

Avid[®] DNxchange[™]

Installation and User's Guide

Avid[®]

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Using This Guide

Congratulations on your purchase of an Avid® DNxchange™ transcoder interface. This document describes how to work with high-definition media in a standard-definition environment.

Symbols and Conventions

Avid documentation uses the following symbols and conventions:

Symbol or Convention	Meaning or Action
	A note provides important related information, reminders, recommendations, and strong suggestions.
	A caution means that a specific action you take could cause harm to your computer or cause you to lose data.
	A warning describes an action that could cause you physical harm. Follow the guidelines in this document or on the unit itself when handling electrical equipment.
>	This symbol indicates menu commands (and subcommands) in the order you select them. For example, File > Import means to open the File menu and then select the Import command.
▶	This symbol indicates a single-step procedure. Multiple arrows in a list indicate that you perform one of the actions listed.
<i>Italic font</i>	Italic font is used to emphasize certain words and to indicate variables.
Courier Bold font	Courier Bold font identifies text that you type.
Ctrl+key or mouse action	Press and hold the first key while you press the last key or perform the mouse action. For example, Ctrl+drag.

If You Need Help

If you are having trouble using DNxchange:

1. Retry the action, carefully following the instructions given for that task in this guide. It is especially important to check each step of your workflow.
2. Check for the latest information that might have become available after the documentation was published:
 - If the latest information for your Avid product is provided as printed release notes, they ship with your application and are also available online.
 - If the latest information for your Avid product is provided as a ReadMe file, it is supplied in your Avid application folder as a PDF document (ReadMe.pdf) and is also available online.

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Chapter 1

Design Overview

This chapter provides background information about the DNxchange transcoder interface. The Avid DNxchange converts high definition (HD) media from HD-SDI devices to Avid DNxHD media encoded in a Serial Digital Transport Interface (SDTI) stream. The Avid DNxchange also transports 8 channels of embedded audio, longitudinal timecode (LTC), and other ancillary data embedded in the HD SDI input stream. This device enables you to move HD media through your existing standard-definition (SD) serial digital interface (SDI) networks. This enables you to transport high quality HD compressed media greater distances than with HD-SDI.

The following topics are discussed:

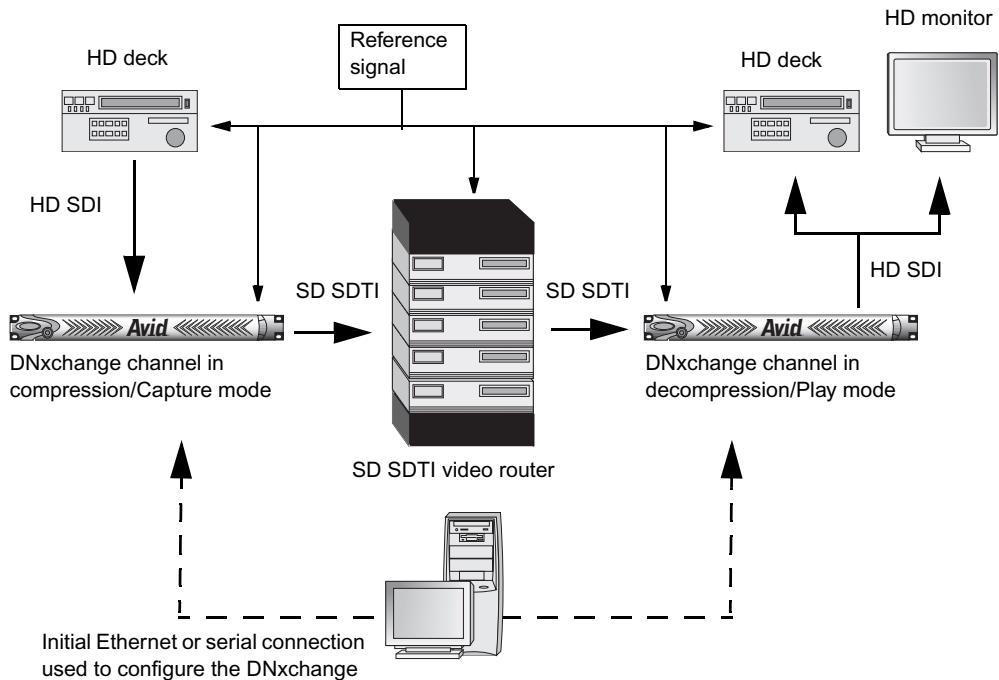
- [Overview](#)
- [Channel Inputs and Outputs](#)
- [Reference Signal](#)
- [Monitoring HD Video During Capture](#)
- [Network Connection](#)
- [Serial Connection](#)

Overview

The Avid DNxchange is a rack-mounted I/O device which can be populated with two transcoder channels. Each DNxchange channel can be configured as either an HD-to-SD transcoder (compression/capture) or as an SD-to-HD transcoder (decompression/play).

A typical application for the DNxchange is to transport HD media over long distances. A deck could physically be located in one room while you are monitoring the HD video on a monitor down the hall. If the distance is greater than what is supported by an HD coax transport solution, the data can be transformed to a lower bit rate using the DNxchange. The DNxchange lowers the bit rate by compressing the data and then transporting the data over an SD-SDI infrastructure to the monitor. Very little quality is lost because of the DNxHD compression and the DNxchange SD SDI supports a distance up to 280 meters.

Typical End-to-End DNxchange Transport Application



This illustration shows the DNxchange capturing an HD serial bit stream and converting it to compressed DNxHD data. Concurrent with the compression operation, up to 8 audio channels and other ancillary data are separated. The audio, ancillary, and the DNxHD data are subsequently rejoined for transport over a SD SDTI serial bit stream. The compression ratio is fixed at approximately 6:1 for all formats.

In Play mode the DNxchange accepts this standard SD SDTI serial bit stream and decompresses it back to HD data for transmission over an HD serial bit stream.

Channel Inputs and Outputs

The DNxchange is available in either a single-channel or dual-channel model. Each channel can be configured to transcode HD to SD or SD to HD. If you have purchased a single channel DNxchange, you can purchase a second channel and install it as described in [“Installing the Optional Second DNxchange Channel”](#) on page 51.

HD data captured by the DNxchange channel is output through the SD SDI output connector as a 525-line or 625-line SDTI signal. The HD SDI output can be used to monitor the HD video while it is being captured.

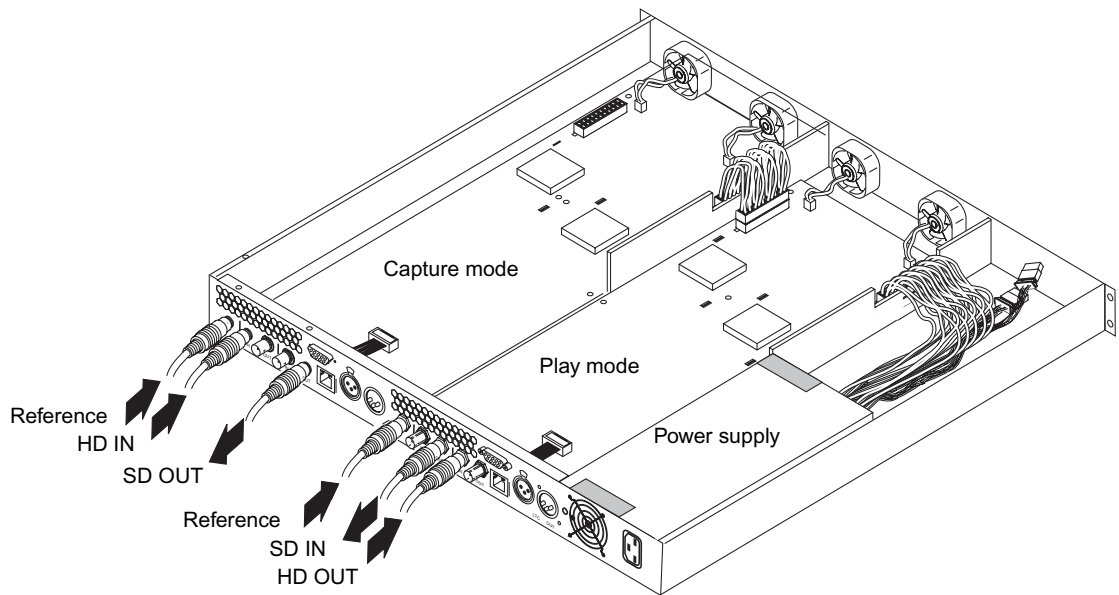
To recover the HD SDI signal, connect the SDTI signal to the SD SDI input connector on a second DNxchange channel, and set the channel to Play mode.

DNxchange supports the following embedded signals:

- video
- 48kHz 24-bit embedded audio
- vertical interval timecode (VITC) or LTC
- closed caption

The following figure shows the minimum connections required for each channel when in Capture mode and Play mode.

Capture and Play Channels Requirements



One power supply is used to power both DNxchange channels. The DNxchange channel closest to the power supply bridges the power to the optional second DNxchange channel.

Capture Mode

In compression/capture mode the DNxchange accepts a standard HD-SDI (SMPTE 292M) serial bit stream and converts the video, embedded audio, and other ancillary data into a compressed data stream for transport over a standard SD SMPTE 259M serial bit stream. The DNxHD compressed data uses an SDTI format for synchronous, real-time transfers of HD data using an existing SD SDI network.

If an LTC signal is connected to the LTC input, it is also captured in Capture mode. The different data types are processed separately and recombined using delays to compensate for the processing and sent out the SD-SDTI output. The total delay through the channel is 6 frames.

Play Mode

In decompression/play mode the DNxchange accepts a standard SD SMPTE 259M serial bit stream and converts it into an HD stream for transmission over an HD SMPTE 292M serial bit stream.

The SD SDTI data received is separated into the various data types. Video data is sent to the codec to be decompressed and subsequently all the data types are recombined with the correct latency. The total delay through the channel is 6 frames.

Embedded Audio Support

Eight channels of 48 kHz SMPTE 299M embedded audio is extracted from the HD SDI input buffered and delayed by the same frame delay as the DNxHD codec and re-inserted on the SD SDI output and locked with the DNxHD compressed data stream in accordance with SMPTE 272M.

LTC In/LTC Out

When the DNxchange channel is in Capture mode and a longitudinal timecode (LTC) signal is connected to the LTC input, the LTC is auto-detected and the timecode is embedded into the SDTI SD stream with the encoded HD media. The LTC is delayed to match the same frame delay as the DNxHD codec output.

This embedded timecode from the DNxchange is used by the AirSpeed when the AirSpeed is in HD mode, even if a separate LTC is connected directly to the AirSpeed. When AirSpeed is in SD mode, the LTC port on AirSpeed is active timecode.

VITC and Closed Caption

VITC and closed caption information are preserved with the media within the device while capturing and playing out.

Supported Media Formats

The following is a list of supported HD formats:

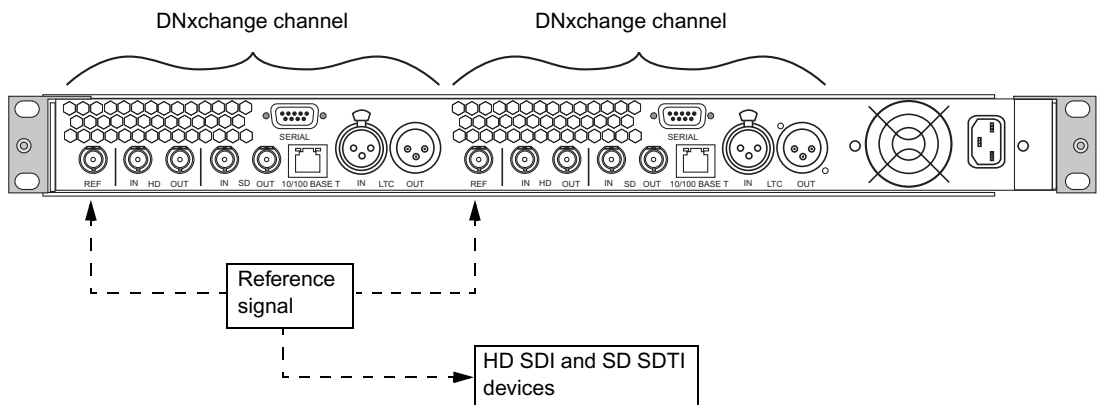
- 1080 Interlaced
 - 1080i/59.94 fields per second
 - 1080i/50 fields per second
- 720 Progressive
 - 720p/59.94 frames per second

Reference Signal

All the components that make up the end-to-end infrastructure solution when using the DNxchange must have a reference connected to their respective reference inputs. The reference signal can either be a black-burst or tri-level reference signal. The HD data source connected to the DNxchange, the DNxchange channel capturing media, and the DNxchange channel playing the DNxHD data must all use reference that are phase-locked to each other.

Each channel in a DNxchange enclosure must have a separate reference signal connected to the REF input connector regardless of the mode in which the channel is configured. Avoid looping the reference signal and terminate any unused loop out with a 75 ohm terminator.

Reference Connections



Monitoring HD Video During Capture

When capturing HD media you can monitor the captured HD media at the following two locations:

- The easiest way to view the HD media coming into the DNxchange is to connect an HD monitor to the HD Out connector on the same DNxchange channel that is doing the capturing. As the media is being captured through the HD In connector, the video (without audio and ancillary data) is looped back through to the HD Out connector.
- If you would rather see that the encoded HD media in the SD SDTI stream is being captured accurately, connect the SD SDTI Out on your video router to the SD In connector on a second DNxchange channel that is configured for Play mode. This output stream includes the video, embedded audio, and ancillary data.



You must provide a reference signal to both DNxchange channels and make sure the appropriate channels are configured for capturing or playing out.

Connect an HD monitor to the HD Out connector on the DNxchange play channel. The HD output of the second channel lags behind the HD input of the first channel by several frames.

Network Connection

A 10/100BASE-T Ethernet port is provided on each DNxchange channel for configuring that channel. Each DNxchange channel in the DNxchange enclosure needs a unique name and IP address. Configuring the DNxchange through the Ethernet port is done with a browser application. For information on configuring DNxchange channels through the network, see [“User Configuration Windows” on page 36](#).

Serial Connection

For flexibility, the DNxchange supports more than one configuration and setup mechanism. You can also configure each DNxchange channel in the DNxchange through its 9-pin RS-232 interface connector on the rear of the DNxchange. For information on configuring DNxchange channels through a serial connection, see [“Accessing the DNxchange Through HyperTerminal” on page 43](#).

Chapter 2

Installation

This chapter provides DNxchange installation, connection, and system configuration instructions.



You might want to configure the DNxchange prior to rack mounting if the front panel access is limited in your rack location.



Do not connect multiple DNxchange channels to your network environment until you have assigned a new unique IP address to each DNxchange channel.

Using the DNxchange on the Desktop

If you do not intend on rack-mounting the DNxchange, Avid includes four adhesive rubber feet that attach to the bottom of the chassis.

To use the DNxchange on a desktop:

1. Locate the four adhesive rubber feet included with the DNxchange.
2. Attach the rubber bumpers so that it adheres to each location marked on the bottom of the DNxchange chassis.

Installing DNxchange in a Rack

The DNxchange is designed for 19-inch (483-mm) rack enclosures and requires one EIA rack unit (1U), or 1 ¾ inches (44.5 mm) of rack space. The DNxchange ships with rack-nut clips for those rack enclosures that do not have threaded holes. Position the rack-nut clips in the holes of the rack used to secure the rack DNxchange in place.



To ensure the stability of the rack enclosure, start from the bottom when you install the rack components in the rack enclosure.

The rack-mount requirements are:

- **Elevated Operating Ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- **Reduced Air Flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

DNxchange airflow is from the front of the chassis enclosure to the rear. Make allowances for cooling air to be available to the front panel surface and without anything restricting the airflow in the rear.
- **Mechanical Loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Make sure your rack enclosure is stable enough to prevent a tip-over hazard when one or more DNxchange systems are extended on the sliding rails.
- **Circuit Overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

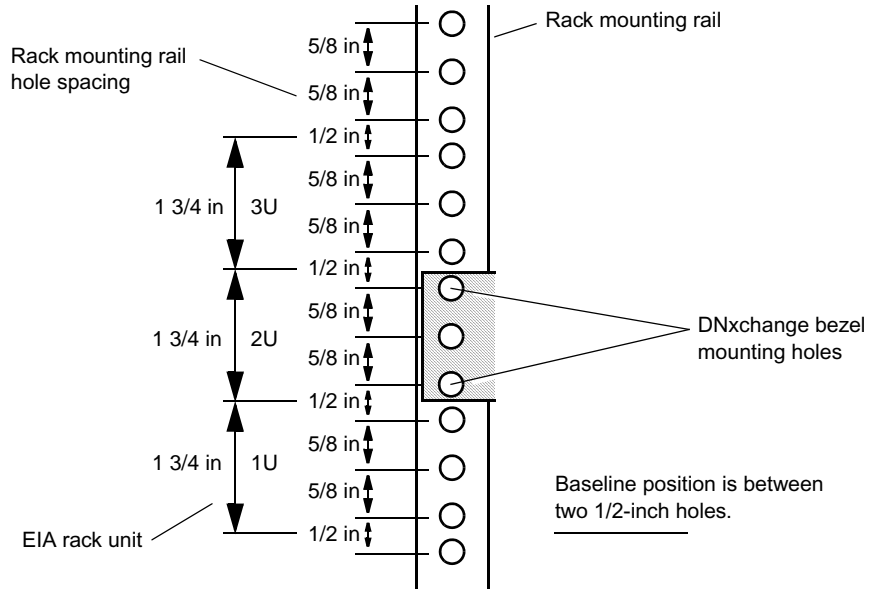
Attaching the Rack-Nut Clips to the Rack

Install the rack-nut clips where the DNxchange front panel will secure to the rack enclosure.

To attach the rack-nut clips to the rack enclosure:

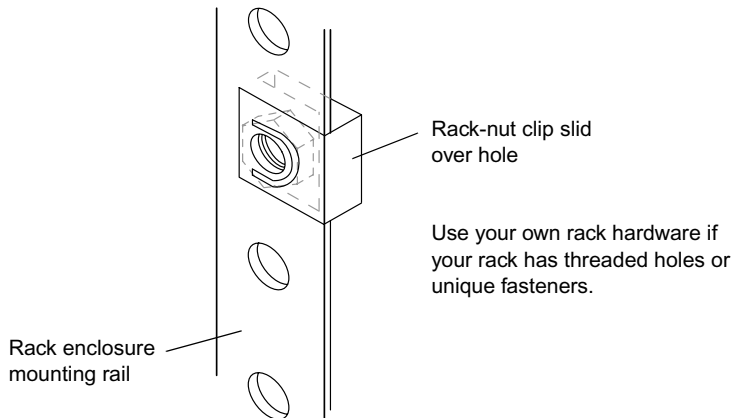
1. Select the lowest position in the rack where you can mount the DNxchange. Position the DNxchange so the bottom is at the baseline of a U-alignment position.

Positioning the Avid DNxchange



2. From the inside of the mounting rail, slide a rack-nut clip over each of the eight holes to be used for the DNxchange.

Attaching Rack-Nut Clips onto the Rack Mounting Rail



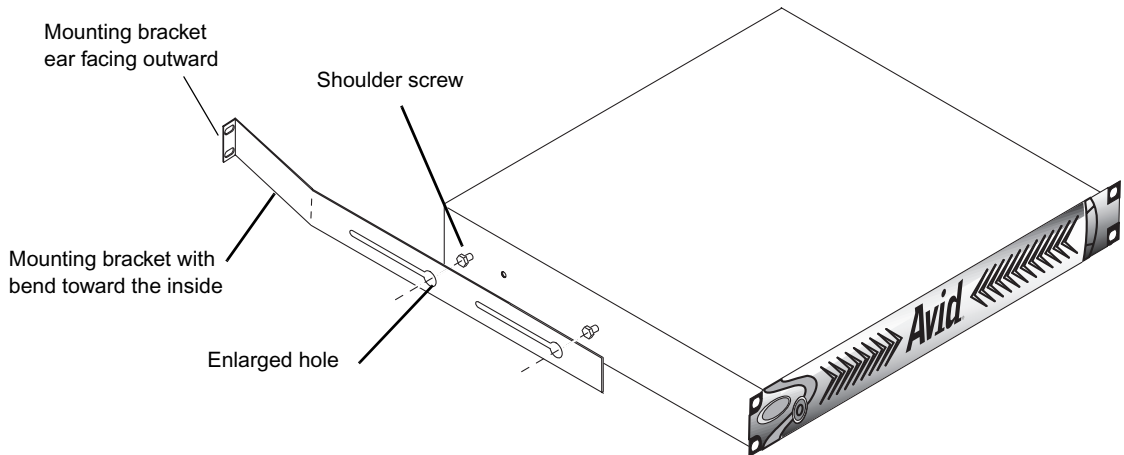
Attaching the Brackets to the DNxchange

You must position the two mounting brackets on the DNxchange before placing the DNxchange in the rack. Both mounting brackets are identical and can be attached to either side of the DNxchange. The brackets that attach to the DNxchange can adjust from 23.5 inches (597 mm) to 30 inches (762 mm).

To attach the mounting brackets:

1. Align the slotted holes in the mounting bracket with the shoulder screws that are on the sides of the DNxchange. Make sure the bend in the bracket is toward the inside with the mounting-bracket ear facing outward.
2. Insert the two shoulder screws through the enlarged holes in the mounting bracket.

Attaching the Brackets to the DNxchange



3. Slide the mounting bracket a couple of inches down the slot to hold the bracket in place. The shoulder screws do not tighten to the mounting brackets. They allow the mounting bracket to slide to the rear rack rails.
4. Repeat this procedure for attaching the second bracket on the other side of the DNxchange.

Securing the DNxchange in a Rack



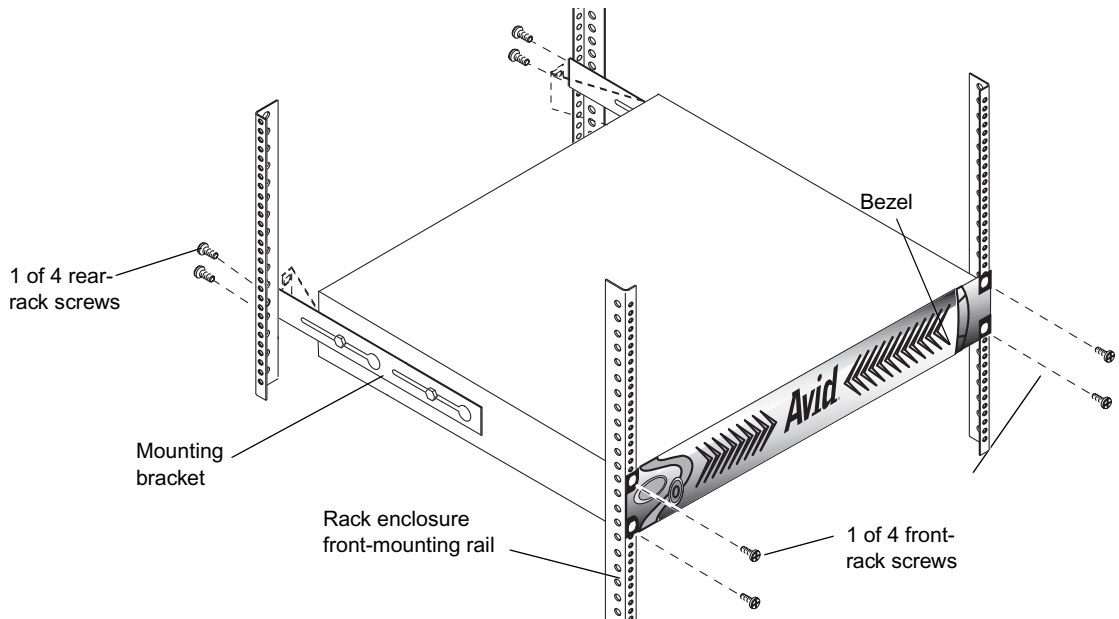
To Avoid injury, you should have someone help you lift the DNxchange while you are positioning it into the rack.

To secure the DNxchange to the rack enclosure:

1. From the front of the rack, slide the DNxchange so that the rear mounting brackets can pass through the rack to the rear mounting rails and the front of the DNxchange is flush against the front mounting rails.
2. Align the holes in the DNxchange bezel with the rack-nut clips in the front mounting rails, insert the front-rack screws through the DNxchange bezel, and front-mounting rail, and tighten.
3. Slide the mounting brackets to the rear-mounting rail so that mounting-rail ears are on the outside of the rear rails.
4. Align the holes in the mounting brackets with the rack-nut clips in the rear-mounting rails.

The mounting bracket is designed to bend to the rear rail.

5. Insert the rear-rack screws through the mounting brackets and rear-mounting rail, and tighten.

Adjusting and Securing the Mounting Brackets

Cabling

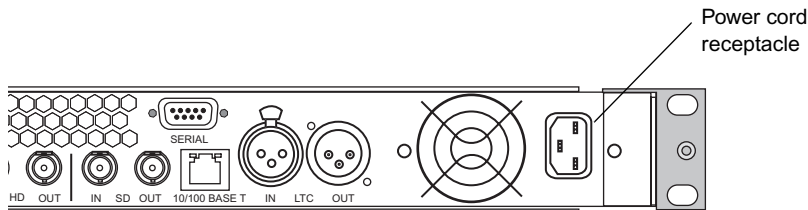
The following sections describe the cabling on the rear of the DNxchange:

- [Power Cord](#)
- [Capture Cables](#)
- [Play Cables](#)
- [Timecode Cables](#)
- [Configuration Cables](#)

Power Cord

A US IEC power cord is shipped with the DNxchange. If your local power distribution is not compatible with the supplied cord, you must provide your own IEC power cable that is compatible with your country's power system. The power connector accepts 100 to 240 Vac, 50/60 Hz.

Power Connection



To connect power:

1. Attach the power cord to the power receptacle on the rear of the DNxchange.
2. Connect the other end of the power cord to a properly grounded, stable power source.



For maximum power protection, Avid recommends surge protected uninterruptible power supply (UPS).

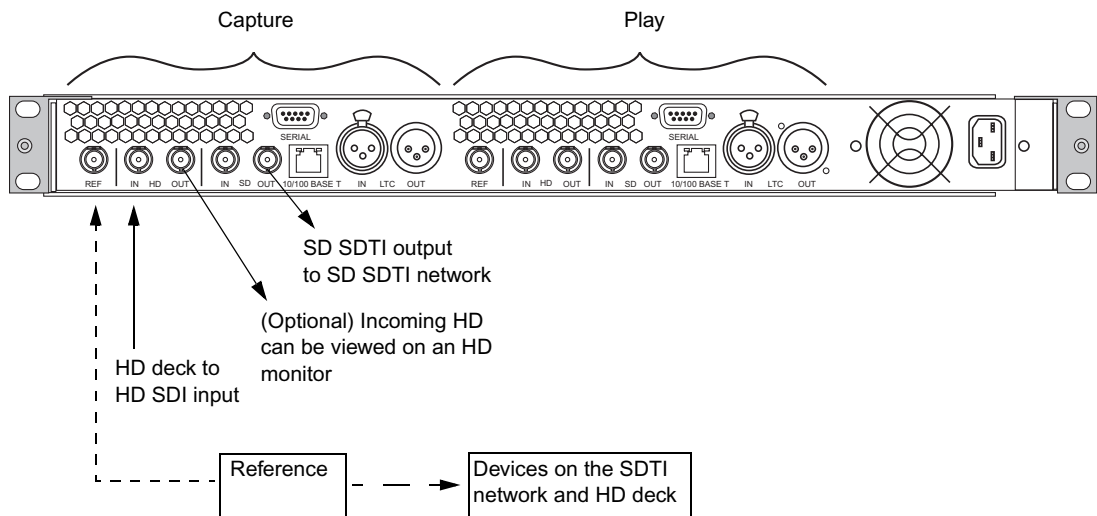
Capture Cables

The HD and SD SDI connections are marked on the rear of the DNxchange. Either channel in the DNxchange can be configured for capture or play. The following figure is shown using the factory default channels (left channel Capture, right channel Play). The following procedure states which connectors to use. To find the exact location for each connection, see [Appendix A](#).

To connect video cables on the chassis:

1. Ensure that you have the proper SMPTE 259M serial digital interface coaxial cables available.

Capture Connections



2. Connect a reference source to the REF input connector on the DNxchange channel. For more information, see [“Reference Signal” on page 15](#).
3. Connect the incoming HD-SDI signal to the HD input connector on the DNxchange channel.
4. Connect the SD OUT on the DNxchange channel to your SDTI network video switcher.

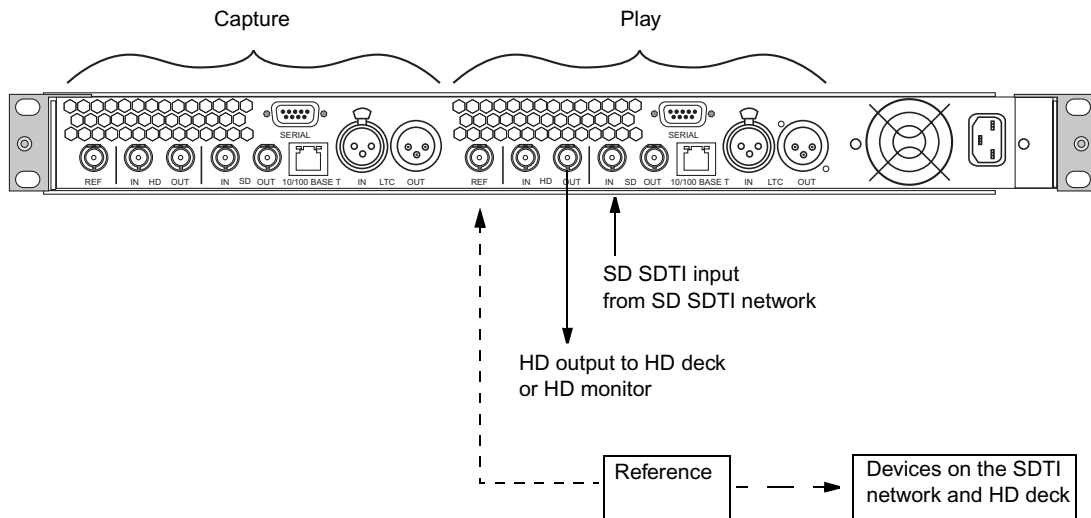
Play Cables

The HD and SD SDI connections are marked on the rear of the DNxchange. The following procedure states which connector to use. To find the exact location for each connection, see [Appendix A](#).

To connect video cables on the chassis:

1. Ensure that you have the proper SMPTE 259M serial digital interface coaxial cables available.

Play Connections



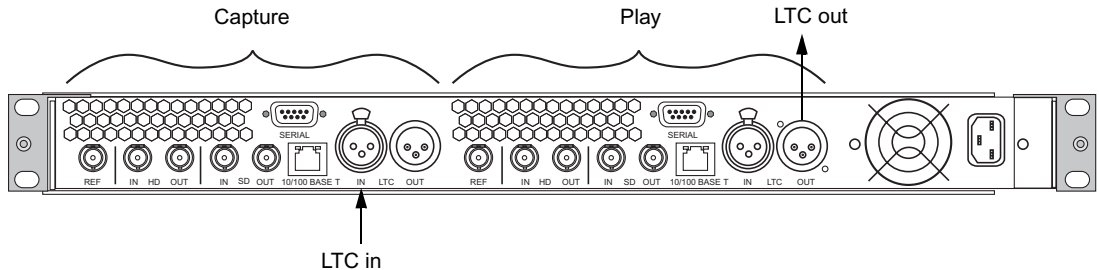
2. Connect a reference source to the REF input connector on the DNxchange channel. For more information, see [“Reference Signal” on page 15](#).
3. Connect the SD-SDTI signal from your SDTI network to the SD IN connector on the DNxchange channel.
4. Connect the HD OUT on the DNxchange channel to your HD deck.

Timecode Cables

To connect longitudinal timecode (LTC) cables:

1. Connect your LTC timecode source to the LTC IN connector.
2. Connect the LTC OUT connector to your LTC timecode device.

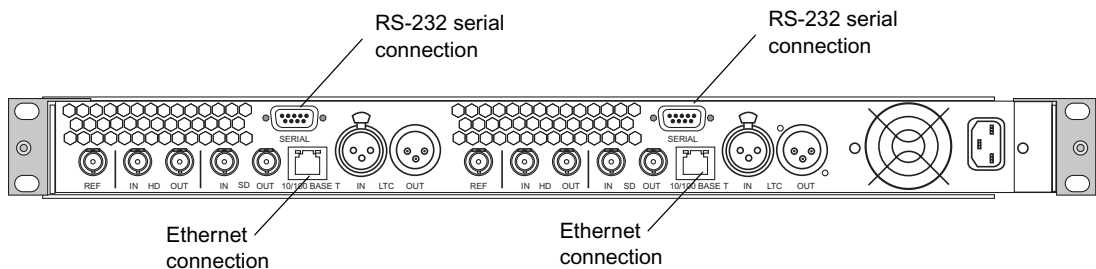
LTC Connection



Configuration Cables

The following figure identifies the connectors used to connect the configure the DNxchange channels.

Configuration Connections



Ethernet Connection

Make the following connection when configuring a DNxchange channel through the Ethernet port.



If connecting a computer directly to the DNxchange Ethernet port, a Ethernet cross-over cable is required.

To connect Ethernet cables:

1. Connect one end of an Ethernet CAT-5 cable to the 10/100BASE-T connector on one of the DNxchange channels.
2. Connect the other end of an Ethernet cable to your network switch.
3. Access the user configuration windows using a browser application. See [“User Configuration Windows” on page 36](#).

Serial Connection

Make the following connection when configuring a DNxchange through through the serial port.



If connecting a computer directly to the DNxchange serial port, a serial cross-over cable is required.

To connect serial cables:

1. Connect one end of a 9-pin serial cable to the RS-232 connector on the DNxchange channel.
2. Connect the other end of the serial cable to your RS-232 device.
3. Access the configuration menu using the HyperTerminal application. See [“Accessing the DNxchange Through HyperTerminal” on page 43](#).

Updating the Firmware

Typically new units are shipped with the latest code loaded on each DNxchange channel. If you are instructed to download a new version of the firmware, this section describes the Avid DNxchange Firmware Updater utility included on the CD-ROM that ships with the DNxchange.

The DNxchange upgrade process requires multiple firmware files to be located in a single folder on a Windows[®] computer. The computer performing the upgrade must be on the same network subnet as the DNxchange channel. The update utility performs the following functions:

- Locates all the DNxchange channels connected to the same subnet as the computer running the utility
- Uploads all the firmware files to the selected DNxchange channel and writes it into flash memory
- Restarts the selected DNxchange channel

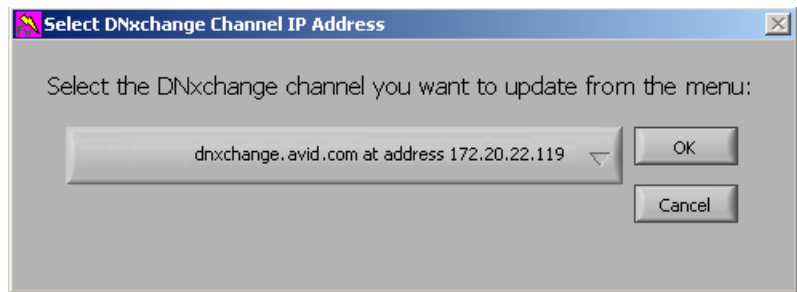
Double-click on the executable file and follow the on-screen instructions to install the utility on your network computer. The utility installs in the following default location:

C:\Program Files\Avid DNxchange Channel FW Updater

To update a DNxchange channel:

1. Create a new folder and copy the new firmware files into a single folder on the computer performing the upgrade.
2. Make sure your computer is connected to same network subnet as your DNxchange.
3. Click Start > Programs > Avid DNxchange FW Updater > Avid DNxchange FW Updater. If you browse to the folder using Windows Explorer, double-click the Avid DNxchange FW Updater.exe file.

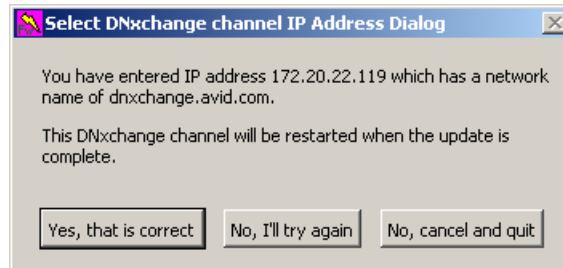
The Avid DNxchange Channel Firmware Updater searches the network and lists the DNxchange channels detected on the same network subnet. The DNxchange Channel Firmware Updater dialog box opens, followed by the Select DNxchange Channel IP Address dialog box.



To find your DNxchange channel IP address, connect the computer's serial port to the serial connector on each DNxchange channel. At the serial configuration menu, go to Network Settings and note each IP address. For information on using the serial port, see "Accessing the DNxchange Through HyperTerminal" on page 43.

4. Select the DNxchange channel you want to upgrade from the menu and click OK. Click Cancel to close this dialog box and quit the utility.

The Select DNxchange IP Address dialog box appears.

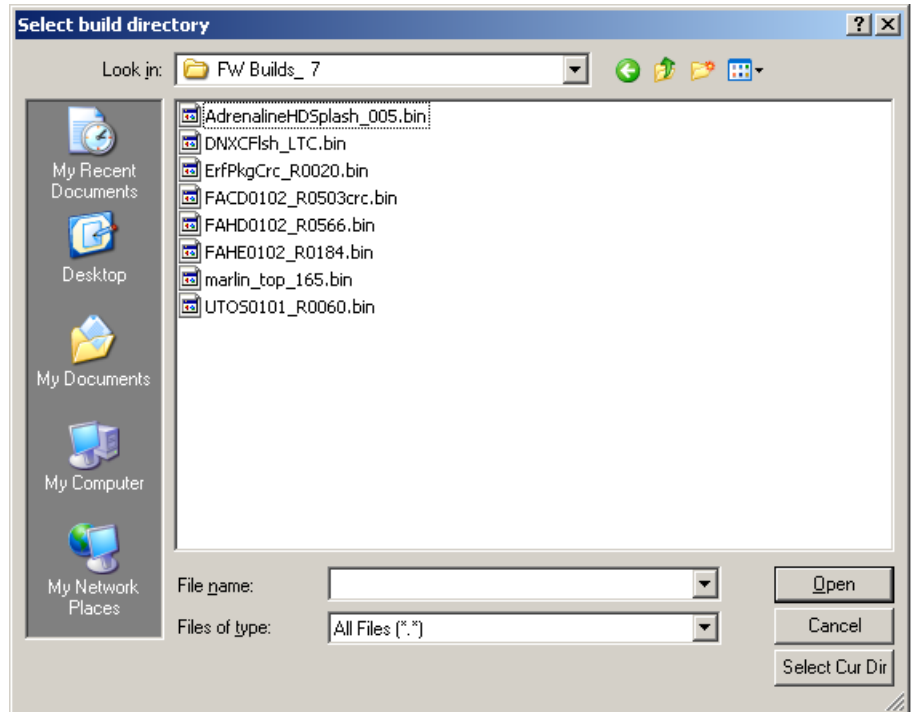


5. Do one of the following:
 - ▶ Click “Yes, that is correct” to accept the IP address for the DNxchange channel selected and continue with the upgrade.
 - ▶ Click “No, I’ll try again” to return to the Select DNxchange channel IP Address dialog box and select a different IP address and DNxchange channel.
 - ▶ Click “No, cancel and quit” to close this dialog box and quit the utility.

- If you clicked “Yes, that is correct,” browse to the folder where you copied the new firmware on your computer.



Make sure the firmware folder does *not* include any files other than the files included in the current upgrade or any files from a previous upgrades. Create a new folder for each upgrade.

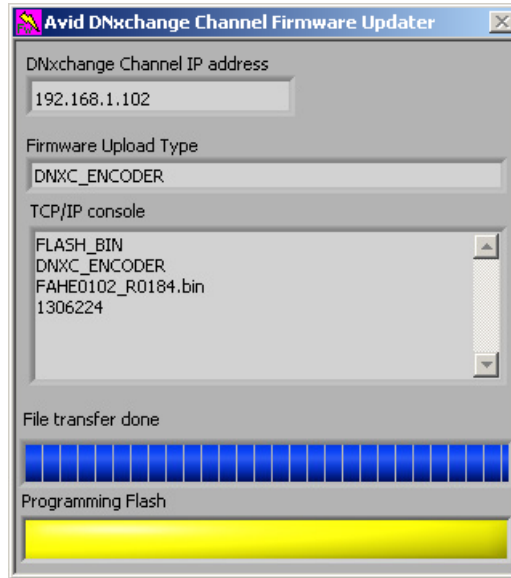


7. Click Select Cur Dir to start the upgrade.

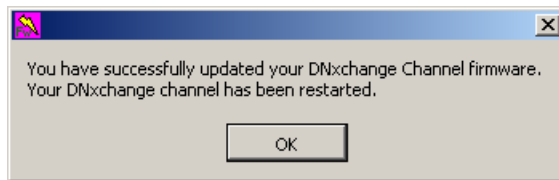


Do not interrupt the upgrade or restart the DNxchange until the utility has finished.

Progress bars are displayed as each firmware file is updated.



The DNxchange channel automatically loads the new code and a dialog box informs you when the process is complete.



8. Click OK to quit the utility.
9. Repeat this procedure for each DNxchange channel that needs upgrading.

If you have two DNxchange channels in your DNxchange, you must upgrade both channels in the DNxchange.

Monitoring Frame Input Errors

The DNxchange_BER_Tool is a utility used to monitor the bit error rate on the SD SDTI input of the DNxchange channel in Play mode. This utility is included on the CD-ROM that ships with the DNxchange.

The DNxchange_BER_Tool utility is used on a Windows® computer connected to the same network subnet as the DNxchange channel. The utility performs the following functions:

- Locates all the DNxchange channels connected to the same subnet as the computer running the utility
- Records the number of frames polled and errors detected
- Displays the amount of time the utility has been monitoring the media



An HD SDI Output on Error setting is provided in the DNxchange UI that enables you to select what to output on the HD Out connector when three or more consecutive frames errors are detected in Play mode. You can either repeat the last good frame or output black frames to the HD Out connector. To more information on this setting, see “I/O Settings Tab” on page 39.

The bit error rate (BER) is displayed in scientific notation based on the number of frames polled and the errors found. A reset button is available in the utility to clear the fields and start monitoring the frames again. If errors are displayed, first run the DNxchange_BER_Tool utility on a different channel using the same cables. If errors continue to be detected, check your cable integrity, cable connections, and cable lengths.

To install the utility:

1. Copy the DNxchange_BER_Tool folder to your computer.
2. Double-click Setup.exe in the utility folder and follow the on-screen instructions. The utility installs in the following default location:

C:\Program Files\DNxchange_BER_Tool



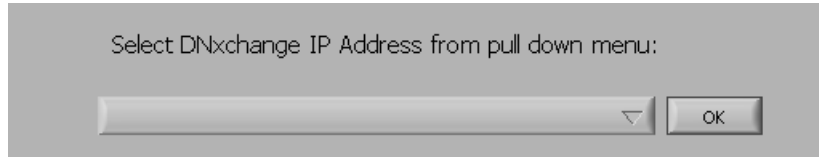
Use the Windows Control Panel to uninstall the DNxchange_BER_Tool. Avid Recommends uninstalling the DNxchange_BER_Tool before installing a later version.

To monitor a DNxchange channel:

1. Load the DNxchange_BER_Tool utility on a Windows computer.
2. Make sure your computer is connected to same network subnet as your DNxchange.

3. Click Start > Programs > DNxchange_BER_Tool > DNxchange_BER_Tool. If you browse to the folder using Windows Explorer, double-click DNxchange_BER_Tool.exe.

The DNxchange_BER_Tool searches the network and lists the DNxchange channels detected on the same network subnet. The following dialog box opens.

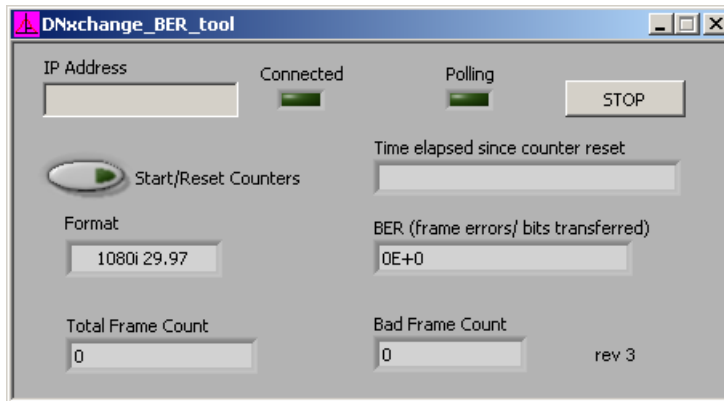


4. Select the DNxchange channel IP address from the menu that you want to monitor and click OK.



To find your DNxchange channel IP address, connect the computer's serial port to the serial connector on each DNxchange channel. At the serial configuration menu, go to Network Settings and note each IP address. For information on using the serial port, see "Accessing the DNxchange Through HyperTerminal" on page 43.

The DNxchange_BER_Tool window opens. Information describing the window follows the figure.



DNxchange_BER_Tool Selections

Button or Field	Description
IP Address	The IP address of the DNxchange channel that was selected is displayed in this text box.
Connected	This light indicator is lit when a valid connection exists between the utility and the DNxchange channel.

DNxchange_BER_Tool Selections (Continued)

Button or Field	Description
Polling	The light indicator flashes each time media is monitored. Frames are monitored approximately every 3 seconds.
Stop	Click the Stop button to stop monitoring frames. The utility stops and closes.
Start/Reset Counters button	Click the Start/Reset Counters button to clear the Time elapsed, BER, Total Frame Count, and Bad Frame Count text fields and restart the monitoring.
Time elapsed since counter reset	Displays the amount of time that has passed since you started monitoring for errors or have last clicked the Start/Reset Counters.
Format	The HD format that is currently set on the DNxchange channel is displayed in the Format text box. 1080i 50.00 (25.00) 1080i 59.94 (29.97) 720p 59.94
BER (frame errors/bits transferred)	Displays the percentage of bit errors detected compared to the number of frames polled. The number displayed is in scientific notation.
Total Frame Count	Displays the number of frames that were polled (monitored) since the counter was last reset.
Bad Frame Count	Displays the number of bad frames detected since the counter was last reset.

To close the DNxchange_BER_Tool, do one of the following:

- ▶ Click the close button at the top right-hand corner of the window.
- ▶ Click Stop.

Chapter 3

Configuration

This chapter describes how to configure the DNxchange through the user interface (UI).



You might want to configure the DNxchange prior to rack mounting if the front panel access is limited in your rack location.



Do not connect multiple DNxchange channels to your network environment until you have assigned a new unique IP address to each DNxchange channel.

Power Up, Power Down

To power up the DNxchange:

- ▶ Press the DNxchange power button, located on the front panel.

The LED ring around the power button lights amber as the DNxchange is powering up and turns green when the DNxchange has completed its startup and is ready.

Power Switch



User Configuration Windows

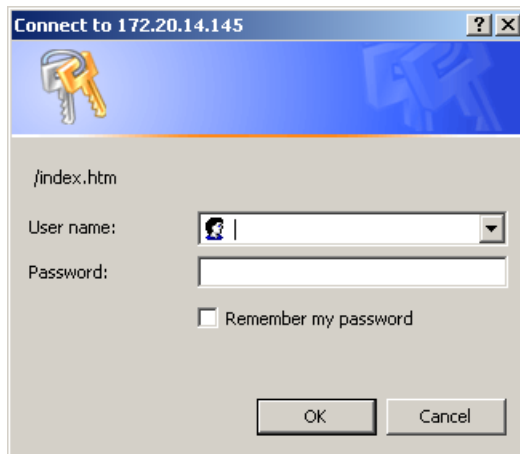
The user interface allows you to set the network configuration and video format parameters. All network communication is done through the Ethernet connection on the rear of DNxchange. Each DNxchange channel needs to be configured separately. As an alternative, you can use HyperTerminal through your serial connector to configure the DNxchange. For more information, see [“Accessing the DNxchange Through HyperTerminal” on page 43](#).

To access the DNxchange configuration windows with your browser:

1. Open your browser application and type in the IP address of your DNxchange channel in the Address text box and press **Enter**.

The Connect to dialog box opens.

Client Password Dialog Box



2. Click OK.

The default shipping configuration does not use a User's Name or Password. Only type a Password if you have set one using the serial connection. To set a Password, see [“Accessing the DNxchange Through HyperTerminal” on page 43](#).



The User Name is always blank and cannot be changed.

Default IP Address

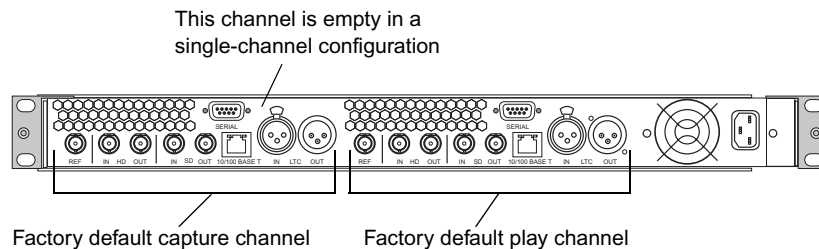
Each DNxchange channel in the DNxchange is initially configured with the following default IP address and Subnet mask:

- Play IP address: 192.168.1.101
- Capture IP address: 192.168.1.102
- Subnet mask: 255.255.255.0



The default Play channel and Capture channel settings do not need to remain set as shipped from Avid. Either or both channels can be set to Play or Capture.

DNxchange Channel Default Dual-Channel Configuration



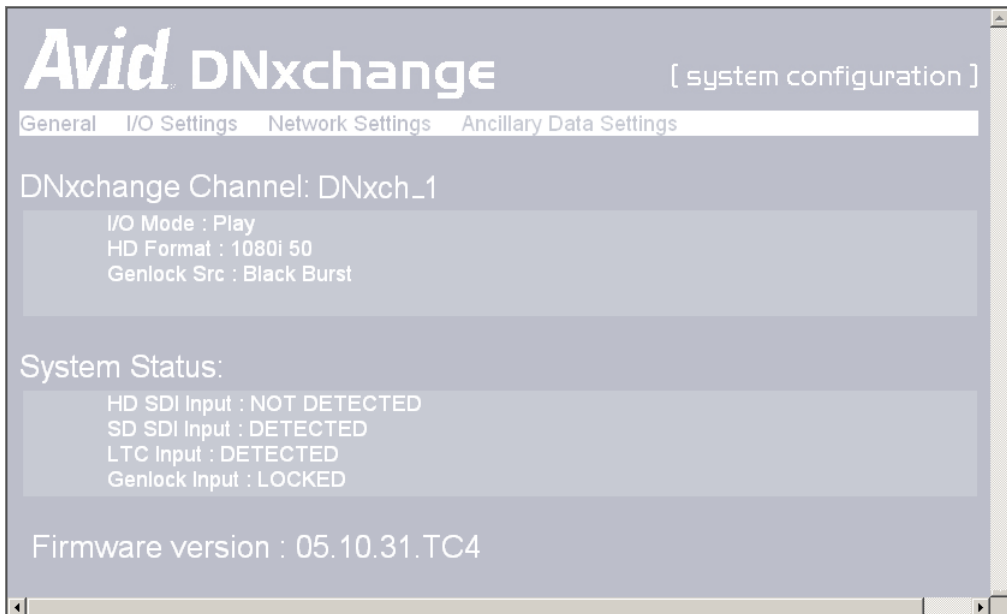
When accessing a DNxchange channel through a browser interface via Ethernet and that DNxchange channel has been removed, the browser application might attempt to connect to a similar IP address before displaying a “Page Not Found” message. Be sure to verify the IP address displayed is the channel to which you want to connect.

To avoid network IP address and subnet mask conflicts, connect one DNxchange to your network at a time. Set the appropriate IP address and subnet mask settings in the Network Setting tab for that DNxchange and save the settings. For information on the Network tab, see “[Network Setting Tab](#)” on page 41. The IP address and subnet mask information must be provided to you by your network administrator.

General Tab

The General tab is used to display the current video settings and status of the DNxchange channel through the network. The information displayed on this tab is either embedded in the channel or is selected in the other tabs of this UI. The following figure shows an example of the General tab.

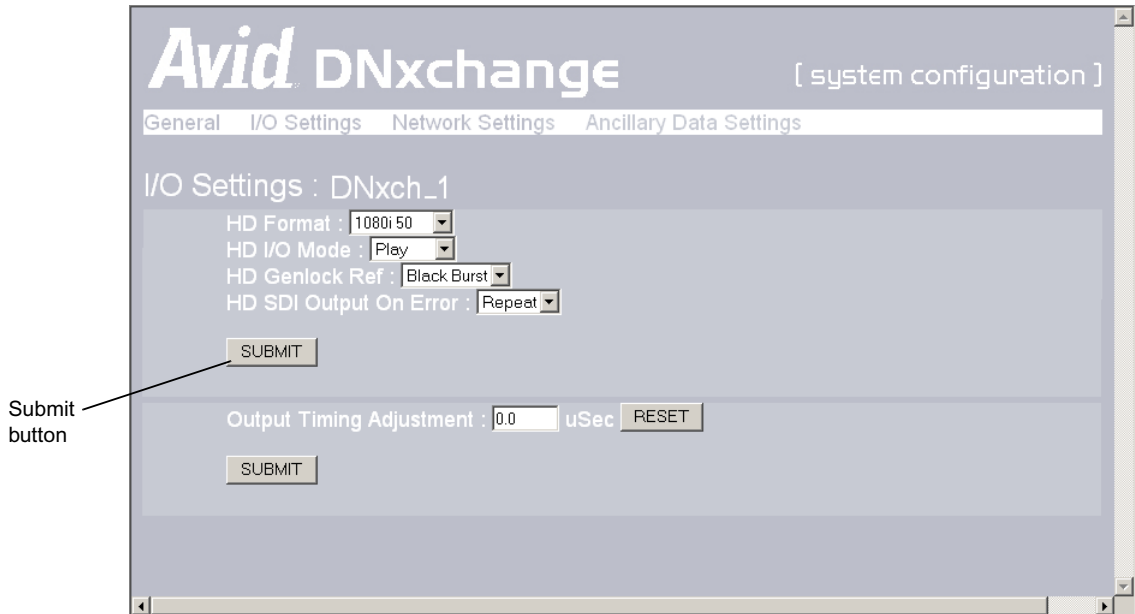
General Tab



I/O Settings Tab

The I/O Settings tab allows you to select the HD format you want to transcode.

I/O Settings Tab



You are required to provide the following input and output information:

- HD Format — This setting is used to select the HD media format being encoded or decoded.
 - 1080 Interlaced — 1080i/50.00 fields per second
 - 1080 Interlaced — 1080i/59.94 fields per second
 - 720 Progressive — 720p/59.94 frames per second
- HD I/O Mode — Use this setting to select how the media is passing through the DNxchange channel:
 - **Capture** — HD to SD (compression/encoder)
 - **Play** — SD to HD (decompression/decoder)

Chapter 3 Configuration

- HD Genlock Ref— Select the type of sync signal connected to the REF connector on the rear of the DNxchange channel.
 - **Black Burst** — select if house reference is NTSC/PAL
 - **Internal** — uses an internal clock for loopback and standalone testing
 - **Tri-Level** — select if house reference is an HD reference source
- HD SDI Output on Error — Use this setting to select what to output on the HD Out connector if an error is detected on three or more consecutive frames of media passing through the DNxchange channel in Play:
 - **Repeat** — Repeats the last good frame to the HD Out connector when errors are detected
 - **Black** — Outputs black frames on the HD Out connector when errors are detected
- Output Timing Adjustment — Locks the video output signal timing to the analog reference input signal provided to the rear panel connector.

Allows you to slow down or advance the video timing in μ secs (microseconds) relative to the horizontal genlock timing source.

Type a “-” (minus sign) in front of the number to slow down the timing and type a “+” (plus sign) in front of the number to speed up the timing.

Click Submit to save your configuration. The DNxchange requires a restart to enable the video changes.

Network Setting Tab

The Network Settings tab allows you enter the network parameters.

Network Settings Tab

Submit button



Any changes you make to the current network settings will not take effect until you click the Submit button and then restart the DNxchange.



If you are unsure about any network configurations, names, or setup values discussed below, please contact your facility's administrator for technical assistance.

You are required to provide the following network information:

- Host Name — Type the network name you want to give the DNxchange channel. Only alpha and numeric characters can be used for the Host Name; no other characters are valid.
- IP Lookup — Select Static or Dynamic from the menu. Select Dynamic if you want the network to provide you with an IP address. Select Static if you want enter an IP address.
- IP Address — Enter the IP address you want to assign to the DNxchange channel. Only enter an IP address if you selected Static in the IP Lookup.
- Subnet Mask — Enter the your subnet mask address.

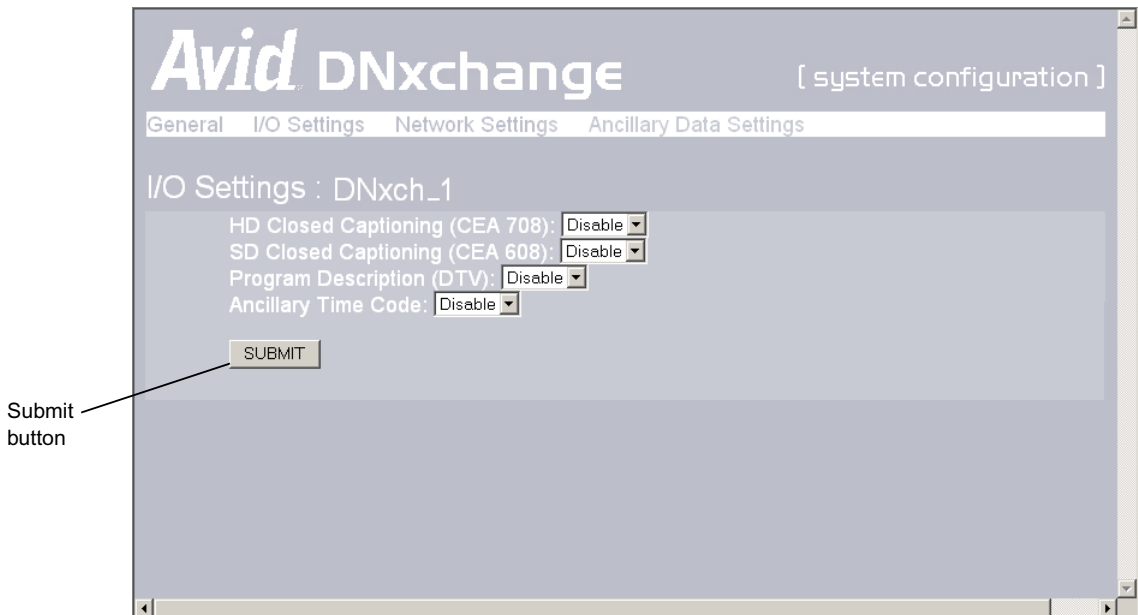
- Gateway — Enter the address for your network’s default gateway (option).
- MAC Address — Displays the Machine Access Control (MAC) address for the DNxchange channel. This information cannot be changed.

Click Submit to save your configuration and enable the network interface. After the network is configured, restart the DNxchange to enable the settings.

Ancillary Data Settings Tab

The Ancillary Data Settings tab allows you to select the HD format you want to transcode.

Ancillary Data Settings Tab



To enable SD and HD closed captioning support use the following settings:

- HD Closed Captioning (CEA 708) — Use this setting to enable support of CEA 708 closed captioning auxiliary data. When enabled, closed capturing ancillary data packets are captured from the HD-SDI source according to the SMPTE 334M standard.
- SD Closed Captioning (CEA 608) — Use this setting to enable support of CEA 608 closed captioning auxiliary data. When enabled, closed capturing ancillary data packets are captured from the HD-SDI source according to the SMPTE 334M standard.

- Program Description (DTV) — Use this setting to enable support of digital television program description auxiliary data. When enabled, DTV ancillary data packets are captured from the HD-SDI source according to the SMPTE 334M standard.
- Ancillary Time Code — Use this setting to enable support of ATC auxiliary data. When enabled, ancillary time code packets are captured from the HD-SDI source.

Click Submit to save your configuration. The DNxchange requires a restart to enable the video changes.

Accessing the DNxchange Through HyperTerminal

You can access the DNxchange configuration settings using HyperTerminal through the serial connector. You need to know the following serial protocol:

- Baud Rate — 19200
- Data Bits — 8
- Parity — None
- Stop Bits — 1
- Flow Control — None

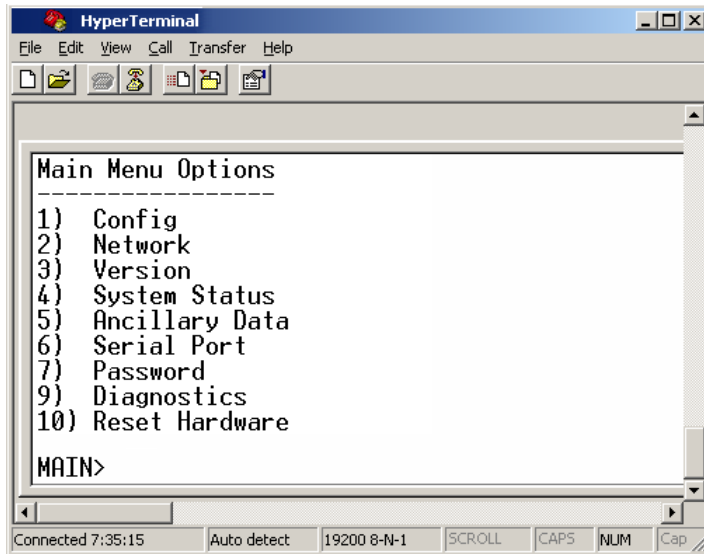
To access your DNxchange using HyperTerminal:

1. Make sure your DNxchange is powered on.
2. Connect the serial COM port on your computer to the serial connector on the DNxchange channel.
3. From a Windows system, click Start > Programs > Accessories > Communications > HyperTerminal.

4. Type a name for the connection, select the COM port, and configure the connection using the serial protocol previously listed.

The following figure is an example of the Main Menu that displays in the HyperTerminal window. Each DNxchange channel is configured using the serial connection on that channel.

Main Menu Options Using HyperTerminal



To select a Main Menu option:

- ▶ Type a number listed in the option list and press **Enter**.

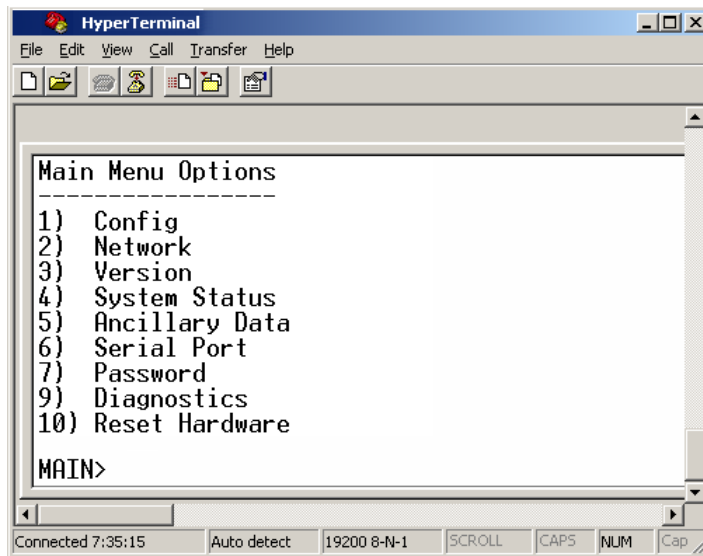
Changing or Resetting the Password

When you change the default or the existing password, the password cannot exceed 31 characters. The Password is case sensitive and the User Name is always blank and cannot be changed.

To set or change the password:

1. Access the DNxchange using the serial port, see [“Accessing the DNxchange Through HyperTerminal”](#) on page 43.

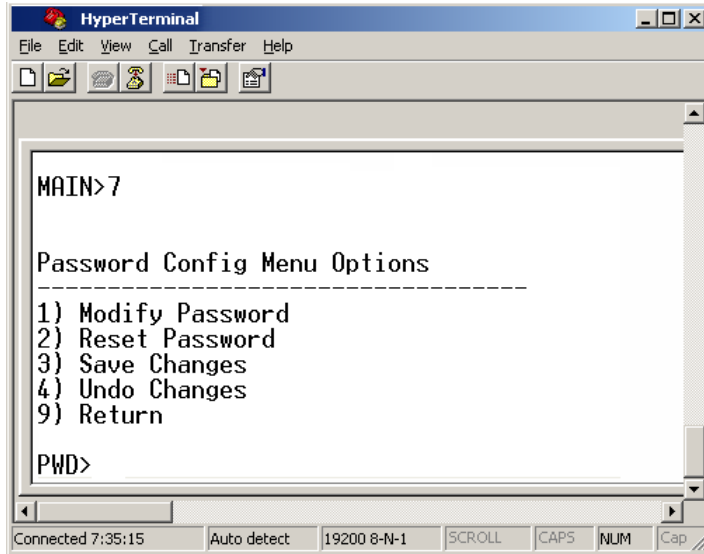
Main Menu Options



Chapter 3 Configuration

2. Type **7** to select the Password.
3. Press **Enter**.

Password Config Menu Options

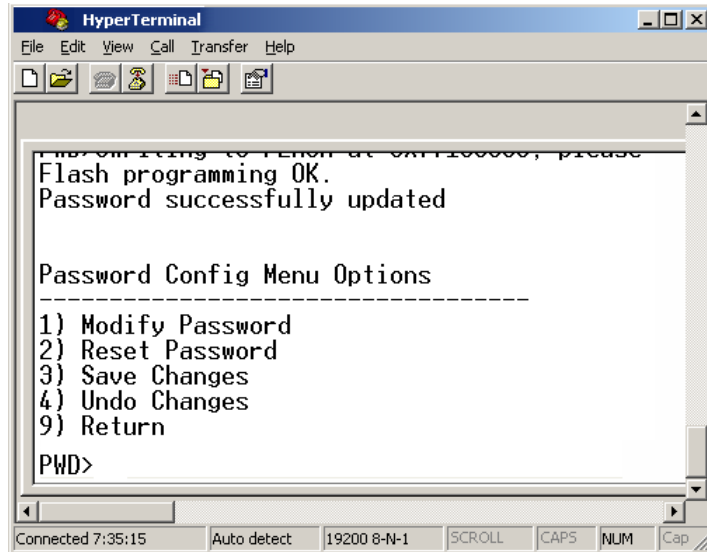


4. Do one of the following:
 - ▶ Type **1** to Modify Password.
 - ▶ Type **2** to Reset Password to the factory default (no user name and password).
5. Press **Enter**.

6. Type 3 to Save Changes.

Allow the DNxchange channel to save the changes and display the “Password successfully updated” message.

Password Successfully Updated



7. Do one of the following:
 - ▶ Type 9 to return to the Main Menu.
 - ▶ Click File > Exit to exit HyperTerminal.

Diagnostic Tests

The input and output circuitry of each connector on the DNxchange channel can be tested using the HyperTerminal application through a serial connection. The serial configuration menu provides a Diagnostics option in the menu. The diagnostic tests require loopback cables on the following DNxchange channel connectors:

- HD IN to HD OUT
- SD IN to SD OUT
- LTC IN to LTC OUT

The DNxchange diagnostics include a test that detects a valid genlock signal when a reference signal is connected to the REF connector.



Do not run the diagnostics unless requested by Avid Customer Support.

Network Test

You can ping the Avid DNxchange to see if the Avid DNxchange is seen by the network. To verify communication from a client system (such as a NewsCutter) which is on the Avid Unity network, obtain the IP address of the target DNxchange.

To ping DNxchange from a client system on the Avid Unity network:

1. Click Start > Run.
2. Type the **ping** command and the **IP address** of your channel in the DNxchange. For example:

```
ping 192.168.1.101
```

A command prompt window will open and display the ping command and a response, if the Avid DNxchange is seen by the network.

If the ping succeeds, a series of responses appears, for example:

8 packets transmitted, 8 packets received, 0% packet loss

3. Close the command prompt window when done.

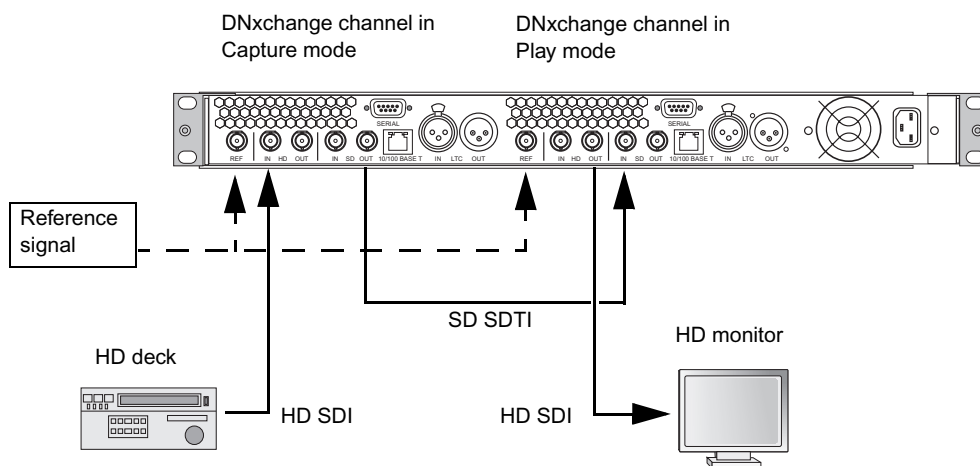
Channel Test

You can test two DNxchange channels by providing an HD signal into one channel and connecting the SD output of that channel to the SD input of a second channel. Connect an HD monitor to the HD output of that second channel. The HD output of the second channel should match the HD input of the first channel.



You must provide a reference signal to both channels and make sure the appropriate channels are configured for capturing or playing out.

End-to-End Channel Loop Test



The HD media from the output of the second channel output is delayed because of internal encoding and decoding taking place in both channels.

To complete the test, reconnect the two channels using the second channel as the HD input and the first channel as the HD output. This test can also be performed using two single-channel DNxchange enclosures.

After connecting an HD SDI signal to the HD In on the capture channel, verify that the HD SDI Input signal is detected by looking at the System Status on the General tab in the DNxchange UI, see [“General Tab” on page 38](#). Check that the SD SDI Input is detected on the Play channel.

You can view media being captured on the HD In connector by connecting an HD monitor to the HD Out connector when the DNxchange channel is in Capture mode. For more information on viewing the media while capturing, see [“Monitoring HD Video During Capture” on page 16](#).

Chapter 4

Installing the Optional Second DNxchange Channel

This chapter describes how to install the second DNxchange channel if you have purchased an Avid DNxchange with a single channel installed. The optional DNxchange channel is initially configured with the following default IP address and Subnet mask:

- IP address: 192.168.1.101
- Subnet mask: 255.255.255.0

The following is a list of required tools for installing the second channel in the DNxchange:

- Phillips screwdriver
- Anti-static ground strap
- 9/16 extended length nut driver
- 3/16 nut driver

If your DNxchange transcoder is rack mounted, turn off the transcoder, disconnect all cables connected to the transcoder, and remove the transcoder from the rack.

To install a second DNxchange channel:

1. Disconnect the ac power cord and any other cables from the rear of the DNxchange enclosure.
2. Put on an antistatic wrist strap and connect it to a metal ground point on the DNxchange.

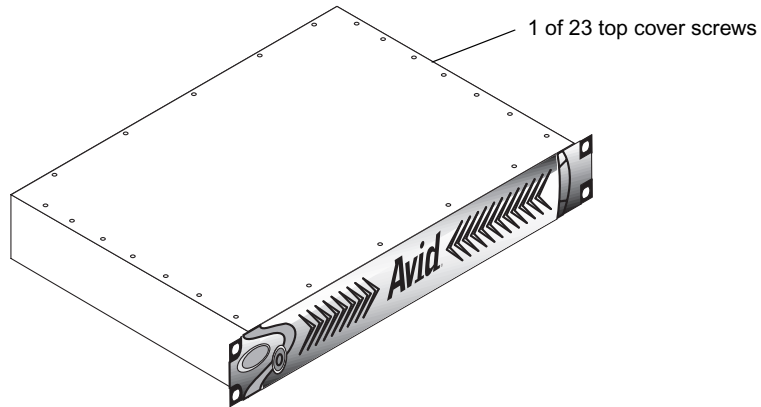


To avoid static damage to your circuit board, take the proper antistatic precautions before handling the board.

Chapter 4 Installing the Optional Second DNxchange Channel

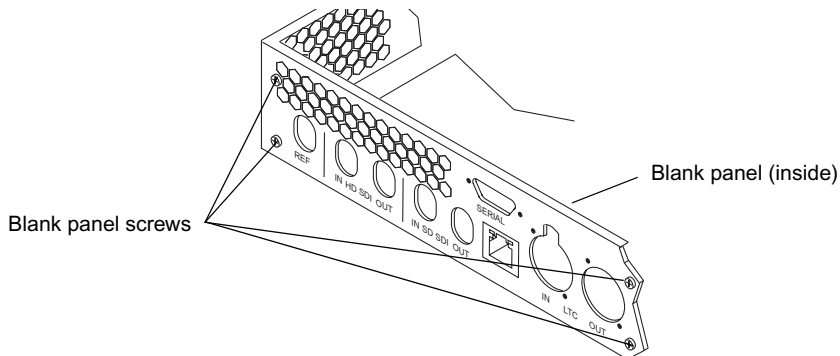
3. Remove the 23 top cover screws.

Top Cover Screws



4. Remove the four blank panel screws on the rear of the DNxchange and remove the blank panel from the inside of the chassis.

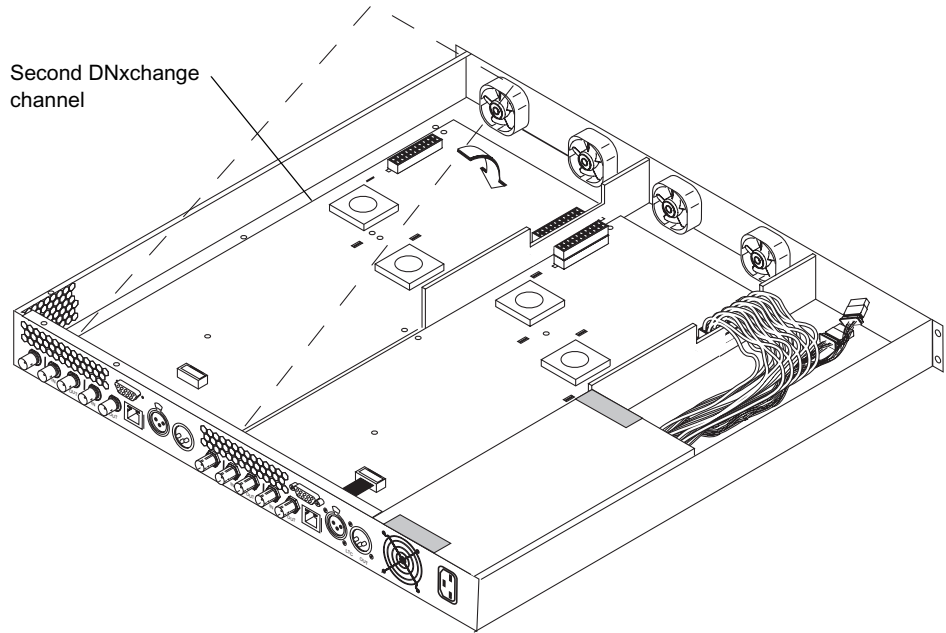
Blank Panel Screws



5. Locate the five spacers included in the option kit and place a spacer on each BNC connector on the new DNxchange channel (see [“BNC Spacers, Lock Washers, and Nuts”](#) on page 54.)

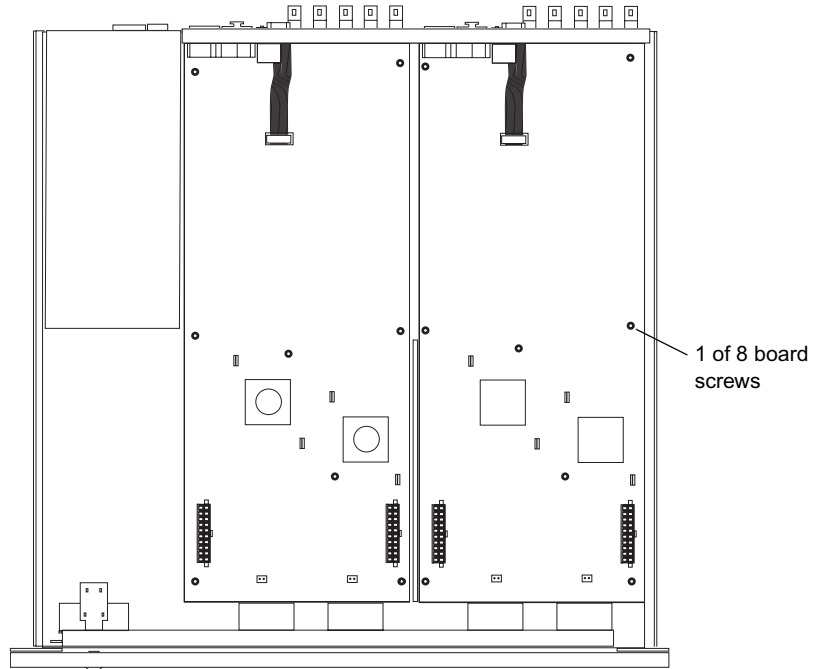
6. Position the new DNxchange channel board such that the connectors are aligned with the holes in the rear panel of the DNxchange and slide the board toward the rear so that the connectors extend through the appropriate holes.

Positioning the Optional DNxchange Channel



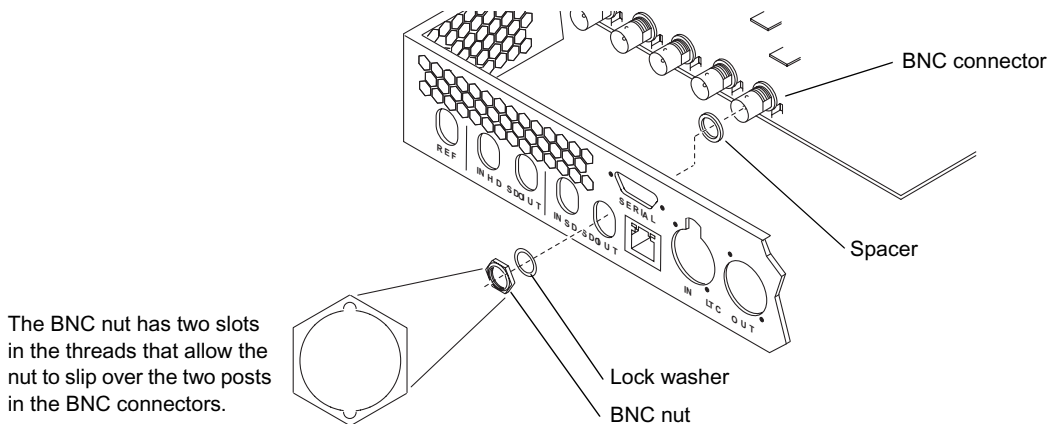
7. Secure the new DNxchange channel board to the DNxchange chassis with eight screws.

Second DNxchange Channel Screws



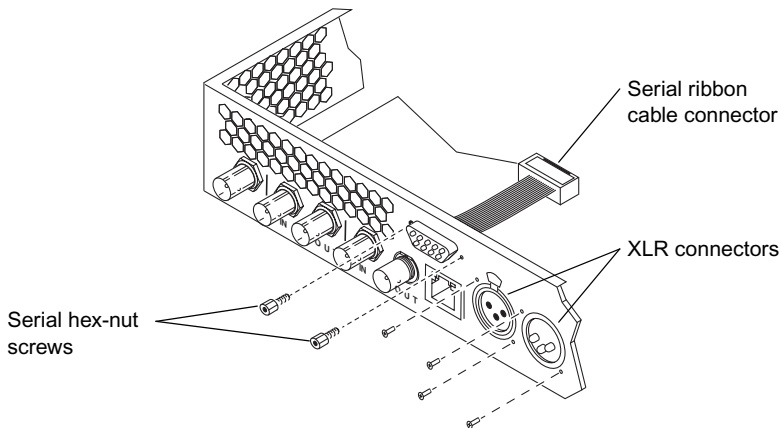
8. Locate the BNC lock washers and nuts included in the option kit and place a washer then a nut on each BNC connector.

BNC Spacers, Lock Washers, and Nuts



9. Use a 9/16 extended-length nut driver to tighten the nuts on the BNC connectors.
10. Insert the serial connector with attached cable into the D-shaped hole in the rear panel from the inside of the chassis.
11. Secure the serial connector using the hex-nut screws and 3/16 nut driver.
12. Connect the serial ribbon cable to the serial connector near the rear of the DNxchange channel.

Serial and XLR Connectors



13. Locate the four self-tapping screws and secure the XLR connectors to the rear of the DNxchange.

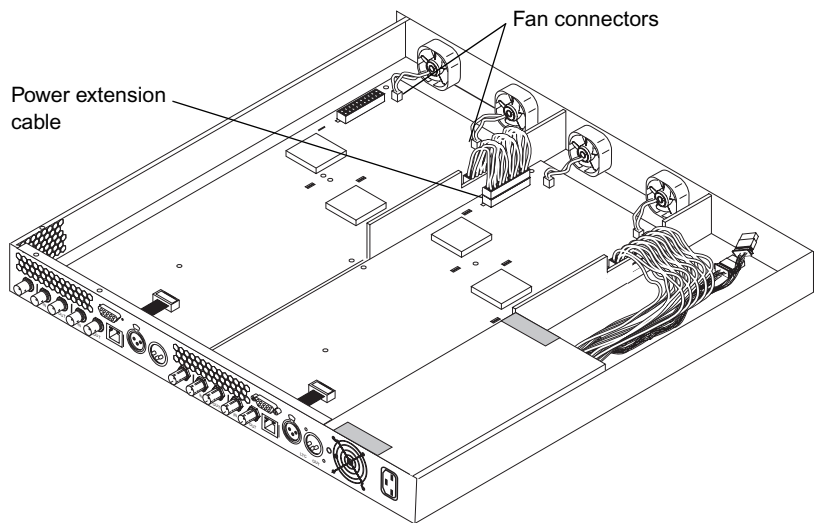


Do not over tighten the self-tapping screws into plastic XLR connectors.

14. Connect the two fan cables to the fan connectors near the front of the DNxchange channel board.

15. Connect the power extension cable between the two DNxchange channels boards.

Internal Cables



16. Replace the DNxchange top cover and 23 screws.



Do not connect the power or attempt to turn on the DNxchange without replacing the top cover on and screws.

Appendix A

Connections

This appendix explains each connector on the rear of the Avid DNxchange. The figure shows the Avid DNxchange with two channels installed in each unit. The dotted line in the figure indicates the separation between the two channels.

The initial configuration is done using the Ethernet port connectors on the rear of the DNxchange. The Ethernet connectors are identified in the [“Control Connections” on page 58](#). Each DNxchange channel must be configured separately. You do not need to connect your SDI inputs and outputs when configuring the channels.

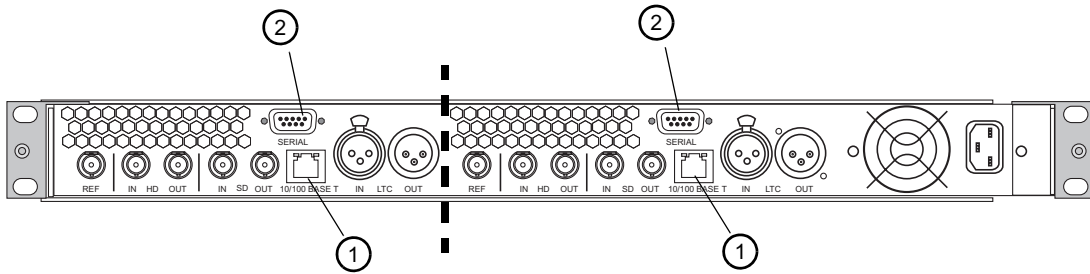


The each DNxchange channel within the DNxchange enclosure ships with a default IP and subnet address (see [“Default IP Address” on page 37](#)). Do not connect more than one DNxchange enclosure to your network environment until you have initially configured each channel in the DNxchange with a unique IP address provided by your network administrator.

Control Connections

The following figure identifies the serial and network connectors on the DNxchange. For a description of each connector, see the following table.

Serial and Ethernet Interface Connectors



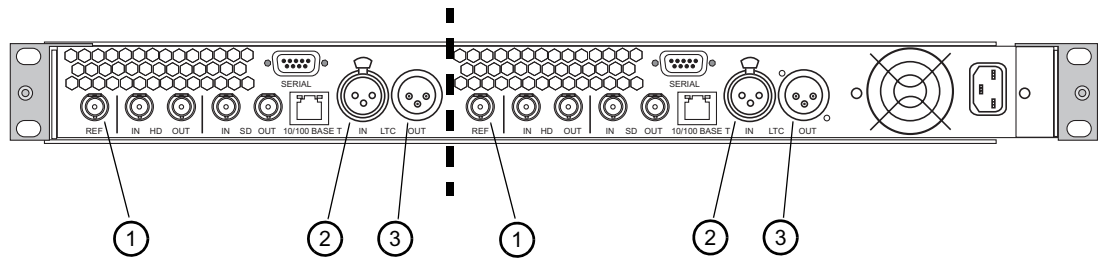
DNxchange Serial and Ethernet Identifiers

Number	Label	Function
1	10/100 BASE-T (Ethernet control interface)	10/100BASE-T port Ethernet connection provides a configuration connection using a browser application. Use a cross-coupled Ethernet cable when connecting to a local computer. DNxchange uses this port to configure each channel through a browser interface.
2	SERIAL (serial interface)	9-pin female RS-232 serial interface used for configuring the DNxchange.

Reference and LTC Connections

The following figure identifies the reference sync and LTC connectors on the DNxchange. For a description of each connector, see the following table.

Reference and LTC Connectors



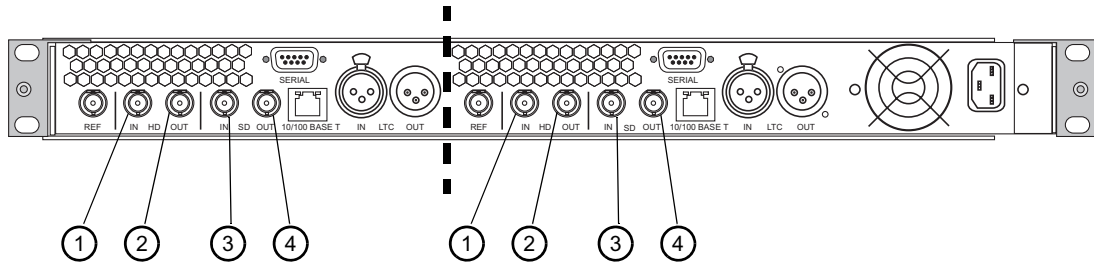
Reference and LTC Identifiers

Number	Label	Function
1	REF (reference input)	Video reference (REF) input for a black-burst generator or tri-level sync with phase lock to black-burst signal, BNC connector.
2	LTC IN	Longitudinal timecode input, female connector. Provides a feed to the DNxchange server for an analog timecode signal, allowing an alternate source generated timecode to be applied to the captured material.
3	LTC OUT	Longitudinal timecode output, male connector. Analog timecode signal that can be used by external devices that require such a signal for their capture or command and control operations.

Standard and High Definition Connections

The following figure identifies the standard definition (SD) and high definition (HD) serial digital interface (SDI) connectors on the DNxchange. For a description of each connector, see the following table.

SDI Connectors



SDI Identifiers

Number	Label	Function
1	HD IN	High Definition Serial Digital Interface input, BNC connector.
2	HD OUT	High Definition Serial Digital Interface output, BNC connector.
3	SD IN	Standard Definition Serial Digital Transport Interface input, BNC connector.
4	SD OUT	Standard Definition Serial Digital Transport Interface output, BNC connector.

Appendix B

Specifications

This appendix provides a detailed listing of the following technical system specifications:

- [Physical Specifications](#)
- [Audio Specifications](#)
- [Video Specifications](#)
- [Control and Synchronization Specifications](#)
- [Data Specifications](#)
- [Rear Panel Specifications](#)



All specifications are subject to change without notice.

Physical Specifications

Physical Specifications

Parameter	Specification
Dimensions	inches: 19.00 (w) x 1.75 (h) x 24.9 (d) cm: 48.3 (w) x 4.4 (h) x 63.3 (d)
Rack Units	1
Weight	pounds: 20 kilograms: 9.07

Power and Environment Requirements

Parameter	Specification
Power	100 to 240 Vac, 50/60 Hz Auto Ranging, 150 Watts
Environmental	10°C to 35°C, 90% RH non-condensing

Audio Specifications

Audio Specifications

Parameter	Specification
Audio Channels	8 audio channels per SDI input embedded audio
Sampling	48 KHz, 24 bit precision, Balanced Differential
AC-3	Fully compatible with professional and consumer encoding

Video Specifications

Video Specifications

Parameter	Specification
Video Channels	1 Receive or 1 Play Channel SD SDTI SMPTE - 259M HD SDI SMPTE - 292
1 SD SDTI input, 1 SD SDTI output	ITU-R BT.-601 10-bit Serial Digital Component Video
1 HD SDI input, 1 HD SDI output	ITU-R BT.-601 10-bit Serial Digital The HD OUT can be used for monitoring video during capture.

Control and Synchronization Specifications

Control and Synchronization Specifications

Parameter	Specification
External Control	RS-232 control configuration and diagnostics
Timecode	Linear Timecode SMPTE 12M Balanced I/O Vertical Interval Timecode, SMPTE 266 Compatible with Input and Output Line Selections
Reference	HD sync signal input

Control and Synchronization Specifications (Continued)

Parameter	Specification
Output timing	5 lines advance to 3 lines delay in 1/8th pixel steps
Internal Time	Derived from VITC on composite reference input
Latency	6 frames per channel

Data Specifications

Data Specifications

Parameter	Specification
Ethernet Port	RJ-45 connector, 10BASE-T or 100BASE-T, auto sensing

Rear Panel Specifications

Rear Panel Specifications

Parameter	Specification
Serial	9-Pin female D connector, RS-232
LTC Timecode	IN: 1 XLR female connector OUT: 1 XLR male connector
HD SDI	IN: 1 BNC connector OUT: 1 BNC connector
SD SDTI	IN: 1 BNC connector OUT: 1 BNC connector
Reference	IN: 1 BNC connector

Appendix C

Regulatory and Safety Notices

Warnings and Cautions



Never install equipment if it appears damaged.



Disconnect the power cord before servicing unit.



Only perform the services explicitly described in this document. For services or procedures not outlined in this document, speak with authorized Avid service personnel.



Follow all warnings and cautions in the procedures.



Operate the device within its marked electrical ratings and product usage instructions.

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian ICES-003

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice



Declaration of Conformity (According to ISO/IEC Guide 22 and EN 45014)

Application of Council 73/23/EEC, 89/336/EEC.

Directives:

Standards to which EN60950:1999 Third Edition

Conformity is Declared: CISPR 22:1997 / EN55022:1994 + A1:1995 + A2:1997 Class A
EN55024:1998/EN61000 — 3-2, 4-2, 4-3, 4-4, 4-5, 4-6, 4-11

Manufacturer's Name: Avid Technology, Inc.
1925 Andover Street
Tewksbury, MA 01876, USA

European Contact: Nearest Avid Sales and Service Office or
Avid Technology International B.V.
Sandyford Business Center
Unit 3,
Dublin 18, Ireland

Type of Equipment: Information Technology Equipment

Product Name:	<p>Products for the Windows NT, Windows 2000, or Windows XP Operating System: Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption V10, Symphony</p> <p>Products for the Mac OS X Operating System: Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, Pro Tools AVoption V10, Symphony</p> <p>Products for the UNIX Operating System: AirPlay, AirSPACE, AirSpeed, DNxchange, VideoSPACE</p> <p>Products for MediaNetwork and Workgroups: Avid ProEncode, Avid Unity ISIS, Avid Unity MediaManager, Avid Unity MediaNetwork (includes File Manager), Avid Unity TransferManager, LANserver, LANserver EX, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, MEDIArray ZX, MEDIArray ZX Drive, Nearchive, PortServer, Vixel switches (8100, 7100, 7200, 9100, 9200), Xdeck</p>
Base Model Numbers:	None
Product Options:	All
Year of Manufacture:	2006

(1) Products for the Windows NT, Windows 2000, or Windows XP Operating System: products were tested in a typical Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid|DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption|V10, or Symphony configuration.

(2) Products for the Mac OS X Operating System: products were tested in a typical Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, Pro Tools AVoption|V10, or Symphony configuration.

(3) Products for the UNIX Operating System: products were tested in an AirPlay, AirSpeed, DNxchange, or VideoSPACE configuration.

(4) Products for MediaNetwork and Workgroups: products were tested in a typical Avid ProEncode, Avid Unity ISIS, Avid Unity MediaManager, Avid Unity MediaNetwork (includes File Manager), Avid Unity TransferManager, LANserver, LANserver EX, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, MEDIArray ZX, MEDIArray ZX Drive, Nearchive, PortServer, or Xdeck configuration.

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directives and Standards.

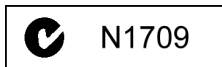
George R. Smith, Director of Hardware Engineering

Disposal of Waste Equipment by Users in the European Union



This symbol on the product or its packaging indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.

Australia and New Zealand EMC Regulations



John Kells, Australian Operations Manager
Avid Technology (Australia)
Unit B
5 Skyline Place
French Forest NSW 2086
Australia
Phone: 61-2-8977-4800

Taiwan EMC Regulations

Taiwan EMC Regulations BSMI Class A EMC Warning

警告使用者：

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

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