



***ioXT***

Published: 1/16/12

# Installation and Operation Guide

B e c a u s e   i t   m a t t e r s .

**AJA**<sup>®</sup>  
VIDEO SYSTEMS

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180 Litton Drive, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048

Fax: 530.274.9442

Web: <http://www.aja.com>

Support Email: [support@aja.com](mailto:support@aja.com)

Sales Email: [sales@aja.com](mailto:sales@aja.com)

When calling for support, first read the Chapter on *Troubleshooting* at the back of this manual. You can often save time and effort by looking there first for simple remedies and information on how to get support from AJA and Apple Computer Inc.

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Licensee understands that Avid Compliant Media Files include files in the two different MXF file formats and the QuickTime format. Therefore, third party products that process Avid Compliant Media Files may not be interoperable with the Licensee Product if the Licensee Product uses a different file format than such third party product. Licensee is encouraged to provide, in its marketing, advertisements and other materials about Licensee Product, information about the file format used by the Licensee Product.



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# Chapter 1: Introduction



***io XT***

## Overview

AJA's io XT provides professional-grade I/O for high-end computers using a Thunderbolt interface with 10Gbps available bandwidth. io XT is the ideal portable companion for lightning-fast video capture, playback and up/down/cross conversion. Designed for today's workflows, io XT provides a new interface for video Pro's working with 10-bit uncompressed, Apple ProRes 422, Apple ProRes 422 (HQ), XDCAM HD, DVCPRO HD, stereoscopic 3D workflows, and more.

io XT connects with a single Thunderbolt cable and provides a second Thunderbolt connector for storage, making it perfect for on set, or in the edit suite.

Based on the KONA 3G hardware, io XT provides 3G/Dual-link/HD/SD-SDI, Component Analog, and HDMI connectivity. The AJA Mac driver delivers extensive codec and media support within all professional 3rd-party video applications.

io XT's 10-bit hardware conversion capability paired with a Thunderbolt RAID System creates a super-fast editing system, portable enough to fit in a backpack—with desktop level power.

**Features:**

- Two Thunderbolt ports (supports pass-through/"daisy-chaining")
- Two SD-SDI, HD-SDI, HSDL, and 3G HD-SDI inputs and outputs
- Single link SDI 4:2:2 or 4:4:4; Dual-link SDI 4:4:4/HSDL support
- HDMI Input and Output (including output for stereoscopic monitoring to consumer 3D displays)
- Analog component/composite output, 10-bit
- Broadcast quality hardware based 10-bit upconversion
- Broadcast quality hardware based 10-bit downconversion
- Broadcast quality hardware based 10-bit crossconversion (1080 to 720 and 720 to 1080)
- DVCProHD hardware scaling acceleration
- HDV hardware scaling acceleration
- Final Cut Pro 7 Dynamic RT Extreme hardware acceleration
- Broadcast quality hardware based 10-bit SD aspect ratio conversion (anamorphic to letterbox, etc.)
- 8-Channel Embedded SDI audio
- Eight channels analog audio output (using Tascam-style DB25-type cable)
- Front panel LED VU meters and Headphone output w/level control
- Reference In/LTC In (selectable)
- LTC Output
- RS-422 control via 9-pin
- Rugged Chassis, Small Size
- 12V DC, 4-pin XLR Power (AC adapter included)

**3D Stereoscopic Workflow**

Io XT offers you the simplest path through 3D stereoscopic workflows.

Through SDI, you can output Discrete Left and Right Eye feeds with a simple Stereo button choice in the AJA Control Panel. Additionally, muxed stereo output is possible using a single SDI output. AJA hardware and software works in close collaboration with CineForm's Neo3D software tools and CineForm codec to allow stereoscopic editorial and viewing when working with Apple's Final Cut Pro 7 or Adobe's CS5.5.

Through its HDMI 1.4a output, Io XT makes it possible to connect to affordable 3D-capable monitors for stereoscopic monitoring.

**Broadcast-Quality Conversion**

Io XT features hardware-based full 10-bit broadcast quality motion adaptive SD to HD upconversion, HD to SD downconversion and HD to HD crossconversion.

The quality of the conversion features found in the Io XT is virtually identical to AJA's award winning stand-alone converter products used throughout the post production market. The Io XT built-in upconverter uses a full 10-bit path, fully motion adaptive de-interlacing, and large multi-point digital interpolators. Downconversion uses large multi-point digital interpolators, anti-alias filtering and interpolation.



Crossconversion is high-quality hardware-based, providing capability to streamline dailies and offers true broadcast picture quality in realtime. Because these functions are in hardware, they are available full time, all the time—with no CPU load. Such conversions are useful for cost effective monitoring, making standard definition dubs of an HD project, or upconverting from a standard definition FCP project to an HD deliverable.

### About Primary & Secondary Video Formats

In Io XT operation, the Primary Format is the media format written to disk and used in your project. The Secondary format is that which may be input for capture or output from Io XT to VTRs or other devices. Down-conversion may be applied to an input or on output.

The Primary Format menu allows you to select the video format used in your current project.

Conversion is performed based on the Primary or Secondary Format settings. Io XT can down-convert the input format (when designated as a Secondary Format input) to the selected Primary Format. Or you can set a Secondary Format output that will be a down-conversion of the Primary Format.

### Convert Mode

Convert Mode allows selection of a mode for conversion between High-definition and Standard-definition formats. Io XT supports up-, down-, and cross-conversion plus SD-to-SD aspect ratio conversions. See the following tables for conversion options.

All conversions use AJA 10-bit hardware inside the Io XT.

For example, to do a down-conversion on an HD input:

Set the Primary Format as an SD format

Select the correct HD format with an (I) input designation for the Secondary Format, then

Choose a “– Secondary” Video Input type

Down-conversion display mode choices that may be available include:

- Anamorphic: full-screen
- Letterbox: image is reduced with black top and bottom added to image area with the aspect ratio preserved
- Crop: image is cropped horizontally to fit new screen size

The following Video Signal Formats are supported by Io XT.

Standard Def.	HD 720	HD 1080	2K
525i @ 29.97 fps	720p @ 50 fps	1080i @ 25 fps	2K1080p23.98
625i @ 25 fps	720p @ 59.94 fps	1080i @ 29.97 fps	2K1080p24
	720p @ 60 fps	1080i @ 30 fps	2K1080p25
	720p @ 23.98 fps	1080PsF @ 23.98 fps	2K1080sf23.98
	720p @ 25 fps	1080PsF @ 24 fps	2K1080sf24
		1080PsF @ 25 fps	2K1080sf25
		1080PsF @ 29.97 fps	
		1080PsF @ 30 fps	
		1080P @ 23.98 fps	
		1080P @ 24 fps	
		1080P @ 25 fps	
		1080P @ 29.97 fps	
		1080P @ 30 fps	
		1080P @ 50 fps A	
		1080P @ 50 fps B	
		1080P @ 59.94 fps A	
		1080P @ 59.94 fps B	
		1080P @ 60 fps A	
		1080P @ 60 fps B	

### Io XT Audio

Io XT provides an 8-channel audio engine for SDI embedded audio. The front panel has a mini TRS headphone output with a lockable level control knob.

For analog audio output monitoring, Io XT provides a DB25 connector with eight channels of audio to be used with industry standard Tascam-style audio breakout cables. The front panel has an eight-channel VU meter display for monitoring levels.

### Dual Link

Io XT supports Dual Link HD-SDI (4:4:4). Io XT supports the ingest and output of SMPTE-372M compliant 4:4:4 RGB video and high-bandwidth 4:2:2 1080p 50, 1080p 59.94, and 1080p 60 at 10-bit.

### Hardware-based Acceleration

Final Cut Pro 7 users will likely notice the DVCPROHD, HDV, and Apple RT Extreme hardware acceleration provided by Io XT. This hardware acceleration was developed in close cooperation with Apple. How does Io XT accelerate DVCPROHD, HDV, and Apple RT Effects? A precision hardware scalar in Io XT does what the Apple computer's processor would otherwise have to do, scale less than full-raster HD (DVCPROHD and HDV) to full-raster size, thus speeding up the system considerably—and doing this scaling at full 10-bit broadcast quality.

When using the Final Cut Pro 7 HDV codec, the Io XT advanced scaling engine takes the native frame (long GOP 1440 HD) and outputs it via hardware-in real time. Precision AJA circuitry re-sizes the video to full-raster 1920 x 1080, providing instantaneous playback of HDV captured by Final Cut Pro 7 for both monitoring and recording.

Unlike the DV25 format, which can preview in realtime natively via Final Cut Pro 7, the MPEG structure of HDV is much more complex. Fortunately, Io XT can provide real time monitoring and playback to both HD and SD monitors and decks via the realtime hardware scaler and down-converter on board.

In addition to speeding up Final Cut Pro 7 Dynamic RT by using the KONA scalar, multiple frame size RT (1/4 size or full size)—a Final Cut Pro 7 feature—also benefits from Io XT. The frame count and image size are dynamically changed during file playback, so you don't get the "un-rendered" message in Final Cut Pro 7.

## Software for Mac

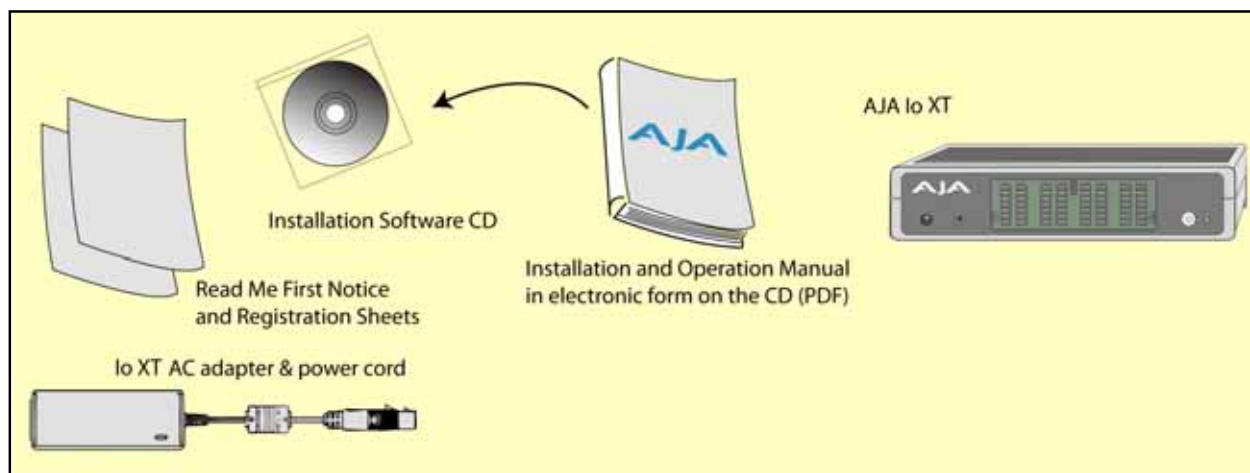
AJA's Io XT software and hardware were developed for powerful integrated video/ audio capture, editing, and production with a variety of 3rd-party software. With an Io XT and qualified Thunderbolt-enabled Mac, you have the ultimate system for standard and high definition video editing, production and DI work. AJA software is supplied on CD.

- AJA QuickTime™ drivers for tightly integrated hardware/software operation.
- AJA Control Panel for source selection and controlling Io XT within the overall MacOS environment, Input Pass through, and more. AJA Control Panel uses a block diagram to show visually what is happening inside Io XT.
- Supports popular 3rd-party Professional Video Applications like Apple Final Cut Pro™ 7, Avid Media Composer, Adobe Premiere Pro, After Effects, Photoshop, and more.

## What's In The Box?

As you unpack the shipping box(es), carefully examine the contents. Ensure you received everything and that nothing was damaged during shipment. If you find any damage, immediately notify the shipping service and supply them with a complete description of the damage. AJA will repair or replace damaged items. If you find shipping damage, contact your AJA dealer or distributor for details on how to have your Io XT repaired or replaced.

Save packing materials and the shipping box. If you ever require service or move your system—use the packaging materials and box for safe shipment.



### ***Io XT Shipping Box Contents***

When you unpack your AJA Io XT, you'll find the following components:

- AJA Io XT Software and Documentation CD-ROM—this CD contains the software installer to place Io XT drivers and related software on an Apple computer featuring Thunderbolt connectivity. Install the software as discussed in this manual in *Chapter 2: Installation and Configuration*. The CD also contains a wide variety of useful information, including this manual you're reading (PDF format).
- Io XT
- 12V power adapter and AC power cord
- Read Me First Notice—Contains late-breaking news and/or errata related to Io XT and the documentation.
- Registration Sheet—allows you to register your Io XT by mail or online (details provided).

## System Requirements

AJA recommends machines with dedicated GPUs as opposed to "built into the motherboard" GPUs. Built in GPU models such as the MacBook Air are still in testing and have not yet been approved for use with Io XT. Below are the current tested and approved Apple models along with representative system configurations for use alongside Io XT.

### System and Software Requirements

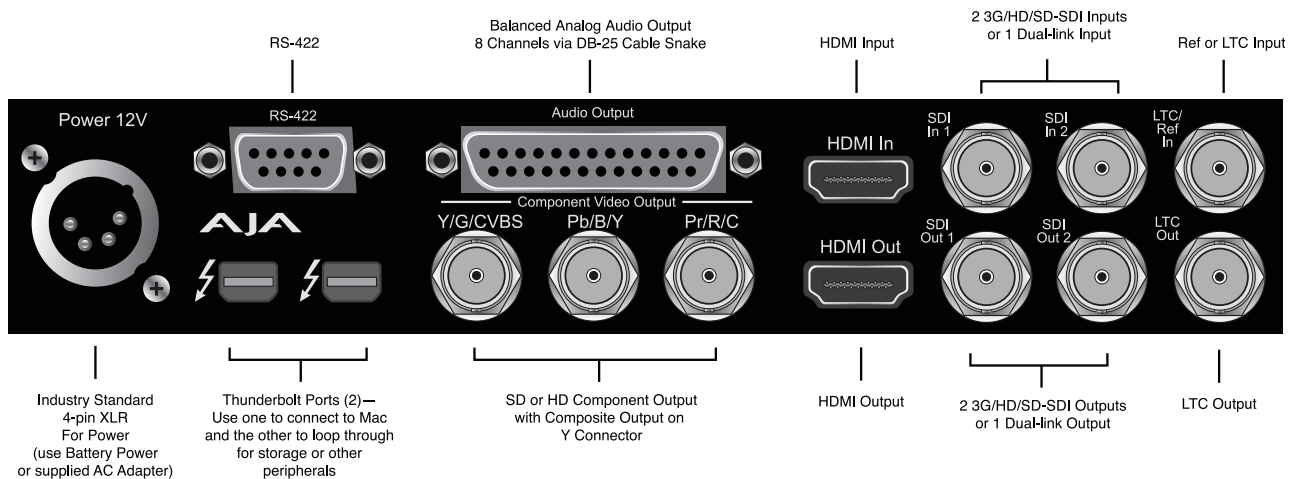
Platform	System Requirements
Mac Mini (with Thunderbolt port)	2.5GHz dual-core Intel Core i5 4GB memory 500GB hard drive1 AMD Radeon HD 6630M OS X Lion
MacBook Pro (with Thunderbolt port)	2.0GHz quad-core Intel Core i7 4GB 1333MHz 500GB 5400-rpm1 Intel HD Graphics 3000 AMD Radeon HD 6490M with 256MB GDDR5
iMac (with Thunderbolt port)	2.5GHz Quad-Core Intel Core i5 1920 x 1080 resolution 4GB (two 2GB) memory 500GB hard drive1 AMD Radeon HD 6750M with 512MB

**Note:** Always consult the release notes for the AJA software version you are running (included with installer) For the latest appropriate match for your software and hardware, visit:

<http://www.aja.com/support/io/io-xt.php>

## Cable Connections

Io XT connections are made directly to the unit's rear connector plate. Eight audio output channels are available through the Tascam-style DB25 connector.



### Io XT Connectors

#### Connector Descriptions— Io XT & Cables

#### HD/SD SDI Input and Output

BNC connectors are provided on Io XT for two HD/SD-SDI inputs and two HD/SD-SDI outputs. The input and output support video and embedded 24-bit digital audio. Use SDI wherever possible for the best quality 10-bit uncompressed video input, capture and output. If peripheral equipment has a variety of inputs/outputs, look to see if it has SDI I/O, and use it where possible. Most high-end professional broadcast equipment supports SDI (VTRs, cameras, media storage servers, etc.).

#### HDMI Input and Output

Two HDMI connectors on the Io XT provide input and output of HDMI compatible video and multi-channel embedded audio (8 channels). Input is HDMI v1.3a while output is HDMI 1.4.

HDCP is not supported on either input or output. Io XT HDMI output does not have HDCP, and input sources having HDCP are not supported. The HDMI input is designed to support long cable runs—up to 100 ft. when using 22 or 24AWG HDMI cable, or up to 50 ft. using 28 or 30AWG HDMI cable. The HDMI output supports standard HDMI cables only.

The AJA Io XT Control Panel allows selection and adjustment of some HDMI parameters; please see Chapter 3 for more information on Control Panel operation.

#### Balanced Analog Audio Out

Io XT provides 8 channel Balanced Analog Audio Output on a DB-25 connector (Tascam-standard pinout, see the Specifications Appendix for this pinout). Audio D/A converters are 24 bit.

## RS422 Machine Control

A female DE-9 connector on Io XT provides connection for VTRs, camcorders, disk media servers, and other devices using RS422 SMPTE (Sony) protocol. (Connector pinout is listed in Appendix A: Specifications.)

## Component Video Output (with Composite and Y/C functions)

Io XT features a group of 3 BNC connectors for output of component, composite and Y/C functions. The signals are labelled on the BNC connectors on the rear panel of Io XT.

**A Note About YPbPr**—Component Video, or YPbPr, has been given several names over time. YUV, Y/R-Y/B-Y, and YCbCr, are just some examples. Although these various formats have some differences in levels, they are all basically the same. Io XT uses the modern YPbPr terminology exclusively. Io XT supports three different types of YPbPr: SMPTE/EBU N10, Betacam (NTSC), and Betacam (NTSC Japan). These three formats differ in level only and are configured in the Mac System via the Io XT Control Panel.

## Reference Video and LTC Input

Two BNC connectors on Io XT provide reference Input and Output. The Reference Video input can also be used for LTC input. The selection of Reference (sync) or LTC is set using the Io XT Control Panel.

In Video Pass-through mode, these connectors are effectively loop-through. Supplying reference signal to the Reference input allows you to synchronize Io XT outputs to your house analog reference video signal (or black burst). If you have a sync generator or central piece of video equipment to use for synchronizing other video equipment in your studio, then connect its analog composite output here. When Io XT outputs video, it uses this reference signal for locking. When connecting a reference video source, the locking signal should be the same format as the Primary format selected in the Io XT Control Panel. It is possible in some circumstances to use an alternate format video signal as long as the basic frame rate is compatible.

## Power

A standard 4-pin male XLR connector provides for 12-Volt DC power to the unit. You can use either the supplied AC Adapter or furnish your own battery source. Since the connector is an industry standard pinout, choices are varied and flexible. Many 3rd party vendors offer products using this standardized power connector.

Pin 1: -  
Pin 4: +  
Pins 2 and 3: not used

## Thunderbolt

Two Thunderbolt connectors are provided for connecting to a Mac that is Thunderbolt-enabled and for connecting to a Thunderbolt peripheral such as a RAID array or Thunderbolt display. Please see the System and Software requirements presented earlier in this Chapter when deciding on the type of Mac to connect.



### Caution!

Although the AJA Io XT supports “plug and play” functionality, many applications do not recognize or operate properly if an input/output device is removed while they are in use. AJA recommends that if the AJA Io XT is ever removed while an application is in use, that the application be quit and then relaunched after the AJA Io XT is reconnected.

**Caution!**

The Io XT can host other devices from its second Thunderbolt connection; however, caution should be used before unplugging the Io XT when other items, such as storage arrays, are attached to the Io XT. Unplugging Io XT will cause these devices to go off line since they will be disconnected from the computer.

## In This Manual

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Chapter 1 is the introduction you're reading, listing features, box contents, and system requirements.

Chapter 2 provides complete instructions for installing and configuring the AJA Io XT. The user is guided through unpacking, cabling the Io XT, installing Io XT Mac Software From CD, then getting it up and running. Important configuration information is also provided on video settings and use of genlock/external reference.

Chapter 3 discusses operational aspects of Io XT and how to work with 3rd-party software.

Appendix A discusses troubleshooting problems with your system and what to do when there's a problem you can't solve.

Appendix B presents a list of technical specifications for the product.

Appendix C details the product safety notes and regulations related to Io XT.



# Chapter 2: Installation & Configuration



## Installation Overview

The installation and set up of an Io XT is very simple. The steps of installation and configuration are discussed here and summarized as follows:

1. Unpack the shipping box (see *What's in the Box* later in this chapter.)
2. If not previously installed on your Thunderbolt equipped Macintosh, ensure that appropriate application software such as Final Cut Pro 7, Avid Media Composer, or Adobe Premiere 5.5 is installed as detailed in its user documentation.
3. For latest System Compatibility and Software Version information for Io XT: Visit: <http://www.aja.com/support/io/io-xt.php>
4. Install AJA Io XT software on your Mac from the latest AJA download (preferred) or from the supplied AJA CD-ROM.

Start by installing the Io XT driver package first, then install any AJA plug-ins for 3rd-party software.

Installers for the Io XT driver software (with AJA Control Panel) are found both on the CD in your shipping box and on the AJA website—we strongly recommend going to AJA website to ensure you get the latest software and documentation.

5. Connect a Thunderbolt cable between the Mac and the Io XT.
6. Cable the system audio and video sources, VTR, audio monitor, and video monitor.
7. When you run the AJA Control Panel, you'll notice that the Io XT is auto-discovered as long as it is properly cabled and powered up.

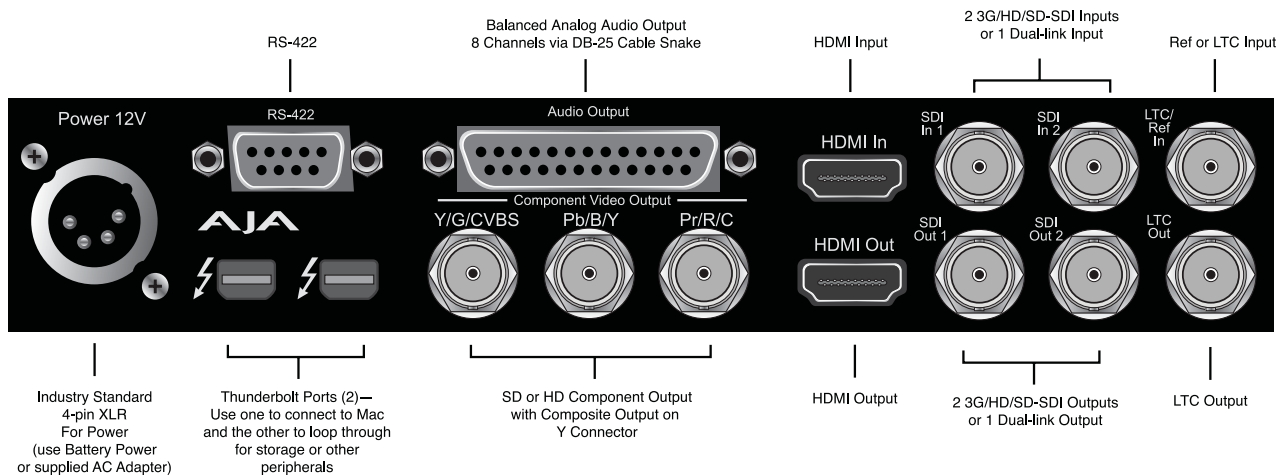
Each of these steps are explained in greater detail on the remaining pages of this chapter.

## Connecting to your Computer

1. With your **computer off**, connect a Thunderbolt cable to one of the two Thunderbolt ports
2. Connect the other Thunderbolt port to storage or other desired peripherals.
3. Assemble the Power Adapter and cable and connect to the Io XT 12V Power connector.
4. Connect your desired Video I/O, Audio monitoring, reference, and machine control cables. (Refer to **Cabling the System** following.)
5. Connect the Power Supply to AC power and turn on Io XT using the front power switch.

**Note:** Ensure that the Apple, Adobe, or other software you are going to use has been installed and used at least once before proceeding to the installation of Io XT software. It is always a good idea to verify you have the most up-to-date release of your AJA software by checking the AJA support site:

<http://www.aja.com/support/io/io-xt.php>



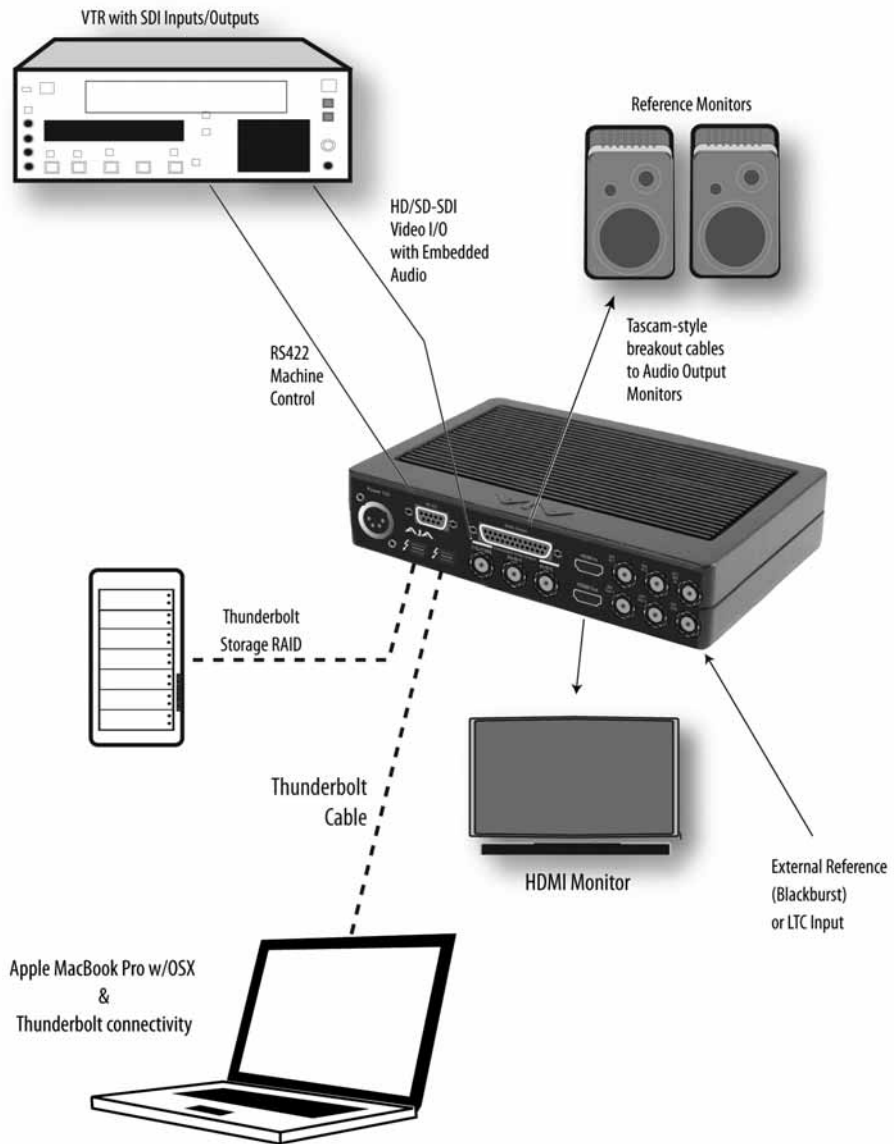
### Io XT Connections

## Cabling the System

### Typical System

Your system may differ depending on VTRs, audio monitoring, and video monitoring.

1. If desired, connect your house reference sync to the lo XT *Ref/LTC* connector (BNC). The second lo XT Ref Loop connector (if used in Pass through mode) can be connected to the VTR or terminated with a 75-ohm terminator. If instead using LTC timecode input, connect to the Ref/LTC input.
2. Connect an HDMI Video Monitor to the lo XT HDMI Out connector. *Or instead, use the Component Analog Video Out* BNC connectors to go to an analog monitor.
3. Connect a 9-pin DE-9 machine control cable between your VTR's RS422 control port and the lo XT *RS-422* machine control connector.
4. Connect two SDI cables between lo XT and your digital VTR (Digital Betacam etc.): one from lo XT *SDI In* to the VTR SDI Out, and one from lo XT *SDI Out* to the VTR SDI In. The lo XT SDI connections have embedded audio so the VTR must be configured accordingly.
5. Use a Tascam-style audio breakout cable to connect stereo output for audio monitoring.



***Typical Thunderbolt Compatible Laptop System Connections***

## Installing Io XT Software

Go to the AJA website and download the latest Io XT driver software and any AJA plug-ins for 3rd-party applications (such as Adobe CS5.5). All of these software installers can be found here:

<http://www.aja.com/support/io/io-xt.php>

If you don't have an appropriate internet connection, use the CD-ROM supplied with the Io XT system to install necessary software drivers. You cannot use Io XT with third-party software until the AJA Io XT software has been installed on the host workstation, plus any AJA plug-ins required.

System software updates may occasionally become available to AJA Io XT owners on our website ([www.aja.com](http://www.aja.com)). We recommend checking occasionally for both software updates and additional product information.

**Note:** If your computer has previously had another video capture or multimedia device installed, ensure you uninstall any related software before installing Io XT. This will prevent any hardware or software conflicts.

If you add Io XT supported applications at a later date and have not previously installed the appropriate drivers, you must run the install program again selecting the appropriate application support software to be installed.

### Macintosh Software Installation

**Note:** Before installing Io XT software, turn off any virus protection and security software that you may have installed on your computer.

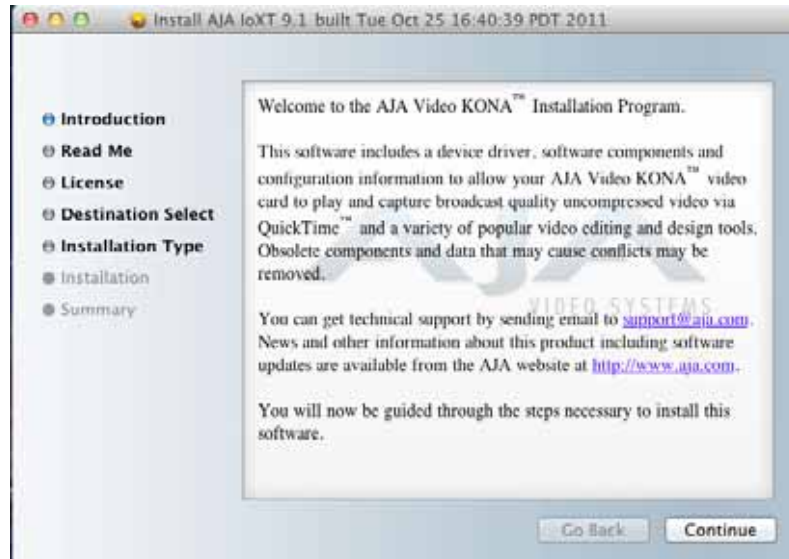
1. For CD-ROM: Insert the Io XT CD in the Mac, locate the Io XT CD icon on the OS X desktop. Double click the icon to see the CD contents, which will appear in its own window.
2. Locate the package files (download or CD); they have an icon that looks like a box and has a ".pkg" or ".mpkg" suffix.

**Note:** Files ending in the ".pkg" and ".mpkg" suffix are OS X installer files. These launch the OS X installer and tell it where and what to install on your system.

3. Double-click the package to log on and begin software installation. Start by installing the Io XT driver package first and then finally install any AJA plug-ins for 3rd-party software.
4. On the following pages, we show the series of screens you'll see when installing the Io XT driver software package.

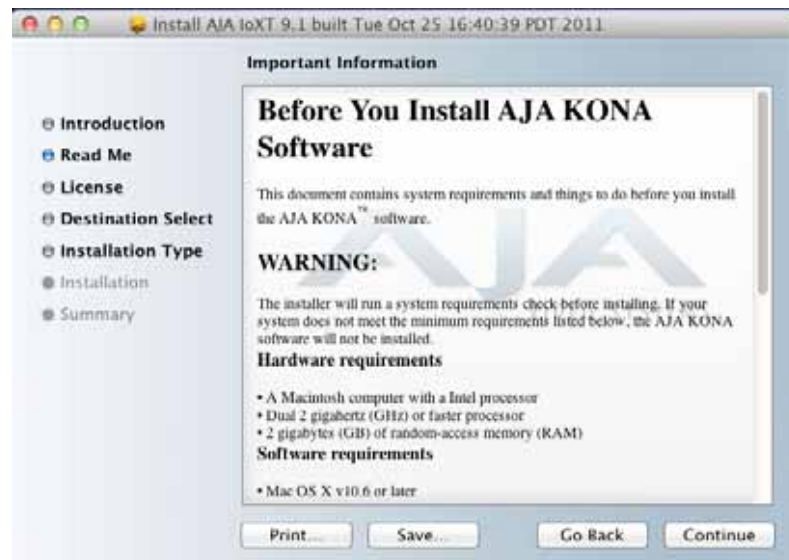
**Note:** During installation the system will ask you to authenticate who you are as currently defined on your OS X user profile. Enter the proper name and password at the Authenticate prompt; if you have multiple users defined, ensure that you log on as a user with administrator-level authority.

5. When you launch the installer, you'll see a series of installer screens.



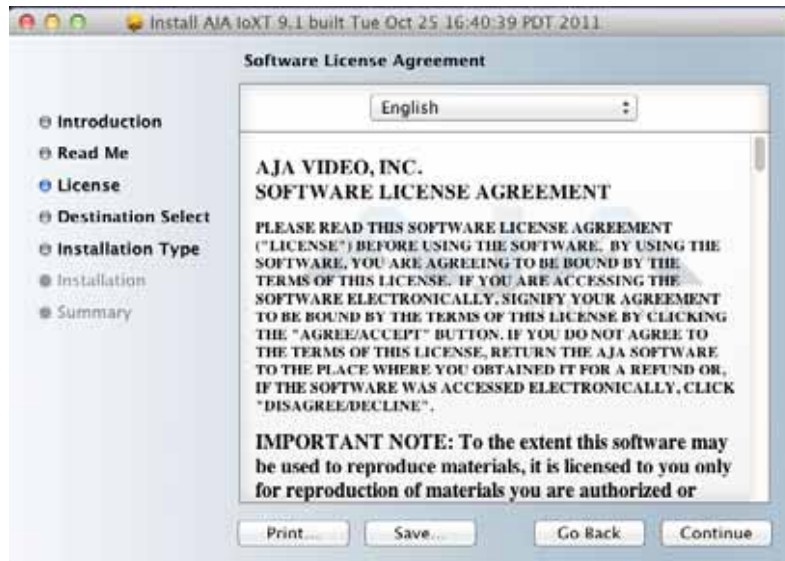
#### *Initial Installer Screen*

6. Click *Continue* to begin installation.
7. The next screen lets you know that the installer will check your Mac to ensure it has the hardware and software resources required (see Minimum Requirements in Chapter 1).



#### *System Check Installer Screen*

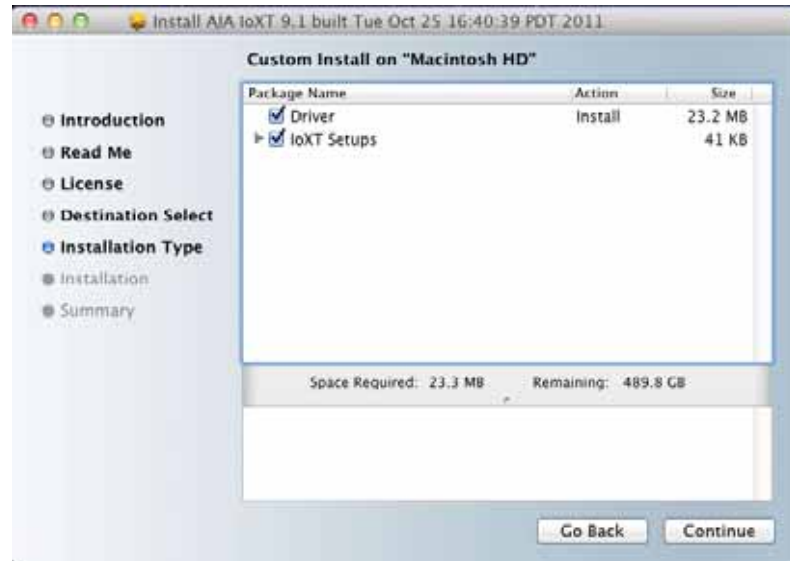
8. Read and agree to the Software License Agreement.



#### ***Io XT Software License Agreement Screen***

9. The next screen shows all the available drives on the Mac Pro. Click on the drive that contains your system files (Apple default is "Macintosh HD"). A green arrow will point to the drive you've selected. Click the *Continue* button to proceed with installation.

10. At the next screen, select the "Io XT Setups" checkbox if you're using Final Cut Pro versions prior to 10. Check any Easy Setups that you want to use (or all of them) and then click the *Continue* button to place the software on the drive you previously selected. If you're using Final Cut Pro X or other 3rd-party applications, you can uncheck the "Io XT Setups" checkbox before clicking Continue.



### ***Installer Screen, Select Easy Setups to be Installed***

**Note:** We only provide the following Easy Setups for FCP 7:

- 1080i 25 Apple ProRes 422 (HQ)
- 1080i 29.97 Apple ProRes 422 (HQ)
- 1080PsF 23.98 Apple ProRes 422 (HQ)
- 720p 50 Apple ProRes 422 (HQ)
- 720p 59.94 Apple ProRes 422 (HQ)

Users can make their own Easy Setups for other formats and frame rates.

11. The installer tells you how much room the installation will take and prompts you to click Install to begin (or go back). Click the *Install* button to proceed.





*Installer Screen, Space Reminder*

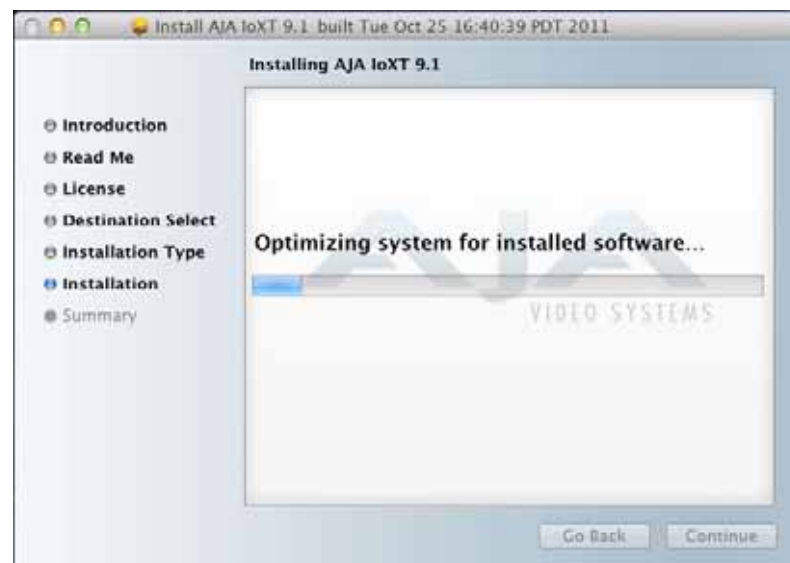


*Authenticate prior to Installing Software*

12. The system will prompt you for your system name and password before writing to disk. Enter your information and click *Install Software* to continue.
13. Next, the system will display a reminder that you'll have to Restart the Mac after installation concludes. Click *Continue Installation*.

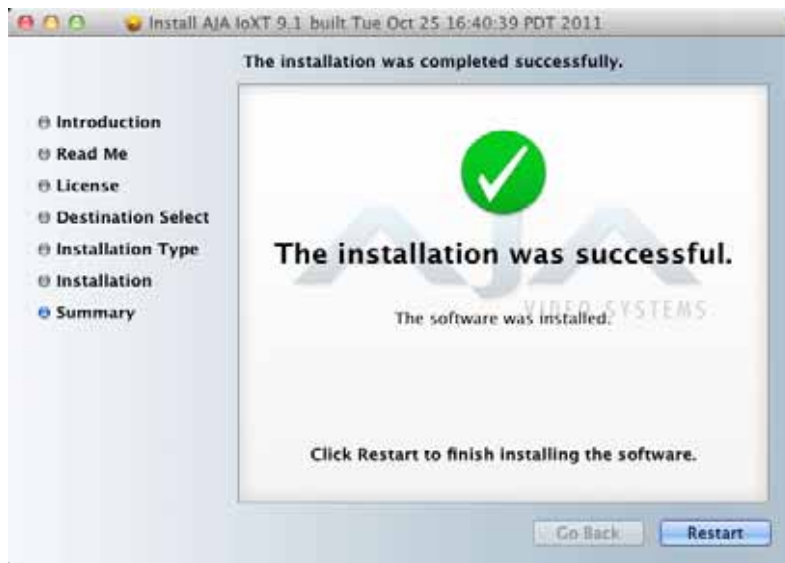


*Installer Screen, Reminder about Restarting*



*Installation Status Messages are Displayed (while installation takes place)*

14. The installer runs and puts all the necessary Io XT drivers and software on the desired hard drive. When it has completed installation, a final screen will be displayed announcing that "software was successfully installed."



***Installation Status Messages are Displayed (while installation takes place)***

15. Click the Restart button to complete the installation procedure. The system will perform software restart.
16. Finally, install any AJA plug-ins required for 3rd-party software. These will have to be downloaded from the AJA website: <http://www.aja.com/support/io/io-xt.php>

For example, if you wish to use the Io XT with Adobe Premiere or Adobe After Effects, you would go the AJA website Io XT support page (URL above) and download the "AJA Mac Plug-ins for Adobe CS5.5". These plug-ins come with complete documentation on how to use them.

## Genlock and Your System

For video stability and proper system operation, you can genlock all equipment to house sync, however genlock is not required for Io XT due to excellent freerun accuracy. To connect genlock, use a black burst generator output looped through the system. On the Io XT house sync is connected to "LTC/Ref In".

**Note:** Be sure to set the Reference/LTC connection to Reference in the AJA Control Panel



## Chapter 3: Operation



### Using io XT with Professional Video /Audio Software

After you install the io XT software and any AJA plug-ins to support your choice of 3rd-party software, you're then ready to begin capturing and playing back video and audio.

Go here to look for AJA plug-ins and documentation for your favorite 3rd-party software applications:

<http://www.aja.com/support/io/io-xt.php>

Once you've installed all the AJA software as detailed in Chapter 2, you'll find the AJA Control Panel application in your Mac Applications folder.



## AJA Control Panel Overview

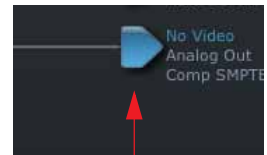
The AJA Io XT Control Panel is a software application that provides a simple visual window showing how the Io XT interface is currently configured, and that allows you to make changes. Settings—both those you changed and those you didn't—can be saved as a snapshot for recall at anytime. This lets you save settings associated with all your frequent tasks; then as you switch tasks you don't have to spend extra time resetting interface configurations—just load the previously saved settings for each task.

One thing you'll notice instantly about the Control Panel is that it represents a visual block diagram of how the unit is configured. The current status, input and output settings, and many other details can be viewed as a color-coded block diagram in the Control Panel.

To ensure you make the most of the software, launch the AJA/Io XT Control Panel application and look at its display. Then refer to the "Basics" described here to fully understand what you're seeing and learn how to view and change the Io XT system configuration.

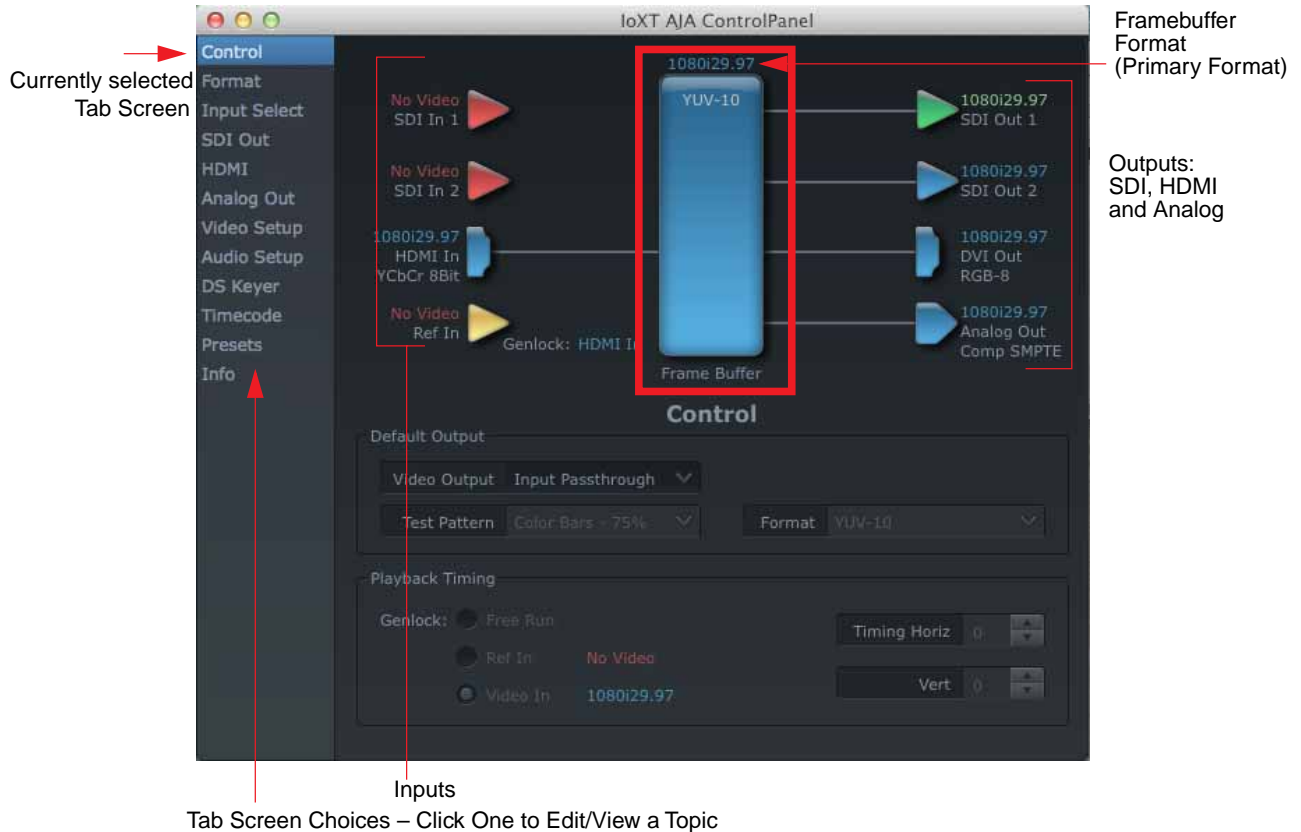
Before we go into too much detail, here are some basic definitions you should know (please refer to the figure that follows for reference). After studying the basics, read "*Who is Controlling Io XT?*" later in this chapter for more advanced information on how applications interact with Io XT.

**Block Diagram Screen**—The top area of the Control Panel shows a visual picture representing the processing (if any) that's currently occurring, including inputs/outputs, reference source, and system status. Lines between inputs, the framebuffer, and outputs, show a video path. Where there are no lines, it shows there is no connection; this can be because an input or output isn't selected. The lines will also show whether the outputs are video or video + key.



Control-Clicking an Icon Produces a Context-sensitive Menu

Icon objects on the block diagram screen (input/output icons, frame buffer, etc.—also called "widgets"—indicate their status by color (explained later) and can be clicked for context-sensitive information and choices. (These same choices can also be made from the tabbed Control Panel screens.)



### AJA Control Panel, Block Diagram

**Framebuffer**—The framebuffer is the “engine” in Io XT where active video operations take place using Final Cut Pro, other 3rd-party applications, or even Io XT itself. The framebuffer has a format (called the “Primary Format” and color space that it follows, as defined in the Tabbed Windows or via external application software (such as the “Easy Setups” in Final Cut). It is important to realize that inside the Macintosh many applications can use the Io XT (as you switch from window to window) and it may not always be obvious which currently controls it.

The Control Panel displays the name of the application controlling the Io XT. In some cases, applications may not always properly “let go” of the I/O interface as another takes over—you’ll be able to tell by looking at the Control Panel.

**Primary Format**—The video format currently assigned to Io XT. This is the format that the framebuffer will use and is shown in the Control Panel using the color blue. All icons in blue are the same as the Primary Format used by the framebuffer. Also any text descriptions in the block diagram that appear in blue also indicate that something is in the primary format. So, for example, if you see that the input and output icons are blue, then you know that the same format is used throughout the video path and that no format conversion is being performed. If a different color is displayed on the input or output, say green for example, then you know that Io XT is performing a format conversion in the video path.

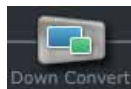
**Secondary Format**—Any format other than the currently selected Primary Format, is a secondary format. As described previously, this means that either the Inputs or Outputs are somehow different from the framebuffer's assigned format (i.e., the "Primary Format"). This can be seen at a glance because the color will be different than blue.

**Input/Output Icons**—The input and output icons are triangles that together with their color show all the input and outputs and their status (selected, not selected, input present or not, format, etc.). A complete video path is shown when inputs and outputs are connected with lines going to/from the framebuffer.



**Input/Output Icon**

**Conversion Icons**—when an input or output is a different standard than the framebuffer, the Io XT may be up- down- or cross-converting the signal to the selected standard. This may be automatic, because it's detected an input signal that differs from the standard currently selected, or because you've explicitly told it to convert. In either case, the block diagram will show the conversion by displaying a conversion icon in between the input/output and the framebuffer.



**Color Meanings**—All items in the Io XT Control Panel block diagram are color-coded to show what is happening in realtime. This applies to both icons and text. These colors have the following corresponding meanings:

- Blue: video is same format as the Primary Format (framebuffer)
- Red: the selected operation cannot be performed
- Yellow: reference video (black burst or other reference source)
- Green: indicates that Io XT is performing an active change to the video making it different from the Primary Format (e.g., down-conversion).

**Control Panel Screens**—The side area of the Io XT Control Panel provides different information categorized by topics. Clicking on a topic—or a block diagram element—displays an information screen corresponding to that topic. Screens that can be selected are:

**Control:** configures Io XT operation and output timing.

**Format:** select the framebuffer primary video format and any secondary formats for conversion of inputs/outputs

**Input Select:** view and edit input selections and how they are mapped

**SDI Out:** select output format

**HDMI:** configure the HDMI I/O

**Analog Out:** configure the component/composite analog output

**Video Setup:** configures Video such as composite black level.

**Audio Setup:** configures Audio options such as analog audio monitor level.

**DS Keyer:** setup and control the insertion of keyed video from the frame buffer or graphics files with alpha channel.

**Timecode:** monitor RP-188 timecode and configure timecode window burn output (Note: SMPTE 12M-2 is the updated name and specification for what was RP-188)

**Presets:** add or delete saved preset configurations (handy for setting up the Io XT for certain workflows and then saving it as a canned configuration for easy later recall)



**Info:** displays status information and firmware version # of the Io XT and how it is installed in the host Macintosh. This information is generally intended for troubleshooting/support.

**Block Diagram Screen** – the top area of the AJA Control Panel shows a visual picture representing the processing (if any) that's currently occurring, including inputs/outputs, any up/down/cross conversion, reference source, and system status. Lines between inputs, the framebuffer, and outputs, show a video path. Where there are no lines, it shows there is no connection; this can be either because an input or output isn't selected or because no video is present at the selected input. The lines will also show whether the input or outputs are single inputs/outputs, video or video + key.

Icon objects on the block diagram screen (input/output icons, frame buffer, etc.- also called "widgets"-indicate their status by color (explained later) and can be clicked for context-sensitive information and choices. (These same choices can also be made from the tabbed Control panel screens.)

**Note:** You can use the Up/Down arrows on your keyboard to navigate Tab selections

**Color Meanings**—all items in the AJA Control Panel block diagram are color-coded to show what is happening in realtime. This applies to both icons and text. These colors have the following corresponding meanings:

*Blue:* video is same format as the Primary Format (framebuffer)

*Red:* the selected operation cannot be performed or an invalid selection has been made

*Yellow:* reference video (black burst or other reference source)

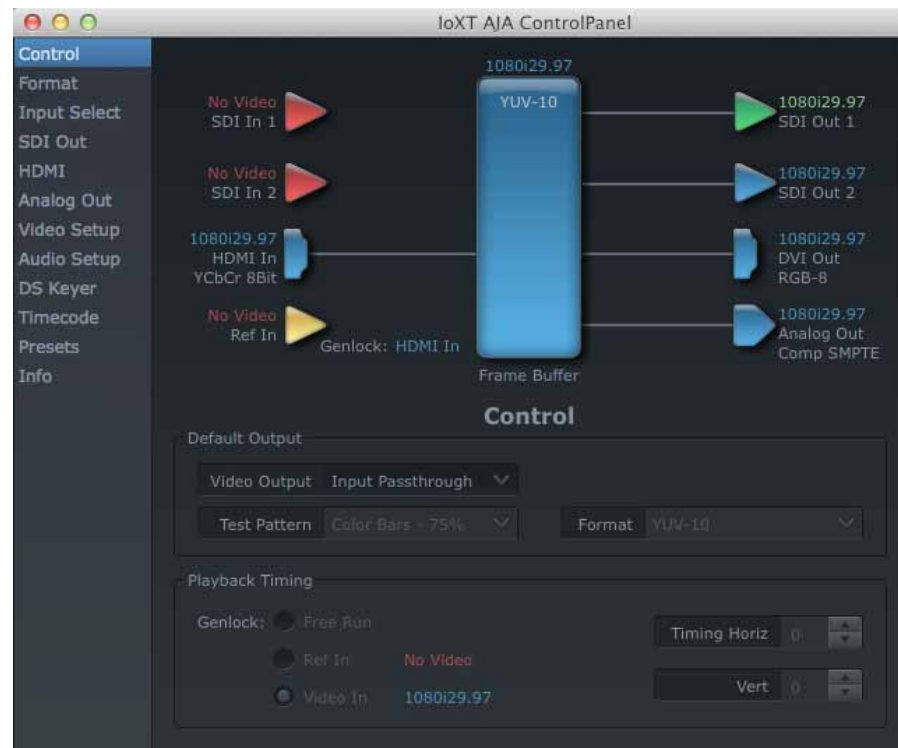
*Green:* indicates that the Io XT is performing some kind of active change to the video, to make it different from the Primary Format (e.g., up/down convert, format change, etc.).

## Control Panel Operation

### Control Tab Screen

The Io XT can be controlled by various software applications running on a host Mac. The Control Tab is where you select how the Io XT directs video and is used by application software. This screen also provides control for configuring output timing with regard to external reference video and horizontal/vertical delay.

At the top of the Control screen it will show the current Default Output and the application currently controlling the Io XT.



*AJA Control Panel, Control Tab*

### Control Tab Screen Settings

**Default Video Output**—this is where you select what Io XT will output as a default when no application has control of the board, such as when the Finder is active. Since Io XT can be controlled by software applications as well as its own control panel, the output can change dynamically. When you select many video applications, they will grab control of the Io XT inputs/outputs. These settings determine what happens when an application that doesn't grab the Io XT inputs/outputs is active.

#### Default Output Choices and their meanings:

*Black:* this selection directs Io XT to output video black whenever an application isn't controlling the card.

*Input Pass through:* this selection directs lo XT to route video from its selected input through the card for processing and output. When this selection is in effect, all Primary/Secondary Format selections are available for selection in controlling the output. This in effect makes the lo XT a converter when used in conjunction with the AJA Control Panel application and a Mac. No applications other than the AJA Control Panel need to be open to convert audio and video from one format to another. For example, if an SD source tape needs to be dubbed to an HD tape, the signal might be routed from the SD VTR to the lo XT, configured for upconversion in the AJA Control Panel and then passed through to the HD VTR for recording.

*Test Pattern:* this selection directs lo XT to output a choice of preset pattern when no other application is using the lo XT. You can choose from:

*Black, Color bars (75% or 100%), Ramp, Multiburst, Line Sweep, Multi Pattern, or Flat Field.*

In addition to the preset test pattern choices, a “Load File...” selection at the bottom of the menu allows you to load any standard Mac RGB graphics file (.tif, .psd, etc.) into the frame buffer for display.

While in Test Pattern mode, you can select RGB or YUV output via a pulldown menu.

**Note:** the graphic file will not be scaled to fit. If it's smaller than the current frame buffer format, lo XT will center it in the frame. If it's larger than the current frame buffer format, it will be cropped on the right and bottom. Also some graphics formats and bit depths may not be supported. Once a graphic file is loaded into the frame buffer it will be retained until it is overwritten by another graphic or test pattern, or when power is turned off. Graphic file names are only “remembered” in the menu as long as the AJA Control Panel application is running.

*Hold Last Application:* this selection directs lo XT to hold and output the last frame of video from the last application to control lo XT. This can be helpful when operating in an environment where you're switching back and forth between multiple application windows.

**Tip:** pressing and holding the Apple *COMMAND* key while clicking in the AJA Control panel—while in any software application—causes control of the lo XT to stay with that application, rather than shifting to the Control Panel. This works regardless of the setting of “Default Output.”

**Playback Timing**—Use these controls to set Genlock and Timing adjustment.

**Genlock** (*Freerun, Ref In, Video In*)—selects how lo XT will synchronize program video:

*Freerun:* In this mode, lo XT generates sync without an external reference source

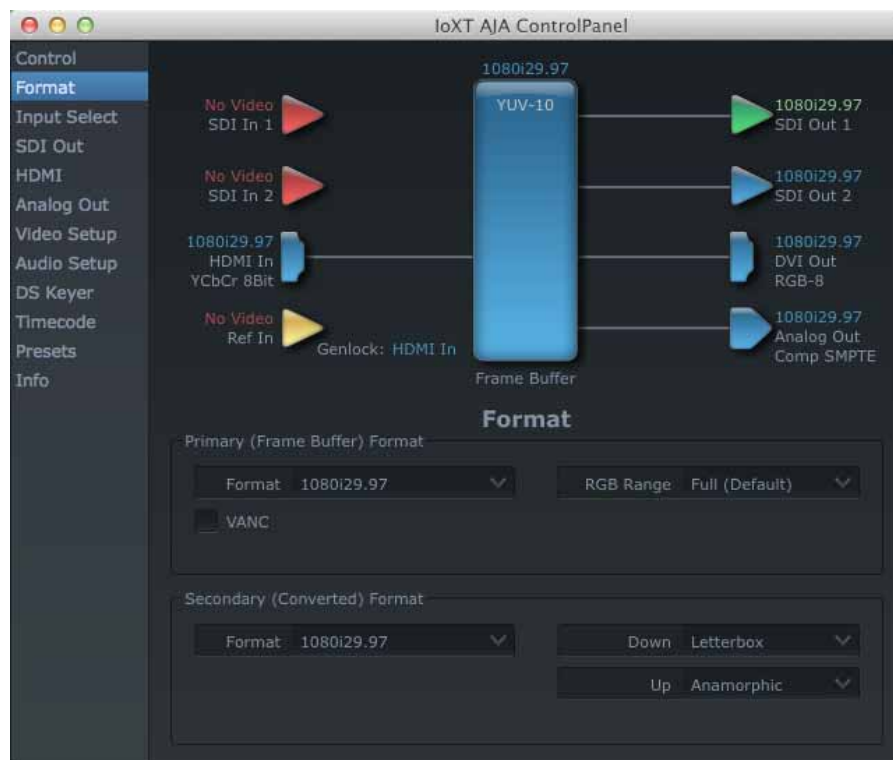
*Ref In:* Directs lo XT to use the Ref Video source for sync (usually an analog black burst video signal)

*Video In:* Directs lo XT to use whichever video input source has been selected in the Inputs tab window for sync

**Timing** (*Horiz* and *Vert*)—these two pull-downs allow output timing adjustment with reference to the Ref Video source selected. The Horizontal reference can be adjusted by selecting a number of pixels (clocks) to offset. Vertical can be adjusted by specifying a number of lines to offset.

## Format Tab Screen

The Formats screen shows the video format currently in use by the Io XT framebuffer (called the *Primary Format*) and allows you to change it. All throughout the Control Panel, choices are always presented based on what Io XT can do with the signals available and the inputs/outputs selected. For example, on the Format screen, if the output or inputs are a different format than the primary, then you'll see an additional information pane that allows you to view and edit the secondary format—including control over whether up/down/cross conversion is employed.



*AJA Control Panel, Formats Tab*

## Format Tab Screen Settings

**Video Format (Primary and Secondary)**—these pull-down menus show the currently selected formats. If you select an alternate value in the Primary Format using the pull-down, it will change the format used by Io XT's framebuffer. When a change is made via the Video Format pull-down or by clicking an icon (widget) and selecting a new format via a contextual menu, the block diagram will change to reflect the new format. In the case of a Secondary Format, the formats available can vary based on what the Primary Format is and the input signal (frame rates of input sources limits the to/from conversion choices). The "Secondary Video Format" pull-down menu lists all compatible formats for selection (incompatible formats are not shown). This allows you to see what you've chosen, and also see those formats that are compatible with the selected Primary format.

The *RGB Range* pulldown menu allows you to select either Full range (0-1023) or SMPTE range (typically 64-940) for RGB color output.

Io XT Formats include:

525i 23.98	1080i 25	1080p23.98	2K1080p23.98
525i 29.97	1080i 29.97	1080p24	2K1080p24
625i 25	1080i 30	1080p25	2K1080p25
720p 23.98	1080sf 23.98	1080p29.97	2K1080sf23.98
720p50	1080sf 24	1080p30	2K1080sf24
720p 59.94	1080sf 25	1080p50a	2K1080sf25
720p 60	1080sf 29.97	1080p59.94a	
	1080sf 30	1080p60a	
		1080p50b	
		1080p59.94b	
		1080p60b	

**Note:** The AJA Control Panel software uses the abbreviation “sf” instead of “psf” when referring to “progressive segmented frame” formats. In the manual and in other literature you may see either of these acronyms used interchangeably. Visually it is easier to discern at a glance if you are working with progressively segmented frame formats (sf in the AJA Control Panel) as compared to progressive frame formats which will show only “p.”

**Crossconversion:** if you have an HD format as your primary and then select a secondary HD format with a different frame size, the Io XT will perform a crossconversion where necessary (input or output) for “like Hz” formats. “Like Hz” means that 720P 59.94 may be converted to 1080i 29.97 (59.94Hz). Converting from disparate Hz is not supported on the Io XT for crossconversions. The example below shows 1080i to 720p.

**Up (Conversion)**—the *Up* and *Down* pull-down menus are available when conversion has been selected for the video path to/from the framebuffer and like Hz formats are selected (the one exception is 1080PsF 23.98 which can be downconverted to 525i 29.97.) Different choices will be available depending on the type of conversion and formats being converted. SD to SD conversions are essentially aspect ratio conversions to accommodate transforming anamorphic images to letterbox or vice versa.

For Upconversion the following choices are available:

- Anamorphic:* full-screen “stretched” image
- Pillar box 4:3:* results in a 4:3 image in center of screen with black sidebars
- Zoom 14:9:* results in a 4:3 image zoomed slightly to fill a 14:9 image with black sidebars
- Zoom Letterbox:* results in image zoomed to fill full screen
- Zoom Wide:* results in a combination of zoom and horizontal stretch to fill a 16:9 screen; this setting can introduce a small aspect ratio change

**Down (Conversion)**—for downconversion the following choices are available:

- Letterbox:* image is reduced with black top and bottom added to image area with the aspect ratio preserved
- Crop:* image is cropped to fit new screen size
- Anamorphic:* full-screen “stretched” image

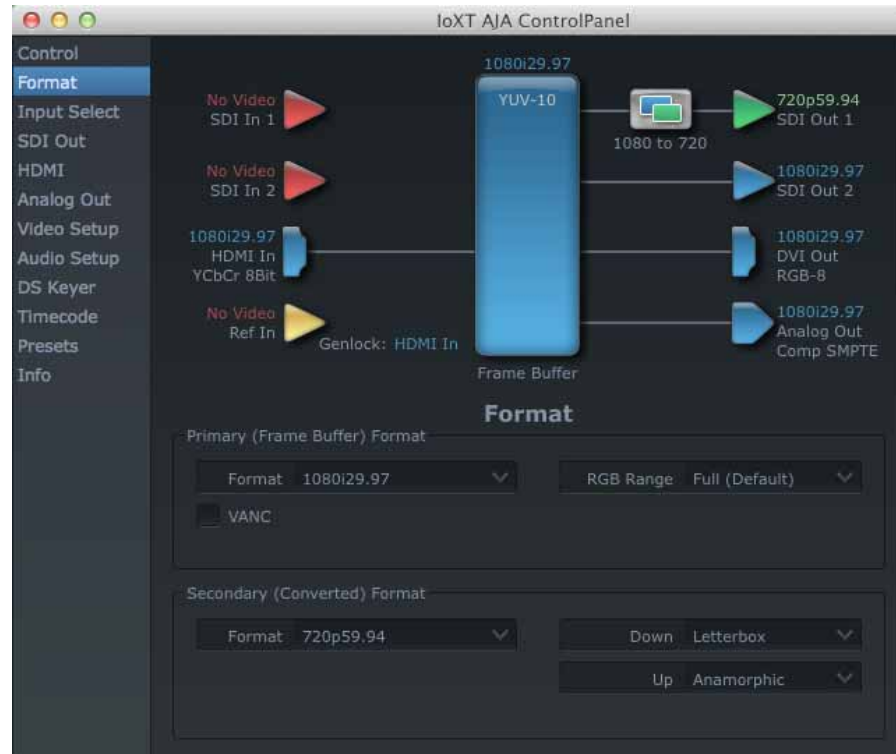
**SD to SD**—this pulldown is for SD to SD aspect ratio conversion.

*Letterbox*: this transforms SD anamorphic material to a letterboxed image.

*H Crop*: will produce a horizontally stretched effect on the image; transforms anamorphic SD to full frame SD

*Pillarbox*: will produce an image in the center of the screen with black borders on the left and right sides and an anamorphized image in the center

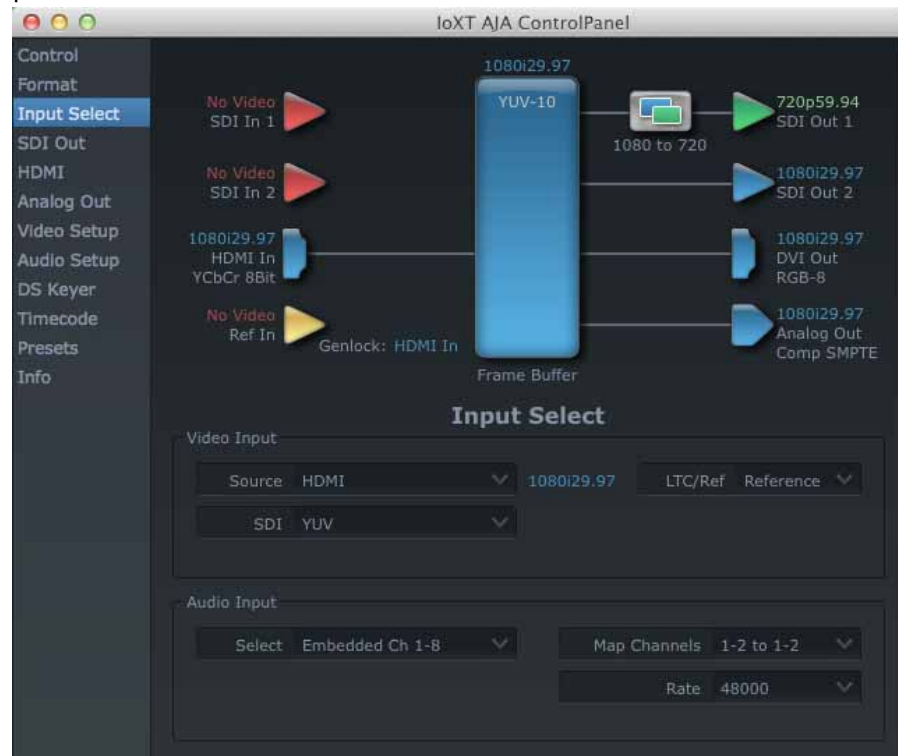
*V Crop*: will transform SD letterbox material to an anamorphic image



*AJA Control Panel, Formats Tab, Example shows cross-conversion*

## Input Select Tab Screen

On the Inputs screen you can view the currently selected video and audio input sources and map audio sources to the channels supported by Final Cut Pro (more on this later). Two information panes in the screen are provided: Video Input and Audio Input.



*AJA Control Panel, Inputs Tab*

## Input Select Tab Settings

**Video Input**—the pulldown menu allows you to see and change what's currently selected and the video format that Io XT has detected (if any). In the example shown previously, it shows that video is selected at the HDMI input and the format is 1080i with a frame rate of 29.97. Since this text is shown in blue, you can tell that it matches the framebuffer's primary format selected in the "Formats" screen. By looking at the input source, you can determine how the primary format should likely be set (unless you want to perform a conversion on input.) If you wish to select a different input use the pulldown to select either SDI 1, 2 or Dual Link for two-wire 4:4:4 RGB, or Stereo 3D. For 3G single-link, choose the SDI Source used and select Stereo 3D from the SDI pulldown menu.

Use the LTC/Ref menu pulldown next to Video Input to select how the LTC BNC is used: selecting Reference means it's used a Reference standard; selecting LTC means it's used for lateral time code (LTC) input.

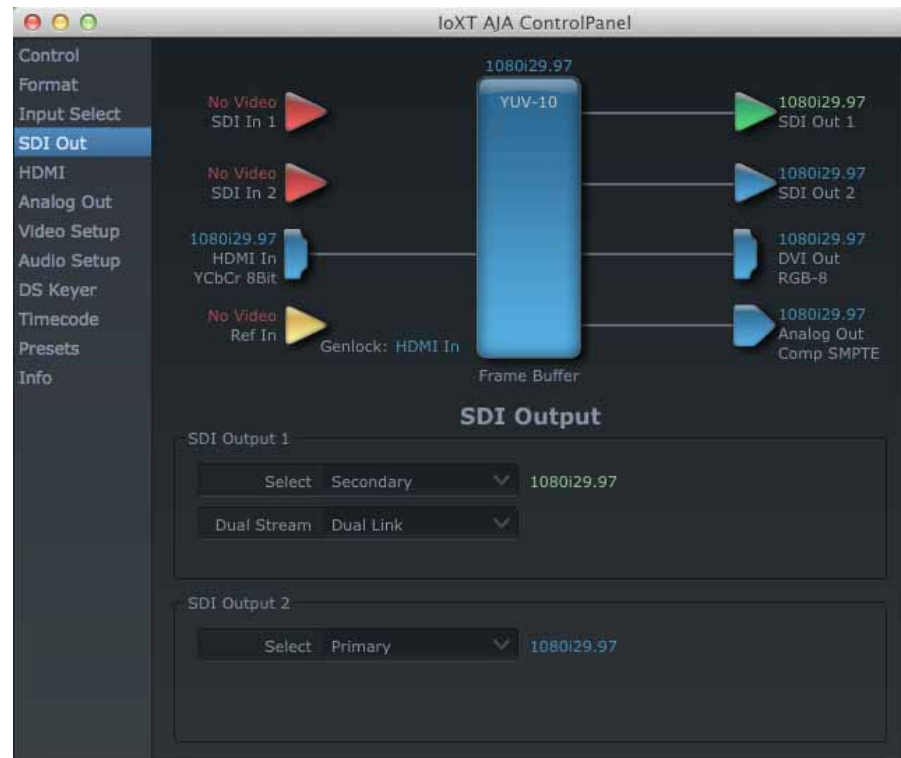
**Audio Input**—this pulldown menu allows you to pick where the audio comes from. Io XT supports up to 8 channels of embedded audio. You can choose out of 16 channels embedded in the SDI which 8 to bring in (1-8 or 9-16). Here you can also select which two channels from the 8 embedded would be mapped to Final Cut Pro if only two channels were selected in that application.

## SDI Output Tab Screen

The SDI Output tab shows the current settings for both of the SDI outputs. Because the outputs can be configured independently, one output may be the Primary format and the other output may be the Secondary format. If an input/output has no video, it will be indicated on the block diagram ("No Video").

### SDI Output Tab Screen Settings—SDI Output 1 and 2

Configure SDI 1 and 2 via pulldowns:



*AJA Control Panel, SDI Output Tab*

#### Select Options:

**Primary**—when selected, this indicates that the SDI output is set to the same format as the framebuffer. That value will be listed in blue.

**Secondary**—when selected, this indicates that the SDI output is set to a format different from the framebuffer (Primary Format). That secondary format value will be listed in green. This shows that active processing of the video is taking place (format change and possibly even up/down-conversion).

**Video+Key**—when selected, this indicates that the SDI 3 video is set to the same format as the framebuffer. SDI 4 is set to a video key signal associated with SDI 3 (the shape to be cut out from the video - this will appear as a black and white image/matte). Using the second io XT output as an Alpha Channel key, with the video output, may be useful for feeding production switchers, DVEs or other professional video equipment. If Video+Key has been selected as an output, the block diagram will indicate the SDI outputs with video in blue and the key in red.

**Stereo**—when selected, this indicates that SDI 1 represents the left eye output and SDI 2 represents the right eye output of stereoscopic material. io XT also offers single link 3Gb output of multiplexed Stereo 3D.



### Dual Stream Options:

**Dual Link**—output (SMPTE 372M) using SDI 1 and SDI 1 in concert.

**3Gb**—output (SMPTE 424M) using a single-link transport.

### HDMI Tab Screen

The Io XT's HDMI input and output are shown and configured at this tab screen.



### AJA Io XT HDMI, HDMI Tab

**HDMI Output Settings**—the Source pulldown menu allows you to select either the primary video format (framebuffer) or a secondary one (up/down/cross-conversion).

Pulldowns are also provided for configuring the video output range, color space and number of embedded audio channels (2 or 8) for the HDMI output. A Protocol pulldown allows you to choose either “HDMI” or “DVI” protocol—use DVI if you’re outputting to a DVI monitor using an HDMI to DVI adapter.

A pulldown menu for 3D output allows you to select either Side-by-Side or Top-Bottom (Stacked) output of left-eye and right-eye signals.

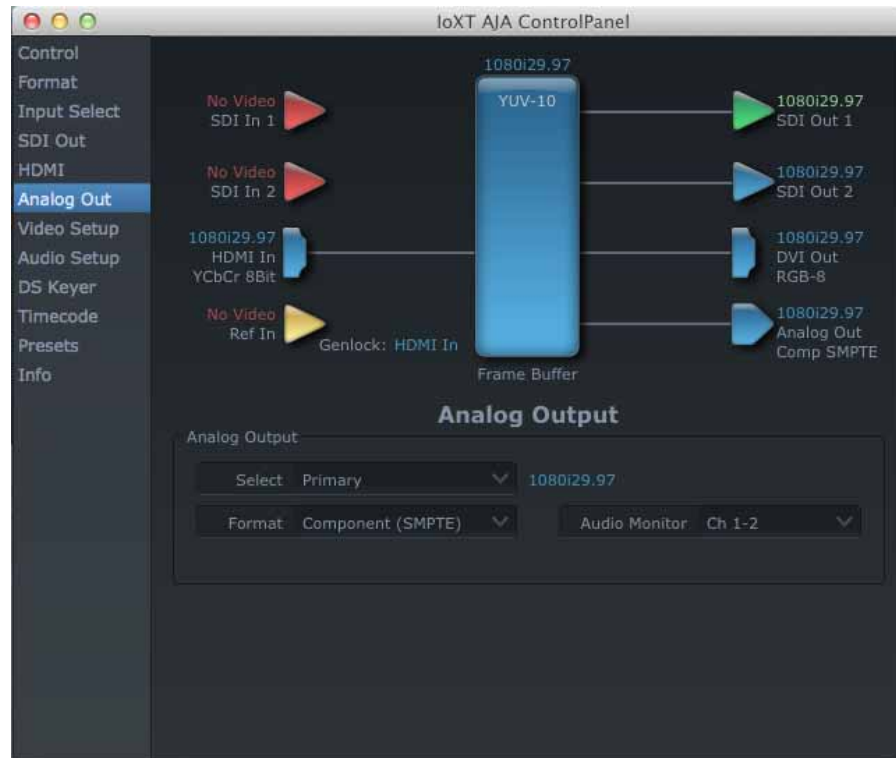
**Note:** This selection must agree with format selection in the third-party CineForm Codec (**NOT** included with AJA Io XT) pulldown menu.

**Audio Channels**—an Audio Channel pulldown allows you to select the number of embedded audio channels for the HDMI output.

**HDMI Input Settings**—the detected HDMI input video format is displayed and you’re given a chance to configure the RGB range (SMPTE or FULL) and select any two embedded channel pairs from those supplied for Final Cut Pro stereo output (if applicable).

## Analog Out Tab Screen

Io XT provides a high-quality analog component or composite + Y/C output, generally used for monitoring. This screen shows the current settings for that analog output, and allows you to re-configure it when desired (format and black-level).



**AJA Control Panel, Analog Out Tab**

### Analog Out Tab Screen Settings

**Analog Output**—select Primary or Secondary (any conversion applied) for the analog output; if a conversion is applied, you'll see the conversion icon appear on the block diagram. Next, select the video format from the *Format* pulldown.

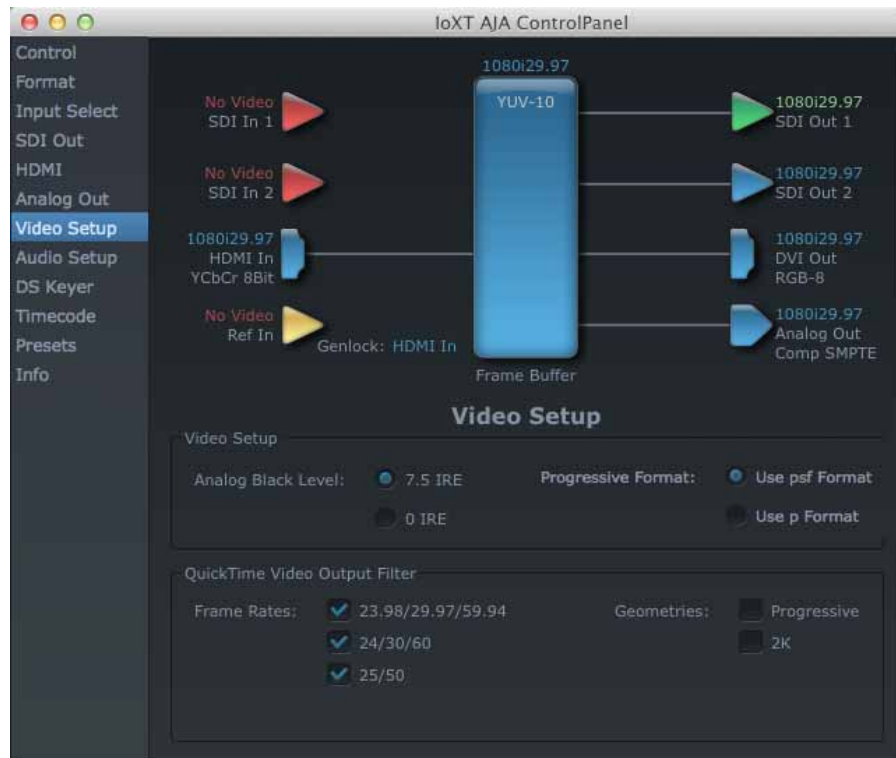
Analog formats can be:

- Composite + Y/C (one composite output *and* a simultaneous Y/C (S-Video) output)
- Component (SMPTE/EBU N10)
- Component (Beta)
- Component (RGB)

**Audio Monitor**—here you select which two channels will be mapped to the analog audio stereo output (headphone jack).

## Video Setup Tab Screen

Io XT provides a high-quality analog component or composite output, generally used for monitoring. This screen shows the current settings for that analog video output, and allows you to re-configure it when desired.



**AJA Control Panel, Video Setup Tab**

### Setup Tab Screen Settings

**Analog Black Level**—choices available for Black Level are the two Composite analog formats. Choices presented are for US or Japan:  
 7.5 IRE (NTSC US)  
 0 IRE (NTSC Japan)

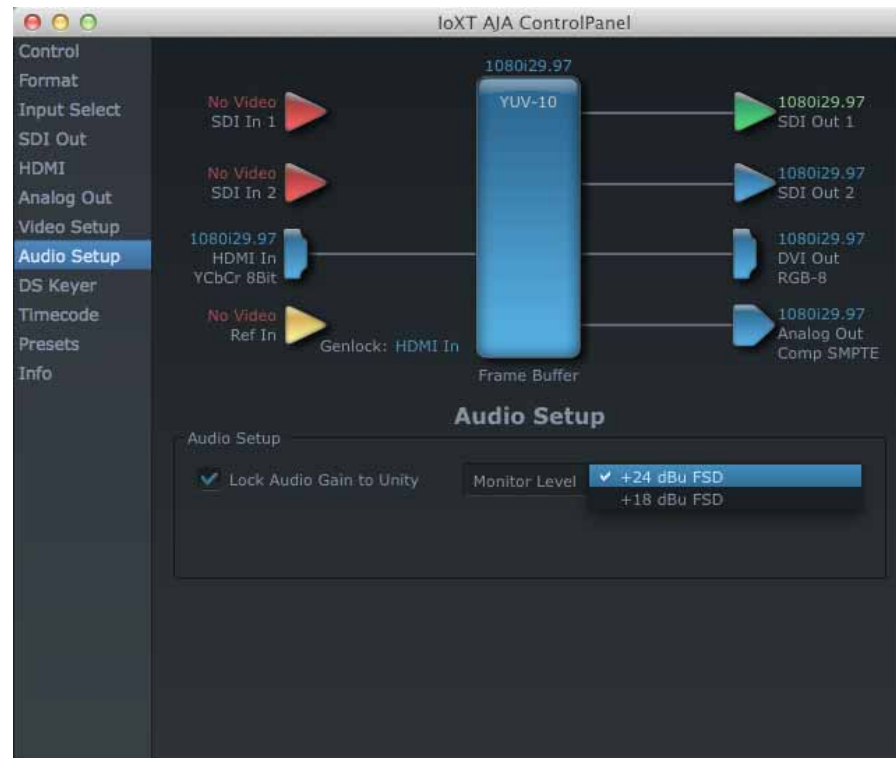
**QuickTime Video Output Filter**—The QuickTime Video Output Display Filter is designed to help manage the comprehensive list of video outputs that may be available to applications, particularly Final Cut Pro's *A/V Devices* tab.

By selecting the checkbox next to specified parameters, the video outputs related to these specified parameters are enabled as possible video outputs for applications. For example, if the checkbox next to *25/50* is unchecked, 50Hz video outputs are deselected and would not be available to the user in the *A/V Devices* tab of Final Cut Pro. To avoid confusion when working in a particular editorial environment, users might elect to leave *50Hz* unchecked if they work solely in a 60Hz editorial environment. The same might be true for users who do not intend to work with true progressive 1080 material.

**Note:** If a prompt occurs in Final Cut Pro stating that the AJA output device is missing, this may be due to the Active Video Filter for a given parameter being unchecked for the format selected in the application. If this occurs, make the appropriate selection in the Control Panel application and re-enter Final Cut Pro where the selection should now be available.

## Audio Setup Tab Screen

This screen shows the current settings for the analog audio output, allowing you to re-configure it when desired.



### *AJA Control Panel, Audio Setup Tab*

#### Audio Setup Screen Settings:

**Lock Audio Gain To Unity**—When set, the io XT will ignore the Final Cut Pro gain setting and set the audio gain at unity. When not set, this checkbox tells the io XT to get the audio gain setting from Final Cut Pro.

**Analog Audio Monitor Level**—This selection determines the audio level that will appear at the analog audio outputs (“FSD” is full-scale-deflection reading as measured on a VU meter). Select +18 for Europe or +24 for USA.

## DS Keyer Tab Screen

The Io XT has a hardware-based downstream keyer that is ideal for putting logos, “bugs” or other video material with an alpha channel on top of video being played out or printed to tape. A typical application would be putting a television station’s call letters or channel over program video content. Keyed video can be from the Io XT internal Frame Buffer (from storage, video In, etc.) or from a graphics file that has an alpha channel (PhotoShop etc.).



**AJA Control Panel, Downstream Keyer Tab**

Settings in the DS Keyer tab provide control over how the keyer operates and whether it's turned on or off. Controls and their meanings in the Tabbed screen are as follows:

### Mode:

**Downstream Keyer Off** — when this pulldown menu item is selected the downstream keyer will be turned off

**Frame Buffer over Matte**— places the keyed video with alpha channel currently in the Frame Buffer over a fixed color matte determined by the “Matte Color” setting set separately.

**Frame Buffer over Video In**—places the keyed video currently in the Frame Buffer over the video input for playout or print-to-tape.

**Graphic over Matte**—places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over a fixed color matte determined by the “Matte Color” setting set separately.

**Graphic over Video In**—places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over the video input for playout or print-to-tape.

**Graphic over Frame Buffer**—places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over the current contents of the Io XT Frame Buffer (which might be from storage, video In, etc.).

**Matte Color:** only available when the pulldown “Frame Buffer over Matte” or “Graphic over Matte” are selected—pressing this button brings up a color selection dialog. The dialog provides a variety of ways to select a matte color including a color wheel, color picker (choose from a location anywhere on the computer screen), numeric sliders, swatches, “crayons”, and spectrums. The matte chosen will be used as a video background under the keyed video.

**Foreground pre-multiplied (checkbox):** use to avoid “matte lines” and improve the appearance of the foreground (key) being composited over the background.

#### Audio Out:

**Frame Buffer**—select audio out to be routed from the Frame Buffer.

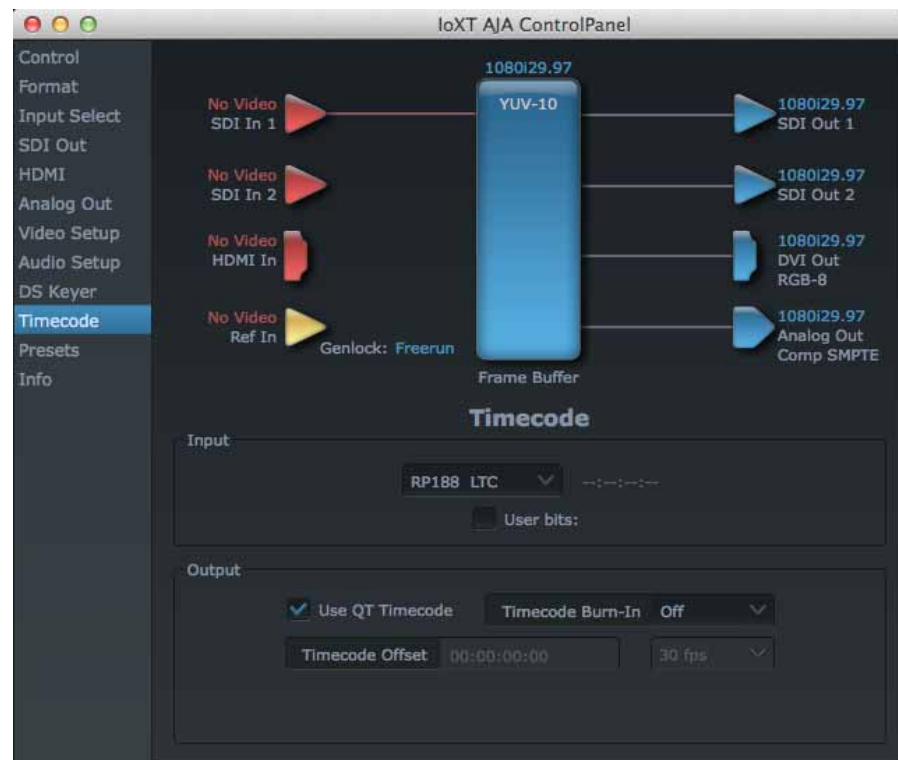
**Audio In**—select audio out to be routed from the Io XT’s selected input(s).

**Graphic File:** this pulldown allows you to choose from any recently accessed file or select a new file (“Load File...”), which then brings up a file dialogue. Remember that the file raster (pixel x pixel count) should match the primary format in the frame buffer or the secondary format if upconverting. Example: you wish to key a logo on top of your 1920x1080 footage, the still image with alpha channel that you load should be 1920x1080.

## Timecode Screen

The timecode screen is used for both monitoring the RP-188 timecode embedded in the digital data stream and for selecting a timecode offset (if required) for the attached VTR (connected to the RS-422 port)—and sent during assemble-edit mode.

Note: SMPTE 12M-2 is the updated name and specification for what was RP-188.



*AJA Control Panel, Timecode Tab*

## Timecode Screen Settings

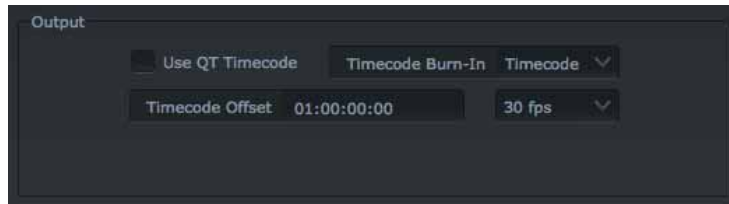
**RP-188 Timecode <n>**—in RP-188 timecode (SMPTE 12M-2) there can be multiple timecode values in the data stream. Use this pull-down to select the one you wish to monitor. The selection will be displayed in the timecode value displayed to the right of the pull-down.



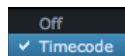
**User Bits**—For monitoring variable framerate (VFR) timecode (such as Varicam), you may wish to monitor the user bits embedded in the timecode. If you set this checkbox, Io XT will detect and interpret the user bits and display them next to the checkbox.

**Use QuickTime Timecode**—when checked, this directs Io XT to output timecode from the QuickTime timecode track. When not checked, Io XT uses the Output Timecode Offset value plus the number of frames into the movie. Note: not all QuickTime applications use or support timecode tracks—so sometimes the QuickTime timecode is missing or not meaningful.

**Output Timecode Offset** (entry field and FPS pull-down)—this text entry field allows you to specify a timecode offset for use with Final Cut Pro 7 (or any other application that has timecode offsets that are user-controlled). In FCP, go to “Timeline Options” and locate the “Starting Timecode” value. Use that same value here as the “Output Timecode Offset” to ensure the timecode is synchronized.



**Timecode Burn-in**—this pulldown selects whether the timecode value is “burned-in” on video output from Io XT.



If set to “OFF”, timecode will not be keyed over the video. If set to “timecode”, then the timecode value will be keyed over the output video. This can be useful for synchronizing, choosing edit points, dailies, and many other purposes.

**Note:** SMPTE RP 188 defines a standard for the transmission of time code and control code in the ancillary data space of a digital television data stream. Time code information is transmitted in the ancillary data space as defined in ANSI/SMPTE 291M. Multiple codes can be transmitted within a single digital video data stream. Other time information, such as real time clock, DTTR tape timer information, and other user-defined information, may also be carried in the ancillary time code packet instead of time code. The actual information transmitted through the interface is identified by the coding of a distributed binary bit. Equipment manufacturers can use the meta data for different purposes.

## Presets Screen

After configuring the AJA Control Panel Tabbed screens, you can then save all your settings as a snapshot for later recall—called a *preset*. In this way, you can organize presets for all your typical tasks, eliminating time-robbing manual reconfiguration each time. To save a preset, simply go to the Presets screen and click “Save Preset”. A dialog will be presented asking you for a name; enter a meaningful name and click “OK”. Thereafter the preset will be available under the Control Panel “Presets” list.



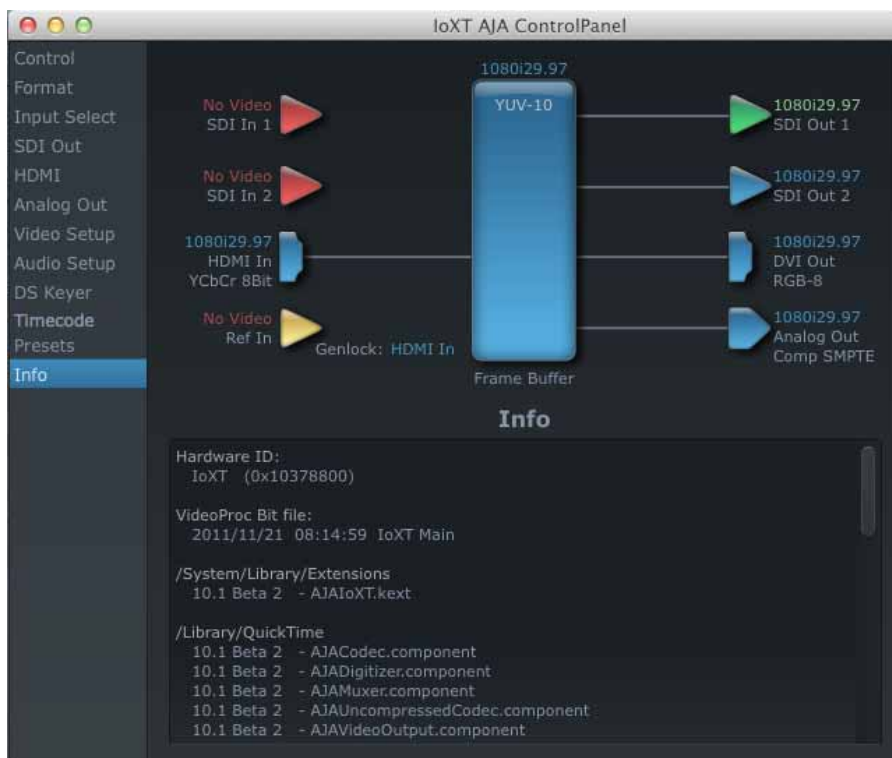
### **Presets Screen**

From the Presets screen you can manage your collection of presets easily. To Load or Delete a stored preset, just select it with your mouse and then click the “Load Preset” or “Delete” button respectively.



## Info Tab Screen

This Tabbed screen shows the Io XT software files that have been installed on your system. This information may be needed if you talk to an AJA Customer Service representative to determine if files are missing or need updating.



*Information Screen in Standard Mode*



# Appendix A: Troubleshooting

## If You Run Into Problems

One useful way to find the source of problems is to isolate your system to the smallest size where the problem still occurs and then note all the symptoms. This serves to eliminate areas not involved in the problem and makes finding the problem easier.

Once you've noted problem symptoms, look through the following table and see if any of the symptoms are listed. If so, check the items listed. If you later need to call for customer service, let them know all of the things you've tried and when and how the symptoms appeared.

Symptom	Check
Disk RAID cannot keep up (dropped frames etc.).	Ensure the disk system is providing at least 50 MB/second sustained transfer rate
Dropped frames during playback.	1. Virus checking software running in the background (disable it). 2. Scratch drive not set to the RAID.
Dropped frames during record.	1. RAID cannot sustain the data rate of the capture preset codec. 2. Virus checking software running in the background (disable it). 3. Scratch drive not set to the RAID.
Media is not being captured from desired external device.	Check the settings in the <i>Input</i> tab of the Io XT Control Panel application. Also check equipment cables.
Dropped frames during playback	Look for scroll bars in the viewer or canvas as a warning sign that the zoom setting exceeds the fit-t-window.
Video stutter during playback.	RAID cannot sustain data rate.
Red render bar occurs when placing a clip on a sequence.	The sequence setting does not match the clip setting.

## Updating Software

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Check on the AJA Video website (<http://www.aja.com/support/io/io-xt.php>) for software updates. If any are available, download the file and read any associated instructions prior to installing the software.

## Support

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When calling for support, first check over your system configuration and ensure everything is connected properly. Even if you cannot find the cause of the problem, having this information at hand will help when you call AJA Customer Support for help.

If the problem is unknown or you need general help, first contact the dealer where you purchased the product. AJA dealers offer product support for many service requirements.

If the problem is a 3rd-party software operational issue, Mac system issue, , then call Apple Customer Support or the 3rd-party software manufacturer for help.

If the problem is an AJA Video Io XT issue, then contact AJA Video Customer Support using one of the methods listed below:

Contacting by Mail Address:

180 Litton Drive, Grass Valley, CA. 95945 USA  
Telephone: 1.800.251.4224 or 1.530.274.2048  
Fax: 1.530.274.9442

Web: <http://www.aja.com>  
Support Email: [support@aja.com](mailto:support@aja.com)

# Appendix B: Specifications

## Formats

525i 29.97	2K1080p23.98
625i 25	2K1080p24
720P 23.98	2K1080p25
720p 25	2K1080sf23.98
720P 50	2K1080sf24
720P 59.94	2K1080sf25
720P 60	
1080i 25	
1080i 29.97	
1080i 30	
1080PsF 23.98	
1080PsF 24	
1080PsF 25	
1080PsF 29.97	
1080PsF 30	
1080p 23.98	
1080P 24	
1080P 25	
1080P 29.97	
1080P 30	
1080P 50	
1080P 59.94	
1080P 60	

## Video Input

Dual-rate (SD or HD)  
3G SD and HD-SDI, SMPTE-259/292/296/424, 10-bits  
Single Link 4:2:2 or 4:4:4 (3G)  
Dual-link HD 4:4:4  
HDMI 1.3a

## Video Output

Digital: H3G SD and HD-SDI, SMPTE-259/292/296/424  
Dual-link HD 4:4:4  
HDMI v1.4, 30/36 bits/pixel, RGB or YUV, 2.25Gbps

Analog: SD and HD Output, 12-bits, BNC  
HD: YPbPr, RGB  
SD: YPbPr, RGB (component mode) or Composite + Y/C (composite mode with simultaneous Y/C)

## Audio Input

Digital: 24-bit SMPTE-259 SDI embedded audio, 8-ch, 48 KHz synchronous  
HDMI embedded audio (8-ch)

## Audio Output

Digital: 24-bit SMPTE-259 SDI embedded audio, 8-ch, 48 KHz synchronous  
HDMI embedded audio (8-ch)  
Analog: 8 channel 24-bit balanced analog audio output (via DB-25 breakout cable)  
Headphone output (mini-TRS) with a lockable level control knob

## Up-Conversion

Hardware 10-bit  
*Anamorphic*: full-screen  
*Pillar box 4:3*: results in a 4:3 image in center of screen with black sidebars  
*Zoom 14:9*: results in a 4:3 image zoomed slightly to fill a 14:9 image  
with black sidebars  
*Zoom Letterbox*: results in image zoomed to fill full screen  
*Zoom Wide*: results in a combination of zoom and horizontal stretch to fill  
a 16:9 screen; this setting can introduce a small aspect ratio change

## Down-Conversion

Hardware 10-bit  
*Anamorphic*: full-screen  
*Letterbox*: image is reduced with black top and bottom added to image  
area with the aspect ratio preserved  
*Crop*: image is cropped to fit new screen size

## Cross-Conversion

Hardware 10-bit  
1080i to 720P  
720P to 1080i  
720P to 1080PsF

## SD to SD Aspect Ratio Conversion

Letterbox: This transforms SD anamorphic material to a letterboxed image.  
H Crop: Will produce a horizontally stretched effect on the image; transforms anamorphic  
SD to full frame  
SD Pillarbox: Will produce an image in the center of the screen with black borders on the left  
and right sides and an anamorphized image in the center  
V Crop: Will transform SD letterbox material to an anamorphic image.

## Reference Input or LTC Input

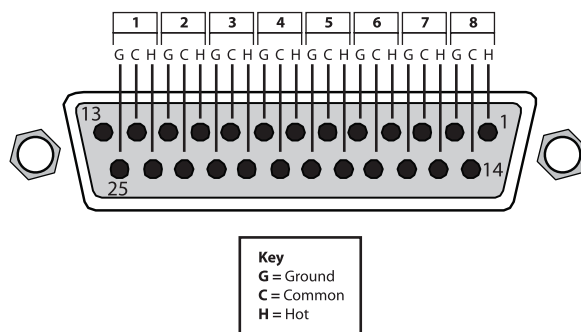
1 BNC assignable to Reference Video or LTC Input  
Reference: Analog Color Black (1V) or Composite Sync (2 or 4V)

## Machine Control

RS-422, Sony 9-pin protocol. 9-pin D-connector pinout is as follows:

1.....	GND
2.....	RX-
3.....	TX+
4.....	GND
5.....	No Connection
6.....	GND
7.....	RX+
8.....	TX-
9.....	GND
Shell.....	GND

## DB25 Analog Audio Output Connection



### Connector Pinout

The DB25 connector on the Io XT rear panel supports a TASCAM-style cable snake for balanced 8-channel analog audio. The pinout follows the TASCAM DB-25 standard shown in the drawing above.





# Appendix C: Safety & Compliance

## Federal Communications Commission (FCC) Compliance Notices

### Class A Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Canadian ICES Statement

### Canadian Department of Communications Radio Interference Regulations

This digital apparatus does not exceed the Class A limits for radio-noise emissions from a digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. This Class A digital apparatus complies with Canadian ICES-003.

### Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

## European Union and European Free Trade Association (EFTA) Regulatory Compliance

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHENSTEIN, NORWAY, SWITZERLAND

### Declaration of Conformity

Marking by this symbol indicates compliance with the Essential Requirements of the EMC Directive of the European Union 2004/108/EC.



This equipment meets the following conformance standards:

#### Safety:

CB- IEC 60065:2001 + A1:2005

NRTL - UL 60065:2003 R11.06, CSA C22.2 NO. 60065:2003 + A1:06

GS - EN 60065:2002 + A1

Additional licenses issued for specific countries available on request.

#### Emissions:

EN 55103-1: 1996

EN61000-3-2:2006, EN61000-3-3:1995 +A1:2001 +A2:2005

CISPR 22: 2006

#### Immunity:

EN 55103-2: 1996

EN61000-4-2:1995 + A1:1999 + A2:2001, EN61000-4-3:2006, EN61000-4-4:2004,

EN 61000-4-5: 2005, EN 61000-4-6:2007, EN61000-4-11:2004

The product is also licensed for additional country specific standards as required for the International Marketplace.

#### Warning!



This is a Class B product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

**Achtung!** Dieses ist ein Gerät der Funkstörgrenzwertklasse B. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

**Attention!** Ceci est un produit de Classe B. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

## Korean Compliance Statement

### 1) Class A ITE

A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
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### 1) Class A device

Class A (Broadcasting Communication Equipment for Office Use)	As an electromagnetic wave equipment for office use (Class A), this equipment is intended to use in other than home area. Sellers or users need to take note of this.
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## Taiwan Compliance Statement

警告使用者：  
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

This is a Class A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class A.

## Japanese Compliance Statement

### 1. Class A ITE

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。V C C I - A

This is a Class A product based on the standard of the VCCI Council (VCCI V-3/2008.04). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

## Translated caution statements, warning conventions and warning messages

The following caution statements, warning conventions, and warning messages apply to this product and manual.



Warning Symbol



Hazard Warning



Caution Symbol

## Before operating your AJA unit, read the instructions in this document

**Warning!**

Read and follow all warning notices and instructions marked on the product or included in the documentation.

**Avertissement !** Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

**Warnung!** Lesen und befolgen Sie die Warnhinweise und Anweisungen, die auf dem Produkt angebracht oder in der Dokumentation enthalten sind.

**¡Advertencia!** Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

**Aviso!** Leia e siga todos os avisos e instruções assinalados no produto ou incluídos na documentação.

**Avviso!** Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.

**Warning!**

Do not use this device near water and clean only with a dry cloth.

**Avertissement!** N'utilisez pas cet appareil près de l'eau et nettoyez-le seulement avec un tissu sec..

**Warnung!** Das Gerät nicht in der Nähe von Wasser verwenden und nur mit einem trockenen Tuch säubern.

**¡Advertencia!** No utilice este dispositivo cerca del agua y límpielo solamente con un paño seco.

**Aviso!** Não utilize este dispositivo perto da água e limpe-o somente com um pano seco.

**Avviso!** Non utilizzare questo dispositivo vicino all'acqua e pulirlo soltanto con un panno asciutto.

**Warning!**

Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

**Avertissement !** Ne bloquez aucune ouverture de ventilation. Suivez les instructions du fabricant lors de l'installation.

**Warnung!** Die Lüftungsöffnungen dürfen nicht blockiert werden. Nur gemäß den Anweisungen des Herstellers installieren.

**¡Advertencia!** No bloquee ninguna de las aberturas de la ventilación. Instale de acuerdo con las instrucciones del fabricante.

**Aviso!** Não obstrua nenhuma das aberturas de ventilação. Instale de acordo com as instruções do fabricante.

**Avviso!** Non ostruire le aperture di ventilazione. Installare in conformità con le istruzioni del fornitore.

**Warning!**

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

**Avertissement !** N'installez pas l'appareil près d'une source de chaleur telle que des radiateurs, des bouches d'air de chauffage, des fourneaux ou d'autres appareils (amplificateurs compris) qui produisent de la chaleur.

**Warnung!** Nicht in der Nähe von Wärmequellen wie Heizkörpern, Heizregistern, Öfen oder anderen Wärme erzeugenden Geräten (einschließlich Verstärkern) aufstellen.

**¡Advertencia!** No instale cerca de fuentes de calor tales como radiadores, registros de calor, estufas u otros aparatos (incluidos amplificadores) que generan calor.

**Aviso!** Não instale perto de nenhuma fonte de calor tal como radiadores, saídas de calor, fogões ou outros aparelhos (incluindo amplificadores) que produzam calor.

**Avviso!** Non installare vicino a fonti di calore come termosifoni, diffusori di aria calda, stufe o altri apparecchi (amplificatori compresi) che emettono calore.

**Warning!**

Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been

dropped.

**Avertissement !** Référez-vous au personnel de service qualifié pour tout entretien. L'entretien est exigé quand l'appareil a été endommagé de quelque manière que ce soit, par exemple lorsque le cordon d'alimentation ou la prise sont endommagés, que du liquide a été versé ou des objets sont tombés dans l'appareil, que l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

**Warnung!** Das Gerät sollte nur von qualifizierten Fachkräften gewartet werden. Eine Wartung ist fällig, wenn das Gerät in irgendeiner Weise beschädigt wurde, wie bei beschädigtem Netzkabel oder Netzstecker, falls Flüssigkeiten oder Objekte in das Gerät gelangen, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht ordnungsgemäß funktioniert oder fallen gelassen wurde.

**¡Advertencia!** Consulte al personal calificado por cuestiones de reparación. El servicio de reparación se requiere cuando el dispositivo ha recibido cualquier tipo de daño, por ejemplo cable o espigas dañadas, se ha derramado líquido o se han caído objetos dentro del dispositivo, el dispositivo ha sido expuesto a la lluvia o humedad, o no funciona de modo normal, o se ha caído.

**Aviso!** Remeta todos os serviços de manutenção para o pessoal de assistência qualificado. A prestação de serviços de manutenção é exigida quando o dispositivo foi danificado mediante qualquer forma, como um cabo de alimentação ou ficha que se encontra danificado/a, quando foi derramado líquido ou caíram objectos sobre o dispositivo, quando o dispositivo foi exposto à chuva ou à humidade, quando não funciona normalmente ou quando foi deixado cair.

**Avviso!** Fare riferimento al personale qualificato per tutti gli interventi di assistenza. L'assistenza è necessaria quando il dispositivo è stato danneggiato in qualche modo, ad esempio se il cavo di alimentazione o la spina sono danneggiati, è stato rovesciato del liquido è stato rovesciato o qualche oggetto è caduto nel dispositivo, il dispositivo è stato esposto a pioggia o umidità, non funziona correttamente o è caduto.

**Caution!**

This device is a Class A product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

**Attention!** Le périphérique est un produit de Classe A. Le fonctionnement de cet équipement dans une zone résidentielle risque de causer des interférences nuisibles, auquel cas l'utilisateur devra y remédier à ses propres frais.

**Achtung!** Dies ist ein Gerät der Klasse A. Bei Einsatz des Geräts in Wohngebieten kann es Störungen des Radio- und Fernsehempfangs verursachen. In diesem Fall muss der Benutzer alle notwendigen Maßnahmen ergreifen, die möglicherweise nötig sind, um die Störungen auf eigene Rechnung zu beheben.

**¡Precaución!** Este es un producto clase A. El uso de este equipo en áreas residenciales puede causar interferencias nocivas, en cuyo caso, se requerirá que los usuarios tomen cualquier medida necesaria para corregir la interferencia por cuenta propia.

**Cuidado!** Este dispositivo é um produto Classe A. Operar este equipamento em uma área residencial provavelmente causará interferência prejudicial; neste caso, espera-se que os usuários tomem as medidas necessárias para corrigir a interferência por sua própria conta.

**Attenzione!** Questo dispositivo è un prodotto di Classe A. Il funzionamento di questo apparecchio in aree residenziali potrebbe causare interferenze dannose, nel cui caso agli utenti verrà richiesto di adottare tutte le misure necessarie per porre rimedio alle interferenze a proprie spese.



**Warning!**

Disconnect the external AC power supply line cord(s) from the mains power before moving the unit.

**Avertissement !** Retirez le ou les cordons d'alimentation en CA de la source d'alimentation principale lorsque vous déplacez l'appareil.

**Warnung!** Trennen Sie die Wechselstrom-Versorgungskabel vom Netzstrom, bevor Sie das Gerät verschieben.

**¡Advertencia!** Cuando mueva la unidad desenchufe de la red eléctrica el/los cable(s) de la fuente de alimentación CA tipo brick.

**Advertência!** Remova os cabos CA de alimentação brick da rede elétrica ao mover a unidade.

**Avvertenza!** Scollegare il cavo dell'alimentatore quando si sposta l'unità.



**Hazard Warning!**

High Voltage. This situation or condition can cause injury due to electric shock.

**Avertissement !** Tension élevée. Cette situation ou condition peut causer des blessures dues à un choc électrique.

**Warnung!** Hochspannung. Diese Situation oder Bedingung kann zu Verletzungen durch Stromschlag führen.

**¡Advertencia!** Alto voltaje . Esta situación o condición puede causar lesiones debidas a una descarga eléctrica.

**Aviso!** Alta Tensão . Esta situação ou condição pode causar danos devido a choques elétricos.

**Avviso!** Alta tensione. Questa situazione o condizione può causare lesioni a causa di scosse elettriche.



**Warning!**

Only use attachments and accessories specified and/or sold by the manufacturer.

**Avertissement !** Utilisez seulement les attaches et accessoires spécifiés et/ou vendus par le fabricant.

**Warnung!** Verwenden Sie nur Zusatzgeräte und Zubehör angegeben und / oder verkauft wurde durch den Hersteller.

**¡Advertencia!** Utilice solamente los accesorios y conexiones especificados y/o vendidos por el fabricante.

**Aviso!** Utilize apenas equipamentos/acessórios especificados e/ou vendidos pelo fabricante.

**Avviso!** Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore.

**Warning!**

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

**Avertissement !** La sécurité de la prise polarisée ou de la prise de type mise à la terre ne doit en aucun cas être empêchée de fonctionner. Une prise polarisée a deux broches, l'une étant plus large que l'autre. Une prise de type mise à la terre a deux broches et une troisième broche pour la mise à la terre. La broche large ou la troisième broche sont fournies pour votre sécurité. Si la prise fournie ne s'insère pas dans votre prise femelle, consultez un électricien pour le remplacement de la prise femelle obsolète.

**Warnung!** Der Sicherheitszweck des gepolten bzw. Schukosteckers ist zu berücksichtigen. Ein gepolter Stecker verfügt über zwei Pole, von denen einer breiter als der andere ist. Ein Schukostecker verfügt neben den zwei Polen noch über einen dritten Pol zur Erdung. Der breite Pol bzw. der Erdungspol dienen der Sicherheit. Wenn der zur Verfügung gestellte Stecker nicht in Ihren Anschluss passt, konsultieren Sie einen Elektriker, um den veralteten Anschluss zu ersetzen.

**¡Advertencia!** No eche por tierra la finalidad del tipo de enchufe polarizado con conexión a tierra. Un enchufe polarizado tiene dos espigas, una más ancha que la otra. Un enchufe con conexión a tierra tiene dos espigas iguales y una tercera espiga que sirve para la conexión a tierra. La espiga ancha, o la tercera espiga, sirven para su seguridad. Si el enchufe suministrado no encaja en el tomacorriente, consulte con un electricista para reemplazar el tomacorriente obsoleto.

**Aviso!** Não anule a finalidade da segurança da ficha polarizada ou do tipo ligação terra. Uma ficha polarizada tem duas lâminas sendo uma mais larga do que a outra. Uma ficha do tipo de ligação à terra tem duas lâminas e um terceiro terminal de ligação à terra. A lâmina larga ou o terceiro terminal são fornecidos para sua segurança. Se a ficha fornecida não couber na sua tomada, consulte um electricista para a substituição da tomada obsoleta.

**Avviso!** Non compromettere la sicurezza della spina polarizzata o con messa a terra. Una spina polarizzata ha due spinotti, di cui uno più largo. Una spina con messa a terra ha due spinotti e un terzo polo per la messa a terra. Lo spinotto largo o il terzo polo sono forniti per motivi di sicurezza. Se la spina fornita non si inserisce nella presa di corrente, contattare un elettricista per la sostituzione della presa obsoleta.

**Warning!**

Since the Mains plug is used as the disconnection for the device, it must remain readily accessible and operable.

**Avertissement !** Puisque la prise principale est utilisée pour débrancher l'appareil, elle doit rester aisément accessible et fonctionnelle.

**Warnung!** Da der Netzstecker als Trennvorrichtung dient, muss er stets zugänglich und funktionsfähig sein.

**¡Advertencia!** Puesto que el enchufe de la red eléctrica se utiliza como dispositivo de desconexión, debe seguir siendo fácilmente accesible y operable.

**Aviso!** Dado que a ficha principal é utilizada como a desconexão para o dispositivo, esta deve manter-se prontamente acessível e funcional.

**Avviso!** Poiché il cavo di alimentazione viene usato come dispositivo di sconnessione, deve rimanere prontamente accessibile e operabile.

**Warning!**

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.

**Avvertissement !** Protégez le cordon d'alimentation pour que l'on ne marche pas dessus ou qu'on le pince, en particulier au niveau des prises mâles, des réceptacles de convenance, et à l'endroit où il sort de l'appareil.

**Warnung!** Es muss verhindert werden, auf das Netzanschlusskabel zu treten oder dieses zu knicken, besonders an den Steckern, den Steckerbuchsen und an dem Punkt, an dem das Kabel aus dem Gerät heraustritt.

**¡Advertencia!** Puesto que el enchufe de la red eléctrica se utiliza como dispositivo de desconexión, debe seguir siendo fácilmente accesible y operable.

**Aviso!** Proteja o cabo de alimentação de ser pisado ou de ser comprimido particularmente nas fichas, em tomadas de parede de conveniência e no ponto de onde sai do dispositivo.

**Avviso!** Proteggere il cavo di alimentazione in modo che nessuno ci cammini sopra e che non venga schiacciato soprattutto in corrispondenza delle spine e del punto in cui esce dal dispositivo.



**Warning!**

Unplug this device during lightning storms or when unused for long periods of time.

**Avvertissement !** Débranchez cet appareil pendant les orages avec éclairs ou s'il est inutilisé pendant de longues périodes.

**Warnung!** Das Gerät ist bei Gewitterstürmen oder wenn es über lange Zeiträume ungenutzt bleibt vom Netz zu trennen.

**¡Advertencia!** Desenchufe este dispositivo durante tormentas eléctricas o cuando no se lo utilice por largos periodos del tiempo.

**Aviso!** Desconecte este dispositivo da tomada durante trovoadas ou quando não é utilizado durante longos periodos de tempo.

**Avviso!** Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore, quali il treppiedi e l'esoscheletro.



**Warning!**

Do not open the chassis. There are no user-serviceable parts inside. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility.

**Avvertissement !** Ne pas ouvrir le châssis. Aucun élément à l'intérieur du châssis ne peut être réparé par l'utilisateur. La garantie sera annulée si le châssis est ouvert par toute autre personne qu'un technicien d'un centre de service ou d'un établissement agréé AJA.

**Warnung!** Öffnen Sie das Gehäuse nicht. Keine der Geräteteile können vom Benutzer gewartet werden. Durch das Öffnen des Gehäuses wird die Garantie hinfällig, es sei denn, solche Wartungsarbeiten werden in einem AJA-Service-Center oder einem lizenzierten Betrieb vorgenommen.

**¡Advertencia!** No abra el chasis. El interior no contiene piezas reparables por el usuario. El abrir el chasis anulará la garantía a menos que se lo haga en un centro de servicio AJA o en un local autorizado.

**Advertência!** Não abra o chassi. Não há internamente nenhuma peça que permita manutenção pelo usuário. Abrir o chassi anula a garantia, a menos que a abertura seja realizada por uma central de serviços da AJA ou por um local autorizado.

**Avvertenza!** Non aprire lo chassis. All'interno non ci sono parti riparabili dall'utente. L'apertura dello chassis invaliderà la garanzia se non viene effettuata da un centro ufficiale o autorizzato AJA.



**Caution!**

For correct performance, always power up the Io XT before starting your computer and power down your computer before powering down the Io XT.

**Attention!** Pour obtenir de bonnes performances, allumez toujours Io XT avant de démarrer l'ordinateur et éteignez ce dernier avant d'éteindre Io XT.

**Achtung!** Um eine fehlerfreie Arbeit sicherzustellen, schalten Sie Io XT ein, bevor Sie den Computer starten, und fahren Sie den Computer herunter, bevor Sie Io XT ausschalten.

**¡Precaución!** Para un correcto desempeño, siempre encienda Io XT antes de iniciar la computadora y apague la computadora antes de apagar Io XT.

**Cuidado!** Para o desempenho correto, sempre ligue o Io XT antes de ligar seu computador e desligue o computador antes de desligar o Io XT.

**Attenzione!** Per prestazioni ottimali, alimentare sempre XT prima di avviare il computer e spegnere il computer prima di spegnere XT.

