MOTU HDX-SDI™

User's Guide for Windows

MOTU

Contents

SAFETY PRECAUTIONS AND ELECTRICAL REQUIREMENTS

⚠️ **CAUTION! READ THIS SAFETY GUIDE BEFORE YOU BEGIN INSTALLATION OR OPERATION. FAILURE TO COMPLY WITH SAFETY INSTRUCTIONS COULD RESULT IN BODILY INJURY OR EQUIPMENT DAMAGE.**

⚡ **HAZARDOUS VOLTAGES: CONTACT MAY CAUSE ELECTRIC SHOCK OR BURN. TURN OFF UNIT BEFORE SERVICING.**

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR OTHER MOISTURE.

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: DO NOT PERMIT FINGERS TO TOUCH THE TERMINALS OF PLUGS WHEN INSTALLING OR REMOVING THE PLUG TO OR FROM THE OUTLET.

WARNING: IF NOT PROPERLY GROUNDED THE MOTU HDX-SDI COULD CAUSE AN ELECTRICAL SHOCK.

The MOTU HDX-SDI is equipped with a three-conductor cord and grounding type plug which has a grounding prong, approved by Underwriters' Laboratories and the Canadian Standards Association. This plug requires a mating three-conductor grounded type outlet as shown in Figure A below. If the outlet you are planning to use for the MOTU HDX-SDI is of the two prong type, DO NOT REMOVE OR ALTER THE GROUNDING PRONG IN ANY MANNER. Use an adapter as shown below and always connect the grounding lug to a known ground. It is recommended that you have a qualified electrician replace the TWO prong outlet with a properly grounded THREE prong outlet. An adapter as illustrated below in Figure B is available for connecting plugs to two-prong receptacles.

Figure A

3-prong plug
Grounding prong
Properly grounded 3-prong outlet

Figure B

Grounding lug
Screw
3-prong plug
Make sure this is connected to a known ground.
Two-prong receptacle
Adapter
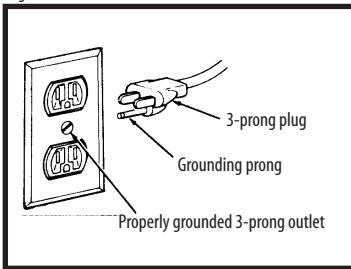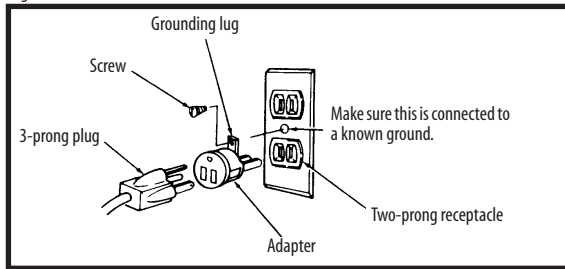
WARNING: THE GREEN GROUNDING LUG EXTENDING FROM THE ADAPTER MUST BE CONNECTED TO A PERMANENT GROUND SUCH AS TO A PROPERLY GROUNDED OUTLET BOX. NOT ALL OUTLET BOXES ARE PROPERLY GROUNDED.

If you are not sure that your outlet box is properly grounded, have it checked by a qualified electrician. NOTE: The adapter illustrated is for use only if you already have a properly grounded two-prong receptacle. Adapter is not allowed in Canada by the Canadian Electrical Code. Use only three wire extension cords which have three-prong grounding type plugs and three-prong receptacles which will accept the MOTU HDX-SDI plug.

IMPORTANT SAFEGUARDS

1. Read these instructions. All the safety and operating instructions should be read before operating the HDX-SDI.
2. Keep these instructions. These safety instructions and the HDX-SDI owner's manual should be retained for future reference.
3. Heed all warnings. All warnings on the HDX-SDI and in the owner's manual should be adhered to.
4. Follow all Instructions. All operating and use instructions should be followed.
5. Do not use the HDX-SDI near water.
6. Cleaning - Unplug the HDX-SDI from the computer and clean only with a dry cloth. Do not use liquid or aerosol cleaners.
7. Ventilation - Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Heat - Do not install the HDX-SDI near any heat sources such as radiators, heat registers, stoves, or another apparatus (including an amplifier) that produces heat.
9. Overloading - Do not overload wall outlets and extension cords as this can result in a risk of fire or electrical shock.
10. Grounding - 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 and electrician for replacement of the obsolete outlet.
11. Power cord - Protect the HDX-SDI power cord from being walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the HDX-SDI.
12. Power switch - Install the HDX-SDI so that the power switch can be accessed and operated at all times.
13. Disconnect - The main plug is considered to be the disconnect device for the HDX-SDI and shall remain readily operable.
14. Accessories - Only use attachments/accessories specified by the manufacturer.
15. Placement - Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the HDX-SDI. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
16. Surge protection - Unplug the HDX-SDI during lightning storms or when unused for long periods of time.
17. Servicing - Refer all servicing to qualified service personnel. Servicing is required when the HDX-SDI has been damaged in any way, such as when a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the HDX-SDI, the HDX-SDI has been exposed to rain or moisture, does not operate normally, or has been dropped.
18. Power Sources - Refer to the manufacturer's operating instructions for power requirements. Be advised that different operating voltages may require the use of a different line cord and/or attachment plug.
19. Installation - Do not install the HDX-SDI in an unventilated rack, or directly above heat-producing equipment such as power amplifiers. Observe the maximum ambient operating temperature listed below.
20. Power amplifiers- Never attach audio power amplifier outputs directly to any of the unit's connectors.
21. Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
22. Safety Check - Upon completion of any service or repairs to this MOTU HDX-SDI, ask the service technician to perform safety checks to determine that the product is in safe operating conditions.

ENVIRONMENT

Operating Temperature: 10°C to 40°C (50°F to 104°)

TO REDUCE THE RISK OF ELECTRICAL SHOCK OR FIRE

⚠️ **CAUTION** RISK OF ELECTRIC SHOCK DO NOT OPEN ⚡

Do not handle the power cord with wet hands. Do not pull on the power cord when disconnecting it from an AC wall outlet. Grasp it by the plug. Do not expose this apparatus to rain or moisture. Do not place objects containing liquids on it.

AC INPUT

100 - 240VAC ~ • 50 / 60Hz • 20 Watts.

Part 1
Getting Started

Quick Reference: HDX-SDI Front Panel

1. Connect an SD source here, such as a camcorder, DVD player, VHS deck or any other composite or S-Video source.

2. Connect an HDMI source here, such as a camcorder, DVD player, set-top box, video game console, AV receiver or other HDMI device. Note that many consumer HDMI sources (such as DVD players) implement HDCP (High Bandwidth Digital Content Protection), which does not allow video capture of copy-protected signals via I/O devices like the HDX-SDI.

3. This is a standard quarter-inch stereo headphone jack. Its output always matches analog outputs 1-2 on the rear panel. Use the volume knob to control its level.

4. Keep this switch in the down position to enable AUTO ON mode. When AUTO ON mode is enabled you can leave the main power switch (item #12) on and the HDX-SDI will power up when you power on your computer and power down when you power off your computer.

5. The HOST light illuminates when the HDX-SDI interface successfully establishes communication with the computer via the PCIe card or ExpressCard adapter.

6. The GENLOCK light glows when the HDX-SDI has successfully locked to the currently selected clock source. The CAPTURE light glows when the HDX-SDI is capturing or previewing video; the MONITOR light glows when the HDX-SDI is playing back (whether still-framed or not).

7. The Timecode Display rolls whenever the HDX-SDI is converting timecode, either from the timecode input or perhaps from SDI-embedded timecode. It also rolls during playback from host software (Premiere Pro) and reflects the position of the play head on the time line.

8. This bank of audio level meters is for Bank A (channels 1-8). The four-segment meters above show input; the round activity LEDs in the bottom row show output. The HDX-SDI provides several 8-channel banks of audio input and output, which you can assign to either Bank A or

Bank B (channels 9-16). Formats include Analog, HDMI embedded, SDI embedded and AES/EBU digital. For input, there is also a mixed bank of stereo RCA and BNC AES/EBU. Use MOTU Video Console to make audio bank assignments. See "Audio tab" on page 43. NOTE: these meters and activity LEDs only operate when audio is actually being sent to/from the computer. For example, if audio is being fed to HDX-SDI inputs, but no host application is running on the computer to receive the audio, the meters won't reflect the audio input.

9. This bank of audio activity meters can be programmed (via the MOTU Video Console software) to display a second bank of audio channels (9-16).

10. The Timecode Lock LED illuminates when the HDX-SDI is converting timecode. The Video Ref LED flashes when the Video ref input has been activated in the MOTU Video Console software, and it glows solid when genlock has been successfully achieved.

11. The VIDEO STATUS section indicates which HDX-SDI video input is chosen as the current video source. This setting is made in the MOTU Video Console software.

12. With AUTO ON mode enabled (see item #4) and this main power switch flipped to the on position, the HDX-SDI will power on and off with your computer.

   When using the HDX-SDI rack-mount interface with the laptop ExpressCard adapter, operation is plug-and-play: you can disconnect and reconnect the interface, and freely switch it on or off as desired.

   When using the PCIe card on a desktop machine, the HDX-SDI rack-mount interface must be connected and powered on before powering on the computer. Similarly, you must power down the computer before powering on or disconnecting the HDX-SDI. If the interface is disconnected or powered off before the computer is powered down, you'll need to restart the computer to bring the interface back online.

Quick Reference: HDX-SDI Rear Panel
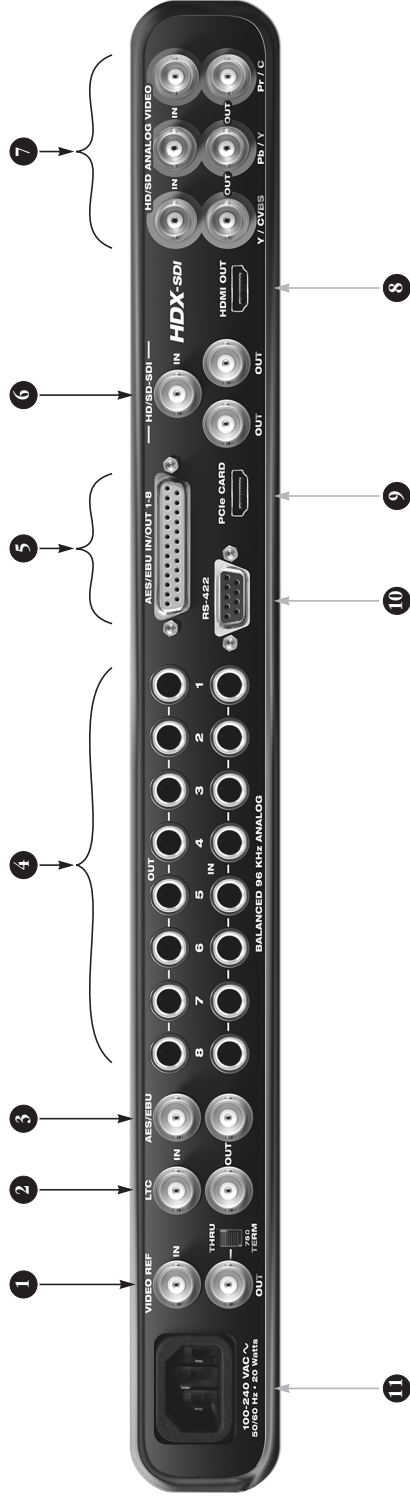
1. Connect blackburst or another video reference signal to the VIDEO REF IN. If the HDX-SDI is at the end of the video sync daisy chain, flip the THRU/TERM switch to the 75Ω TERM position. If you are daisy-chaining another device, flip it to THRU. This jack also supports HD Tri-level sync.

2. Connect timecode input and output here, to the LTC IN and LTC OUT. The HDX-SDI supports all standard timecode formats.

3. If you only need two channels of AES/EBU digital audio I/O, connect them to these BNC jacks. If you need eight channels, connect a breakout cable to the DB-25 connector to the right.

4. These eight gold-plated, balanced +4 dB TRS (tip/ring/sleeve) quarter-inch analog inputs and outputs are equipped with 24-bit converters that support sample rates from 44.1 kHz up to 96 kHz. These connectors can also accept an unbalanced plug.

5. If you need more than stereo AES/EBU input/output, connect an 8-channel DB-25 to XLR breakout cable to this DB-25 connector. When you do so, the BNC AES/EBU output jack mirrors DB-25 channels 1-2. The BNC inputs, however, are mutually exclusive from the DB-25 inputs, and you must choose one input or the other in MOTU Video Console. See "Audio tab" on page 43.

6. Connect HD-SDI or SD-SDI devices here. The SDI outputs provide the same (duplicated) signal on both outputs, so you can route SDI output to both a monitor and a deck, for example.

7. Connect component HD or SD input and output here. The analog video I/O section of the HDX-SDI is equipped with 12-bit converters that deliver 10-bit capture and playback, with support for either RGB or YPbPr component color space. Alternately, you can connect a composite video (CVBS) input or output signal to the Y connectors or an S-Video input or output signal to the Y/C connectors.

8. Connect a plasma, LCD, DLP or other HDMI-equipped monitor here. Alternately, you can connect a DVI-equipped device with an adapter cable. The HDX-SDI supports 8-channel PCM (uncompressed) embedded audio over HDMI, so you could also connect this output to an HDMI-equipped home theater receiver to deliver both picture and multi-channel audio.

9. Connect the HDX-SDI to the computer here using any standard HDMI cable. If you are connecting the interface to an ExpressCard adapter for laptop operation, use a standard HDMI-to-mini-HDMI cable. In either case, it is recommended that you use the supplied cable. If you use another cable, the length should not exceed six feet, and use a high-quality cable.

10. For 9-pin machine control over an RS-422 equipped device, such as a VTR or camera, connect it here. This allows you to control the transport of the device from Premiere Pro.

11. The HDX-SDI has an internal, international, auto-switching power supply. Connect any AC power source from 100V to 240V.

Quick Reference: MOTU Video Console

Choose the video format that you wish to capture or play back.

The status area tells you what mode the HDX-SDI hardware is in. It also provides helpful troubleshooting info.

When capturing video, choose the input source here. Also determines the clock source for playback, if the Playback Clock Source is set to Input Source.

Video Format

1080p 23.976

Capture mode

Input Source

SDI

Default Mode

○ Capture
○ Playback

Capture Clock Source

Input Source

Playback Clock Source

Internal

HDMI Format

HDMI (YCbCr)

SDI Loop Thru Mode

Indirect

○ Reset to Defaults

Timecode Source

Sony 9-Pin

Timecode Destination

None

SDI Output Timecode Format

VITC 1

Analog Output Format

Component YPbPr

480i Setup

USA (7.5%)

480i Component Levels

Sony Beta

Driver: 4.0.4.6137   Firmware: 1.06b6   Bootloader: 1.02

Input: 1080p 23.976   Setup   Playback   Preview   Audio   Genlock: On

Click a tab to view its settings above. For complete details on the settings in these tabs, see chapter 6, "MOTU Video Console" (page 35).

Indicates when the HDX-SDI has successfully achieved lockup to the currently selected clock source, which could be the HDX-SDI's internal clock, the video REF IN jack or the current video input source.

Indicates the video format detected on the currently chosen video Input Source (above).
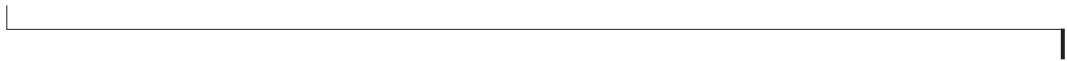
About the HDX-SDI

OVERVIEW

The HDX-SDI is a PCI Express video interface for Windows that provides broadcast-quality video capture and monitoring for Adobe Premiere Pro.

The HDX-SDI connects to a PC desktop computer via a standard PCI Express card or a PC laptop via an ExpressCard adapter and turns the computer into a powerful HD/SD video production workstation equipped with all the video and audio I/O needed to produce broadcast quality HD and SD video material.

In Premiere Pro, the HDX-SDI supports playback of any video format supported natively by Premiere Pro, including uncompressed, P2, XDCAM, HDV, and AVCHD. Video can be captured as 8- or 10-bit uncompressed, or as DVCPRO, DVCPro 50, or DVCPRO HD.

The HDX-SDI is ideal for any natively supported workflow because you can immediately play back clips (either imported or ingested) with no transcoding necessary. Conversely, you can connect any SD or HD video source such as an HDV camera, legacy video deck, or DVD player and then capture it directly in the format of your choice in Premiere Pro. Many cameras now feed their uncompressed SDI or component output directly from the camera's optics and image sensor, before compression, for the best-possible picture quality during capture with the HDX-SDI.

A wide range of video equipment can be connected to the HDX-SDI, from legacy SD camcorders and CRT monitors to the latest HD cameras, video decks, LCD reference monitors and plasmas.

The HDX-SDI provides advanced synchronization and machine control features, including support for timecode, 9-pin machine control, and video reference. For audio synchronization, the HDX-SDI employs Direct Digital Synthesis (DDS), a DSP-driven phase lock engine that delivers fast lockup times and sub-frame accuracy.

The HDX-SDI is housed in a rugged aluminum alloy chassis with a standard 19-inch, single-space, rack-mountable form factor. Included rack mounting brackets can easily be removed for convenient desktop operation.

The HDX-SDI is designed to streamline your video production workflow, with unified control over all your video gear from the convenience of your computer desktop.

FEATURE HIGHLIGHTS

- HD/SD PCI Express video interface for Mac and Windows — provides HD and SD capture and playback for any current-generation PCIe- or ExpressCard-equipped computer.

- Tower or laptop operation — connects to a Mac or PC tower via PCI Express for ultra-fast operation, or connect to a laptop via ExpressCard connectivity for mobile operation.

- Comprehensive video capture & monitoring — captures and plays uncompressed video in all standard SD and HD video formats up to and including 1080p30 (720p, 1080i, 1080p & 1080PsF).

- Supports Adobe Premiere Pro.

- Captures and plays uncompressed HD and SD — 10-bit 4:2:2 color depth and 1920 x 1080 resolution, all standard HD and SD formats up to and including 1080p30 (720p, 1080i, 1080p and 1080PsF).

- Support for all codecs supported natively by Premiere Pro — monitor any host-based codecs supported by Premiere Pro.

- Support for file-based workflows — lets you edit and monitor file-based workflow codecs supported natively in Premiere Pro, including HDV, XD CAM, P2/DVCPro, AVCHD, and others with no transcoding needed.

- Broadcast quality — 10-bit 4:2:2 signal path throughout.

- HDMI capture and monitoring — provides both HDMI in and out.

- Color lookup tables — provides flexible, industry-standard color adjustment with separate color lookup tables for capture and playback.

- Sync and machine control — advanced sync features include timecode, large front panel timecode display, video ref input and 9-pin machine control.

- Comprehensive audio — capture or monitor up to 16 channels of audio via any two 8-channel banks of TRS analog, AES/EBU digital or embedded (SDI or HDMI) at sample rates up to 96kHz.

- Single rack space form factor with dedicated connectors — no cable swapping or gangly, inconvenient breakout cables.

- International auto-switching internal power supply with powersave mode.

VIDEO I/O

The HDX-SDI provides comprehensive video input and output connectivity. The SDI section supplies two mirrored outputs so that you can connect both a deck and a monitor simultaneously.

The front panel provides convenient inputs for legacy SD capture and full 10-bit uncompressed HDMI capture from today's latest HD camcorders.

The component section provides both RGB and YPbPr, but can alternately serve as CVBS (composite) in/out or even Y/C (S-Video) in/out.

- 1 x HD/SD-SDI in and out (4:2:2 10-bit) on BNC connectors

- 1 x extra HD/SD-SDI output BNC connector

- 1 x HDMI in and out (4:2:2 10-bit, YCbCr or RGB)

- Support for DVI output with HDMI-to-DVI adapter (sold separately)

- 1 x HD/SD component in and out (10-bit, YPbPr or RGB) on BNCs

- 1 x composite in (10-bit) on RCA

- 1 x S-Video in (10-bit) on 4-pin mini-DIN

- 1 x composite in and out (10-bit CVBS) on shared BNC

- 1 x S-Video in and out (10-bit Y/C) on shared BNC

VIDEO FORMATS

- SD — 576i25 (PAL) and 486i29.97 (NTSC)

- HD — 720p23.976, 720p24, 720p25, 720p29.97, 720p30, 720p50, 720p59.94, 720p60, 1080p23.976, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080PsF23.976, 1080PsF24, 1080PsF25, 1080PsF29.97, 1080PsF30, 1080i25, 1080i29.97, 1080i30

- Supported Premiere Pro HD formats — Uncompressed HD (8-bit and 10-bit), DVCProHD 720p at all eight frame rates listed above, plus DVCProHD 1080 (1280 and 1440 rasters) at all 1080 frame rates listed above

- Supported Premiere Pro SD formats — Uncompressed 8-bit and 10-bit, DVCPro and DVCPro 50 at 486i29.97 and 576i25

AUDIO I/O

The HDX-SDI delivers comprehensive audio capture and monitoring in stereo or full surround with support for both 5.1 or 7.1 configurations.

The HDX-SDI provides four 8-channels banks of audio output: analog, AES/EBU digital, SDI embedded, and HDMI embedded. All four banks can be active at once, and each can be independently assigned to either channels 1-8 (Bank A) or 9-16 (Bank B).

The HDX-SDI also provides four banks of audio input: analog, AES/EBU on DB-25 breakout, SDI/HDMI embedded, and one mixed bank of stereo AES/EBU on BNC connectors plus stereo analog on RCA connectors. Any two banks can be active at one time, except for the mixed bank, which cannot be active at the same time as either the analog bank or the AES/EBU DB-25 bank.

The HDX-SDI's bank of quarter-inch analog TRS connectors makes it a snap to connect cameras and a wide range of video and audio gear up to eight channels at a time.

- 16 channels of simultaneous audio input and output

- Supports all standard audio sample rates from 44.1 to 96kHz

- 8 x quarter-inch TRS analog in and out via direct connection (no breakout cable)

- 2 x RCA analog input on the front panel for SD Composite/S-Video capture

- 2 x AES/EBU digital in and out on BNC connectors

- 8 x AES/EBU digital in and out on standard DB-25 breakout cable (sold separately)

- 8 x HD/SD-SDI embedded audio in and out

- 8 x HDMI embedded audio in and out

- Front panel headphone jack with dedicated volume control

- Front panel audio channel metering — two 8-channel banks of status LEDs

SYNC AND DEVICE CONTROL

The HDX-SDI provides comprehensive video and audio synchronization features, including timecode I/O, video ref with loop through, large front panel timecode readout and RS-422 (Sony 9-pin) machine control.

Synchronize your HDX-SDI system with reliable performance and fast lock-up times. Perform batch capture and edit/export to tape operations in Premiere Pro with a 9-pin compatible camera or deck connected to the HDX-SDI.

- Video reference in and thru — resolve to blackburst, composite or HD Tri-level sync.

- Timecode in and out — generate and resolve to timecode (LTC, SD VITC or embedded).

- Front panel timecode display — provides frame-accurate timecode readout when converting timecode, or during playback from host software.

- RS-422 machine control — control the transports of a connected camera or video deck using Premiere Pro.

- Direct Digital Synthesis — DSP-driven phase lock engine provides ultra-low jitter.

POWER

■ International auto-switching internal power supply

INCLUDED SOFTWARE AND COMPATIBILITY

■ MOTU Video console software — provides complete control of all programmable features and settings.

■ Supports Premiere Pro CS5 (version 5.0.3) or later

CHAPTER 2 Packing List and System Requirements

PACKING LIST

The HDX-SDI ships with the items listed below. If any of these items are not present in your HDX-SDI box when you first open it, please immediately contact your dealer or MOTU.

- One HDX-SDI with removable rack ears

- One HDMI cable

- One PCI card or ExpressCard adapter

- One power cord

- One HDX-SDI Mac/Windows manual

- One software installer disc

- Product registration card

SYSTEM REQUIREMENTS

The HDX-SDI system requires the following Windows system:

- Intel Core 2 Duo, AMD Phenom II, or equivalent 64-bit processor; multiple processors or multi-core processor required

- Available PCI Express slot or ExpressCard slot

- 2 GB RAM; 4 GB or more is recommended

- Windows 7 or Vista, 64-bit versions only; Vista SP1 or later required

- Large hard disk drive, preferably at least 500 GB

- Adobe Premiere Pro CS5 or CS5.5; version 5.0.3 or later required

PLEASE REGISTER TODAY!

Please register your HDX-SDI today. There are two ways to register.

- Visit www.motu.com/registration to register online

OR

- Fill out and mail the included product registration card

As a registered user, you will be eligible to receive technical support and announcements about product enhancements as soon as they become available. Only registered users receive these special update notices, so please register today.

Thank you for taking the time to register your new MOTU products!

CHAPTER 3   Installing the HDX-SDI Windows Software

IMPORTANT! INSTALL THE HDX-SDI SOFTWARE FIRST!

Before you connect the HDX-SDI interface to your computer and turn it on, run the HDX-SDI Software Installer. This ensures that all the HDX-SDI components are properly installed in your system.

If Windows asks you to locate the drivers

If you've already connected the HDX-SDI to your computer and switched it on, Windows probably issued an alert notifying you that the HDX-SDI requires drivers, followed by another window asking you to locate the drivers. If this happens:

1 Cancel the driver search.

2 Run the HDX-SDI Software Installer as instructed in the next section.

INSTALLING THE HDX-SDI SOFTWARE

Install the HDX-SDI software as follows:

1 Insert the HDX-SDI Installer disc; or, if you have downloaded the MOTU Video installer, locate the folder containing the download.

2 If there are *Read Me* files or other documents containing installation assistance or other important information, review each one.

3 Open the installer application.

4 Follow the installer's directions.

The HDX-SDI ships with the following software for Windows:

Software component	Purpose	For more information
MOTU Sequence presets	Provides sequence presets for Premiere Pro. These help you quickly configure Premiere for the HDX-SDI.	See "Sequence presets" on page 46
MOTU PCI Video Console	Provides access to all of the HDX-SDI's video settings.	See chapter 6, "MOTU Video Console" (page 35)

CHAPTER 4   Installing the HDX-SDI Hardware

OVERVIEW
Here's an overview for installing the HDX-SDI:

DID YOU RUN THE SOFTWARE INSTALLER FIRST?
Before installing the HDX-SDI hardware in your computer, be sure to run the software installer first. See chapter 3, "Installing the HDX-SDI Windows Software" (page 15).

PRECAUTIONS BEFORE YOU BEGIN
Installing the HDX-SDI hardware requires the handling of sensitive electronic components that can be easily damaged by static electricity, even in the very small amounts generated by our bodies every time we move. Please take these basic precautions before and during installation to avoid permanently damaging your HDX-SDI hardware:

■ Completely review the installation procedure on the following pages before you begin the installation.

■ Avoid wool or synthetic clothing, which tends to generate much more static electricity than cotton.

■ Static electricity occurs much more readily in dry climate conditions. If you can, perform the installation with a relative humidity of at least 50%.

■ Leave the HDX-SDI PCIe card in its anti-static bag until you are ready to install it.

■ When you are ready to begin installation, have the PCIe card, still in its anti-static bag, close by so it is in within easy reach during installation.

■ Before you begin, turn off the computer and unplug it from any power source. Do the same for any connected components (hard drives, etc.)

■ When handling the HDX-SDI PCIe card adapter, hold it by the silver bulkhead, or by the edges of the circuit board. Be careful not to touch the components on the circuit board or the metal contacts on the insert tab.

INSTALLING THE PCI EXPRESS CARD
If you have a PCI Express card for the HDX-SDI, install it as follows:

1 Power off and unplug your computer.

☛ Failure to do so may result in serious shock or injury.

2 Open your computer.

3 Find an available PCI Express slot.

4 Remove the slot cover, if necessary.

5 Before removing the HDX-SDI PCIe card from it's anti-static bag, touch the power supply inside your computer to discharge any static electricity that may have built up on you.

6 Remove the HDX-SDI PCIe card from its anti-static bag.

7 Gently but firmly insert the card into any available PCIe slot.
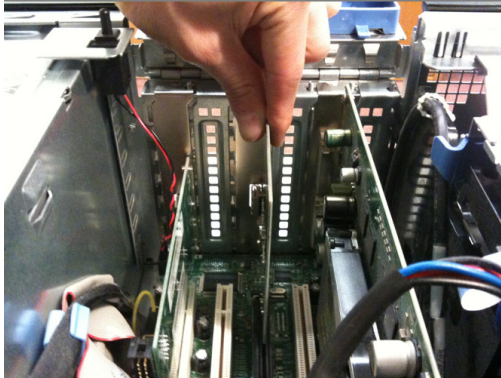
Figure 4-1: Inserting the HDX-SDI PCIe card.

8 Secure the bulkhead of the card to the computer chassis with the bolt from the slot cover.

☛ We strongly recommend securing the HDX-SDI PCIe card in this manner. Doing so allows you to ensure secure connections to the card later on in the installation.

9 Place the cover back on your computer.

10 Reconnect the power cord to the computer before proceeding.

INSTALLING THE EXPRESSCARD ADAPTER

If you have a laptop ExpressCard adapter for the HDX-SDI, you can install it as follows, with your laptop computer turned on or off:

1 Before removing the ExpressCard adapter from it's anti-static bag, touch the metal chassis of your laptop computer to discharge any static electricity that may have built up on you.

2 Remove the ExpressCard adapter from its anti-static bag.

3 Insert the adapter into the ExpressCard slot on your laptop computer with the top of the ExpressCard adapter (the side with the label on it) facing up and the mini-HDMI connector (the smaller of the two connectors) facing out.

Figure 4-2: Inserting the HDX-SDI ExpressCard adapter.

4 Push the adapter into the slot until it clicks into place.

☛ Do not force the ExpressCard adapter into the slot. If it does not easily slide into place, remove it and try again.

When the card is properly seated in the slot, it should be flush with the side of your laptop.

Removing the ExpressCard adapter

To safely remove the ExpressCard adapter, first disconnect the HDMI cable, and then push the adapter inwards until you hear and feel it click. This releases it from its installed position and it should pop out of the slot far enough for you to grasp it and gently remove it. Immediately place it in its anti-static bag.

CONNECT THE HDX-SDI TO YOUR COMPUTER

1 Plug one end of the supplied HDMI cable into the HDMI socket on the PCI card or ExpressCard adapter as shown below in Figure 4-3.
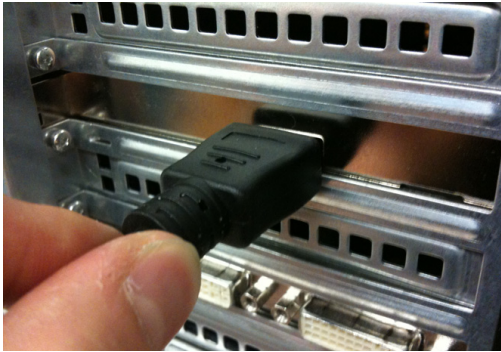
Figure 4-3: Connecting the HDX-SDI to the computer.

☞ If you are using the HDX-SDI with an ExpressCard adapter, the included HDMI cable has a regular HDMI plug at one end and a smaller, mini-HDMI plug at the other end. Plug the mini-HDMI plug into the ExpressCard adapter.

2 Plug the other end of the HDMI cable into the HDX-SDI I/O "PCIe CARD" jack as shown below in Figure 4-4.

Figure 4-4: Making the connection from the computer to the HDX-SDI.

☞ When making the connection from the computer (Figure 4-3) to the interface (Figure 4-4), be sure to plug the HDMI cable into the jack labeled *PCIe Card*, as shown in Figure 4-4. DO NOT plug it into the *HDMI OUT* jack. The computer must be connected to the PCIe Card jack for proper operation.

POWER-UP/POWER-DOWN SEQUENCE

When using the HDX-SDI rack-mount interface with the laptop ExpressCard adapter, operation is plug-and-play: you can disconnect and reconnect the interface, and freely switch it on or off as desired.

However, when using the PCIe card adapter on a desktop machine, the HDX-SDI rack-mount interface must be connected and switched on before starting up the computer. Similarly, you must shut down the computer before switching it off and/or disconnecting it. If the interface gets disconnected or switched off before computer shut-down, you'll need to restart the computer to bring the interface back online.

CONNECT VIDEO INPUTS AND OUTPUTS

The HDX-SDI provides a wealth of video input and output connectivity, from consumer analog formats such as S-video and composite to broadcast formats such as HD-SDI.

Support for both NTSC and PAL

The HDX-SDI supports both NTSC and PAL formats on all inputs and outputs. It does not, however, convert between NTSC and PAL. Instead, it operates all inputs and outputs in one format or the other, as determined by the chosen video source. For details about choosing a video source, see "Input Source" on page 36.

S-video (Y/C) input

You have two choices for connecting S-video (Y/C) input: you can use the 4-pin mini-DIN jack on the HDX-SDI front panel, or you can use the two BNC inputs on the rear panel labeled "Y" and "C". Either way, be sure to make the corresponding Input Source setting in the software. See "Input Source" on page 36.

Connect any S-video source, including consumer or prosumer camcorders, desktop video converters, VTRs, etc. For best results, use standard, high-quality shielded BNC or 4-pin mini-DIN S-video cables.

You can connect the same device to both the input and output, or you can connect two separate devices (one to the input and the other to the output).

S-video (Y/C) output

Connect a monitor or other S-video output device to the BNC Y/C connectors on the rear panel. Be sure to make the necessary settings in the software to change the output of these connectors from component (the factory default format) to S-video. See "Analog Output Mode" on page 39 for details.

Composite (CVBS) input

You have two choices for connecting composite (CVBS) input: you can use the RCA jack on the HDX-SDI front panel labeled *VIDEO*, or you can use the BNC input on the rear panel labeled *CVBS*. Either way, be sure to make the corresponding Input Source setting in the software. See "Input Source" on page 36.

Connect any composite source, including consumer or prosumer camcorders, desktop video converters, VTRs, etc. For best results, use a standard, high-quality shielded video RCA or BNC cable. You can connect the same device to both the input and output, or you can connect two separate devices (one to the input and the other to the output).

Composite (CVBS) output

Connect a monitor or other composite output destination to the BNC CVBS connector on the rear panel. Be sure to make the necessary settings in the software to change the output of these

connectors from component (the factory default format) to composite. See "Analog Output Mode" on page 39 for details.

Component

The *HD/SD Analog Video* Section (Figure 4-5) provides either HD or SD component input and output. The HDX-SDI provides 10-bit analog performance with 12-bit A/D and D/A converters. In general, component video signals tend to be higher quality than composite or S-video, so to take full advantage of the component format, be sure to use high quality shielded BNC cables.

Configuring the analog video section

The HDX-SDI component input and output supports YPbPr or RGB operation, as shown by the labeling below the connectors in the *Analog Video* section. Accordingly, the input and output jacks in this section can be independently configured for one of three different analog video formats:

- Component RGB

- Component YPbPr

- Composite + S-video

This setting is made in the MOTU Video console software. For the component inputs, see "Input Source" on page 36. For the component outputs, see "Analog Output Mode" on page 39. Be sure that the mode you choose for each bank matches the component video source or destination to which it

is connected. If the device you are connecting supports both RGB and YPbPr, use YPbPr, as it is the standard for broadcast video.

☛ Analog YPbPr component video is sometimes referred to by other names, such as *YUV*, *Y/R-Y/B-Y* or *YCbCr*.

SD (480i) component formats

The HDX-SDI supports four different SD component formats: SMPTE/EBU N10, Sony Beta, Sony Beta Japan and Panasonic MII. This setting is made in the MOTU Video console software. See "480i Component Levels" on page 39 and "480i Setup" on page 39. For PAL (576i) and HD component operation, the HDX-SDI supports the industry standard SMPTE/EBU N10 specification.

HD-SDI and SD-SDI

The HDX-SDI provides HD-SDI or SD-SDI input and output in professional, broadcast quality 10-bit 4:2:2 resolution. A second, duplicate SDI output is provided, allowing you to connect a second SDI output device. For example, you could connect both an HD monitor and an HD video deck.

For best results, be sure to use cables that are designed for SDI use (such as Belden part number 8281, or similar). The HDX-SDI has been designed to support SDI cable lengths up 500 feet with SDI rated cables.

Figure 4-5: The HDX-SDI video connectors.

HDMI

The HDX-SDI provides HDMI input and output in professional, broadcast quality 10-bit 4:2:2 resolution. The input is ideal for capturing video from HDMI-equipped cameras, many of which send the video signal to their HDMI output before it is compressed in the camera.

The HDMI output can be connected to any device equipped with an HDMI input, such as a plasma screen, LCD screen or even a home theater receiver. The HDX-SDI supports up to 8 channels of PCM (uncompressed) audio output via the HDMI connection for devices that can receive digital audio via HDMI.

DVI output

Using a HDMI-to-DVI cable, or a female HDMI-to-male DVI plug adaptor connected to one end of an HDMI-to-HDMI cable, you can connect the HDX-SDI's HDMI output to the DVI input of another device, such as a computer monitor. In addition to the cable connection, you also need to make a software setting that changes the HDX-SDI's HDMI output signal to the DVI format. See "HDMI format" on page 39.

EXAMPLE HDX-SDI VIDEO CONNECTIONS

Here is an example of the types of video devices that you can connect to the HDX-SDI. You can mix and match HD and SD sources and destinations, connect them all, and then choose the desired source from the MOTU Video console software.

Figure 4-6: HDX-SDI video connections.

CONNECT AUDIO INPUTS AND OUTPUTS

The HDX-SDI provides the following audio input and output:

Audio format	Input channels	Output channels
96 kHz quarter-inch TRS analog	8	8
96 kHz AES/EBU on DB-25 breakout	8	8
48 kHz embedded SDI	8	8
96 kHz embedded HDMI*	8	8
Stereo AES/EBU on BNC + stereo analog on RCA	2+2	2 (AES/EBU only)

HDMI audio is stereo at sample rates above 48kHz when playing or capturing SD video.

Up to two 8-channel banks can be enabled at a time, for a total of sixteen channels of simultaneous audio input and output.

Analog audio I/O

The eight quarter-inch analog inputs and outputs (Figure 4-7) are balanced (TRS) connectors that can also accept an unbalanced plug.

The quarter-inch outputs are calibrated to produce a +4 dBu line level output signal.

Quarter-inch analog input trims

The quarter-inch inputs are calibrated to accommodate either +4 or -10 dBu signals and are equipped with digitally controlled analog trims that provide +22 dB of gain and -12 dB of cut. To adjust these trims, see "Analog input trims" on page 44.

AES/EBU digital audio I/O

The HDX-SDI provides eight channels of 24-bit AES/EBU digital audio input and output at standard sample rates from 44.1 kHz up to 96 kHz.
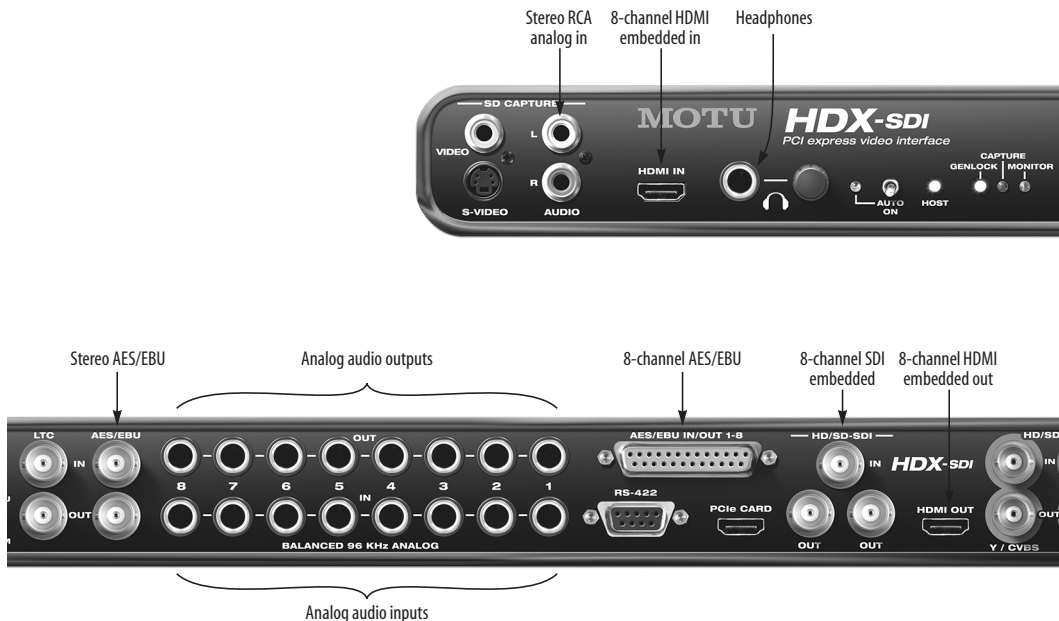

Figure 4-7: The HDX-SDI audio connectors.

Stereo AES/EBU with sample rate conversion
As shown in Figure 4-7, there are two sets of AES/EBU connectors: stereo BNC and 8-channel DB-25. The BNC input and output jacks provide stereo AES/EBU digital audio input and output via direct connection to the HDX-SDI rear panel using standard broadcast-grade BNC cables.

The stereo BNC AES/EBU input in the HDX-SDI is sample-rate converted, so you do not need to worry about digital audio clocking issues when using BNC AES/EBU input. Simply set the HDX-SDI clock source as desired (see "Capture Clock Source" on page 38), and any AES/EBU digital audio transfers will be clean and trouble-free. Just make sure that the AES/EBU device is resolved to the video in some way to prevent drift. See "Syncing digital audio devices" on page 28.

8-channel AES/EBU
The HDX-SDI provides eight channels of AES/EBU digital audio input or output using a DB-25–to–XLR breakout cable (sold separately). The AES/EBU breakout cable supplies 8 channels of AES/EBU input on four *female* XLR connectors and 8 channels of AES/EBU output on four *male* XLR connectors, as shown in Figure 4-8.

Figure 4-8: An example of a DB-25–to–XLR breakout cable (sold separately) for 8-channel AES/EBU input and output. This cable has four female XLR connectors and four male XLR connectors. See Appendix B, "DB-25 to XLR Pin Outs" page (59) for pin out details.

For AES/EBU input, BNC and breakout cable operation in the AES/EBU section are mutually exclusive. You cannot capture from both the BNC inputs and the breakout cable inputs at the same time.

For AES/EBU output, the stereo BNC outputs mirror the DB-25 breakout cable output channels 1-2.

Synchronization and sample rate conversion
When making AES/EBU digital audio transfers to and from the HDX-SDI via the 8-channel DB-25 breakout cable, the two devices must be synchronized with one another. See "Syncing digital audio devices" on page 28.

EXAMPLE HDX-SDI AUDIO CONNECTIONS

Figure 4-9 shows an example of the types of audio connections you can make between other devices and the HDX-SDI. You can mix and match analog and digital sources and destinations, connect them all. The 8-channel banks of AES/EBU digital I/O are ideal for connection to a digital mixer.

Figure 4-9: HDX-SDI audio connections.

VIDEO SYNC CONNECTIONS

Connect a video sync source, such as blackburst, to the VIDEO REF IN jack (Figure 4-10). This input accepts either a Bi-level (SD) sync source or a Tri-level (HD) sync source. The HDX-SDI can resolve to a VIDEO REF IN signal only when it is in Playback mode, or when it is capturing SDI. When capturing other sources, it genlocks to the current video source, or its own Master (Internal) clock. For further information, see "Capture Clock Source" on page 38.

Video ref termination and "thru"

The HDX-SDI lets you daisy-chain the VIDEO REF signal to another video device using the THRU jack below the VIDEO REF jack. If you connect a device to the THRU jack, set the termination switch (Figure 4-10) to the *THRU* position.

If the HDX-SDI is the only device (or the last device in a daisy-chain), set the termination switch to the *75Ω TERM* position. This is crucial for successful genlock.

Figure 4-10: Video sync connectors.

TIMECODE CONNECTIONS

Connect any timecode source, such as the timecode output from a camera or VTR, to the LTC IN jack (Figure 4-10). If you wish to transmit timecode from the HDX-SDI to another device, connect the HDX-SDI LTC OUT to the timecode input on the other device. See "Setup tab" on page 37 and "Playback tab" on page 40 for information about managing the HDX-SDI's timecode features.

RS-422 MACHINE CONTROL

If you have a VTR or other device equipped with Sony 9-pin compatible machine control, and you would like to control it using Premiere Pro's machine control features, connect its RS-422 port to the HDX-SDI's RS-422 port (Figure 4-11). Also see "Device control" on page 52.

RS-422 IN

VTR or other device equipped
with machine control

Figure 4-11: RS-422 machine control.

SYNCING DIGITAL AUDIO DEVICES

The HDX-SDI's stereo BNC AES/EBU input is equipped with sample rate converters (SRC). This allows the digital audio data to be transferred cleanly, with no dropped samples, clicks, or pops , even when the two devices are not resolved to one another. However, it is still a good idea to resolve digital audio devices with the HDX-SDI during digital audio transfers to prevent audio from drifting out of sync with picture.

The 8-channel DB-25 AES/EBU connection is not equipped with sample rate conversion and therefore requires that the HDX-SDI is synchronized with the connected digital audio device.

Audio clock synchronization is described in the following sections, starting with a general discussion of digital audio phase lock, and why it is essential for clean and successful digital audio transfers.

Digital audio phase lock

Without sample rate conversion, when you transfer digital audio between two devices, their audio clocks must be in phase with one another — or *phase-locked* — as demonstrated below in Figure 4-12. Otherwise, you'll hear clicks, pops, and distortion in the audio, or perhaps no audio at all.
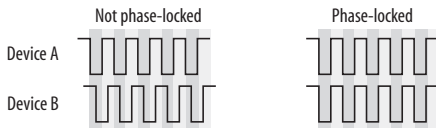

Figure 4-12: When transferring audio without sample rate conversion, two devices must have phased-locked audio clocks to prevent clicks, pops or other artifacts.

Without sample rate conversion, there are two ways to achieve phase lock: slave one device to the other, or slave both devices to a third master clock. If you have three or more digital audio devices, you need to slave them all to a single master audio clock.
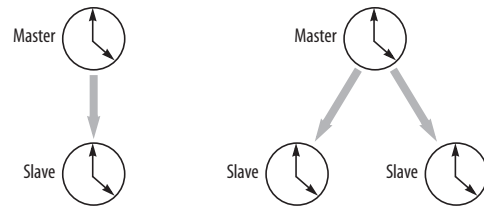

Figure 4-13: Without sample rate conversion, you need to choose a clock master to which all other devices slave. Each slaved device remains continuously resolved to the master, meaning that there will be no drift over time.

Audio phase lock as shown above in Figure 4-13 can be achieved independently of timecode (location). For example, one device can be the timecode master while another is the clock master. But only one device can be the audio clock master.

Another benefit of direct master/slave clocking (without sample rate conversion) is that each slaved device remains continuously resolved to the master, which means that there will be no gradual drift over time. This form of synchronization is best for audio that must remain resolved to picture.

Audio synchronization when capturing or playing video

The HDX-SDI audio clock always resolves to its video clock. The HDX-SDI has three possible sources for video clock:

■ The currently chosen video input source (Figure 6-3 on page 36)

■ The VIDEO REF IN jack

■ The HDX-SDI's own internal video clock

Resolving to the current video source

If the HDX-SDI is transmitting or receiving digital audio from the current video source, the video genlock between the two devices ensures that their digital audio clocks remain resolved and phase locked.

Resolving a third device to the HDX-SDI

If you need to make digital audio transfers between the HDX-SDI and third device (that is not the current video source), you must resolve the third device to the HDX-SDI, as demonstrated in Figure 4-14. In this example, the third device, a field recorder, is being resolved to the HDX-SDI via AES/EBU input.
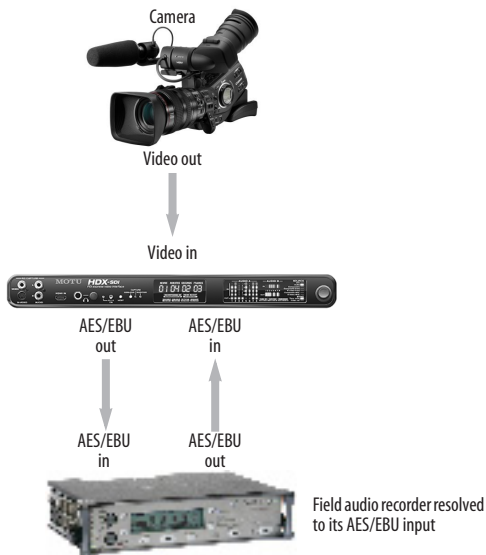
Camera

Video out

Video in

AES/EBU out

AES/EBU in

AES/EBU in

AES/EBU out

Field audio recorder resolved to its AES/EBU input

Figure 4-14: Capturing digital audio from a third device that is not the current video source. In this case, the third device must resolve to the HDX-SDI via its AES/EBU input.

Resolving a digital mixer to the HDX-SDI

If you would like to connect a digital mixer via the 8-channel AES/EBU DB-25 connector, resolve the digital mixer to the HDX-SDI, either via its AES/EBU connection, similar to what is shown in Figure 4-14.

Resolving to the VIDEO REF IN

If the HDX-SDI is currently resolved to its VIDEO REF IN, you can either resolve the other digital audio device to the HDX-SDI (Figure 4-14), or you can resolve the other device to the same genlock source that is feeding the HDX-SDI's VIDEO REF IN. In this scenario, the genlock source serves as a master clock to which both the HDX-SDI and the other device are resolved (Figure 4-13).

Sample rate conversion

The HDX-SDI BNC AES/EBU input is equipped with stereo real-time sample rate conversion. This feature provides a great deal of flexibility in making digital transfers. For example, you can:

■ Transfer digital audio into the HDX-SDI at a sample rate that is completely different than the HDX-SDI system clock rate.

■ Transfer digital audio into the HDX-SDI without the need for any external synchronization arrangements.

Rate conversion does not add any appreciable noise or distortion to the audio signal (under -120 dB).
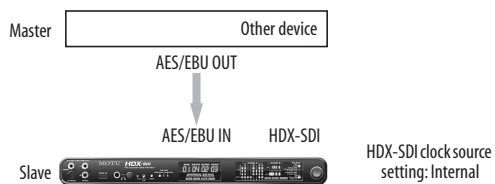
Here are a few examples:

Master

Other device

AES/EBU OUT

AES/EBU IN   HDX-SDI

Slave

HDX-SDI clock source setting: Internal

Figure 4-15: Rate-converting AES/EBU input.

Figure 4-16: Capturing digital audio from a device that is not resolved with the HDX-SDI. In this case, sample rate conversion is used.

A caution about using rate conversion

Rate conversion can be a life saver in situations where resolving digital audio clocks is difficult or impossible. As long as you are capturing audio and video together, audio will remain perfectly in sync with picture.

However, if you use sample rate conversion when capturing audio separately from its corresponding video, you run the risk of the audio drifting apart from picture over time. If the audio clip being captured is short, this may not be an issue. But for longer record/playback passes (more than a few minutes), you are much better off resolving the HDX-SDI to picture during the digital audio transfer.

As a general rule of thumb, most devices employ a clock crystal that has an accuracy of about ±50 parts per million, which produces drift that amounts to approximately one frame every five minutes at 60 fps.

Part 2
Using the HDX-SDI

CHAPTER 5   HDX-SDI Basics

TWO MODES

The HDX-SDI provides two basic modes of operation:

- Capture

- Playback (monitor)

The current mode is clearly indicated by the Status area in MOTU Video Console (Figure 6-1 on page 35), unless there is no genlock, in which case it will display a message explaining why not.

The HDX-SDI is always either in Capture mode or Playback mode. If no application is actively capturing, previewing or playing back, the *Default Mode* setting ("Default Mode" on page 37) determines which mode the box is in.

CAPTURE

The HDX-SDI is in *Capture* mode when it is successfully communicating with the computer (the HOST LED is illuminated) and video software has actively taken control of the HDX-SDI hardware for the purposes of capturing video and audio from the HDX-SDI. Here are some examples of when video software would put the HDX-SDI into Capture mode:

- You open the Capture window in Premiere Pro. Or you use any Premiere Pro feature that involves capturing or previewing the live video input from the HDX-SDI.

- You run the MOTU Video console software and click the Preview tab (Figure 6-1 on page 35, Figure 6-10 on page 42). This causes MOTU Video console to "take over" the video signal being supplied by the HDX-SDI and display it in the preview window.

In Capture mode, the HDX-SDI uses the Capture Clock Source setting ("Capture Clock Source" on page 38), and if it is set to Input Source, the input signal is passed through to the video outputs (SD in to SD out or HD in to HD out).

Even though the primary purpose of Capture mode is to feed video to the computer, the HDX-SDI continues to send the source video signal to any video outputs that match the source format (HD or SD). This allows you to simultaneously monitor what you are capturing via the HDX-SDI's video outputs. You could even dub the source signal to a video deck or other video recorder during capture.

Live monitoring is only active when the Capture Clock Source setting ("Capture Clock Source" on page 38) is set to *Input Source*. When it is set to *Master* or *REF In*, the HDX-SDI outputs a black image (i.e. black burst) on all video outputs.

PLAYBACK (MONITOR)

The HDX-SDI goes into *Playback* mode when an application is sending video to it. When not playing or capturing, the HDX-SDI reverts to the *Default Mode* setting ("Default Mode" on page 37).

In Playback mode, the HDX-SDI uses the Playback Clock Source setting ("Playback Clock Source" on page 38), and if no application is playing back, will output black.

ONE SOURCE TO MANY OUTPUTS

The HDX-SDI allows you to choose a single video source and route it to the video outputs that match the input format. (A standard definition input is routed to the standard definition outputs; a high definition input is routed to the high definition outputs.) Multiple input devices such as cameras,

playback decks, or DVD players, can be connected to the HDX-SDI along with multiple output devices such as monitors, recording decks, or distribution amplifiers. Choose the input source in the Setup tab in MOTU Video console, and the HDX-SDI will route that input to the corresponding outputs (either SD or HD).

Choosing the current video source

The MOTU Video console software lets you choose the current video source (input). For details, see "Input Source" on page 36.

Audio I/O and monitoring

On the audio side, the HDX-SDI feeds audio input to the computer and plays audio back from the computer, so that you can easily capture and playback audio in Premiere Pro.

If you are capturing multi-channel audio and wish to monitor all channels on stereo headphones or speakers, you can configure the HDX-SDI's audio monitoring settings in Premiere Pro. For more information, see "Audio Monitoring" on page 50.

MOTU Video Console

MOTU Video Console (Figure 6-1) is accessed via the Windows Start menu and provides convenient access to all HDX-SDI settings from your computer desktop.
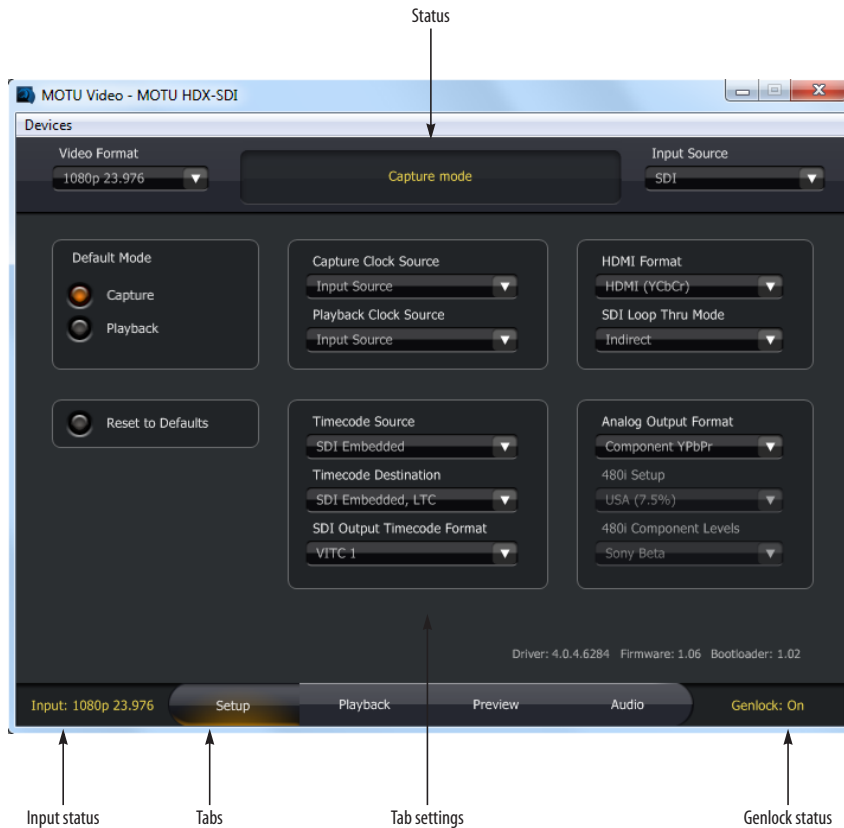
Figure 6-1: MOTU Video console.

VIDEO FORMAT

The *Video Format* setting (Figure 6-1 on page 35) shows the format in which the HDX-SDI is capturing or playing back video, and allows you to change the format manually. When capturing or playing video from Premiere Pro, this setting will be changed automatically by the host application.

486i 29.97
576i 25
720p 23.976
720p 24
720p 25
720p 29.97
720p 30
720p 50
720p 59.94
720p 60
1080p 23.976
1080p 24
1080p 25
1080p 29.97
1080p 30
1080i 25
✓ 1080i 29.97
1080i 30
1080PsF 23.976
1080PsF 24
1080PsF 25
1080PsF 29.97
1080PsF 30
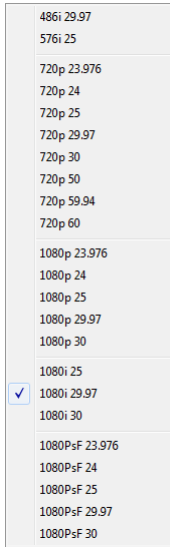
Figure 6-2: The Video Format menu.

INPUT SOURCE

The *Input Source* menu (Figure 6-1) is important because this is where you choose the video input from which the HDX-SDI will capture. This input may also be used as the clock source for playback (see "Playback Clock Source" on page 38).

✓	SDI
	HDMI
	Component YPbPr
	Component RGB
	Composite (front)
	S-Video (front)
	Composite (BNC)
	S-Video (BNC)
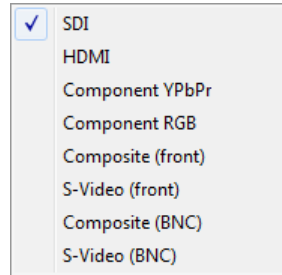
Figure 6-3: The Input Source menu.

The menu choices with *front* or *BNC* in their names (Figure 6-3) refer to the video inputs on the front panel of the HDX-SDI or the BNC video input connectors on the rear panel.

STATUS AREA

The Status area (Figure 6-1) displays what mode the HDX-SDI is in. It also provides helpful status information and troubleshooting suggestions. For example, if there is no video signal because of a wrong setting, the Status area will tell you which setting(s) to check.

INPUT STATUS

The *Input Status* (Figure 6-1) indicates the video format detected on the currently chosen video Input Source.

GENLOCK STATUS

The *Genlock Status* (Figure 6-1) indicates when the HDX-SDI has successfully achieved lockup to the currently selected clock source, which could be the HDX-SDI's internal clock, the video REF IN jack or the current video input source.

SETUP TAB

The *Setup* tab (Figure 6-4) provides several general settings for HDX-SDI operation.

Default Mode

The HDX-SDI has two modes of operation: *Capture* and *Playback*. Your host video software determines the mode, depending on what you are doing (i.e. capturing or playing back the timeline). The *Default Mode* setting (Figure 6-1) lets you choose which mode the HDX-SDI enters when the host relinquishes control over the HDX-SDI hardware, such as when you quit or switch out of your host software. If you spend most of your time just monitoring or just capturing, operation will be faster if you set this to the mode you expect to use most.
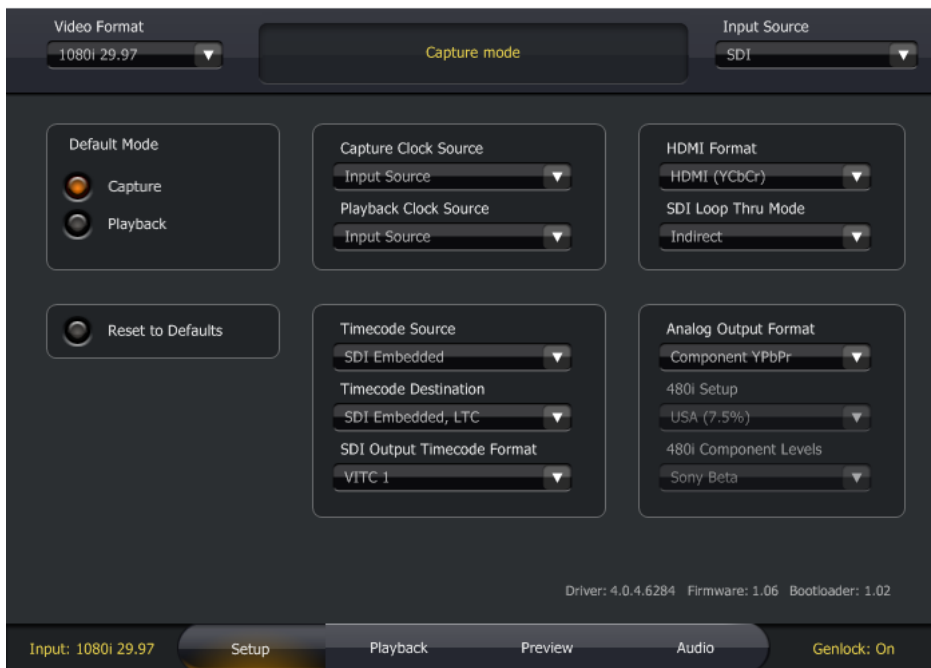
Figure 6-4: Setup tab.

Capture Clock Source

The *Capture Clock Source* setting (Figure 6-4) lets you specify the timing reference for the HDX-SDI when it is in Capture mode. Three choices are provided in the menu, as shown below in Figure 6-5:
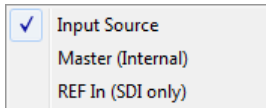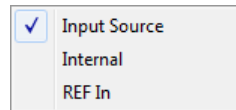

Figure 6-5: Capture Clock Source menu.

Input Source

Choose *Input Source* (Figure 6-5) when you wish to resolve the HDX-SDI to the video signal being received on the currently chosen input in the *Input Source* menu (Figure 6-3).

Master (Internal)

Choose *Master (Internal)* (Figure 6-5) to make the HDX-SDI resolve to its own internal clock when capturing from a device (such as a deck) that is resolved to the HDX-SDI's output. For example, when using RS-422 machine control to drive a video deck connected to the HDX-SDI, the HDX-SDI serves as the clock master and drives the video deck. Because the deck is resolved to the HDX-SDI, the video signal being captured from the deck is genlocked.

REF In (SDI only)

Choose *REF In (SDI only)* (Figure 6-5) when you wish to resolve the HDX-SDI to house sync (blackburst) or another clock source connected to its VIDEO REF input while capturing video from the SDI input. The REF IN can only be used when capturing SDI input and cannot be used when capturing other video formats. For other formats, use the *Input Source* or *Master (Internal)* setting instead.

When capturing HD, the REF In option supports both Bi-Level and Tri-Level sync. When capturing SD, the reference input must be bi-level.

Clock source during capture

If the input source is SDI, you can choose any of the three available clock source options. For other input formats, use either the *Input Source* or *Master (Internal)* Capture Clock Source setting.

Playback Clock Source

The *Playback Clock Source* setting (Figure 6-1) lets you specify the timing reference for the HDX-SDI when it is in Playback mode. Three choices are provided in the menu, as shown in Figure 6-6:

Figure 6-6: Playback Clock Source menu.

Input Source

Choose *Input Source* (Figure 6-6) when you wish to resolve the HDX-SDI to the video signal being received on the currently chosen input in the *Input Source* menu (Figure 6-3) during playback.

Internal

Choose *Internal* (Figure 6-6) when you wish to resolve the HDX-SDI to its own internal clock during playback.

REF In

Choose *REF In* (Figure 6-6) when you wish to resolve the HDX-SDI to house sync (blackburst) or another clock source connected to its VIDEO REF input while playing video.

When playing back HD, the REF In option supports both Bi-Level and Tri-Level sync. When playing back SD, the reference input must be bi-level.

Clock source when switching between Capture and Playback modes

When the HDX-SDI switches its clock source, it may take a brief moment for it to resolve to the new source. If you need to frequently switch between

Capture and Playback modes, set the capture and playback clock sources to one of the combinations listed below:

Capture	Playback
Input Source	Input Source
Master (Internal)	Internal
REF In (SDI only)	REF In

With any of these combinations, you can switch back and forth between capture and playback without losing genlock. This ensures a smooth, quick, seamless transition when switching modes.

HDMI format

The *HDMI Format* menu (Figure 6-4) lets you choose the output format for the HDMI output on the rear panel of the HDX-SDI. If you choose DVI, you'll need an HDMI-to-DVI cable or adapter.

SDI Loop Thru Mode

The *SDI Loop Thru Mode* (Figure 6-4) setting controls the routing of audio and timecode to the SDI output during SDI capture.

If set to *Direct*, audio and timecode from the SDI source are passed through to the SDI output, as if the output was just connected directly to the input. You could use this mode to make a dub of an SDI source including audio and timecode.

If set to *Indirect*, audio from the computer and timecode from the selected timecode source are inserted into the SDI output. In this case, the SDI output is acting in the same way as the other audio outputs and timecode outputs.

Timecode Source

The *Timecode Source* menu (Figure 6-4) lets you specify which timecode source you would like the HDX-SDI to resolve to: *Sony 9-pin* (via the RS-422 port), the *LTC* jack on the rear panel of the HDX-SDI, *SD VITC* (vertical interval timecode) from the currently chosen SD source input, or *SDI*

Embedded timecode from the SDI input currently chosen in the Input Source menu (Figure 6-3 on page 36).

Timecode Destination

The *Timecode Destination* menu (Figure 6-4) lets you specify the video destination for timecode generated or regenerated by the HDX-SDI. You can choose *None*, *SD VITC, LTC* (vertical interval timecode plus longitudinal timecode), or *SDI Embedded, LTC*. For the SDI option, the timecode is encoded as standard embedded timecode in the chosen SDI stream. This setting also determines the timecode format to be transmitted from the HDX-SDI's LTC output jack on the rear panel.

SDI Output Timecode Format

Use the *SDI Output Timecode Format* menu (Figure 6-4) to specify the form of embedded timecode to include in the HDX-SDI SDI output signal. Choices are *LTC*, *VITC 1* and *VITC 2*.

Analog Output Mode

The Analog Output Mode menu (Figure 6-4) lets you configure the analog outputs as Composite and S-Video (*CVBS + S-Video Y/C*), Component YPbPr, or Component RGB.

Figure 6-7: Analog Output Mode menu.

480i Setup

The *480i Setup* option (Figure 6-4) lets you choose between *USA (7.5%)* and *Japan (0%)* for NTSC composite and S-video input and output.

480i Component Levels

The *480i Component Levels* option (Figure 6-4) lets you specify the voltage level standard for the HDX-SDI's SD component inputs and outputs when running at 480i (NTSC). Choices are: EBU N10, Sony Beta, Sony Beta Japan and Panasonic

MII. Choose the format that best matches the device(s) connected to the SD component input and output.

Reset to Defaults

The *Reset to Defaults* button (Figure 6-4) restores all settings in the HDX-SDI hardware to their original (factory) values.

PLAYBACK TAB

The *Playback* tab (Figure 6-8) provides settings that apply to video playback from Premiere Pro (as opposed to capturing). Therefore, these settings relate to the current settings in Premiere Pro and its timeline.

Interlace Pause Mode

If you are working with an interlaced video format, the *Interlace Pause Mode* (Figure 6-8) lets you choose between viewing a *Full Frame* or individual *Fields* (1 or 2) when Premiere Pro parks on a frame. .

Playback Timecode Offset

The *Playback Timecode Offset* options (Figure 6-8) let you specify the frame format and timecode offset for timecode generated by the HDX-SDI during playback. Make sure these settings match their corresponding settings in your Premiere Pro project, so that the HDX-SDI generates timecode that matches Premiere Pro's time line.

Playback 29.97 fps Timecode

If your Premiere Pro timeline is currently set to the 29.97 drop-frame format, choose *Drop Frame* from the *Playback 29.97 fps Timecode* menu (Figure 6-8) so that the HDX-SDI matches Premiere Pro's frame format. If Premiere Pro is running 29.97 non-drop, choose *Non-Drop Frame*. (If you are running Premiere Pro at any other frame rate besides 29.97, this setting is ignored.)

Color Lookup Table for playback
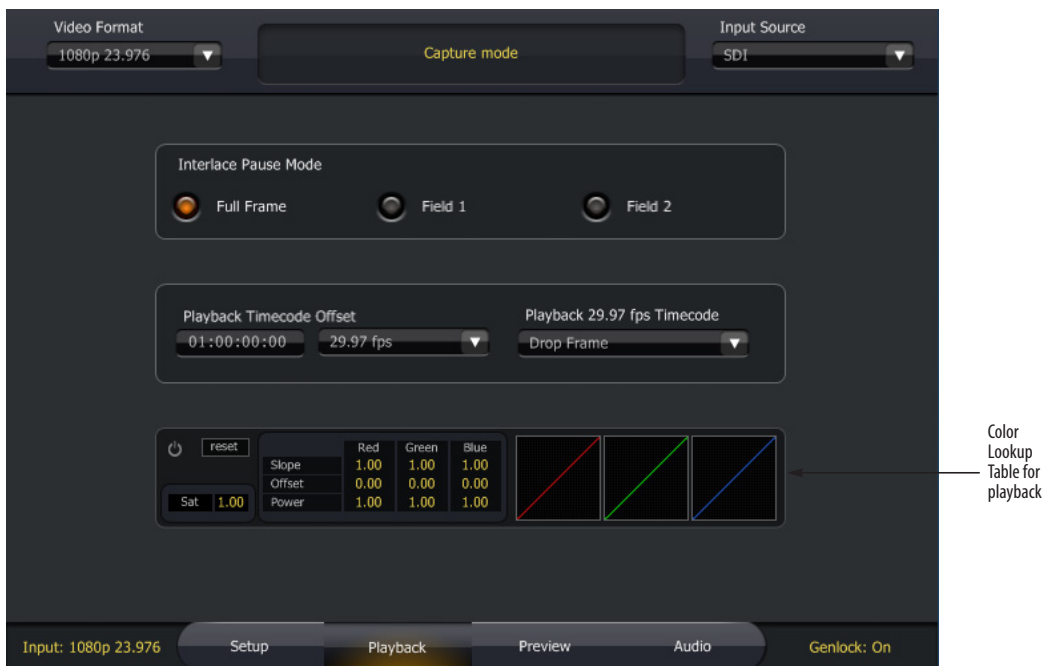
Figure 6-8: The Playback tab settings.

Color lookup table

In the *Color Lookup Table* (CLUT) section (Figure 6-8), there are ten parameters which define a color transfer function, as defined by the *American Society of Cinematographers Color Decision List* (ASC CDL) specification.

The Color Lookup Table controls in the Playback tab (Figure 6-8) define a transfer function which applies to the output on playback. The controls in the Preview pane (Figure 6-10) define a transfer function which applies to the input on capture. In this case, it affects pass through as well as capture.

The power switch icon (Figure 6-9) is an enable/bypass control. Click it to turn the Color Lookup Table on or off.

Enable/disable
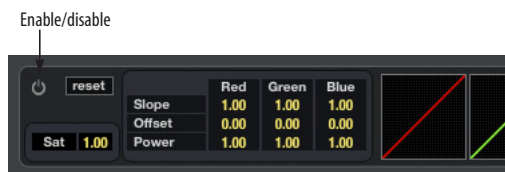
Figure 6-9: Color lookup table controls.

The *Reset* button resets the transfer function to its default, which passes through each pixel unchanged, and also switches to bypass mode.

Changing any control automatically enables the transfer function, but you can also toggle between *Enabled* and *Bypassed* by clicking on the enable/bypass control.

The *Sat* parameter is ASC CDL Saturation. A value of 1.0 passes each pixel through unchanged. Values below 1.0 will desaturate, with 0.0 resulting in a monochrome image. Values greater than 1.0 increases saturation. The maximum legal value is 10.0, which produces extreme results.

The *Slope*, *Offset*, and *Power* parameters for each component define a transfer function for that component, as per the ASC CDL specification. Offset ranges from -1 to +1, with a default of 0. Power and Slope range from 0.10 to 10.00, with a default of 1.0.

Each of the numeric controls may be modified in three ways:

- If the console window is in front, click on a control to select it, and type a new value

- Click and drag up or down

- Use the mouse wheel

The capture color correction controls (in the Preview tab) only appear over the preview when the mouse is over the preview. The panel holding the capture color correction controls can be dragged around within the preview pane, allowing you to see any part of the preview while adjusting the controls. To drag it, click on any part of the panel other than one of the buttons or numeric controls.

PREVIEW TAB

The *Preview* tab (Figure 6-10) lets you preview the video signal being received from the currently selected input in the Input Source menu (Figure 6-3 on page 36).

If you don't see the source video signal

If you have trouble getting the source video signal to appear in the preview frame, make sure the Final Cut Pro Capture window isn't open in the background. If so, the Status area (Figure 6-1 on page 35) will alert you to the fact that the host application is currently capturing or previewing.

The Preview tab and Premiere Pro

When Premiere Pro is running, it takes over the HDX-SDI hardware in regards to previewing. In this situation, the Preview window simply displays a message saying that previewing is unavailable. When you quit Premiere Pro, the Preview tab operates normally, as described above.

Color lookup table

See "Color lookup table" on page 41.

Brightness, Contrast and Hue

When previewing a Composite or S-Video signal, the *Preview* tab provides several settings for adjusting the *Brightness*, *Contrast* and *Hue*, as shown in Figure 6-10 below.

Figure 6-10: The Preview tab.

AUDIO TAB

The Audio tab (Figure 6-11) provides access to the HDX-SDI's audio features. The HDX-SDI provides 16 channels (two 8-channel banks) of simultaneous audio input and output. For a summary of audio bank formats, see "Connect audio inputs and outputs" on page 24.

Sample rate

Choose the audio sample rate (Figure 6-11) for capture or playback. Make sure this setting matches the rate of the audio being captured or played back. Sample rates up to 96 kHz are supported, with the following restrictions:

■ The HDMI input and output are stereo at sample rates above 48000 Hz when playing SD video.

■ SDI audio output is disabled at sample rates over 48000 Hz.

When using the HDX-SDI with Premiere Pro, the sample rate should be set from within Premiere Pro.

Inputs

Choose the desired audio input format for Bank A (channels 1-8) and Bank B (channels 9-16) from the menus provided. These banks correspond to the channel assignments for host software (Premiere Pro), as well as the meters and activity LEDs on the front panel of the HDX-SDI. The menus provide the following choices:

Figure 6-11: Audio tab.

Bank A (1-8)

✓	Analog (TRS)
	SDI/HDMI
	AES/EBU (DB-25)
	AES/EBU (BNC) + Analog (RCA)

Bank B (9-16)

	Analog (TRS)
✓	SDI/HDMI
	AES/EBU (DB-25)
	AES/EBU (BNC) + Analog (RCA)
	None
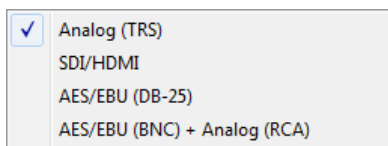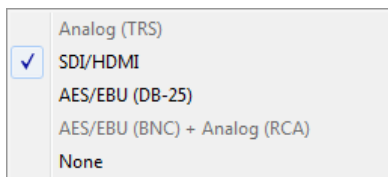
Figure 6-12: Input bank assignments.

The first three choices are *Analog (TRS)*, *SDI/HDMI* and *AES/EBU (DB-25)*. These are all 8-channel banks. The fourth choice, *AES/EBU (BNC) + Analog (RCA)*, is a four channel bank referring to the stereo AES/EBU BNC input on the rear panel (channels 1-2 in the bank) and the stereo RCA analog inputs on the front (channels 3-4 in the bank).

AES/EBU input
The HDX-SDI provides two different banks of AES/EBU input:

■ Stereo BNC

■ Eight channels on DB-25 breakout

These two banks operate exclusively. For example, if you choose *AES/EBU DB-25* for Bank A, the *AES/EBU (BNC) + Analog (RCA)* bank will be grayed out in the menu for Bank B, since they cannot both be enabled at the same time.

Analog input
Similar to the AES/EBU banks explained above, The HDX-SDI provides two different banks of analog input:

■ Stereo RCA

■ Eight channels of TRS

These two banks operate exclusively. For example, if you choose *Analog (TRS)* for Bank A, the *AES/EBU (BNC) + Analog (RCA)* bank will be grayed out in the menu for Bank B, since they cannot both be enabled at the same time.

Grayed out input menu items
If an item is grayed out in the Bank A or Bank B input menus, it is disabled. See the previous two sections for further information.

Analog input trims
Use the analog input trim controls (Figure 6-11 on page 43) to apply up to +22 dB of gain or -12 dB of cut to each individual TRS analog input. You can also apply up to +18 dB of gain or -6 dB of cut to RCA analog inputs.

Outputs
Use the buttons provided to assign each audio output format to the desired HDX-SDI output channel bank (1-8 or 9-16). You can assign two or more formats to the same bank, in which case the audio output is mirrored (duplicated) on each output format.

Mirroring output banks
To make two or more output banks produce the same audio output, simply assign them to the same output bank (either 1-8 or 9-16).

Disabling output banks
To disable a bank completely, click its *Off* button.

Audio banks and front-panel metering
The HDX-SDI front panel provides two banks of activity LEDs for audio input and output. Bank A represents channels 1-8 and Bank B represents channels 9-16. These input meters and output activity LEDs only operate when at least one bank is assigned to them. In addition, they are only active when audio is being sent to/from the computer (i.e. the HDX-SDI driver is sending audio to/from a host application).

CHAPTER 7   Adobe Premiere Pro

OVERVIEW

The HDX-SDI serves as a powerful video capture and playback device for Adobe Premiere Pro. Operation is straightforward and follows the general workflow prescribed by Premiere Pro for capture procedures and time line playback.

FAMILIARITY WITH PREMIERE PRO

This chapter assumes that you have a working knowledge of basic Premiere Pro operation.

BEFORE YOU LAUNCH PREMIERE PRO

Before you launch Premiere Pro, be sure to:

■ Insert the HDX-SDI software, as explained in chapter 3, "Installing the HDX-SDI Windows Software" (page 15).

■ Install the HDX-SDI hardware and connect your video devices to it as explained in chapter 4, "Installing the HDX-SDI Hardware" (page 17).

■ Power on the HDX-SDI and run the MOTU Video Console to make sure that installation has been successful. If MOTU Video Console launches without any error messages, then Premiere Pro should successfully communicate with the HDX-SDI.

GETTING STARTED

1 Launch Premiere Pro.

2 When the Welcome screen appears, click New Project and choose the desired Capture Compression Codec from the Capture Format menu (Figure 7-1).

3 Click *Configure...* to access capture parameters of the HDX-SDI (Figure 7-2).

Figure 7-2: MOTU video capture settings.

4 Name the project and click OK.

PLAYBACK SETTINGS

If you are using a progressive 1080 line timeline, click *Playback Settings* to choose the desired 1080p Playback Format (Figure 7-3). This setting determines whether the video will be played back as progressive (1080p) or progressive segmented frame (1080PsF).
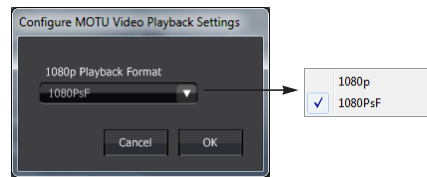
Figure 7-3: Playback settings.

SEQUENCE PRESETS

The HDX-SDI software installer provides the MOTU HDX-SDI factory-supplied sequence presets shown in Figure 7-4. These presets are organized in directories by video format. Each preset is clearly named with a video frame format, raster size and frame rate. Choose the preset that
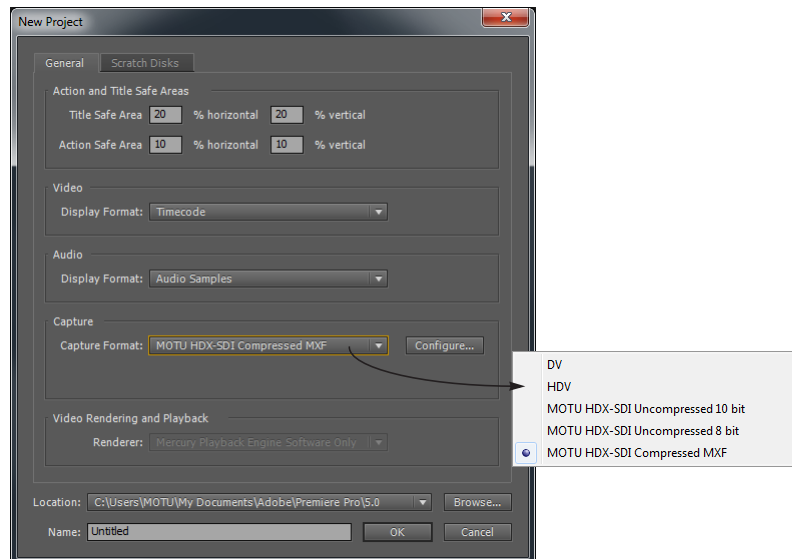
Figure 7-1: Creating a new project in Premiere Pro.

most closely matches the settings you need. You can adjust settings further using the *Settings* tab *(General* tab in 5.0) and *Tracks* tab.

Custom settings

You can further adjust project settings or even create your own custom sequence presets to suit your workflow. Click the *Settings* tab (Figure 7-5) to further configure your settings. (This is the *General* tab in version 5.0.) Always be sure, however, to choose a MOTU PCI video preset from the Editing Mode menu. This ensures that you will be able to play video via the HDX-SDI hardware. For information about other custom settings, consult your Premiere Pro documentation.

HDX-SDI VIDEO SETTINGS

Once the HDX-SDI hardware has been configured by the Premiere Pro settings you made in the previous section, open the MOTU Video Console

application (Figure 6-1 on page 35) to view the HDX-SDI's hardware settings and make any adjustments, if necessary, as explained in the following sections.

Basic hardware settings

Check the three basic hardware settings:

- "Video format" on page 36
- "Input Source" on page 36
- "Capture Clock Source" on page 38
- "Playback Clock Source" on page 38

Input/capture settings

To access the HDX-SDI's capture settings, click the Setup tab (Figure 6-4 on page 37) and Preview tab (Figure 6-10 on page 42).
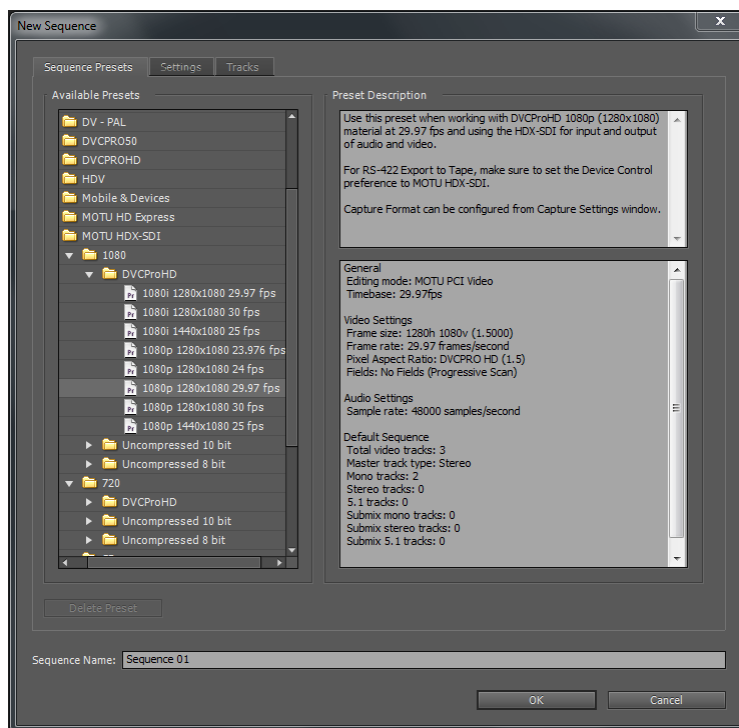
Figure 7-4: Sequence presets.

For details on other Capture settings, review chapter 6, "MOTU Video Console" (page 35).

Playback settings
Click the Playback tab (Figure 6-8 on page 40) to view Playback settings.

In the Playback tab, make sure the *Playback Timecode Offset* and frame rate match your Premiere Pro sequence offset and frame rate. If you are working with drop frame timecode, be sure to choose *Drop frame* from the *Playback 29.97 fps Timecode* menu (Figure 6-8 on page 40).

If you want Premiere Pro to resolve to an external sync source during playback, choose the desired source from the *Playback Clock Source* menu (Figure 6-5 on page 38); otherwise, leave it set to *Internal*.

For details on other playback settings, review chapter 6, "MOTU Video Console" (page 35).

VIDEO CAPTURE
Once you've made the appropriate settings in Premiere Pro and you've reviewed the capture settings in MOTU Video Console, you are ready to capture video from the HDX-SDI:

1 In Premiere Pro, choose *Capture* from the File menu to open the Capture window (Figure 7-6).

2 Click the Settings tab and click the Edit button (Figure 7-6) to access the Capture settings (Figure 7-7).
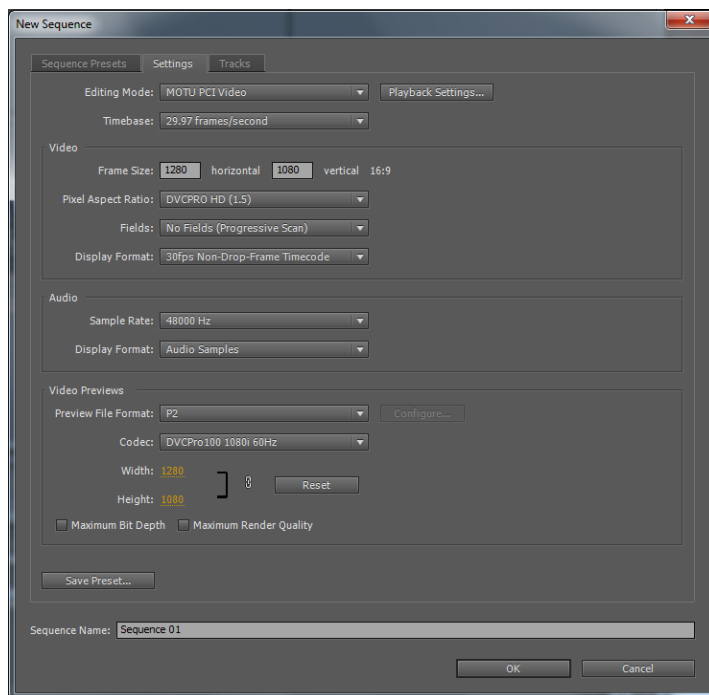
Figure 7-5: Settings tab.
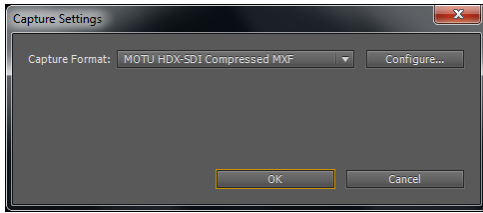
Figure 7-7: Capture settings.

3 Choose the desired Capture Compression Codec from the Capture Format menu.

4 Click *Configure...* to access the capture parameters for the HDX-SDI.

Refer to the following sections for information about the Capture settings (Figure 7-9 on page 50).

5 Click the *Logging* tab (Figure 7-6) and name the clip (Figure 7-8).

☛ Be sure to name the clip before you begin capture to avoid potential issues during capture.
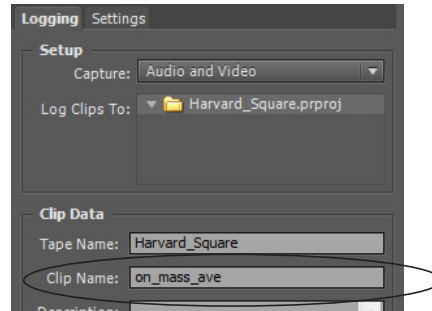
Figure 7-8: Be sure to name the clip before you capture.
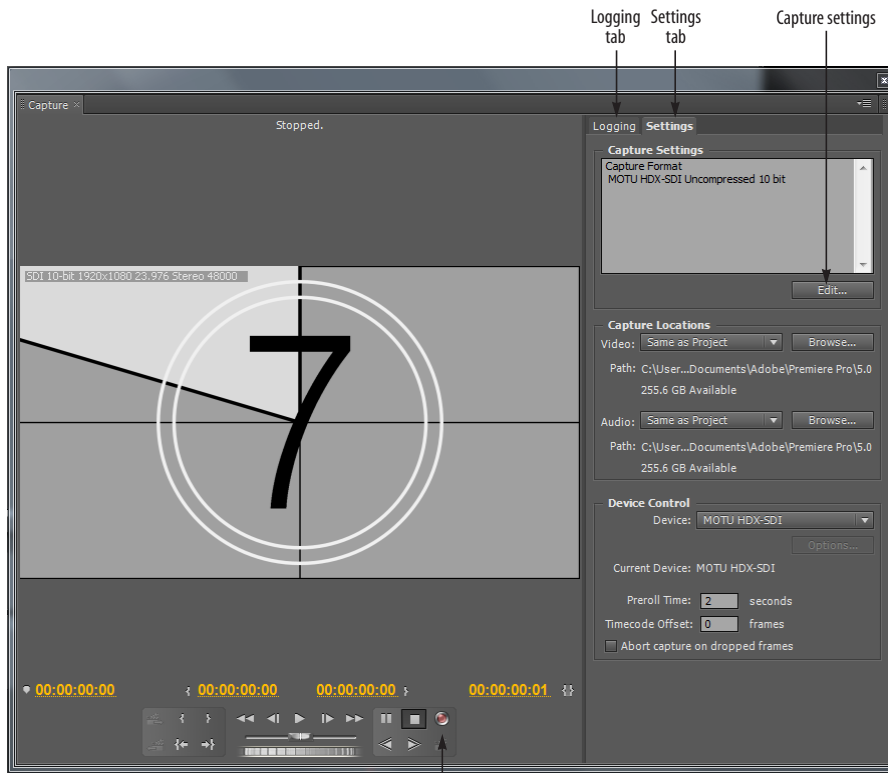
Figure 7-6: Capture window.

6 Click the Record button (Figure 7-6) to start capturing.

Capture settings

To access the capture settings, choose *File menu> Capture* to open the Capture window, click the Settings tab (Figure 7-6 on page 49), then click Configure (Figure 7-7 on page 49). Each setting is explained briefly below.
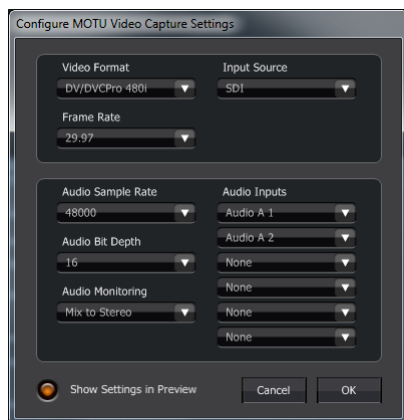
Figure 7-9: Capture settings.

Video format

Choose the desired video format Figure 7-2 on page 46.

Input source

Choose the desired video input on the HDX-SDI from the Input Source menu (Figure 7-9). This is the physical input on the interface that you wish to capture from, and it is the same setting as the *Input Source* menu in MOTU Video Console (Figure 6-3 on page 36).

Frame rate

Choose the desired video frame rate from the Frame Rate menu (Figure 7-9). Make sure this setting matches your project frame rate.

Audio Sample Rate

From the Audio Sample Rate menu, choose the desired audio sample rate for the captured audio.

Audio Inputs

From the Audio Inputs menu, choose the audio channels that you wish to capture. These audio channels correspond to the audio bank configuration settings in the Audio tab in MOTU Video Console (Figure 6-11 on page 43).

For example, if Input Bank A is set to SDI/HDMI, choosing Audio A 1 and A 2 will capture the first two audio channels from SDI/HDMI inputs.

☛ The SDI/HDMI audio input bank is available only when the Video Input Source is set to SDI or HDMI.

Audio Bit Depth

The HDX-SDI supports both 16-bit and 24-bit audio capture and playback. Choose the desired format from the Audio bit depth menu (Figure 7-9).

Audio Monitoring

Audio monitoring menu settings are as follows:

Setting	What it does
None	No audio patch-through during capture.
Mix to Stereo	All audio inputs will be mixed down to outputs 1 and 2. This lets you monitor any inputs being recorded in Premiere Pro on headphones or stereo monitors.
Direct	All audio inputs will be routed directly to their corresponding outputs.

Show Settings in Preview

This option will overlay the current video and audio settings in the Capture window.

☛ NOTE: The overlay is for monitoring only and will not be captured with the video signal.

PLAYBACK AND MONITORING

To play back your Premiere Pro project and view it on any monitor or other device connected to the HDX-SDI's video outputs:

1 Choose Edit menu > Preferences > Player Settings.

2 Choose the MOTU HDX-SDI as the Default Player (Figure 7-10).

This allows you to view the Source window on any monitor connected to the HDX-SDI's video outputs.

3 Start playback.
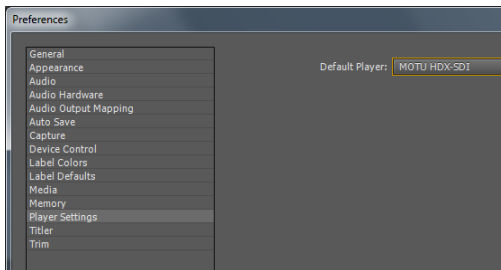
Figure 7-10: Choosing the HDX-SDI as the default player.

Native versus non-native clips

Clips that match the native video format of your Premiere Pro project and don't require any further rendering will play back. Clips that don't match the native video format of your Premiere Pro project will appear in the time line with the red render bar. For example, if you place an HDV clip in the time line, it will appear with a red render bar. In this case, it will likely not play smoothly, unless your computer is fast enough to transcode it in real time during playback (see "Mercury playback engine" below). For smooth playback, render the clip to convert it to the native video format for your project.

Mercury playback engine

The HDX-SDI take full advantage of Premiere Pro's Mercury playback engine. If your system is equipped with a Mercury-enabled video card, you will enjoy industry-leading rendering speeds. Consult your Premiere Pro documentation for full details.

The HDX-SDI does not require any additional configuration or settings to support the Mercury engine. If you enable Mercury as explained in the Premiere Pro documentation, the HDX-SDI will take full advantage of the engine.

AUDIO HARDWARE SETTINGS

Choose *MOTU PCI Video ASIO* as a Default Audio Device (Edit > Preferences > Audio Hardware) to ensure that audio and video stay in sync during playback (Figure 7-11).
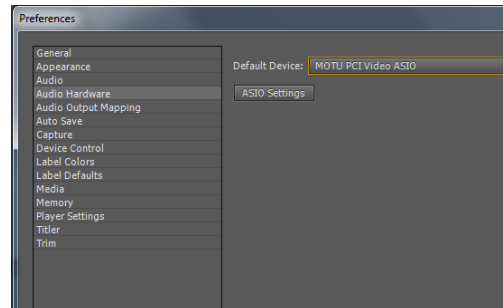
Figure 7-11: Default Audio Device.

Two 8-channel banks of audio

The HDX-SDI provides two 8-channel banks of simultaneous audio input and output: Bank A (channels 1-8) and Bank B (channels 9-16). Use the settings in the Audio tab (Figure 6-11 on page 43) to assign the desired audio formats to each input and output bank.

Audio Output Mapping

Audio Output Mapping (Edit > Preferences > Audio Output Mapping) lets you configure the audio output destination. Choose MOTU PCI Video ASIO to view and make changes to fit your workflow (Figure 7-12).

TIMECODE

To lock Premiere Pro to timecode during capture, go to the Setup tab (Figure 6-4 on page 37) in MOTU Video Console and choose the *Timecode Source* (page 39).

To configure the timecode format being output by the HDX-SDI hardware while Premiere Pro is playing back, go to the Setup tab (Figure 6-4 on page 37) in MOTU Video Console and choose the desired destination from *Timecode Destination* menu. Also check the following additional Playback tab settings:

- *Playback 29.97 fps Timecode* (page 40)

- *Playback Timecode Offset* (page 40)

DEVICE CONTROL

To configure HDX-SDI RS-422 (Sony 9-pin) device control in Premiere Pro:

1 Connect an RS-422 cable from HDX-SDI to the video deck or other machine control device.

2 Make sure the video deck is configured properly for remote operation via RS-422 machine control.

3 In MOTU Video Console, choose *Sony 9-Pin* from the Timecode Source menu (Figure 6-4 on page 37), which is found in the *Setup* tab, or choose LTC if your deck is feeding timecode to the computer via the LTC input (instead of via 9-pin).

4 Back in Premiere Pro, choose *Edit menu> Preferences> Device Control* and choose *MOTU HDX-SDI* from the Devices menu (Figure 7-13).

You can now use Premiere Pro's transport features to control your deck. Consult the Premiere Pro documentation for complete information about using machine control.
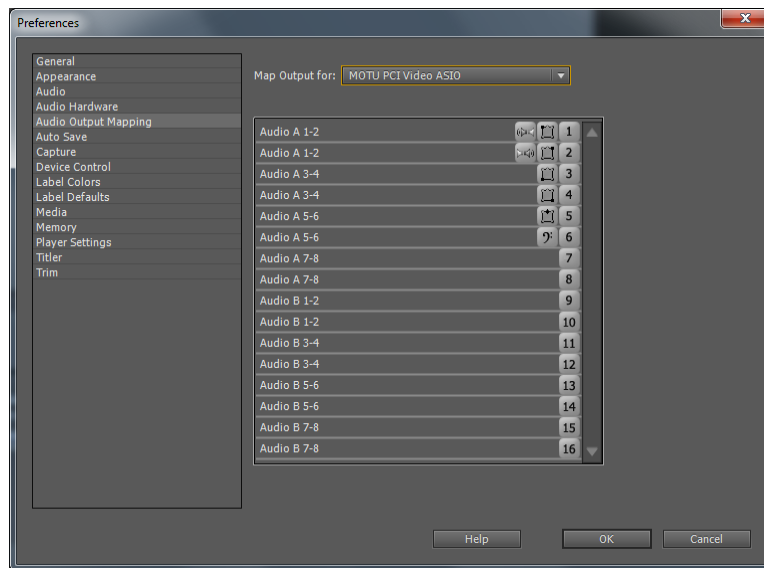
Figure 7-12: Audio Output Mapping.
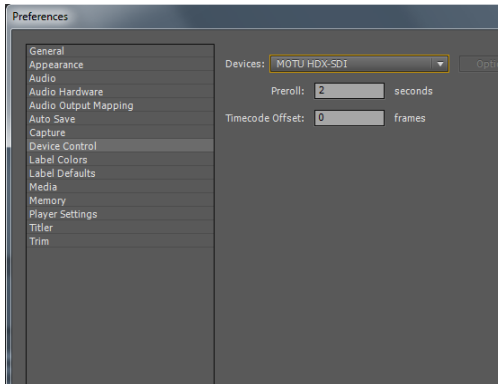
Figure 7-13: Device control.

Figure 7-14: Export to Tape.

EXPORT TO TAPE

The HDX-SDI provides an Export to Tape feature. This allows you to lay back material in your Premiere Pro time line to a tape deck equipped with RS-422 device (machine) control support.

Setting up device control

Before using the HDX-SDI's Export to Tape feature, you must first connect your tape deck to the HDX-SDI's RS-422 machine control port to establish device control, as described in the previous section.

Exporting to tape

To export to tape:

1 Select a work area in your project time line.

2 To access the Export to Tape settings (Figure 7-14), choose *File menu> Export> Export to Tape*.

3 Choose the desired Export Mode (see explanations below) and specify the insert time in the timecode field provided (Figure 7-14).

4 Click the Export button (Figure 7-14) to begin the export operation.

Three Export to Tape modes are provided: *Insert*, *Assemble* and *Preview*.

Insert

Insert mode records the current *Sequence Work Area* to tape, replacing any existing video and audio on the tape. Because timecode and control track are not replaced, this mode keeps the tape playing at the proper speed, resulting in a smooth transition at the In and Out points.

Assemble

Assemble mode records the current *Sequence Work Area* to tape, replacing all existing video, audio, timecode and control track information on the tape. Because of the potential discrepancy between the timing of the newly recorded signal and the original signal on tape, the Out point transition may not be as smooth as Insert mode.

Preview

Preview mode previews the *Sequence Work Area* without actually recording to tape.

BATCH CAPTURE

The HDX-SDI supports Premiere Pro's Batch Capture feature, as follows:

1   In the Capture panel, use the *Set In* and *Set Out* buttons (Figure 7-15) to specify the desired log region.
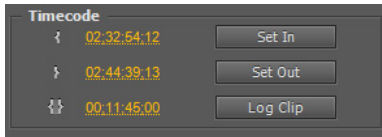
Figure 7-15: Logging clips.

2   Click the *Log Clip* button (Figure 7-15) to log the clip you specified, and name the clip when prompted.

3   When you are ready to begin, select all logged clips in the Project panel.

4   Choose *File menu> Batch Capture*.

5   Follow the on-screen instructions.

For more information about Batch Capture, refer to the Adobe Premiere Pro CS5 user guide.

Part 3
Appendices

USE THE STATUS DISPLAY

Use the Status display in MOTU Video Console (Figure 6-1 on page 35) for help with various issues having to do with capture, playback, sync and other aspects of HDX-SDI operation. MOTU Video Setup is engineered to detect problems and report them in the Status area. Most common issues can be resolved by following the instructions given by the Status display.

FREQUENTLY ASKED QUESTIONS

MOTU Video Console cannot detect the HDX-SDI. Why not?
Is the HDX-SDI connected to the PCIe card adapter installed in a desktop computer? If so, did the HDX-SDI breakout interface get disconnected or powered off while the computer is still powered on? In this case, you need to shut down the computer, plug in the interface, switch it on and then power up the computer. The breakout interface must remain connected and powered on while the computer is running. The HDX-SDI's Auto On mode lets you leave the power switch on, and the interface will power up and power down with your computer. See page 5 for details on Auto On mode.

Connecting or powering gear during operation
It is not recommended that you connect, disconnect, or power on/off devices connected to the HDX-SDI while recording or playing back audio. Doing so may cause a brief glitch in the audio.

When I try to genlock via the HDX-SDI's VIDEO REF input, I have problems.
If there is no device connected to the REF THRU jack, make sure that the termination switch is set to the *75Ω TERM* position. Proper termination is critical for successful genlock.

The HDX-SDI is having trouble genlocking to my video deck.
Is the deck connected to a video output from the HDX-SDI? If so, it could be a clock loop problem, where the deck is trying to resolve to its video input, while the HDX-SDI is trying to resolve to video input from the video deck. See "Master (Internal)" on page 38.

I experience glitching in my video signal when switching between Capture and Playback.
See "Clock source when switching between Capture and Playback modes" on page 38.

My HDMI output does not output any video.
Make sure the *HDMI Format* setting is set to HDMI, not DVI.

I hear clicks and pops on audio from an external SDI device.
Make sure your Capture Clock Source and Playback Clock Source settings are properly set to work with an external SDI device. See "Capture Clock Source" on page 38 and "Playback Clock Source" on page 38.

The audio meters on the front panel don't work.
The meters and activity LEDs only operate when audio is actually being sent to/from the computer. For example, if audio is being fed to HDX-SDI inputs, but no host application is running on the computer to receive the audio, the meters won't be

active. To activate the meters, run your video host application or MOTU Video **Console** and enable its audio capture features.

CUSTOMER SERVICE

We are happy to provide customer service to our registered users. If you haven't already done so, please take a moment to register on line at www.motu.com/register, or fill out and mail the registration card included with your HDX-SDI. Doing so entitles you to technical support and notices about new products and software updates.

TECHNICAL SUPPORT

If you are unable, with your dealer's help, to solve problems you encounter with the HDX-SDI system, you may contact our technical support department in one of the following ways:

■ Tech support hotline: (617) 576-2760 (Monday through Friday, 9 am to 6 pm EST)

■ Online support: www.motu.com/support

Please provide the following information to help us solve your problem as quickly as possible:

■ The serial number of the HDX-SDI system. This is printed on a sticker placed on the bottom of the HDX-SDI rack unit. You must be able to supply this number to receive technical support.

■ A brief explanation of the problem, including the exact sequence of actions which cause it, and the contents of any error messages which appear on the screen.

■ The pages in the manual which refer to the parts of the HDX-SDI with which you are having trouble.

■ Windows version information.

We're not able to solve every problem immediately, but a quick call to us may yield a suggestion for a problem which you might otherwise spend hours trying to track down.

If you have features or ideas you would like to see implemented, we'd like to hear from you. Please visit www.motu.com/suggestions or write to the HDX-SDI Development Team, MOTU Inc., 1280 Massachusetts Avenue, Cambridge, MA 02138.

APPENDIX B   DB-25 to XLR Pin Outs

DB-25 TO 4 FEMALE (IN) / 4 MALE (OUT) XLR
For bi-directional HDX-SDI AES/EBU digital I/O
Panasonic/Tascam standard

Pin	Signal
1	Channel 7/8 Out (+)
2	SG (Signal Ground)
3	Channel 5/6 Out (-)
4	Channel 3/4 Out (+)
5	SG
6	Channel 1/2 Out (-)
7	Channel 7/8 In (+)
8	SG
9	Channel 5/6 In (-)
10	Channel 3/4 In (+)
11	SG
12	Channel 1/2 In (-)
13	Not used
14	Channel 7/8 Out (-)
15	Channel 5/6 Out (+)
16	SG
17	Channel 3/4 Out (-)
18	Channel 1/2 Out (+)
19	SG
20	Channel 7/8 In (-)
21	Channel 5/6 In (+)
22	SG
23	Channel 3/4 In (-)
24	Channel 1/2 In (+)
25	SG

AES/EBU DB25
8 CHANNEL BIDIRECTIONAL IN AND OUT