new firmware. To update another OSA, repeat from the beginning of “Continue with the upgrade on the OSA” on page 1-6, remembering to connect the cross-over LAN cable to the next OSA.
 - 11** When all upgrades are complete, select “**Quit**” on the PC to shut down. When the laptop reboots, re-enter the BIOS and reset the boot priority to its original configuration.

Appendix A. Resetting the boot device priority in your PC's BIOS.

This requires modifying the priority of available boot devices. In order for the PC to boot the Agilent Upgrade CD, the BIOS must be configured to boot from the CD-ROM drive first. Please consult your PC user's manual or IT professional for detailed instructions on how to reset the boot priority on your system. The example below details the steps to change the boot priority on an HP Omnibook Laptop. In general, you will interrupt the boot of the PC, and navigate the BIOS menu to reorder the boot device priority.

- 1** Restart the Laptop, during bootup press F2 to enter setup.
- 2** Under the 'Boot' menu, select CD-ROM/DVD.
- 3** Write down the current boot priority (the order of the boot disks) so that you can restore it after you have completed this procedure.
- 4** Use the keys indicated at the bottom of the screen (F5/F6) to move the CD-ROM/DVD drive to the top of the boot list.
- 5** Press ESC to exit and save changes.

Appendix B. Creating New Floppy Disks

New floppy disks can be made in the Linux environment, or within a Windows environment. If you cannot access a floppy disk drive and a CD-ROM drive simultaneously, you will need to create the floppy disks within Windows.

In Linux

- 1** From the Main Menu, use the arrow keys to highlight Option 2 “Create Floppy Disk”, and press “Enter”.
- 2** Insert a formatted floppy disk into the floppy drive of the PC.
 - If the OSA you wish to upgrade has A.01.00 – A.02.03 revision firmware, you will need to create both floppy disks.
 - a** Select Floppy Disk 1 and press enter. Label this “Floppy Disk 1”
 - b** When the floppy disk is copied, select Option 2 again.
 - c** Insert a second formatted floppy disk in to the floppy drive of your PC.
 - d** Select Floppy Disk 2 and press enter. Label this “Floppy Disk 2”
 - If the OSA you wish to upgrade has B.01.00 – or later revision firmware, you will need only the second floppy disk.
 - a** Insert a formatted floppy disk in to the floppy drive of your PC.
 - b** Select Floppy Disk 2 and press enter. Label this “Floppy Disk 2, B.06.02”

In Windows

- 1** With your PC running in Windows, insert the Upgrade CD into the CD-ROM drive.
- 2** Copy the folder “make_floppy” to your hard disk.

CAUTION

There are separate raw write executables for Windows 95/98 (write_95.exe) and Windows NT/2000 (write_nt.exe) operating systems. Matching the correct utility to your PC’s operating system is *critical*.

- 3** Insert a formatted floppy disk into the PC’s floppy disk drive.
- 4** From the Windows Start menu, click on Programs > MS DOS Command Prompt to open the MS DOS window. Navigate to the directory where you stored the update files. For example if the directory, “make_floppy”, is located under the C: drive, at the prompt type, `C:> cd make_floppy` and press Enter.
 - a** At the prompt, type `dir` and press Enter. All of the downloaded files in the directory should be listed.
 - b** To copy the firmware upgrade files, perform one of the following steps:
 - For *Windows NT/2000*, at the prompt type `write_nt floppy2.upd a:` (“a:” represents the designation of your disk drive) and press Enter.
 - For *Windows 95/98*, at the prompt type `write_95 floppy2.upd a:` (“a:” represents the designation of your disk drive) and press Enter.

Appendix B. Creating New Floppy Disks

Label this, "Floppy Disk 2, B.06.02". The disk contents cannot be examined because the entire disk contains the disk image, not a directory structure.

- c) Remove Floppy Disk 2 from the disk drive and insert another formatted disk to copy the upgrade utility files.
- 5) Repeat Step 3 to copy the Floppy Disk 1. For example, type "write_nt floppy1.upd a:"
This disk will be Floppy Disk 1. The disk cannot be examined because the entire disk contains the disk image, not a directory structure.
- 6) Remove the disk from the PC disk drive.

Appendix C. Linux CD-ROM Background Information

The CD-ROM provided is a bootable Linux operating system. The CD-ROM is used with a PC or a laptop to act as a file server which holds OSA firmware files. The OSA and PC can be connected directly with the provided cross-over LAN cable, or over a network. Once the Linux CD-ROM has booted up, it is possible to change the configuration of the network parameters. Once configured correctly, the PC's role is to wait to be queried for the firmware files by the OSA.

Transferring firmware files is a pull by the OSA. Once the Upgrade Utility is started, a floppy disk is used to tell the instrument the target firmware revision, and the files that it needs to pull to upgrade to that revision. The floppy disk is provided in the upgrade kit. After the disk has been read, the target firmware revision will appear in a window. When you choose to continue at this point, the instrument will query you for an upgrade method. A CD-ROM used in a PC that has been left on the network will use the "Local Server" upgrade. A directly configured OSA will use the "Laptop" or "CDROM/LT" method.

It is possible to connect the Linux server on the CD-ROM to the OSA in two ways. The most straightforward method uses the cross-over LAN cable provided in the upgrade kit. Directly connect the LAN port on your PC to the LAN port on the rear panel of the OSA. When the CD boots, the message "Configured for direct connection" will be displayed.

The second option is to connect the server to the OSA via your network. This will require knowledge of your network, and a static IP address for the OSA. If you wish to upgrade OSA firmware over the network, the Linux server must be no more than one gateway from the instrument(s). The Linux server configuration can be set either by DHCP (if the PC has DHCP support on the network), or by manual configuration. If the PC is currently on the LAN, the message "Configured for Local Server LAN Upgrade" will appear when the CD boots up. The dynamically configured parameters are available under "View Network Settings". For more information on upgrading an OSA over the LAN, refer to the "Network_Upgrade_Instructions.pdf" on the CD-ROM. You can access this by booting your PC into Windows, and viewing the files on the CD-ROM.

Appendix D. PC Hardware Compatibility Matrix

Manufacturer	Processor	Chipset	Lan Card	CD ROM
Dell Precision 410	PIII 600	Intel 440BX	Embedded 3Com 3c906B	NEC 446 SCSI
PC Clone	Duron 900	SiS 630/730	Embedded Realtek RTL8139	56X G6D
Dell Dimension XPS T500	PIII 500	Intel	PCI 3COM Etherlink 10 TPCNIC (3C900B-TPC)	
Dell Dimension XPS T700	PIII 700	Intel	PCI 3COM Etherlink XL 10/100 (3C905c-TX)	
HP Vectra VL	PII 450	Intel	PCI 3Com Fast EtherLink XL 10/100Mb	IDE CD-ROM / Dual Channel PCI -IDE Controller
Gateway2000 E5250	PIII Xeon 550	Intel 440GX	PCI 3com fast etherlink XL 3c905-TX	Toshiba XM-6041B SCSI
Compaq Presario 5000	Duron 800	VIA KT133	PCI Accton EN1207D	Compaq CRD-8484B
Alien Ware	Athlon K7 950	VIA KX133	PCI D-Link DFE 530TX	Pioneer DVD-115 IDE
Micron Millennia	PII 350	Intel 440BX	PCI LanPro (Realtek) EN-5200PXA	Delta OIP-CD5200A IDE
HP Pavilion 8495	PIII 550	Intel 440BX	PCI MPX EN5038	Pioneer DVD-113 IDE
PC Clone	PIII 933	vIA Apollo pro 133	PCI NetGear FA310TX	Creative Labs CD 5230E IDE
IBM Aptiva	Athlon K7 800	AMD 750	PCI NetGear FA310TX	Hitachi GD-5000 IDE
Gateway 2000 Performance	PIII 600	Intel 440BX	PCI Netgear FA310TX	Hitachi DVD GD-5000
IMB Thinkpad770	PMMX 233	Intel	PCMCIA 3Com 10/100 LAN CardBus	Toshiba CD-C2002
HP Omnibook 4150	PII 366	Intel	PCMCIA 3Com 10/100 LAN Cardbus 3CXFE575BT	
HP Omnibook 900	PII 366	Intel	PCMCIA 3Com 10/100 LAN Cardbus 3CXFE575CT	
Dell Inspiron 7500	PII 400	Intel	PCMCIA Dlink DFE-650	Toshiba XM-1902B IDE
HP Omnibook 4150	PII 366	Intel	PCMCIA Xircom Credit Card 10/100 LAN	
HP Omnibook 900	PII 366	Intel	PCMCIA Xircom Realport Ethernet 10/100 LAN+Modem 56	