Autodesk®
Visual Effects and Finishing
2009 Edition

HP® xw9400 Workstation Hardware Setup Guide

Autodesk®

Autodesk® Inferno® 2009, Autodesk® Flame® 2009, Autodesk® Flint® 2009, Autodesk® Smoke® 2009, Autodesk® Backdraft® Conform 2009

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Contents

Introduction

Topics in this chapter:

About This Guide

This guide describes how to set up the HP® xw9400 workstation for your Autodesk® Visual Effects and Finishing 2009 application (Autodesk Inferno®, Autodesk Flame®, Autodesk Flint®, Autodesk Smoke®, Autodesk Backdraft® Conform).

If you already own an HP xw9400 workstation that shipped with a previous release of a Visual Effects and Finishing application, you normally do not need to change its configuration. But you do need to verify its BIOS and firmware settings. See BIOS and Firmware on page 10.

Use this guide in conjunction with the *Software Installation Guide*, the *Configuration File Reference Guide*, the *Stone Direct Configuration Guide*, and the *Stone and Wire Filesystem and Networking Guide* to install and configure the hardware and software components of your Visual Effects and Finishing system.

NOTE In most cases, both hardware setup and application installation is done on delivery by an authorized technician, so you may not need to perform some of the procedures in these guides.

Related Documentation

This release has documentation that helps you install, configure, and use the software. This documentation is available from the application DVD, on the Autodesk Web site, and is installed with the product (as PDF files and as an HTML help system).

For a list of all the documentation available to you, visit *http://www.autodesk.com/me-documentation*. From this page you can access the complete documentation library.

You should also refer to your product's release notes for all late-breaking release information.

Notation Conventions

A number of style conventions are used throughout this guide. These conventions and examples of their use are shown as follows.

Convention	Example
Text that you enter in a command line or terminal appears in Courier bold. You must press the Enter key after each command.	**`rpm -qa`**
Variable names appear in Courier, enclosed in angle brackets.	`<filename>`
Variables that appear enclosed in square brackets are optional.	`[<filename>]`
Feedback from the command line or terminal appears in Courier.	`limit coredump-size`
Directory names, filenames, URLs, and command line utilities appear in italics.	*/usr/discreet*

Contacting Customer Support

For contact information for Autodesk Media and Entertainment Customer Support, consult your release notes, or visit *http://www.autodesk.com/support*.

Customer support is also available through your Autodesk reseller. To find a reseller near you, consult the reseller look-up database at *http://www.autodesk.com/resellers*.

Getting Started 2

Topics in this chapter:

Workflow for Hardware Setup and Application Installation

The following procedure provides the general workflow for installing an Autodesk Visual Effects and Finishing application on a workstation.

To install a Visual Effects and Finishing application on a workstation:

1. Review the guidelines for working with hardware components. See Hardware Configuration Guidelines on page 6.
2. Connect all peripherals (mouse, keyboard, Wacom® tablet, graphics monitor) to the proper ports, and connect your workstation to the Autodesk Wire® network. See Peripherals Connection Diagrams on page 19.
3. Connect your workstation to the storage. See Connecting Storage on page 24.

4 Connect a VTR and a broadcast monitor to your workstation. See Setting Up Video Hardware on page 27.

5 Set up the audio hardware. See Setting Up Audio Hardware on page 39.

6 Perform the procedures in the *Red Hat Enterprise Linux Workstation 4, Update 3 Installation and Configuration Guide* to install your operating system and the Discreet® Kernel Utility (DKU).

7 Perform the procedures in the *Autodesk Visual Effects and Finishing Software Installation Guide* to install and license your Visual Effects and Finishing application.

Hardware Configuration Guidelines

In most cases, hardware integration and application installation are done on delivery by an authorized technician, and some of the procedures in this guide may not be necessary. Still, it is a good idea to read through all chapters to familiarize yourself with the configuration procedures for the following reasons:

- Many suspected problems with your system may be due to loosened connections or improperly configured devices. This guide helps you troubleshoot problems by providing information about properly configured systems.
- If you need to call Customer Support, familiarity with this guide allows you to help Customer Support diagnose problems.
- If you want to move your system at any time, or upgrade certain hardware components, this guide contains crucial information.

This guide, in conjunction with the *Autodesk Stone Direct Configuration Guide*, provides complete information about the configuration of hardware components. However, hardware configuration should only be performed by an experienced hardware integrator.

Your Autodesk system consists of high-performance hardware that must be configured in an environment suited to its operational needs. The following sections discuss:

- Memory requirements
- Proper environmental conditions
- Power and air-conditioning

- Rack-mounting
- Static discharges
- Audio grounding

Memory Requirements

The HP xw9400 supports up to 16 GB of memory, and uses DDR2-667 ECC Registered / Unbuffered DIMMs. The amount of memory required for your Autodesk Visual Effects and Finishing system depends on the resolution of your projects, the type of work you perform and, in some cases, the platform on which you are running the application. Refer to the *Autodesk Visual Effects and Finishing Software Installation Guide* to determine the memory requirements for your Visual Effects and Finishing application.

Ensuring Proper Environmental Conditions

You should consider the following environmental guidelines for all hardware configuration:

- Place all components in an air-conditioned environment. All hardware components generate heat and must be kept cool. See Power and Air Conditioning Requirements on page 8.
- Make sure the rack on which hardware components are mounted is open or well ventilated. Follow the ventilation specifications that apply to your system. See Rack Mount Requirements on page 9.
- Keep all hardware components in a clean, dust-free location.
- Minimize vibration and humidity.
- Do not block the vents on the component housing.
- Do not drape anything, such as a jacket or a blanket, over hardware components.
- Minimize electromagnetic noise by separating digital data and power cables from analog audio cables and running them in different cable ducts.

Power and Air Conditioning Requirements

The values for power consumption and heat output were recorded on an Autodesk certified system with all of the required peripherals and certified components.

NOTE These values can fluctuate if uncertified hardware components or third party applications are added to your system. The use of uncertified hardware components or third party applications is not supported. Please consult the manufacturer's documentation for standardized minimum and maximum values.

The following table summarizes the peak (at startup) power consumed by the HP xw9400 system and the heat it generates under the maximum processing load produced by your Visual Effects and Finishing application. For detailed specifications, including noise output, see the documentation provided by the manufacturer.

Component	Quantity	Startup Amps (120V / 240V)	Max. Amps (120V / 240V)	Watts	Heat (BTUs)
HP xw9400	1	3.5 / 1.8	3.0 / 1.5	360	1228.68
Miranda DVI-Ramp2	1	0.5 / 0.3	0.5 / 0.3	50	170.65
Lucid ADA 88192	1	0.5 / 0.3	0.5 / 0.3	45	153.58

NOTE Workstations equipped with the NVIDIA® Quadro® FX 5600 graphics board and the NVIDIA Quadro SDI board do not use the Miranda DVI-Ramp2.

You must be able to meet the startup power requirement and have a climate control system with the capacity to maintain the temperature of these components under the maximum processing load. Refer to the following table for standard conversion benchmarks and an example of how they are used to establish climate control requirements.

Unit Conversion	Example
1 Watt = 3.413 BTU	384 Watts = 1228.68 BTU
12000 BTU = 1 Ton of air conditioning	1228.68 BTU = 0.102 Ton of air conditioning

Rack Mount Requirements

You can rack mount your Visual Effects and Finishing system. Plan for sufficient space in your rack mount chassis to install the following components:

- An HP xw9400 system
- An AJA OEM-2K breakout box
- A Miranda DVI-Ramp2, if your workstation uses one
- A Stone® Direct storage chassis (XR model)
- Additional Stone Direct expansion chassis (XE model), as required

The form factor units of these components are provided in the following table.

Component	Quantity	Form Factor	Required Rack Space
HP xw9400	1	5U	5U
AJA OEM-2K breakout box	1	1U	1U
Miranda DVI-Ramp2	1	1U	1U
Stone Direct storage chassis (XR)	1	2U	2U
Stone Direct expansion chassis (XE) (each)	1	2U	2U

Avoiding Damage from Static Electricity

When installing any hardware equipment, take the following precautions to prevent damage to sensitive components from static discharge:

- Make sure power is turned off on the component you are working on. It is a good idea to unplug components until all other connections are configured.
- Always wear a grounded static wrist strap. Attach the strap's alligator clip to any grounded metal surface on the component's chassis that you are working on. Place the wristband around your wrist.

- Do not handle any components unnecessarily, particularly boards and cards that slide in and out of PCI slots on their parent hardware components.

Grounding Audio Hardware Components

It is important to properly ground your audio components. Otherwise, you may have ground loops, or humming in the system. To ensure audio components are properly grounded, use the XLR-3 cables shipped with your system. Using any other cables may cause humming in the system.

Receiving Your Shipment

When you receive your shipment, check all the boxes for dents or other markings that may indicate damage during transport. If you suspect a component is damaged, carefully inspect it before setting up the system. If you receive a damaged component, call Customer Support.

Use the enclosed packing checklist to ensure that you received all of the parts.

BIOS and Firmware

In most cases, hardware integration and application installation are done on delivery by an authorized technician, so you should not have to verify or upgrade the BIOS or the different firmwares. But, if you are upgrading your Visual Effects and Finishing application yourself, perform the following procedures.

System BIOS

System configuration is done prior to delivery by an authorized technician. The procedures in this section may not be necessary, and are provided here for informational purposes only.

Verifying Your System BIOS

The system BIOS on your workstation must correspond to the certified version required by your Visual Effects and Finishing application version. If the BIOS

version on your system does not correspond to the table below, you must update to the certified version.

Visual Effects and Finishing Application Version	Certified BIOS Version
2009	3.05

Updating Your System BIOS

The BIOS version installed on your system appears on the screen while booting the workstation. The following procedure describes how to update a workstation to the certified BIOS version required by your Autodesk Visual Effects and Finishing application.

To update the BIOS on your workstation:

1. Open a terminal, and log is as root.
2. Insert the application DVD in the drive of the workstation and mount it.
3. Go to the *DKU_*`<version_number>`*/Utils/BIOS* directory on the DVD, where `<version_number>` represents the version of the DKU. For example:

   `cd /mnt/cdrom/DKU_3.0.0/Utils/BIOS`

   TIP If the DKU has already been installed on the workstation, you can access its contents in the */usr/discreet/DKU* directory, without having to use the application DVD.

   Each platform supported by the version of your Visual Effects and Finishing application has its own directory that contains an *.iso* file.

   NOTE For more information about updating the BIOS on your workstation, refer to the README file also located in the platform's directory.

4. Type:

   `cd <platform>`

5. Burn the *.iso* file onto a CD and place it in the DVD-ROM drive of the workstation.
6. Reboot the workstation and press **F10** to enter BIOS.

7 Optional: Press **F8** to select a language.

8 Select File | Flash® System ROM.
The Select a Drive dialog box appears.

9 Select CD-ROM, and press **F10** to confirm.

10 Select the *.bin* file.
The Flash System ROM confirmation dialog box appears.

11 Press **F10** to confirm.

12 Press any key.
A message stating that the system ROM flash was successful appears.

13 Verify system BIOS settings. See Checking Your System BIOS Settings on page 12.

14 Select File | Save Changes and Exit.

Checking Your System BIOS Settings

You do not normally need to adjust these settings. BIOS settings for the workstation are provided here for informational purposes only.

To enter the system BIOS, you must press **F10** while booting the workstation.

The following table lists the proper Autodesk certified BIOS settings. Items not listed are set to their default factory settings.

BIOS Menu	Item	Value
Storage	Boot Order	Optical Drive
		USB Device
	Boot Order, Hard Drive	Integrated SATA
		Integrated IDE
Advanced	OS Power Management, ACPI S3 Support	Disabled
	Chipset / Memory, ECC Support	Enabled
	Chipset / Memory, Memory Scrubbing	Enable

BIOS Menu	Item	Value
	Chipset / Memory, Memory Node Interleave	Enable
	Chipset / Memory, PCI Serr# Generation	Enable
	Chipset / Memory, Net Watch-dog Timer	Enable
	Chipset / Memory, ACPI Bus Segmentation	Disabled
	Chipset / Memory, HPET	Enabled
I/O	Device Options, S5 Wake on LAN	Disabled

WARNING Before installing Red Hat® Linux®, validate the BIOS Settings.

Restoring BIOS to Default Factory Settings

If there is any doubt about whether items contain factory default values, the following procedure restores default factory settings.

To restore default factory BIOS settings:

1. Press **F10** while booting the workstation to enter the system BIOS.
2. Select File | Default setup | Restore Factory Settings as Default.
3. Press **F10** to accept the changes.
4. Select Apply Defaults and Exit, then press **F10** to confirm.
   The factory system defaults are restored.

DVI-Ramp Firmware

NOTE Refer to this section only if your workstation uses a Miranda DVI-Ramp or Miranda DVI-Ramp2. If your workstation is equipped with an NVIDIA Quadro FX 5600 graphics board and an NVIDIA Quadro SDI board, you do not need a DVI-Ramp or DVI-Ramp2.

System configuration is done prior to delivery by an authorized technician. The following procedures may not be necessary, and are provided here for informational purposes only.

Verifying DVI-Ramp and DVI-Ramp2 Firmware

The firmware on your DVI-Ramp must correspond to the certified version required by your Visual Effects and Finishing application version. Each firmware is itself associated to a DVI-Ramp version and a hardware version. If the firmware on your DVI-Ramp does not match the hardware version listed in the table below, you must update the firmware to the certified version.

Visual Effects and Finishing Application Version		Hardware Version	Certified Firmware Version
2009 with	DVI-Ramp	3.20	3.70
	DVI-Ramp	4.20	4.71
	DVI-Ramp2	6.00	6.0506 6.0507 6.0508

The DVI-Ramp firmware update utilities required to check your firmware version and perform the update are included with the DKU version associated with the release of your Visual Effects and Finishing application. The following procedure describes how to verify the firmware version of the DVI-Ramp.

To verify the firmware version of the DVI-Ramp:

1. With the DVI-Ramp connected to your workstation and powered up, open a terminal, and log in as root.

   WARNING If your DVI-Ramp is connected to the HP workstation using a USB-to-Serial adapter, you must remove the adapter from the USB port, and connect the serial cable of the DVI-Ramp to the serial port of the workstation. This does not apply to DVI-Ramp2 units.

2. Insert the application DVD in the DVD-ROM drive of the workstation and mount it.

3. Go to the *DKU_*`<version_number>`*/Utils/DVI_firmwareUpdate* directory on the DVD,

   where `<version_number>` is the DKU version. For example:

   `cd /mnt/cdrom/DKU_3.0.0/Utils/DVI_firmwareUpdate`

TIP If the DKU has already been installed on the workstation, you can access its contents in the */usr/discreet/DKU* directory, without having to use the application DVD.

4 Run the *info* command to scan the DVI-Ramp's current firmware. Type:

`./info`

The output is similar to the following example:

```
Versions:
Hardware = <Hardware Version>
Micro = <Firmware version>
Genlock = 3.21
DVI = 4.01
FrameBuffer = 4.05
SDI = 4.10
```

Where `<Hardware Version>` is the current version of the DVI-Ramp hardware, and `<Firmware version>` is the firmware currently loaded in the DVI ramp. If the firmware version does not match the hardware version listed in the table that precedes this procedure, you must perform the firmware update procedure.

Updating the DVI-Ramp Firmware

The firmware on your DVI-Ramp must correspond to the certified version required by your Visual Effects and Finishing application version. If you verified the firmware on your DVI-Ramp and it did not match the certified version, you must update it. The following procedure describes how to update the firmware version of the DVI-Ramp.

To update the DVI-Ramp firmware:

1 Open a terminal, log in as root, and go to the *DKU_*`<version_number>`*/Utils/DVI_firmwareUpdate* directory of the application DVD, where `<version_number>` represents the version of the DKU. For example:

`cd /mnt/cdrom/DKU_3.0.0/Utils/DVI_firmwareUpdate/`

TIP If the DKU has already been installed on the workstation, you can access its contents in the */usr/discreet/DKU* directory, without having to use the application DVD.

2 From the *DVI_firmwareUpdate* directory, launch the DVI-Ramp upgrade utility by typing:

```
./updateDVI
```

The script checks the hardware version of the DVI-Ramp and then installs the firmware update. The update should take between 5 and 10 minutes. You can monitor the progress of the firmware update in the terminal.

The DVI-Ramp is rebooted several times during the firmware update. Any monitors connected directly to the DVI-Ramp (such as the graphics monitor and/or a broadcast monitor) flash each time the DVI-Ramp is rebooted. This is normal and indicates that the firmware is being updated.

3 Once the firmware update is complete, updated hardware information for your DVI-Ramp appears in the terminal.

4 If you had to remove the USB-to-Serial adapter, reconnect the serial cable to the adapter, then put the adapter back in the USB port. Restart the HP workstation.

AJA OEM-2K PCI-X Firmware

System configuration is done prior to delivery by an authorized technician. The following procedures may not be necessary, and are provided here for informational purposes only.

Verifying the AJA OEM-2K PCI-X Firmware

The firmware on your AJA OEM-2K PCI-X (AJA PCI-X) must correspond to the certified version required by your Visual Effects and Finishing application version. If the firmware on your AJA PCI-X board does not correspond to the table below, you must update it to the certified version.

Visual Effects and Finishing Application Version	Certified Firmware Version
2009	0x55

The AJA PCI-X firmware update utilities required to check your firmware version are included with the DKU version associated with the release of your Visual Effects and Finishing application. The following procedure describes how to verify the firmware version of the AJA PCI-X.

To verify the AJA PCI-X firmware version:

1. Open a terminal, and type:

   `cat /proc/driver/aja`

   An output similar to the following should appear:

   ```
   AJA Driver Name: oem2k
   Version: 4.1 Beta 11
   Card #: 0
   Board Version String: OEM 2K - Rev 0
   PCI Version: 0x55
   Board ID: 10196500
   FPGA built on 2007/09/18 at 10:57:41
   ```

   NOTE If there is no *aja* file in /proc/driver, you are using an outdated driver or the driver is not loaded and you must install the latest DKU for your workstation. Refer to the *Autodesk Visual Effects and Finishing Software Installation Guide*.

Updating the AJA PCI-X Firmware

The firmware on your AJA PCI-X must correspond to the certified version required by your Visual Effects and Finishing application version. If you verified the firmware on your AJA PCI-X and it did not match the certified version, you must update it. The following procedure describes how to update the firmware of the AJA PCI-X to the certified version required by your Visual Effects and Finishing application.

To update AJA PCI-X firmware:

1. Log in as root and open a terminal.
2. Insert the application DVD in the DVD-ROM drive of the workstation, and mount it.
3. Go to the *DKU_*`<version_number>`*/Utils/AJA_firmwareUpdate* directory of the DVD,

   where `<version_number>` represents the version of the DKU. For example:

   `cd /mnt/cdrom/DKU_3.0.0/Utils/AJA_firmwareUpdate`

TIP If the DKU has already been installed on the workstation, you can access its contents in the */usr/discreet/DKU* directory, without having to use the application DVD.

4 Run the *AJAfw_update* utility to scan the AJA current firmware and, if required, update to the latest firmware version. Type:

```
./AJAfw_update
```

The script checks the firmware of your AJA board, and one of the following events occurs:

- The script detects that the firmware and drivers need to be updated and prompts you to start the update. In this case, continue to the next step of this procedure.
- The script indicates that the firmware is up-to-date and exits. In this case, you are finished; go to step 6 of this procedure to eject the DVD.

NOTE For more details about the AJA firmware procedures, consult the *README* file located in the current directory.

5 Start the firmware update by typing **Y** and then pressing **Enter**.

While the AJA board's firmware and drivers are being updated, your workstation appears to be frozen and your mouse and keyboard do not work. This is normal and indicates that the firmware is being updated. Once the firmware update is complete, you are returned to the terminal.

6 When you are returned to the terminal, return to the root directory and eject the DVD by typing:

```
cd /
eject /mnt/cdrom
```

7 Shut down your workstation by typing:

```
shutdown -g0
```

If your workstation does not prompt you to power down, press the power button for 10 seconds to force a power down.

8 Disconnect the power cord.

9 Wait 10 seconds, reconnect the power cord, then restart your workstation.

Connecting Peripherals 3

Topics in this chapter:

Peripherals Connection Diagrams

You must connect all hardware peripheral devices before you boot your workstation. The following two diagrams identify the ports to which the peripherals connect on the HP xw9400 workstation:

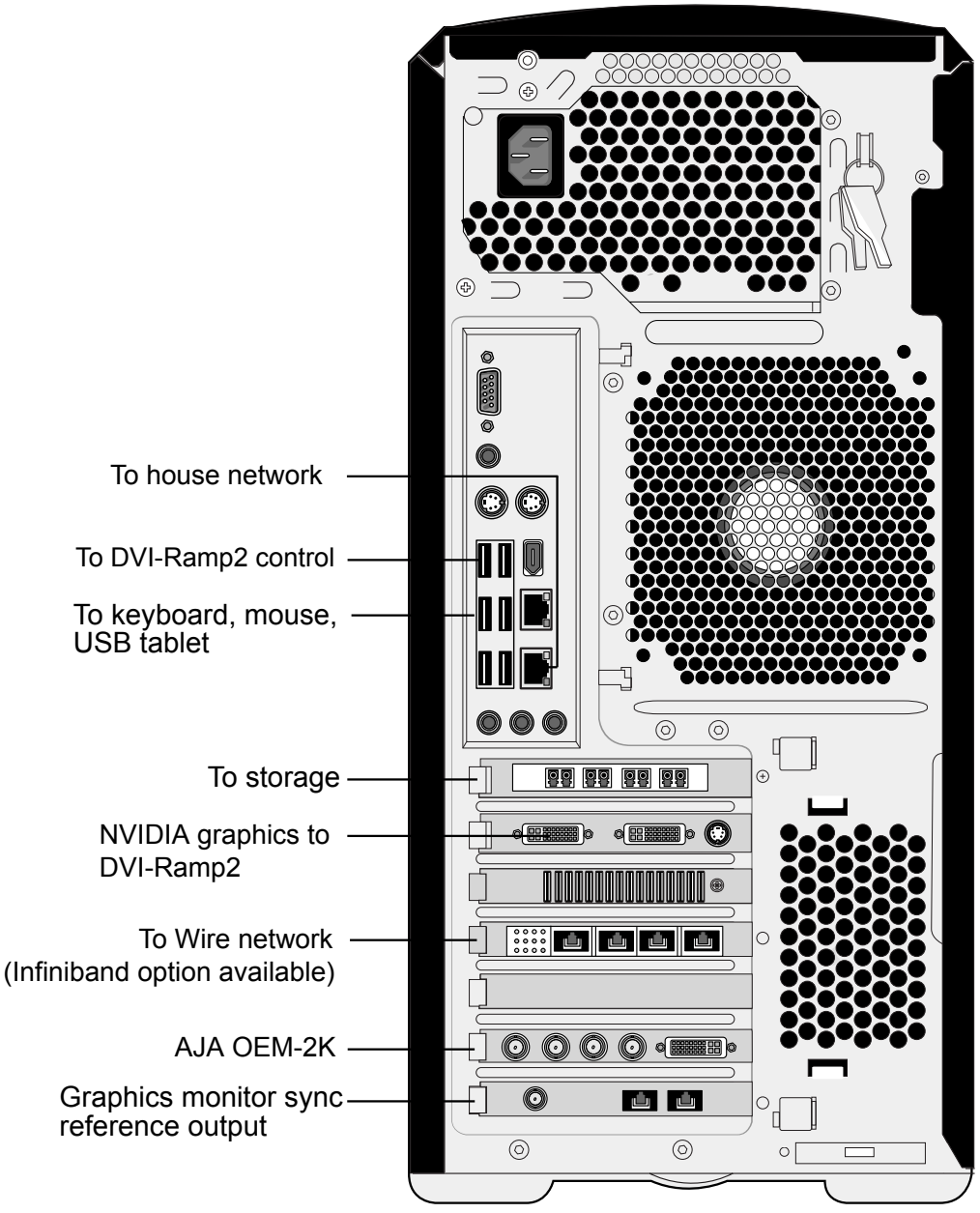
- The first diagram illustrates the peripherals setup for an HP xw9400 workstation equipped with an NVIDIA® Quadro® FX 5500G graphics board and a DVI-Ramp.
- The second diagram illustrates the peripherals setup for an HP xw9400 workstation equipped with an NVIDIA Quadro FX 5600 graphics board and an NVIDIA Quadro SDI board.

NOTE All the diagrams in this document illustrate a Gigabit Ethernet (GigE) adapter located in PCI slot four. Your workstation may also be configured with an optional QuickSilver InfiniSERV 9000 PCIe-DDR adapter that replaces the GigE adapter. On the HP xw9400 workstation, the PCI slots are numbered one to seven from top to bottom.

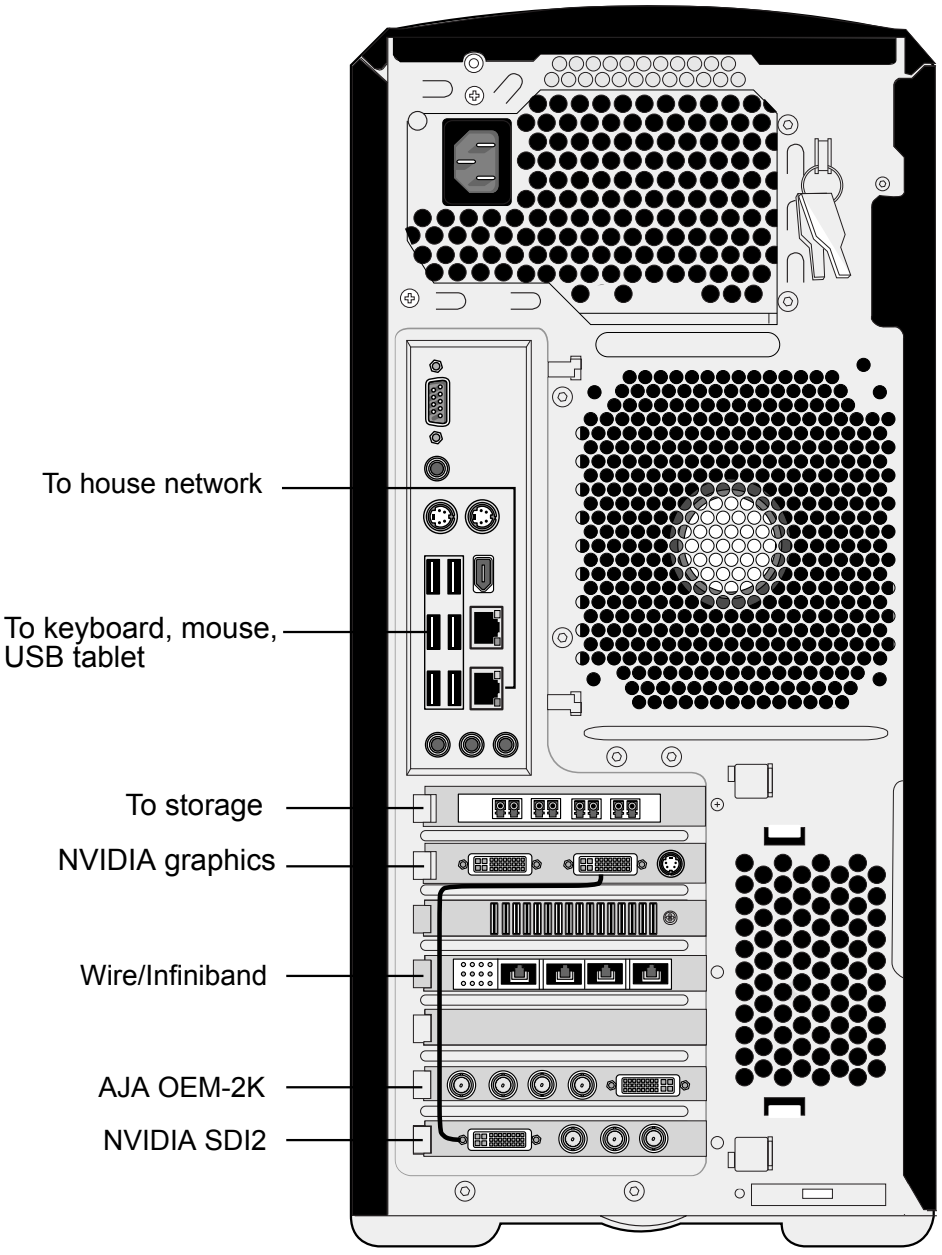
For detailed information on video connections, refer to Setting Up Video Hardware on page 27.

For detailed information on audio connections, refer to Setting Up Audio Hardware on page 39.

HP xw9400 Workstation with DVI-Ramp



HP xw9400 Workstation with NVIDIA Quadro SDI



Connecting the Keyboard, Mouse, and Tablet

Connect the keyboard, mouse, and tablet to the USB extender and the workstation *before* booting the workstation and before installing the application.

The Wacom® Intuos USB tablet is shipped with your system. All customization with respect to the tablet, including setting tablet margins, should be done in the Preferences menu of your application. For help, see the description of Pointer preferences in your application User Guide.

Network Connections

Consult the Peripherals Connection Diagrams on page 19 as a reference for network interface card (NIC) locations.

Connecting to Gigabit Ethernet (GigE) Networks

You must use the correct Gigabit Ethernet network card to connect your workstation to the Wire network. Otherwise, you may degrade the performance of your Wire network.

Do the following to maximize Wire network performance in your facility:

- Connect ports from the add-on network card to the switch used for your Wire network.
- Connect the house network to the on-board network port shown in the Peripherals Connection Diagrams on page 19. Do not use any of the ports on the add-on network card for your house network. If the house network is not connected to the on-board network port, consult your system administrator to reconfigure it.
- Use high-quality Category 6 (Cat 6) network cables when connecting the workstation to your Wire network switch.

Connecting to the Infiniband (IB) Network

Your workstation may be configured with an optional QuickSilver InfiniSERV 9000 PCIe-DDR series IB adapter. The IB network adapter resides in PCI slot four. Consult the Peripherals Connection Diagrams on page 19 as a reference for the optional IB network adapter location.

You must use the correct port on the IB network adapter to connect your workstation to the IB Network.

To connect the workstation to IB network:

1. Connect port 1 of the IB network adapter to the IB network. On the HP xw9400 workstation Port 1 is the port on the right. For information on how to configure the IB adapter, refer to the *Autodesk Stone and Wire Filesystem and Networking Guide*.

Connecting Storage

You can connect your workstation to two types of storage:

- One or more Stone Direct disk arrays that provide storage to individual workstations. Refer to the *Autodesk Stone Direct Configuration Guide* for information on connecting disk arrays to your workstation.
- A storage-area network (SAN), such as a CXFS volume. Refer to the SAN vendor documentation for details on SAN configuration.

WARNING The system has a filesystem limit of 8 terabytes. Ensure each partition does not exceed 8 terabytes, and that inodes are correctly configured. Refer to the *Autodesk Stone and Wire Filesystem and Networking Guide*.

Connecting and Configuring the ATTO Fibre Channel Adapter

Your workstation is configured with a 4-port ATTO Celerity FC-44ES fibre channel adapter in PCI slot one. Consult the Peripherals Connection Diagrams on page 19 as a reference for the ATTO fibre channel adapter location.

Connecting Archive Storage

For data archiving, your Visual Effects and Finishing application supports the following devices:

- USB 2 and FireWire® (IEEE 1394) attached devices. They can be formatted as XFS, ext2, ext3, or HFS (Mac®) file systems. NTFS is *not* supported.

- Fibre channel devices that use standard UNIX tape device calls.

The fibre channel devices that may be used are the ones for which the vendor confirms the following:

- The device driver is compliant with standard UNIX tape device calls.
- The device is certified for use with the specific versions of your operating system and kernel, Red Hat Enterprise Linux Workstation 4.0, Update 3.

While Autodesk Media & Entertainment makes no certification statement about any device, the following SCSI devices have been tested and found to be reliable when connected using an ATTO Fibre Channel to SCSI Bridge 2390:

- Quantum LT03
- Quantum DLT8000
- Quantum DLT7000
- Sony™ AIT3 SDX-D700C
- Sony AIT2

Configuring the Archiving Device

The software initialization file (*init.cfg*) for your Visual Effects and Finishing application contains examples of the use of the *ClipMgtDevice Tape* keywords. Use them to select a block size value for your tape device, as well as to select a text label that identifies the device in the Archiving module. Refer to the *Autodesk Visual Effects and Finishing Configuration File Reference Guide* for additional information.

You should also refer to the documentation from your archiving device vendor for guidelines on the actual block size to use.

Setting Up Video Hardware

4

Topics in this chapter:

Video I/O Setup

Use the information and wiring diagrams in this section to connect the video I/O components and a broadcast monitor to the HP xw9400 workstation.

Depending on the video preview device the workstation is equipped with, and on whether the Real-Time Deliverables (RTD) feature will be used or not, there are three possible video I/O configurations for your workstation:

- For workstations equipped with a Miranda DVI-Ramp2 as a video preview device, see Video I/O Setup for Workstations Using a DVI-Ramp2 on page 28.
- For workstations equipped with a NVIDIA Quadro SDI board as a video preview device, without support for Real-Time Deliverables, see the first

wiring diagram in Video I/O Setup for Workstations Using the NVIDIA Quadro SDI Board on page 31.

- For workstations equipped with a NVIDIA Quadro SDI board as a video preview device, and with support for Real-Time Deliverables, see the second wiring diagram in Video I/O Setup for Workstations Using the NVIDIA Quadro SDI Board on page 31.

This section also lists the video components that are included with your shipment. The only video hardware you must provide are a sync generator, a VTR, a patch panel, if necessary, and an HD/SDI broadcast monitor.

NOTE Do not use an SD (NTSC or PAL) sync generator for HD projects. Always use a tri-level sync generator for HD projects. Using the wrong sync generator for a project may impact the stability of your workstation.

Video I/O Setup for Workstations Using a DVI-Ramp2

The following video components are included with your shipment if your workstation uses a NVIDIA Quadro FX 5500 graphics board and a DVI-Ramp2.

NVIDIA Quadro FX 5500G graphics board The NVIDIA Quadro FX 5500G graphics board provides output to your computer monitor and to the broadcast monitor via the Miranda DVI-Ramp2.

Miranda DVI-Ramp2 The DVI-Ramp2 connects the workstation to two display devices: a high-resolution computer monitor and a broadcast monitor. This allows the application user interface to be displayed on a high-resolution computer monitor, while the video content (preview window) is extracted and output to a broadcast video monitor. The DVI-Ramp2 can output either a standard definition serial digital video signal or a high definition serial digital video signal.

AJA OEM-2K board and breakout box The AJA OEM-2K board provides video I/O, audio, and VTR control. The AJA breakout box connects to the AJA OEM-2K board and handles SD (NTSC, PAL), and HD at a depth of 8 and 10 bits.

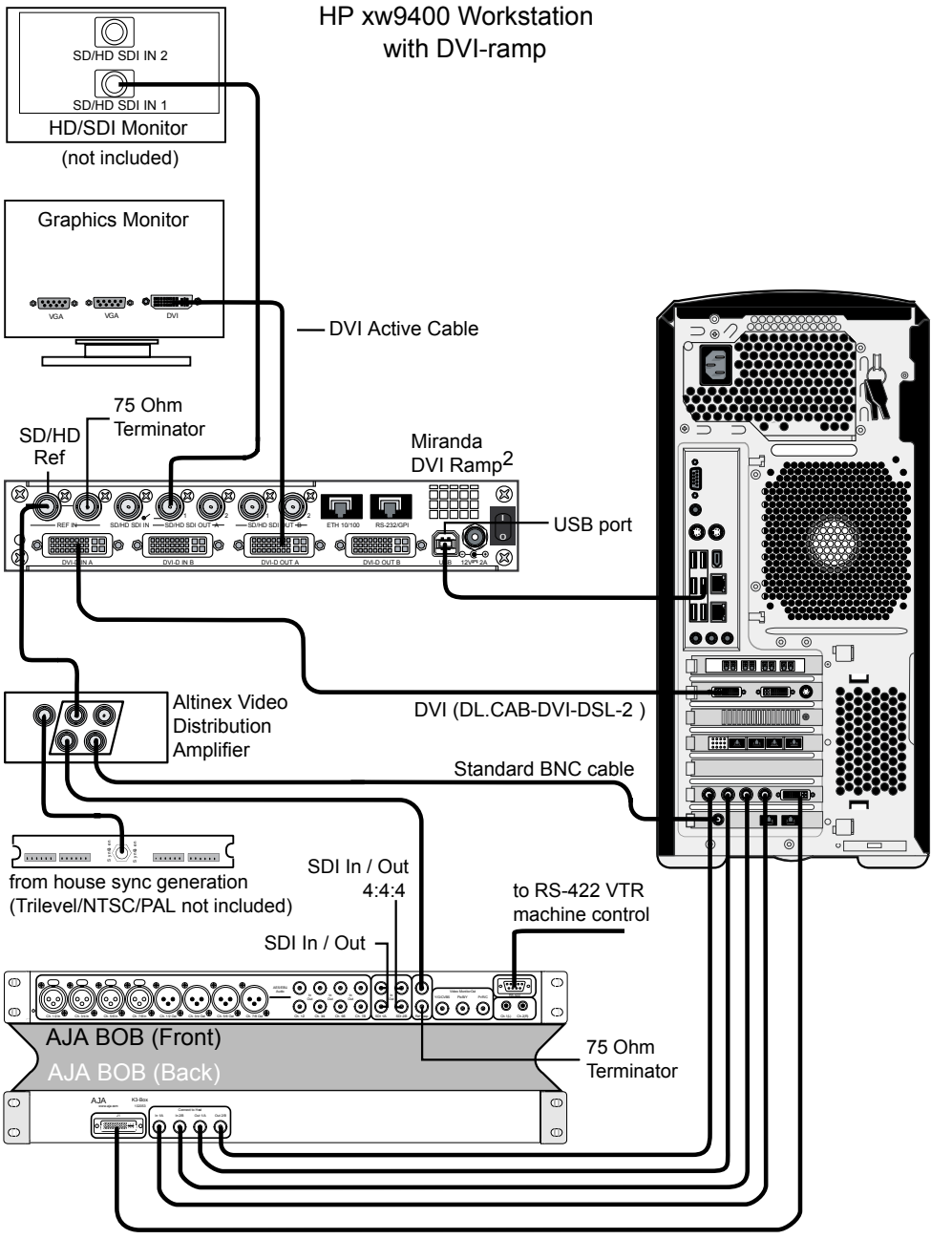
NOTE The VTR connects to the SDI In A and SDI Out A ports of the AJA breakout box. You can use the SDI In B and SDI Out B ports for dual link video I/O. VTR control is provided through the RS-422 port on the AJA breakout box.

LCD graphics monitor The LCD graphics monitor features a wide screen with a 16:9 aspect ratio, and a maximum resolution of 1920x1200.

Altinex DA1804NT video distribution amplifier The Altinex® video distribution amplifier can serve up to four video hardware devices from a single sync source/generator. It serves the sync signal to the NVIDIA graphics board, the AJA OEM-2K board, and the Miranda DVI-Ramp2.

Use the following diagram to connect the video I/O components to an HP xw9400 workstation equipped with a Miranda DVI-Ramp2.

WARNING It is critical to connect the sync source to the Altinex distribution amplifier exactly as shown in the diagrams to ensure the sync works correctly.


HP xw9400 Workstation
with DVI-ramp
SD/HD SDI IN 2
SD/HD SDI IN 1
HD/SDI Monitor
(not included)
Graphics Monitor
VGA
VGA
DVI
DVI Active Cable
75 Ohm
Terminator
SD/HD
Ref
Miranda
DVI Ramp2
USB port
Altinex Video
Distribution
Amplifier
DVI (DL.CAB-DVI-DSL-2)
Standard BNC cable
from house sync generation
(Trilevel/NTSC/PAL not included)
SDI In / Out
4:4:4
to RS-422 VTR
machine control
SDI In / Out
AJA BOB (Front)
AJA BOB (Back)
75 Ohm
Terminator

Video I/O Setup for Workstations Using the NVIDIA Quadro SDI Board

The following video components are included with your shipment if your workstation uses a NVIDIA Quadro FX 5600 graphics board and a NVIDIA Quadro SDI board.

NVIDIA Quadro FX 5600 graphics board The NVIDIA Quadro FX 5600 graphics board provides output to your computer monitor directly, and to the broadcast monitor via the NVIDIA Quadro SDI board.

NVIDIA Quadro SDI board The NVIDIA Quadro SDI board provides 2K, HD, or SD video output to a broadcast monitor, VTR, or SDI projector. The board features a BNC genlock connector that connects to your sync generator.

AJA OEM-2K board and breakout box The AJA OEM-2K board provides video I/O, audio, and VTR control. The AJA breakout box connects to the AJA OEM-2K board and handles SD (NTSC, PAL), and HD at a depth of 8 and 10 bits.

LCD graphics monitor The LCD graphics monitor features a wide screen with a 16:9 aspect ratio, and a maximum resolution of 1920x1200.

AJA HD10DA Distribution Amplifier The AJA distribution amplifier receives its signal from the NVIDIA SDI board and provides output to a VTR and broadcast monitor. The distribution amplifier is necessary in order to use the Real-Time Deliverables feature.

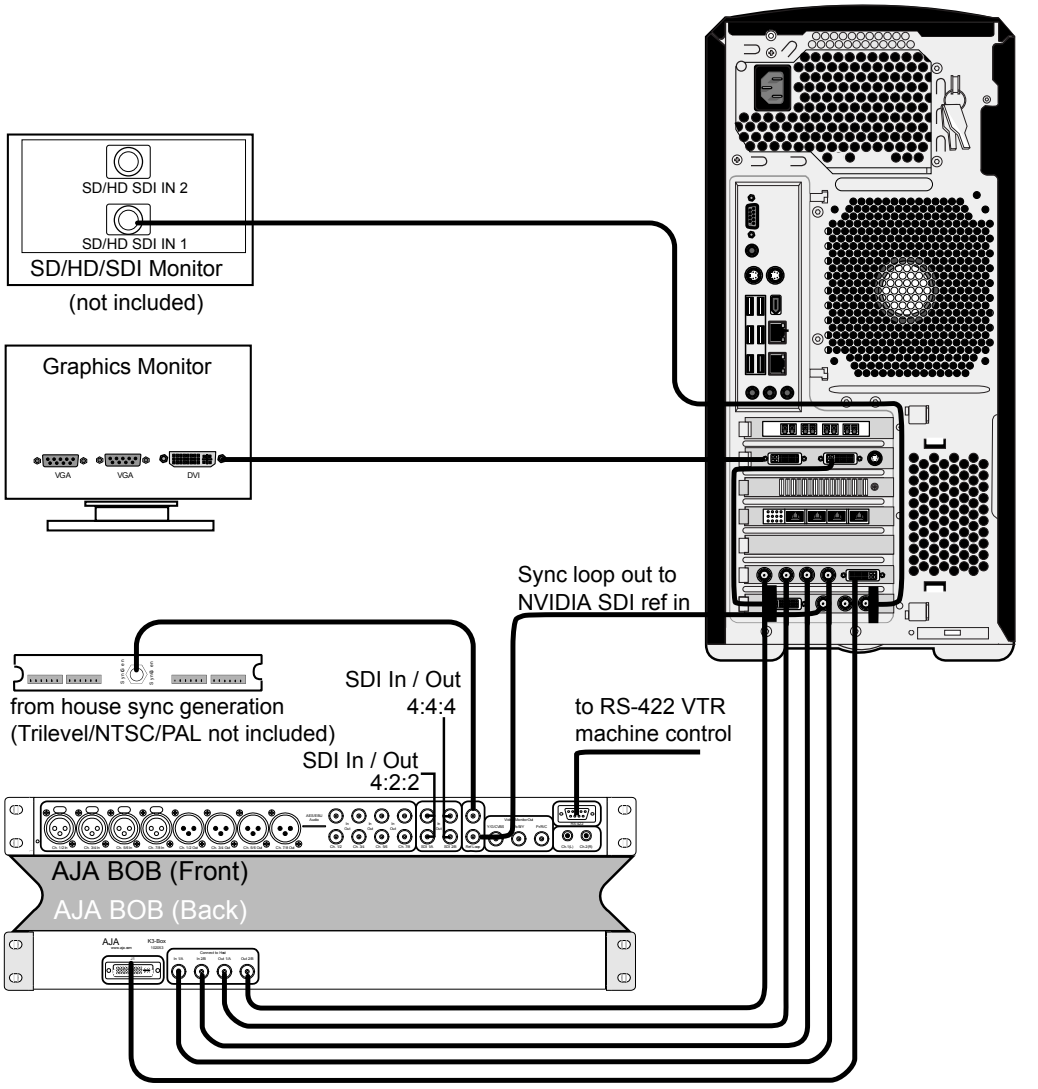
Refer to the following diagrams to connect the video I/O components to an HP xw9400 workstation equipped with a NVIDIA Quadro SDI board.

Note the following about the wiring diagrams:

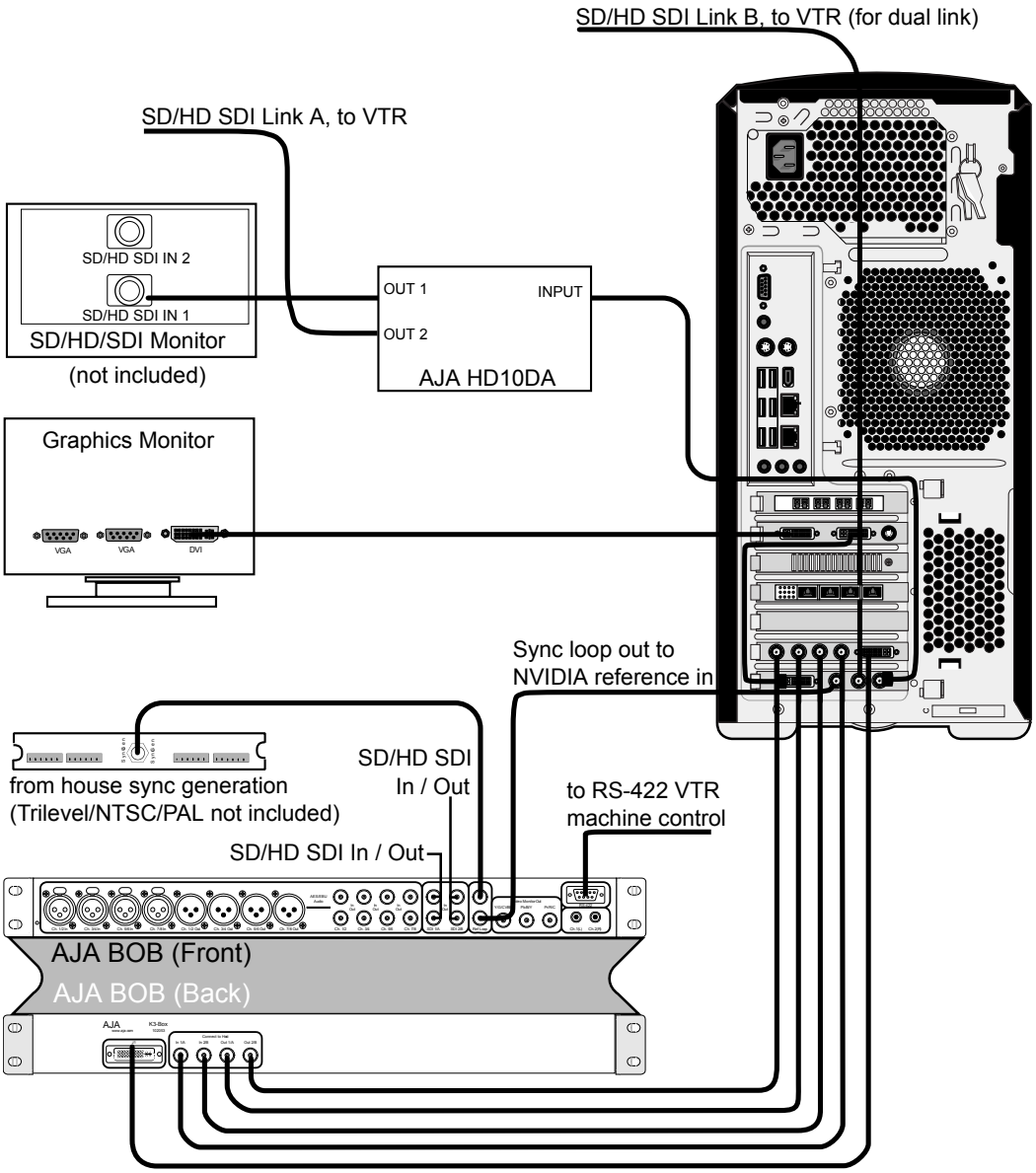
- The output port and, if Real-Time Deliverables are not used, input port of the VTR connect to the SDI In A and SDI Out A ports of the AJA breakout box. You can use the SDI In B and SDI Out B ports for dual link video I/O.
- For Real-Time Deliverables, input port A of the VTR connects to the AJA HD10DA distribution amplifier (for 4:2:2 signal), and input port B connects to the appropriate connector on the NVIDIA SDI board (for dual link 4:4:4 signal).
- VTR control is provided through the RS-422 port on the AJA breakout box. See Standard VTR Control Cable Pinout on page 34.

WARNING It is critical to connect the sync source to the appropriate connector on the SDI board, exactly as shown in the diagrams.

HP xw9400 with NVIDIA SDI, without RTD support



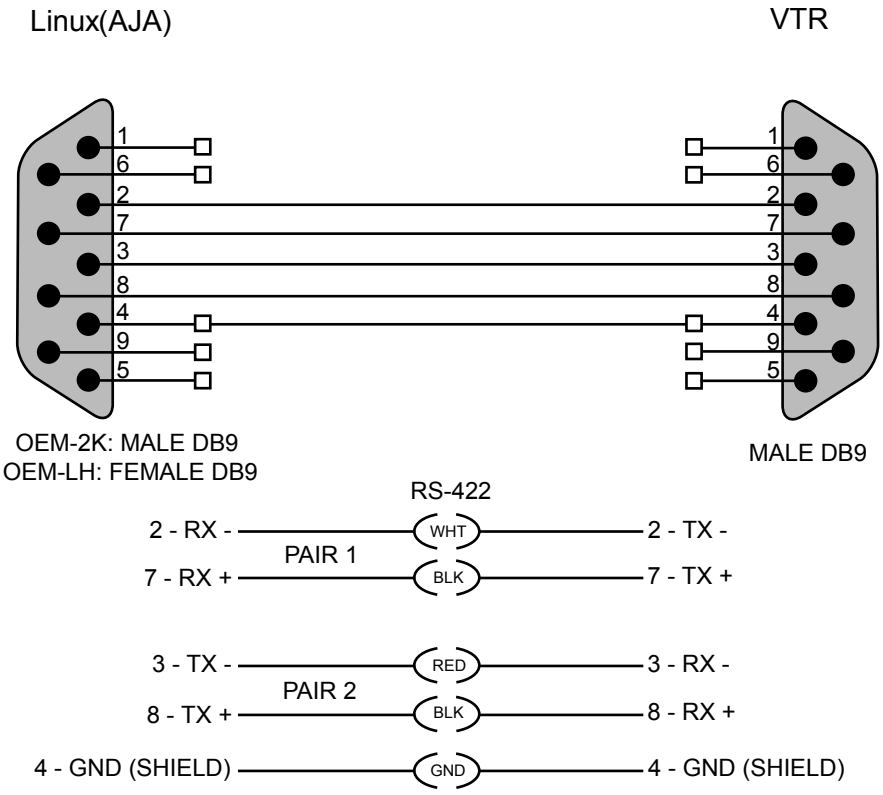
HP xw9400 with NVIDIA Quadro SDI, for RTD



Standard VTR Control Cable Pinout

The following diagram depicts the RS-422 control cable pinouts for the standard VTR control cable.

Standard VTR Control Cable:
Linux(AJA) Controlling VTR (Normal Video I/O Control Cable)



Setting Up VTR Emulation

You can configure your Finishing application to emulate a VTR for both input and output in real time. You control the emulator from the application or device that sees the Finishing application as a VTR.

The following procedure describes how to configure the hardware for VTR emulation. Consult the *"VTR Emulation"* chapter in your application User Guide for more information.

To configure hardware for VTR emulation:

1. Connect the video I/O cables between the devices involved in the VTR emulation process (out-to-in/in-to-out). Make sure the connections support the video standard you want to work with.

   If you intend to use the emulator as a Player, it is recommended that you connect one black or colour bar SDI signal to the input of the system serving as the VTR emulator. This ensures the Player is stable and correctly synced.

   NOTE VTR emulation requires a workstation with a video board. The Video keyword for the corresponding device must be uncommented in the software initialisation configuration file, *init.cfg*. See the description of the Video keyword in the *Autodesk Visual Effects and Finishing Configuration File Reference Guide*.

2. Connect the audio I/O cables between the devices involved in the VTR emulation process (out-to-in/in-to-out).

   If you intend to use the emulator as a Player, it is recommended that you connect an external AES signal such as a tone to the input of the system serving as the VTR emulator. This ensures the Player is stable and correctly synced.

   NOTE Connect an RS-422 control cable to the serial ports between the devices used in the VTR emulation process. Make sure the serial ports correspond to those defined by the Emulator keywords in the software initialisation configuration file. See the description of the Emulator keyword in the *Autodesk Visual Effects and Finishing Configuration File Reference Guide*

   NOTE The RS-422 cables for VTR emulation require custom pinouts. See VTR Emulation RS-422 Control Cables on page 36.

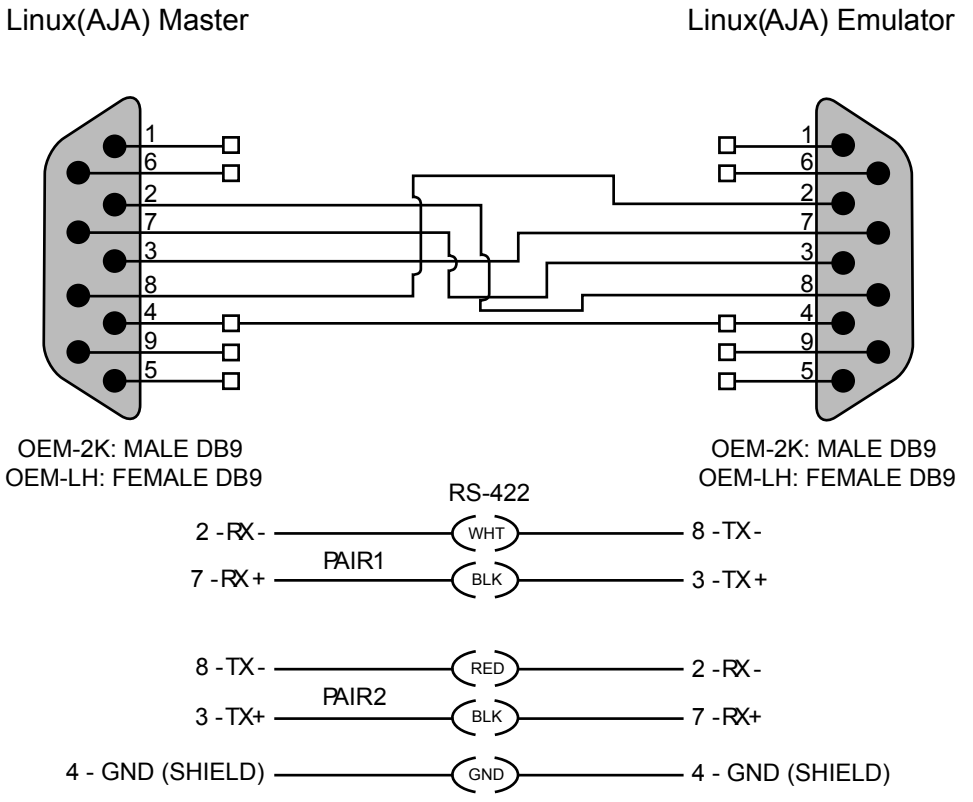
3. Make sure the appropriate video and audio sync setup is in place.

VTR Emulation RS-422 Control Cables

Custom cables are required to control the VTR emulator. The pinouts required by the cable depend on the workstation and device involved in the VTR emulation process. The following diagrams depict the control cable pinouts required for the most common VTR emulation setups.

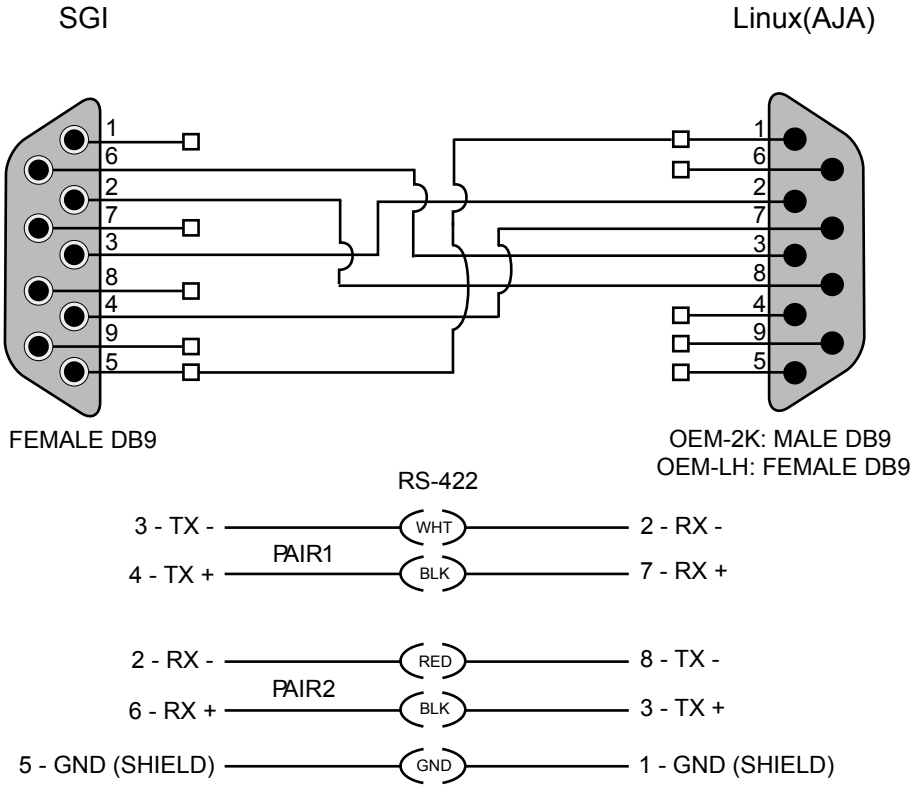
VTR-Emulation Control Cable

Linux(AJA) Master Controlling Linux(AJA) Emulator

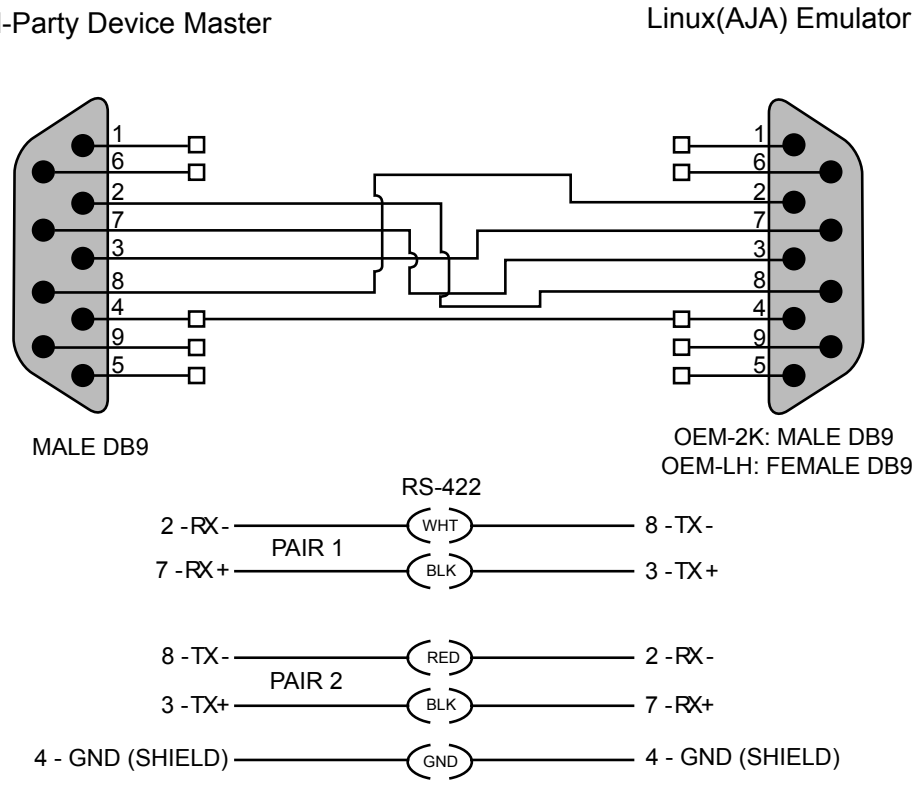


VTR-Emulation Control Cable:

SGI® to/from Linux(AJA) — one master, one emulator



VTR-Emulation Control Cable:
3rd-Party Device Master Controlling Linux (AJA) Emulator



Setting Up Audio Hardware

5

Topics in this chapter:

About Audio

Your application uses the Discreet® Native Audio subsystem. Discreet Native Audio offers 8 audio input and 8 audio output channels. They all use 24-bit audio resolution.

Audio Wiring Workflow

The following procedure provides the general workflow for setting up the audio subsystem of your Visual Effects and Finishing application.

To wire the audio subsystem:

1. Ensure that all of your workstation peripherals and video hardware components are properly connected. If necessary, refer to Connecting Peripherals on page 19 and Setting Up Video Hardware on page 27.
2. Verify that you have all the required audio hardware components. See Audio Hardware Components on page 40.
3. Determine whether you want to control the Lucid converter remotely or locally. This affects the way you wire the audio hardware. See Understanding Remote vs. Local Control of the Lucid Converter on page 41.
4. Connect your audio hardware devices. To avoid system instability, make sure you connect your audio hardware as illustrated for your configuration. See Audio Wiring on page 41.
5. Configure the Lucid converter for remote or local control. See Configuring the Lucid ADA 88192 Converter on page 43.
6. Set the appropriate keywords in the software initialisation file. See Audio Keywords in the Software Initialisation Configuration File on page 46.

Audio Hardware Components

Discreet Native Audio uses the following hardware components, shipped with your system.

Lucid Converter ADA 88192 Converts signals between the workstation and all digital or analog audio I/O devices.

AJA Balanced Audio breakout box and AJA OEM-2K board The Balanced Audio breakout box is the audio component of the AJA breakout box. It provides connections for audio I/O. This breakout box connects to the AJA OEM-2K board on your workstation. The OEM-2K board provides real-time input and output of uncompressed SD and HD video signals as well as audio data at 24-bit resolution. The OEM-2K board handles balanced AES/EBU audio signals from the Balanced Audio breakout box. The OEM-2K board supports embedded audio up to 8 track.

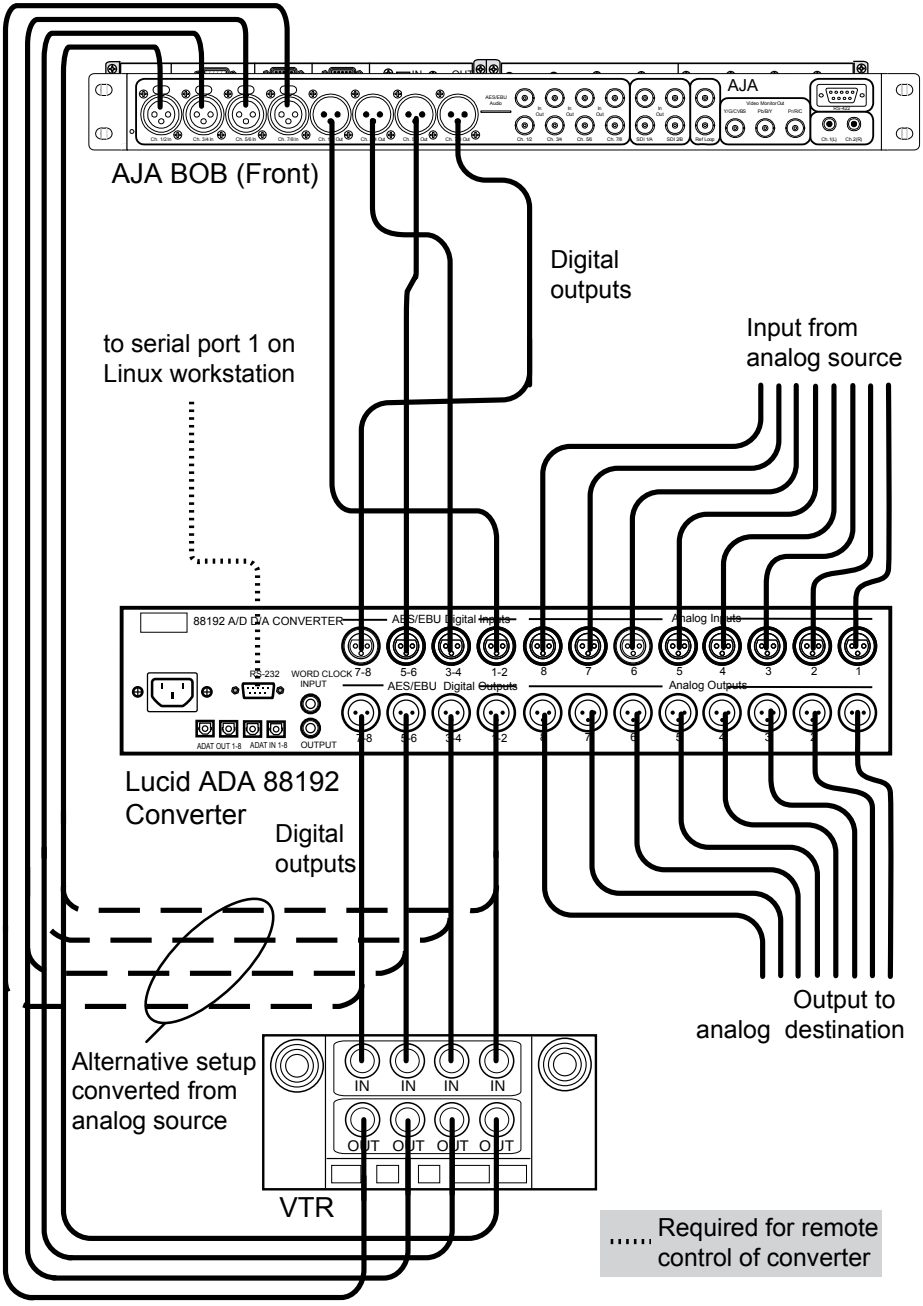
Understanding Remote vs. Local Control of the Lucid Converter

You can control the converter either remotely or locally. Remote control of the converter means that you adjust converter settings through the audio preferences of the application. If you want to control the converter remotely, you must connect the converter to the serial port of the HP xw9400 workstation. Local control means you adjust converter settings manually, using the controls on the front of the converter. Controlling the converter remotely is the recommended method as it does not require physical access to the converter to change settings.

Whether you control the converter remotely or locally, you should take any necessary precautions to prevent inadvertent adjustments to settings via the controls on the front of the converter. For example, if the converter is one of several in a machine room, you might label each with the name of the computer to which it is connected, along with whether control is local or remote.

Audio Wiring

To connect the Discreet Native Audio hardware components to the AJA breakout box, refer to the following diagram.


AJA BOB (Front)
Digital outputs
to serial port 1 on Linux workstation
Input from analog source
88192 A/D D/A CONVERTER
AES/EBU Digital Inputs
Analog Inputs
AES/EBU Digital Outputs
Analog Outputs
RS-232
WORD CLOCK INPUT
ADAT OUT 1-8
ADAT IN 1-8
OUTPUT
Lucid ADA 88192 Converter
Digital outputs
Output to analog destination
Alternative setup converted from analog source
IN IN IN IN
OUT OUT OUT OUT
VTR
Required for remote control of converter

Configuring the Lucid ADA 88192 Converter

You must manually configure the Lucid converter for either remote or local control. This section describes how to use the controls on the front of the converter to adjust settings, and lists the proper settings for remote control and for local control.

Adjusting Lucid ADA 88192 Converter Settings

You configure the converter through a series of setup menus that appear in the display on the front of the converter. Use the encoder dial and button immediately to the right of the display to navigate these menus and adjust settings.

The top level setup menu contains the following menu items: ADAT, AES, Analog, Meter, Route, Sync, and System. Each of these menu items takes you into a submenu, from which you can select and adjust settings.

The procedures below provide basic information on navigating and adjusting settings. If you require additional information, refer to the Lucid ADA 88192 manual included with your shipment.

To navigate menus and adjust settings:

1 Use the encoder dial and the button as follows.

To:	Do this:
Select a menu option	Rotate the dial to highlight the option, then press the dial to select that option. If the option you select has choices (as, for example, in the Route menu), rotate the dial again to move through the choices, and press the dial to select an option.
Back up one level in the menu tree	Press the button.
Navigate to the top level setup menu	Press the button. Repeat until you are in the top level setup menu.

To reset all settings to their factory defaults:

1 In the top level setup menu, select System, then select Miscellany.

2 In the Miscellany menu, select Defaults: RESET.

All settings are reset to their factory defaults.

NOTE The factory default for the items in the AES setup menu is SRC ON. Both local and remote control require these items to be set to SRC OFF. If you reset to defaults, be sure to manually set these items back to OFF (you cannot adjust these settings remotely).

Lucid ADA 88192 Converter Settings for Remote Control

You must configure the following settings to control the converter remotely. Any setting not listed here either has no effect with the application or can be set through the audio preferences of the application.

Menu	Menu Item	Comment
ADAT	ADAT INs: SRC ONADAT INs: SMUX OFF	
AES	AES IN1+2: SRC OFFAES IN3+4: SRC OFFAES IN5+6: SRC OFFAES IN7+8: SRC OFF	
AnalogAnalog INs: SoftClip	IN1+2: SoftClip OFFIN3+4: SoftClip OFFIN5+6: SoftClip OFFIN7+8: SoftClip OFF	
Meter	Clip Detect: 3	3 is the recommended setting
SystemMiscellany	Route Unit: 8	8 is the recommended setting

Lucid ADA 88192 Converter Settings for Local Control

You must configure the following settings to control the converter locally. Any setting not listed here either has no effect with the application or can be set to any of the values available for it.

Menu	Menu Item	Comment
ADAT	ADAT INs: SRC ONADAT INs: SMUX OFF	
AES	AES IN1+2: SRC OFF AES IN3+4: SRC OFF AES IN5+6: SRC OFF AES IN7+8: SRC OFF	
Analog Analog INs: SoftClip	IN1+2: SoftClip ON IN3+4: SoftClip ON IN5+6: SoftClip ON IN7+8: SoftClip ON	
Analog Analog INs: Gain	set each input channel to a value in the range -95.5 to +31.5 dB	
Analog Analog OUTs: Level	set either -10 or +4 for each output channel	
Meter	Clip Detect: 3	3 is the recommended setting
Route	For analog audio: AES INs --> ADAT OUTs Analog INs --> AES OUTs AES INs --> Analog OUTs	If these options do not appear, verify that Route Unit (in the System, Miscellany menu) is set to 8.
	For digital audio: AES INs --> ADAT OUTs AES INs --> AES OUTs AES INs --> ANALOG OUT	
Sync	Internal OFF External AES 1+2	External AES 1+2 is the recommended setting.

Menu	Menu Item	Comment
System Miscellany	Route Unit: 8	

Audio Keywords in the Software Initialisation Configuration File

There are two keywords in the software initialisation file (by default, *init.cfg*) that must be uncommented and set to the correct values to ensure Discreet Native Audio works properly. The first, Audiodevice, enables Discreet Native Audio. The second, MidiDevice, determines whether control of the Lucid converter is remote or local.

Keyword:	Setting:
Audiodevice	AJA
MidiDevice	If you are using local control of the converter, comment out this keyword. If you are using remote control of the converter, uncomment the keyword, set the serial port parameter to /dev/ttyS1 and leave all other parameters set to their default value.

For additional information on these keywords and help setting them, see the *Autodesk Visual Effects and Finishing Configuration File Reference Guide*.

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