Omneon, Inc. • Omneon ProXchange • Installation and User’s Guide


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Software Release

Release 1.7

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Important Safeguards and Notices

This section provides important safety guidelines for both the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons.

Safety and Regulatory Information

Refer to the third party documentation that ships with this product for safety and regulatory information pertaining to certain hardware components of the ProXchange system.

Safety Symbols

- **Hazardous Voltage**
- **Caution**

The product is marked with this symbol when it is necessary to refer to the manuals to prevent damage to the product.

Warnings

Please observe the following important warnings:

- Any instructions in this guide that require opening the chassis, changing a power supply, or removing a board should be performed by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so.
- Heed all warnings on the unit and in the operating instructions.
- Do not use this product in or near water. Disconnect AC power before installing any options or servicing the unit unless instructed to do so by this manual.
- This product is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.
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- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected.
- Do not wear hand jewelry or watches when troubleshooting high current circuits, such as the power supplies.
- To avoid fire hazard, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel.

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Apple ProRes 422 Notice
This product supports the Apple ProRes 422 post production format.
## Contents

### Chapter 1 Introduction
- Omneon ProXchange System Documentation Suite
- Locating the Latest Documentation on the Omneon Web Site
- About the ProXchange System
- Media API
- Automation
- ProXchange System Components
- ProXchange System Feature Highlights
- Technical Support
- Useful Information when Contacting Technical Support

### Chapter 2 System Overview
- Overview
- PXD2000A JobDirector
- Front Panel Components
- Rear Panel Components
- PXD2001A JobScaler
- Front Panel Components
- Rear Panel Components

### Chapter 3 ProXchange System Installation
- About Licenses for ProXchange Use
- Mounting the ProXchange Devices
- Connecting the ProXchange Devices
- About Bandwidth from ProXchange to Omneon MediaGrid
- Option A: Connecting ProXchange to a Client Network
  - Connecting the JobDirector to the Client Network
  - Connecting the JobScaler to the Client Network
- Option B: Connecting ProXchange to Omneon MediaGrid
  - Connecting the JobDirector to Omneon MediaGrid
  - Connecting the JobScaler to Omneon MediaGrid
- Creating Fixed IP Addresses for ProXchange
  - Assigning IP Addresses on a Client Network
  - Assigning IP Addresses on an Omneon MediaGrid Network
  - Setting up Reverse DNS Lookups
  - Setting the ProXchange System Time Zone
Installing the Time Zone Information ............................................................ 47
Configuring the ProXchange JobDirector Time and Date ............................ 48
Installing ProXchange Manager ................................................................. 49
System Compatibility ............................................................................. 49
What Gets Installed ............................................................................... 49
Software Installation ............................................................................. 50
ProXchange Licensing ........................................................................... 52
Updating the ProXchange License File on the JobDirector ......................... 52
Updating the ProXchange License File on the JobScaler ........................... 52
Upgrading ProXchange ........................................................................... 53
About SystemManager for ProXchange .................................................. 53
Reinstalling the Operating System and System Software .......................... 53
ProXchange JobDirector Software Installation ...................................... 53
ProXchange JobScaler Software Installation .......................................... 55

Chapter 4 ProXchange Manager ................................................................. 57
User Interface and Menu Overview .......................................................... 57
Main Window ......................................................................................... 58
  Menu Bar ............................................................................................ 58
  Directories Pane ............................................................................... 58
  Tasks Pane ....................................................................................... 59
  Presets Pane .................................................................................... 59
  File Menu ........................................................................................ 59
  Setup Menu ..................................................................................... 60
  View Menu ..................................................................................... 60
  Help Menu ...................................................................................... 61
Starting ProXchange Manager .................................................................. 61
Using ProXchange Manager ..................................................................... 62
  Connecting to the ProXchange JobDirector ...................................... 62
  Connecting to an Omneon MediaGrid .............................................. 63
  Setting up MediaGrid Resources ...................................................... 64
  Creating a Transcode Preset .............................................................. 65
  About Multiple Web Clip Output ...................................................... 75
  About Audio Resampling ................................................................. 75
  Editing a Preset ............................................................................... 77
  Renaming a Preset ......................................................................... 77
  Deleting a Preset ............................................................................ 77
  Assigning Directories for Transcoding .............................................. 78
Viewing ProXchange Transcode Status and Results ................................ 81
  Viewing Job Results ....................................................................... 81
  Aborting a Transcode Job ................................................................. 82
Troubleshooting .................................................................................... 83
### Appendix A Media Types
- Video Input and Output Formats ................................. 87
- Audio Input and Output Formats .................................. 87
- Wrapper Formats .......................................................... 91
- ProXchange Ancillary Data Support .............................. 96
- Apple ProRes 422 Support .............................................. 98

### Appendix B Legacy Hardware Platforms
- PXD2000 JobDirector ................................................. 101
- PXD2001 JobScaler ..................................................... 106

### Appendix C Panasonic P2 Clips
- Directory Structure ...................................................... 113
- Requirements ............................................................ 114
- Examples ................................................................. 114
- ProXchange Tasks that Accept P2 Clips as Input ............... 114

### Index ................................................................. 117
CHAPTER 1

Introduction

Congratulations on choosing a ProXchange System from Omneon.

This guide provides information on how to set up a ProXchange system and how to install and operate the ProXchange Manager application. Choose from the following sections:

- "Introduction" gives an overview of the ProXchange system and the Documentation Suite, lists terms and conventions, provides background information about ProXchange, and provides Technical Support information.

- **System Overview** provides detailed information about each of the system components.

- **ProXchange System Installation** provides step-by-step hardware and software installation instructions.

- **ProXchange Manager** provides an overview of the ProXchange Manager User Interface and its menus; instructions for creating custom transcoding rules; and assigning source and destination directories on the Omneon MediaGrid system.

- **Media Types** shows the video input, output and wrapper formats that are supported by ProXchange.

- **Legacy Hardware Platforms** provides information about legacy system components.

Omneon ProXchange System Documentation Suite

The following table describes the items that comprise the Omneon ProXchange System Documentation Suite. Product guides are available for download from the Omneon Support Server at [http://support.omneon.com/Updates/Omneon/Current/ProXchange/](http://support.omneon.com/Updates/Omneon/Current/ProXchange/)

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**NOTE:** Product information is also available from the Help menu in ProXchange Manager.
Locating the Latest Documentation on the Omneon Web Site

The latest product technical documentation, as well as information provided for older releases, is available at:

http://www.omneon.com/service-support/documentation.php

About the ProXchange System

Omneon ProXchange is a high-performance transcoding system specifically designed for high-volume multi-format media environments. As the first application to take advantage of the combined storage and processing architecture of Omneon MediaGrid, ProXchange delivers grid-based transcoding of media clips stored within Omneon MediaGrid.

ProXchange can transcode clips between a wide range of DV and MPEG-2 formats, including both Standard Definition (SD) and High Definition (HD). These formats can also be transcoded to several mobile formats. ProXchange supports clips in DV and MPEG formats generated by or destined for Spectrum, and supports clips in DV and XDCAM HD formats generated by or destined for Apple Final Cut Pro®. The scalable architecture of Omneon MediaGrid enables ProXchange to bring new levels of performance by distributing jobs across multiple processors in an Omneon MediaGrid active storage system.
Broadcasters and content production facilities increasingly need to work with multiple formats of a media clip as it moves from acquisition to production to distribution to archive. ProXchange streamlines the transcode process to enable more efficient workflows and lower operating costs by eliminating external clip management and the need for multiple add-on systems associated with traditional transcoding applications.

The combination of Omneon ProXchange and the Omneon MediaGrid active storage system also makes repurposing media more efficient and cost effective than ever. ProXchange leverages the available processing capability of Omneon MediaGrid to produce incredible performance that scales as an Omneon MediaGrid system grows. ProXchange takes full advantage of the grid processing capability of Omneon MediaGrid by splitting transcode jobs across a pool of available ContentServers. This eliminates file replications required by traditional transcoding solutions that rely on separate storage and processing resources. ProXchange’s unique approach allows deployment of a single infrastructure for both storage and processing requirements, minimizing complexity of system and reducing the total cost of ownership.

ProXchange’s rules engine can be configured to automatically convert content from one format to another based on a user-defined profile. You can create rules to transcode content of a particular format, set the desired output formats and control more detailed parameters such as bitrates and output directories.

Once a set of rules has been applied to a specific directory in Omneon MediaGrid, ProXchange automatically begins processing any clips appearing there. ProXchange can produce multiple output formats, each transferred to an assigned directory within Omneon MediaGrid.

**Media API**

ProXchange 7.1 now supports Media API 6.2. Refer to the *Media API Programmer Guide 6.2* for complete information.

**Automation**

Automation is managed from the ProXchange JobDirector. When a new clip arrives in a watched directory on Omneon MediaGrid that matches the criteria of one of the tasks created using the ProXchange Manager application, the clip is transcoded to another directory on the same Omneon MediaGrid system. Omneon MediaGrid is the source and destination of all content for ProXchange.

Optionally, a client may trigger a transcode through the API hosted on the JobDirector. Omneon provides a development tool that can be used for exploration by 3rd party integrators; it is expected that 3rd party integrators will provide the user interface that makes use of this API feature. Contact Omneon for information about the *ProXchange API Reference Guide*. 
About the ProXchange Database

The ProXchange database contains tables used to track the clips on Omneon MediaGrid that are watched by ProXchange. The database information is used to decide if a particular clip is new or has been seen before. **Clipdirs**, one of the database tables, contains all the clip directories on Omneon MediaGrid that are watched by ProXchange.

Another set of database tables hold the preset and task information defined using the ProXchange Manager application. Presets are a set of rules defining the output clip wrapper, video and audio. Each entry in the tasks table links one preset with an input directory; each task also identifies which directory holds the output.

When a new clip is discovered, the set of all tasks that specify the directory of the new clip is formed. Each task of that set is tested to verify that the new clip is a valid input for that task. A new transcode job is created when there is a match of a new clip with the preset information for a task. There is an entry created in the **jobs table** of the database for each new job; that entry captures the status of that transcode job.

Each JobDirector can transcode one clip at a time; each JobScaler can simultaneously process one additional clip. The pending jobs are formed into a queue using the entries in the jobs table of the database. The JobDirector and the JobScalers pick up the next pending job upon completing their current job. The pending jobs are kept in two lists—one of high priority and one of low priority. Each list is sorted so that the oldest jobs of that list are completed first.

ProXchange supports a two-level transcode job priority scheme. When a task is created using ProXchange Manager, it can be a normal or high priority task. Jobs associated with high priority tasks are performed before any normal priority jobs. New high priority transcode jobs will not interrupt an ongoing normal priority transcode, but will execute immediately upon completion of that job, regardless of how many normal priority jobs are already queued up.

Maintaining Clip Directories Information

There are two ways to find the clip directories: scan and callback.

**Scan**

The clip directories on the file systems are scanned periodically and the clipdirs table is updated.

If the scan process does not find the directory that is already in the clipdirs table, the directory is marked “missing.” If the directory is not accessible because Omneon MediaGrid is temporarily offline, it is not marked missing.

**Callback**

Whenever a new file system is added, the clip directories of that new file system are scanned immediately without waiting for the next scan. Whenever a new directory is added, renamed, moved or deleted on the existing file system, that directory is scanned immediately for subdirectories without waiting for the next scan.
**Job Monitoring**

The state of the job in the jobs table is monitored as described below.

**At Startup**

The “Posted” and “Active” jobs from the previous session (for example, the session before the server reboots) are aborted and retried.

**Stalled**

If the job is stuck in an “Accepted” or “In Progress” state for more than three minutes without any update from the transcoders, it is considered to be “Stalled” and aborted. This job is retried later (see **Retrying**).

**Retrying**

The failed/stalled jobs are retried a maximum of three times. The first retry is 5 minutes after the job fails; the subsequent two retries are 1 hour after the previous retry failed. If the job still fails after three retries, the job state indicates the job was given up after too many retries and no more attempts are made. The job is retried in the same priority as submitted.

**ProXchange System Components**

The Omneon ProXchange system is comprised of the following components:

- **ProXchange JobDirector**
- **ProXchange JobScaler** (optional)
- **ProXchange Manager**

In addition to a basic ProXchange system, the following are required:

- An Omneon MediaGrid system with the Grid Processing License installed. This license is required to run grid applications on Omneon MediaGrid (see the *Omneon SystemManager User's Guide* for instructions on installing the file that contains this license).
- An Omneon SystemManager platform with the latest SystemManager release installed

**ProXchange JobDirector**

The JobDirector automates the transcoding of content and manages the transcode-specific workload requested of all available ContentServers, balancing the work for the most efficient use of each resource.

Refer to **PXD2000A JobDirector** for more information about the ProXchange JobDirector.
ProXchange JobScaler

The JobScaler is an optional server that can be added to your ProXchange system to improve throughput. Refer to PXD2001A JobScaler for more information about the ProXchange JobScaler.

ProXchange Manager

ProXchange Manager is a Windows® application that allows you to set up automated transcode rules (presets) and apply them to content stored on Omneon MediaGrid. Automation is a two-step process: first you set up the rules that define the format of output clips, then you create tasks that specify the source and destination directories, using your custom predefined rules. Once a set of rules is applied to a specific Omneon MediaGrid directory, ProXchange Manager automatically begins processing any clips appearing there.

There are three types of output resolution available: standard definition, high definition, and a lower resolution output for uses such as internet distribution or for use with mobile devices.

NOTE: ProXchange Manager has no control of the format of clips that are stored in a source directory on Omneon MediaGrid. Clips that do not fit one of its tasks are logged but not transcoded.

Refer to ProXchange Manager for more information about ProXchange Manager.

ProXchange System Feature Highlights

The Omneon ProXchange system includes the following features:

• **Grid-based Transcoding**
  ProXchange uses available processing power of the Omneon MediaGrid active storage system to transcode stored content.

• **Transcode Various Media Formats**
  ProXchange can transcode media clips between a wide range of DV and MPEG-2 formats, including both Standard Definition (SD) and High Definition (HD). These formats can also be transcoded to several mobile formats.

• **Create Multiple Transcode Presets**
  Set up multiple transcode rules (presets) and apply them as “tasks” to your source clip directories, creating various output formats for playout. Once applied to a source directory, these tasks automatically complete transcode jobs when source clips arrive in the source directory.

• **View Transcode Job Status**
  The ProXchange Manager application provides a menu option that accesses the JobDirector's transcode status page, displaying results of recent transcode jobs in a browser. In addition to viewing the results of completed transcode jobs, you can check the status of posted and in progress jobs.
• **Up/Down/Cross Conversion with Aspect Ratio Conversion**

ProXchange provides up-conversion to scale lower resolution images to a higher resolution, down-conversion to scale from higher resolutions to lower resolutions, and cross-conversion to convert progressive material to interlaced material or from interlaced to progressive. When converting between different video formats the aspect ratio of the output may be different than the source. ProXchange Manager allows you to convert the aspect ratio of the output video to resize correctly.

## Technical Support

Omneon provides many ways for you to obtain technical support. In addition to contacting your Distributor, System Integrator, or Omneon Account Manager, you can contact the Omneon Technical Support department as follows:

For support in the Americas:

- Telephone (Toll Free): +1(888) OVN SPT1 (686 7781)
- Telephone (Local): +1(408) 585 5200
- Fax: (408) 490 7390
- E-mail: support@omneon.com
- [http://www.omneon.com/service-support](http://www.omneon.com/service-support)

For support in Europe, Middle East, and Africa:

- Telephone: +44 1256 347 401
- Fax: +44 (0) 1256 347 410
- E-mail: emeasupport@omneon.com
- [http://www.omneon.com/service-support](http://www.omneon.com/service-support)

For support in Russia and CIS:

- Telephone: +7 495 506 5981
- Fax: +7 495 937 8290
- E-mail: RUsupport@omneon.com
- [http://www.omneon.com/service-support](http://www.omneon.com/service-support)

For support in Japan:

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For support in China (mainland)
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• Fax: +86 10 6581 9190
• E-mail: chinasupport@omneon.com
• http://www.omneon.com/service-support

For support in Asia Pacific (other territories):
• Telephone: +65 6542 0050
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• E-mail: apacsupport@omneon.com
• http://www.omneon.com/service-support

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San Jose, CA 95134 U.S.A.

**Useful Information when Contacting Technical Support**

In order to assist Omneon Technical Support, review the following information:

**What version of firmware is installed on your system?**

From the Home tab, click the Upgrade Firmware icon in the left-hand column to display the Upgrade Firmware page. The firmware version for each device is shown in the Current Firmware Version column.

**What version of SystemManager software is installed?**

From SystemManager, click the Help tab. The version is shown in the Server Software section of the page.
**Which Windows operating system is running on the SystemManager client PC?**

1. From Windows, click the **Start** button, and then click **Run**.
2. In the **Open** field, type: `winver`, and then press **Enter** to open the **About Windows** dialog box, which shows the version number.

**How much memory is installed on the SystemManager platform? (for example, 256 MB, 512 MB, or 1 GB)**

1. From Windows, click the **Start** button, and then click **Run**.
2. In the **Open** field, type: `winver` and then press **Enter** to open the **About Windows** dialog box. Look for the line which reads “Physical memory available to Windows.”

**Please provide the manager.oda file from the SystemManager platform or client PC**

Omneon Technical Support may request that you email the manager.oda file, which contains configuration information for your system. This file is located on the SystemManager platform at `D:\Omneon\Manager\omdb`, or if you are using a client PC with a single C: partition, it will be in the same directory on the C: drive.

**What is the model and serial number of the hardware involved?**

- For Spectrum and MediaDeck devices: from the **Home** tab, click the **Upgrade Firmware** icon in the left-hand column to display the **Upgrade Firmware** page. Both MediaDirectors and MediaDecks are listed in the **MediaDirectors** section. Find the Model Numbers and Serial Numbers listed in their respective columns.

- Scroll down to the **MediaPorts** section to view the Model Numbers and Serial Numbers for MediaPorts and MediaDeck Modules.

- For Omneon MediaGrid Devices: Click the **Servers & Switches** icon in the left-hand column. From the Servers and Switches page, in the **Name** column, click the link for the Omneon MediaGrid device to open the **Properties** page for that device.

- For ProXchange devices: Click the ProXchange Servers icon in the left-hand column. From the **Servers** page, in the **Name** column, click the link for the ProXchange device to open the **Properties** page for that device.

- For ProBrowse devices: Click the ProBrowse Servers icon in the left-hand column. From the **Servers** page, in the **Name** column, click the link for the ProBrowse device to open the **Properties** page for that device.

- For MAS devices: Click the MAS Servers icon in the left-hand column. From the Servers page, in the **Name** column, click the link for the MAS device to open the **Properties** page for that device.
For Spectrum Systems

What is the name of the Player that is being used?

From SystemManager, click the Player Configuration link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The Player List page for that device appears. The names and status of all players are listed.

What file format and bit rate is the Player configured for? (for example, MPEG, DV, IMX?)

1. From SystemManager, click the Player Configuration link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The Player List page for that device appears.

2. From the player list, click the Properties link to view all the details for a player.

If the problem is related to Ingest or Playout of a clip, what is the Clip ID involved?

The clip name or clip ID should be indicated by whatever software application you are using to play or record video. For Omneon ClipTool, clip names are displayed in the clip management area of the ClipTool main window.

• What brand of Automation, if any, is being used for control?

• Is the Automation using VDCP or API for communication control?

• What other third party device (for example, Tandberg* or Snell and Wilcox*) is involved?

For Omneon MediaGrid Systems

For failures with the Omneon MediaGrid client:

• What operating system is running on the client computer?

• What applications are you using?

• What version of the Omneon MediaGrid FSD is installed?

To determine the FSD version on Windows:

1. From the Control dialog box, click the Add/Remove Programs icon.

2. Locate the Omneon MediaGrid File System Driver entry and click the link, which says Click here for support information. The version is displayed.

To determine the FSD version on Macintosh:

1. Select Find from the File menu.

2. Click Applications in the Finder sidebar of the Searching “This Mac” window.

3. Double-click the Connect to MediaGrid icon to open the Connect to Omneon MediaGrid dialog box.
To determine the FSD version on Linux:

Use the following command: `tail /proc/sys/omfs`

- Please supply an error message, screen capture, or description of the symptom
- Is the issue repeatable? If so, what is the procedure to reproduce the issue?
- Please supply log files for the client FSD and ContentBridge FSD

Once you are able to reproduce the issue, Omneon Technical Support may ask you to provide log files from the client computers or the ContentBridge. The following instructions describe how to turn on logging on a client system.

**IMPORTANT:** Do not perform the following procedures unless directed by Omneon Technical Support.

To enable logging for a Windows client:

1. Add two registry parameters to the OmRdr registry key:
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\OmRdr\Parameters
   - DWORD “debug” with value 1
   - DWORD “LogToFile” with value 1

2. For debug to take effect, make sure the client is mounted to the Omneon MediaGrid system.

3. For LogToFile to take effect, run the “taillog” executable and redirect the output to a file. From the Start menu, click Run, and paste the location of tailog.exe and desired location of the log file into the Open field, as shown in this example: “C:\Program Files\Omneon\Omneon MediaGrid\tailog.exe” > c:\clxxxxxx-1.log

   In this example, the log file will be created at the c:\ directory.

4. Reproduce the issue, and then collect all log files from taillog and the omxxx.log from the WinFSD installed directory.

5. Once you have collected the log files make sure to delete the LogToFile parameter from the registry, otherwise it will have a negative impact on performance.

To enable logging for a Macintosh client:

1. Run the following command to ensure that the debug level is set to default:
   ```
   sudo sysctl –w debug.omfs=3
   ```

2. Reproduce problem.

To collect log messages for a Linux client:

1. Collect /var/log/messages.

   Omneon may also want to collect the current configured Linux FSD parameters.

2. Access these by entering the following command:
   
   ```
   cat /proc/sys/omfs*
   ```

To collect log messages for the ContentBridge:

1. Locate the log file at:/var/log/omneon/remote/<IP address of ContentBridge>.

   • **What was the time of the failure?**
     
     For information on the time of failure, navigate to the View Alarms page in SystemManager. To open the View Alarms page, click the Diagnostics tab, and then click the View Alarms icon in the left-hand column.

   • **What is the name of the device that experienced the failure?**
     
     From SystemManager, click the Servers & Switches icon in the left-hand column to access the Servers & Switches page. Device names are listed in the Name column.

   • **Please provide an error message and/or a description of the symptom**

   • **Is this failure affecting clients or other systems?**

   • **Please provide the appropriate log file or remote access to the device**
     
     The Omneon MediaGrid provides logs files for all of the core services. Omneon Technical support may wish to view one of these logs to determine the root cause of the problem. The following three log files are used most often when troubleshooting. These files are located on the ContentDirector at /var/log/omneon.

     • **ssmd**: SliceServer Manager
     
     • **mdscore**: MetaData Server
     
     • **startup**: Core Omneon MediaGrid Services Startup and Shutdown
CHAPTER 2
System Overview

This section provides an overview of the components of a basic Omneon ProXchange system, including the following devices:

- PXD2000A JobDirector
- PXD2001A JobScaler

Overview

Figure 1 represents a ProXchange installation, comprised of one JobDirector and one JobScaler (optional) connected to a client network, which connects to an Omneon MediaGrid system. The ProXchange Manager application is installed on a customer PC.
Refer to **ProXchange System Installation** for detailed installation instructions.

A system consists of the following hardware components:

- **PXD2000A JobDirector**
- **PXD2001A JobScaler(s) (optional)**

And the following software component installed on a customer-supplied computer:

- **ProXchange Manager**
  
  Refer to **ProXchange Manager** for details about this Omneon program.

### PXD2000A JobDirector

This section includes details on the PXD2000A JobDirector:

- **Front Panel Components**
- **Rear Panel Components**

For details on the legacy hardware platform, refer to **Appendix B, Legacy Hardware Platforms**.

### Front Panel Components

**Figure 2** and **Table 2** detail the front panel view of the JobDirector with the bezel removed.

![JobDirector Front Panel Diagram](image-url)

**Figure 2. JobDirector Front Panel**
Table 2. JobDirector Front Panel Components

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power-on indicator/button</td>
<td>The power button controls the DC power supply output to the system. The power-on indicator lights when the system power is on. When the power-on indicator is off, this indicates that no power is supplied to the system.</td>
</tr>
<tr>
<td>Video Connector</td>
<td>Connects a monitor to the system.</td>
</tr>
<tr>
<td>LCD menu buttons</td>
<td>Allows you to navigate the control panel LCD menu.</td>
</tr>
<tr>
<td>LCD display</td>
<td>Provides status information and system error messages. The LCD display lights during normal system operation. Both the systems management software and the identification buttons located on the front and back of the system can cause the LCD to flash blue to identify a particular system. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives. <strong>Note:</strong> If the system is connected to AC power and an error has been detected, the LCD display lights amber regardless of whether the system has been powered on.</td>
</tr>
<tr>
<td>System identification button</td>
<td>Pressing this button will cause the Front LCD display and the system status indicator on the rear panel to blink.</td>
</tr>
<tr>
<td>USB connectors</td>
<td>Use to connect the front bezel.</td>
</tr>
<tr>
<td>Optical drive</td>
<td>Use for software installation.</td>
</tr>
<tr>
<td>Hard drives (2)</td>
<td>Refer to Table 4 for a description of the indicator codes.</td>
</tr>
</tbody>
</table>

**Front Panel Status Indicators**

**System Status Indicators**

The bezel on the JobDirector includes six system status indicators, as shown in Figure 3. Note that the top left and top right LEDs apply to two Ethernet ports each. Refer to Table 3 for system status indicator patterns.
### Table 3. JobDirector System Status Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
</table>
| 1. Ethernet Port 0 and Ethernet Port 2 | White | **NIC0/Gb1/eth0:** Active (requires both a good Ethernet link status and completed IP configuration)  
**NIC2/Gb3/eth2:** Active (requires both a good Ethernet link status and completed IP configuration) |
| | Blue | **NIC0/Gb1/eth0:** Inactive  
**NIC2/Gb3/eth2:** Active (requires both a good Ethernet link status and completed IP configuration) |
| | Yellow | **NIC0/Gb1/eth0:** Active (requires both a good Ethernet link status and completed IP configuration)  
**NIC2/Gb3/eth2:** Inactive |
| | Red | **NIC0/Gb1/eth0:** Inactive  
**NIC2/Gb3/eth2:** Inactive |
Table 3. JobDirector System Status Indicators (Continued)

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
</table>
| 2. Ethernet Port 1 and Ethernet Port 3 | White | NIC1/Gb2/eth1: Active (requires both a good Ethernet link status and completed IP configuration)  
NIC3/Gb4/eth3: Active (requires both a good Ethernet link status and completed IP configuration) |
| Blue | NIC1/Gb2/eth1: Inactive  
NIC3/Gb4/eth3: Active (requires both a good Ethernet link status and completed IP configuration) |
| Yellow | NIC1/Gb2/eth1: Active (requires both a good Ethernet link status and completed IP configuration)  
NIC3/Gb4/eth3: Inactive |
| Red | NIC1/Gb2/eth1: Inactive  
NIC3/Gb4/eth3: Inactive |
| 3. Software Monitor | Yellow | Power on |
| Blue | The ProXchange software service is not running  
This LED is white for 60 seconds prior to changing to blue when the system is starting up and when the front panel is attached after the system is started. |
| White | Normal, healthy state |
| 4. RAID Monitor | Yellow | Power on |
| Blue | RAID protection compromised; warning or error |
| White | Normal, healthy state |
| 5. Job Monitor (jobs running on this JobDirector only) | Yellow | Power on |
| Blue | No transcode job running |
| White | Transcode job running |
| 6. Systemwide Job Monitor | Yellow | Power on |
| Blue | No active transcode job running |
| White | Active transcode job running |
**Hard Drive Indicators**

Refer to Figure 4 and Table 4 for a description of JobDirector hard drive indicators.

![Figure 4. JobDirector Hard Drive Indicators](image)

1. Drive-activity indicator (green)  
2. Drive-status indicator (green and amber)

<table>
<thead>
<tr>
<th>Drive-status Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinks green two times per second</td>
<td>Identify drive/preparing for removal</td>
</tr>
</tbody>
</table>
| Off | Drive ready for insertion or removal  

**Note:** The drive-status indicator remains off until all hard drives are initialized after system power is applied. Drives are not ready for insertion or removal during this time.

<table>
<thead>
<tr>
<th>Drive-status Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinks green, amber, and off</td>
<td>Drive predicted failure</td>
</tr>
<tr>
<td>Blinks amber four times per second</td>
<td>Drive failed</td>
</tr>
<tr>
<td>Blinks green slowly</td>
<td>Drive rebuilding</td>
</tr>
<tr>
<td>Steady green</td>
<td>Drive online</td>
</tr>
<tr>
<td>Blinks green three seconds, amber three seconds, and off six seconds</td>
<td>Rebuild aborted</td>
</tr>
</tbody>
</table>
Rear Panel Components

Figure 5 and Table 5 detail the rear panel view of the JobDirector.

![Figure 5. JobDirector Rear Panel](image)

Table 5. JobDirector Rear Panel Components

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial connector</td>
<td>This connector is unused in a ProXchange system.</td>
</tr>
<tr>
<td>Video connector</td>
<td>Use to connect a monitor to the system (for maintenance only).</td>
</tr>
<tr>
<td>USB connectors (2)</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>NIC0/Gb1/eth0 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>NIC1/Gb2/eth1 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>NIC2/Gb3/eth2 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>NIC3/Gb4/eth3 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>System status indicator</td>
<td>Blinks when the front or back system identification button is pressed.</td>
</tr>
<tr>
<td>System identification button</td>
<td>Both the SystemManager application and the identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the LCD display on the front of the device and the blue system status indicator on the back blink until one of the buttons is pressed again.</td>
</tr>
</tbody>
</table>
Rear Panel Status Indicators

The following sections describe the rear panel indicators and their conditions.

**System Status Indicator**

![System status indicator](image)

**Table 5. JobDirector Rear Panel Components (Continued)**

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply 1</td>
<td>Dual redundant power supplies provide power to the system.</td>
</tr>
<tr>
<td>Power supply 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Solid: Normal system operation&lt;br&gt;Blink: System is being identified (winked)</td>
</tr>
<tr>
<td>Amber</td>
<td>Solid: System needs attention.</td>
</tr>
</tbody>
</table>

**Power Supply Indicator**

![Power supply status indicator](image)

**Figure 6. JobDirector System Status Indicator**

**Figure 7. JobDirector Power Supply Indicator**
**Table 7. JobDirector Power Supply Indicator Pattern**

<table>
<thead>
<tr>
<th>Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not lit</td>
<td>AC power is not connected.</td>
</tr>
<tr>
<td>Green</td>
<td>In standby mode, indicates that a valid AC source is connected to the power supply, and that the power supply is operational. When the system is on, it also indicates that the power supply is providing DC power to the system.</td>
</tr>
<tr>
<td>Amber</td>
<td>Indicates a problem with the power supply.</td>
</tr>
<tr>
<td>Alternating Green and Amber</td>
<td>When hot-adding a power supply, this indicates that the power supply is mismatched with the other power supply (a high output power supply and a Energy Smart power supply are installed in the same system). To correct this, replace the power supply that has the flashing indicator with a power supply that matches the capacity of the other installed power supply.</td>
</tr>
</tbody>
</table>

**NIC Indicator Codes**

Each NIC on the rear panel has an indicator that provides information on network activity and link status. **Figure 8**, and **Table 8** describe the NIC indicators and the status of each.

**Figure 8. JobDirector NIC Indicators**

1. Link indicator 2. Activity indicator

**NOTE:** The indicator codes for NIC0/Gb1/eth0 and NIC1/Gb2/eth1 differ from NIC2/Gb3/eth2 and NIC3/Gb4/eth3.
## PXD2001A JobScaler

This section includes details on the PXD20001A JobScaler:

- **Front Panel Components**
- **Rear Panel Components**

For details on the legacy hardware platform, refer to [Appendix B, Legacy Hardware Platforms](#).

### Front Panel Components

*Figure 9* and *Table 9* detail the front panel view of a JobScaler with the bezel removed. Note that your JobScaler may differ somewhat from the one described below.

### Table 8. JobDirector NIC Indicator Codes

<table>
<thead>
<tr>
<th>NIC0/Gb1/eth0 and NIC1/Gb2/eth1 Indicators</th>
<th>NIC2/Gb3/eth2 and NIC3/Gb4/eth3 Indicators</th>
<th>Connection Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link and activity indicators are off</td>
<td>Link indicator is amber</td>
<td>NIC is not connected.</td>
</tr>
<tr>
<td>Link indicator is green</td>
<td>Link indicator is green or blinking green</td>
<td>NIC is connected to a valid link on the network.</td>
</tr>
<tr>
<td>Link indicator is amber</td>
<td>Link indicator is green or blinking green</td>
<td>NIC is connected to a valid network link at 10/100 Mbps</td>
</tr>
<tr>
<td>Activity indicator is amber blinking</td>
<td>Activity indicator is green blinking</td>
<td>Data is being sent or received over the network.</td>
</tr>
</tbody>
</table>

---

*Figure 9. JobScaler Front Panel*
Table 9. JobScaler Front Panel Components

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Power-on indicator/button</td>
<td>The power button controls the DC power supply output to the system. The power-on indicator lights when the system power is on. When the power-on indicator is off, this indicates that no power is supplied to the system.</td>
</tr>
<tr>
<td>2. Video Connector</td>
<td>Connects a monitor to the system.</td>
</tr>
<tr>
<td>3. LCD menu buttons</td>
<td>Allows you to navigate the control panel LCD menu.</td>
</tr>
<tr>
<td>4. LCD display</td>
<td>Provides status information and system error messages. The LCD display lights during normal system operation. Both the systems management software and the identification buttons located on the front and back of the system can cause the LCD to flash blue to identify a particular system. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives. <strong>Note</strong>: If the system is connected to AC power and an error has been detected, the LCD display lights amber regardless of whether the system has been powered on.</td>
</tr>
<tr>
<td>5. System identification button</td>
<td>Pressing this button will cause the Front LCD display and the system status indicator on the rear panel to blink.</td>
</tr>
<tr>
<td>6. USB connectors</td>
<td>Use to connect the front bezel.</td>
</tr>
<tr>
<td>7. Optical drive</td>
<td>Use for software installation.</td>
</tr>
<tr>
<td>8. Hard drive 0</td>
<td>Refer to Table 10 for a description of the indicator codes.</td>
</tr>
<tr>
<td>9. Hard drive 1</td>
<td></td>
</tr>
</tbody>
</table>
Front Panel Status Indicators

System Status Indicators

Figure 10 and Table 10 detail the six system status indicators on the front of the JobScaler.

Table 10. JobScaler Front Panel Indicator Descriptions

<table>
<thead>
<tr>
<th>LED</th>
<th>Color/State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIC0/Gb1/eth0 Link</td>
<td>White</td>
<td>Ethernet communications OK</td>
</tr>
<tr>
<td>NIC1/Gb2/eth1 Link</td>
<td>Red</td>
<td>Ethernet communications problem</td>
</tr>
<tr>
<td>NIC2/Gb3/eth2 Link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIC3/Gb4/eth3 Link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard drive 0</td>
<td>White</td>
<td>Drive status OK</td>
</tr>
<tr>
<td>Hard drive 1</td>
<td>Red</td>
<td>Drive error</td>
</tr>
</tbody>
</table>

Hard Drive Indicators

Refer to Figure 11 and Table 11 for a description of JobDirector hard drive indicators.
Figure 11. JobScaler Hard Drive Indicators

1. Drive-activity indicator (green)  
2. Drive-status indicator (green and amber)

Table 11. JobScaler Drive-status Indicator Pattern (RAID Only)

<table>
<thead>
<tr>
<th>Drive-status Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinks green two times per second</td>
<td>Identify drive/preparing for removal</td>
</tr>
<tr>
<td>Off</td>
<td>Drive ready for insertion or removal</td>
</tr>
<tr>
<td>Note: The drive-status indicator remains off until all hard drives are initialized after system power is applied. Drives are not ready for insertion or removal during this time.</td>
<td></td>
</tr>
<tr>
<td>Blinks green, amber, and off</td>
<td>Drive predicted failure</td>
</tr>
<tr>
<td>Blinks amber four times per second</td>
<td>Drive failed</td>
</tr>
<tr>
<td>Blinks green slowly</td>
<td>Drive rebuilding</td>
</tr>
<tr>
<td>Steady green</td>
<td>Drive online</td>
</tr>
<tr>
<td>Blinks green three seconds, amber three seconds, and off six seconds</td>
<td>Rebuild aborted</td>
</tr>
</tbody>
</table>
**Diagnostic Indicator Codes**

The four diagnostic indicator lights on the system front panel display error codes during system startup. This table lists the causes and possible corrective actions associated with these codes. A highlighted circle indicates the light is on; a non-highlighted circle indicates the light is off.

### Table 12. JobScaler Diagnostic Indicator Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Light 1] ![Light 2] ![Light 3] ![Light 4]</td>
<td>The system is in a normal off condition or a possible pre-BIOS failure has occurred. The diagnostic lights are not lit after the system successfully boots to the operating system.</td>
<td>Plug the system into a working electrical outlet and press the power button.</td>
</tr>
<tr>
<td>![Light 1] ![Light 2] ![Light 3] ![Light 4]</td>
<td>The system is in a normal operating condition after POST.</td>
<td>Information only.</td>
</tr>
</tbody>
</table>
Hard drive failure.  Ensure that the diskette drive and hard drive are properly connected.

Possible USB failure.  Refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/trouble.htm#wp1182140

No memory modules detected.  Refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/trouble.htm#wp1186501

System board failure.  Refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/get_help.htm#wp1181261

Memory configuration error.  Refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/trouble.htm#wp1186501

Possible system board resource and/or system board hardware failure.  Refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/get_help.htm#wp1181261

Possible system resource configuration error.

Other failure.  Ensure that the optical drive and hard drives are properly connected.  For the appropriate drive installed in your system, refer to:  
http://support.dell.com/support/edocs/systems/per410/en/HOM/HTML/trouble.htm#wp1186188
If the problem persists, contact Omneon Technical Support.
Rear Panel Components

Figure 12 and Table 13 describe the rear panel view of the JobScaler.

Table 13. Job Scaler Rear Panel Components

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Serial connector</td>
<td>Use to connect a serial device to the system</td>
</tr>
<tr>
<td>2. Video connector</td>
<td>Use to connect a monitor to the system (for maintenance only).</td>
</tr>
<tr>
<td>3. USB connectors (2)</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>4. NIC0/Gb1/eth0 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>5. NIC1/Gb2/eth1 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>6. NIC2/Gb3/eth2 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>7. NIC3/Gb4/eth3 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>8. System status indicator</td>
<td>Blinks when the front or back system identification button is pressed.</td>
</tr>
<tr>
<td>9. System identification button</td>
<td>Both the SystemManager application and the identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the LCD display on the front of the device and the blue system status indicator on the back blink until one of the buttons is pressed again.</td>
</tr>
</tbody>
</table>
Figure 13 and Table 14 describe the typical redundant power supply indicator and its functions.

Table 13. Job Scaler Rear Panel Components (Continued)

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Power supply 1</td>
<td>Dual redundant power supplies provide power to the system.</td>
</tr>
<tr>
<td>11. Power supply 2</td>
<td></td>
</tr>
</tbody>
</table>

**Power Supply Indicator**

Figure 13 and Table 14 describe the typical redundant power supply indicator and its functions.

Table 14. Job Scaler Power Supply Indicator Pattern

<table>
<thead>
<tr>
<th>Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not lit</td>
<td>AC power is not connected.</td>
</tr>
<tr>
<td>Green</td>
<td>In standby mode, indicates that a valid AC source is connected to the power supply, and that the power supply is operational. When the system is on, it also indicates that the power supply is providing DC power to the system.</td>
</tr>
<tr>
<td>Amber</td>
<td>Indicates a problem with the power supply.</td>
</tr>
<tr>
<td>Alternating Green and Amber</td>
<td>When hot-adding a power supply, this indicates that the power supply is mismatched with the other power supply (a high output power supply and a Energy Smart power supply are installed in the same system). To correct this, replace the power supply that has the flashing indicator with a power supply that matches the capacity of the other installed power supply.</td>
</tr>
</tbody>
</table>
**NIC Indicator Codes**

Each NIC on the rear panel has an indicator that provides information on network activity and link status. **Figure 14** and **Table 15** describe the NIC indicators and the status of each.

![NIC Indicator Diagram](image)

**Figure 14.** JobScaler NIC Indicators

1. Link indicator  
2. Activity indicator

**NOTE:** The indicator codes for NIC0/Gb1/eth0 and NIC1/Gb2/eth1 differ from NIC2/Gb3/eth2 and NIC3/Gb4/eth3.

**Table 15.** JobScaler NIC Indicator Codes

<table>
<thead>
<tr>
<th>NIC0/Gb1/eth0 and NIC1/Gb2/eth1 Indicators</th>
<th>NIC2/Gb3/eth2 and NIC3/Gb4/eth3 Indicators</th>
<th>Connection Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link and activity indicators are off</td>
<td>Link indicator is green</td>
<td>NIC is not connected.</td>
</tr>
<tr>
<td>Link indicator is green</td>
<td>Link indicator is amber</td>
<td>NIC is connected to a valid link on the network.</td>
</tr>
<tr>
<td>Link indicator is amber</td>
<td>Link indicator is green or blinking green</td>
<td>NIC is connected to a valid network link at 10/100 Mbps</td>
</tr>
<tr>
<td>Activity indicator is amber blinking</td>
<td>Activity indicator is green blinking</td>
<td>Data is being sent or received over the network.</td>
</tr>
</tbody>
</table>
CHAPTER 3
ProXchange System Installation

Installation of the ProXchange system consists of connecting the JobDirector—and JobScaler (optional)—to the client network, or directly to a switch in the Omneon MediaGrid system. The client network must have good gigabit Ethernet connectivity to Omneon MediaGrid for optimal performance.

This section provides step-by-step installation instructions, which are covered in the following topics:

- Mounting the ProXchange Devices
- Connecting the ProXchange Devices
- Creating Fixed IP Addresses for ProXchange
- Installing ProXchange Manager
- Upgrading ProXchange
- ProXchange Licensing
- About SystemManager for ProXchange
- Reinstalling the Operating System and System Software

About Licenses for ProXchange Use

Note that the following licenses are required to use ProXchange. These licenses must be present or installed prior to using the ProXchange system:

- **ProXchange License**: The ProXchange license, which corresponds to the initial ProXchange order, is pre-installed on the ProXchange JobDirector and JobScaler prior to shipment.

- **Grid Processing License (Omneon MediaGrid)**: This license, which is required to operate grid applications on Omneon MediaGrid, is installed with new Omneon MediaGrid systems. If this ProXchange system will be working with an existing Omneon MediaGrid system, this license must be requested from Omneon and then installed on the Omneon MediaGrid system. See the Omneon SystemManager User’s Guide for more information about, and installing, this license.

- **Cluster Keys (Omneon MediaGrid)**: These security keys are installed on an Omneon MediaGrid system to initialize an Omneon MediaGrid ContentDirector with its cluster ID. The keys are installed during Omneon MediaGrid installation. See the Omneon MediaGrid Installation and Configuration Guide for more information about the cluster keys.
Mounting the ProXchange Devices

Mount the ProXchange JobDirector and JobScaler (optional) in cable range of the client network or Omneon MediaGrid system. (See the rack mounting instructions provided with the JobDirector or JobScaler for complete mounting instructions.)

**NOTE:** A Rack Mounting Kit is provided with each ProXchange device, which includes the necessary hardware along with detailed mounting instructions.

Connecting the ProXchange Devices

The ProXchange devices can be connected to a client network or directly to the Omneon MediaGrid system. However, connecting the ProXchange devices to the client network is the preferred method because ProXchange is considered a client of the Omneon MediaGrid system; Omneon MediaGrid clients are typically connected outside of the Omneon MediaGrid internal network. Connecting ProXchange to the internal Omneon MediaGrid network does not improve performance nor provide any increased efficiency.

Refer to one of the following options to connect the ProXchange devices:

- Refer to **Option A: Connecting ProXchange to a Client Network** if you are connecting the ProXchange devices to a client network.
- Refer to **Option B: Connecting ProXchange to Omneon MediaGrid** if you are connecting the ProXchange devices to Omneon MediaGrid.

**IMPORTANT:** All ProXchange devices must be connected in the same manner, either to a client network or to an Omneon MediaGrid system—you cannot connect one device to a client network and another directly to Omneon MediaGrid.

About Bandwidth from ProXchange to Omneon MediaGrid

The aggregate bandwidth of all connected Gigabit Ethernet (GigE) ports of all ProXchange JobDirectors and JobScalers must be maintained through the switch fabric all the way to Omneon MediaGrid. For example, one JobDirector and two JobScalers with both ports connected require 6 Gbps bandwidth to Omneon MediaGrid.
Option A: Connecting ProXchange to a Client Network

This section provides instructions for connecting the ProXchange devices to a client network, which is the recommended way to install the ProXchange system. Refer to Option B: Connecting ProXchange to Omneon MediaGrid if you are connecting the devices directly to an Omneon MediaGrid system.

**IMPORTANT:** The JobDirector and the JobScaler (if installed) must be connected to the same subnet. This includes all the Ethernet ports on both the JobDirector and JobScaler—all of the ports must be connected to the same subnet.

Connecting the JobDirector to the Client Network

This section provides instructions for connecting the JobDirector directly to the client network. Refer to Connecting the JobDirector to Omneon MediaGrid if this connection method is not possible.

The client network switch must have good Gigabit Ethernet connectivity to Omneon MediaGrid.

**IMPORTANT:** Omneon strongly recommends connecting the ProXchange systems to the same switch to which Omneon MediaGrid’s switches connect. If there are any network devices in between the ProXchange systems and the MediaGrid switches which can interrupt network traffic, the ProXchange system may not operate correctly.

Refer to Figure 15 when completing these instructions.
1. Connect an Ethernet cable to NIC1/Gb2/eth1 on the back of the JobDirector. Connect the other end of the cable to an available port on the client switch.

2. Connect an Ethernet cable to NIC0/Gb1/eth0 on the back of the JobDirector. Connect the other end of the cable to an available port on the client switch, within the same subnet as NIC1/Gb2/eth1.

3. Connect an Ethernet cable to NIC2/Gb3/eth2 on the back of the JobDirector. Connect the other end of the cable to an available port on the client switch.

4. Connect an Ethernet cable to NIC3/Gb4/eth3 on the back of the JobDirector. Connect the other end of the cable to an available port on the client switch.

**NOTE:** Omneon recommends that you connect all four Ethernet ports on both the JobDirector and the JobScaler for best performance. If you do not connect NIC2/Gb3/eth2 and NIC3/Gb4/eth3 on the JobDirector, the top left and right front panel LEDs will display white and the system will operate at lower performance. For a description of the front panel LEDs, refer to Table 3.
5. If not already connected, make sure that the Omneon MediaGrid network switches are connected to the client network using 10GbE connections. See the Omneon MediaGrid Installation and Configuration Guide for details.

6. The JobDirector has two power supplies. To take full advantage of its dual redundant power supplies, ensure that separate, isolated power sources are available. Connect the power cords to the JobDirector’s two power connectors.

**NOTE:** Do not power on the JobDirector at this point.

This completes the hardware installation of the JobDirector. Refer to the following sections to complete the ProXchange system installation:

- **Connecting the JobScaler to the Client Network**
  
  Follow these steps if you are installing an optional JobScaler.

- **Creating Fixed IP Addresses for ProXchange**
  
  Complete this section to create fixed IP addresses for the ProXchange devices.

### Connecting the JobScaler to the Client Network

This section provides instructions for connecting the JobScaler directly to the client network, which is the recommended way to install the ProXchange system. Refer to Connecting the JobScaler to Omneon MediaGrid if this connection method is not possible.

The client network switch must have good Gigabit Ethernet connectivity to Omneon MediaGrid. In this case, it is recommended that you connect the JobScaler to the same switch to which Omneon MediaGrid’s switches connect. Refer to Figure 16 when completing these instructions.
Figure 16. Connecting the JobScaler to the Client Network

1. Connect an Ethernet cable to NIC1/Gb2/eth1 on the back of the JobScaler. Connect the other end of the cable to an available port on the client switch.

2. Connect an Ethernet cable to NIC0/Gb1/eth0 on the back of the JobScaler. Connect the other end of the cable to an available port on the client switch, within the same subnet as NIC1/Gb2/eth1.

3. Connect an Ethernet cable to NIC2/Gb3/eth2 on the back of the JobScaler. Connect the other end of the cable to an available port on the client switch.

4. Connect an Ethernet cable to NIC3/Gb4/eth3 on the back of the JobScaler. Connect the other end of the cable to an available port on the client switch.

**NOTE:** Omneon recommends that you connect all four Ethernet ports on both the JobDirector and the JobScaler for best performance. If you do not connect NIC2/Gb3/eth2 and NIC3/Gb4/eth3 on the JobDirector, the top left and right front panel LEDs will display white and the system will operate at lower performance. For a description of the front panel LEDs, refer to Table 3.
5. If not already connected, make sure that the Omneon MediaGrid network switches are connected to
the client network using 10GbE connections. See the Omneon MediaGrid Installation and Configuration
Guide for details.

6. The JobScaler has two power supplies. To take full advantage of its dual redundant power supplies,
ensure that separate, isolated power sources are available. Connect the power cords to the JobScaler’s
two power connectors.

NOTE: Do not power on the JobScaler at this point.

This completes the hardware installation of the JobScaler. Refer to Creating Fixed IP Addresses for
ProXchange to create fixed IP addresses for the ProXchange devices.

Option B: Connecting ProXchange to Omneon MediaGrid

This section provides instructions for connecting the ProXchange devices directly to an Omneon
MediaGrid system. Follow the instructions in this section only if it is not possible to connect the
ProXchange devices to the client network, which is the preferred connection method.

Connecting the JobDirector to Omneon MediaGrid

This section provides instructions for connecting the JobDirector directly to the Omneon MediaGrid
network switches. Refer to Figure 17 when completing these instructions.

Figure 17. Connecting the JobDirector to Omneon MediaGrid
**NOTE:** If the Omneon MediaGrid switch is the all-1GbE 5406 Network Switch, connect the JobDirector to available ports on the top module of the switch. These ports are reserved for client connections. Refer to the Omneon MediaGrid Installation and Configuration Guide for more information.

1. Connect an Ethernet cable to NIC1/Gb2/eth1 on the back of the JobDirector. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

2. Connect an Ethernet cable to NIC0/Gb1/eth0 on the back of the JobDirector. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

3. Connect an Ethernet cable to NIC2/Gb3/eth2 on the back of the JobDirector. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

4. Connect an Ethernet cable to NIC3/Gb4/eth3 on the back of the JobDirector. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

**NOTE:** Omneon recommends that you connect all four Ethernet ports on both the JobDirector and the JobScaler for best performance. If you do not connect NIC2/Gb3/eth2 and NIC3/Gb4/eth3 on the JobDirector, the top left and right front panel LEDs will display white and the system will operate at lower performance. For a description of the front panel LEDs, refer to Table 3.

5. The JobDirector has two power supplies. To take full advantage of its dual redundant power supplies, ensure that separate, isolated power sources are available. Connect the power cords to the JobDirector's two power connectors.

**NOTE:** Do not power on the JobDirector at this point.

This completes the hardware installation of the JobDirector. Refer to the following sections to complete the ProXchange system installation:

- **Connecting the JobScaler to Omneon MediaGrid**
  Follow these steps if you are installing an optional JobScaler.

- **Creating Fixed IP Addresses for ProXchange**
  Complete this section to create fixed IP addresses for the ProXchange devices.
Connecting the JobScaler to Omneon MediaGrid

This section provides instructions for connecting the JobScaler directly to the Omneon MediaGrid network switches. Refer to Figure 18 when completing these instructions.

1. Connect an Ethernet cable to NIC1/Gb2/eth1 on the back of the JobScaler. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

2. Connect an Ethernet cable to NIC0/Gb1/eth0 on the back of the JobScaler. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

3. Connect an Ethernet cable to NIC2/Gb3/eth2 on the back of the JobScaler. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

4. Connect an Ethernet cable to NIC3/Gb4/eth3 on the back of the JobScaler. Connect the other end of the cable to an unused port on the Omneon MediaGrid network switch. Use port 38 and up.

**NOTE:** If the Omneon MediaGrid switch is the all-1GbE 5406 Network Switch, connect the JobScaler to available ports on the top module of the switch. These ports are reserved for client connections. Refer to the Omneon MediaGrid Installation and Configuration Guide for more information.
NOTE: Omneon recommends that you connect all four Ethernet ports on both the JobDirector and the JobScaler for best performance. If you do not connect NIC2/Gb3/eth2 and NIC3/Gb4/eth3 on the JobDirector, the top left and right front panel LEDs will display white and the system will operate at lower performance. For a description of the front panel LEDs, refer to Table 3.

5. The JobScaler has two power supplies. To take full advantage of its dual redundant power supplies, ensure that separate, isolated power sources are available. Connect the power cords to the JobScaler’s two power connectors.

6. Connect the power cord.

NOTE: Do not power on the JobScaler at this point.

This completes the hardware installation of the JobScaler. Refer to Creating Fixed IP Addresses for ProXchange to create fixed IP addresses for the ProXchange devices.

Creating Fixed IP Addresses for ProXchange

Fixed IP addresses must be created for the ProXchange devices to ensure that the JobDirector and JobScaler (if installed) always receive the same IP addresses.

This section describes how to create fixed IP addresses for the ProXchange devices. How you set up the IP addresses depends on how you connected the JobDirector and JobScaler:

• Refer to Assigning IP Addresses on a Client Network if you connected the devices to the client network.

• Refer to Assigning IP Addresses on an Omneon MediaGrid Network if you connected the devices to an Omneon MediaGrid switch.

Assigning IP Addresses on a Client Network

Client reservations need to be created for the JobDirector and JobScaler (if installed) on the DHCP server that services these clients. Creating reservations ensures that the JobDirector and JobScaler always receive the same IP address leases when started.

See the documentation for your DHCP server for instructions on creating reservations.

Use the following steps to set up the ProXchange system.

1. Ensure that a DHCP server is in place and appropriately configured with scope (Windows), gateway and DNS addresses (including reverse DNS entries), and an NTP server if you are using one. The DHCP server must be on the same subnet on which the JobDirector and JobScaler reside. Refer to Setting up Reverse DNS Lookups to add reverse DNS entries.

   If using vDHCP (installed on the SystemManager platform), ensure that version 0.11 or later, is installed and the vDHCP service started.

2. In the DHCP server, create an IP address reservation for both JobDirector ports, starting at xx.xx.xx.50
3. In the DHCP server, create an IP address reservation for both JobScaler ports (if installed) at xx.xx.xx.52

4. Make sure that the ProXchange devices are installed and the Ethernet cable connections are completed as described in the previous sections.

5. Apply power to the JobDirector and then allow a boot up time of at least two minutes.
   a. Check the JobDirector power on indicator lights.
   b. Check the ProXchange Servers page in the SystemManager application to ensure that there are no problems and the assigned IP address has been reserved. For more information on viewing ProXchange status using SystemManager, refer to the Omneon SystemManager User's Guide.

6. Apply power to the JobScaler (if installed), and then allow a boot up time of at least two minutes.
   a. Check the JobScaler power on indicator lights.
   b. Check the ProXchange Servers page in the SystemManager application to ensure that there are no problems and the assigned IP address has been reserved. For more information on viewing ProXchange status using SystemManager, refer to the Omneon SystemManager User's Guide.

Refer to PXD2000A JobDirector and PXD2001A JobScaler for the location and a description of the indicator lights.

Assigning IP Addresses on an Omneon MediaGrid Network

When connecting to an Omneon MediaGrid network, Omneon recommends that you assign static IP addresses for both the JobDirector and JobScaler (if installed). Each Ethernet port must be configured with an IP address. Follow the instructions in Assigning IP Addresses on ProXchange Network Interfaces.

Another method of assigning IP addresses is to reserve IP addresses on the DHCP server for each ContentDirector. For instructions, refer to Reserving IP Addresses on ContentDirector DHCP Servers.

Assigning IP Addresses on ProXchange Network Interfaces

A configuration file is created for each ProXchange Ethernet port during the ProXchange software installation. You must update these configuration files so that each IP address fits within your specific network. Follow these steps to assign each ProXchange server network interface with a static IP address.

1. Log on to the device using the following user name and password:
   
   User name: ovnuser
   Password: OVN@SvCaUsa

2. Open the following file on the ProXchange server: /etc/sysconfig/network.
3. Name the ProXchange server. For example,
   NETWORKING=yes
   HOSTNAME=xcodesvr_100_20 (Name of this ProXchange server)

4. Configure Ethernet port 0 (eth0) with a public IP addresses. Open the Ethernet port 0 configuration file /etc/sysconfig/network-scripts/ifcfg-eth0. Type the following:
   sudo vi /etc/sysconfig/network-scripts/ifcfg-eth0

5. Change the “BOOTPROTO” from “dhcp” to “static”.
   BOOTPROTO=static

6. Add a NETMASK entry to the file for the specified network. Most will be 255.255.255.0.
   NETMASK=<netmask>

7. Add an entry for the network’s GATEWAY.
   GATEWAY=<gateway ip>

8. Add an IPADDR entry to the file for the specified IP.
   IPADDR=<ip address>

   The following shows an example of a modified configuration file:
   DEVICE=eth0
   BOOTPROTO=static
   HWADDR=00:14:22:23:6B:1E
   IPADDR=10.5.100.20
   NETMASK=255.255.255.0
   ONBOOT=yes
   TYPE=Ethernet
   GATEWAY=10.5.100.1

9. Repeat steps 4-8 for /etc/sysconfig/network-scripts/ifcfg-eth1.

**IMPORTANT:** Do not change the HWADDR values when updating these files, as they are the actual MAC addresses of each Ethernet port. If this file is created from scratch or copied from another system, remove the line that begins with “HWADDR”. This line is created automatically by the system.
Hostname-to-IP Address Resolution

The resolv.conf file is installed on each ProXchange Server. The purpose of this file is to resolve names into addresses. The information that you enter is specific to the installation location.

1. Open the following file on each ProXchange server: /etc/resolv.conf
2. Add the following lines to this file:

   search <fully qualified domain name>
   nameserver <IP address of Primary DNS server>
   nameserver <IP address of Secondary DNS server>

The following shows an example of a resolv.conf file with the previous additions:

   search omneon.com
   nameserver 10.2.1.3
   nameserver 10.2.1.4

Reserving IP Addresses on ContentDirector DHCP Servers

This section is provided for reference only. If you have performed the steps in Assigning IP Addresses on ProXchange Network Interfaces, continue to the next section. To reserve IP addresses on ContentDirector DHCP servers, you will need the following:

- The JobDirector Ethernet port MAC addresses and the JobScaler Ethernet port MAC addresses (if installed). Refer to Acquiring the JobDirector and JobScaler MAC Address.
- The JobDirector host name and the JobScaler host name (if installed). Refer to Acquiring the Host Name.

1. Connect a monitor and keyboard to the primary Omneon MediaGrid ContentDirector. See the Omneon MediaGrid Installation and Configuration Guide if you cannot locate the primary ContentDirector.
2. Log on to the ContentDirector using the following user name and password:
   - User name: ovnuser
   - Password: OVN@SvCaUsa
3. Open the DHCP configuration file by typing the following:
   sudo vi /etc/dhcp.conf
4. Edit the DHCP configuration file to specify the MAC addresses, gateway IP addresses, and static IP addresses for both ports (eth0 and eth1) on your JobDirector and JobScaler. Use the following IP address range when assigning the addresses: xx.xx.xx.20-49.

   Use the following example as a reference. In this example:
   - hardware ethernet = MAC address of the ProXchange device
   - option routers = gateway IP address
   - fixed-addresss = static IP address for eth0/eth1 on the ProXchange device.
# ProXchange

host 130-20
{
    hardware ethernet 00:19:B9:DF:36:98;
    option routers 10.4.130.1;
    fixed-address 10.4.130.20;
}

host 130-21
{
    hardware ethernet 00:19:B9:DF:36:9A;
    option routers 10.4.130.1;
    fixed-address 10.4.130.21;
}

5. Once you have modified the DHCP configuration file, restart the DHCP service on your ContentDirector by running the following command:
sudo /sbin/service dhcpd restart

6. Perform steps 1-5 for the remaining ContentDirectors in your Omneon MediaGrid network.

**Verifying Your DNS Server Information**

When an Omneon MediaGrid is installed, the configuration assistant asks for information about the DNS server. Verify that the correct information about your DNS server appears on the DHCP configuration file for the ContentDirector.

1. Open the DHCP configuration file by typing the following:
sudo vi /etc/dhcp.conf

2. Verify the following values, which appear below the header information:
   - `option domain-name = “your domain name”`
   - `option domain-name-servers = IP address of Primary DNS server, IP address of Secondary DNS server`

   The following shows an example of DNS information in the dhcp.conf file:
   # - Version 2.2 $Date: 2008-06-09 12:40:25 -0700 (Mon, 09 Jun 2008) $ $Revision: 107935 $
ddns-update-style interim;
max-lease-time 2592000;
default-lease-time 2592000;  #4 weeks
option domain-name "tac.omneon.local"
option domain-name-servers 10.6.160.251, 10.6.160.252;
Acquiring the JobDirector and JobScaler MAC Address

Follow these steps to acquire the hardware address for port number GB 1 for either the JobDirector or JobScaler.

1. Connect a monitor and keyboard to the ProXchange device (JobDirector or JobScaler).
2. Log on to the device using the following user name and password:
   
   User name: ovnuser
   
   Password: OVN@SvCaUsa
3. Type the following at the command prompt:
   
   ifconfig eth0
   
   The output displays the hardware address, for example:
   
   ...
   
   HWaddr 00:19:B9:E5:BF:28
   
   ...
4. Repeat the above steps for Ethernet port 1 (eth1).

Acquiring the Host Name

The JobDirector and JobScaler host names are automatically generated and stored in the following location on each device: /etc/sysconfig/network

For example:

   cat /etc/sysconfig/network
   
   NETWORKING=yes
   
   HOSTNAME=xcodesvr81_99

Setting up Reverse DNS Lookups

Follow these steps to configure reverse DNS entries for ProXchange devices on a Microsoft Windows-based DNS server. For other types of DNS servers, consult the appropriate documentation or your Network Administrator to set up reverse DNS entries.

These instructions are an overview of setting up reverse DNS lookups. Refer to the appropriate Windows documentation for complete instructions.

NOTE: The following instructions apply only to a simple DNS/network configuration in which there is a single DNS server.

1. Log in to the console of your Microsoft Windows DNS computer. From the Manage Your Server window, click Manage this DNS server.
2. In the left panel of the DNS management window, click the Reverse Lookup Zones folder that is associated with the DNS server. There may already be reverse zones defined for the DNS server.
3. Right-click to select the **Reverse Lookup Zones** folder and then select **New Zone** from the menu. The New Zone Wizard displays.

4. Start the New Zone Wizard.

5. Select **Primary zone** as the Zone Type from the list of options.

6. On the Active Directory Zone Replication Scope screen, select the option **To all DNS servers in the Active Directory domain** [YOUR DOMAIN].

7. On the Reverse Lookup Zone Name screen, select the **Network ID** option and then enter the Omneon MediaGrid subnet.

8. On the Dynamic Update screen, select the option **Allow both nonsecure and secure dynamic updates**.

9. Finish the new Zone Wizard.

10. Display again the DNS management window and then expand the **Reverse Lookup Zones** folder to see the sub-entries. Verify that the newly created reverse zone is shown.

### Setting the ProXchange System Time Zone

A correct time zone setting is helpful when analyzing log files. Complete the following steps to set the ProXchange system time zone.

**NOTE:** Repeat these steps (connecting the monitor and keyboard to the JobScaler) if a JobScaler is part of the ProXchange system.

1. Connect a monitor and keyboard to the JobDirector.

2. Log on to the device using the following user name and password:
   
   User name: ovnuser
   
   Password: OVN@SvCaUsa

3. Check which time zone the ProXchange JobDirector is currently using by typing the following at the command prompt:
   
   `date`

   You will see something like the following, which in this case is the current time: “Mon June 16 10:45:27 PDT 2007.”

   Use the `tzselect` program to access the file that holds the best set of time zone information for your location. These time zone files are located in subdirectories of `/usr/share/zoneinfo`.

4. Type the following at the command prompt:
   
   `tzselect`

   You will see something like the following, which lists available locations.

   `ovnuser@xcodesvr75_99)# tzselect`
Please identify a location so that time zone rules can be set correctly.

Please select a continent or ocean.

1) Africa
2) Americas
3) Antarctica
4) Arctic Ocean
5) Asia
6) Atlantic Ocean
7) Australia
8) Europe
9) Indian Ocean
10) Pacific Ocean
11) none - I want to specify the time zone using the Posix TZ format.

5. Enter the number associated with your location. For example, type 5 if you are located in Asia.

6. Select the country in which you are located from the next screen. There may be additional choices to make depending on your location.

7. Answer the final question, “Is the above information OK?”, by entering a 1.

   A text string identifies the most suitable time zone file. Make this change permanent by appending the following line:
   
   TZ='Asia/Tokyo'; export TZ

   to the file “.bash_profile” in your (ovnuser) home directory.

8. Log out and then log in again.

   The name of the time zone file is formed by joining /usr/share/zoneinfo with the text on the last line of the tzselect program. In this example, the file name is /usr/share/zoneinfo/Asia/Tokyo.

---

**Installing the Time Zone Information**

1. If you want, back up the previous time zone configuration file by copying it to a different location. For example:

   sudo cp /etc/localtime /etc/localtime-old

2. Establish a link from the time zone file from the selected file to the location /etc/localtime. In the example the command would be:

   sudo ln -sf /usr/share/zoneinfo/Asia/Tokyo /etc/localtime

   You will see the following reply if the link is valid:

   /etc/localtime
3. Restart the ProXchange JobDirector after changing the time zone by typing the `sudo reboot` command. This updates the hardware clock and restarts the various services with the correct time zone in their log files.

**Configuring the ProXchange JobDirector Time and Date**

**NOTE:** ProXchange automatically synchronizes with the NTP Server if it is already set up, in which case the following steps may not be necessary.

The following instructions are for manual configuration of the time and date.

1. Stop the JobDirector services by clicking the **Services Stop** button on the SystemManager **ProXchange – Servers** page.

2. Stop the `ntpd` service by typing the following at the command prompt:
   ```
   sudo service ntpd stop
   ```

3. Manually set the ProXchange JobDirector system clock by using the `date` command in the following format:
   ```
   sudo date [-u|--utc|--universal] [MMDDhhmm[[CC][YY]][.ss]]
   ```
   For example, to set the date to June 16, 2007, 14:50:25 PM, type the following:
   ```
   sudo date 061614502007.25
   ```
   You will see the response as:
   ```
   Mon Jun 16 14:50:25 SGT 2007
   ```

4. Restart the JobDirector services by clicking the **Services Start** button on the SystemManager **ProXchange – Servers** page.

5. Restart the `ntpd` service by typing the following command:
   ```
   sudo service ntpd restart
   ```
   This completes configuration of the ProXchange devices. Refer to **Installing ProXchange Manager** to install the transcode management application.
**Installing ProXchange Manager**

Prior to installing ProXchange Manager, your PC must conform to the following minimum requirements and must be connected by Ethernet to your facility's LAN:

- 2.4 GHz Pentium 4 or equivalent CPU
- 512 megabytes (MB) of RAM
- 20 gigabyte (GB) hard drive
- At least 3 Megabytes of free disk space
- Windows XP only
- Display resolution should be set to 1024 x 768 minimum
- 100 BaseT (Gigabit Ethernet recommended)

**System Compatibility**

ProXchange 1.7 is compatible with Omneon Spectrum 5.5, 6.0, 6.1, 6.2, 6.3; Omneon MediaGrid 2.2.3, 2.3, 2.4, 2.5, 2.6, 3.0; SystemManager 5.13, 5.14 and 5.15. ProXchange 1.7 is built using the Omneon Media Layer 6.2. See the *ProXchange Release Notes* for the latest compatibility information.

**NOTE:** Systems running previous Spectrum versions must also be upgraded in order to play content transcoded by ProXchange 1.7.

**What Gets Installed**

The following items are included with the ProXchange Manager application:

- *Omneon ProXchange Release Notes*
- *Omneon ProXchange Installation and User's Guide* (this guide)
- Online Help files
Software Installation

Complete the installation procedures in the order below.

Downloading the Software

Before you begin, make sure that the PC on which the ProXchange Manager application will be installed is started. It is also highly recommended that you exit all Windows programs at this point.

To install ProXchange Manager on your PC:

1. If you have not already done so, open the ProXchangeManager.zip file that you downloaded from the Omneon support Web site: http://support.omneon.com/Updates/Omneon/Current/ProXchange
2. Extract the files using the password provided by Technical Support. Contact Technical Support if you need assistance.
3. Locate the ProXchange Manager executable file icon from the ProXchangeManager.zip folder.
4. Double-click the ProXchange Manager icon to begin the installation.
5. Choose a destination location and click Next.
6. Select a Program Folder and click **Next**.

When the installation has completed, the following window appears.

7. Click **OK**.

This completes the ProXchange Manager installation procedure. Refer to **ProXchange Manager** to begin using the application.
ProXchange Licensing

The licenses for your ProXchange system are pre-installed on the JobDirector and the JobScaler, corresponding to your initial ProXchange order. The license files are located in the same directory on both the JobDirector and JobScaler: /opt/omtrancode/license. The JobDirectors come with 12 ContentServer licenses, which exist in a simple file on the JobDirector.

If you are upgrading your existing JobScalers from version 1.2 or earlier, you must obtain a license file for those units from Omneon Technical Support. Follow the instructions in Updating the ProXchange License File on the JobScaler.

IMPORTANT: In addition to the ProXchange licenses, a Grid Processing License must be installed on the Omneon MediaGrid system to use ProXchange. This license should be installed with new Omneon MediaGrid systems. The file is installed from the D:\Licenses directory of the SystemManager platform that controls the Omneon MediaGrid. See the Omneon SystemManager User’s Guide for information on verifying the existence of this license.

Updating the ProXchange License File on the JobDirector

An updated license file is provided by Omneon when you upgrade your system or add a JobScaler to the system. The new file contains the licenses needed to operate the upgraded ProXchange system.

Install the updated license file on the JobDirector as described below. Contact Omneon Technical Support if you need assistance installing the updated license file.

NOTE: The JobDirector must be accessible from a computer or SystemManager platform to update the license file.

1. Using Windows Explorer®, access the JobDirector by typing the following in the address bar:
   \JobDirector IP address\license
   where JobDirector IP address is the IP address of the JobDirector.
2. Copy the new license file (“omtranscode.lic”) to the above directory using a drag and drop operation.
3. Restart the JobDirector services by clicking the Services Start button on the SystemManager ProXchange – Servers page.

Updating the ProXchange License File on the JobScaler

An updated license file is provided by Omneon when you upgrade your system or add a JobScaler to the system. The new file contains the licenses needed to operate the upgraded ProXchange system.

Install the updated license file on the JobScaler as described below. Contact Omneon Technical Support if you need assistance installing the updated license file.

NOTE: The JobScaler must be accessible from a computer or SystemManager platform to update the license file.
1. Using Windows Explorer®, access the JobScaler by typing the following in the address bar:
   \JobScaler IP address\license
   where JobScaler IP address is the IP address of the JobScaler.
2. Copy the new license file (“omtranscode.lic”) to the above directory using a drag and drop operation.
3. Restart the JobScaler services by clicking the Services Start button on the SystemManager ProXchange – Servers page.

### Upgrading ProXchange

For information about upgrading your ProXchange system, refer to “Upgrading ProXchange System Firmware” in the Omneon SystemManager User’s Guide.

### About SystemManager for ProXchange

The ProXchange system requires the latest SystemManager release to be installed on your Omneon MediaGrid’s SystemManager platform. See the Omneon SystemManager Installation Guide for instructions on upgrading SystemManager to the latest version.

See the Omneon SystemManager User’s Guide for ProXchange configuration and management procedures using the SystemManager application.

### Reinstalling the Operating System and System Software

**WARNING:** The ProXchange JobDirector and JobScaler ship with the operating system and system software pre-installed. Reinstalling the software removes the licenses required to perform transcode operations. Only perform the procedures in this section if directed by Omneon Technical Support.

The same DVD and CD are used to install the software on both the JobDirector and the JobScaler. Follow the procedures below to complete the software installation.

### ProXchange JobDirector Software Installation

**To back up the ProXchange License File:**

1. Locate the JobDirector IP address.
2. Using Windows Explorer from a desktop PC, access the JobDirector by typing the following in the address bar:
   \<<JobDirector IP address>>\license
3. Copy the license file (“omtranscode.lic”) from the Explorer window to the PC.
To install the operating system:

1. Attach a monitor, keyboard, and mouse to the rear panel of the ProXchange JobDirector.
2. If the JobDirector is not already powered down, hold down the power button on the front panel for approximately 10 seconds to shut it down.
3. Press the power button to boot the server and immediately insert the ProXchange JobDirector/JobScaler Operating System DVD into the DVD-ROM drive.
4. Wait for the warning screen to display. Type “director” at the boot: prompt to begin the automated operating system installation. This process takes approximately 15 minutes.

   The JobDirector automatically ejects the DVD and then reboots after the installation is complete.

To install the system software:

1. After the JobDirector has rebooted, the Fedora Login window displays.

   ![Figure 19. Fedora Log In](image)

   Log in with user name “ovnuser” and password “OVN@SvCaUsa”. For example:

   Fedora Core release 7 (Moonshine)
   Kernel 2.6.21-1.3194.fc7 on an x86_64
   login: ovnuser
   Password: OVN@SvCaUsa
   [ovnuser@xcodesvr]#

   2. Enter the following at the Linux command prompt to open the DVD tray:
      [ovnuser@xcodesvr]# sudo eject

   3. Insert the ProXchange CD into the DVD-ROM drive.

   4. Mount the DVD-ROM drive by entering the following at the command prompt:
      [ovnuser@xcodesvr]# sudo mount /dev/cdrom /mnt/cdrom
NOTE: The resulting expected message "mount: block device /dev/cdrom is write-protected, mounting read-only," message should be displayed.

If a "no medium found," message is generated, run the following command:

```
[ovnuser@xcodesvr]# sudo mount /dev/cdrom-hda /mnt/cdrom
```

5. Change to the `cdrom` directory by entering the following at the command prompt:

```
[ovnuser@xcodesvr]# cd /mnt/cdrom
```

6. Execute the installation script by entering the following at the command prompt:

```
[ovnuser@xcodesvr]# sudo ./install.sh
```

This process requires several minutes to complete.

7. Copy the Omneon-provided license file to the “license” share on the ProXchange JobDirector by typing the following in the address bar of Internet Explorer on the SystemManager platform:

```
\JobDirector IP address\license
```

`JobDirector IP address` is the IP address of the JobDirector.

8. Move the Omneon-provided license file to the window using a drag-and-drop operation.

9. Reboot the ProXchange JobDirector to complete the installation by typing the following at the command prompt:

```
[ovnuser@xcodesvr]# sudo reboot
```

ProXchange JobScaler Software Installation

To install the operating system:

1. Attach a monitor and keyboard to the ProXchange JobScaler.

2. If the JobScaler is not already powered down, hold down the power button on the front panel for approximately 10 seconds to shut it down.

3. Press the power button to boot the JobScaler and immediately insert the ProXchange JobDirector/JobScaler Operating System DVD into the DVD-ROM drive.

4. Wait for the warning message to display. Type “`scaler`” at the `boot:` prompt to begin the automated operating system installation. This process takes approximately 15 minutes.

5. The JobScaler automatically ejects the DVD and reboots after the installation is complete.

To install the system software:

1. After the JobScaler has rebooted, log in with username “`ovnuser`” and password “`OVN@SvCaUsa`” using the attached keyboard and monitor. For example:

```
Fedora Core release 7 (Moonshine)
Kernel 2.6.21-1.1394.fc7 on an x86_64
login: ovnuser
Password: OVN@SvCaUsa
```
2. Type the following at the Linux command prompt to open the DVD tray:
   [ovnuser@xcodesvr -]# sudo eject

3. Insert the ProXchange CD into the DVD-ROM drive.

4. Mount the DVD-ROM drive by typing the following at the command prompt:
   [ovnuser@xcodesvr]# sudo mount /dev/cdrom /mnt/cdrom

   **NOTE:** The resulting expected message "mount: block device /dev/cdrom is write-protected, mounting read-only," message should be displayed.

   If a "no medium found," message is generated, run the following command:
   [ovnuser@xcodesvr]# mount /dev/cdrom-hda /mnt/cdrom

5. Change to the `cdrom` directory by typing the following at the command prompt:
   [ovnuser@xcodesvr]# cd /mnt/cdrom

6. Execute the installation script by typing the following at the command prompt:
   [ovnuser@xcodesvr]# sudo ./install.sh

   This process requires several minutes to complete.

7. Reboot the ProXchange JobScaler to complete the installation by typing the following at the command prompt:
   [ovnuser@xcodesvr]# sudo reboot

   This process requires several minutes to complete.
CHAPTER 4
ProXchange Manager

This section covers the operation of the Omneon ProXchange Manager application. Refer to the Introduction for an overview of the ProXchange Manager features. Choose from the following topics:

- **User Interface and Menu Overview**
  An introduction to the ProXchange Manager application main window, its components and a description of each menu and its options.

- **Starting ProXchange Manager**
  Instructions on starting the ProXchange Manager application.

- **Using ProXchange Manager**
  Detailed instructions on using ProXchange Manager, including:
  - Setting up MediaGrid Resources
  - Creating a Transcode Preset
  - Assigning Directories for Transcoding
  - Troubleshooting

**User Interface and Menu Overview**

This section describes the ProXchange Manager main window, and provides an overview of each menu and its commands. The following topics are covered:

- **Main Window**
- **Menu Bar**
- **File Menu**
- **Setup Menu**
- **View Menu**
- **Help Menu**
Main Window

The ProXchange Manager main window provides a central control panel for creating transcode presets and applying them to Omneon MediaGrid directories. Figure 20 shows a sample main window.

Figure 20. ProXchange Main Window

NOTE: A green-colored folder identifies a directory that is being watched by the ProXchange API. See the ProXchange API Reference Guide for details.

Menu Bar

The Menu Bar provides access to the File Menu, Setup Menu, View Menu and Help Menu, which are used to operate the ProXchange Manager application. Refer to each menu for complete details.

Directories Pane

The Directories pane displays the Omneon MediaGrid mounted by ProXchange Manager and its directories and subdirectories, from which you select source and destination directories.

Refer to Assigning Directories for Transcoding for instructions on selecting the source and destination directories to be used for transcoding.
Directories Pane Options

The following options are available for file systems and directories, depending on which is selected.

**With a file system selected:**

Right-click an Omneon MediaGrid file system to display the following menu items, which are specific to the selected Omneon MediaGrid:

- **Create Subdirectory:** Create a new subdirectory on the Omneon MediaGrid.
- **Properties:** Display the properties of the Omneon MediaGrid system that ProXchange Manager uses for transcoding jobs. Refer to [Connecting to an Omneon MediaGrid](#) for more information.
- **Delete:** Remove a mounted Omneon MediaGrid from the Directories pane.

**With a directory selected:**

Right-click a directory to display the following menu items:

- **Create Subdirectory:** Create a subdirectory within the selected directory.
- **Rename Subdirectory:** Rename the selected subdirectory.
- **Delete Subdirectory:** Delete the selected subdirectory.

Tasks Pane

The Tasks pane contains the transcode presets that are assigned to a specific source and destination directory. Refer to [Assigning Directories for Transcoding](#).

Presets Pane

The Presets pane contains the automated transcode rules (presets) that you can apply to directories stored on Omneon MediaGrid. Refer to [Creating a Transcode Preset](#).

File Menu

The **File** menu includes the following:

- **Refresh:** Refresh all of the database information.
- **Exit:** Close the ProXchange Manager application.
Setup Menu

The Setup menu includes the following:

- **Database IP**: Display and change the current IP address of the ProXchange JobDirector system to which ProXchange Manager is connected, and the default port number through which the ProXchange Manager connects to the database.

  You are prompted to enter the ProXchange JobDirector IP address the first time you start ProXchange Manager, as shown in the following figure. The last IP address is remembered the next time ProXchange Manager is started.

- **Grid Resources**: Choose the number of ContentServers from the Omneon MediaGrid system to use for transcode jobs. Refer to Setting up MediaGrid Resources for more information.

- **Omneon MediaGrid**: Enter the Omneon MediaGrid-specific information when first connecting. Refer to Connecting to an Omneon MediaGrid for more information.

- **Database Preset Backup**: Create a backup file (in .xml or .txt formats) of all presets, tasks and source and destination directories that are currently set up.

- **Database Preset Restore**: Reload the preset, task, source and destination directory information that was saved using the Database Preset Backup option.

View Menu

The View menu includes the following:

- **ProXchange Status**: Click this option to open a Web browser showing the results of transcoded jobs as well as posted and in-progress jobs. Refer to Viewing ProXchange Transcode Status and Results for more information.

- **Status Bar**: Display/remove the status bar.

- The Toolbar menu option is currently unavailable.
Help Menu

The Help menu includes the following:

- **ProXchange Manager Help**: Opens the ProXchange Manager help system.
- **About ProXchange Manager**: Displays the version, date and copyright information for ProXchange Manager.

Starting ProXchange Manager

This section provides instructions on starting the ProXchange Manager application.

A ProXchange Manager icon is placed on your desktop during installation of the program. Use the following steps to start ProXchange Manager.

1. Double-click the **ProXchange Manager** icon.

   ![ProXchange Manager Icon](image)

   The following dialog box displays.

   ![Figure 21. ProXchange JobDirector Address](image)

   **Figure 21. ProXchange JobDirector Address**

2. Enter the **IP Address** of the ProXchange JobDirector.

**NOTE**: Do not change the default port number of 65020 without specific guidance from Omneon Technical Support.

The ProXchange Manager main window appears. Refer to **Using ProXchange Manager**.
Using ProXchange Manager

Use the ProXchange Manager application to set up the automated transcode rules (presets) for the content stored on your Omneon MediaGrid. In addition to automating the transcode process, the manager provides several different output resolutions and formats from which to choose.

ProXchange can transcode clips with a wide range of DV and MPEG-2 video formats, including both SD and HD, as well as generate low-bit rate distribution formats such as H.264. Refer to Media Types for more information.

Refer to the following sections for details about using ProXchange Manager:

- Connecting to the ProXchange JobDirector
- Setting up MediaGrid Resources
- Creating a Transcode Preset
- Assigning Directories for Transcoding

Connecting to the ProXchange JobDirector

The first time you launch ProXchange Manager, you are prompted to enter the IP address of the ProXchange JobDirector, as shown in the following figure:

![ProXchange JobDirector Address](image)

**Figure 22. ProXchange JobDirector Address**

Enter the **IP Address** of the ProXchange JobDirector.

**NOTE:** Do not change the default port number of 65020 without guidance from Omneon Technical Support.
The ProXchange Manager main window appears.

![Figure 23. ProXchange Manager Main Window](image)

**Connecting to an Omneon MediaGrid**

ProXchange Manager requires the DNS name or IP address, the file system name and the login information of the Omneon MediaGrid system that contains the source and destination directories that will be used for transcoding. Contact your Network Administrator if you do not know this information.

1. Select **Omneon MediaGrid** from the **Setup** menu. The **Configure Omneon MediaGrid** dialog box displays.

![Figure 24. Configure Omneon MediaGrid](image)

Enter the information as follows:

- **ProXchange Alias Name**: Enter a name to identify the Omneon MediaGrid system. You may want to create a name more recognizable than the Omneon MediaGrid’s actual name. This alias appears as the name of the Omneon MediaGrid in ProXchange Manager’s Directories pane.
• **File System Name:** Enter the name of the Omneon MediaGrid file system that contains the source clips.

The file system name is shown on the SystemManager Cluster Properties page in the Volumes section. (Click the Omneon MediaGrid Servers & Switches icon on the Configuration tab. In the Clusters section, click the Name hyperlink for the Cluster with the required Volume. Scroll to the Volume section.)

• **DNS Name or IP address of Omneon MediaGrid:** Enter the DNS name of this Omneon MediaGrid as it appears in the site’s domain name server, or the IP address of the primary or secondary ContentDirector.

It is recommended that you use the DNS name for better performance.

• **User Name:** Enter the user name used to mount the Omneon MediaGrid.

• **Password:** Enter the password used to mount the Omneon MediaGrid.

• **Domain:** Enter the name of the domain to which this Omneon MediaGrid belongs.

### Setting up MediaGrid Resources

ProXchange uses the available processing capability of the ContentServers in a Omneon MediaGrid system to transcode clips. You choose the number of ContentServers to use for your transcoding jobs up to the number of licensed ContentServers. Transcode jobs are split across the available ContentServers.

1. Make sure that ProXchange Manager is connected to an Omneon MediaGrid system before beginning. Refer to **Connecting to an Omneon MediaGrid**.

2. Select **Grid Resources** from the Setup menu. The Omneon MediaGrid Resources dialog box displays.

![Omneon MediaGrid Resources dialog box](image)

**Figure 25. MediaGrid Resources**

3. Select the number of **Transcode Resources** (ContentServers) to use for transcoding. You can either scroll to the desired number or enter the number directly.

4. Select **Use all available** to set the number of Transcode Resources to the total number of licensed or available ContentServers (whichever is less) on the Omneon MediaGrid system.

5. Click **OK** to apply your settings.
Creating a Transcode Preset

A transcode preset is a set of rules that define the video output, audio output, wrapper format, as well as aspect ratio conversion options for the clips that are transcoded. ProXchange Manager provides several different video output resolutions and formats from which to choose.

**NOTE:** Preset options vary according to the wrapper, video format, and output resolution that you choose.

1. Right-click within the Presets pane.
2. Select **New** from the menu.

The **New Transcode Preset** dialog box displays. You can also display this dialog box by selecting the Preset panel and then pressing the **Insert** key. The following sections provide information about each of the tabs in the **New Transcode Preset** dialog box.

**General Info Tab**

![General Info Tab](image)

The **General Info** tab is shown in **Figure 26**. Complete the settings as follows:

- **Preset Name**: Enter the name of the preset.
- **Description**: Enter a description of the preset.
- **Output format string**: This field allows you to define the output format, including the source name, video format, and bit rate. Use \#s for source name, \#f for video format, and \#r for bit rate.
• **Append Timestamp**: When selected, a suffix will be added to the root file name of the transcode job.

• **When file names conflict**: This section allows to select the action that will be taken if another file with the same name already exists. Select one of the following radio buttons:
  
  • **Skip**: When selected, the transcode job will be aborted if there is already a file with the same name in the output location.
  
  • **Overwrite**: When selected, the existing clip with the same name will be overwritten

• **Source Characteristics: Source Contains Open LGOP**: Select this option if you are transcoding MPEG Long GOP material, which has been edited and exported from Apple Final Cut Pro.

• **Output Options**:
  
  • **Re-Wrap Only**: Select this option to transform the wrapper without transcoding video or audio essence.
  
  • **Generate Thumbnails**: Select this option to generate thumbnails as part of the transcode job. Click **Include Underburn** to include underburn information in the thumbnail output and specify the **Interval (seconds)**. The minimum interval is 5 seconds while the maximum interval is 60 seconds.

  **NOTE**: Underburn information is the clip's timecode. By default this is the original timecode. If **Restrripe Option** is selected in the preset, then the underburn on the thumbnail shows the restriped value.

**Video Encoder Tab**

![Video Encoder Tab](image)

**Figure 27. Video Encoder Tab**
The Video Encoder tab is shown in Figure 27. Complete the settings as follows:

- **Wrapper**: Select the desired wrapper format for the transcoded clips.
- **Output Aspect Ratio**: Select the appropriate aspect ratio for the transcoded material. The options in this menu will vary according to the previous selection.
- **Video Format**: Choose the video format for the transcoded clips.
- **Video Resolution**: Select the desired video resolution for the transcoded clips. Depending on the previous selections, this field may not be active.
- **Mbits/sec (3 - 100) or kbits/sec (300 - 24,000)**: This field will vary based on selected wrapper and video format. Enter the desired megabits or kilobits per second. Note that the DV formats are forced to the proper bit rates and cannot be changed.
- **DVD Output** (For the MPEG2 PS Wrapper only): Check if the transcoded clips are intended for DVD output.
- **Bitrate Profile** (For QuickTime 7 Self wrapper with Apple ProRes 422 video only): Choose the bitrate profile for ProRes clips. The options are: Standard, Proxy, LT, or HQ.
- **Final Cut Pro Compliant** (For XDCAM HD 4:2:0 only): If you will be using Final Cut Pro to edit the output after transcoding, Omneon recommends that you select this option.

**Additional Options**:

- **Video GOP Size**: Enter the desired GOP size. The GOP length can range from 6 to 180, depending on the video format selected. If iPod Compatible is selected, this field will be disabled.
- **Multipass VBR/CBR**: Select for multi-pass variable bit rate (VBR) or constant bit rate (CBR) encoding. Note that either option takes longer than standard processing.
  
  The Multipass check box is selectable only for the following video formats: H.264, MPEG LGOP, 4:2:0, or MPEG LGOP 4:2:2. The Multipass check box is on and grayed out for XDCam HD 4:2:0 18 and 35 Mbits/sec, as this setting is always used for this video format and is not user configurable.
  
  The Multipass check box is off and grayed out for XDCam HD 4:2:0 25 Mbits/sec and all bit rates of XDCam HD 4:2:2, as this setting is always used for this video format and is not user configurable.
  
  The VBR/CBR drop-down list is only selectable if the video format is H.264 and the Multipass option is selected. CBR is the default value if nothing is selected.
- **Closed Caption**: Select to include closed captioning to the H.264 video stream, if the source clip has closed captioning.
- **Quality/Speed**: Select the performance vs. quality levels for MPEG2 video format destinations. There are three positions for Quality/Speed:
  - **Position #1**: Fastest performance with “Good” video quality.
  - **Position #2**: Average performance with “Better” video quality. This is the default position.
• **Position #3**: Slower performance with “Best” video quality.

If the source is DNxHD and you transcode to XDCAMHD, example values for each position would be:

• Position #1: Fastest performance with “Good” video quality. The transcode time is approximately 3.0x real time (3.0 times faster than real time). This performance and video quality are similar to how ProXchange 1.5.0.0 behaves.

• Position #2: Average performance with “Better” video quality. The transcode time is approximately 2.6x real time (2.6 times faster than real time). This performance and video quality are similar to how ProXchange 1.5.3.4 behaves.

• Position #3: Slowest performance with the “Best” video quality. The transcode time is approximately 1.1x real time (1.1 times slower than real time). This performance and video quality are similar to how ProXchange 1.6.0.0 behaves.

**NOTE:** Actual transcode performance times will vary according to the actual source and destination specified, number of content servers on the MediaGrid, and model of JobDirector/JobScaler used.

• **H.264 Options**. The following options apply to H.264 material.

  • iPod Compatible: Select to create iPod compatible clips.

  • Profile: Check to select one of the H.264 profiles from the profiles list. Available profiles include Baseline, Cif, Main, SVCD, D1, High, DVD, BD (Blu-Ray HD), BD HDMV (Blu-Ray HD), HDTV 720p, HDTV 1080i, AVCHD, 1 SEG, PSP 480x270, PSP 640x480, DivX, Flash Low-Res (320x240), or Flash High-Res (640x480)

  • Encode for Streaming: When generating MP4 wrapped H.264, select this option to generate the clip for streaming.

  • Override: Select Yes to enable changes to the values supplied (bitrate, resolution, GOP, or aspect ratio) for a profile. Note that choosing this option may result in a failed transcode with an error.
**TS Options Tab**

The **TS Options** tab, as shown in **Figure 28**, appears when a single program transport stream is selected. Transport streams are supported as both an input and output format. Only single program transport streams are allowed as an output. Complete the settings as follows:

- **TS Settings**
  - **Use Profile**: If selected, the PID Profile option is enabled. The PID Profile options are: *None*, ATSC, ATSC Hi, AVCHD, Blu-Ray, CableLabs, or DVB.
  - **Specify values**: If selected, the PID Profile option is hidden and additional user-configurable parameters are shown for a custom PID profile.
    - **Program Number**: Range is 1-32764.
    - **Program PID**: Range is 32-8190.
    - **PCR PID**: Range is 32-8190.
    - **Video Delay**: Range is 0-1000.
    - **PCR Interval**: Range is 0-255.
    - **PAT Interval**: Range is 0-255.
    - **Video PID**: Range is 32-8190.
    - **Audio Delay**: Range is 0-1000.
• **PMT Interval:** Range is 32-8190.

For all PIDs, including audio, the valid range is Range 32-8190, if an ATSC, ATSC-Hi, or DW8 profile is selected. If none of these profiles is selected, then a PID value of 1-31 is allowed.

Within each preset, the program, video and audio PIDs must be unique otherwise you will be unable to save the preset.

• **TS Bitrate (Mbits/sec):** Select the Transport Stream bit rate for the clip. The maximum is 150 Mbits/sec.

The bitrate selected needs to be greater than the combined bitrates of the video and audio (accounting for the number of tracks specified) plus an overhead of 5%. If it is not, the TS Bitrate line will highlight in red when you try to save the preset.

Specify the video bitrate on the Video Encoder tab and the audio bitrate on the Audio Encoder tab. The audio bitrate is the value specified on the tab * the number of output audio tracks specified.

\[ TS \text{ BitRate} = (V + A) \times 1.05 \]

• **MIP-4010 Compatible:** Check to generate a transport stream that can be played by an 4010 MediaPort. This will generate three files: 
  *data file which will be saved in the destination dir/media.dir, 
  *.ts file saved to the destination dir, and 
  *.mov file saved to the destination dir.

• **Output Audio Tracks:**
  
  • **Input Track #:** Shows the track specified for use from the source clip.
  
  • **Audio PID:** Shows the output track PID. Range is 32-8190.
  
  • **Language:** Shows the language tag selected.
  
  • **Add:** Click to add Input Audio Track parameters including the Source Clip Track Number, Output Track PID and Language Tag to apply, if any.
Figure 29. Edit Transcode Preset

- Click **Choose** to select the language tag to apply to the track.

- **Edit:** Click to edit **Input Audio Track** parameters including the **Source Clip Track Number**, **Output Track PID** and **Language Tag** to apply, if any.
**Video Conversion Tab**

![Video Conversion Tab Image](image)

**Figure 30. Video Conversion Tab**

The **Video Conversion** tab is shown in **Figure 30**. Complete the settings as follows:

- **Aspect Conversion**: The drop-down menu allows you to select the aspect ratio conversion method to be used when the aspect ratio of the source material does not match that of the output material. Note that the options will vary based on your selections in the Video Encoder tab.

- **Frame Rate Conversion**: Select from these options:
  - **29.97 => 23.98 (Inverse Telecine)**: Select this option to convert 29.97 FPS interlaced material, which was originally 24 FPS, back to 24 FPS. Note the following:
    - The **Inverse Telecine** check box is displayed all the time except with DV video format and QT wrapped clips.
    - If Apple ProRes is selected, **Inverse Telecine** is shown. Thus, if you select QT7 Self as a wrapper type, with **Aspect Ratio** 16:9 and the **Video Format** as ProRes, **Inverse Telecine** is available.
    - When **Inverse Telecine** is selected, ProXchange will perform this operation before any cropping or resizing of the source content.
    - **Inverse Telecine** does not support the propagation of metadata within the essence from the source to the output.
    - **Inverse Telecine** does not support 10 bit source material where the output is ProRes 10 bit. ProXchange will block attempts to transcode in this situation and will produce an error.
    - **Inverse Telecine** requires an input clip that has been telecined using the 3:2 pulldown.
• ProXchange will perform Inverse Telecine on clips which contain both regular and irregular cadence transitions. Irregular cadence transitions usually occur in clips that were edited after being telecined. Sometimes an edit is made in the middle of the 3:2 cadence, which causes an irregular transition to the next cadence. If ProXchange processes such a clip, any of the following defects may be present in the output clip:
  • A repeat frame may be inserted
  • An interlaced frame may be inserted
  • Irregular motion may be noticeable in high motion scenes
  • A/V Sync may be off for a short period of time

• **23.98 => 29.97 (Telecine):** Select this option to convert 23.98 FPS interlaced material to 29.97 FPS.

  **NOTE:** When generating H.264 or MPEG 2 clips with a custom GOP size, the GOP size must be a multiple of 5.

• **Progressive Output:** When selected, this option converts interlaced material to progressive material. This option is only available when ASF, MP4, or MPEG TS have been selected as the output wrapper type.

  **NOTE:** When converting from interlaced to progressive, the source must be deinterlaced prior to creating the progressive frame.

• **Source Cropping:** This option allows you to crop the source content. The cropping will occur before content is resized or aspect conversion is performed. Enter the pixels that you wish to crop.

• **Time Code Options:** The two check boxes in this section allow you to change the timecode in the output clip or display the timecode in an area of 32 lines at the bottom of the picture (also known as underburn) on mobile output formats.

• **Restripe option:** If selected, this option replaces the timecode in the video essence of the output clip as follows:
  • *If the source is an EDL,* ProXchange will either use the timecode specified in the .xml file, if the EDL file was saved with the EDL timecode offset box checked, or use the timecode of the first frame of the first clip if the timecode offset box was not checked.
  • *If the source is not an EDL and is not MXF Op1a,* ProXchange will use the timecode from the wrapper.
  • *If the source is MXF Op1a,* ProXchange will get the start timecode from the Material Package. If the Material Package does not have a time track with a start time, the system will use a default start time of 00:00:00:00.
• **Add underburn timecode display**: Select this option to add an underburn area which will contain the timecode. If the restripe option is selected, the output timecode will contain the new timecode values.

The restripe option is supported with any format. However, the underburn timecode option is only supported with Flash and Windows media formats and only for video resolutions that are equal to, or less than 1070x600.

The timecode options are not supported with Apple iPod-compatible output.

**Audio Encoder Tab**

![Figure 31. Audio Encoder Tab](image)

The **Audio Encoder** tab is shown in **Figure 31**. Complete the settings as follows:

• **Audio Encoding** *(For MP4 and MPEG TS wrappers only)*: Select the audio encoding to use for the transcoded clips. The options are: AAC-LC, AAC+, or MP3 for MP4 wrapper types and AAC MPEG-2 and MPEG1 Layer 2 for MPEG TS wrapper types.

• **Audio Bit Rate**: Select the audio bit rate to use for the transcoded clips. The options range from 32 to 192, depending on the audio encoding selected. The minimum selectable audio bit rate for Windows Media output is 48 kbps.

• **Resample Audio** *(For ASF and MP4 wrappers only)*: Check to resample audio before it is encoded to web formats. Select the resampling rate from 16 kHz, 22 kHz, 32 kHz, or 44.1 kHz. Refer to **About Audio Resampling** for supported rates according to encoder.
• **Multiple Output Clips** (For ASF and MP4 wrappers only): Check to specify multiple audio clip outputs. Specify the track numbers in the source to use for clip outputs. Refer to About Multiple Web Clip Output for additional information.

**NOTE:** Define audio tracks starting with the number 1. Specified tracks do not need to be sequential.

3. Once you have created the preset, click **Save** to save the preset.

### About Multiple Web Clip Output

Starting with release 1.6, ProXchange supports multiple audio clip outputs for mobile formats such as ASF and MP4. From the **Audio Encoder** tab in the ProXchange Manager, select the audio track(s) by track number. ProXchange then generates one output clip for each source audio track selected, using the same video as the selected audio track.

Note the following:

- Supported sources include a clip, transport stream, program stream, or EDL.
- Only the first stereo pair from each selected track is encoded; and no track splitting is performed. For example, if the source was recorded with one eight channel audio track, only the first stereo pair in that track would be selectable for inclusion in a web output format clip.
- Up to any eight audio tracks can be selected for a single transcode job
- Track numbers need to be separated by a comma only, not a comma followed by a space
- No trailing or leading commas are allowed

### About Audio Resampling

Starting with release 1.6, ProXchange supports the resampling of audio before it is encoded as, for example, low bit files for web distribution. ProXchange supports the following resampling:

- 16 kHz
- 22 kHz (22.050)
- 32 kHz
- 44 kHz (44.100)

<table>
<thead>
<tr>
<th>Audio Encoder is Set to WMA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Rate</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Bit Rate (kbps)</td>
</tr>
<tr>
<td>48</td>
</tr>
<tr>
<td>64</td>
</tr>
<tr>
<td>96</td>
</tr>
</tbody>
</table>
### Audio Encoder is Set to WMA

<table>
<thead>
<tr>
<th>Sample Rate</th>
<th>16 kHz</th>
<th>22 kHz</th>
<th>32 kHz</th>
<th>44 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>128</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>160</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>192</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Audio Encoder is Set to AAC-LC or MP3

<table>
<thead>
<tr>
<th>Sample Rate</th>
<th>16 kHz</th>
<th>22 kHz</th>
<th>32 kHz</th>
<th>44 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit Rate (kbps)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>48</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>64</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>96</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>128</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>160</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>192</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Audio Encoder is Set to AAC+ and Source has 1 Channel of Audio

<table>
<thead>
<tr>
<th>Sample Rate</th>
<th>16 kHz</th>
<th>22 kHz</th>
<th>32 kHz</th>
<th>44 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit Rate (kbps)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>48</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>64</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>96</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### Audio Encoder is Set to AAC+ and Source has 2 Channels of Audio

<table>
<thead>
<tr>
<th>Sample Rate</th>
<th>16 kHz</th>
<th>22 kHz</th>
<th>32 kHz</th>
<th>44 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit Rate (kbps)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>48</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>64</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>96</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
NOTE: When the output clip is set to use AAC+ and the preset configuration is not valid for the Source clip, the transcode will not succeed and the Job Status will display a message such as "Max Bitrate for AAC single channel (sample rate 32000) is 56000". This means the source clip has only one channel of audio and the preset specified a Sample Rate of 32 kHz and a Bit Rate higher than 56 kbps.

Editing a Preset

1. Double-click or right-click a preset and then select Edit from the menu. The Edit Transcode Preset dialog box appears.

   The various tabs and fields of the Edit Transcode Preset dialog box are described in Creating a Transcode Preset.

2. Make your changes to the preset and then click Save to replace the preset or Save As to create a new Transcode Preset.

Renaming a Preset

1. Right-click a preset and then select Rename from the menu.

2. Enter a new name for the preset and then click OK.

Deleting a Preset

1. Right-click a preset and then select Delete from the menu.

2. Click OK to confirm the deletion. The preset is also deleted from the Tasks pane (if it exists there).

NOTE: You can also select a preset and then press the DELETE key.
Assigning Directories for Transcoding

Assigning the directory for transcoding is a two-part process: you first select the source directory and then the destination directory. The destination directory must be different from the source directory and both directories must reside on the same Omneon MediaGrid. Refer to Directories Pane Options if you would like to create a new subdirectory before beginning.

1. Make sure you have a transcode preset created before beginning. Refer to Creating a Transcode Preset.

2. Select the Omneon MediaGrid source directory in the Directories pane. The source directory is the directory containing the clips that you want to transcode. You may need to expand folders to select the directory.

3. Drag the transcode preset to the source directory in the Directories pane. You can also right-click the preset and then select Apply from the menu.

The following dialog box displays, on which you select the destination directory (where the clips should reside after they have been transcoded).

4. Expand the directories on the right and then select a directory that is different from the source directory. Once selected, the directory displays within the Destination Directory.
5. Set the **Priority** to High (optional) to move the task to the top of the transcode queue. High priority tasks are placed at the top of the job queue and start before Normal priority tasks. However, jobs that are currently in progress are completed and not interrupted even if a high-priority job appears in the queue.

6. Set the **Source Type** you want:

   - **Panasonic P2 Clips**: Select to transcode Panasonic P2 wrapped clips in the task’s source directory. See Appendix C, “Panasonic P2 Clips” for more information.

     P2 media has a unique directory structure that is different from any other media type in that it is a combination of media files and xml. ProXchange combines the mono tracks associated with Panasonic P2 clips and creates a paired output for both transport streams and clips.

     **NOTE**: The following P2 clips can be spanned: AVC-Intra, DV, DVCPro, and DVCPro HD.

   - **Other Types**: Select other source types to transcode in the task’s source directory.

     - **Standard Clips**: Transcodes clips other than transport stream, program stream, or Panasonic P2 clips from the task’s source directory.

     - **EDL Files (*.xml)**: Transcodes EDL files in the task’s source directory.

     - **Transport Streams**: Check to specify the source as Transport Stream.

       - **Handle Growing Clips**: Check to allow transcoding to occur on growing transport stream clips.

       - **Input Program Numbers**: Enter number(s), separated by a comma to define the program numbers to transcode in the transport stream. A maximum of two numbers can be entered.

     - **Program Streams**: Check to transcode program stream wrapper MPEG2 PS.

       When transcoding 720p source clips and EDL files, the clip must have an even number of frames or an error message will appear and the clip will not be transcoded. To verify the number of frames in the clip, check the underburn timecode.

       To specify EDL flattening, the following restrictions apply:

       - Only EDL files generated by EDLTool are supported

       - All of the clips contained in any single EDL must have the same number of audio tracks, same number of audio channels per file, have the same audio bit rate (16, 24, or 32) and be the same audio type (either .wav or .aiff).

       - All of the clips contained in any single EDL must be of the same resolution (all 480i, all 1080i, or all 720p), and frame rate.

       - The clips must all be located on the same Omneon MediaGrid server.

7. (Optional) Click **JobScaler Processed** to run the entire job using the PX JobScaler.

   **NOTE**: Only the PX2001A JobScaler supports this feature.

8. Click **OK** to apply the task.
Refer to **Viewing ProXchange Transcode Status and Results** to see the status of transcode jobs that have completed, as well as those that are posted and in progress.

**Additional Task Options**

Additional options are available once you have created a task. Right-click a task in the Tasks pane to select options from the following menu.

<table>
<thead>
<tr>
<th><strong>Change Destination</strong></th>
<th><strong>Delete Task</strong></th>
<th><strong>Run Task Now</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Priority</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Normal Priority</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Change Destination**: Change the destination directory.
- **Delete Task**: Remove the task from the Tasks pane. Pending jobs that refer to the deleted task are cancelled. You can also select a task and then press the DELETE key.

Jobs cannot be deleted while transcoding is in progress. Follow these steps if you want to rerun a transcode job with different preset settings:

a. Delete the task from the Tasks pane.
b. Make the appropriate change to the preset.
c. Reassign the task to the appropriate directory.
d. Right-click the task in the Tasks pane and then select **Run Task Now**.

- **Run Task Now**: Transcode all clips in the source directory that match the criteria for this task. The new output overwrites previous output only if the transcode preset specifies that overwriting is allowed. Note that it may take several minutes for the task to begin if there are a large number of directories on the system.

Refer to **Viewing ProXchange Transcode Status and Results** to open a Web browser showing the results of transcoded jobs as well as posted and in progress jobs.

**Priority Scheme**

ProXchange supports a two-level transcode job priority scheme. When a task is created, it can be a **Normal** or **High** priority task. Jobs associated with high priority tasks are performed before any normal priority jobs. New high priority transcode jobs will not interrupt an ongoing normal priority transcode, but will execute immediately upon completion of that job, regardless of how many normal priority jobs are already queued up.

- **High Priority**: Change the priority to High.
- **Normal Priority**: Change the priority to Normal.
Viewing ProXchange Transcode Status and Results

The status and results of ProXchange jobs are viewable in a Web browser. The following information is available on a per clip basis:

- the source clip name
- the job description, entered using ProXchange Manager
- the state of the transcode process, including Complete, Posted, and In progress
- the clip’s transcode progress
- when the clip was posted; when the transcode job started
- when the transcode process completed
- status information

Viewing Job Results

1. Do one of the following:
   - Select ProXchange Status from the ProXchange Manager View menu.
   - Type the following information in a Web browser address bar:
     http://<IP address of JobDirector>:65020/jobstats

   You should see a Web page similar to the example below.

Figure 34. ProXchange Job Status Page
Click any clip in the **Source Clip Name** column to view more detailed information about the clip. Details are shown in the page’s lower panel. By default, jobs are listed by starting time, with the newest shown first. Columns can be sorted in ascending or descending order by clicking the column heading.

Adjust the information displayed by choosing the different options from the menus at the top of the page, including:

- **View**: Select from All Jobs, Completed Jobs, Failed Jobs, Posted Jobs, Active Jobs, Jobs in Progress, Errors.
- **Posted/Started**: View jobs posted or started from any time to within the last hour.
- **Page Size**: Choose to list from 10 to 500 jobs per page.
- **Page**: Enter the page you want to display and then press ENTER, or click prev/next to cycle through pages.
- **Refresh**: Select to Manually refresh the page, or set the refresh time to Every 15 Seconds or Every Minute.
- **Refresh Now**: Press to refresh the page, keeping the current information display selections. If instead you use the browser's refresh button, the display is reset to show all jobs in the last hour.

---

**NOTE:** Starting with release 1.6, the progress of transcodes is reported as “**job size unknown**” when the “**State**” is “**Posted**” or “**Accepted**”. Some transcodes, such as those for Transport Streams and Program streams, report “**job size unknown**” even after the “**State**” changes to “In Progress”.

---

### Aborting a Transcode Job

1. From the **Source Clip Name** column, click the name of the clip you wish to abort. The **Abort selected job** button appears in the bottom left-hand corner of the browser window, as shown in **Figure 35**.

**NOTE:** This button only appears if the transcode state is **Posted**, **Accepted**, **In Progress**, **Active**, **Error**, **will retry**, or **Stalled**. If the job status is **Stalled**, or **Error**, clicking the abort button will abort the retry of the stalled job.

2. Click **Abort selected job** to abort the selected transcode job.

---

**Figure 35. Abort Button**
Troubleshooting

This section provides information on the following topics:

- **Troubleshooting Using the ProXchange Manager**
- **About Transcode to Transport Stream Failures**
- **About Output File Names**

**Troubleshooting Using the ProXchange Manager**

1. Verify if Grid Framework is running with the expected number of licenses.

2. Check the ProXchange Job Status page for general health information:
   - Check the ProXchange Service Status (All services should be running).
   - Restart the ProXchange services, if needed.
   - Check again for normal operation.

3. If a clip fails to transcode, look at the Jobs Table for an error indication. Do the following:
   a. Verify that the source clip is valid (4.6SR2 Spectrum or FCP).
   b. Verify that the Omneon MediaGrid is healthy by checking the Omneon MediaGrid logs.
   c. Review the various logs to determine the cause of the problem.

4. Review the ProXchange system logs from the SystemManager.
   a. From the Configuration tab in SystemManager, click the ProXchange icon in the left-hand column to open the ProXchange Servers page.
   b. Click the Logs hyperlink for the JobDirector or JobScaler you want to view. The View ProXchange JobDirector/JobScaler Logs page appears.
5. View the logs on the ProXchange JobDirector, as follows:

<table>
<thead>
<tr>
<th>Service/Component</th>
<th>Log Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>OmTranscode Service</td>
<td>/var/log/omtranscode/omtranscode.log</td>
</tr>
<tr>
<td>MediaLayer</td>
<td>/var/log/omtranscode/medialayer.log</td>
</tr>
<tr>
<td>OmGrid Service</td>
<td>/var/log/omtranscode/omgrid.log</td>
</tr>
<tr>
<td>Watchdog</td>
<td>/var/log/ombrowse/omb_watchdog.log</td>
</tr>
<tr>
<td>DB Server</td>
<td>/var/log/ombrowse/omb_dbsvr.log</td>
</tr>
<tr>
<td>ProXchange Synchronizer</td>
<td>/var/log/ombrowse/bst/omb_bst.log</td>
</tr>
</tbody>
</table>

6. If Engineering support is needed, do the following:
   a. Capture the logs.
   b. Provide the short source and output clips with a format description.
   c. Provide the device and release that generated or consumed the short source and output clips.
   d. Provide remote access information.
**About Transcode to Transport Stream Failures**

Transcodes to transport streams can fail and give the error “Aborting job due to corrupt source clip”. One reason this happens is because the source clip is Open GOP instead of Closed GOP. To prevent or resolve this issue, in the Transcode Preset dialog, from the General Info tab, check the Source contains Open GOP option. Omneon recommends that you always check this option if the source clip has Open GOP.

Note that ProXchange automatically treats the source clip as if it is Open GOP in the following instances:

- When the source is EDL and it contains LGOP clips or a mix of IFrame and LGOP clips.
- When the source is non-AVC_intra H.264.
- When the output requires De-interlacing.

If you have checked the Source contains Open GOP option and the clip still fails to transcode and gives a “corrupt source clip” error, then the clip may contain bad frames, or there is another issue which is causing the clip to be unreadable by ProXchange.

**About Output File Names**

ProXchange limits the length of a clip name to 59 characters. This limitation, which includes the file extension, leaves room for extra characters which are automatically added to audio media file names.

If the limitation is exceeded, you may experience problems with the file when using the Omneon TransferTool, or Apple’s Final Cut Pro 6 with Mac OS X 10.4.9.

**Tip:** Downloading and installing Mac OS X 10.4.10 Update, or later will resolve the problem when using Final Cut Pro.

ProXchange creates the output file name by creating a base name using the template as defined in the preset. If a timestamp needs to be appended, ProXchange checks to see if the long form of the timestamp can be used without exceeding the limit. If the long form exceeds the limit, ProXchange uses the short form of timestamp.

**NOTE:** If the total length of the file name exceeds 59 characters, ProXchange truncates the end of the base name.

**For 1 to N outputs:**

The maximum # of characters is less than 59 to accommodate adding a suffix to the base name.

The suffix is “_x_y”, where x is the program number and y is the audio track number.

- For clips, “x” will be 0.
- For Transport Streams, “x” will match the selected program number defined in the task.
- “y” matches the Multiple Output Clips value defined in the Audio Encoder tab of the preset.
APPENDIX A

Media Types

This section shows supported video input, output and wrapper formats. Formats not shown are not supported by ProXchange.

- **Video Input and Output Formats**
  
  This section shows supported video input and output formats, as well as which input formats are supported for each output format.

- **Audio Input and Output Formats**
  
  This section shows supported audio input and output formats, as well as which input formats are supported for each output format. Audio embedded in DV is not supported.

- **Wrapper Formats**
  
  This section shows supported wrapper formats.

- **ProXchange Ancillary Data Support**

**Video Input and Output Formats**

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG-2</td>
<td>SD, I-frame, 25-50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td></td>
<td>SD, long GOP (length 15), 3-14.9 Mbps</td>
<td>4:2:0</td>
</tr>
<tr>
<td></td>
<td>SD, long GOP (length 15), 3 to 24.9, 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td></td>
<td>HD, I-frame, 50-100 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td></td>
<td>HD, Long GOP (length 15), 18 to 100 Mbps/720p, 1080i</td>
<td>4:2:0, 4:2:2</td>
</tr>
<tr>
<td>DV</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO 50</td>
<td>SD 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DVCPRO HD</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>IMX</td>
<td>SD 30, 40, 50 Mbps</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>
### Table 16. Input Video Essence Formats Generated by Omneon Spectrum (Continued)

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>XDCAM-HD</td>
<td>HD 18/25/35 Mbps (1080i)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>AVC-Intra 50</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>AVC-Intra 100</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

### Table 17. Input Video Essence Formats Generated by Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td>SD 25 Mbps</td>
<td>4:1:1 (@29.97Hz) or 4:2:0 (@25Hz)</td>
</tr>
<tr>
<td>DVCPRO</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO 50</td>
<td>SD 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DVCPRO HD</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 18/25/35 Mbps (1080i)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>Apple ProRes 422</td>
<td>Refer to <a href="#">Apple ProRes 422 Support</a></td>
<td>4:2:2</td>
</tr>
<tr>
<td>IMX</td>
<td>SD 30, 40, 50 Mbps</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

### Table 18. Input Video Essence Formats Stored on Panasonic P2 Cards

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVCPRO</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO 50</td>
<td>SD 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DVCPRO HD</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>AVC-Intra 50</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>AVC-Intra 100</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

### Table 19. Input Video Essence Formats Generated by Avid Transfer Manager

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNxHD 145</td>
<td>145Mbps, 8 bit (1920x1080i 59.94), OP1a Wrapped.</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DNxHD 120</td>
<td>120Mbps, 8 bit (1920x1080i 50), OP1a Wrapped.</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>
Table 20. Input Video Essence Formats Generated by EVS

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNxHD 145</td>
<td>145Mbps, 8 bit (1080i/29.97), OP1a Wrapped.</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

Table 21. Output Video Essence Formats Played by Omneon Spectrum

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG-2</td>
<td>SD, I-frame, 25-50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td></td>
<td>SD, Long GOP (length 6-15), 3 to 14.9 Mbps</td>
<td>4:2:0</td>
</tr>
<tr>
<td></td>
<td>SD, Long GOP (length 6-15), 3 to 24.9, 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DV</td>
<td>SD 25 Mbps</td>
<td>4:1:1 (@29.97Hz) or 4:2:0 (@25Hz)</td>
</tr>
<tr>
<td>DVCPRO</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO50</td>
<td>SD 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DVCPRO HD</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>IMX</td>
<td>30, 40, 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 18, 25, 35 Mbps (1080i)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>AVC-Intra 50</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>AVC-Intra 100</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

Table 22. Output Video Essence Formats Played by Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td>SD 25 Mbps</td>
<td>4:1:1 (@29.97Hz) or 4:2:0 (@25Hz)</td>
</tr>
<tr>
<td>DVCPRO</td>
<td>SD 25 Mbps</td>
<td>4:1:1</td>
</tr>
<tr>
<td>DVCPRO 50</td>
<td>SD 50 Mbps</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DVCPRO HD</td>
<td>HD 100 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 18, 25, 35 Mbps (1080i)</td>
<td>4:2:0</td>
</tr>
<tr>
<td>XDCAM-HD</td>
<td>HD 50 Mbps (1080i/720p)</td>
<td>4:2:2</td>
</tr>
<tr>
<td>Apple ProRes 422</td>
<td>Refer to Apple ProRes 422 Support.</td>
<td>4:2:2</td>
</tr>
<tr>
<td>IMX</td>
<td>SD 30, 40, 50 Mbps</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>
Table 23. Output Video Formats Consumed by Avid Transfer Manager

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNxHD 145</td>
<td>145 Mbps, 8 bit (1920x1080i 29.97), OP1a Wrapped.</td>
<td>4:2:2</td>
</tr>
<tr>
<td>DNxHD 120</td>
<td>120 Mbps, 8 bit (1920x1080i 29.97), OP1a Wrapped.</td>
<td>4:2:2</td>
</tr>
</tbody>
</table>

Table 24. Output Formats Played by VLC Media Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
<th>Video Resolution</th>
<th>Audio Bit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.264 video / MP3 audio, 4x3 aspect</td>
<td>300-24,000 kbps</td>
<td>4:2:0</td>
<td>160x120 - 1920x1440</td>
<td>32-192 kbps</td>
</tr>
<tr>
<td>H.264 video / MP3 audio, 16x9 aspect</td>
<td>300-24,000 kbps</td>
<td>4:2:0</td>
<td>160x92 - 1920x1080</td>
<td>32-192 kbps</td>
</tr>
</tbody>
</table>

Table 25. Output Video Essence Formats Played by Adobe Flash 9 Player and Newer

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.264 Main 3.1, 4x3</td>
<td>300-24,000 kbps</td>
<td>4:2:0</td>
<td>160x120 - 1920x1440</td>
</tr>
<tr>
<td>H.264 Main 3.1, 16x9</td>
<td>300-24,000 kbps</td>
<td>4:2:0</td>
<td>160x92 - 1920x1080</td>
</tr>
</tbody>
</table>

Table 26. Output Video Essence Formats Played by Windows Media Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC-1 Advanced L1, 4x3</td>
<td>300-24,000 kbps</td>
<td>Not specified</td>
<td>160x120 - 1920x1440</td>
</tr>
<tr>
<td>VC-1 Advanced L1, 16x9</td>
<td>300-24,000 kbps</td>
<td>Not specified</td>
<td>160x92 - 1920x1080</td>
</tr>
</tbody>
</table>

Table 27. Output Video Essence Formats Played by Apple iPod

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Chroma</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.264 Baseline-LC L1.3</td>
<td>300-1500 kbps</td>
<td>4:2:0</td>
<td>320x240</td>
</tr>
<tr>
<td>H.264 Baseline-LC L1.3</td>
<td>300-1500 kbps</td>
<td>4:2:0</td>
<td>384x216</td>
</tr>
<tr>
<td>H.264 Baseline L3.0 (iPod Touch only)</td>
<td>300-1500 kbps</td>
<td>4:2:0</td>
<td>640x480</td>
</tr>
<tr>
<td>H.264 Baseline L3.0 (iPod Touch only)</td>
<td>300-1500 kbps</td>
<td>4:2:0</td>
<td>640x360</td>
</tr>
</tbody>
</table>
# Audio Input and Output Formats

## Table 28. Input audio essence formats generated by Omneon Spectrum and Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIFF</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>AIFF</td>
<td>24 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>24 bit, 48 kHz</td>
</tr>
</tbody>
</table>

## Table 29. Input audio essence formats generated by Avid Transfer Manager

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAV</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>24 bit, 48 kHz</td>
</tr>
</tbody>
</table>

## Table 30. Input Audio Essence Formats wrapped in Program or Transport Streams

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG-1 Layer 2</td>
<td>48 kHz. If the sample rate is 32kbps or greater, mono audio can only be encoded at 96kbps and greater, and stereo audio can only be encoded at 128kbps and above. If the sample rate is below 32kbps, then stereo audio must be encoded at 96kbps and greater.</td>
</tr>
</tbody>
</table>

## Table 31. Output Audio Essence Formats Played by Omneon Spectrum and Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIFF</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>AIFF</td>
<td>24 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>24 bit, 48 kHz</td>
</tr>
</tbody>
</table>

## Table 32. Output Audio Essence Formats Consumed by Avid Transfer Manager

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAV</td>
<td>16 bit, 48 kHz</td>
</tr>
<tr>
<td>WAV</td>
<td>24 bit, 48 kHz</td>
</tr>
</tbody>
</table>
### Table 33. Output Audio Essence Formats Played by VLC Media Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3</td>
<td>First two channels of selected audio track only; 32-192 kbps. Requires resampling to be enabled for rates below 48 kbps.</td>
</tr>
</tbody>
</table>

### Table 34. Output Audio Essence Formats Played by Adobe Flash 9 Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC-HE</td>
<td>First two channels of selected audio track only; 32-192 kbps. Rates below 48 kbps require resampling to be enabled.</td>
</tr>
</tbody>
</table>

### Table 35. Output Audio Essence Formats Played by Apple iPod

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC-LC</td>
<td>First two channels of selected audio track only; 128 kbps</td>
</tr>
</tbody>
</table>

### Table 36. Output Audio Essence Formats Played by Windows Media Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMA</td>
<td>First two channels of selected audio track only; 48-192 kbps. Rates lower than 48 kbps require resampling to be enabled.</td>
</tr>
</tbody>
</table>

### Table 37. Output Audio Essence Formats Wrapped in Program or Transport Streams

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG- 1 Layer 2</td>
<td>First two channels of first audio track only for Program Streams, or selected tracks for Transport Streams; 64-192 kbps.</td>
</tr>
<tr>
<td>AAC (LC or HE)</td>
<td>First two channels of first audio track only for Program Streams, or selected tracks for Transport Streams; 48-192 kbps.</td>
</tr>
</tbody>
</table>
## Wrapper Formats

### Table 38. Input Wrapper Formats Generated by Omneon Spectrum 6.1

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickTime 7</td>
<td>Reference or self-contained</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, IMX, XDCAM-HD, DV, DVCPRO, DVCPRO 50, DVCPRO HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>MXF OP1b (External Omneon Spectrum 6.1-compatible)</td>
<td>Reference</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, IMX, XDCAM-HD, DV, DVCPRO, DVCPRO 50, DVCPRO HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>MXF OP1a</td>
<td>Self-contained</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, IMX, XDCAM HD, DV, DVCPRO, DVCPRO50, DVCPROHD, AVC-Intra 50, AVC-Intra 100</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>MXF OP1a eVTR</td>
<td>Self-contained</td>
<td>IMX</td>
<td>32 bit, AES3, 8 channels</td>
</tr>
</tbody>
</table>

### Table 39. Input Wrapper Formats Generated by Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickTime 7</td>
<td>Reference</td>
<td>DV, DVCPRO, DVCPRO 50, DVCPRO HD, IMX, XDCAM-HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>QuickTime 7</td>
<td>Self-contained</td>
<td>DV, DVCPRO, DVCPRO 50, DVCPRO HD, IMX, XDCAM-HD, Apple ProRes 422</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
</tbody>
</table>

### Table 40. Input Wrapper Formats Store on Panasonic P2 Cards

<table>
<thead>
<tr>
<th>Formats</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panasonic OP Atom</td>
<td>Reference</td>
<td>DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100</td>
<td>Multi-channel essence or a single channel of audio</td>
</tr>
</tbody>
</table>
Table 41. Other Input Wrapper Formats

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVI</td>
<td>Self-contained</td>
<td>DV, DVCPRO, DVCPRO 50, DVCPRO HD</td>
<td>16/24 bit, 48kHz AIFF, WAV</td>
</tr>
</tbody>
</table>

Table 42. Input Wrapper Formats Generated by EVS

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXF OP1a</td>
<td>Self-contained</td>
<td>DNxHD 145</td>
<td></td>
</tr>
</tbody>
</table>

Table 43. Input Wrapper Formats Generated by Avid Transfer Manager

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXF OP1a</td>
<td>Self-contained</td>
<td>DNxHD 120, DNxHD 145</td>
<td>24 bit, 48kHz WAV</td>
</tr>
</tbody>
</table>

Table 44. Program and Transport Stream Input

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Input Video Types</th>
<th>Input Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Stream</td>
<td></td>
<td>MPEG-2</td>
<td>MPEG-1 Layer 2</td>
</tr>
<tr>
<td>Transport Stream</td>
<td>Qualified with Harmonic Electra ® only. Max. 2 programs.</td>
<td>MPEG-2, H.264</td>
<td>MPEG-1 Layer 2, AAC. Only AC-3 pass through from Transport Stream to Spectrum format is supported.</td>
</tr>
</tbody>
</table>

Table 45. Output Wrapper Formats Played by Omneon Spectrum

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Video Types</th>
<th>Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickTime 7</td>
<td>Reference</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, DV, DVCPRO, DVCPRO 50, DVCPRO HD, IMX, XDCAM-HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>QuickTime 7</td>
<td>Self-contained</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, DV, DVCPRO, DVCPRO 50, DVCPRO HD, IMX, XDCAM-HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
</tbody>
</table>
### Table 45. Output Wrapper Formats Played by Omneon Spectrum

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Video Types</th>
<th>Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXF OP1b (External Omneon Spectrum 6.1 compatible)</td>
<td>Reference</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, DV, DVCPro, DVCPro 50, DVCPro HD, IMX, XDCAM-HD</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>MXF OP1a</td>
<td>Self-contained</td>
<td>MPEG-2 I-frame, MPEG-2 Long GOP, DV, DVCPro, DVCPro 50, DVCPro HD, IMX, XDCAM-HD, AVC-Intra 50, AVC-Intra 100</td>
<td>16/24 bit, 48 kHz AIFF, WAV</td>
</tr>
<tr>
<td>MXF OP1a eVTR</td>
<td>Self-contained</td>
<td>IMX</td>
<td>32 bit, AES3, 8 channels</td>
</tr>
</tbody>
</table>

### Table 46. Output Wrapper Formats Played by Apple Final Cut Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Video Types</th>
<th>Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickTime 7</td>
<td>Reference</td>
<td>DV, DVCPro, DVCPro 50, DVCPro HD, IMX, XDCAM-HD</td>
<td>16/24 bit, 48kHz AIFF, WAV</td>
</tr>
<tr>
<td>QuickTime 7</td>
<td>Self-contained</td>
<td>DV, DVCPro, DVCPro 50, DVCPro HD, IMX, XDCAM-HD, Apple ProRes 422</td>
<td>16/24 bit, 48kHz AIFF, WAV</td>
</tr>
</tbody>
</table>

### Table 47. Output Wrapper Formats Played by Windows Media Player

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Video Types</th>
<th>Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMV</td>
<td>Self-contained</td>
<td>VC-1</td>
<td>WMA</td>
</tr>
</tbody>
</table>

### Table 48. Output wrapper formats played by Apple iPod

<table>
<thead>
<tr>
<th>Format</th>
<th>Details</th>
<th>Video Types</th>
<th>Audio Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP4</td>
<td>Self-contained</td>
<td>H.264 Baseline-LC 1.1.3, H.264 Baseline L3.0 (iPod Touch only)</td>
<td>AAC-LC</td>
</tr>
</tbody>
</table>
NOTE: When transcoding 720p HD content to the Apple formats, the content is created at H.264 level 3.1. Level 3.1 is the minimum level that supports frame rates greater than 30 frames per second. None of the current Apple mobile products support this H.264 level. The Apple iPod supports H.264 up to and including level 1.3; The Apple iPod Touch supports H.264 content up to and including 3.0.

<table>
<thead>
<tr>
<th>Table 49. Output Wrapper Formats Played by Adobe Flash Player</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Format</strong></td>
</tr>
<tr>
<td>MP4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 50. Output wrapper formats consumed by Avid Transfer Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Format</strong></td>
</tr>
<tr>
<td>MXF OP1a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 51. Program and Transport Stream Output</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Format</strong></td>
</tr>
<tr>
<td>Program Stream</td>
</tr>
<tr>
<td>Transport Stream</td>
</tr>
</tbody>
</table>

**ProXchange Ancillary Data Support**

The ProXchange system has support for Ancillary Data in the digital domain. The ancillary data is mapped from the source format to the target format on a frame by frame basis. Some formats have provisions for ancillary data that other formats do not support. Wherever possible, the ancillary data from the source format will be transported to the target format. If the target format does not support ancillary data from the source the additional data will not be stored in an external file.
Table 52 and Table 53 define the source and destination ancillary data that are supported in ProXchange.

**Table 52. Input Ancillary Data**

<table>
<thead>
<tr>
<th>Input Ancillary data Type</th>
<th>Details</th>
<th>Input Video Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw user_data buffer</td>
<td>ATSC A/53</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Captioning Data (CEA-708B format)</td>
<td>ATSC A/53</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Additional EIA 608 Data</td>
<td>SCTE 21</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Time code 1</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>Time code 2</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>Ancillary data</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>VANC Data</td>
<td>Omneon Private User Data</td>
<td>MPEG</td>
</tr>
<tr>
<td>Timecode</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>CC Field 1</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>CC Field 2</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>VANC</td>
<td>SMPTE 291</td>
<td>DVCPRO HD</td>
</tr>
</tbody>
</table>

**Table 53. Output Ancillary Data**

<table>
<thead>
<tr>
<th>Output Ancillary Data Type</th>
<th>Details</th>
<th>Output Video Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw user_data buffer</td>
<td>ATSC A/53</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Captioning Data (CEA-708B format)</td>
<td>ATSC A/53</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Additional EIA 608 Data</td>
<td>SCTE 21</td>
<td>MPEG-2</td>
</tr>
<tr>
<td>Time code 1</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>Time code 2</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>Ancillary data</td>
<td>SMPTE 328M</td>
<td>MPEG</td>
</tr>
<tr>
<td>VANC Data</td>
<td>Omneon VBI</td>
<td>MPEG</td>
</tr>
<tr>
<td>Timecode</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>CC Field 1</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>CC Field 2</td>
<td>IEC 61834-4 1998(E)</td>
<td>DV/DVCPRO</td>
</tr>
<tr>
<td>VANC</td>
<td>SMPTE 291</td>
<td>DVCPRO HD</td>
</tr>
</tbody>
</table>
Apple ProRes 422 Support

This release of ProXchange supports Apple ProRes 422 as a Source and Destination format. ProXchange uses a codec from Apple that supports decoding and encoding of the resolutions in the following table.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Frame Rate</th>
<th>Apple ProRes 422 (Proxy)</th>
<th>Apple ProRes 422 (LT)</th>
<th>Apple ProRes 422 (HQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mbps</td>
<td>GBph</td>
<td>Mbps</td>
</tr>
<tr>
<td>960 x 720</td>
<td>24p</td>
<td>15</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>30p</td>
<td>32</td>
<td>14</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>60p</td>
<td>38</td>
<td>17</td>
<td>87</td>
</tr>
<tr>
<td>1280 x 720</td>
<td>24p</td>
<td>18</td>
<td>8</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>30p</td>
<td>38</td>
<td>17</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>60p</td>
<td>45</td>
<td>20</td>
<td>101</td>
</tr>
<tr>
<td>1440 x 1080</td>
<td>24p</td>
<td>31</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>50i</td>
<td>32</td>
<td>14</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>60i</td>
<td>38</td>
<td>17</td>
<td>87</td>
</tr>
<tr>
<td>1920 x 1080</td>
<td>24p</td>
<td>36</td>
<td>16</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>50i</td>
<td>38</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>60i</td>
<td>45</td>
<td>20</td>
<td>102</td>
</tr>
</tbody>
</table>

Note the following:

- There are two types of 24p:
  - *True 24p*: This is true film 24 fps and cannot be telecined to make 29.97 video that is correct. Doing a 2:3 pull down on this material causes A/V sync issues unless the audio is processed to match.
  - *23.976p*: This is source material that is prepared for telecine. This video is correct and without A/V sync issues.

- The only wrapper supported is QuickTime.
- The Omneon media layer does not support wrapping ProRes in the QuickTime wrapper. Starting with release 1.6, ProXchange uses MainConcept MP4 mux and demux with Omneon modifications to support Apple ProRes 422 and uncompressed audio.
Resizing from any 10bit source material to ProRes is not supported. For example, resizing from a 10bit DNXHD clip that is 1920x1080 to a ProRes clip that is 1280x720, or resizing from an SD clip to ProRes.
APPENDIX B

Legacy Hardware Platforms

The following contains information about the legacy ProXchange JobDirector:

- PXD2000 JobDirector
- PXD2001 JobScaler

PXD2000 JobDirector

Figure 37 and Table detail the front panel view of the JobDirector with the bezel removed.

![Figure 37. JobDirector Front Panel](image)

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power-on indicator/power button</td>
<td>The power button controls the DC power supply output to the system. The power-on indicator lights when the system power is on. When the power-on indicator is off, this indicates that no power is supplied to the system.</td>
</tr>
<tr>
<td>NMI button</td>
<td>This button is unused in a ProXchange system.</td>
</tr>
<tr>
<td>System identification button</td>
<td>This button is unused in a ProXchange system.</td>
</tr>
</tbody>
</table>
**Figure 38** and **Table** describe the JobDirector system status indicator patterns.

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD display</td>
<td>Provides status information and system error messages. The LCD display lights during normal system operation. Both the systems management software and the identification buttons located on the front and back of the system can cause the LCD to flash blue to identify a particular system. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives. <strong>Note:</strong> If the system is connected to AC power and an error has been detected, the LCD display lights amber regardless of whether the system has been powered on.</td>
</tr>
<tr>
<td>DVD-ROM drive</td>
<td>Use for software installation.</td>
</tr>
<tr>
<td>USB connectors</td>
<td>Use to connect the front bezel.</td>
</tr>
</tbody>
</table>

**Table 56. JobDirector System Status Indicators**

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ethernet Port 1</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>Inactive</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Active (requires both a good Ethernet link status and completed IP configuration)</td>
</tr>
<tr>
<td>2. Ethernet Port 2 (if used)</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>Inactive</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Active (requires both a good Ethernet link status and completed IP configuration)</td>
</tr>
</tbody>
</table>
Table 56. JobDirector System Status Indicators (Continued)

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Software Monitor</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>The ProXchange software service is not running This LED is white for 60 seconds prior to changing to blue when the system is starting up and when the front panel is attached after the system is started.</td>
</tr>
<tr>
<td></td>
<td>white</td>
<td>Normal, healthy state</td>
</tr>
<tr>
<td>4. RAID Monitor</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>RAID protection compromised; warning or error</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Normal, healthy state</td>
</tr>
<tr>
<td>5. Job Monitor</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td>(jobs running on this JobDirector only)</td>
<td>Blue</td>
<td>No transcode job running</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Transcode job running</td>
</tr>
<tr>
<td>6. Systemwide Job Monitor</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>No active transcode job running</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Active transcode job running</td>
</tr>
</tbody>
</table>

Figure 39 and Table 57 detail the rear panel view of the JobDirector.

![Figure 39. JobDirector Rear Panel](image)
Table 57. JobDirector Rear Panel Descriptions

<table>
<thead>
<tr>
<th>Indicator, Button, or Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial connector</td>
<td>This connector is unused in a ProXchange system.</td>
</tr>
<tr>
<td>Video connector</td>
<td>Use to connect a monitor to the system (for maintenance only).</td>
</tr>
<tr>
<td>USB connectors (2)</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>NIC1/Gb2/eth1 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>NIC0/Gb1/eth0 connector</td>
<td>Use for Gigabit Ethernet connection to switch.</td>
</tr>
<tr>
<td>System status indicator connector</td>
<td>For Service Personnel use only.</td>
</tr>
<tr>
<td>System identification button</td>
<td>Both the SystemManager application and the identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the LCD display on the front of the device and the blue system status indicator on the back blink until one of the buttons is pressed again.</td>
</tr>
<tr>
<td>System status indicator</td>
<td>Blinks when the front or back system identification button is pressed.</td>
</tr>
<tr>
<td>Power supply 1</td>
<td>Dual redundant power supplies provide power to the system.</td>
</tr>
<tr>
<td>Power supply 2</td>
<td></td>
</tr>
</tbody>
</table>

JobDirector Power Indicator Codes

The power button on the front panel controls the power input to the system’s power supplies. The power indicator can provide information on power status. Figure 40, Table , and Table describe the typical power indicators and their conditions.

Power Button Indicators

Table 58. JobDirector Power Button Indicators

<table>
<thead>
<tr>
<th>Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Indicates that power is supplied to the system and the system is operational.</td>
</tr>
<tr>
<td>Flashing</td>
<td>Indicates that power is supplied to the system but the system is off.</td>
</tr>
<tr>
<td>Off</td>
<td>Indicates that no power is supplied to the system.</td>
</tr>
</tbody>
</table>
Power Supply Indicators

![Power supply indicators](image1)

1. Power supply status indicator
2. Power supply fault indicator
3. AC line status indicator

Table 59. JobDirector Power Supply Indicators

<table>
<thead>
<tr>
<th>Indicator Pattern</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply status</td>
<td>Green indicates that the power supply is operational.</td>
</tr>
<tr>
<td>Power supply fault</td>
<td>Amber indicates a problem with the power supply.</td>
</tr>
<tr>
<td>AC line status</td>
<td>Green indicates that a valid AC source is connected to the power supply.</td>
</tr>
</tbody>
</table>

JobDirector NIC Indicator Codes

Each NIC on the back panel has an indicator that provides information on network activity and link status. **Figure 41**, and **Table** describe the NIC indicators and the status of each.

![JobDirector NIC Indicators](image2)

1. Link indicator
2. Activity indicator
Table 60. JobDirector NIC Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link and activity indicators are off</td>
<td>The NIC is not connected to the network.</td>
</tr>
<tr>
<td>Link indicator is green</td>
<td>The NIC is connected to a valid link partner on the network.</td>
</tr>
<tr>
<td>Activity indicator is amber blinking</td>
<td>Network data is being sent or received.</td>
</tr>
</tbody>
</table>

PXD2001 JobScaler

Front Panel Components

Figure 42 illustrates a typical front panel view of the JobScaler with the front bezel removed.

<table>
<thead>
<tr>
<th>1. Optical Drive</th>
<th>4. NMI Button</th>
<th>7. Video Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Diagnostic Indicators (4)</td>
<td>5. USB Connectors (2)</td>
<td>8. System Status Button and Indicator</td>
</tr>
</tbody>
</table>
Table 61. JobScaler Front Panel Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Drive</td>
<td>SATA DVD-ROM drive.</td>
</tr>
<tr>
<td>Diagnostic Indicators (4)</td>
<td>The diagnostic LEDs aid in diagnosing and troubleshooting the system. For more information, see the Gigantic Indicator Codes section in the Dell documentation that ships with this unit.</td>
</tr>
</tbody>
</table>
| Power Button, Power-on LED         | The Power Button controls the power input to the system’s power supply. The Power-on LED lights or blinks to indicate the status of power to the system.  
• The power-on LED lights when the system is on.  
• The power-on LED is off when power is disconnected from the system.  
• The power-on LED blinks when power is supplied to the system but in standby state, and when the system is off but connected to the power source. |
| NMI Button                         | This button is not used in a ProXchange system.                              |
| USB Connectors                     | One USB connector is used to connect the front panel.                       |
| Hard-drive Activity LED            | The green hard-drive activity LED flashes when the hard drives are being accessed. |
| Video Connector                    | Used for maintenance purposes only.                                        |
| System Status Button and Indicator | Can be used to locate a particular unit within a rack. After the System ID Indicator on the rear is pushed, the System Status LED on the front of the unit flashes blue, making it easier to locate that unit from the front of a rack. The SystemManager application can also be used to locate a device.  
• Blue LED: Indicates normal system operation.  
• Amber LED: Indicates that the system needs attention due to a system problem. |
| Hard Drive                         | An 80 GB SATA hard drive is included.                                       |
Front Panel Status Indicators

System Status LEDs

Figure 43 and Table describe the patterns of the system status indicators on the JobScaler bezel.

Figure 43. JobScaler System Status Indicators

Table 62. JobScaler System Status Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ethernet Port 1</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>Inactive</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Active (requires both a good Ethernet link status and completed IP configuration)</td>
</tr>
<tr>
<td>2. Ethernet Port 2</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td>(if used)</td>
<td>Blue</td>
<td>Inactive</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Active (requires both a good Ethernet link status and completed IP configuration)</td>
</tr>
<tr>
<td>3. Software Monitor</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>The ProXchange software service is not running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This LED is white for 60 seconds prior to changing to blue when the system is starting up and when the front panel is attached after the system is started.</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Normal, healthy state</td>
</tr>
<tr>
<td>4. Unused</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Normal, healthy state</td>
</tr>
</tbody>
</table>
Table 62. JobScaler System Status Indicators (Continued)

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Job Monitor (jobs running on this JobScaler only)</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>No transcode job running</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Transcode job running</td>
</tr>
<tr>
<td>6. Unused</td>
<td>Yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>Normal, healthy state</td>
</tr>
</tbody>
</table>

**Hard Drive Indicator Codes**

Figure 44 illustrates the hard drive indicators and status of each.

![Hard Drive Indicators](image)

**Figure 44. Hard Drive Indicators**

1. Drive Status Indicator - green and amber
2. Drive Activity Indicator - green during activity.
Rear Panel Components

Figure 45 illustrates a typical rear panel view of the PXD2001.

Figure 45. JobScaler Rear Panel

Following are descriptions of each rear panel section as identified above:

Table 63. JobScaler Rear Panel Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Tag</td>
<td>Use the service tab number on the Dell Support site to get more information about the unit.</td>
</tr>
<tr>
<td>Power Supply</td>
<td>One AC IN connector is available on this unit.</td>
</tr>
<tr>
<td>Mouse Connector</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>Kensington Lock</td>
<td>Used to connect security lock.</td>
</tr>
<tr>
<td>System Identification Button</td>
<td>The System ID Button (also located on the front panel) can be used to locate a particular unit within a rack. Once the System ID Button on the rear is pushed, the System Status LED on the front of the unit flashes blue, making it easier to locate that unit from the front of a rack. The SystemManager application can also be used to locate a device.</td>
</tr>
<tr>
<td>Keyboard Connector</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>USB Connectors (2)</td>
<td>Two 2.0-compliant USB connectors for maintenance purposes only.</td>
</tr>
</tbody>
</table>
JobScaler NIC Indicator Codes

**Figure** illustrates the JobScaler NIC indicators and the status of each.

![NIC Indicator Diagram](image)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Port Connector</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>Video Connector</td>
<td>Used for maintenance purposes only.</td>
</tr>
<tr>
<td>System Status Indicator</td>
<td>The System Status LED can flash either blue or amber:</td>
</tr>
<tr>
<td></td>
<td>• Blue LED: Indicates normal system operation.</td>
</tr>
<tr>
<td></td>
<td>• Amber LED: Indicates that the system needs attention due to a system problem.</td>
</tr>
<tr>
<td>NIC1/Gb2/eth1 and NIC2/Gb3/eth2 Connectors</td>
<td>Two 12-pin RJ-45 connector (LAN1 &amp; LAN 2) are provided for Ethernet connection (10/100/1000). A gigabit Ethernet connection is required</td>
</tr>
<tr>
<td>Expansion Slots (2)</td>
<td>Unused.</td>
</tr>
</tbody>
</table>

### Table 63. JobScaler Rear Panel Components (Continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Link Indicator</td>
<td><strong>Color</strong> Green&lt;br&gt;NIC is connected to a valid link on the network.</td>
</tr>
<tr>
<td></td>
<td>Off&lt;br&gt;NIC is not connected.</td>
</tr>
<tr>
<td>2. Activity Indicator</td>
<td><strong>Color</strong> Blinking Amber&lt;br&gt;Data is being sent or received over the network.</td>
</tr>
<tr>
<td></td>
<td>Off&lt;br&gt;NIC is not connected.</td>
</tr>
</tbody>
</table>
APPENDIX C

Panasonic P2 Clips

This appendix provides information on working with Panasonic P2 clips.

Directory Structure

P2 media has a unique directory structure that is different from any other media type in that it is a combination of media files and xml. P2 media is recorded in MXF format. The top-level directory structure of a P2 card will always include a file called LASTCLIP.TXT and a folder called CONTENTS.

The components of the video stream (video, audio, metadata, thumbnail, etc) are divided into subfolders within the CONTENTS folder. These folders include VIDEO and AUDIO directories for the MXF OP-Atom wrapped essence tracks. The “CLIP” folder contains information about the video and audio essence files.

ProXchange generates the essence files for the VIDEO and AUDIO sub-directories as follows:

- CONTENTS
  - AUDIO: Audio essence files. A single essence container (OP-Atom file) can contain a multi-channel essence or a single channel of audio.
  - CLIP: .xml (essence list & description, clip metadata, etc.).
  - ICON: Not needed.
  - PROXY: Not needed.
  - VIDEO: video essence files
  - VOICE: Not needed
Requirements

The following requirements apply to P2 clip name and directory structure.

• The clip base name consists of six characters: four numbers followed by two characters that are either numbers or upper-case letters. These restrictions on the base name are not enforced by ProXchange. The names of audio files contain an additional two numbers that indicate the channel number. All media files of the same clip must use the same base name.

• The directory structure that starts with a top-level directory of CONTENTS and subdirectories of CLIP, VIDEO, and AUDIO. Directory names are not case sensitive.

• An XML file that describes the clip structure. The xml file has the base clip name with an .xml extension. The file extension is not case sensitive. This xml file is located in the CLIP subdirectory.

Examples

It is expected that the user will point the task at a directory that is two levels above CONTENTS. For example:

“./clips/Monday/CONTENTS”

“./clips/Tuesday/CONTENTS”

“./clips/FredMack/CONTENTS”

In these examples “./clips” is a permanent watch folder. A new directory is created at the next lower level whenever the contents of a P2 card are copied onto the MediaGrid storage.

A task that is designated for P2 input will be able to search for clips in the CONTENTS directories that are two levels below the designated watch directory.

ProXchange can handle a P2 task that is assigned to:

“./clips/CONTENTS”

“./CONTENTS”

“./CONTENTS/CLIP”

Tasks of these variations will search subdirectories for a P2 xml file.

ProXchange Tasks that Accept P2 Clips as Input

ProXchange supports certain MXF OP-Atom clips according to SMPTE 390M-2004. The only type of OP-Atom that ProXchange supports is the OP-Atom for Panasonic P2 Deck as ProXchange input.

NOTE: These clips can be 'spanned' clips, as described in Annex C of the Panasonic P2 specification, Specification of Content Data Structure on P2 Card (version 3). The video formats are: AVC-Intra, DV, DVCPro, and DVCPro HD.
A task designated for Panasonic clips will not recognize any other type of input. Tasks that are not designated for Panasonic P2 clips cannot be used on Panasonic P2 clips. Tasks not designated for Panasonic P2 clips are ignored if assigned to the CONTENTS directory of a P2 structure or to one of subdirectories of CONTENTS.

P2 clips can also be transcoded to transport streams that can be played out on a Spectrum 4010.
Index

A
About ProXchange 2
About ProXchange Manager 61
About SystemManager 53
Apple ProRes 422
  about 98
  supported 98
Audio formats 91
Audio resampling
  about 75

D
Directories
  assigning 78
  change destination 80
DNS, setting reverse lookups 45
Documentation
  ProXchange suite 1

E
Exit 59

F
File Menu 59
  Fixed IP address 40

G
Grid resources 60
  setting 64

H
Help Menu 61

I
Installation
  JobDirector 33, 37
  JobScaler 35, 39
  ProXchange Manager 50, 51
  system software 53
  IP address
    assigning 40, 41

J
JobDirector

front panel
  indicator lights 15, 102, 108
introduction 5
NIC indicator 21, 30, 105
power indicator 104
rear panel 103
JobScaler
  front panel 22
  introduction 6
  power supply 29
  rear panel
    descriptions 110

L
License information iii
Licenses, grid processing 52

M
Main Window 58
Media types 87
MediaGrid
  configuring 63
  connecting to 63
  DNS name 64
  file system name 64
Mount, ProXchange devices 32
Multiple web clip output
  about 75

O
Omneon ProXchange System
  components 5

P
Panasonic P2
  directory structure 113
ProXchange 114
  requirements 114
  source type 79
Port number, default connection 60
Power supply, JobScaler 29
Preset
  create 65
create backup 60
delete 77
edit 77
rename 77
restore backup 60
Preset audio 74
ProXchange features 6
hardware connections 32
   JobDirector to client network 33
   JobDirector to MediaGrid 37
   JobScaler to client network 35
   JobScaler to MediaGrid 39
to client network 33
to MediaGrid 37
hardware mounting 32
licenses 52
Manager installation 49
system overview 13
ProXchange alias name 63
ProXchange devices
   host name 45
   MAC address 45
ProXchange Manager
   Directories pane 58
   exit 59
   installation 50
   installing 51
   introduction 6
   IP address for JobDirector 60
   IP address, enter for JobDirector 61, 62
   main window 58
   Menu Bar 58
   overview 57
   Presets pane 59
   starting 61
   Status Bar 60
   system compatibility 49
   Task pane 59
   using 62
ProXchange Status
   transcode jobs 60
ProXchange system
   components 5

R
Refresh database 59
Reverse DNS lookups 45
Run Task Now 80

S
Safety information iii
Services, start 48, 52, 53