HP xw8400 Workstation Hardware Setup Guide

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Autodesk® Lustre® 2011

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Contents

Introduction

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Topics in this chapter:

About This Guide

This guide describes how to set up the HP® xw8400 workstation and the other hardware components of your Autodesk® Lustre® 2011 workgroup. The HP xw8400 workstation is available for Lustre systems on Windows®, as well as for Autodesk® Incinerator® Lustre systems on Linux®. To install and configure hardware and software components, use this guide in conjunction with the following documents: the *Autodesk Lustre Installation and Configuration Guide for Windows Workstations*, and the *Autodesk Incinerator Installation and User Guide* for Lustre with Incinerator.

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

The latest versions of all guides are available in PDF format from the Web at *http://www.autodesk.com/lustre-documentation*. For best results viewing and printing these PDF files, use Adobe® Acrobat® Reader™ 6 or later, or Xpdf viewer.

NOTE If you do not have Acrobat Reader, you can download a free copy from the Adobe Web site (*http://www.adobe.com*). If you do not have Xpdf viewer, you can download a free copy from the Xpdf Web site (*http://www.foolabs.com/xpdf/*).

The Lustre Workgroup

Lustre is a modular system that you can configure and expand to suit your needs. The features you purchase determine the hardware included with your system.

Central to any system is the Master Station or HD Station. The Master Station is a high-end Windows- or Linux-based PC designed to accommodate real-time interactivity in a client-attended or supervised session. You can add a Lustre Station to improve the efficiency of your pipeline.

Master Station   Includes the full Lustre toolset and is designed for GPU-accelerated sessions where the colorist works together with the cinematographer. Contains an extensive creative toolset for more elaborate visual design and grading using up to 4K resolution and 16-bit files and for completing tasks like dust busting, conforming, rotoscoping and capture/playout.

HD Station   Cost-effective GPU workstation for conforming, preparing, grading and mastering short-form and long-form HDTV projects, as well as HD film projects. Input up to 10-bit 2K and output HD and SD.

Lustre Station   Tasks that do not require the direct intervention or supervision of the colorist can be efficiently handled by a Lustre Station. Multiple Lustre Stations can work in parallel to increase throughput and can be used for tasks such as dust-busting, preparatory work, fine-tuning creative sessions, conforming data from EDLs, updating editorial changes using change lists, and mastering to different formats using the real-time deliverables function.

Lustre Workstation Features

The following table describes the features available to each Lustre workstation.

NOTE The features of Lustre 2011 may vary based on your hardware platform. Consult the *Autodesk 2011 Release Notes* for your release for specific system information.

Station	Configuration
Master Station	**Default** All features are available including SD and HD I/O, dual link and HSDL video formats and the DI Pack, which consists of infrared channel dust removal and support for all standard input and output resolutions and bit-depths. Certain features require add-on licensing. **Add-Ons** The following features can be added to the Default configuration: the Slave Renderer and up to three panels for the Autodesk control surface. The Slave Renderer requires a separate license.
Lustre HD Station	**Default** Includes all features except for the DI Pack (see the Master Station description). File input is limited to 2K resolution. File output is limited to HD resolution, 10-bit. Certain features require add-on licensing. **Add-Ons** The following features can be added to the Default configuration: SD and HD I/O, dual link and HSDL video formats, the Slave Renderer, and up to three panels for the Autodesk control surface. The Slave Renderer requires a separate license.
Lustre Station	**Default** All features are available except for primary and secondary colour grading. The DI Pack (see the Master Station description) is also included, along with full dust removal functionality, and the ability to create geometries and masks. **With Primary Colour Correction** Includes all features of the default option as well as primary colour grading. **Add-Ons** The following features are available for either the Default configuration or the With Primary Colour Correction configuration, and require an additional license: SD and HD I/O, dual link and HSDL video formats, and up to three panels for the Autodesk control surface. The Slave Renderer requires a separate license.

Optional Lustre Components

You can expand the features of your Lustre system and improve the efficiency of your workflow by adding any of the following components.

Control Surface   The Autodesk control surface provides improved interactivity when colour grading film and video footage. You can perform many of the same tasks you do in the Lustre user interface using the control surface.

Video I/O   Video I/O is provided by the DVS Centaurus® board, which consists of an HD/SD board and a breakout box. This configuration provides real-time SDI input and output of uncompressed 8- or 10-bit HD or SD video in both YUV (4:2:2) and RGB formats (4:4:4 or 4:2:2).

For a list of supported video formats, see the *Autodesk Lustre 2011 User Guide*.

Audio I/O   Audio I/O is provided by the DVS Centaurus board, which consists of an HD/SD board and a breakout box, and an ADAT Converter such as the Lucid ADA 88192. This configuration offers eight audio input and eight audio output channels. They all use 24-bit audio resolution.

Slave Renderer   The Slave Renderer is a rack-mounted server that is connected directly to the Lustre workstation. It frees system resources by off-loading render tasks on an 'as-needed' basis, thus ensuring real-time interaction on the Lustre system.

Background Renderer   Background rendering frees up Lustre workstations for colour grading. You can use up to eight background rendering machines to process your final frames.

NOTE For a list of Incinerator system components, refer to the *Autodesk Incinerator 2011 Installation and User Guide*

Typical Configuration Overview

The following illustration shows a typical configuration, including the Master Station, Lustre Station, and other optional components.

Control Surface

AJA BOB (breakout box)

Peripheral Options

Network Options

Slave Renderer

Background Rendering (Burn)

Lustre Station

Video I/O

Lustre Master Workstation

Lustre Storage

SAN options

Stone Shared
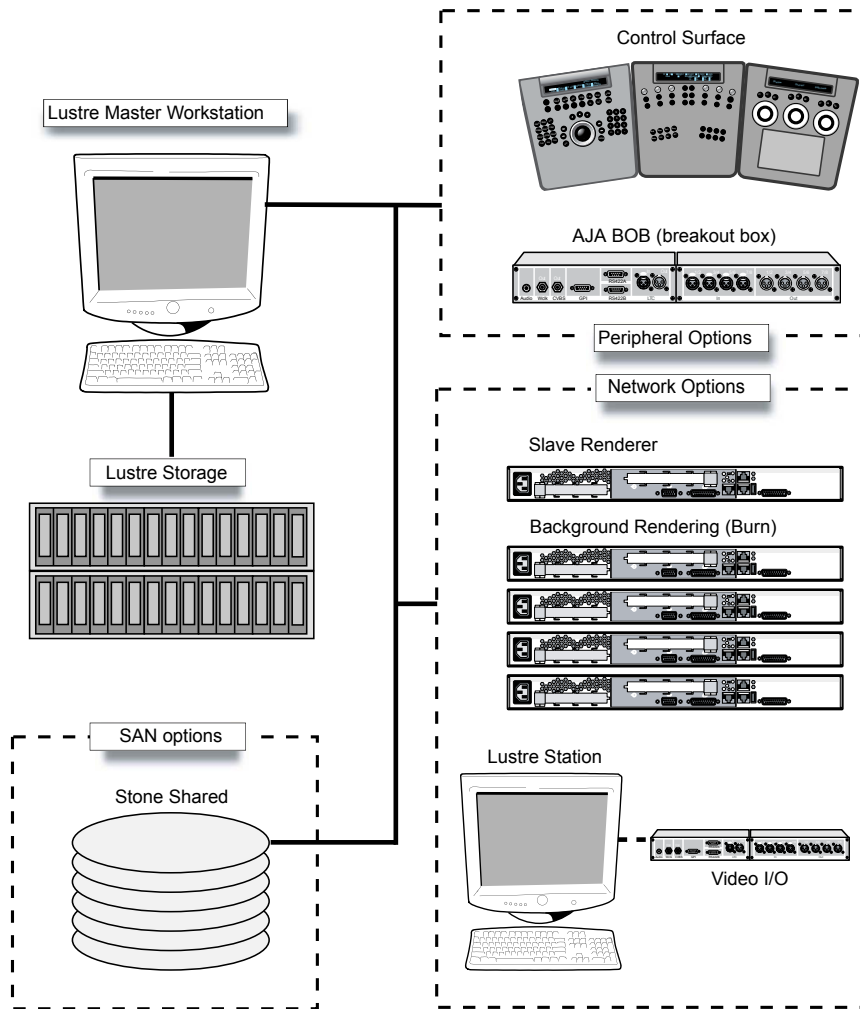
NOTE For an Incinerator system configuration overview, refer to the *Autodesk Incinerator 2011 Installation and User Guide*.

Workflow for Hardware Setup and Application Installation

The following procedure provides the general workflow for installing Lustre on an HP xw8400 workstation running Windows.

For workflow information related to the HP xw8400 running on Linux for Incinerator, refer to the *Autodesk Incinerator 2011 Installation and User Guide*.

To install Lustre on an HP xw8400 workstation:

1   Review the guidelines for working with hardware components. See Hardware Configuration Guidelines on page 7.

2   Connect all peripherals (mouse, keyboard, graphics monitor, storage, etc.) to each workstation in your workgroup, and connect each workstation to the network. See Connecting Peripherals on page 17.

3   Connect your workstation to Autodesk® Stone® Direct storage. See the Installation and Configuration Guide.

4   Connect your Master or HD Station to a Slave Renderer, a control surface, tablet, and video I/O components. See Connecting System Components on page 31.

> **NOTE** The Slave Renderer is not used in Incinerator configurations.

5   Perform the procedures in the *Autodesk Lustre 2011 Software Installation Guide* or the *Autodesk Incinerator 2011 Installation and User Guide* to install and license Lustre and Incinerator.

Related Documentation

The following table describes the documentation associated with your application. For a detailed list of the latest documentation, see your release notes.

User Guides	Provides
Autodesk Lustre 2011 User Guide	Detailed instructions on using the software.
Autodesk Control Surface User Guide	Detailed instructions on using the Autodesk control surface and the Tangent CP100.
Autodesk Lustre 2011 New Features Guide	A list of the new features for this release.
Autodesk Lustre 2011 Hot Keys Card	A list of the most frequently used hot keys.
Autodesk Lustre 2011 Release Notes	A complete list of documentation and information on late-breaking features.

User Guides	Provides
Autodesk Lustre 2011 Fixed and Known Bug List	A complete list of fixed and known bugs for this release.

Installation and Configuration Guides	Provides
Hardware Setup Guide (for your workstation)	Information on how to set up your workstation and video I/O peripherals.
Autodesk Lustre Installation and Configuration Guide (for your operating system)	Information about installing and licensing yourAutodesk Lustre software. Note: For Lustre and Incinerator, see the *Autodesk Incinerator Installation and User Guide*.

Other Guides	Provides
Autodesk Lustre Sparks API Reference Guide	Instructions for developing Sparks® plugins for Lustre.
Autodesk Backburner 2011 Installation Guide *Autodesk Backburner 2011 User Guide*	Information on how to install, set up, and use Autodesk® Backburner™.

Consult the Autodesk Web site at *http://www.autodesk.com/lustre-documentation* for the latest version of guides, release notes, and fixed and known bugs documents.

Hardware Configuration Guidelines

In most cases, hardware integration and application installation is 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 Lustre 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 puts you in a better position to provide diagnostic information.

■ If you want to move your Lustre system at any time, or upgrade certain hardware components, information in this guide is crucial.

Although this guide, in conjunction with the Installation and Configuration Guide, provides complete information regarding hardware component configuration, it should only be undertaken by an experienced hardware integrator. This individual should be familiar with the Windows or Linux operating systems, HP xw8400 workstations, and peripherals associated with professional high-performance video and post production of film.

Your Lustre system consists of high-performance hardware that must be configured in an environment suited to its operational needs. Other considerations include minimizing the risk of damage due to static discharge and ensuring all components are properly grounded.

Verifying and Updating The System BIOS Version

System configuration is performed by an authorized technician prior to delivery. As such, some of the procedures here may not be necessary. Workstation BIOS settings are provided for informational purposes.

The system BIOS on your workstation must correspond to the certified version required by your software version. If the BIOS version on your system does not correspond to the table below, you must update to the certified version.

Product Version	Certified BIOS Version
2011	2.26

The BIOS version installed on your system appears onscreen while booting the workstation. The following procedures describe how to update the BIOS on your workstation.

WARNING You should only update the BIOS if you find that it is not at the version listed in this guide, or if your are advised to do so by Customer Support. Do not update the BIOS with a more recent version published by the hardware vendor, if it has not been certified by Autodesk Customer Support.

To update the BIOS on a Windows workstation:

  1 Get the BIOS upgrade utility and burn it to a CD.

2 Insert the CD into the CD-ROM drive

3 Reboot the workstation and press **F10** to enter BIOS.

4 Select a language.

5 From the File menu, select `Flash System ROM`.
The Select a Drive menu appears.

6 Click `Optical Drive`.
The Select a Drive confirmation menu appears.

7 Press **F10** to confirm.

8 Select the *7D5_0115.bin* file.
The Flash® System ROM confirmation menu appears.

9 Press **F10** to confirm.

10 Press any key.
System ROM Flash was successful appears.

11 Verify system BIOS settings. See

12 From the File menu, select `Save Changes and Exit`.

To update the BIOS on a Linux workstation:

1 Load the DKU CD in the DVD-ROM drive on the workstation.

2 Open a terminal.

3 Type:

`cd /mnt/cdrom/Utils/BIOS/`

Each supported platform 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 located in your platform's directory.

---

4 Type:

`cd ./<platform>`

5 Burn the *.iso* file for your platform onto a CD-ROM and place it in the DVD-ROM drive on the workstation.

6 Reboot the workstation and press **F10** to enter BIOS.

7 Select a language.

8 From the File menu, select **Flash System ROM**.
The Select a Drive menu appears.

9 Click **Optical Drive**.
The Select a Drive confirmation menu appears.

10 Press **F10** to confirm.

11 Select the *7D5_0115.bin* file.
The Flash System ROM confirmation menu appears.

12 Press **F10** to confirm.

13 Press any key.
System ROM Flash was successful appears.

14 Verify system BIOS settings. See

15 From the File menu, select **Save Changes and Exit**.

Verifying BIOS Settings

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

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

WARNING Before installing Red Hat® Linux, it is recommended that you verify the workstation's BIOS settings. If the storage SATA emulation option is not set correctly (to Separate IDE Controller), you must redo Red Hat Linux installation.

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, Storage options	SATA Emulation	Separate IDE Controller
Storage	Boot Order	Optical Drive USB Device Hard Drive, Integrated SATA

BIOS Menu	Item	Value
		Hard Drive, Integrated IDE
Storage, Power, OS Power Management	Runtime Power Management	Disabled
Storage, Power, OS Power Management	Idle Power Savings	Normal
Storage, Power, OS Power Management	ACPI S3 Support	Disabled
Storage, Advanced, Device Options	S5 Wake on LAN	Disabled
Advanced	Slot5 - PCI 133	Slot5 speed 100Mhz PCI-x m1

Restoring BIOS to Default Factory Settings

The following procedure restores the default factory BIOS settings.

To restore default factory BIOS settings:

1 Press **F10** while booting the workstation to enter the system BIOS.

2 From the File menu select `Default setup`|`Restore Factory Settings as Default`.

3 Press **F10** to accept the changes.

4 Select `Apply Defaults and Exit`.
   This restores the original factory system defaults.

Verifying and Updating the Graphics Card Driver

A new graphic driver (NVIDIA® driver 165.46) is required for Lustre 2011 Windows systems. To upgrade the NVIDIA graphics card driver, complete the following instructions.

To upgrade the NVIDIA graphics driver:

1 Copy the driver upgrade package located in the Lustre 2011 release package (*Drivers\Nvidia\165.46.zip*) to a temporary location on your system.

2 Use a compression utility, like Winzip, to decompress the driver upgrade package and extract it to a folder on your system.

3 Open the folder that contains the upgrade package you extracted and double-click *setup.exe* to start the driver update.

4 Click Next to continue the upgrade procedure.

A Hardware Installation warning message appears.

5 Click Continue Anyway.

6 Select Yes, I want to restart my computer now, and click Finish.

After you reboot, the NVIDIA graphics card driver is installed.

Ensuring Proper Environmental Conditions

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

■ Make sure the rack in which hardware components are installed is open or ventilated. Follow the ventilation specifications that apply to your system.

■ 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 13.

■ 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 peripheral 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 power consumed by the HP xw8400 system and the heat it generates under the maximum processing load produced by your Lustre 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 xw8400	1	3.5 / 1.8	2.8 / 1.4	336	1146.4

You must be able to meet the startup power requirement and have a climate control system with the capacity to maintain the temperature of this component 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	480 Watts = 1638 BTU
12000 BTU = 1 Ton of air conditioning	1638 BTU = 0.137 Ton of air conditioning

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 slots on their parent hardware components.

Grounding Hardware Components

It is important to properly ground any audio components used with Lustre to avoid ground loops and humming. To ensure audio components are properly grounded, use the XLR-3 cables. Using any other cables may cause humming in the system.

Receiving Your Lustre System

When you receive the shipment containing your Lustre, 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 you received all parts.

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 shell appears in Courier bold. You must press the Enter key after each command.	`rpm -qa`
Variable names appear in Courier, enclosed in angle brackets. No spaces are allowed in variable names.	`<variable_name>`
Variables that appear enclosed in square brackets are optional.	`[<filename>]`
Feedback from the command line or shell appears in Courier.	`limit coredump-size`

Convention	Example
Directory names, filenames, URLs, and command line utilities appear in italics.	*/usr/discreet*

Contacting Customer Support

A list of contact information for Autodesk Media and Entertainment Customer Support is available at *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 on the Autodesk web site at *www.autodesk.com/resellers*.

Connecting Peripherals

2

Topics in this chapter:

Workflow for Connecting Peripherals

You must connect peripherals (monitor, keyboard, mouse, storage, and network) to each Lustre workstation before you connect the workstations to video I/O, a control surface, or to other components in the workgroup.

Connect all hardware peripherals before you boot your workstation.

See the following table for a summary of the steps necessary to connect peripherals to your Lustre workstation.

Step:	Refer to:
1. Review the connection diagram for your workstation.	Connection Diagram for the HP xw8400 on page 18.

Step:	Refer to:
2. Connect a monitor to the workstation.	Connecting the Monitor on page 20.
3. Connect a keyboard, mouse, and calibration device to your workstation.	Connecting the Keyboard, Mouse, and Monitor Calibration Device on page 21.
4. Connect the workstation to storage.	Connecting Storage on page 21.
5. Connect the workstation to your network.	Network Connections on page 22.
6. After you connect all the peripherals to your Lustre workstations, you can connect the workgroup components together.	Connecting System Components on page 31.

Connection Diagram for the HP xw8400

The following diagrams show the connections for the HP xw8400 workstation.

NOTE These diagrams provide an overview of video I/O connections. See

HPxw8400 Workstation
(Windows Configuration)

HD-SDI (V2) Out
0:2:2/4:0:0 to 4:4:4
display device or VTR

HD-SDI (V1) Out 4:2:2 to 4:2:2 or 4:4:4
display device or VTR

Ref In from sync gen

Connect to second
DVI out on the
main FX5500 card

To USB extender for mouse
keyboard, monitor calibrator

HD-SDI Out (B) to
4:4:4 VTR
(dual link 0:2:2)

To Slave Renderer

HD-SDI In (B) from
4:4:4 VTR
(dual link 0:2:2)

To DVS BOB

DV12 Out to FX5500
SDI daughter card

To GFX monitor

HD-SDI Out (A) to 4:2:2
VTR (or 4:4:4 dual link)

To storage
1, 4 to SAN; 2, 3 to Stone

Ref In from sync gen

To InfiniBand switch
(optional)

0 to control surface,
1 to LAN, 3 to SAN

HD-SDI In (A) from 4:2:2
VTR (or 4:4:4 dual link)

NOTE Systems connected to the high-speed InfiniBand network may experience performance degradation if high bandwidth is requested on the Broadcom GigE card (slot 7).

HPxw8400Workstation
(Linux - Incinerator only)

HD-SDI (V2) Out
0:2:2/4:0:0 to 4:4:4
display device or VTR

HD-SDI (V1) Out 4:2:2 to 4:2:2 or 4:4:4
display device or VTR

Ref In from sync gen

Connect to second
DVI out on the
main FX5500 card

To USB extender for mouse,
keyboard, monitor calibrator

HD-SDI Out (B) to
4:4:4 VTR
(dual link 0:2:2)

To Incinerator
GigE switch

HD-SDI In (B) from
4:4:4 VTR
(dual link 0:2:2)

To DVS BOB

To GFX monitor

DVI2 Out to FX5500
SDI daughter card

To InfiniBand
switch

HD-SDI Out (A) to 4:2:2
VTR (or 4:4:4 dual link)

Ref In from sync gen

0 to control su rface,
1 to LAN , 3 to SAN

HD-SDI In (A) from 4:2:2
VTR (or 4:4:4 dual link)

NOTE The Slave Renderer option is not available for Lustre with Incinerator.

Connecting the Monitor

Connect the monitor to the DVI connection on the Lustre workstation's graphics card. You can use the DVI extender cable (DL.CAB-HDTV-FO-82-MM) to extend the cable to a machine room.

To connect the monitor:

➤ Use the DVI cable to connect the DVI OUT1 port of the NVIDIA® Quadro® FX5500 graphics card to the DVI-D IN port of the monitor.

NOTE Although the DVI fiber cable connectors are identical, their functions are different. Ensure that the connector labeled Send is connected to the Lustre workstation, and that the connector labeled Receive is connected to the monitor.

Connecting the Keyboard, Mouse, and Monitor Calibration Device

Connect the mouse, keyboard, and monitor calibration device to the workstation via the 4-port USB extender (TP.USB-EXT-400).

To connect the keyboard and mouse:

1 Connect the USB keyboard to port 2 on the remote unit of the USB extender.

2 Connect the USB mouse to port 3 on the remote unit of the USB extender.

3 Connect the monitor calibration device (TP.MON-CAL-LCDCRT) to port 4 on the remote unit of the USB extender.

4 Use an RJ-45 cable to connect the remote unit of the USB extender to the local unit of the USB extender.

5 Connect the local unit of the USB extender to USB1 port on the workstation.

To enable the Eye-One calibration utility driver:

➤ Do one of the following:
   ■ For Windows-based workstations, if the driver is not already installed, you will be prompted to install the monitor calibration device driver when you restart the workstation. The driver is available from the *C:\Program Files\Autodesk\Lustre Color 2008 SP3\Calibration\drivers* directory.

   ■ For Linux workstations, once the software installation has been completed, start the *eyeone27* daemon on the workstation. Type:
   /etc/init.d/eyeoned_2011 start

Connecting Storage

The storage connections for your system depend on whether you are running Lustre on the Windows or Linux operating system.

Storage for Windows-Based Workstations

Your workstation is configured with a 4-port ATTO Celerity FC-44ES fibre channel adapter. See Connection Diagram for the HP xw8400 on page 18for the fibre channel adapter location and connections.

You can connect your workstation to two types of storage:

■ One or more Stone Direct disk arrays that provide storage to individual workstations.

■ A Storage Area Network (SAN) that provides shared storage for multiple workstations.

Storage for Linux-Based Workstations

Lustre systems on Linux are used in conjunction with Incinerator and do not require local storage. Instead, your workstation is configured with an Infiniband 9000 DDR dual port HCA, which allows it to connect to the Incinerator high-speed Infiniband network.

Refer to the *Autodesk Incinerator Installation and User Guide* for information on how to connect your workstation to the Incinerator high-speed Infiniband network.

Network Connections

Your workstation is configured with a 4-port Broadcom network card, and an integrated network port.

Infiniband Network Support for Lustre on Windows-based Workstations

Lustre supports the use of an Infiniband network for HP xw8400 workstations running Windows XP SP2. The workstation must have the required Infiniband driver installed.

NOTE Real-time playback using the Infiniband support in Windows is limited to 24 frames per second HD at 1920x1080 resolution with an 8-bit bit depth from Wiretap clips loaded from Autodesk® Smoke® or Autodesk® Flame®.

When the Infiniband topology (including driver) is fully installed, Autodesk recommends adjusting specific configuration parameters in the Windows operating system to optimize performance.

To install the Infiniband driver for use with a Windows-based Lustre workstation:

1 Download the driver package to a temporary location on your system. You can find the appropriate driver package here:

   ftp://ftp.discreet.com/pub1/release/lustre/lustre2008/drivers/SilverStormHCA.msi

   NOTE Contact Customer Support if you have any problems downloading the driver package. See Contacting Customer Support on page 15.

2 Double-click the driver package and click Run.

   The SilverStorm HCA Setup Wizard opens.

   Click Next.

3 On the License Agreement page, read the agreement before selecting the I Agree radio button. Click Next.

4 On the SilverStorm HCA Information page, read through the driver manufacturer Release Notes, then click Next.

5 On the Installation Options page, make sure no optional components are checked, then click Next.
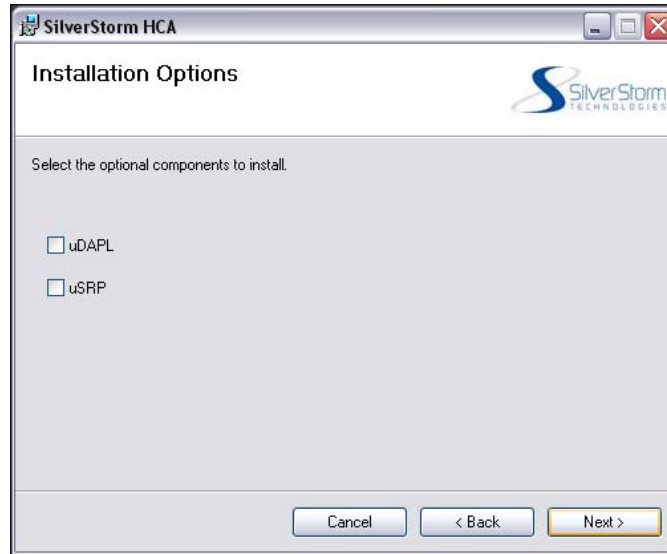
**6** On the Select Installation Folder page, browse for the correct path in which to install the driver.
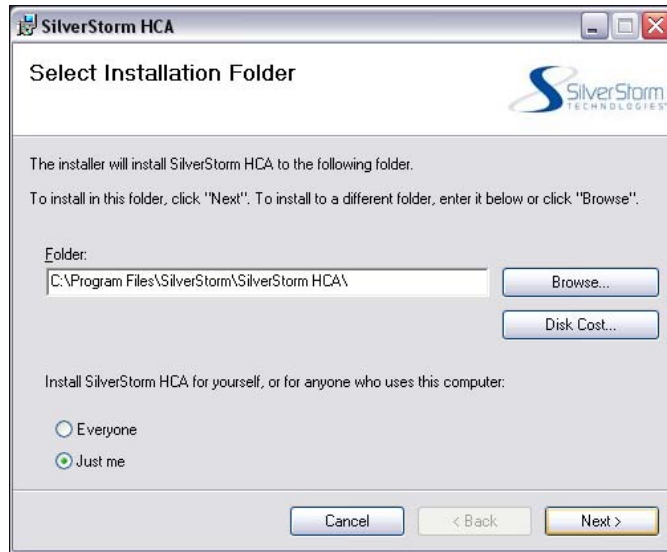
7 Choose the system user permissions by selecting either the Everyone radio button or the Just me radio button. Click Next.

8 On the Confirm Installation page, click Next to begin the installation.

The wizard displays an installation progress bar.

9 On the Installation Complete page, click Close.

10 On the Windows Desktop, right-click My Computer and select Properties in the drop-down menu.

The System Properties dialog box appears.

11 Click the Hardware tab.

12 Click Device Manager.

The Device Manager dialog box appears.

13 Right-click the PCI Device under Infiniband Host Channel Adapters.

The Hardware Update Wizard appears.

14 Select No and click Next.

15 Select Install from a list or specific location and click Next.

16 Browse for the driver and click Next.

17 Click Finish.

The driver and interface install.

18 In the Device Manager dialog box, right-click the first Infiniband port adapter.
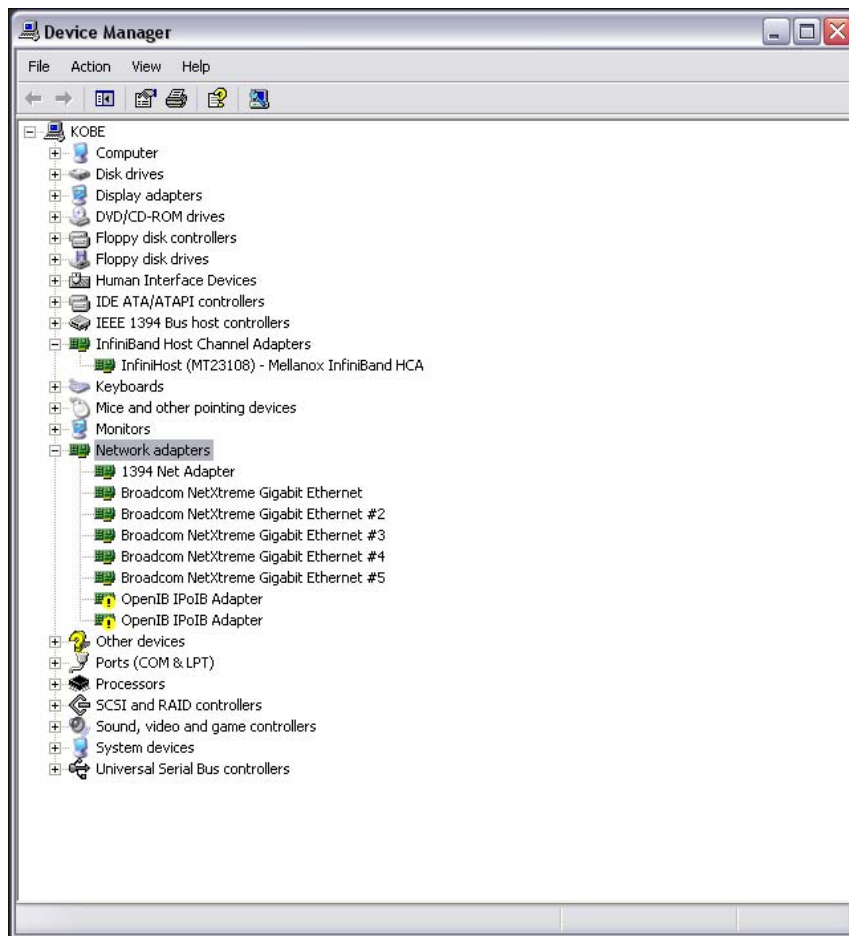
NOTE There are two Infiniband port adapters. In the Device Manager, at this point, the adapters should each be indicated by the adapter icon with an exclamation mark through it. This shows that the adapter drivers are not yet installed.

The Hardware Update Wizard appears.

19 Select No and click Next.

20 Select Install from a list or specific location and then click Next.

21 Browse for the driver and click Next.

22 Click Finish.

The driver and interface install.

Repeat step 19 to step 22 for the second Infiniband port adapter.

The Infiniband Host Channel Adapter and the two IP over IB port adapters should appear in the Device Manager dialog box, without exclamation marks on their icons.
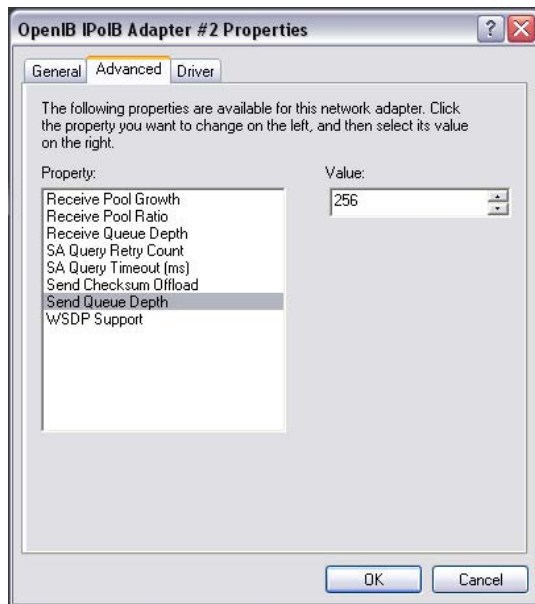

To optimize the Infiniband driver on Windows:

NOTE The Infiniband driver optimization steps are optional.

---

1 Go to the Network Connections panel.

2 Right-click on the connected IPoIB port and select Properties.

3 Click the Advanced tab.

4 Click Configure.

5 Configure the card so you have these values:
   ■ Receive Queue Depth of 256
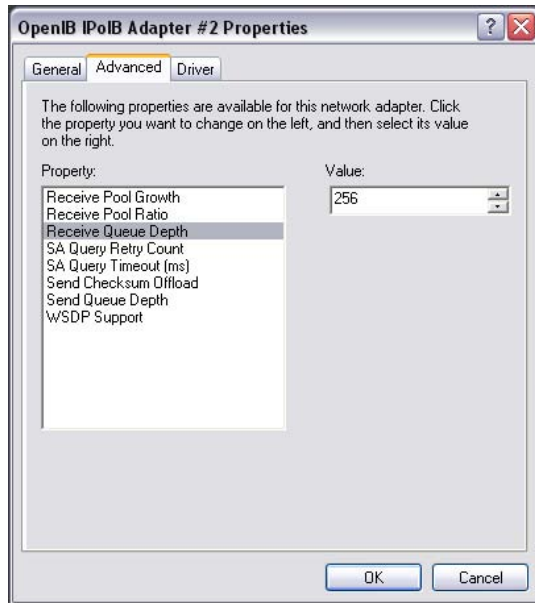
■ Send Queue Depth of 256

4-Port Broadcom Adapter

Connect the workstation to your facility's network to access background rendering nodes, other Lustre Stations, and the facility's NAS or SAN centralized storage (if applicable). You connect the ports on the Broadcom card as follows:

■ Connect Port 0 to the Autodesk control surface hub or the control surface itself.

■ Connect Port 1 to your house network.

■ Connect Port 2 to a SAN private network (optional).
For more details about configuring the Autodesk control surface, see Connecting the Autodesk Control Surface on page 32.

Integrated Network Adapter

For Windows-based workstations, connect the integrated network port to the Slave Renderer. For more details about configuring the Slave Renderer, see Connecting the Slave Renderer to a Lustre Workstation on page 39.

For Linux-based workstations, connect the integrated network port to the Incinerator private port. Refer to the *Autodesk Incinerator Installation and User Guide* for information on how to connect your workstation to the Incinerator private network.

Connecting System Components

3

Topics in this chapter:

Workflow for Connecting System Components in the Lustre Workgroup

After you have connected peripherals to your workstation, you are ready to connect it to the Autodesk control surface, to video I/O hardware, and to a Slave Renderer.

See the following table for a summary of the steps necessary to connect components in your workgroup.

Step:	Refer to:
1. Connect the control surface to your workstation.	For the Autodesk control surface: Connecting the Autodesk Control Surface on page 32, Assigning an IP Address to the Autodesk Control Surface on page 35, and Configuring Lustre to Connect to the Autodesk Control Surface on page 38.
2. If necessary, connect a tablet to your workstation.	Connecting a Stand-Alone Tablet on page 38.
3. Connect a Slave Renderer to the Lustre workstation (Windows only).	Connecting the Slave Renderer to a Lustre Workstation on page 39.
4. Connect the workstation to video I/O components.	Connecting Video I/O to a Master or HD Station on page 40.
5. Connect the workstation to a high-speed data link device.	Connecting to a High-Speed Data Link Device (HSDL) on page 46.
6. Connect the workstation to audio I/O components.	Connecting Audio Hardware on page 47.

Connecting the Autodesk Control Surface

The Autodesk control surface consists of three panels. You can use any combination of them. If you are using more than one panel, you must use the network switch included with your shipment to cross-connect them.

Refer to the *Autodesk Control Surface User Guide* for information on how to use the control surface with Lustre.

NOTE The illustrations in the following procedure only show the central module, i.e. the colour grading panel. This is the only panel that has a USB connection for the integrated tablet, and a network port. The other two panels only have a network port, which you connect to the network switch.

To connect the Autodesk control surface:

1 Use the AC power adapter cables to connect each panel to a power supply.

2 Use a network cable to connect port 0 (the far right port) of the Broadcom network card on your workstation to port 1 on the Netgear ProSafe FS108 network switch.

HP xw8600 Workstation

To USB extender

Network Switch

Ports 3 and 4 to additional panels

NETGEAR

PWR

1   2   3   4   5   6   7   8

Autodesk Control Surface

To port 1 on USB Extender

Autodesk

System   Power   Link   Activit y

5V DC 4A   Ethernet   Tablet
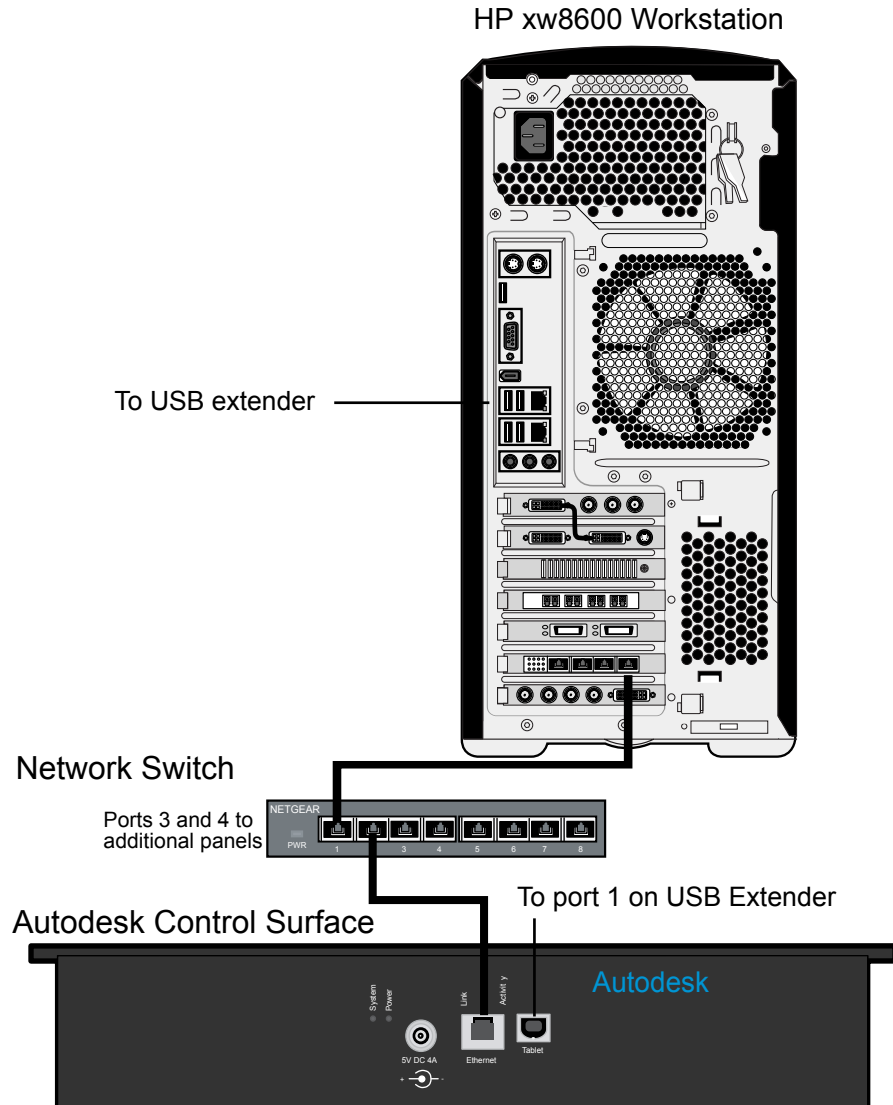
If you are using only one panel, you can connect that panel directly to the workstation, instead of using the switch.

To USB extender

Autodesk Control Surface

To port 1 on USB Extender

Autodesk

System
Power

Link

Activity

5V DC 4A
Ethernet
Tablet
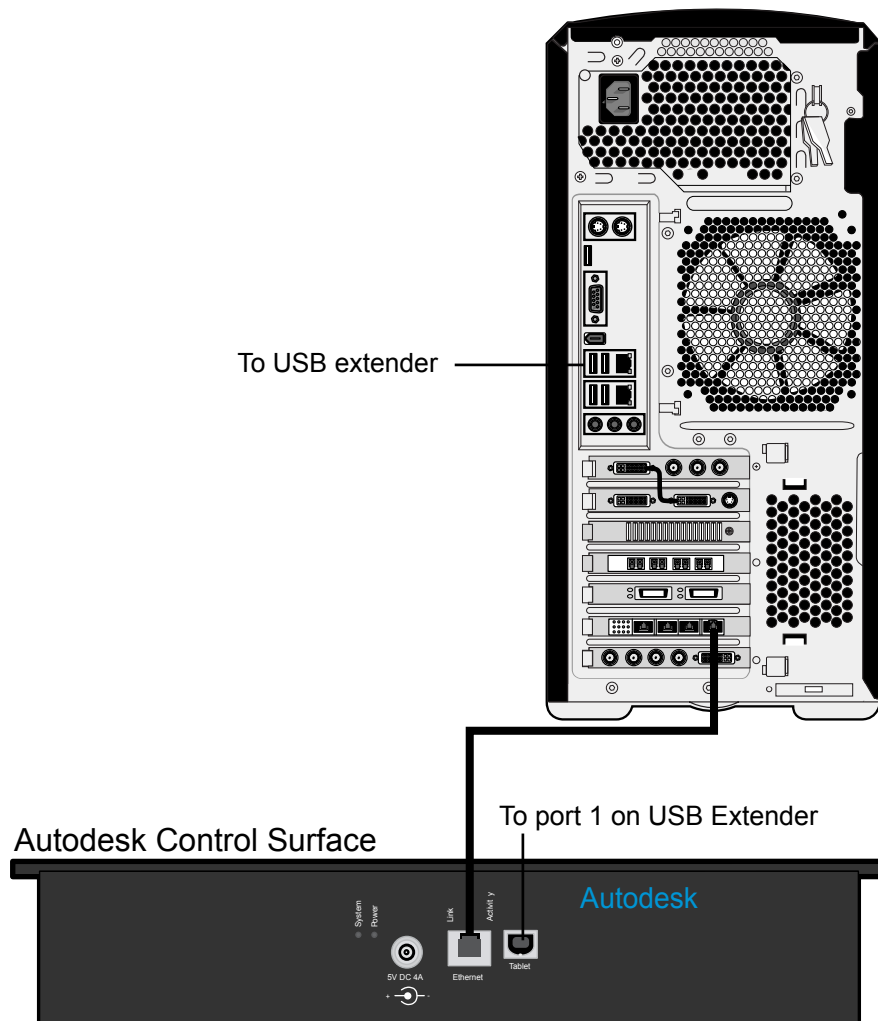
3 If you are using more than one panel, use network cables to connect each of the panels to the network switch.

4 If you are using the panel that includes the tablet, use a USB cable to connect the panel to a USB port on the back of your workstation.

NOTE The above diagrams represent a Windows-based configuration. Components may differ slightly for the Linux configuration but the control surface connections are identical.

# Assigning an IP Address to the Autodesk Control Surface

After you have connected the Autodesk control surface, you must assign it an IP address.

To configure the Autodesk control surface on Windows-based workstations:

1   Click Start | Settings | Network Connections.

> **NOTE** You can also access Network Connections from the Control Panel.

2   Right-click the port that the control surface switch or panel is connected to and choose Properties.

3   In the Local Area Connections Properties dialog box, select Internet Protocol (TCP/IP) and click Properties.
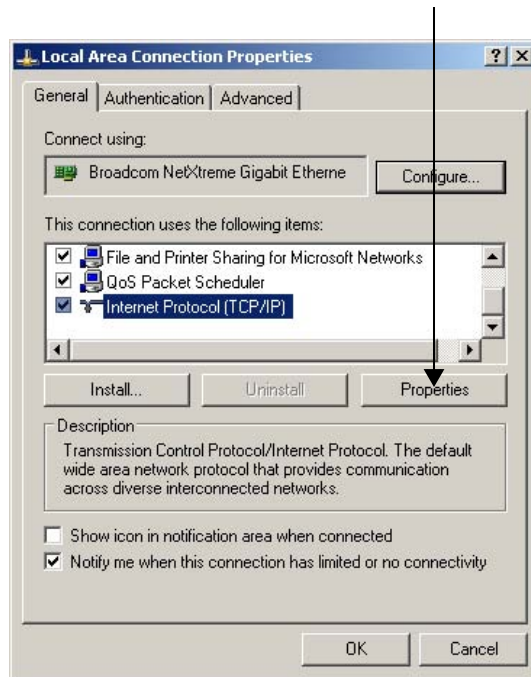
The Internet Protocol (TCP/IP) Properties dialog box opens.

4 Select the Use the following IP address option.
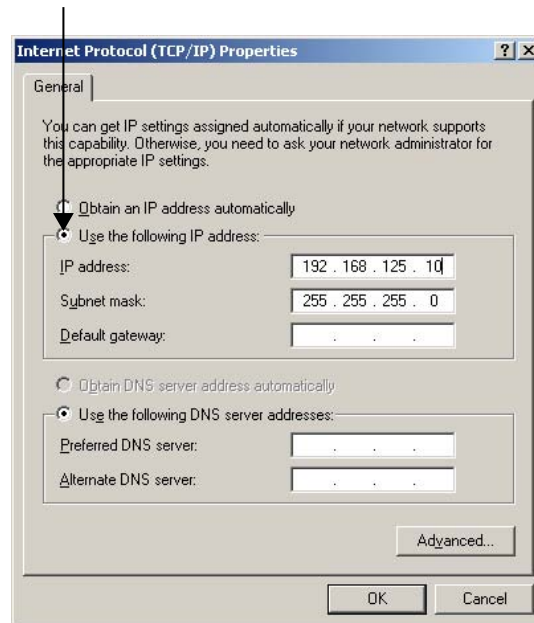
5 Set a static IP and Subnet mask address for the port. Select values that do not conflict with any other machine on your network. Consider using the following values:

- IP address: 192.168.125.10

- Subnet mask: 255.255.255.0

6 Click OK twice.

To configure the Autodesk control surface on Linux-based workstations:

➤ On the Lustre workstation, use a text editor such as *nedit* to configure the network port connected to the control surface with an unrelated static IP address that does not interfere with any of the IP addresses on the network. Also assign an appropriate subnet mask. Type:

nedit
/etc/sysconfig/network-scripts/ifcfg-eth<port#>

Modify the IPADDR and NETMASK values. For example:

```
IPADDR=192.168.125.10
NETMASK=255.255.255.0
```

Configuring Lustre to Connect to the Autodesk Control Surface

After you have configured the IP address of the control surface, you must configure Lustre to use the control surface.

To configure Lustre to use the Autodesk control surface on Windows- or Linux-based workstations:

1   Turn the power on to each of the modules and look at the top display panel on the module. It should display the panel name and ID.

2   After you install Lustre 2011, open the *init.config* file located in *C:\Program Files\Autodesk\<lustre version>* in Windows, or in */usr/autodesk/<lustre version>* in Linux with a text editor.

3   In the `ControlSurface` section of the *init.config* file of your project, enter the panel IDs for each panel.

    ```
    ControlSurface

    AutodeskPanels state="On"

    PanelIDs function="0" grading="0" navigation="0"
    ```

    Once the steps above are completed, the ACS panels will be recognized, loaded, and connected when launching the application.

4   Start Lustre. The following message should appear in the Console:

    ```
    Panel #<panel_ID> is detected
    ```

    This confirms that the Autodesk Control Surface is enabled.

Connecting a Stand-Alone Tablet

If you do not have the modular Autodesk control surface panel that includes the tablet, you can connect a stand-alone tablet.

To connect a stand-alone tablet, connect the tablet to USB Out 1 on the USB extender.

NOTE On Windows-based workstations, you may need to restart Windows for the tablet to be recognized. On Linux-based workstations, re-starting the Xserver prompts tablet recognition. Press **Ctrl**+**Alt**+**backspace** to start the Xserver.

Connecting the Slave Renderer to a Lustre Workstation

The Slave Renderer is available for the Master Station, the Lustre Station, and the Lustre HD Station, all of which must be running on a Windows-based workstation. The Slave Renderer is not available for the Linux-based version of Lustre, since it uses Incinerator to obtain real-time rendering and playback.

Although the Slave Renderer uses a network connection, a higher Category 6 grade cable is needed to accommodate the data that is transmitted. For information on configuring the IP addresses of the network ports that connect the two workstations, see the *Autodesk Lustre 2011 Installation and Configuration Guide for Windows Workstations*.

To connect the Slave Renderer to a Windows-based workstation:
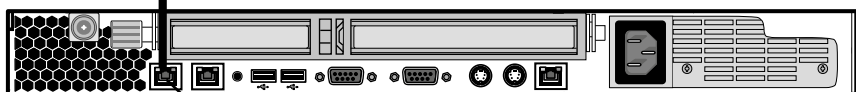
1 Connect the Category 6 crossover cable to the on-board network port at the back of the Lustre workstation.

2 Connect the other end of the cable to the network port 1 of the Slave Renderer machine.

   The Slave Renderer should be connected as shown in the following diagram.

HP xw8600 Workstation
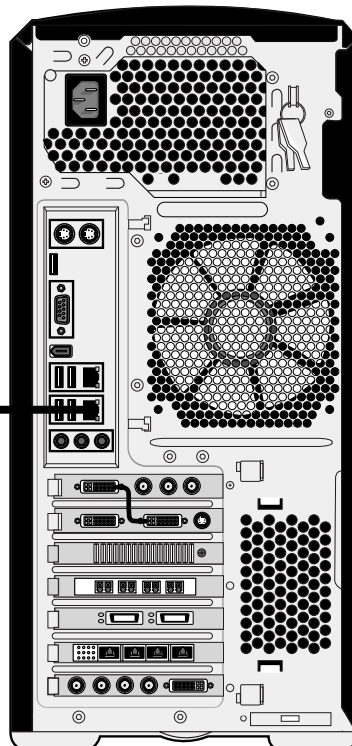
Slave Render Station (HP DL 140 G3)

Port 1

Connecting Video I/O to a Master or HD Station

You use the video components to set up video I/O and a broadcast monitor. The only video hardware you must provide are: a sync generator, a VTR, and an SD or HD SDI broadcast monitor. The following components are included in your hardware shipment.

DVS Centaurus 1 or 2 board and DVS Breakout Box II The DVS Centaurus board provides video I/O. Use the DVS Breakout Box II for serial control of a VTR or other slave device and LTC output to an audio device.

NVIDIA Quadro FX5500 graphics board The NVIDIA Quadro FX graphics board provides output to your computer monitor.

EIZO 24-inch or Sony 21-inch wide screen LCD graphics monitor The EIZO® and Sony LCD graphics monitors provide a 16:9 widescreen aspect ratio for film or HD projects. With these monitors, the application runs at a maximum resolution of 1920x1200. For instructions on connecting the graphics monitor, see Connecting the Monitor on page 20.
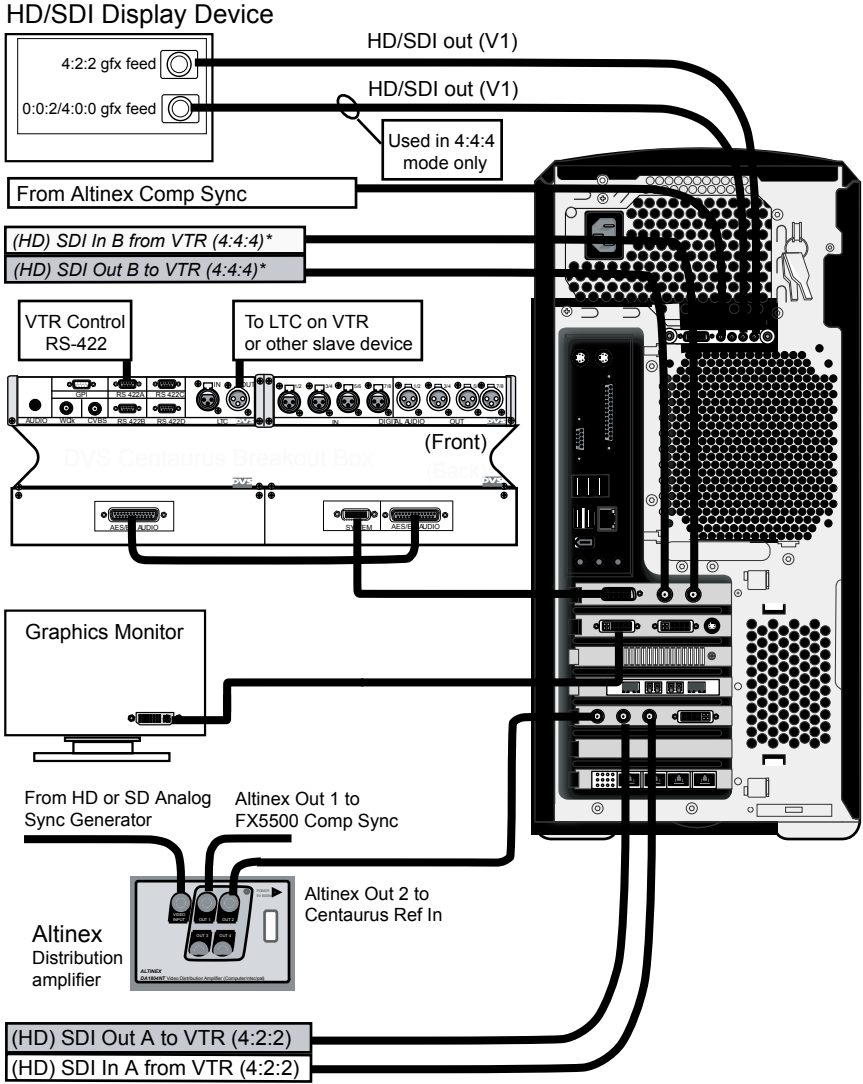
Altinex DA1804NT video distribution amplifier The Altinex® video distribution amplifier can serve a bi-level (SD) or tri-level (HD) sync signal to up to four video hardware devices from a single sync source/generator. It serves the sync signal to the NVIDIA graphics board and the DVS Centaurus board.

Video I/O for Real-Time Deliverables and Without Real-Time Deliverables

The following diagram describes the video I/O wiring for both the Real-time deliverables configuration and without Real-time deliverables. Real-time deliverables allows Lustre to play out to a VTR directly through the DVS SDI OUT.

NOTE The backplanes depicted in the following diagram represent a Windows-based configuration, but, it is also accurate for a Linux-based configuration, where the ATTO fibre-channel adapter is replaced by the Infiniband HCA.

HP xw8400 Workstation
Real-Time Deliverables*

HD/SDI Display Device

4:2:2 gfx feed	
0:0:2/4:0:0 gfx feed	

HD/SDI out (V1)

HD/SDI out (V1)

Used in 4:4:4 mode only

From Altinex Comp Sync

(HD) SDI In B from VTR (4:4:4)*

(HD) SDI Out B to VTR (4:4:4)*

VTR Control RS-422

To LTC on VTR or other slave device

(Front)

DVS Centaurus Breakout Box

Graphics Monitor

From HD or SD Analog Sync Generator

Altinex Out 1 to FX5500 Comp Sync

Altinex Out 2 to Centaurus Ref In

Altinex Distribution amplifier

(HD) SDI Out A to VTR (4:2:2)

(HD) SDI In A from VTR (4:2:2)

Video I/O without Real-Time Deliverables

The following illustration shows the video I/O wiring for a configuration that does not support playout to a VTR through the NVIDIA board (Real-time deliverables).

HP xw8400 Workstation
No Real-Time Deliverables*

HD/SDI Display Device

HD/SDI out (V1)

4:2:2 gfx feed

HD/SDI out (V2)

0:0:2/4:0:0 gfx feed

Used in 4:4:4
mode only

From Altinex Comp Sync

(HD) SDI In B from VTR (4:4:4)
(HD) SDI Out B to VTR (4:4:4)*

VTR Control
RS-422

To LTC on VTR
or other slave device

(Front)

DVS Centaurus Breakout Box (rear)

Graphics Monitor

Altinex Out 1 to
FX5500 Comp Sync

From HD or SD Analog
Sync Generator

Altinex
Distribution
amplifier

Altinex Out 2 to
Centaurus Ref In

(HD) SDI Out A to VTR (4:2:2)
(HD) SDI In A from VTR (4:2:2)

Setting Up VTR Emulation

You can configure your Autodesk Lustre 2011 application to emulate a VTR for output in real time. You control the emulator from the application or device that sees the Autodesk Lustre 2011 application as a VTR.

The following procedure describes how to configure the hardware for VTR emulation. Consult the "VTR Emulation" chapter in the *Autodesk Lustre 2011 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.

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

> **NOTE** Connect an RS-422 control cable to the serial ports between the devices used in the VTR emulation process.
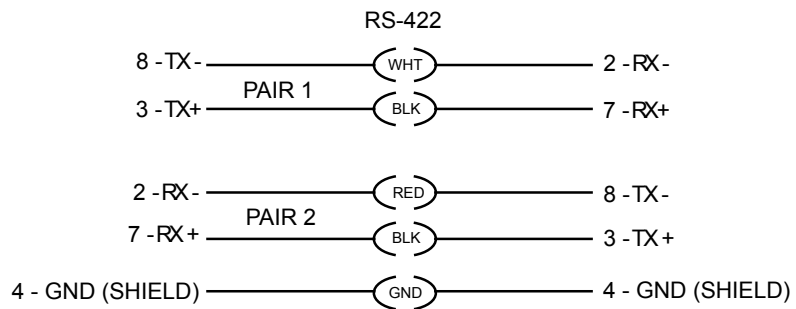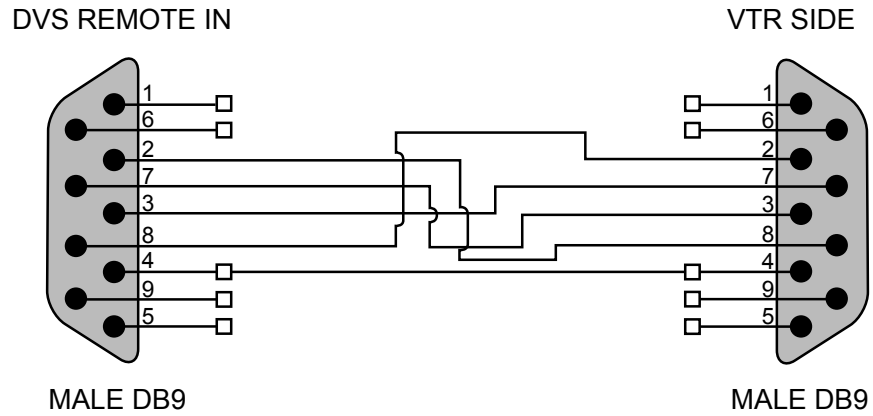
> **NOTE** The RS-422 cables for VTR emulation require custom pinouts. See VTR Emulation RS-422 Control Cables on page 45.

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 Control Cable

DVS REMOTE IN   VTR SIDE

```
1                                                    1
6                                                    6
2                                                    2
7                                                    7
3                                                    3
8                                                    8
4                                                    4
9                                                    9
5                                                    5
```

MALE DB9   MALE DB9

RS-422

```
8 - TX -  ──────────( WHT )──────────  2 - RX -
             PAIR 1
3 - TX+  ──────────( BLK )──────────  7 - RX+


2 - RX -  ──────────( RED )──────────  8 - TX -
             PAIR 2
7 - RX +  ──────────( BLK )──────────  3 - TX +

4 - GND (SHIELD)  ──────( GND )──────  4 - GND (SHIELD)
```

Connecting to a High-Speed Data Link Device (HSDL)

If you have purchased an HSDL license, you can connect to an HSDL device through the DVS Centaurus.

Connect both the A and B in/out ports on the DVS main board and daughter card to your HSDL device.

Connecting Audio Hardware

Lustre accommodates as many as eight audio inputs and eight audio output channels, each with a 24-bit audio resolution. Lustre 2011 uses the audio BOB of the DVS (Centaurus 1 and 2).

Audio Wiring Workflow

The following procedure provides the general workflow for setting up the audio subsystem for Lustre.

To wire the audio subsystem:

1 Ensure that all of your workstation peripherals and video hardware components are properly connected.

2 Verify that you have all the required audio hardware components. See Audio Hardware Components on page 47.

3 Connect your audio hardware devices. See Audio Wiring on page 48.

4 Configure the Lucid converter for local control. See Configuring the Lucid ADA 88192 Converter on page 50.

Audio Hardware Components

Lustre uses the following hardware components that are shipped with your system.

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

DVS Balanced Audio breakout box and DVS Centaurus 1 or 2 board　The Balanced Audio breakout box is the audio component of the DVS breakout box. It provides connections for audio I/O. This breakout box connects to the DVS Centaurus 1 or 2 board on your workstation. The Centaurus board provides real-time input and output of uncompressed SD and HD video signals, as well as audio data at 24-bit resolution. The Centaurus board handles balanced AES/EBU audio signals from the Balanced Audio breakout box.
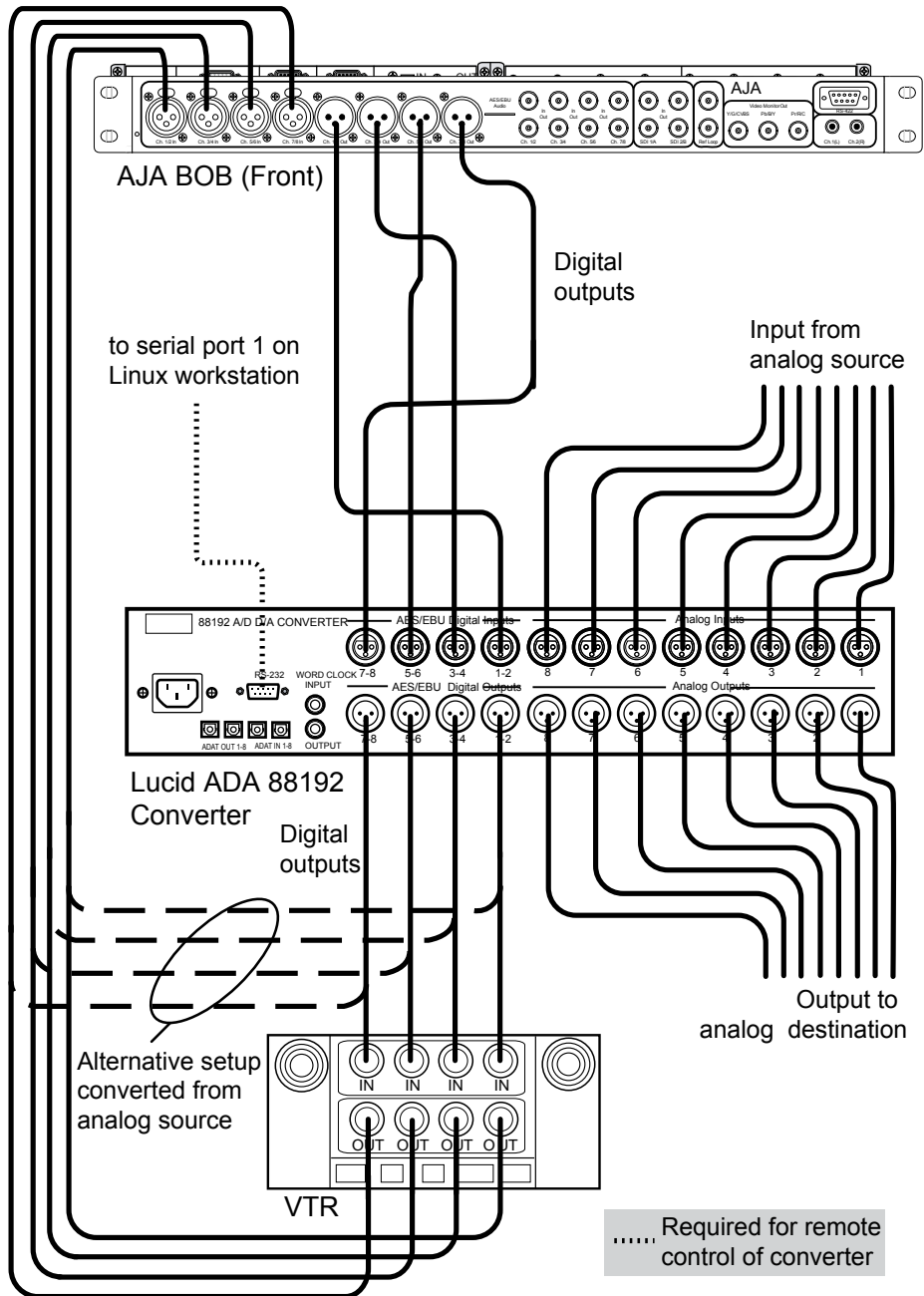
Understanding Local Control of the Lucid Converter

You can control the converter locally by adjusting converter settings manually, using the controls on the front of the converter.

Whether you control the converter, 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.

Audio Wiring

If you have a DVS video device with a Lucid ADA 88192 converter, to connect the Lustre hardware components to the DVS breakout box, refer to the following diagram.

AJA BOB (Front)

Digital outputs

Input from analog source

to serial port 1 on Linux workstation

88192 A/D D/A CONVERTER AES/EBU Digital Inputs Analog Inputs

RS-232 WORD CLOCK 7-8 5-6 3-4 1-2 8 7 6 5 4 3 2 1
INPUT AES/EBU Digital Outputs Analog Outputs

ADAT OUT 1-8 ADAT IN 1-8 OUTPUT 7-8 5-6 3-4 1-2 8 7 6 5 4 3 2 1

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

If you have a DVS video device with an ADAT converter, to connect the Lustre hardware components to the DVS breakout box, refer to the following diagram.
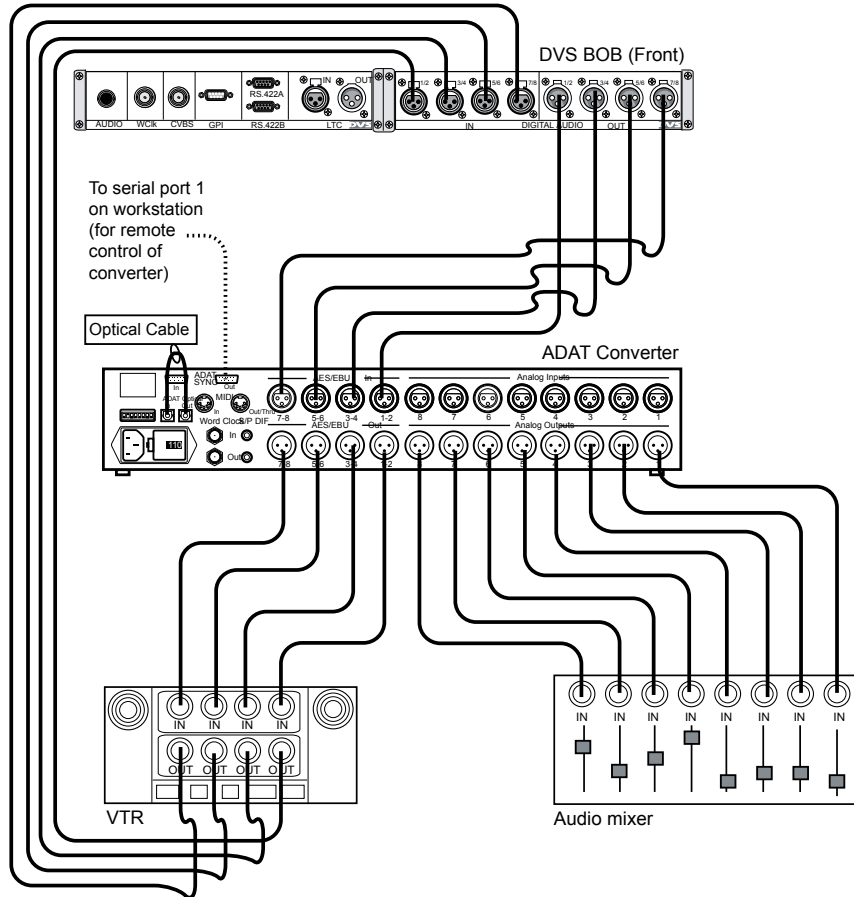
Configuring the Lucid ADA 88192 Converter

You must manually configure the Lucid converter for 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 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.

2 Make sure Lucid's AES inputs are routed to both AES and analog outputs.

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. Local control requires these items to be set to SRC OFF. If you reset to defaults, be sure to manually set these items back to OFF.

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 ON ADAT 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.
System Miscellany	Route Unit: 8	

Index