AVN420 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

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 manufacture and distribute the AVN420, 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 AVN420 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 AVN420 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, Inc., introduces the AVN420 h.264 (AVC, MPEG-4 part 10) over IP encoder "blade" (card) with the Media Processing Platform (MPP), a high density rackmount system for video over IP transport. Plug a video source directly into the blade, plug into the network via the RJ-45 connection, and stream real time DVD quality video over your LAN or WAN. The MPP, with AVN420 blades, is suitable for all applications requiring cost effective, low bitrate video distribution over IP networks. There are currently two MPP chassis options. The MPP1700 has the option of dual redundant power supplies and holds up to 17 blades, while the MPP200 has a single power source and holds up to 2 blades.

1.1   Features

•   **Stand-Alone Operation.** The AVN420 runs independently of any other server. To stream and view live S-Video, all that is needed is an AVN420 encoder in an MPP chassis and any standards-compliant h.264 decoder (hardware or software). The AVN420 is easy to access and configure through the Browser Interface, and an optional AVN Control Protocol (API) is available for qualified customers. TCP/IP, HTTP, and other Internet-related protocols are supported. The Console Interface can be used for network configuration only (IP Address, Netmask, Gateway, and DNS), and not general device control.

•   **The Media Processing Platform Chassis (MPP200 & MPP1700).**

—   The MPP200 is a high density 2-slot chassis that houses Visionary Solutions' IPTV MPP blades, including the AVN420 h.264 over IP encoder blade, or any other dual slot blade or up to two single slot blades. The MPP200 is designed to stand alone or be rack mounted with one side "ear."

—   The MPP1700 is a high density rack mount blade chassis for IPTV. It is scalable to 17 encoding channels using Visionary Solutions' IPTV MPP blades, including the AVN420 h.264 over IP encoder blade. The MPP1700 features modular architecture and a dual redundant power supply.

•   **Superior Audio/Video Quality.** h.264 hardware compression and Visionary Solutions, Inc.'s optimized transmission technology provides a superior video image at full frame rates and resolution. The video stream can be viewed by an unlimited number of licensed clients on a LAN and full frame rate (25 PAL to 30 NTSC frames per second) is assured, provided that bandwidth is available. Available image resolutions are: 720x480, 480x480, 320x480, 320x240, 160x120 NTSC; 720x576, 576x576, 360x576, 360x288, 176x144 PAL. The bit rate is configurable from 100 kbps to 4,000 kbps (4 Mpbs). The audio compression can be either Advanced Audio Codec (AAC) with configurable audio encoding from 8 to 384 kbps with a 48 kHz sample rate, or MPEG-1 Layer 2 with configurable audio encoding at either 256 or 384 kbps with a 48 kHz sample rate.

•   **Video Inputs.** The AVN420 video inputs include one BNC composite, and one S-Video input for connecting cameras or other video equipment.

- **Audio Inputs.** The AVN420 features user control of analog audio input, including mute. 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.

- **External Device Connections.** The AVN420 includes a serial connection via an RJ-45 connector, which can also accept an RJ-11 connector. This connector can be used as an RS-232C port (full-duplex, no hand shaking) or an RS-422 (full-duplex) port. These ports allow the AVN420 to interface with a variety of external devices.

- **Security.** Administrators can create and modify accounts for authorized users, as well as allow anonymous viewing.

- **Program Clock Reference on Video Packet ID**
    — Effective with 2.13 firmware, VSI encoders support Program Clock Reference (PCR) on the same Packet ID (PID) as the video. This support enables AVN encoders to be used by various Telco operators.
    — PCR support enables consumer and professional TVs and STBs to accept the AVN encoder Transport Stream (TS) via QAM modulation. An external QAM Modulator is required.
    — Other IPTV remote content sources supported are PEG, off air, affiliate, special events, front gate cameras, and other "additive" programming.
    — PCR support was tested using a Technicolor COM-1000 QAM Modulator. The payload of the TS is MPEG-2 Video with MPEG-1 layer 2 Stereo Audio.

Chapter 2   Hardware

2.1   Product Description

2.1.1   AVN420 Blade Front Panel
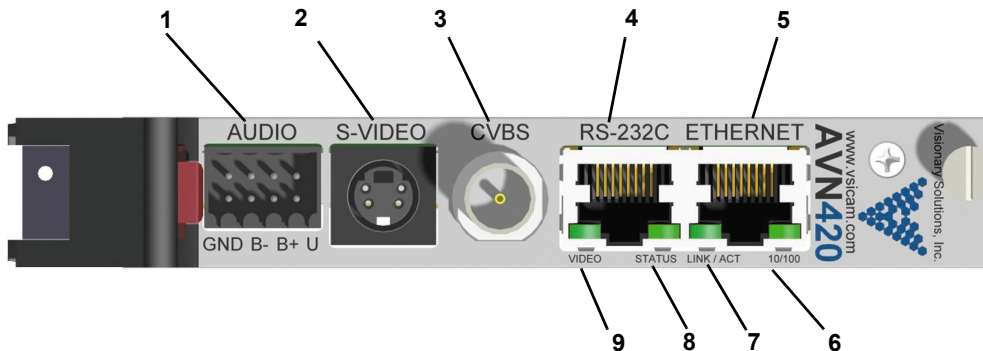
1. Audio Connector – provides support for right/left, balanced and unbalanced audio. See *Chapter 9 Unit Connections* for terminal block pinout information.

2. S-Video Connector – provides input for a Y/C video cable.

3. CVBS Connector – provides input for composite video sources. An RCA to BNC adaptor is provided for RCA type composite connections.

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

6. 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.

7. 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).

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

9. 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.

See *2.4 Blade Installation and Removal* for information on how to install the AVN420 into an MPP chassis.

2.1.2 Shipping Inventory

Your AVN420 is shipped with the following:

*   One AVN420 blade

*   One captive screw to use for installing the blade into the handle if desired

*   One RCA-to-BNC adapter, female-to-male

*   One Wiedenmuler terminal block connector for audio connections

*   One Installation Guide

2.2   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.

2.2.1 MPP1700 Front Panel Slots

Blade Slots

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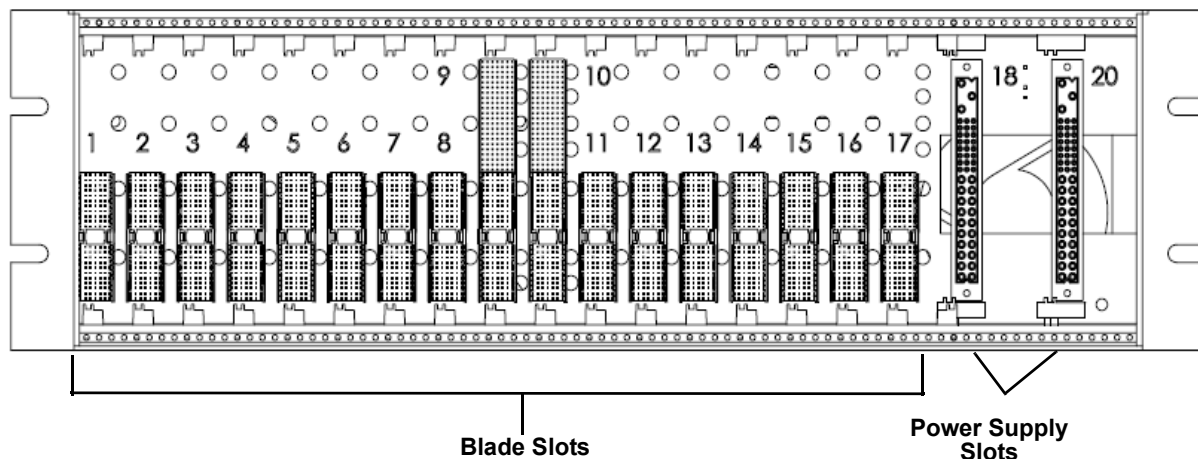
Refer to the *MPP1700 User's Manual* for more information about the MPP1700.

2.3   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.

2.3.1 MPP200 Front Panel Slots

Blade Slots
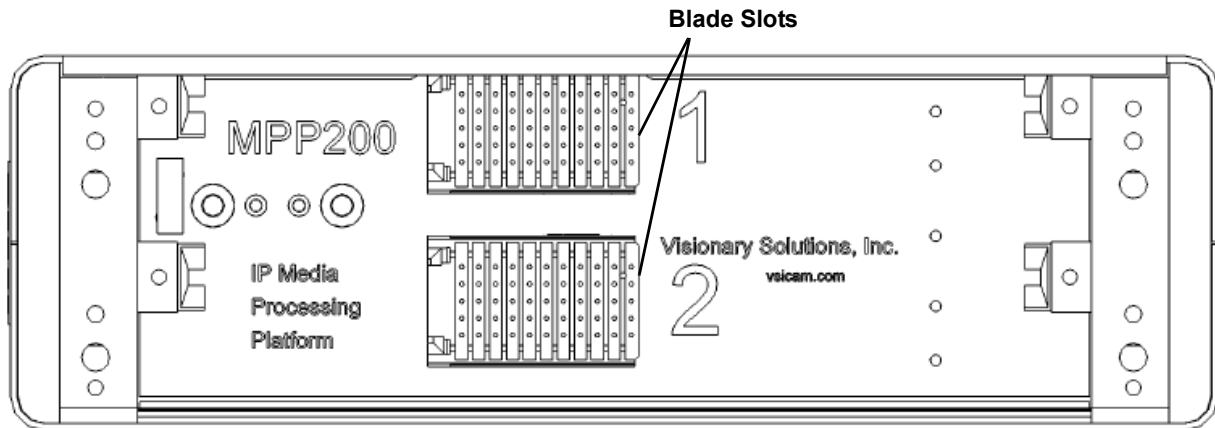
2.3.2 MPP200 Rear Panel
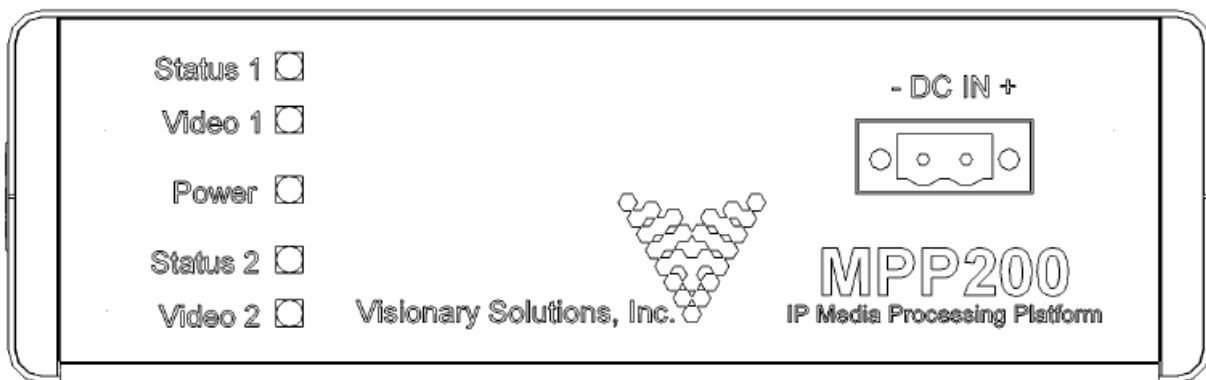
Refer to the *MPP200 User's Manual* for more information about the MPP200.

2.4   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.

2.5   Minimum Connections Installation

The minimum connections to the AVN420 should include a video source connected to either a composite video input or an S-Video input, and an RJ-45 LAN connection to the Ethernet connector.

To connect the AVN420:

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 AVN420 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 AVN420 has Dynamic Host Configuration Protocol (DHCP) enabled as the factory default. If your network has a DHCP server on it, the AVN420 will automatically acquire an IP address. If the AVN420 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 AVN420, 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 AVN420, refer to the following section.

3.4   Static IP Configuration (Recommended Configuration)

If the AVN420 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 AVN420 be statically configured to a specific IP address. This enables the AVN420 to be consistently found at the same address. Prior to statically configuring the AVN420, 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 AVN420, follow these steps:

1. Power on the AVN420 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 AVN420 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 AVN420'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 AVN420

The AVN420 has these control interfaces that you can use to operate and configure the AVN units:

• 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   AVN420 Console Interface

For information on using the AVN420 Console Interface, refer to *Chapter 5 The Console Interface*.

4.2   AVN420 Browser Interface

The AVN420 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 AVN420 IP address.

2. Click **Enter/Go**. The AVN420 Web Management Login Page will display.

3. Enter the Username and Password of the AVN420 and click the **Login** button. The AVN420 Browser Interface pages will display.

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

4.3   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 support@vsicam.com for AVN420 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 either the Browser or API interface.*

The AVN420 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 AVN420 and a COM port on your PC (typically the COM1 port). The AVN420 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 AVN420 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 AVN420 Browser Interface pages using their Username and Password. The default Username and Password are admin/admin.

The AVN420 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 AVN420 IP address.

2. Click **Enter/Go**. The AVN420 Web Management Login Page will display.
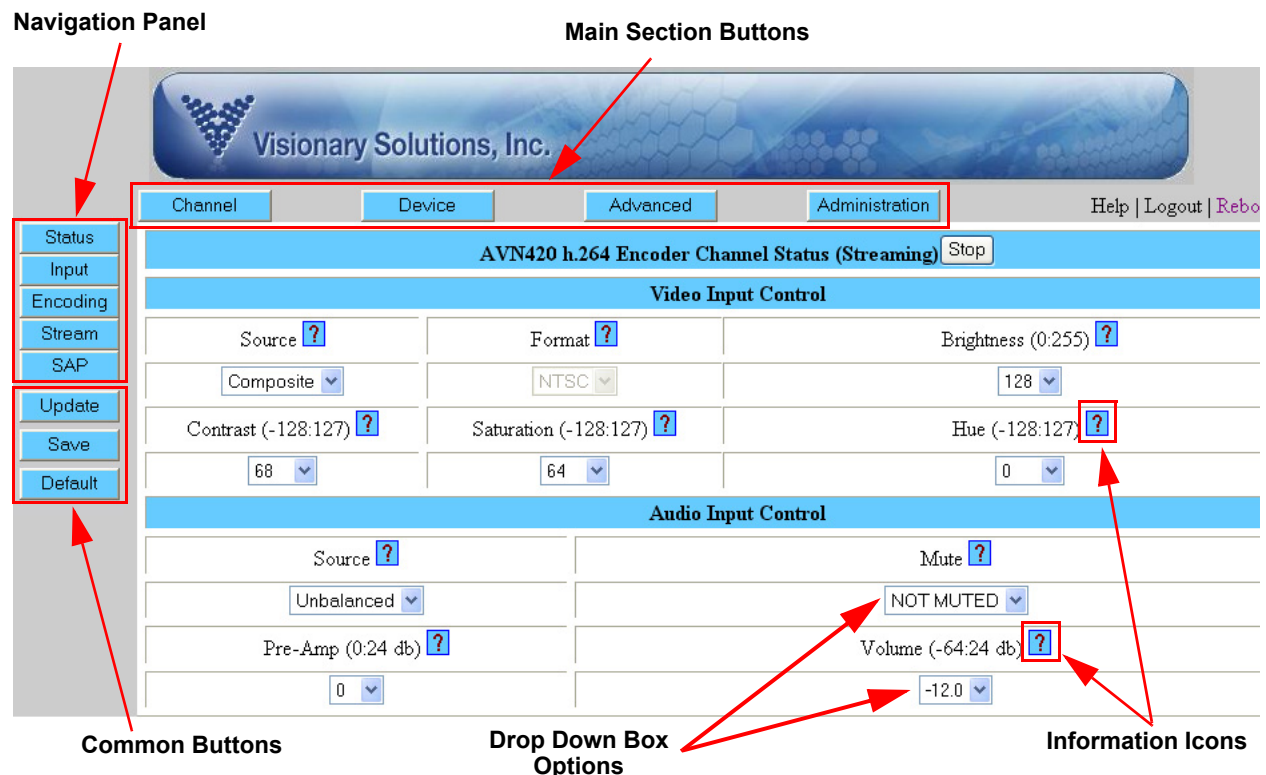
3. Click **Manage Device** to open the web server authentication prompt.
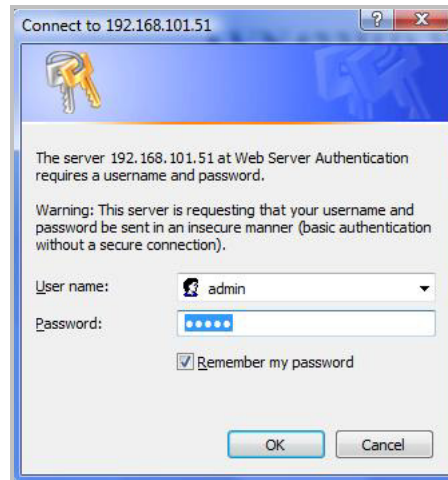
4. Enter the Username and Password of the AVN420 and click the **OK** button. The AVN Browser Interface menu will display.

6.2   The Browser Interface Main Page

Once you log in to AVN420 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 <u>not</u> 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 AVN420 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 AVN420 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: SVideo or Composite.

Format – Displays the current Video Format and allows the editing of this parameter. Possible values are: NTSC or PAL.

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

Format – Displays the current Video Format and allows the editing of this parameter. Possible values are: NTSC or PAL.

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 or Unbalanced.

> **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

AV Mode – Displays the current AV Mode and allows the editing of this parameter. Possible values are: Audio Only, Video Only, Audio, and Video.

GOP Size – Displays the current GOP Size and allows the editing of this parameter. Possible values range from 15 to 120 (refer to *10.3 Group of Pictures (GOP)*).

Picture Coding – Displays the current Picture Coding and allows the editing of this parameter. Possible values are: Frame, FrameB, Field, AFF.

Scene Change Detection – Displays the current Scene Change Detection and allows the editing of this parameter. Possible values are: None, Insert Frame, Insert Slices, and I Frame + New GOP.

Video Bitrate – Displays the current Video Bitrate and allows the editing of this parameter. Possible values range from 100 to 4000 kbps.

Video Size – Displays the current Video Size and allows the editing of this parameter. Possible values are selectable in the drop down list and vary depending upon Video Format (NTSC or PAL) found on the Channel Input page.

Video Width can range between 180 to 720 pixels (*720)
Video Height can range between 120 to 480 pixels (*480)
D1 = NTSC 720x480, PAL 720x576
2/3D1 = NTSC 480x480, PAL 576x576
1/2D1 = NTSC 360x480, PAL 360x576
SIF = NTSC 360x240, PAL 360x288
1/2SIF = NTSC 180x120, PAL 180x144

Force 16:9 Aspect Ratio – Forcing Widescreen Aspect Ratio will inform the decoding device that you want 16:9 display. The default is 4:3.

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
    RTSP (Real Time Streaming Protocol, based on Live555)

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 AVN420 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.

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 Stream RTSP

From the Channel Stream page, when Stream Mode is configured for RTSP, the RTSP page loads. This page allows configuration of the Stream Output Control and Stream Announce Control settings.

Stream Mode – Displays the current Stream Mode and allows the editing of this parameter.

Direct Stream URL – RTSP://(*unit IP Address)*:8554/channel.sdp
This is the address to enter into an RTSP client to allow the client to access the Stream directly through the RTSP Server on the AVN420. RTSP uses a pull model as opposed to a push model,

in other words no streaming occurs until a client requests the feed. RTSP can support multiple unicast clients simultaneously

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 AVN420 will not start streaming upon boot up).

Enable Multicast RTSP – Creates a multicast RTSP encoded stream that can be viewed by multiple RTSP-enabled viewers/decoders on a local area network. Not recommended for most users.

Announce Stream – This Parameter is used in RTSP Mode to automatically announce and send the stream to a given location, normally an RTSP Reflector.

Announce Stream URL – RTSP://(*announce IP Address*):(*announce Server Port*)/ (*announce filename*)
This is the address to enter into an RTSP client to allow the client to access the Stream through the RTSP Reflector Server. RTSP uses a pull model as opposed to a push model, in other words no streaming occurs until a client requests the feed. RTSP can support multiple unicast clients simultaneously.

Announce Address – This Parameter is used in RTSP Announce Mode to specify the IP Address of the Reflector Server, or whatever we are announcing/streaming to.

Announce Server Port – This Parameter is used in RTSP Announce Mode to specify the Server Port of the Reflector Server, or whatever we are announcing/streaming to. Common Port values are 554 for Darwin Streaming Server and 1935 for Wowza Media Server.

Announce Username – This Parameter is used in RTSP Announce Mode to specify the Username for publishing to the specified Reflector Server. This must match the user database on the Reflector Server.

Announce Password – This Parameter is used in RTSP Announce Mode to specify the Password for publishing to the specified Reflector Server. This must match the user database on the Reflector Server.

Announce Filename – This Parameter is used in RTSP Announce Mode to specify the Filename for publishing to the specified Reflector Server. This filename will become part of the source URL for clients to access the stream through the Reflector Server.

Announce Mode – This Parameter is used in RTSP Announce Mode to specify the Transport Mode of the Stream after Announce. Currently only TCP encapsulation mode is supported, but we will add UDP/RTP and possibly direct UDP.

6.4.6 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.
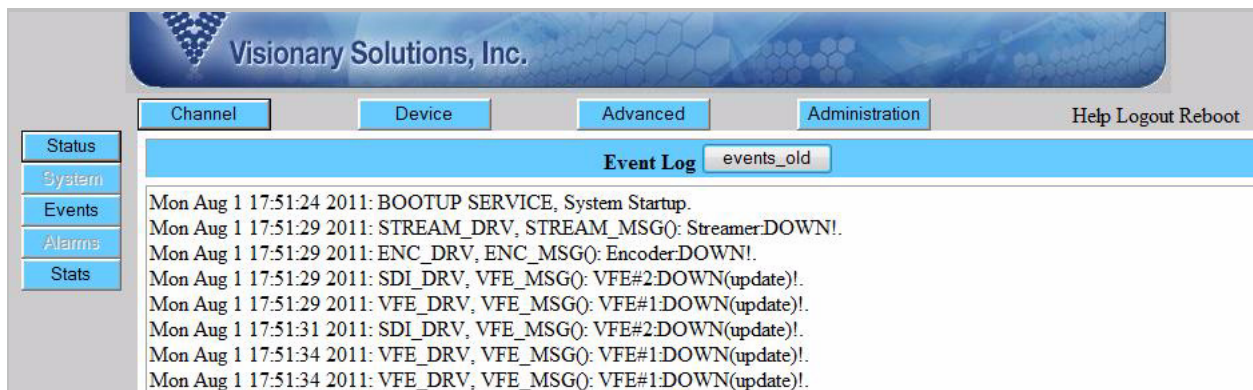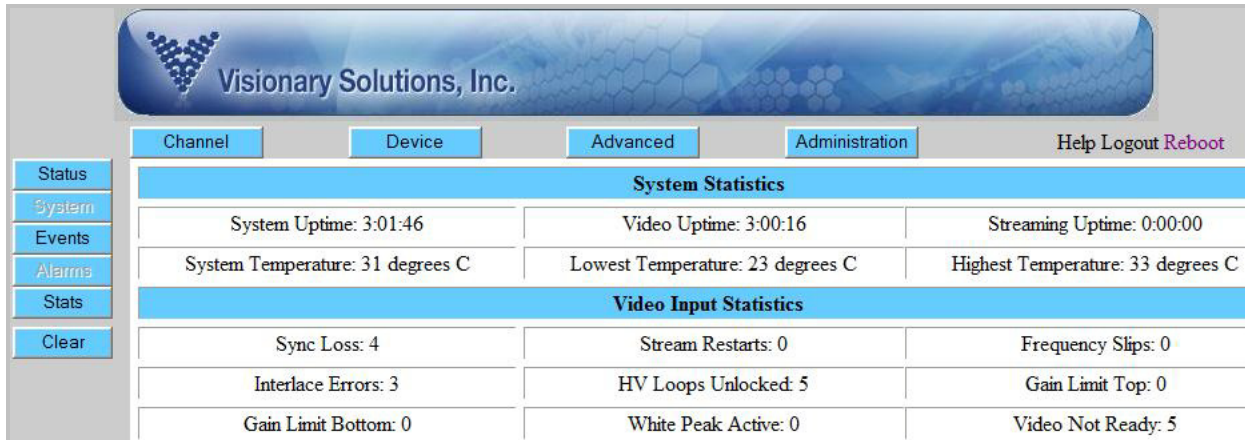
6.6.4 Advanced Alarm

Not currently implemented.

6.6.5 Advanced Statistics

Displays System Statistics and Video Input Statistics since the last power cycle 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 (Errors Detected)

Sync Loss – Momentary "bad" video detected. This error can increment when one of the other errors is detected. Three Sync Loss error detections in a row cause the video encoding to stop and attempt to be restarted.

Interlace Errors – Progressive verses Interlace mismatch (progressive video was detected). The AVN420 only supports Interlaced video and not Progressive.

Gain Limit Bottom – Gain value for active luminance channel is limited; minimum (bottom). The video amplitude is too large. The AVN420 encoder has a built-in amplifier that attempts to correct video amplification issues but the amplitude was too large to correct.

Stream Restarts – The number of times the encoder has attempted to re-stream because of a detected error.

HV Loops Unlocked – Unable to lock to Horizontal/Vertical timing of incoming video. This error is commonly seen if there is a mismatch in the detected verses configured video input format (e.g., expected NTSC but detected PAL or vise versa).

White Peak Active – White peak loop is activated.

Frequency Slips – Video field rate frequency detected does not match configured value. This error is seen with NTSC verses PAL mismatch.

Gain Limit Top – Gain value for active luminance channel is limited; maximum (top). The video amplitude is too small. The AVN420 encoder has a built-in amplifier that attempts to correct video amplification issues but the amplitude was too small to correct.

Video Not Ready – No video detected.

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.
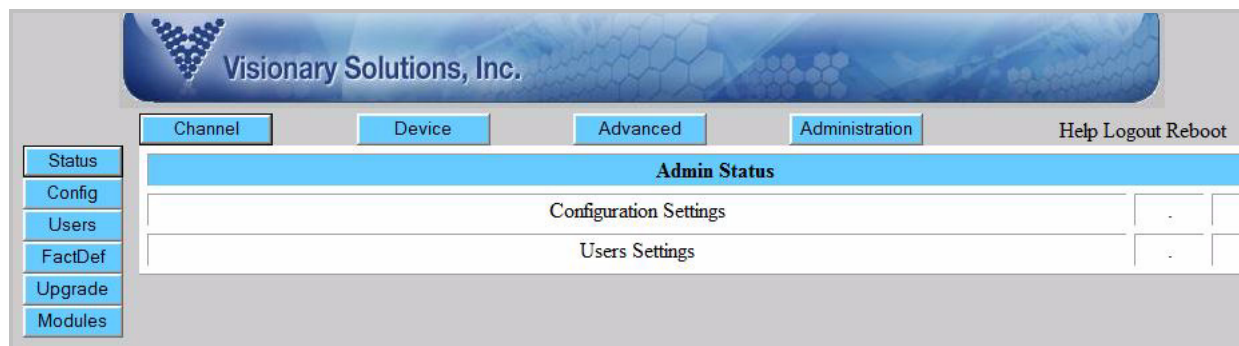
6.7.2 Administration Configuration

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 AVN420 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 AVN420 must have a valid Gateway IP address configured and be on a network that has access to the Internet.*

The AVN420 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 AVN420 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.

Important Upgrade Note: In old firmware (versions pre 039), the System Upgrade Menu displays the firmware components in a counter intuitive order, with the Boot Loader on top and the Root File System under the Linux Kernel. No matter how the components are listed or displayed in the System Upgrade Menu, out-of-date components must be updated in the order specified above.

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 AVN420 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 AVN**420**, 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 AVN420 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 AVN420 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 AVN420.

7.1   Checking the Firmware

It is important to know the version of the AVN420 firmware in order to troubleshoot the unit. To find the firmware version of your AVN420, select one of the following methods:

1. From the AVN420 Browser Interface pages, navigate to the Device ID page (refer to section *6.5.2 Device ID*), and the firmware version is shown.

2. From the Console Interface, every menu has the firmware version listed.

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/downloads/.

•   Find answers to resolved problems in the FAQ database. Search by product, category, or phrases. Go to www.vsicam.com/faqs/.

•   Report problems to VSI support staff by sending an email to: support@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 AVN420 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 AVN420 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 AVN420 to the Factory Default settings:

1. Remove the AVN420 blade from the chassis (see *2.4 Blade Installation and Removal*).

2. Locate the Factory Default DIP switch near the top center of the AVN420 blade's PCB.

3. If present, remove the plastic cover from the DIP switch.

4. Set the left DIP switch into the Factory Default position as labeled on the unit.

Warning: Do not change the position of the other dip switch.

---

5. With the chassis powered on, insert the AVN420 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.

---

6. Observe the Status and Video LEDs on the front of the unit.

7. Wait for these lights to be "solid" on (no blinking); this indicates that the default reset is complete.

8. Remove the blade from the chassis to return the DIP switch to the Normal Operation setting, then re-install the blade.

Chapter 8   Field Upgrade

8.1   Firmware Component Overview

The AVN420 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/_update/avn4xx-firmware-updates-2/ and look at the AVN4XX firmware table.

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 AVN420 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 AVN420 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.

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.

8.3.2 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.

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 <u>upgrade the firmware components in order</u> 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.

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
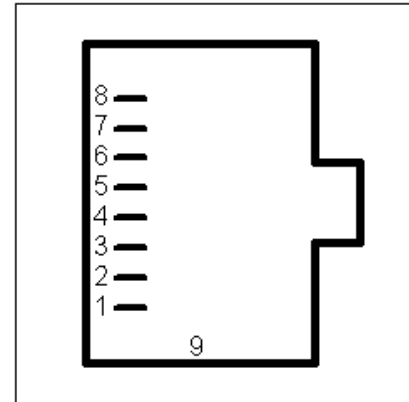
View is looking into the connector.

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
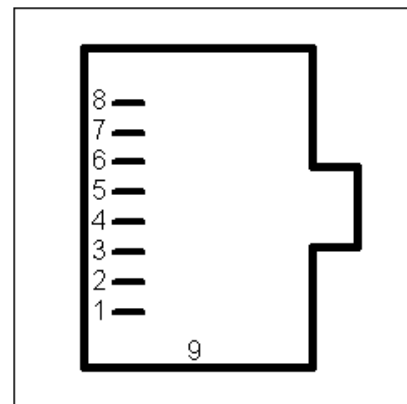
View is looking into the connector.

Alternate View.

9.3 CVBS Connector

Pin	Function
1	Composite Video
2	Ground
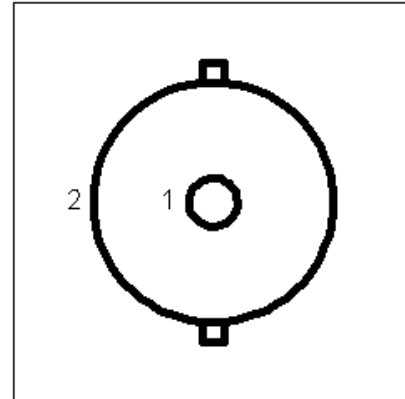
View is looking into the connector.

9.4 S-Video Connector

Pin	Function
1	Chrominance [C]
2	Luminance [Y]
3	Signal Ground
4	Signal Ground
5	Ground Shield
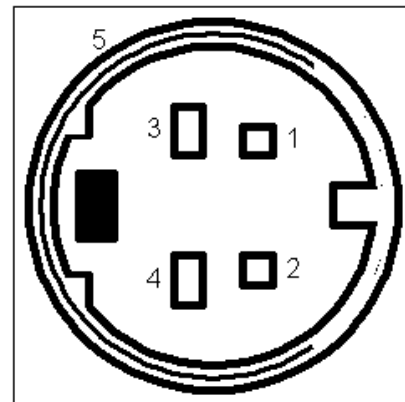
View is looking into the connector.

9.5   Audio Terminal Block Connector

9.5.1   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
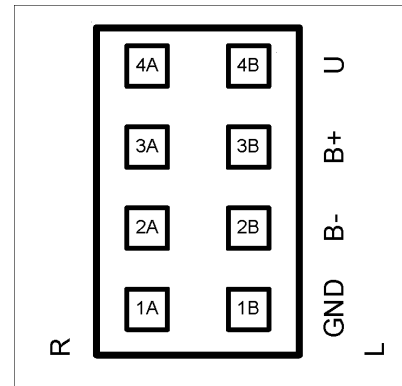
View is looking into the connector.

Note: The L and R designations on the connector faceplate may be incorrectly identified on earlier products. If the connector label does not match the drawing above, follow the pin numbering as identified in the table.

9.5.2   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 Information

10.1 Technical Specifications

h.264 Stream Information:

- Video
    — Real-time h.264 encoding compliant to Main Profile at Main Level (MP@ML) for 625 and 525 interlaced line systems.

- Audio
    — MPEG-2 AAC (Advanced Audio Codec) with configurable audio encoding from 8 to 384 kbps with a 48 kHz sample rate
    — MPEG-1 Layer II with configurable audio encoding at either 256 or 384 kbps with a 48 KHz sample rate

Audio Inputs:

- Audio Terminal Block Connector:
    — Left and Rightbalanced audio, maximum input level 1 Vrms
    — Left and Rightunbalanced audio, maximum input level 1 Vrms

Video Inputs:
    — One CVBS connector for composite video. NTSC and PAL
    — One S-Video connector. NTSC and PAL

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

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

Environmental:
    — Operating Temperature 10ºC to 50ºC (14ºF to 122ºF)

10.2 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:

EMC: FCC Part 15 Class A or B

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

SAFETY: EN60950-1

10.3 Group of Pictures (GOP)

The Group of Pictures (GOP) Size in the AVN420 environment is defined by Length as follows:

The GOP Size determines the number of frames in a single repeating GOP structure, which is the distance between I frames. The lower the GOP Size, the more I frames are included in the stream per unit of time. This results in the stream containing more data. The higher the GOP Size, the fewer I frames are included in the stream per unit time. This results in the stream containing less data.

There are 30 fps. Consequently, a GOP Size of 15 = one I frame every 0.5 seconds, a GOP Size of 30 = one I frame every 1.0 seconds, and so on.

Length can be set to any of the following values: 15, 30, 60, 90, or 120. The default is 60, which is generally considered the best for most streaming applications. For low bandwidth streaming, it is best to set GOP size higher (90 or 120) so that there is less data in the stream.

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
DSCP	Differentiated Services Code Point
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 Installation
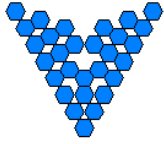
Visionary Solutions, Inc.

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 <u>NOT</u> the full User's Manual. Current user manuals are available online.**

April 2013
Revision: 1.0.4

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:

    o AVN420 – SVideo or Composite

    o AVN422 – HDMI (DVI-D with adaptor cable)

    o AVN441 – HDMI (DVI-D with adaptor cable), Component or Composite

    o 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 "Amino Configuration Manual" (click here), or at the following URL:

   http://www.vsicam.com/core/__downloads/Amino_140_VSI_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
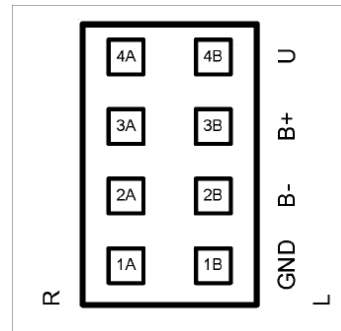
View is looking into the connector.

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.