AVN443 h.264 IP Audio Video Node
User's Manual

Please visit the support section of our web site at www.vsicam.com for manuals, other documentation, and software downloads.

Visionary Solutions, Inc.
2060 Alameda Padre Serra
Suite 100
Santa Barbara, CA 93103
T:805-845-8900
F:805-845-8889
www.vsicam.com

September 6, 2011
Revision 1.0.5 (compatible with version 063 firmware)

About This Guide

VSI recommends that you download the most recent version of this Manual from www.vsicam.com.

Legal Considerations

Intellectual Property Rights

Visionary Solutions, Inc. warrants that it, or its licensors, have good and clear title or right to license the PackeTV™ Manager and its components and to manufacture and distribute the AVN443, free and clear of all liens and encumbrances.

No part of this document may be copied or reproduced in any form or by any means, electronic or mechanical, for any purpose without the express written permission of Visionary Solutions, Inc.

All rights, title, copyrights in and to the design, firmware object and source code of the AVN443 belong exclusively to and are the property of Visionary Solutions, Inc.

All rights, title, and copyrights in and to the PackeTV™ Manager and any copies of the PackeTV™ Manager belong exclusively to and are the property of Visionary Solutions, Inc.

Limited Liability

In no event shall Visionary Solutions, Inc. be liable, whether in contract, tort, or otherwise, to OEM or Customers for (a) any damages resulting from loss of use, data or profits howsoever arising hereunder in relation to or in connection with Visionary Solutions, Inc. Software, (b) any special, indirect, incidental or consequential damages, even if Visionary Solutions, Inc. has been advised of the possibility thereof. Visionary Solutions, Inc.'s total liability in contract, tort or otherwise arising out of, in connection with or in relation to the Software or otherwise under this Agreement shall be limited to the amount paid to Visionary Solutions, Inc. or and authorized Visionary Solutions, Inc. reseller for the Visionary Solutions, Inc. Software or Hardware for a Customer in the 12 month period immediately preceding the event which has given rise to the liability.

The contents of this document are subject to revision without notice due to continued progress in methodology, design, and manufacturing. Visionary Solutions, Inc. shall have no liability for any error or damages of any kind resulting from the use of this document.

Trademark Acknowledgements

All trademarks or registered trademarks are properties of their respective owners.

Visionary Solutions, Inc., Limited 12-Month AVN443 Warranty

We appreciate your purchase of this Visionary Solutions, Inc. product. We feel confident that in normal use it will provide years of satisfactory performance.

Visionary Solutions, Inc. warrants to the original user that the video equipment supplied by us will be free of defects in materials and workmanship for a period of twelve (12) months from the date of purchase from Visionary Solutions, Inc. or an authorized reseller of Visionary Solutions, Inc. Visionary Solutions, Inc.'s obligation under this warranty shall be to the repair including any necessary parts and the cost of labor connected therewith, or at its option, the exchange or the refund of the purchase price, of any video equipment that is determined by us to have a manufacturing defect within the warranty period.

Replacement parts furnished in connection with this warranty shall be warranted for a period equal to the unexpired portion of the original equipment warranty.

Warranty Exclusions

This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of Visionary Solutions, Inc., including, but not limited to, acts of nature, improper installation, misuse, lack of proper maintenance, accident, voltage fluctuations, and unauthorized repairs or modifications.

This warranty becomes void in the event serial numbers are altered, defaced, or removed.

Visionary Solutions, Inc. reserves the right to make changes in the design, or make additions to, or improvements upon, this product without incurring obligations to install the same on products previously manufactured.

The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Visionary Solutions, Inc. neither assumes nor authorizes any person to assume for it any other obligations or liabilities in connection with the sale of its products. In no event shall Visionary Solutions, Inc. or its authorized resellers be liable for special or consequential damages arising from the use of its products, or any delay in the performance of this warranty due to causes beyond its control.

IN THE U.S.A., SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR THE EXCLUSION OR LIMITATION OF CONSEQUENTIAL DAMAGES, SO THE PREVIOUSLY STATED LIMITATIONS ON IMPLIED WARRANTY AND CONSEQUENTIAL DAMAGES MAY NOT APPLY TO YOU.

Customer Obligations

The original, dated, bill of sale should be retained as proof of purchase and must be presented to the Visionary Solutions, Inc. or a Visionary Solutions, Inc. Authorized Service Center when this equipment is to be serviced under the provisions of this warranty.

The cost of transportation to and from the Authorized Service Center is the responsibility of the user.

How to Obtain Warranty Service

Should this equipment require warranty service you may obtain specific information on how to obtain this service by directly contacting Visionary Solutions, Inc., or the reseller who sold you this equipment.

Contents

Chapter 1 Introduction

Visionary Solutions' IPTV AVN443 encoder can turn video from SDI (SD/HD/3G), or HDMI (DVIP-D with optional adapter cable) sources into full-screen, full resolution, Internet Protocol (IP) digital video in real time.

The AVN443 encodes high or standard definition video in an h.264 stream (MPEG-4 Part 10/ AVC). It is used in a Media Processing Platform (MPP), a high density rack mount system. Plug a video source directly into the blade, plug into the network via the RJ-45 connection, and stream real-time high or standard definition video over your LAN or WAN. The MPP with AVN443 blades is suitable for all applications requiring cost-effective, low bit rate, high or standard definition video distribution over IP networks.

1.1 Features

- **Modular Flexibility**. The AVN443 features modular firmware architecture, which lowers the base price by allowing the user to purchase only those features they need at the moment, while at the same time maintaining the flexibility to upgrade in the future as requirements change. The list of optional add-on-modules currently include 720p, 1080i (with 1080p @24 support), 1080p @60, and Forward Error Correction (FEC).

- **Superior Audio/Video Quality**. h.264 (MPEG-4 Part 10/AVC) hardware compression and Visionary Solutions' optimized transmission technology provide a high or standard definition, full frame rate, IP video stream. The stream can be viewed by an unlimited number of clients on a LAN or WAN provided that bandwidth is available. Image resolutions are configurable based upon purchased modules. The base model includes 480i SD encoding, with Closed Captioning (CC) support. Optional modules allow FEC support and image resolutions to be configured up to 720p, 1080i (with 1080p @24 support) or full 1080p at 60 fields per second. The total bit rate can be configured from 4 to 20 Mbps for HD and 2 to 10 Mbps for SD. The audio compression is either AAC (32 to 384 kbps audio encoding, average bitrate) or MPEG-1 Layer II (32 to 384 kbps audio encoding) with up to 48 kHz sample rate.

- **Forward Error Correction (FEC)**. For superior image quality and reliability in the most demanding network video environments, the AVN443, with an optional FEC module, incorporates SMPTE-2022 Pro-MPEG FEC Code of Practice # 3, Releases 1 and 2. This allows FEC enabled receivers to monitor the stream and recover missing packets.

- **Closed Captioning**. Using the SDI / HD-SDI input, the AVN443 allows Closed Captioning of both SD and HD signals. Supports EIA-608 and EIA-708.

- **Video Inputs**. The AVN443 includes one BNC connector for SDI, HD-SDI and 3G inputs, and one HDMI input (DVI-D with optional adaptor cable) for connecting video and audio source equipment.

- **Audio Inputs**. A terminal block connector provides audio inputs for Balanced and Unbalanced connections. This allows for easy onsite connections regardless of the cabling outputs of the audio source. There are also two RCA audio connectors (L/R) which support only unbalanced connections, and the HDMI input can carry audio as well. The AVN443 can also extract embedded audio from the HD-SDI input. See sections *1.3.1 AVN443 Front Panel* and *6.4.2.2 Audio Input Control* for additional information about unbalanced audio inputs.

- **External Device Connections**. The AVN443 includes a serial connection via an RJ-45 connector. This connector can be used as an RS-232 port (full duplex, no hand shaking) or an RS-422 (full-duplex) port. These ports allow the AVN443 to interface with external devices such as terminal emulation equipment.

- **Management and Configuration**. Management and configuration of the device is accomplished by any of four methods: PackeTV™ Manager (2nd generation), console menus, a Web interface, or the AVN Control Protocol API. TCP/IP, HTTP and other Internet-related protocols are supported.

- **IPTV Media Processing Platform (MPP) Component.** The AVN443 is a component of the MPP from Visionary Solutions. The MPP is a high density rack mountable blade system. The MPP1700 platform holds up to 17 single slot encoder blades, or a combination of dual and single slot blades. The MPP200 has a single power source and can hold two single slot encoder blades or one dual slot blade. Each MPP will incorporate a growing family of modules to support transport, switching, transcoding, and monitoring of IPTV.

1.2 Specifications Overview

Also see *Chapter 10 Technical Specifications*.

Inputs and Outputs BNC (SD, HD, 3G) serial digital input with EDH error detection
BNC (SD, HD, 3G) loop through (re-clocked)
HDMI or DVI-D with optional adaptor cable
Terminal block audio connector for Balanced and Un-Balanced Stereo
RCA Stereo Audio
RJ-45 Ethernet 10/100 Tx
RJ-45 Serial RS-232C or RS-422

Video Resolutions

Input Format @ Hz		Module Required	Video Bitrate (Mbps)	h.264 Profile
HD	1080p @ 60	1080p60	6–20	High Profile Level 4.0
	1080p @ 24	1080i	6–20	High Profile Level 4.0
	1080i @ 59.94/60	1080i	6–20	High Profile Level 4.0
	1080i @ 50	1080i	6–20	High Profile Level 4.0
	720p @ 59.94/60	720p	4–20	High Profile Level 4.0
	720p @ 50	720p	4-20	High Profile Level 4.0
SD	576i @ 50		2–10	Main Profile Level 3.0
	480i @ 59.94		2–10	Main Profile Level 3.0

HD Video Encoding	h.264 MPEG-4 AVC Compression High Profile at level 4 (HP@L4) 4 Mbps to 20 Mbps
SD Video Encoding	h.264 MPEG-4 AVC Compression Main Profile at Level 3 (MP@L3) 2 Mbps to 10 Mbps
Dimensions	W x D x H 40 cm x 131 cm x 175 cm (1.6 in. x 5.2 in. x 6.9 in.)
Weight	220 g or 0.49 lb (approximate)
Environmental	Operating Temperature 10ºC to 50ºC (14ºF to 122ºF)
Power Input	DC Input 4.75 watts – MPP200 Chassis 100–240 VAC 50/60 Hz Adapter – MPP1700 Chassis 100–240 VAC 50/60 Hz

Closed Captioning (CC)

SDI only (SD/HD/3G) EIA-608 and EIA-708

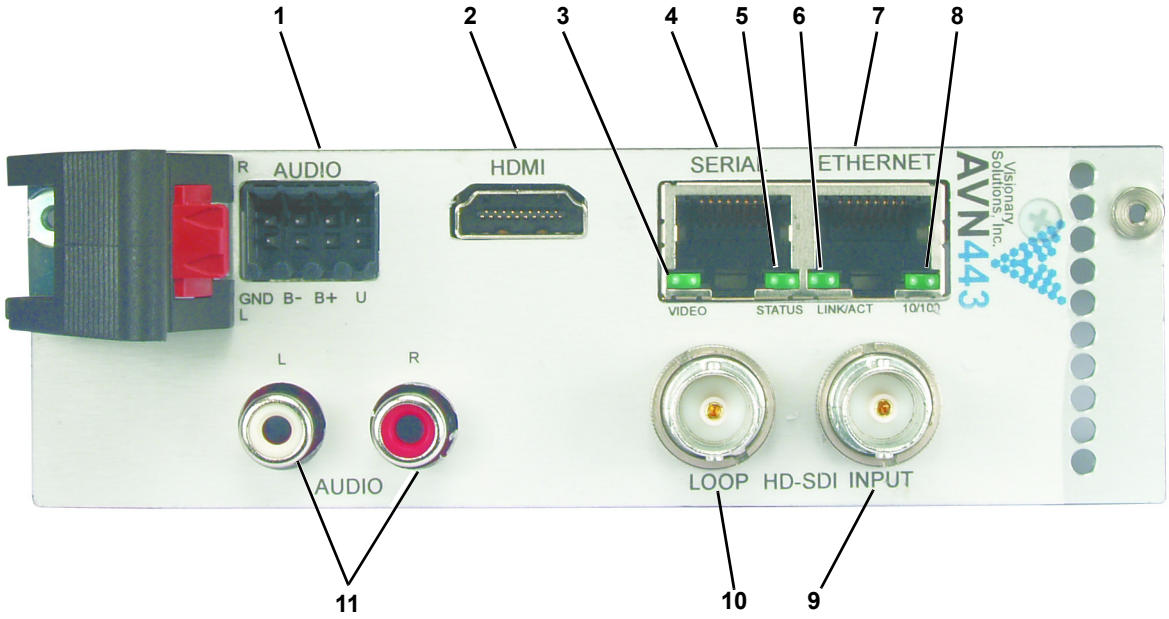
Forward Error Correction (FEC)

SMPTE-2022 Pro-MPEG FEC Code of Practice # 3, Release 1 and 2 (requires FEC module)

Audio Encoding	MPEG-1 Layer II stereo, 32–384 kbps, with a sample rate of up to 48 kHz MPEG-2 Advanced Audio Code (AAC) stereo, 32–384 kbps, with a sample rate of up to 48 kHz
Security	Administrators can create and modify accounts for authorized users, as well as allow anonymous viewing.
Compliance	CE, UL Listed I.T.E E257717 EMC: FCC Part 15 Class A [MPP200] Class A, EN55022 [MPP1700] Class A, EN55022, EN61000-3-2, EN61000-3-3, EN55024 SAFETY: EN60950-1

1.3 Product Description

1.3.1 AVN443 Front Panel



1. Audio Connector – provides support for right/left, balanced and unbalanced audio. See *Chapter 9 Unit Connections* for terminal block pinout information.

2. HDMI Connector – provides input for HDMI video sources.

3. Video LED – indicates the state of the video input signal. It will illuminate solid green when a valid video source is detected for the selected video input. It will blink at a speed of 4 times per second when the unit is properly encoding video.

4. Serial Connector – an RJ-45 connector which allows RS-232C (full-duplex, no handshaking) and RS-422 (full-duplex) communication. See *Chapter 9 Unit Connections* for pinout information.

5. Status LED – blinks once every second when properly installed, powered, and operational.

6. Link/Act LED – indicates the status of the Ethernet link. It will illuminate solid green when a 10 or 100 Mbit Ethernet link is established. It will blink to indicate activity (Tx or Rx).

7. Ethernet Connector – an RJ-45 network connector, 10/100 Tx.

8. 10/100 LED – indicates the speed of the connection. It will illuminate green when the link is 100 Mbit, and will remain off for 10 Mbit connections.

9. HD-SDI Input – BNC connector provides input for HD-SDI video sources.

10. Loop – BNC connector provides loop through functionality (re-clocked).

11. RCA Connectors (x2) - provides inputs for right and left unbalanced audio sources.

Note: *Excluding HDMI which is always supported, only one unbalanced audio input source is supported at any one time. If the Audio Connector is configured for unbalanced audio and plugged in, the RCA audio inputs (which are always unbalanced) cannot be used at the same time, and visa versa. If two unbalanced audio inputs are connected at the same time, the result will be undetermined audio and is not recommended.*

1.3.2 Shipping Inventory

Your AVN443 is shipped with the following:

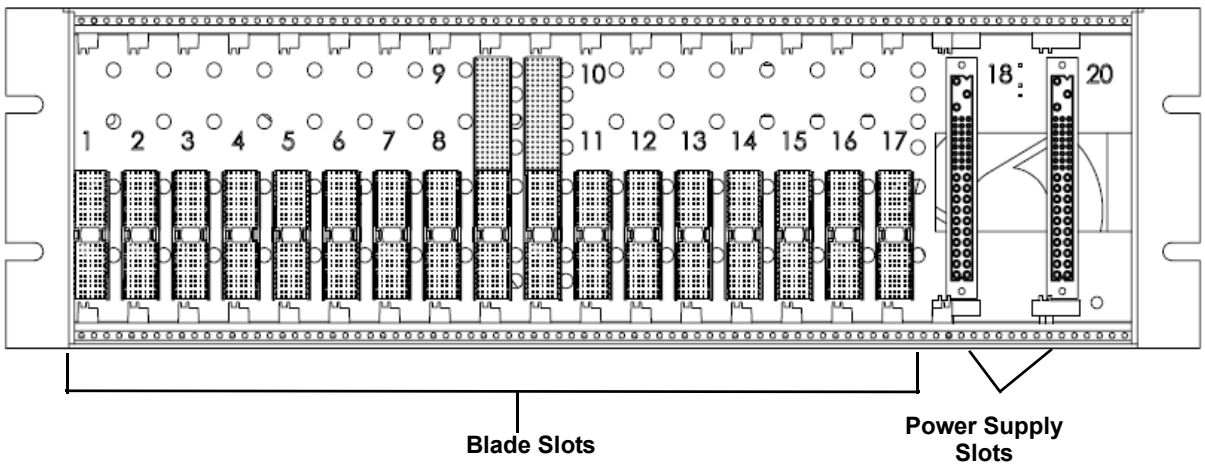
- One AVN443 blade
- One captive screw to use for installing the blade into the handle if desired
- One Factory Default Jumper
- One Wiedenmuler terminal block connector for audio connections
- One Installation Guide (see *Appendix A – Quick Start Guide Installation*)

1.4 The MPP1700

The Media Processing Platform (MPP) 1700 is a high density, rack mount blade chassis used in VSI IPTV applications.

Slots 1-17 on the chassis can be filled with any VSI blade product. Slots 18 and 20 can be filled with power supplies. At least one of the power supply slots must be filled, and for dual redundant power supply support, both power supply slots must be populated.

1.5 MPP1700 Front Panel Slots



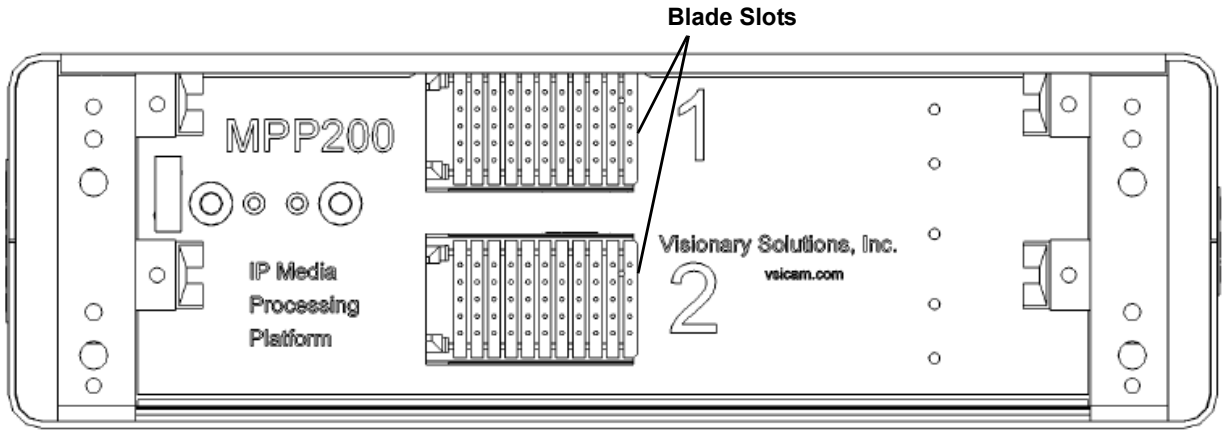
Refer to the *MPP1700 User's Manual* for more information about the MPP1700.

1.6 The MPP200

The Media Processing Platform (MPP) 200 is a high density, blade chassis used in VSI IPTV applications. It can be rack mounted in a 1U space or used as a stand alone. If rack mounting, an optional MPP200 Rack Mount Kit is available which holds one or two MPP200 chassis in a 1U space.

Slots 1 and 2 on the chassis can be filled with any VSI blade product.

1.6.1 MPP200 Front Panel Slots



1.6.2 MPP200 Rear Panel

Refer to the *MPP200 User's Manual* for more information about the MPP200.

Chapter 2 Installation

2.1 Blade Installation and Removal

Note: *It is important that the module be properly aligned with the slot guides before it is inserted into the appropriate slot on the chassis. It is recommended that the user's line of sight be level with the middle of the backplane in order to see both slot guides clearly.*

Install a VSI blade into the chassis as follows:

Caution: Use proper ESD precautions when installing or removing a VSI blade to avoid damaging the unit's circuitry.

1. Slide the blade, open end first, into the desired slot on the chassis until it plugs into the connector located on the backplane at the rear of the unit.
2. Use the bottom ejector handle to securely seat the blade into the chassis and to properly mate the rear connectors. The handle should lock closed when properly inserted to secure the unit.
3. Tighten the captive thumb screw located at the top of the blade to provide a more secure mounting.
4. If desired, an additional Phillips screw can be installed through the handle.
5. The Status LED will blink once per second when the blade is properly installed, powered, and operational.

To remove a VSI blade:

1. Loosen the mounting screw at the top of the blade.
2. If installed, loosen the additional Phillips screw in the ejector handle.
3. Press the red tab on the bottom of the ejector handle to unlock the blade.
4. Pull down on the handle and pull the blade out of its slot away from the chassis.

2.2 Minimum Connections Installation

The minimum connections to the AVN443 should include a video source connected to the HDMI or SDI video inputs, and an RJ-45 LAN connection to the Ethernet connector.

To connect the AVN443:

1. Connect the cable from the desired video source to its appropriate connector.

2. Connect an Ethernet cable to the Ethernet RJ-45 connector. The other end of the Ethernet cable should be connected to a switch or hub on your LAN network.

Chapter 3 Connecting to the Network

3.1 Unicast and Multicast Transmissions over the Network

A Unicast transmission sends IP packets to a single recipient on a network. A Multicast transmission sends IP packets to a group of hosts on a network. If the streaming video is to be distributed to a single destination, then you would start a Unicast stream by setting the destination IP address and port on the AVN equal to the destination's values. If you want to view the stream at multiple concurrent locations, then you would set the AVN's destination IP address to a valid Multicast IP address (224.0.0.0 - 239.255.255.255).

Note that while the Multicast IP address range is from 224.0.0.0 - 239.255.255.255, the first octet (224.xxx.xxx.xxx) is generally reserved for administration. VSI recommends setting the first octet to 225 and the remaining three octets to the AVN's IP address. For example, if the AVN's IP address is 192.168.1.53, then set the destination IP address to 225.168.1.53 for Multicast streaming.

Since Multicasting is a relatively new technology, some legacy devices that are part of your network might not support Multicasting.

Before using the AVN443 in Multicast streaming mode, check the functional specifications of your network infrastructure to ensure that the Multicast stream will not create major traffic on your network. Verify that your backbone switch supports Internet Group Messaging Protocol (IGMP) snooping, which allows the core of your network to ignore the traffic streams that Multicasting may generate.

3.2 IGMP Querying and IGMP Snooping

IGMP is a session-layer (Layer 3) protocol used to establish membership in a Multicast group and can register a router to receive specific Multicast traffic. (Refer to RFC 1112 and RFC 2236 for information on IGMP versions 1 and 2.)

Multicast aware switches are slowly making their way into the network cores for businesses and universities that have heavy traffic to move through their networks. Multicast filtering is achieved by dynamic group control management. By default, all Multicast traffic should be blocked until requested by a Multicast group member. (Default behavior depends on switch manufacturer.) The master of the IGMP filter lists is the router or switch that is configured to act as the IGMP Querier. The responsibility of the Querier is to send out IGMP group membership queries on a timed interval, to retrieve IGMP membership reports from active members, and to allow updating of the group membership tables.

A Layer 2 switch supporting IGMP Snooping can passively snoop on IGMP Query, Report, and Leave (IGMP version 2) packets transferred between IP Multicast routers/switches and IP Multicast hosts to determine the IP Multicast group membership. IGMP snooping checks IGMP packets passing through the network, picks out the group registration, and configures Multicasting accordingly.

Without IGMP Querying/Snooping, Multicast traffic is treated in the same manner as a Broadcast transmission, which forwards packets to all ports on the network. With IGMP Querying/Snooping, Multicast traffic is only forwarded to ports that are members of that Multicast group. IGMP Snooping generates no additional network traffic, which significantly reduces the Multicast traffic passing through your switch.

If your network distribution core does not support IGMP Querying/Snooping, the AVN streams will still function as designed but your network may be subjected to high traffic loads and condensed collision domain due to the broadcasting action used by the older switch or hub. If this is the case, you may wish to isolate the streaming nodes within the network so that the streams may be viewed without crossing the normal network traffic along its path.

Otherwise, for a general performance improvement, you may consider upgrading your network core to a switch that is Multicast aware.

3.3 DHCP IP Configuration

The AVN443 has Dynamic Host Configuration Protocol (DHCP) enabled as the factory default. If your network has a DHCP server on it, the AVN443 will automatically acquire an IP address. If the AVN443 is not able to find a DHCP server, it will default to the IP Address, Subnet Mask and Gateway that are configured into the unit. The factory default IP address is 192.168.1.253.

To disable or enable DHCP on the AVN443, use either the Console Interface (refer to section *5.1 Establishing a Connection*) or the Browser Interface (refer to section *6.5.3 Device Network*).

To assign a static IP address for the AVN443, refer to the following section.

3.4 Static IP Configuration (Recommended Configuration)

If the AVN443 is not able to find a DHCP server, it will default to the IP Address, Subnet Mask and Gateway that are configured into the unit. The factory default is 192.168.1.253.

It is strongly recommended that the AVN443 be statically configured to a specific IP address. This enables the AVN443 to be consistently found at the same address. Prior to statically configuring the AVN443, check with your IT department and/or make sure the IP address to be assigned is not in use by any other device on the LAN.

To assign a static IP address to the AVN443, follow these steps:

1. Power on the AVN443 blade and connect the console (light blue) and the network cables.

2. Run a terminal emulation program such as TeraTerm to communicate via console (refer to section *5.1 Establishing a Connection*). Use the following communication parameters: **Bits per second (38400), Data bits (8), Parity (None), Stop bits (1), Flow Control (None)**.

3. Press **Enter** to get the login prompt.

4. Log in to the unit with the valid username/password (by default admin/admin).

5. An unconfigured unit automatically starts the Network Configuration Wizard, and will prompt the user to enter an IP Address, Netmask, Gateway, and DNS Server.

6. Once the values have been entered, the AVN443 should reboot and be accessible at its newly assigned address. Type the unit's IP address into a browser (http://xxx.xxx.xxx.xxx) to bring up the AVN443's Browser Interface (refer to *Chapter 6 Using the Browser Interface*).

7. For previously configured units, press "**n**" and then **Enter** from the Console Interface to unlock the display and start the Network Configuration Wizard (see step 5 above).

8. Units can be reconfigured at any time using the Console Interface as described in the previous step.

Chapter 4 Operating the AVN443

The AVN443 has three control interfaces that you can use to operate and configure the AVN units:

- PackeTV™ Manager (2nd generation, not currently supported) – GUI-based program installed on a Windows-based PC.
- Browser Interface – uses a browser interface.
- AVN Control Protocol Application Programming Interface (AVNCP API) – available upon request from Visionary Solutions, Inc.

The AVN's Console Interface may only be used to configure the unit's network settings (IP Address, Netmask, Gateway and DNS). This interface does NOT support general device control.

4.1 PackeTV™ Manager (2nd generation)

This program is not currently released.

4.2 AVN443 Console Interface

For information on using the AVN443 Console Interface, refer to *Chapter 5 The Console Interface*.

4.3 AVN443 Browser Interface

The AVN443 must be on a network in order to connect to its Browser Interface. Once connected:

1. Type the following URL (**http://xxx.xxx.xxx.xxx**) into your browser, where the xxx.xxx.xxx.xxx corresponds to the AVN443 IP address.
2. Click **Enter/Go**. The AVN443 Web Management Login Page will display.
3. Enter the Username and Password of the AVN443 and click the **Login** button. The AVN443 Browser Interface pages will display.

Refer to *Chapter 6 Using the Browser Interface* for information about the Browser Interface pages and their functionality.

4.4 AVN Control Protocol (API)

For programmers who wish to integrate AVN control functionality into their own applications, the AVN Control Protocol (API) offers all the "hooks" needed. Contact avntech@vsicam.com for AVN443 API documentation. Available to prequalified customers only.

Chapter 5 The Console Interface

Note: *The Console Interface can only be used for device network configuration and cannot be used for general device control. For general device control, please use one of the other interfaces (Browser, PackeTV™, or API).*

The AVN443 Console Interface may be used to configure the unit's network settings.

5.1 Establishing a Connection

1. Connect the serial cable between the serial port of the AVN443 and a COM port on your PC (typically the COM1 port). The AVN443 uses an RJ-45 to DB9-F serial cable (shipped with the MPP chassis).

2. Launch a terminal application, such as TeraTerm (google: teraterm download):

   a. Create/Open a new serial connection.

   b. Specify the PC port you are connected to (**typically COM1**), click **OK**.

   c. Configure the Port Settings as follows: **Bits per second (38400), Data bits (8), Parity (None), Stop bits (1), Flow Control (None).** Click **OK**.

   d. Press **Enter** to get the login prompt for the encoder.

3. Log in to the unit with the **Username/Password**. The default values are: **admin**/**admin**

4. After valid authentication, the Console Interface will display on your monitor.

5. The first time you log on, you will need to configure your network settings (see *5.1.1 Initial Network Configuration Settings*).

5.1.1 Initial Network Configuration Settings

An AVN443 is considered to be either configured or unconfigured depending upon previous actions.

- An unconfigured unit does not have any network configuration settings. When the Console Interface is opened for the first time, the Network Configuration Wizard automatically appears and prompts the user to enter four pieces of information: the IP Address, Netmask, Gateway and DNS Server values.
- A configured unit is one where the network configuration settings have been entered and saved. When the Console Interface is opened on a configured unit, it will display the basic network information about the unit and that it is in a "Locked" state. To change any of the current values, the user will need to unlock the Console Interface and activate the Network Connection Wizard. Doing this will automatically resets the network configuration settings back to the unconfigured state.

If any typing errors occur during the configuration steps, just press the **Enter** key and re-enter the desired values.

5.1.2 Using the Network Configuration Wizard

1. Open the Console Interface using your terminal application (see *5.1 Establishing a Connection*).

    a. If configuring an unconfigured unit, the Network Configuration Wizard appears; or

    b. Press **n** (lower case "n") followed by the **Enter** key to unlock the display and open the Network Configuration Wizard.

2. **Please Enter Unit IP Address**:

    a. To configure the unit statically (recommended), enter the AVN's new IP address and press **Enter**.

    b. To enable DHCP on the unit, enter **0.0.0.0** and press **Enter**.

3. **Please Enter Unit Netmask**: Enter the AVN's new Netmask address, commonly **255.255.255.0**, and press **Enter**.

4. **Please Enter Unit Gateway**: Enter the AVN's new Gateway address. This value is critical for updating firmware as it enables the AVN to find the Internet and download updates as needed.

5. **Please Enter DNS Server**: Enter the AVN's new DNS Server address, commonly **4.2.2.1**, and press **Enter**.

To restart the entire configuration, press **n** (lower case "n") followed by the **Enter** key.

Chapter 6 Using the Browser Interface

Note: *The screen captures in this chapter may differ slightly than the menus on your AVN. If you have any questions, please contact VSI technical support.*

6.1 The Web Management Login Page

The login page allows authorized users to login to the AVN443 Browser Interface pages using their Username and Password. The default Username and Password are admin/admin.

The AVN443 must be on a network in order to connect to its Browser Interface. Once connected:

1. Type the following URL (**http://xxx.xxx.xxx.xxx**) into your browser, where the xxx.xxx.xxx.xxx corresponds to the AVN443 IP address.

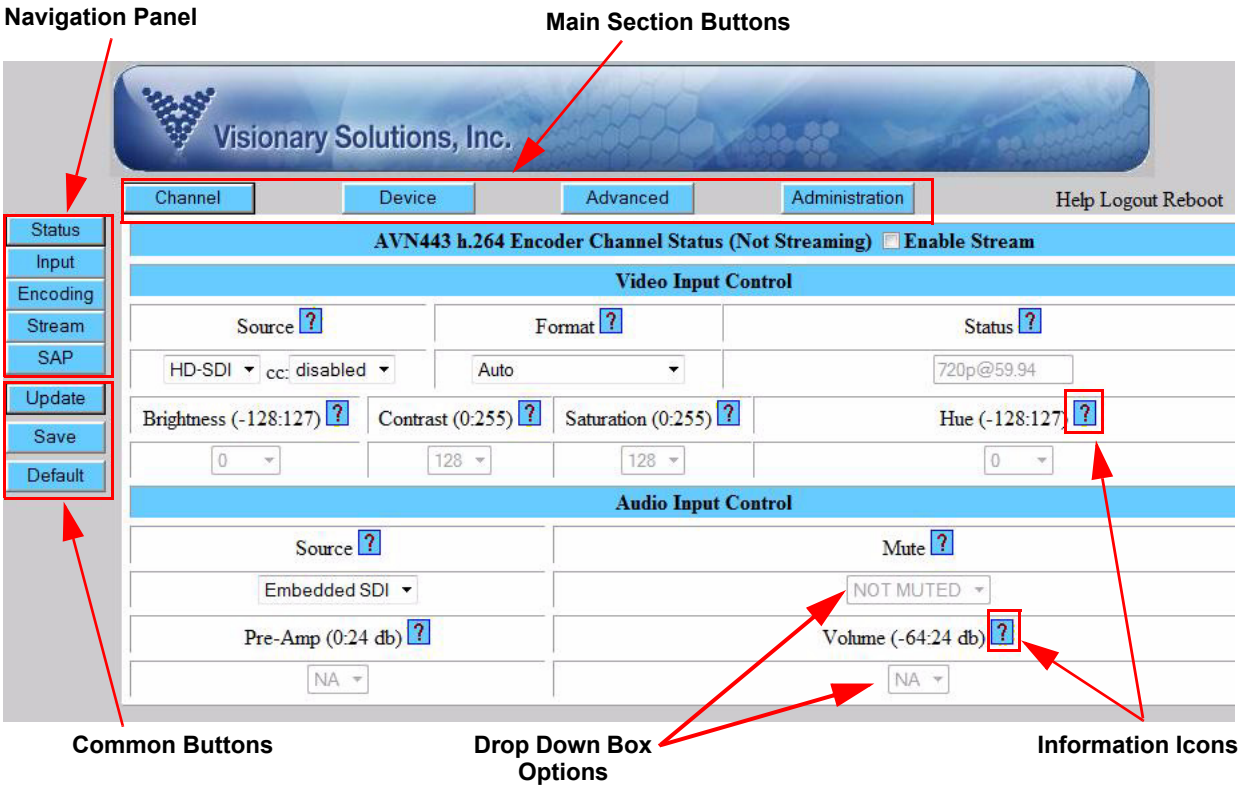
2. Click **Enter/Go**. The AVN443 Web Management Login Page will display.

3. Click **Manage Device** to open the web server authentication prompt.

4. Enter the Username and Password of the AVN443 and click the **OK** button. The AVN443 Browser Interface menu will display.

6.2 The Browser Interface Main Page

Once you log in to AVN443 using your browser (refer to the previous section), you will be directed to the Browser Interface main page.



The **Main Section Buttons** provide quick access to the four main sections for the AVN's Browser Interface. These sections always display across the top of the page: Channel, Device, Advanced, and Administration. Refer to the sections that follow for a description of each of these sections and their sub-pages.

Each main section provides access to a number of **Sub-pages**, which are listed along the left hand side of each page. As each sub-page is selected, the main viewing area will change and offer additional page options.

Note: *The following buttons may display on several of the pages, but will only apply to the settings on the page where they appear. Setting changes on other pages will need to be saved separately.*

Update – The **Update** button changes the device's settings to those currently displayed on the page. Only settings displayed on the page are updated. Updated settings are not saved to the device's memory and will be lost after a reboot.

Save – The **Save** button both updates the current page's settings to the device and saves them to memory. Saved settings are persistent and will be used after a reboot.

Default – The **Default** button changes and updates the device's settings to their default values. Only the settings displayed on the current page are updated to default values. For example if the current page is Channel Encoding, only the encoding settings will be returned to their default values (Video Bitrate, Video Size, etc.). Default values are updated but not saved. If the default settings are to be saved after a reboot, you will need to click the Save button after clicking the Default button.

 – The question mark button next to many settings opens a context sensitive help file with details about the setting.

The available values for each feature display in the **Drop Down Box** for that parameter.

6.3 Browser Interface Tree Menu

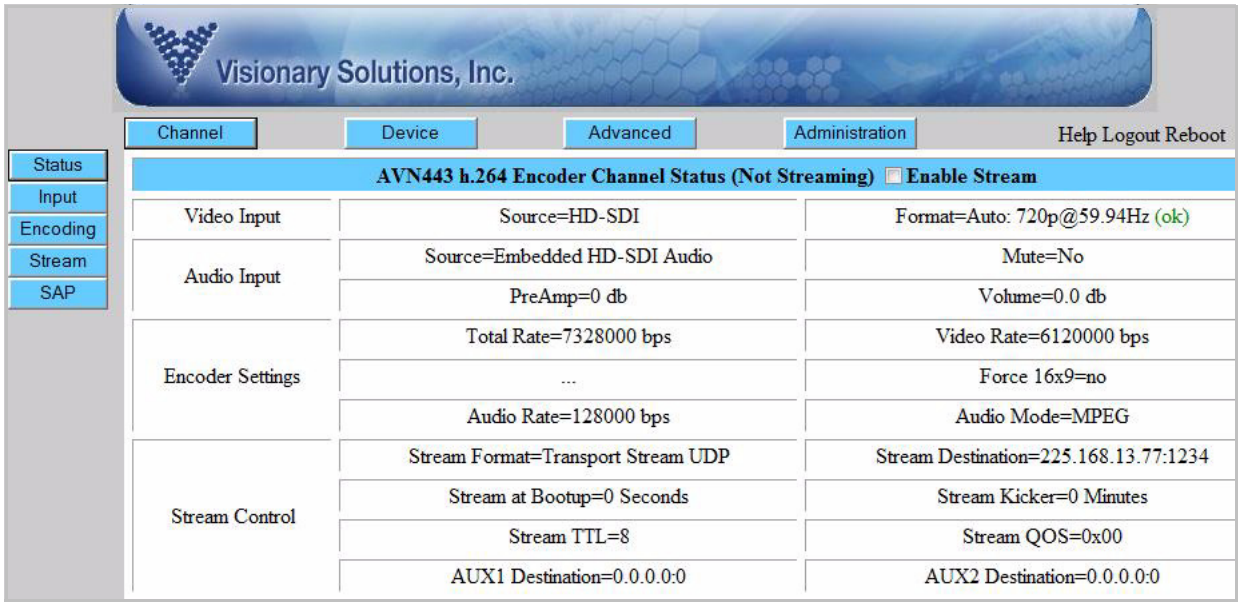
The following table provides a menu tree overview of the Browser Interface's main sections and their sub-sections.

Browser Interface Menu Tree		
Channel Page >	Status >	Enable Stream
	Input >	Enable Stream Update Save Default
	Encoding >	Enable Stream Update Save Default
	Stream >	Enable Stream Update Save Default
	SAP >	Enable Stream Update Save Default
Device Page >	Status	
	ID >	Update Save Default
	Network >	Update Save Default Sync Time
Advanced Page >	Status	
	System – Under Development	
	Events – Displays the unit's event log.	
	Alarms – Under Development	
	Stats – Displays the current System and Video Input statistics.	
Administration Page >	Status	
	Config – Displays the unit's settings	
	Users >	Add User Save User Config Reset Default User Config Edit User Delete User
	FactDef (Factory Default)	
	Upgrade	
	Modules	

6.4 Channel Page

Use the Channel page to view most of the device's channel/stream settings, including inputs, encoding, and destination parameters.

6.4.1 Channel Status

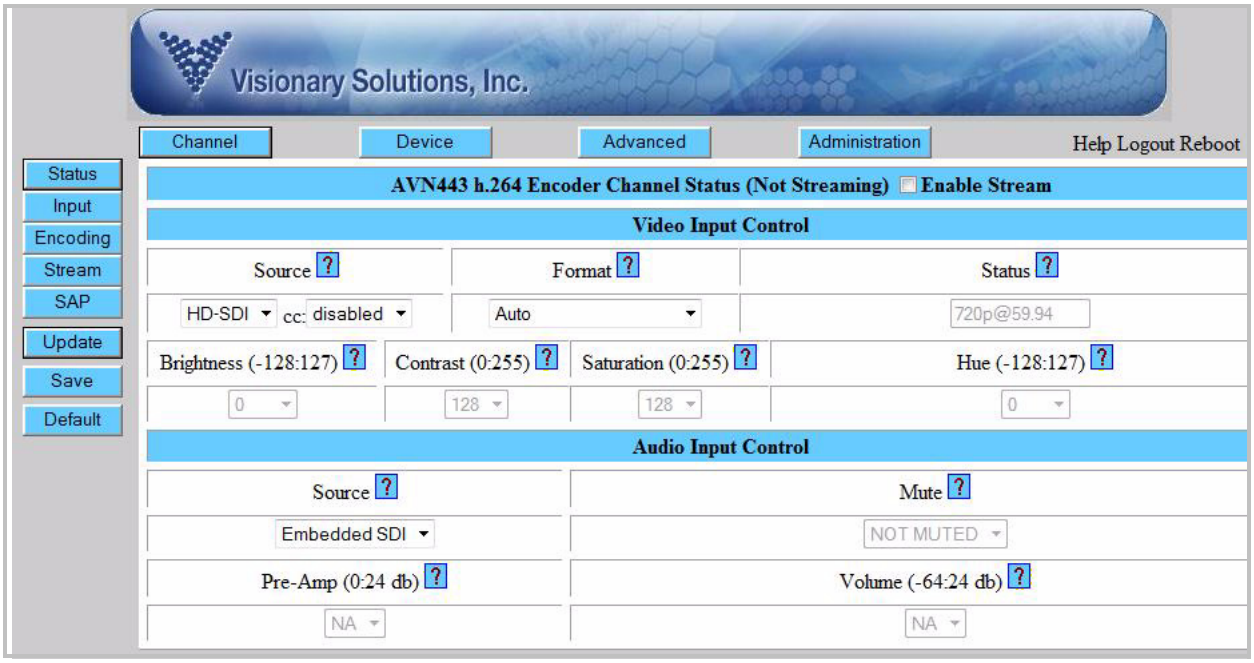


The Channel Status page displays the current status (Streaming or Not Streaming) and allows the user to check the **Enable Stream** option. If the **Enable Stream** option is enabled/checked, the AVN443 will stream when a valid video source is detected. If no video or an invalid video source is detected, streaming will stop. When this option is disabled/not checked, the AVN443 will not stream.

The main viewing area provides a general overview of the major channel settings, including: Audio and Video Inputs, Encoding Settings, and Stream Control. Except for the Enable Stream option as specified above, settings cannot be changed from this page.

6.4.2 Channel Input

Use the Channel Input page to configure both the audio and video inputs.



6.4.2.1 Video Input Control

Source – Displays the current Video Source and allows the editing of this parameter. Possible values are: HDMI or SDI.

- Closed Captioning (CC) is available on SDI only. Available options for CC are: disabled, EIA-608, or EIA-708.

Format – Displays the current Video Format and allows the editing of this parameter. If Auto is selected, the AVN detects the input video format and the Video Format is automatically adjusted for proper encoding.

Status – Displays the Video Format status detected on the selected input. Note that if no video is detected, or if the detected video input is encrypted or in an unlicensed format, the Status value will display this fact. For more on licensing of different formats (720p, 1080i, 1080p), please refer to *6.7.6 Administration Modules*.

Brightness – (HDMI only) Displays the current Video Brightness and allows the editing of this parameter. Possible values range from –128 to 127.

Contrast – (HDMI only) Displays the current Video Contrast and allows the editing of this parameter. Possible values range from 0 to 255.

Saturation – (HDMI only) Displays the current Video Saturation and allows the editing of this parameter. Possible values range from 0 to 255.

Hue – (HDMI only) Displays the current Video Hue and allows the editing of this parameter. Possible values range from –128 to 127.

6.4.2.2 Audio Input Control

Source – Displays the current Audio Source and allows the editing of this parameter. Possible values are: Balanced, Unbalanced, and Embedded HDMI or Embedded SDI, depending upon the selected Video Source.

Note: *Excluding HDMI which is always supported, only one unbalanced audio input source is supported at any one time. If the Audio Connector is configured for unbalanced audio and plugged in, the RCA audio inputs (which are always unbalanced) cannot be used at the same time, and visa versa. If two unbalanced audio inputs are connected at the same time, the result will be undetermined audio and is not recommended.*

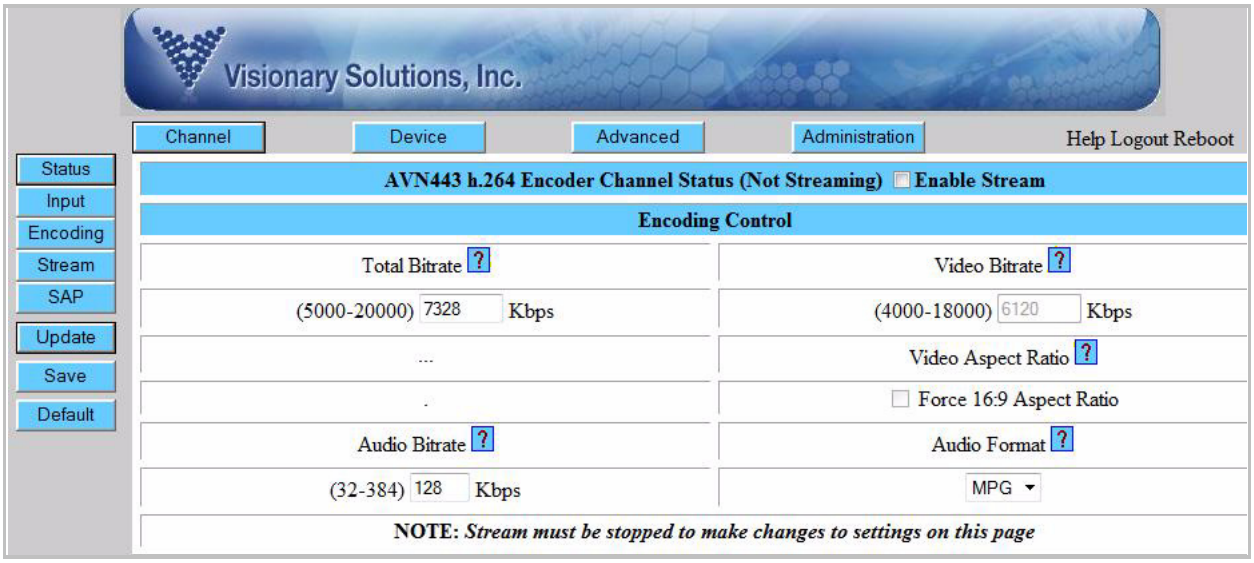
Mute – (Balanced and Unbalanced audio sources only) Displays the current Audio Mute and allows the editing of this parameter. Possible values are Muted or Not Muted.

Pre-Amp – (Balanced and Unbalanced audio sources only) Displays the current Audio Pre-Amp and allows the editing of this parameter. Possible values range from 0 to 24 dB.

Volume – (Balanced and Unbalanced audio sources only) Displays the current Audio Volume and allows the editing of this parameter. Possible values range from –64 to 24 dB.

6.4.3 Channel Encoding

Use this page to configure the Channel Encoding settings.



6.4.3.1 Encoding Control

Total Bitrate – Displays the Total Bitrate (audio and video bitrates combined), and allows the editing of this parameter. Possible values vary depending upon the Video Input Format and selected Audio Bitrate.

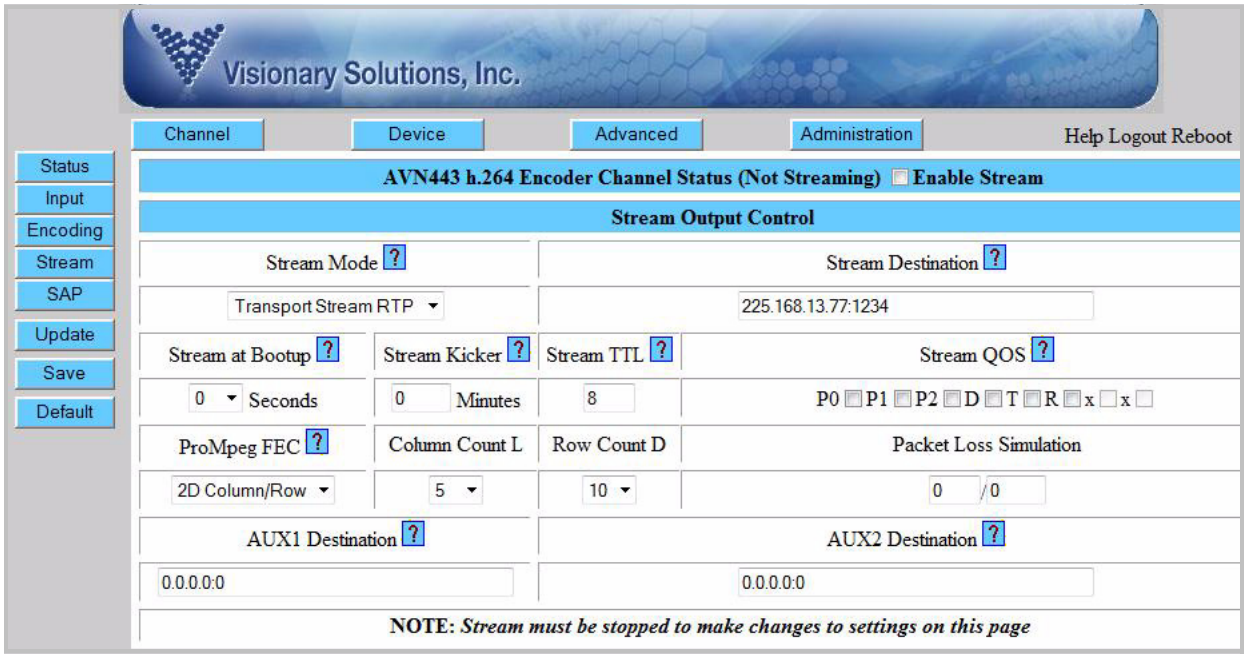
Video Bitrate – Displays the current Video Bitrate. This value cannot be modified directly but is based upon the Total Bitrate and selected Audio Bitrate values.

Audio Bitrate – Displays the current Audio Bitrate and allows the editing of this parameter. Possible value ranges are dependent upon audio format (MPEG or AAC), with both ranges currently from 32 to 384 kbps.

Audio Format – Displays the current Audio Format and allows the editing of this parameter. Possible values are: AAC (MPEG-2 AAC stereo) or MPG (MPEG-1 Layer II stereo).

6.4.4 Channel Stream

Use this page to configure the Channel Stream Output Control.



Stream Mode – Displays the current Stream Mode and allows the editing of this parameter. Possible values are:

Transport Stream UDP (13818-1 MPEG-2 TS) *Default
Transport Stream RTP (13818-1 MPEG-2 TS) + RTP encapsulation

Stream Destination – Displays the current Stream Destination and allows the editing of this parameter. The format of this parameter is the destination IP address, colon ":" and then the destination port number (*xxx.xxx.xxx.xxx*:*xxx*).

Stream at Bootup – Displays the current Stream at Bootup time in seconds and allows editing of this parameter. Possible values are: 0 to 90 seconds. Note that a value of 0 means Stream at Bootup will be disabled (the AVN443 will not automatically start streaming upon boot up).

Stream Kicker – This parameter controls if and when a running / playing stream gets automatically restarted (stopped then started). If set to 0, the stream will not be automatically restarted but will continue to play until stopped by the user. If set to a value greater than zero, the stream will be automatically restarted every *X* minutes where *X* equals the configured number. The default value is 0 / disabled.

Stream TTL – This parameter controls the streams Time-To-Live (TTL), which is effectively the number of network "hops" that the stream will cross before "dying." For Unicast streams, TTL values are defined as network segments, which are effectively routers/switches. For Multicast streams, the TTL value is more loosely defined as "scope" which is network dependent and not always directly associated with network segments. The default value is 8.

Stream QOS – This parameter controls the stream Quality of Service (QOS) through a network. Parameters P0 through P2 are precedence bits (0 to 7, 0 is highest). D is a low delay request bit. T is a high throughput request bit. R is a high reliability request bit. Any other scheme utilizing the setting of the upper 6 bits of the Type of Service (TOS) byte in the IP header may also be used.

Forward Error Correction (FEC) (requires optional FEC Module). For more information on licensing optional modules please refer to *6.7.6 Administration Modules*.

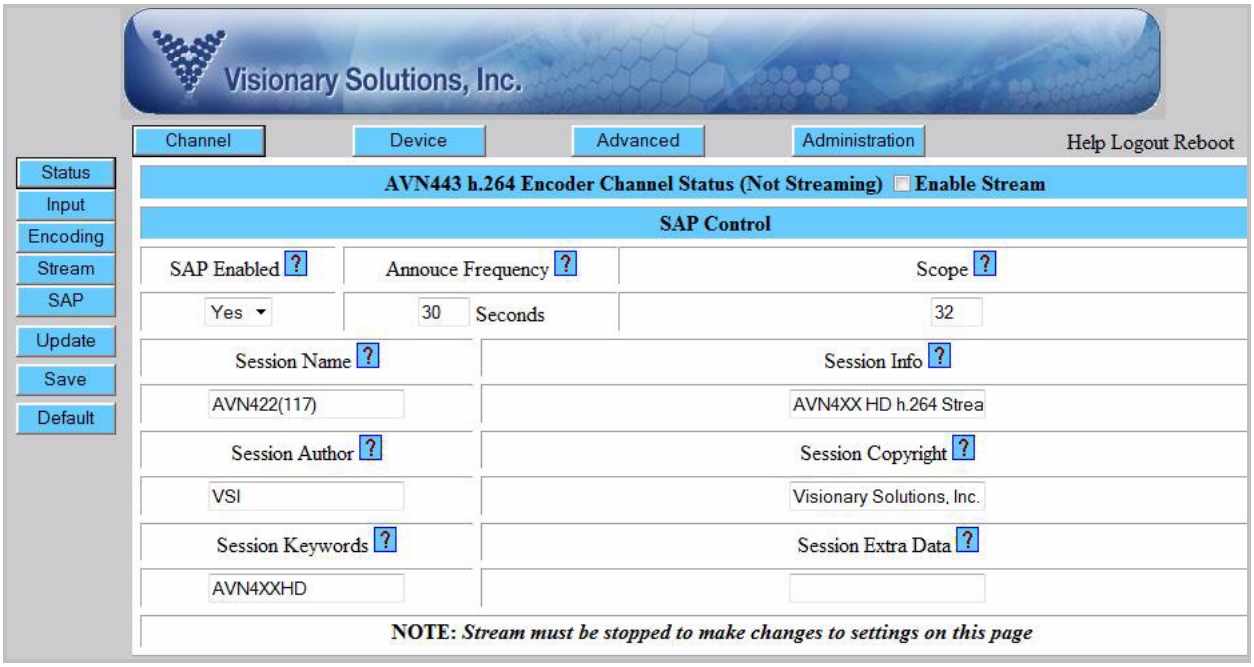
- **Special Note:** The following FEC capabilities / parameters (ProMPEG FEC, Column Count L, Row Count D, and Packet Loss Simulation) are **only available with Transport Stream RTP stream mode**.
- **ProMpeg FEC** – Displays the current ProMpeg FEC Enabled status and allows the editing of this parameter. Available options are: Disabled, 1D Column only, or 2D Column/Row.
- **Column Count L** – Displays the current Column Count L value and allows editing of this parameter. Possible values are: 1 to 10. L represents the number of Columns in the packet matrix.
- **Row Count D** – Displays the current Row Count D value and allows editing of this parameter. Possible values are: 4 to 10. Note that value of "Row Count D" actually represents the length of "Columns" in the packet matrix, not "Rows".
- **Packet Loss Simulation** – Packet Loss simulation allows testing of the FEC by removing (M / N) original data packets from the outgoing stream, forcing the usage of FEC packets for recovery.
  For example: To "drop" one out of every thousand packets, thus forcing FEC to work to recover them, set the first number (M) to 1 and the second value (N) to 1000. The Packet Loss Simulation value will look like 1 / 1000. The valid ranges for testing are 0<=M<=L (where L is the column count value) and 0<=N<=5000.

AUX1 Destination – Displays the destination IP address and port for Auxiliary Stream 1 and allows the value to be changed.

AUX2 Destination – Displays the destination IP address and port for Auxiliary Stream 2 and allows the value to be changed.

6.4.5 Channel SAP Page

Use this page to configure the Channel Session Announcement Protocol (SAP) settings.



SAP Enabled – Displays the current SAP Enabled status and allows the editing of this parameter. When SAP is enabled (Yes), SAP announcements are broadcast over the network at the SAP announce frequency. When SAP is disabled (No), no SAP announcements are broadcast over the network.

SAP Announce Frequency – Displays the current SAP Announce Frequency and allows the editing of this parameter. The SAP Announce Frequency determines how often (in seconds) the SAP announcement is broadcast. The default value is 30 seconds.

SAP Scope – Displays the current SAP Scope and allows the editing of this parameter. SAP Scope determines how "far" the SAP broadcast will go on the network. Scope, as pertains to SAP, is loosely defined. It is network dependent and not always directly associated with network segments. The default value is 32.

SAP Session Name – Displays the current SAP Session Name and allows the editing of this parameter. SAP session's name is often used or displayed in SAP aware applications.

SAP Session Info – Displays the current SAP Session Info and allows the editing of this parameter. SAP session's info is often used or displayed in SAP aware applications.

SAP Session Author – Displays the current SAP Session Author and allows the editing of this parameter. SAP session's author is often used or displayed in SAP aware applications.

SAP Session Copyright – Displays the current SAP Session Copyright and allows the editing of this parameter. SAP session's copyright is often used or displayed in SAP aware applications.

SAP Session Keywords – Displays the current SAP Session Keywords and allows the editing of this parameter. SAP session's keywords can be used by SAP aware applications.

SAP Session Extra Data – Displays the current SAP Session Extra Data and allows the editing of this parameter. SAP session's extra data can be used by SAP aware applications.

6.5 Device Page

Use the Device pages to view and configure device descriptors (name, location, comments) and network information.

6.5.1 Device Status

Use the Device Status page to view the current device settings. Settings cannot be changed from this page.

ID Settings – Displays the current ID settings (Product Code, Serial Number, Name, Location).

Network Settings – Displays the current network settings (IP Address, Netmask, Gateway, DNS, Time Server, UTC Time Offset, Use DHCP, and DHCP Valid).

6.5.2 Device ID

Use this page to configure the Device ID settings.

Product Code – read only and cannot be changed.

Serial Number – read only and cannot be changed.

FW Version – Firmware Version is read only and cannot be changed.

Slot ID – read only and cannot be changed. The Slot ID corresponds to the slot number of the chassis the blade currently occupies.

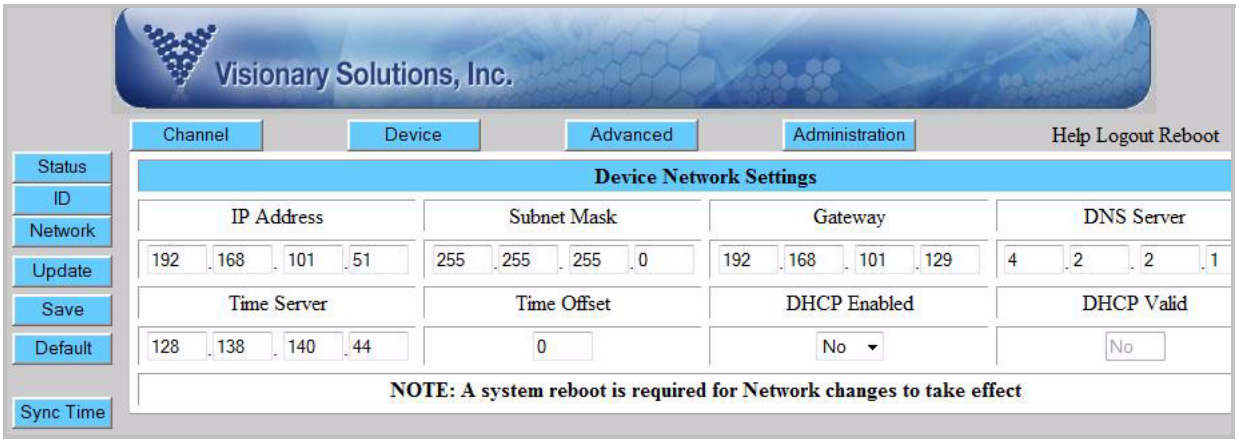
Device Name – an editable character string used to help ID the device. The device name can be up to 64 characters long.

Device Location – an editable character string used to help describe the location of the device. The device location can be up to 64 characters long.

Device Comments – an editable character string used for general comments regarding the device. Comments can be up to 256 characters long.

6.5.3 Device Network

Use this page to configure the Device Network settings.



IP Address – Displays the IP address of the device and allows its configuration.

Subnet Mask – Displays the subnet mask of the device and allows its configuration.

Gateway – Displays the gateway of the device and allows its configuration.

DNS Server – Displays the DNS server of the device and allows its configuration.

Time Server – Displays the IP address of a time server and allows its configuration.

Time Offset – Displays the number of time zones ahead of Greenwich Mean Time (GMT). For Pacific Standard Time (PST), the time offset is either 7 or 8 depending upon daylight savings.

DHCP Enabled – Options are Yes or No.

DHCP Valid – Displays whether a valid DHCP server is detected on the device's network segment. Options are Yes or No.

Sync Time button – Synchronizes the encoder's time with the time of the specified Time Server.

6.6 Advanced Page

Use the Advanced page to view and configure advanced settings from the Channel and Device groups. These settings include Advanced Status, System, Events, Alarms, and Statistics.

6.6.1 Advanced Status

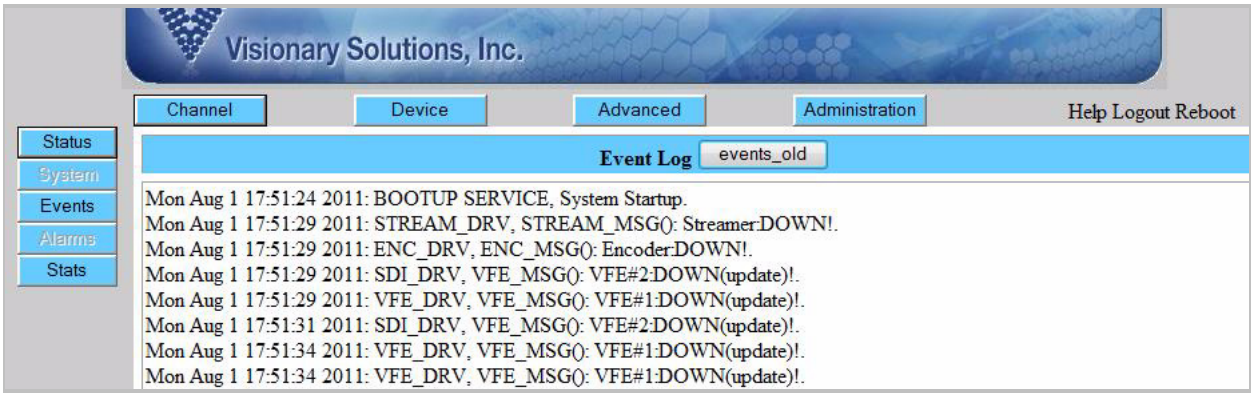
This feature is partially implemented.

6.6.2 Advanced System

Not currently implemented.

6.6.3 Advanced Events

Use this page to display the internal Events log. The **events_old** button is not currently implemented.

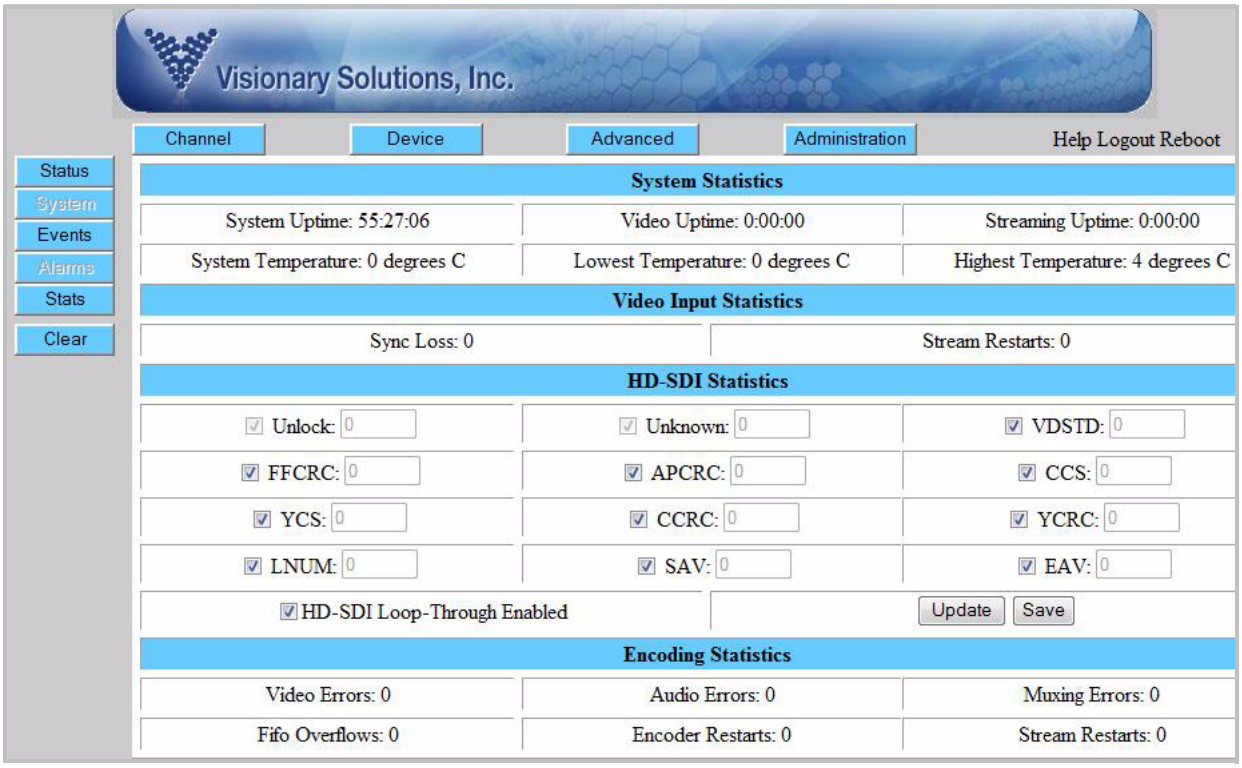


6.6.4 Advanced Alarm

Not currently implemented.

6.6.5 Advanced Statistics

Use the Advanced Statistics page to view advanced system, video input, HD-SDI, and encoding statistics since the last power cycle, reboot, or Factory Default reset.



The **Clear** button sets all the stats back to "zero" or appropriate values.

6.6.5.1 System Statistics

System Uptime – Displays the amount of time the encoder (system) has been powered on.

Video Uptime – Displays the amount of time the encoder has detected "good" video.

Streaming Uptime – Displays the amount of time the encoder has been streaming.

System Temperature – Displays the current encoder (system) temperature.

Lowest Temperature – Displays the lowest registered temperature.

Highest Temperature – Displays the highest registered temperature.

6.6.5.2 Video Input Statistics

Sync Loss – Displays the number of times "No Video" is reported while streaming.

Stream Restarts – Displays the number of times a stream had to be stopped and restarted because of a video input error.

6.6.5.3 HD-SDI Statistics (Error Checks)

The HD-SDI Statistics section lists the HD-SDI input errors that the encoder monitors. Check or uncheck an error for the encoder to monitor or ignore/mask errors detected in the HD-SDI input. If a monitored error is detected, the encoder increments the error counter and reports "No Video" to the system. Any active streams are stopped until the error is resolved, at which time streaming will resume.

If the encoder detects an error that is not checked and is actively encoding/streaming at the time, the encoder will attempt to encode the video with undefined results. While some errors can be ignored without issue, some errors will stop the encoding process.

Important: After making changes to the checked states of any errors, click the **Update** or **Save** button at the bottom of the HD-SDI Statistics section to save the new states. **Update** temporarily saves the change until the next reboot/power cycle, while **Save** writes the data to permanent memory.

VDSTD – Video Standard error.

FFCRC – Full Frame CRC error.

APCRC – Active Picture CRC error.

CCS – Chroma ancillary data checksum error.

YCS – Luma ancillary data checksum error.

CCRC – Chroma CRC error.

YCRC – Luma CRC error.

LNUM – Line number error.

SAV – SAV error.

EAV – EAV error.

6.6.5.4 Encoding Statistics

Video Errors – Displays the number of video errors detected by the encoder.

Audio Errors – Displays the number of audio errors detected by the encoder.

Muxing Errors – Displays the number of multiplexing (muxing) errors detected by the encoder.

Fifo Overflow – Displays the number of Fifo Overflows detected by the encoder.

Encoder Restarts – Displays the number of times the encoder has had to restart because of a detected encoder error.

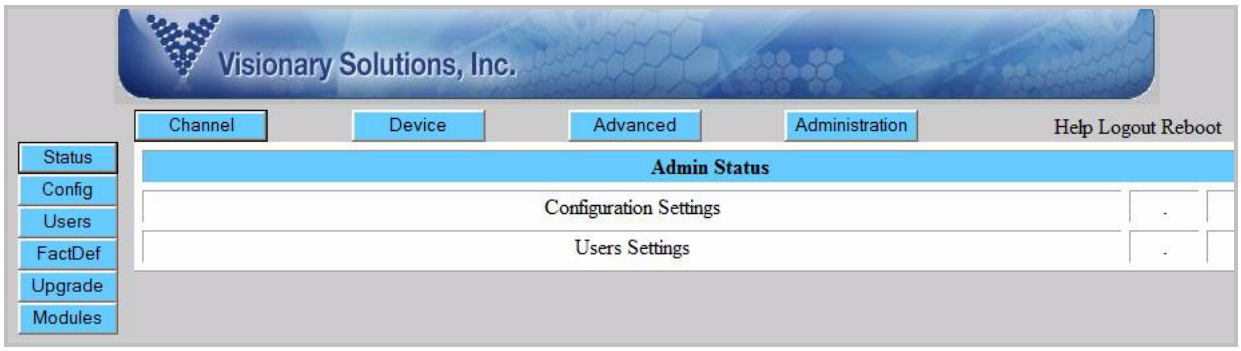
Stream Restarts – Not currently used.

6.7 Administration Page

Use the Administration page to view and configure all administration related settings, including Administration Configuration Data, Admin Users, initiate a Factory Default reset, perform an Upgrade, and manage Modules.

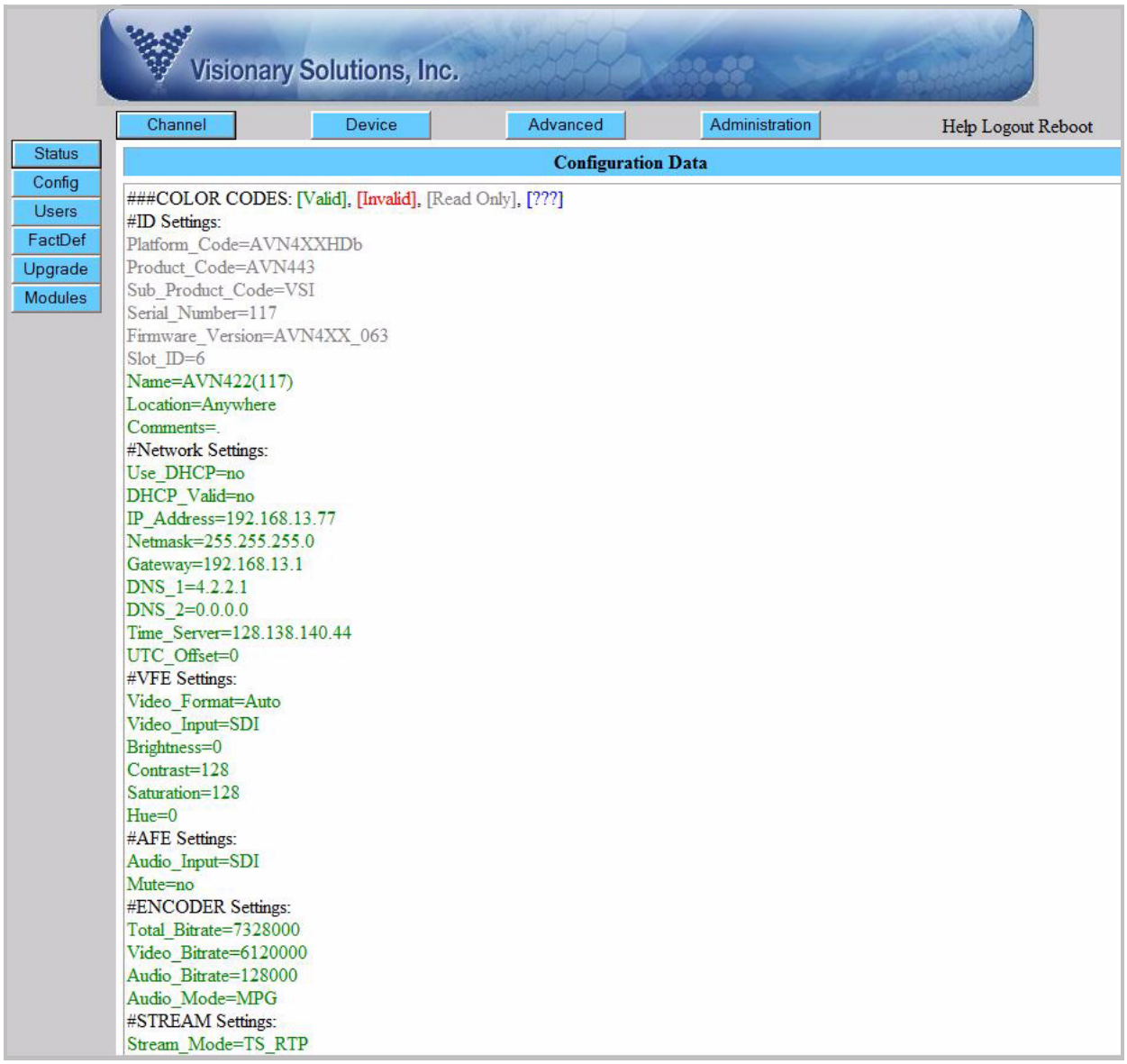
6.7.1 Administration Status

The Administration Status page is partially implemented.



6.7.2 Administration Configuration

The Administration Configuration Data page displays an overview of all the encoder's configured settings. This page is read only.



6.7.3 Administration Users

The Administration Users page displays all of the authorized users, along with their respective passwords and user levels. Use this page to add, modify, delete, save and restore user settings.

Note: *The illustration above shows a System Users page with the Default Admin User, along with two added users with Channel and Start/Stop user level authorization respectively.*

Edit User – Click to change the Password and Level fields. Once clicked, the **Edit User** button changes to **Update User**. After entering changes, make sure to click the **Update User** button to save the changes for the user before clicking the **Save User Config** button to make the changes persistent.

Note: *The Default Admin User cannot be deleted or have its Username or User Level modified. Only the Password may be changed.*

Delete User – Deletes the user. Make sure to click the **Save User Config** button after deletion to make the change persistent.

Add User – Displays the Add User page which allows for the creation and addition of a new user. Enter the Username, Password and Level fields as desired and click the **Add User To Database** button. Make sure to click the **Save User Config** button after creating the user to make the changes persistent.

Save User Config – Saves all of the user page changes to flash memory so that they will be persistent.

Reset Default User Config – Removes any added users and returns the Default Admin User to its default username and password values (admin/admin). Make sure to click the **Save User Config** button after reset to make the changes persistent.

About User Levels:

There are four possible authorization levels which can be assigned to a given user.

Admin – The Admin user level has full administrative authorization and can modify all device parameters, including other users. Note that you can only change the default admin user's password, and not the Username or Level, and the default admin user cannot be deleted. Other

admin users can be created with different Usernames, but the Default Admin User will always exist in the list.

Channel – The Channel user has the ability to configure, update and save any setting in the Channel pages, including Input, Encoding, Stream, and SAP, as well as the ability to view the Advanced pages, Events and Stats. All other browser pages (Device and Administration) are disabled.

Start/Stop – The Start/Stop user only has the ability check and uncheck the Enable Stream option on the device, which starts and stops the device's stream (including any auxiliary streams) depending on the video input status. All the settings on the Channel and Advanced pages can be viewed, but not configured, updated, or any changes saved.

Invalid – The Invalid user cannot log in to the device. This user level can be assigned to disable a previously saved user, if deleting the user is not desirable.

6.7.4 Administration FactDef

Clicking the **FactDef** button causes the AVN443 to reset all of its settings to Factory Default values, including network settings.

6.7.5 Administration Upgrade

The Administration Upgrade page displays all of the current firmware "image/component" versions and allows each firmware component to be upgraded independently (refer to *Chapter 8 Field Upgrade*).

Note: *In order to upgrade firmware components, the AVN443 must have a valid Gateway IP address configured and be on a network that has access to the Internet.*

The AVN443 has four firmware components:

1. Root File System
2. Linux Kernel
3. U-Boot Boot Loader (Boot Loader)
4. Configuration Partition (not currently implemented).

Each firmware component must be updated independently, but not all components will always need to be updated. The Root File System is the most likely to change, and therefore the most likely to require updating. If two or more image/components need to be updated, the updates must be performed in the order specified above (1. Root File System, 2. Linux Kernel, 3. Boot Loader, and 4. Configuration Partition).

Warning: Failure to upgrade the firmware components in the proper order can cause the AVN443 to become non-operational and require that it be reprogrammed by VSI at customer's expense.

However, only out-of-date components need to be updated. For example, if both the Root File System and the Boot Loader components are out-of-date, update the Root File System component first and the Boot Loader second. The Linux Kernel, which is not out-of-date in this example, would not need to be updated. If it did, update it after the Root File System and before the Boot Loader.

Component – Displays the current firmware component name.

Installed Version – Displays the current firmware component version information.

Latest Available Version – Displays the most current firmware component version available.

Note: *The Latest Available Version column and **Upgrade Latest** buttons are only enabled if the encoder blade is properly configured for a given network (valid Gateway and DNS) and has the ability to request data (firmware components) from the public Internet.*

Actions:

Upgrade Latest – This button causes the corresponding component to be upgraded to the latest version. After each upgrade, the AVN443 automatically reboots.

Upgrade Custom Image – This button is for advanced users only and requires specific component files in order to work properly. ****IMPORTANT** Improper use of this option can seriously impair the functionality of the AVN443, requiring it to be returned to VSI for repair at the customer's expense.**

6.7.6 Administration Modules

The Administration Modules page displays the modules that are currently available, including the name, key value and license status for each module. If a module is not currently licensed, the

Key Value field displays "no key", and the License Status field displays "unlicensed". If a module is licensed, the Key Value field displays the password place holders, and the License Status field displays "license ok". The modules can be updated automatically or manually.

In order to purchase a new module license, contact your sales representative. Once purchased, the license key is added to an online database. You can select either the Auto or Manual Key Update buttons to active the module.

Forward Error Correction – This module allows the AVN443 to use FEC when the stream mode is set to Transport Stream RTP. (See section *6.4.4 Channel Stream* for information on setting the stream mode and configuring the FEC parameters.)

720P HD Resolution – This module allows encoding for the following video input formats:

- 720p 59.94/60
- 720p 50

1080i HD Resolution – This module allows encoding for the following video input formats:

- 1080p 24
- 1080i 59.94/60
- 1080i 50
- 720p 59.94/60
- 720p 50

1080p HD Resolution – This module allows encoding for the following video input formats:

- 1080p 60
- 1080p 24
- 1080i 59.94/60
- 1080i 50
- 720p 59.94/60
- 720p 50

Auto Key Update – This button instructs the AVN443 to update the module status by checking against an online database.

To auto update a module's keys: Purchase the desired module license(s) from your sales representative. Click the **Auto Key Update** button. The keys will be updated automatically, assuming the device is configured properly to reach the Internet.

Note: *In order for the blade to obtain the latest module license information, it must be configured with valid Gateway and DNS addresses and have access to the Internet. If this is not an option, use the Manual Key Update described below.*

Manual Key Update – This button allows the user to manually input Key Values for a selected module type, and either update the values until the next reboot/power cycle using the **Update Keys** button, or save the values so that they are persistent after a reboot/power cycle using the **Save Keys** button. The **Update** and **Save Keys** buttons behave the same as the **Update** and **Save** buttons on the main page (refer to section *6.2 The Browser Interface Main Page*).

To manually update a modules key: Purchase the desired module license from your sales representative and get a copy of the key. Click the **Manual Key Update** button, enter the new key value in the field for the selected module, then click either the **Update Keys** or **Save Keys** button.

Chapter 7 Troubleshooting

This section provides useful information to help you to resolve any difficulty you might have with your AVN443.

7.1 Checking the Firmware

It is important to know the version of the AVN443 firmware in order to troubleshoot the unit. To find the firmware version of your AVN443, select one of the following methods:

1. From the PackeTV™ Manager (2nd generation), this functionality is not currently implemented.

2. From the AVN443 Browser Interface pages, navigate to the Device ID page (refer to section *6.5.2 Device ID*), and the firmware version is shown.

7.2 Support

Should you require any technical assistance, please contact your VSI reseller. If your questions cannot be answered immediately, your reseller will forward your queries through the appropriate channels to ensure a rapid response.

If you are connected to the Internet, you can:

- Download user documentation. Go to www.vsicam.com/index.php?p=documentation.
- Find answers to resolved problems in the FAQ database. Search by product, category, or phrases. Go to www.vsicam.com/index.php?p=faq.
- Report problems to VSI support staff by sending an email to: avntech@vsicam.com.
- Visit the Customer Support section of the VSI web site at www.vsicam.com.

7.3 Factory Default Settings

This procedure provides a way to reset the AVN443 configurations back to the factory default settings, which may be necessary or desirable in certain circumstances.

If restoring the Factory Default, it is recommended that it be performed through the Browser Interface as described in section *6.7.4 Administration FactDef*. The unit will reboot to its Factory Default settings. Note that a Factory Reset causes all of the settings, including the network settings, to be reset to Factory Default values. Performing a Factory Default reset will restore the DHCP settings to DHCP-On, causing the unit to acquire a new IP address. If there is no DHCP server available on the network segment, the AVN443 will automatically reset to default IP address 192.168.1.253.

However, if necessary (possibly due to lack of ability to communicate with the unit due to misconfiguration), a hardware reset procedure is provided below.

To return the AVN443 to the Factory Default settings:

1. Remove the AVN443 blade from the chassis (see *2.1 Blade Installation and Removal*).
2. Locate the Factory Default 2 pin vertical header, located at the top center of the AVN443 blade's PCB, near the Ethernet connector.
3. Place a 100 mil jumper/shunt (one is provided with AVN443) on the Factory Default 2 pin vertical header.
4. With the chassis powered on, insert the AVN443 blade back into the chassis.

Warning: Do not remove the blade or turn off power to the unit until the default is complete as described below.

5. Observe the Status and Video LEDs on the front of the unit.
6. Wait for these lights to be "solid" on (no blinking); this indicates that the default reset is complete.
7. Remove the blade from the chassis, remove the jumper/shunt, and then re-install the blade. The Factory Default should be complete.

Chapter 8 Field Upgrade

8.1 Firmware Component Overview

The AVN443 h.264 encoder blade is built on top of an embedded Linux software platform. The Overall functionality of the system software is best looked at in four distinct pieces.

1. **Root File System**. The Root File System contains all of the necessary scripts and libraries for Linux, as well as all of the additional value added software for user interfaces, encoding and streaming control, and everything else that runs outside of the context of the Linux Kernel.

2. **Linux Kernel**. The Linux Kernel is the core of the running system after control is handed over by the Boot Loader. The Linux Kernel is responsible for virtualizing access to the underlying hardware and controlling all of the running processes in the system.

3. **U-Boot Boot Loader**. The U-Boot Boot Loader (Boot Loader) is responsible for early system initialization and configuration. It allows for updating and system configuration, but is locked down to prevent system level accidents.

4. **Configuration Partition**. Not currently implemented.

Note: *Each top level AVN4XX firmware version is made up of three component images, and each component image has it's own version information. For example, the top level firmware version AVN4XX_063 consists of the following component (image) versions: Root File System - 051, Linux Kernel - 01A, and U-Boot - 023. The same information is displayed in the AVN4XX Release Notes as "AVN4XX_063: (UB4XX_023, LK4XX_01A, BB4XX_00A, VSI4XX_06C, CFG4XX_051, RFS4XX_051) ".*

8.2 Firmware Component Versions

In order to determine if a firmware upgrade is required, you will need two pieces of information: namely what is currently installed and what is available. This is most easily done through the Browser Interface as you can view both the current versions and the latest versions that are available, assuming the blade is configured with valid Gateway and DNS addresses and has access to the Internet.

Note: ***In order for the blade to obtain the Latest Version Information, it must be configured with valid Gateway and DNS addresses and have access to the Internet. If this is not an option, use method 8.2.2 described below.***

8.2.1 Browser Interface: To Determine Both the Current and Latest Version Information

1. Open the Browser Interface.
2. Navigate to the Administration Upgrade page (refer to section *6.7 Administration Page*).

This will display both the Current Version and Latest Version component information.

8.2.2 Via the Internet: To Determine the Latest Available Firmware Component Version

1. Open a browser.
2. Go to http://www.vsicam.com/index.php?p=custom_pages&page_name=AVN4XX_Updates to view the latest released firmware component versions (images) and their release dates.

8.3 Updating Firmware Components

Each firmware component must be updated independently, but not all components will always need to be updated. The Root File System is the most likely to change, and therefore the most likely to require updating. If two or more image/components need to be updated, the updates must be performed in the following order:

- Root File System
- Linux Kernel
- Boot Loader, and
- Configuration Partition (not currently implemented).

Warning: Failure to upgrade the firmware components in the proper order can cause the AVN443 to become non-operational and require that it be reprogrammed by VSI at customer's expense.

However, only out-of-date components need to be updated. For example, if both the Root File System and the Boot Loader components are out-of-date, you would update the Root File System component first and the Boot Loader second. The Linux Kernel, which is not out-of-date in this example, would not need to be updated. If it did, you would update it after the Root File System and before the Boot Loader.

Only one firmware component can be updated at a time.

Note: Depending upon the blade's previous firmware version, updating the U-Boot components may cause the blade to acquire a new MAC address. This means that DHCP-configured units may acquire a new IP address, and it may take statically configured blades up to three minutes to appear correctly in the ARP table.

8.3.1 General Firmware Component Update Procedure

In order to use these procedures, the AVN443 needs to be on a network that has access to the Internet, and all of the network settings, including the Gateway and DNS addresses, need to be configured correctly. If this information is not configured correctly, the device will not be able to download the required firmware files and the "Upgrade" buttons will be disabled.

Also note that while following the component update procedures, the Browser interface may display the Unrecognized Internal Machine State page (see below) instead of the Channel Status page. This is normal and simply indicates that one or more of the component images are incompatible with each other in their current state. Finish the rest of the component updates as described and the device will return to its normal state.

8.3.1.1 Browser Interface

1. Open the Browser Interface.
2. Navigate to the Administration Upgrade page (refer to section *6.7 Administration Page*).
3. Determine which firmware components need updating by comparing the Current Version information to the Latest Version information.
4. Click on the **Upgrade Latest** button for the firmware component to upgrade. ****IMPORTANT** Remember to upgrade the firmware components in order as described above in section *8.3 Updating Firmware Components*.**
5. Select **Yes** when prompted to proceed with the component upgrade.
6. Select **OK** when told to wait for the page to reload before proceeding.
7. Wait (**2-4 minutes, depending upon the component**) for the unit to reboot and the Browser Interface to reload. Note that when the reboot is complete, the Browser Interface will open to either the Urecognized Internal Machine State page (refer to *8.3.1* above) or the Channel Status page, depending upon which component update completes.

8.3.1.2 PackeTV™ Manager (2nd generation)

Not Currently Implemented.

8.3.2 Custom Firmware Component Update Procedure

In the case that Internet connectivity is not available or that a firmware component version other than the latest released version from the standard location is desired, use one of the following procedures.

8.3.2.1 Browser Interface

1. Open the Browser Interface.
2. Navigate to the Administration Upgrade page (refer to section *6.7 Administration Page*) and click on the **Upgrade Custom Image** button.
3. From the Custom Upgrade page, specify the following values:
   a. The firmware image/component to update;
   b. The HTTP URL, to specify where the firmware component is located; and
   c. The MD5 checksum URL, to specify where the MD5 checksum is located.
4. Click on the **Upgrade Latest** button for the firmware component to upgrade.
   ****IMPORTANT** Remember to upgrade the firmware components in order as described above in section *8.3 Updating Firmware Components*.**
5. Select **Yes** when prompted to proceed with component upgrade.
6. Select **OK** when told to wait for the page to reload before proceeding.
7. Wait (**2-4 minutes, depending upon the component**) for the unit to reboot and the Browser Interface to reload. Note that when the reboot is complete, the Browser Interface will open to either the Urecognized Internal Machine State page (refer to *8.3.1* above) or the Channel Status page, depending upon which component update completes.

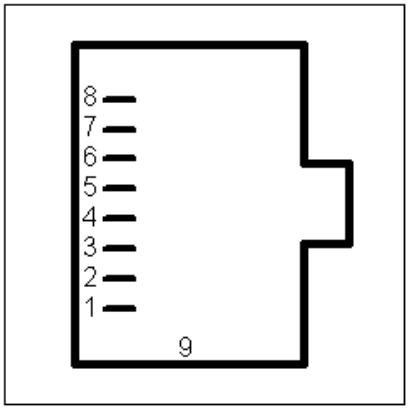
8.3.2.2 PackeTV™ Manager (2nd generation)

Not Currently Implemented.

Chapter 9 Unit Connections

9.1 Ethernet Connector

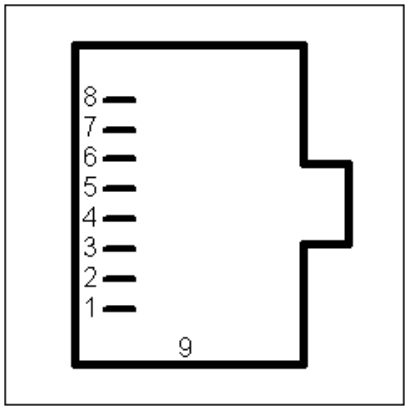
Pin	Function
1	TX+
2	TX-
3	RX+
4	
5	
6	RX-
7	
8	
9	Shield Ground



View is looking into the connector.

9.2 Ethernet Serial Connector

Pin	Function
1	RS422 TX+
2	RS422 TX-
3	RS232C TXD
4	Signal Ground
5	GPIO
6	RS232C RXD
7	RS422 RX-
8	RS422 RX+
9	Shield Ground

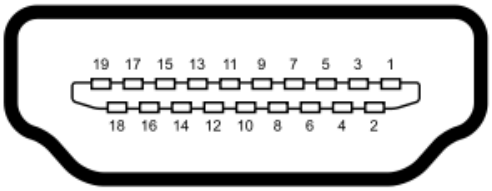


View is looking into the connector.

Alternate View.

9.3 HDMI Connector

Pin	Function
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	CEC
14	Reserved (N.C. on device)
15	SCL
16	SDA
17	DDC/CEC Ground
18	+5 V Power (max 50 mA)
19	Hot Plug Detect

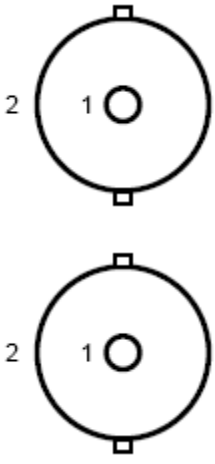


Type A (Female) HDMI
View is looking into the connector.

9.4 HD-SDI/Loop Connectors

Pin	Function
1	HD-SDI
2	Ground

Pin	Function
1	HD-SDI (re-clocked)
2	Ground

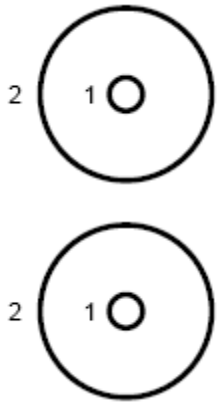


View is looking into the connector.

9.5 RCA Audio Connectors

Pin	Function
1	Right (Red)
2	Ground

Pin	Function
1	Left (White)
2	Ground



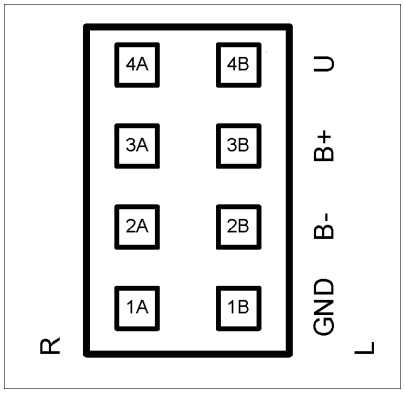
View is looking into the connector.

9.6 Audio Terminal Block Connector

9.6.1 Pinouts

See the following paragraph for instructions on configuring the supplied Audio terminal block connector (supplied).

Pin	Function
1A	Right Ground
2A	Right Balanced Audio Negative
3A	Right Balanced Audio Positive
4A	Right Unbalanced Audio
1B	Left Ground
2B	Left Balanced Audio Negative
3B	Left Balanced Audio Positive
4B	Left Unbalanced Audio



View is looking into the connector.

9.6.2 Configuration

The following describes how to configure the Audio terminal block connector:

1. Cut and strip the wires on the cable that will connect to your audio source. The strip length should be approximately 1/4 inch long.

2. For each connection, insert a small object, such as a screw driver, into the terminal block's latch in order to open the wire clamp.

3. Insert each wire into its wire clamp.

4. Release the latch allowing the wire clamp to close.

Chapter 10 Technical Specifications

h.264 Stream Information:

- Video: h.264 MPEG-4 AVC Compression

Input Format @ Hz		Module Required	Video Bitrate (Mbps)	h.264 Profile
HD	1080p @ 60	1080p60	6–20	High Profile Level 4.0
	1080p @ 24	1080i	6–20	High Profile Level 4.0
	1080i @ 59.94/60	1080i	6–20	High Profile Level 4.0
	1080i @ 50	1080i	6–20	High Profile Level 4.0
	720p @ 59.94/60	720p	4–20	High Profile Level 4.0
	720p @ 50	720p	4-20	High Profile Level 4.0
SD	576i @ 50		2–10	Main Profile Level 3.0
	480i @ 59.94		2–10	Main Profile Level 3.0

- Audio:
  - MPEG-2 AAC (Advanced Audio Codec) with configurable audio encoding from 32 to 384 kbps with a 48 kHz sample rate
  - MPEG-1 Layer II with configurable audio from 32 to 384 kbps with a 48 kHz sample rate

Audio Inputs:

- Audio Terminal Block Connector:
  - Left and Right balanced audio, maximum input level 1 Vrms
  - Left and Right unbalanced audio, maximum input level 1 Vrms

- RCA Audio:
  - Two RCA audio connectors, unbalanced L and R (left and right)

Video Inputs:
- One HDMI connector
- One HD-SDI video connector (input)
- One HD-SDI video connector (re-clocked loop through)

Network Connection:
- One RJ-45 connector on dual connector, twisted pair cable, 10baseT or 100baseTX Fast Ethernet

Serial Connector:
- One RJ-45 connector on dual connector

Closed Captioning (CC):
- SDI only (SD/HD/3G) EIA-608 and EIA-708

Forward Error Correction (FEC)

- SMPTE-2022 Pro-MPEG FEC Code of Practice # 3, Release 1 and 2 (requires FEC module)

Power Supply: Input 4.75 watts, powered through the MPP chassis

- MPP200 Chassis 100–240 VAC 50/60 Hz Adapter
- MPP1700 Chassis 100–240 VAC 50/60 Hz

Physical Dimensions:

- Width: 40 cm (1.6 in.)
- Depth: 131 cm (5.2 in.)
- Height: 175 cm (6.9 in.)

Weight:

- 220 g or 0.49 lb (approximate)
- 230 g or 0.51 lb (approximate)

Environmental:

- Operating Temperature 10ºC to 50ºC (14ºF to 122ºF)

Chapter 11 Safety and Compliance Information

This product can only be used in a VSI blade system. Unintended use of this product, or use with non-VSI listed components, is forbidden and violates safety approvals.

Safety Approval:

CE, UL Listed I.T.E. E257717

EMC: FCC Part 15 Class A

[MPP200] Class B, EN55022
[MPP1700] Class A, EN55022, EN61000-3-2, EN61000-3-3, EN55024

SAFETY: EN60950-1

Glossary of Terms

AAC	Advanced Audio Coding
AC	Alternating Current
AFF	Adaptive Frame/Field per Picture
ARP	Address Resolution Protocol
AT	Active Tunnel
ATSC	Advanced Television Systems Committee
AUX	Auxiliary
AV	Audio Video
B Frames	Bi-directional Frames (pictures)
dB	decibel
BNC	Bayonet Neill-Concelman (connector)
CC	Closed Captioning
CCTV	Closed Circuit Television
CD	Compact Disc
cm	centimeter
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CVBS	Composite Video Broadcast Signal
DHCP	Dynamic Host Configuration Protocol
DVI-D	Digital Visual Interface - Digital only
ESD	Electrostatic Discharge
FEC	Forward Error Correction
fps	fields per second
FTP	File Transfer Protocol
GND	Ground
GMT	Greenwich Mean Time
GOP	Group of Pictures

GPIO	General Purpose Input/Output
h.264	Video compression standard, also known as MPEG-4 AVC (Advanced Video Coding) or MPEG-4 Part 10
HD	High Definition
HDMI	High Definition Multimedia Interface
HTTP	Hyper Text Terminal Protocol
Hz	Hertz
I Frame	Intracoded Frames (pictures)
I/O	Input/Output
IGMP	Internet Group Messaging Protocol
IPTV	Internet Protocol Television
in.	inch
IP	Internet Protocol
kbps	kilobits per second (1 kbps =1,000 bits per second)
kg	kilogram
kHz	kilohertz
LAN	Local Area Network
MAC	Media Access Control
MB	Mega byte
Mbps	Megabits per second
MHz	Megahertz
MPEG	Motion Picture Experts Group
ms	millisecond
NTSC	National Television Standards Committee (USA)
P Frames	Predicted Frames (pictures)
PAL	Phase Alternating Line (Europe)
PHY	Phase Alternating Line (Europe)
PID	Packet Identifier
PT	Passive Tunnel

PTZ	Pan Tilt Zoom (device)
QOS	Quality of Service
TCP/IP	Transmission Control Protocol/Internet Protocol
RAM	Random Access Memory
RCA	Radio Corporation of America
RFC	Request for Comments
RFC 1112	Host Extensions for IP Multicasting
RFC 2236	Internet Group Management Protocol, Version 2
RTSP	Real Time Streaming Protocol, based on Live555
SAP	Session Announcement Protocol
SDI	Serial Digital Interface
SMTP	Simple Mail Transfer Protocol
TOS	Type of Service
TTL	Time to Live (IP)
UDP	User Data Protocol
VBI	Vertical Blanking Interval
VDC	Volts Direct Current
Vrms	Volts Root Mean Square

Appendix A – Quick Start Guide

Visionary Solutions, Inc.

AVN4XX Quick Start Guide

(AVN420, AVN422, AVN441, and AVN443)

AVN420

AVN422

AVN441

AVN443

- **Please visit the support section of our website at www.vsicam.com for manuals, other documentation, and software downloads.**
- **This is a Quick Start Guide only and NOT the full User's Manual. Current user manuals are available online.**

September 6, 2011
Revision: 1.0.0

2060 Alameda Padre Serra, Suite 100· Santa Barbara, CA 93103

Tel: (805) 845-8900 · Fax: (805) 845-8889 www.vsicam.com

AVN4XX Quick Start Guide

Introduction

This document is intended to assist users in the initial configuration and setup of the AVN4XX series of encoders. This document is NOT intended to provide installation instructions for either the AmiNet or other AVN products (AVN2XX).

Equipment Required

- 1 Blade card (AVN420, AVN422, AVN441, or AVN443)
- 1 MPP200 or MPP1700 Chassis with matching power supply
- 1 Ethernet cable
- 1 RJ45 to DB9 serial cable (same as Cisco console cable, only needed for initial configuration)
- 1 Video cable:
    - AVN420 – SVideo or Composite
    - AVN422 – HDMI (DVI-D with adaptor cable)
    - AVN441 – HDMI (DVI-D with adaptor cable), Component or Composite
    - AVN443 – HDMI (DVI-D with adaptor cable) or SDI
- 1 Audio connector (for balanced or unbalanced audio input), or RCA audio cable (unbalanced only) for an AVN441 or AVN443.

Step 1: Connect AVN4XX Hardware

***Note**: It is important that the module be properly aligned with the slot guides before it is inserted into the appropriate slot on the chassis. It is recommended that the user's line of sight be level with the middle of the backplane in order to see both slot guides clearly.*

Install a VSI blade into the chassis as follows:

Caution: Use proper ESD precautions when installing or removing a VSI blade to avoid damaging the unit's circuitry.

1. Slide the blade, open end first, into the desired slot on the chassis until it plugs into the connector located on the backplane at the rear of the unit.
2. Use the bottom ejector handle to securely seat the blade into the chassis and to properly mate the rear connectors. The handle should lock closed when properly inserted to secure the unit.
3. Tighten the captive thumb screw located at the top of the blade to provide a more secure mounting.
4. If desired, an additional Phillips screw can be installed through the handle.
5. The Status LED will blink once per second when the blade is properly installed, powered, and operational.

Step 2: Initial AVN4XX Network Configuration

In order to configure your AVN4XX blade, you will first need to know some basic information about the network where it is going to be installed. Specifically, would you like the unit to be configured statically or set up to use DHCP? If static addressing is used, you will need to have an available IP address that you can use, as well as a subnet mask, default gateway, and DNS server(s). **It is highly recommended that you assign a static IP address to your AVN4XX,** because communicating and configuring a unit remotely (over the network without having to use the serial console) requires that you know the unit's IP address.

The AVN4XX encoders ship with DHCP turned on by default. If there is no DHCP server on the network, the encoder defaults to IP address *192.168.1.253*. To assign a static IP address to your device, use one of the following two methods.

Method I – Console Interface (recommended method)

1. Connect the serial cable between the serial port of the AVN4XX blade and a COM port on your PC (typically the COM1 port). The AVN4XX blade uses an RJ-45 to DB9-F serial cable (shipped with the MPP chassis). See the appropriate AVN4XX user's manual for information on that particular blade.
2. Launch a terminal emulation program, such as TeraTerm (google: teraterm download).
    a. Create/Open a new serial connection.
    b. Specify the PC port you are connected to (**typically COM1**), click **OK**.
    c. Configure the Port Settings as follows: **Bits per second (38400), Data bits (8), Parity (None), Stop bits (1), Flow Control (None).** Click **OK**.
    d. Press **Enter** to get the login prompt for the encoder.
3. Log in to the unit with the **Username/Password**. The default values are: **admin/admin**
4. If the unit has not been previously configured, the Network Connection Wizard automatically appears and prompts you to enter values for the IP Address, Netmask, Gateway, and DNS. If the unit has been previously configured, and you are not prompted to enter new network settings, type a lower case '***n***' into the console interface and click ***Enter***. This will bring up the Network Configuration Wizard and allow you to enter new values.

    If you make a mistake before you have finished entering all of the new values, you can press **CTRL+C** to cancel the process, and log in again to restart the Network Configuration Wizard.
    a. Enter the IP Address:
        i. To configure the unit for DHCP:
            1) Make sure the network supports DHCP.
            2) Enter **0.0.0.0**.
            3) You will be prompted for a backup IP address in the event that DHCP fails. Enter a static IP address (e.g., 192.168.1.253).
        ii. To statically configure the unit, enter the IP address (e.g., 192.168.1.45)
    b. Enter the Subnet Mask (e.g., 255.255.255.0)
    c. Enter the Default Gateway (e.g., 192.168.1.1)
    d. Enter the DNS Server Address (e.g., 4.2.2.1)
5. Once the initial Network Identification data is entered, the blade will reboot and should be accessible at its newly assigned location from a web server. Make sure to connect the audio/video and network cables to the blade.
6. Exit the terminal emulation program and disconnect the serial cable if it is no longer needed.

Method II – Web Interface

1. For the PC that is going to do the AVN4XX network configuration, assign an IP address on the "one" subnet (e.g. 192.168.1.100). Since the AVN4XX will default to 192.168.1.253 if it cannot find a DHCP server, it requires a PC on the same subnet in order to "see" and configure it. Note, that if there is a DHCP server running on the PC, disable it before connecting the AVN4XX.
2. Using any Ethernet cable (crossover or regular), connect one end to Ethernet port on the AVN4XX and the other to the Ethernet port on the PC.
3. Open the AVN4XX's browser interface.
    a. From the configuration PC, open up a web browser.
    b. Type in the AVN4XX's default IP address (192.168.1.253) into the URL after the 'http://" and click ***Enter***. The resulting URL will look like: **http://192.168.1.253**.
    c. Login with the AVN4XX's username/password (admin/admin by default). Refer to Figure 1 below.
    d. Navigate to the Device Network Settings page. From the main browser interface page, click the ***Device*** button in the top row, followed by the ***Network*** button in the left hand column. Refer to Figure 2.
4. Edit the AVN4XX's network settings as desired: enter the IP address (e.g., 192.168.1.45), Subnet Mask (e.g., 255.255.255.0), Gateway (e.g., 192.168.1.1), DNS Sever address (e.g., 4.2.2.1), and make sure to set **DHCP Enabled** to **No**.
5. Save the new settings by clicking the ***Save*** button in the left hand column.
6. Reboot the unit by clicking the ***Reboot*** button/link in the upper right hand corner (see Figure 2).
7. Finished. The unit now has the new network settings.

Note: *It is recommended that the browser interface be used for managing the AVN after the initial network configuration.*

Step 3: Configure the AVN4XX for Streaming

1. Enter the IP Address for the AVN4XX blade (http://xxx.xxx.xxx.xxx) into your favorite browser to bring up the blade's web interface. Log in using the unit's username/password (admin/admin by default).

Figure 1 Web Interface Login

2. The **IP Address**, **Netmask**, **Gateway and DNS** info should have already be configured, however if necessary, this information can be changed from the *Device> Network* page.

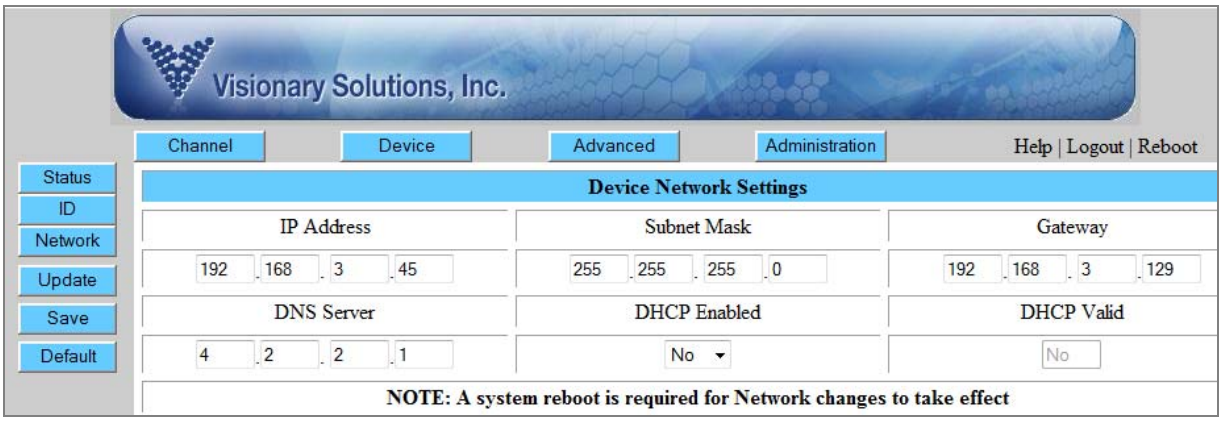


Figure 2 Web Interface - Device Network page

3. Configure the critical Audio and Video Input settings (**Video Source, Video Format** and **Audio Source**). From the *Channel> Input* page (setting options dependent upon blade type) enter the correct input values.
    a. AVN420
        i. Video Source – Svideo or Composite
        ii. Video Format – NTSC or PAL
        iii. Audio Source – Balanced or Unbalanced
    b. AVN422
        i. Video Source – HDMI (DVI-D with adaptor cable)
        ii. Video Format * – from 1080p to 480i or Auto
        iii. Audio Source - Embedded HDMI, Balanced or Unbalanced
    c. AVN441
        i. Video Source – HDMI (DVI-D with adaptor cable), Component YPbPr, RGB, or Composite
        ii. Video Format * – from 1080p to 480i or Auto
        iii. Audio Source – Embedded HDMI, Balanced or Unbalanced
    d. AVN443
        i. Video Source – HDMI (DVI-D with adaptor cable) or SDI
        ii. Video Format * – from 1080p to 480i or Auto
        iii. Audio Source – Embedded HDMI, Balanced or Unbalanced

    * - valid video formats dependent upon optional purchased modules (720p, 1080i, 1080p)

4. Configure the Encoding settings (optional). From the *Channel> Encoding* page enter the desired values.
    a. AVN420
        i. Video Bitrate (100-4,000 kbps)
        ii. Video Size (720x480 down to 160x120)
        iii. Audio Bitrate (8 to 384 kpbs)
        iv. Audio Format (AAC or MPG)
    b. AVN422, AVN441 and AVN443
        i. Video Bitrate (Mbps) - (6-20 for >=1080i, 4-20 for 720p, and 2-10 for SD)
        ii. Audio Bitrate (32 to 384 kpbs)
        iii. Audio Format (AAC or MPG)

    HD Encode Note: The minimum Video Bitrate value for 1080i is 6,000 kbps (6 Mbps), which requires setting the Total Bitrate value to 7100 kbps. The Video Bitrate is based upon the Total Bitrate minus the audio bitrate and some overhead.

5. Configure the ***critical*** Stream Output Control setting (**Stream Destination**). From the *Channel>Stream* page, enter the desired stream destination value. This setting controls where the encoder sends the stream and is therefore a critical component to successful streaming.

   The Stream Destination consists of two parts: the Destination IP address (underlined in Figure 3) and the Destination Port number (underlined in Figure 3), separated by a **" : "** colon.

   The destination IP address can either be a Unicast address (single point/viewer) or Multicast (many viewers). For more information, see the section titled "Unicast and Multicast Transmissions over the Network" below.

   The Destination IP Address shown Figure 3 is a multicast address (starts with *225*) and viewable to multiple users on the network. The Destination Port is an arbitrary number (above *1024*) that is matched when configuring channels on a hardware or software decoder. The factory default destination port number is *1234*.

   VSI recommends using an even number for the port.

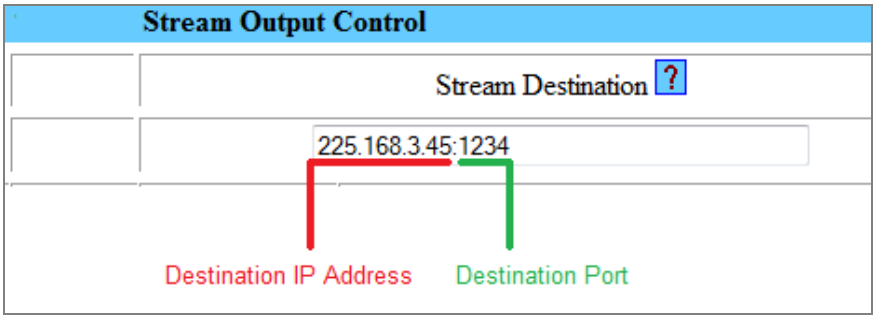


Figure 3 Stream Destination Example

Unicast and Multicast Transmissions over the Network

A Unicast transmission sends IP packets to a single recipient on a network. A Multicast transmission sends IP packets to a group of hosts on a network. If the streaming video is to be distributed to a single destination, start a Unicast stream by setting the destination IP address and port on the AVN equal to the destination's values. To view the stream at multiple concurrent locations, set the AVN's destination IP address to a valid Multicast IP address (224.0.0.0 - 239.255.255.255).

Note that while the Multicast IP address range is from 224.0.0.0 - 239.255.255.255, the first and last octets (224.xxx.xxx.xxx and 239.xxx.xxx.xxx) are generally reserved for administration. VSI recommends setting the first octet to 225 and the remaining three octets to the AVN's IP address. For example, if the AVN's IP address is 192.168.1.53, set the destination IP address to 225.168.1.53 for Multicast streaming.

Since Multicasting is a relatively new technology, some legacy devices that are part of your network might not support Multicasting.

Before using the AVN4XX in Multicast streaming mode, check the functional specifications of your network infrastructure to ensure that the Multicast stream will not create major traffic on your network. Verify that your network supports Multicast/IGMP streaming to insure proper filtering and routing of multicast traffic. If your backbone switch supports Internet Group Messaging Protocol (IGMP) snooping, it allows the core of your network to ignore the traffic streams that Multicasting may generate.

Step 4: Check the Enable Stream Checkbox

1. To begin encoding / streaming, check the Enable Stream checkbox in the upper right hand area of the title bar on any of the AVN4XX's Channel pages (*Channel> Input, Encoding, Stream or SAP)*. See Figure 4 below.

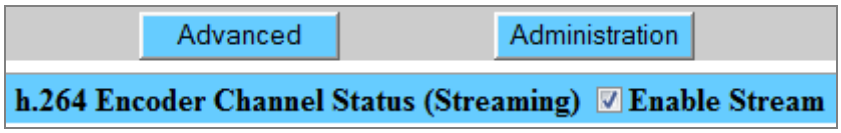


Figure 4 Enable Stream checkbox checked with successful streaming

2. If successful, the word "Streaming" will show in parenthesis next to the Stream Enable checkbox as shown in Figure 4 above. If there is no video or invalid video detected, the AVN4XX will not stream even if the Enable Stream checkbox is checked.

Step 5: View / Decode the AVN4XX Stream

The AVN4XX should now be streaming to the Destination IP address and Destination Port configured in Step 3 above. To decode the stream, it is necessary to configure the decoder (whether hardware or software) to find the stream on the network. The decoder configuration is dependent upon the decoder being used and is therefore beyond the scope of this document.

To find out how to configure and view AVN-generated streams using Amino STBs (set top boxes) and VLC Media Player, please review the following support documentation:

1. **AmiNet STB (hardware decoders)**:

   For instructions on configuring AmiNet hardware decoders for use with the AVN4XX, see the "AmiNet and AVN Configuration Manual" (click here), or at the following URL:

   http://www.vsicam.com/files/documents/AmiNet/AmiNet_and_AVN_Configuration_Manual.pdf

2. **VLC Media Player**:
   a. To get the free VLC Media Player software decoder, go to http://www.videolan.org/ and download the VLC media player (current version).
   b. Once installed, configure the decoder to receive the AVN generated stream.
   c. Select the *Open Network…* option, under the Media menu.
   d. In the following dialog, enter the AVN4XX's "critical" destination stream information from the browser interface (Destination IP address and Port number, see Step 3, #5 above).

      How this information is entered into the VLC varies based on the version of the player.

      i. For VLC versions 1.1.0 and above: Enter: udp://@xxx.xxx.xxx.xxx:yyyy where "x" represents the Destination IP address and "y" the Destination Port. **DO NOT FORGET THE @ sign!**
      ii. For VLC versions between 1.0.0 and 1.1.0: Set the protocol to UDP and enter the Destination IP address and Port into the corresponding fields.
      iii. For VLC versions pre 1.0.0: Select the UDP/RTP Multicast radio button and enter the Destination IP address and Port into the corresponding fields.

   e. Click the ***Play*** or ***OK*** button at the bottom the dialog to begin viewing.

Safety and Compliance Information

This product can only be used in a VSI blade system. Unintended use of this product, or use with non-VSI listed components, is forbidden and violates safety approvals.

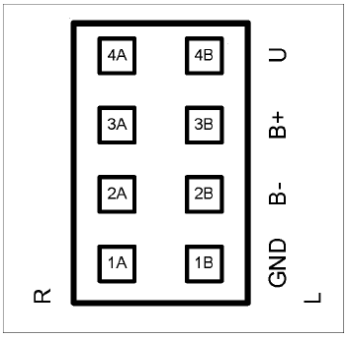
Safety Approval: UL Listed I.T.E. E257717

Audio Terminal Block Connector

Pinouts:

See the following paragraph for instructions on configuring the supplied audio terminal block connector (supplied).

Pin	Function
1A	Right Ground
2A	Right Balanced Audio Negative
3A	Right Balanced Audio Positive
4A	Right Unbalanced Audio
1B	Left Ground
2B	Left Balanced Audio Negative
3B	Left Balanced Audio Positive
4B	Left Unbalanced Audio



View is looking into the connector.

Configuration:

The following describes how to configure the audio terminal block connector:

1. Cut and strip the wires on the cable that will connect to your audio source. The strip length should be approximately 1/4 inch long.
2. For each connection, insert a small object, such as a screw driver, into the terminal block's latch in order to open the wire clamp.
3. Insert each wire into its wire clamp.
4. Release the latch allowing the wire clamp to close.