AVN210 MPEG-2 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.

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About This Guide

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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 AVN210, a simple stand alone *IP Audio Video Node* for full motion, high resolution MPEG-2 video transmission over IP. Plug any analog video source directly into the node, plug into the network via the RJ-45 connection, and stream real time DVD quality video over your LAN or WAN. This low cost network appliance is an effective solution for Industrial Process Monitoring, Security Surveillance, Intra-Facility Communication, or any other application that requires 30 fps high resolution video.

The AVN210 has a unique embedded platform that enables consistent full motion video preserved from delay, jitter, packet losses, and packet out-of-order instabilities. This technology is unrivaled for cost-to-performance value and features state-of-the-art core reliability proven through countless hours of use in the demanding environment of commercial television broadcasting.

1.1 Features

- **Stand-Alone Operation.** The AVN210 runs independently of any other server. To stream and view live S-Video, all that is needed is an AVN210 encoder and any standards-compliant MPEG-2 decoder (hardware or software). The AVN210 is easy to access and configure by any of four methods: AVN2XX Configuration Utility, Console Interface, Browser Interface, or the AVN Control Protocol (API). TCP/IP, HTTP, and other Internet-related protocols are supported.

- **AVN2XX Configuration Utility**. This free software interface used to configure and control the AVN2XX encoders (AVN200, AVN210, and AVN220) and their video streams on Windows-based PCs. It has a Mass Configuration dialog that enables the configuration of encoder settings on multiple AVN units at one time.

  Download the application here:
  http://www.vsicam.com/core/__downloads/AVN2XX_Configuration_Utility.zip.

- **Superior Audio/Video Quality.** MPEG-2 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, 352x480, and 352x240 NTSC; and 720x576, 480x576, 352x576, and 352x288 PAL. The bit rate is configurable from 1.5 Mbps to 7.5 Mbps. The audio compression is MPEG-1 Layer 2 audio encoding at either 256 or 384 kbps with a 48 kHz sample rate.

- **Event Driven.** The AVN210 can respond to external events such as motion and intrusion detection. Possible actions include starting a video stream, activating a local switch closure, or activating external devices over an RS-232C or RS-422 cable.

- **Video Inputs.** The AVN210 video inputs include one BNC composite, one RCA composite, and one S-Video input for connecting S-Video cameras or other video equipment.

- **Audio Inputs.** The AVN210 features user control of volume, muting, bass boost, tone control (bass and treble), and balance. The audio input connectors consist of XLRs for balanced audio and RCAs for unbalanced audio.

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

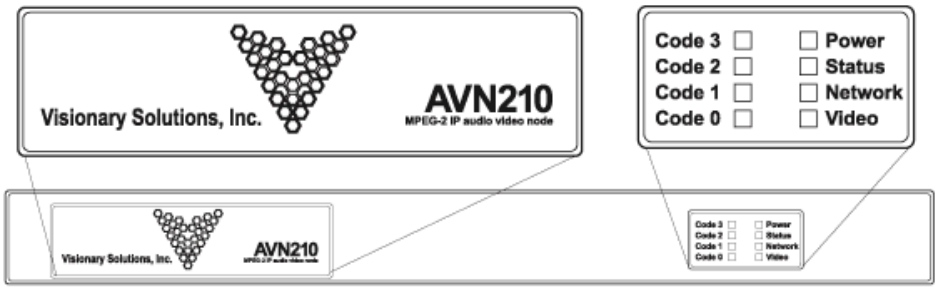
- **Closed Captioning (CC).** VSI supports both ATSC EIA-608 and EIA-708 standards in the AVN210encoder line. In accordance with EIA-708, the incoming analog signal may contain encoded CC data during the Vertical Blanking Interval (VBI) on line 21 NTSC (EIA-608), which the AVN210then extracts and "stuffs" into the encoded MPEG data stream for transmission. A CC-compliant decoder, such as an Aminet, then extracts the EIA-708 data and places it back in the VBI on line 21 (EIA-608), along with the normal video picture for the display device.

- **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 AVN210 Front Panel



The AVN210 front panel features a system status interface with two columns of LEDs that display unit diagnostics and error reporting information. The first column provides testing and diagnostics modes and the second column display system status: Power, Status, Network, and Video.

- The **Power LED** indicates that the unit is powered up. It will illuminate green to show that the unit is turned on.
- The **Status LED** indicates the overall status of the system. It will blink on and off at a rate of approximately once a second to provide a system heart beat to indicate that the AVN210 is operating. It will blink green if all elements of the system are operating properly for its current configuration and operational state. It will blink orange if any system error for the current operational state was detected during the heartbeat period. This LED should always be blinking. If it remains off or on solid (either color), the AVN210 is not operational.
- The **Network LED** indicates the Link state of the AVN210's Ethernet. It will illuminate green to indicate a 100 Mbit link or orange to indicate 10 Mbit links. If the LED is off, no network link is detected. (Future versions of software may indicate network activity by quickly blinking this LED on/off.)
- The **Video LED** indicates the activity and state of the Video/Audio encoder. If the LED is off, no valid video source is detected on the selected video input. If it illuminates green, a valid, error free video source is detected, and the encoder is operational and ready to encode. If it illuminates orange, a valid video source is detected, but errors in the video or setup of the encoder will not allow proper video encoding. Once video streaming is started, this led will blink relative to the encoding rate to indicate that the AVN210 is currently encoding video and audio and the bit rate of this encoding. While streaming, the blinking LED will blink green to indicate proper operation. It will blink on orange to indicate that an error was detected during that toggle period. This error also indicates audio clipping (audio levels too high, causing distortion).

For a more detailed description of the LED indicators, refer to *8.5 AVN210 Advanced Audio Testing and Diagnostics*.

2.1.2 AVN210 Real Panel

The AVN210 rear panel features the following components:

1. XLR Audio Connectors – right and left Balanced audio inputs.
2. RCA Audio Connectors – right and left Unbalanced audio inputs.
3. RCA Video Connector – composite video input.
4. BNC Video Connector – composite video input.
5. S-Video Connector – provides input for a Y/C video cable.
6. Ethernet Connector – an RJ-45 network connector, 10/100 base Tx.
7. RS-232C Serial Connector – full duplex, serial console port access.
8. Factory Reset button – restores the settings on the AVN210 to factory default settings.
9. LEDs system status panel – displays the same information as the front panel.
10. Power Supply Connector – 100V-240V AC, 0.25 Amp.

2.1.3 Shipping Inventory

Your AVN210 is shipped with the following:

- One AVN210
- One power cable
- One CAT 5 Ethernet cable, blue molded, 6 feet
- One Null Modem cable, 6 feet
- One Ethernet Crossover cable, red molded, 3 feet
- One Installation Guide

- Four adhesive rubber feet
- One rack mount kit: 2 ears and 6 screws.

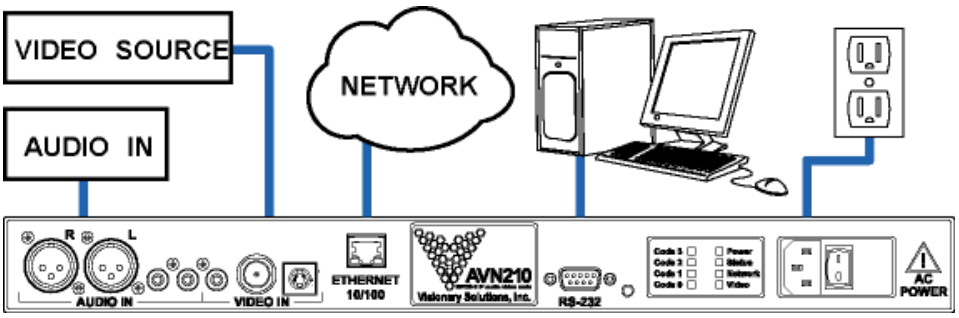
2.2 Installation

The minimum connections to the AVN210 should include a video source connected to either of the composite video inputs or the S-Video input, the power cable, and an RJ-45 LAN connection to the Ethernet connector.

To connect the AVN210:

1. Connect a video source to one or all of the video input connectors (composite RCA/BNC, S-Video).
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.
3. Connect the power cable (included) to the AVN210.

2.3 AVN210 Rear Panel Connection Diagram



Chapter 3 Using the Administrative Privileges

The administrative user has the capability of overriding all controls and actions of an AVN210.

The AVN210 is shipped with a default Administrative Username and Password (admin/admin). It is recommended that you change the default values that are shipped with your AVN unit before installing it on your network.

Note: *The Administrative Username and Password can be up to 31 characters in length and are case sensitive.*

There are two methods that you can use to change the AVN210's Administrative Username and Password, depending upon your connection method:

1. If you have a serial connection on your PC, you can connect to the AVN210 using a terminal emulation program. Refer to *3.1 Connecting With a Terminal Emulation Program* below.

2. If you are able to connect to your AVN210 over the network, you have the option of opening a Telnet session to access your AVN. Refer to *3.2 Connecting With a Telnet Session* below.

3.1 Connecting With a Terminal Emulation Program

1. Connect the serial cable between the serial port of the AVN210 and a COM port on your PC (typically the COM1 port). The AVN210 uses an RJ-45 to DB9-F serial cable (shipped with the MPP chassis).

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

    a. Create/Open a new serial connection.

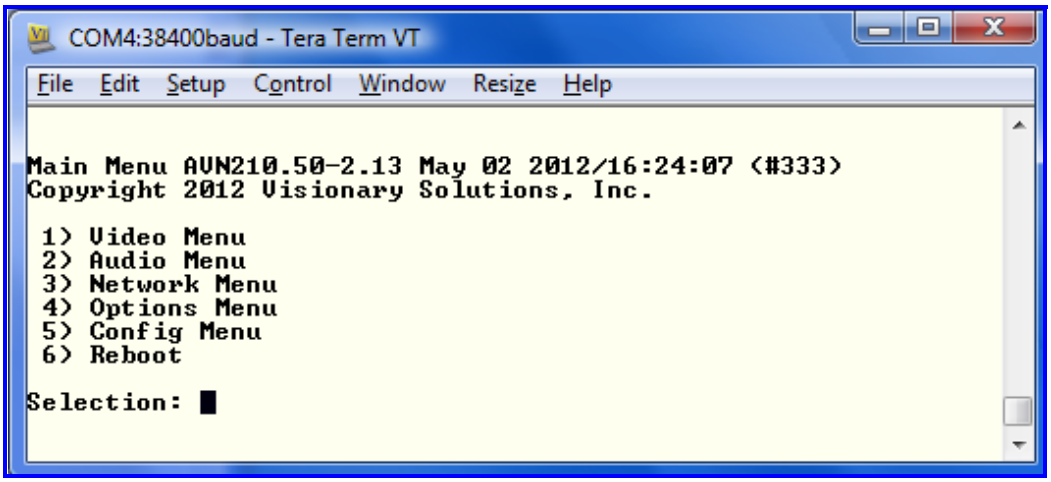
    b. Specify the PC port you are connected to (**typically COM1**), click **OK**.

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

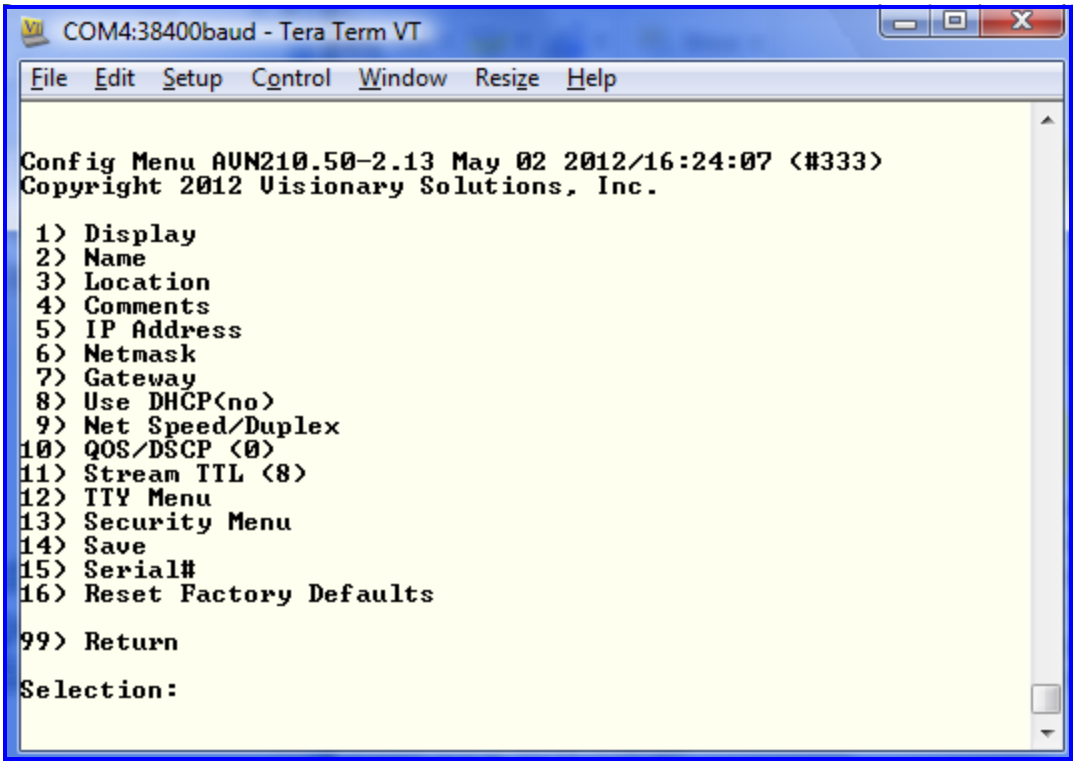
    d. Press **Enter** to get the login prompt for the encoder.

3. Power on your AVN210. The Main Admin Menu prompt will display on your monitor.

4. Select the Config Menu. Type `5` and press **Enter**.

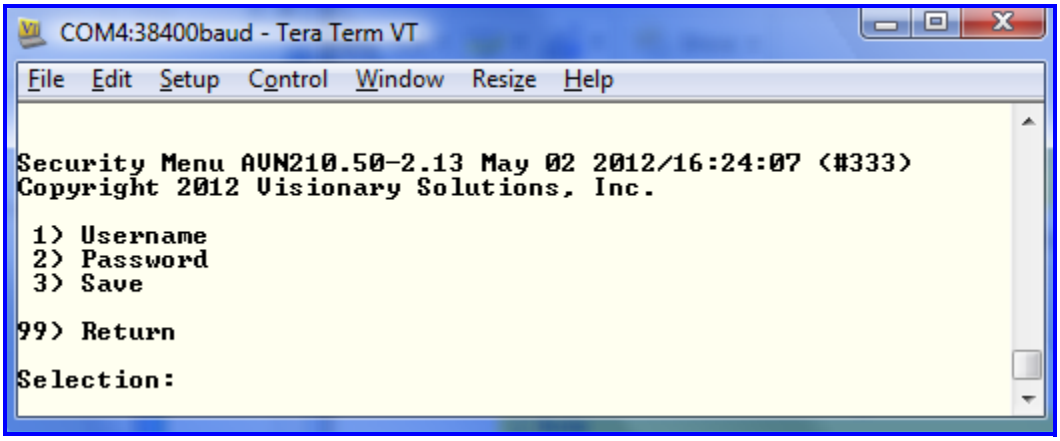


5. Select the Security Menu. Type `13` and press **Enter**.



6. At the Security Menu, to change the Username, type `1` and the current Username will display. Enter a new Username and press **Enter**, or, to keep the same Username, press **Enter**.

> ***Note:*** *Username and Password can be up to 31 characters in length and are case sensitive.*



7. To enter a password, type `2`. The prompt will come up empty and your entry will be visible in plain text. Type your new Password and press **Enter**. You will be asked to confirm your entry.

8. You must save your new settings in order for them to take effect. Type `3` and press **Enter**.

9. Exit the terminal emulation program and continue installing your AVN210.

3.2 Connecting With a Telnet Session

> ***Note:*** *For users that will connect to an AVN210 via Telnet on a Windows XP-based PC: If you have run and installed all of your Windows Critical Updates, this paragraph will not apply and you may proceed to Step 1. If your Critical Updates are not current, it may be necessary to precede **ALL** commands, **except** for the initial Username entry, with a single blank space. This includes the initial Password and all commands entered at the Telnet prompt.*

1. Open a Telnet session. From the Windows Start menu, select Run and at the prompt type **telnet xxx.xxx.xxx.xxx**, where *xxx.xxx.xxx.xxx* is the IP address of the AVN210 that you want to connect to. For example: **`telnet 192.168.1.90.`**

2. Enter the Administrative Username of the AVN210.

3. Enter the Administrative Password of the AVN210. All characters should be hidden with the asterisk (*) character. **If you are on a Windows XP-based PC and have not installed all of your Windows Critical Updates, you must precede your password entry with a single blank space.** See Note above.

4. Navigate the AVN210 menus. Follow Steps 4. through 8. from*3.1 Connecting With a Terminal Emulation Program*.

5. End the Telnet session. Click **Ctrl +]** to return to the prompt, and then type **quit**.

Chapter 4 Connecting to the Network

4.1 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 AVN210 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.

4.2 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 with serious 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 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 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, allowing a significant reduction in 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.

4.3 DHCP IP Configuration

The AVN210 has Dynamic Host Configuration Protocol (DHCP) turned on as the factory default. If your network has a DHCP server on it, the AVN210 will automatically acquire an IP address.

To view your AVN210's IP address, and ensure that it is properly connected to your network, follow these steps:

1. Launch the AVN2XX Configuration Utility. A list of AVNs will display in the AVNs on Network list in serial number order.

2. Locate the AVN210 in question by its serial number. The DHCP-assigned IP address will be listed.

If you do not see the AVN210 and you know that it is properly connected to the network, you may have a switch or router on the network preventing the multicast message from properly getting through, refer to *4.1 Unicast and Multicast Transmissions over the Network*.

4.4 Static IP Configuration

If the AVN210 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. Factory Default is 192.168.1.253.

In order to configure your AVN210 with a static IP address, you will need to turn off its DHCP functionality (see Steps 4 and 5 below).

To assign a static IP address to the AVN210, follow these steps:

1. Launch the AVN2XX Configuration Utility. A list of AVNs will display in the AVNs on Network list in serial number order.

2. If there is more than one network connected to the PC, select the network from the drop-down list and a new list of AVNs will display in the AVNs on Network list.

3. Highlight the AVN and click **Properties**, or double-click the AVN on the list.

4. Set DHCP to **Off**.

5. Enter the IP Address, Netmask, and/or Gateway values for your AVN.

6. Enter the Administrative Username and Password values for the selected AVN.

7. Click **OK** to update the selected AVN with the newly entered values, or **Cancel** to prevent any changes from taking effect.

For more information about using the utility, refer to *5.1 The AVN2XX Configuration Utility*.

4.5 Viewing the AVN210 on the Network

If you have difficulty finding the AVN210 on your network, you may need to check the DHCP setting and/or the AVN210's IP properties.

1. Check to see if you can view the AVN210 on your network:

    a. Launch the AVN2XX Configuration Utility, which will automatically discover and list all AVNs on the LAN.

    b. If the AVN210 you are expecting is not listed, verify that the correct network is listed in the Network drop-down list.

2. Contact your network administrator to ensure that your client PC is properly connected to the network.

3. Ensure that the DHCP setting is correct for your network. For a network that does not have a DHCP server, follow the Static IP Configuration steps.

4. If you still do not see the AVN210 in the AVNs on Network list, you may have to move the AVN unit to a local segment on the network. Follow the steps in *3.1 Connecting With a Terminal Emulation Program* or *3.2 Connecting With a Telnet Session* to change the IP Address, Netmask, and/or Gateway properties of the AVN210 and then return it to the desired location.

If you still do not see the AVN210 and you know that it is properly connected to the network, you may have a switch or router on the network preventing the Multicast message from properly getting through. Contact the network administrator to allow for a multicast message for discovery.

Chapter 5 Operating the AVN210

The AVN210 has four control interfaces that you can use to operate and configure the AVN units:

- AVN2XX Configuration Utility – GUI-based programs installed on a Windows-based PC.
- Console Interface – connects to an AVN unit using a terminal emulation program.
- Browser Interface – uses a browser interface.
- AVN Control Protocol Application Programming Interface (AVNCP API) – available upon request from Visionary Solutions, Inc.

The Console Interface and the Browser Interface are the preferred methods of configuring the AVN210, although a user will have nearly the same access to the AVN's functionalities using any of the four interface options.

5.1 The AVN2XX Configuration Utility

The AVN2XX Configuration Utility is a free software interface used to configure and control the AVN2XX encoders (AVN200, AVN210, and AVN220) and their video streams on Windows-based PCs. It can be used to update the firmware and has a Mass Configuration dialog that is able to configure the encoder settings on multiple AVN units at one time.

Download the application here:
http://www.vsicam.com/core/__downloads/AVN2XX_Configuration_Utility.zip.

5.2 AVN210 Console Interface Menus

To access the AVN210's Console Interface, establish a terminal emulation session or a Telnet session.

- Refer to *3.1 Connecting With a Terminal Emulation Program* or *3.2 Connecting With a Telnet Session* for connection instructions.
- Refer to *Chapter 6 Using the Console Interface* for information about the Console Interface menus and their functionality.

5.3 AVN210 Browser Interface Menus

The AVN210 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 AVN210's IP address.

2. Click **Enter/Go**. The AVN210's Web Management page will display.

3. Enter the Username and Password of the AVN210 and click the **Login** button. The AVN210's Browser Interface pages will display.

Refer to *Chapter 7 Using the Browser Interface* for information about the Browser Interface pages and their functionality.

5.4 AVN Control Protocol (API)

For programmers who wish to integrate AVN control functionality into their own applications, the AVN Control Protocol (API) offers all the "hooks" needed. Contact support@vsicam.com for AVN210 API documentation. Available to prequalified customers only.

Chapter 6 Using the Console Interface

To access the AVN210's Console Interface, establish a terminal emulation session or a Telnet session. Refer to *3.1 Connecting With a Terminal Emulation Program* and *Chapter 3 Using the Administrative Privileges* for connection instructions.

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

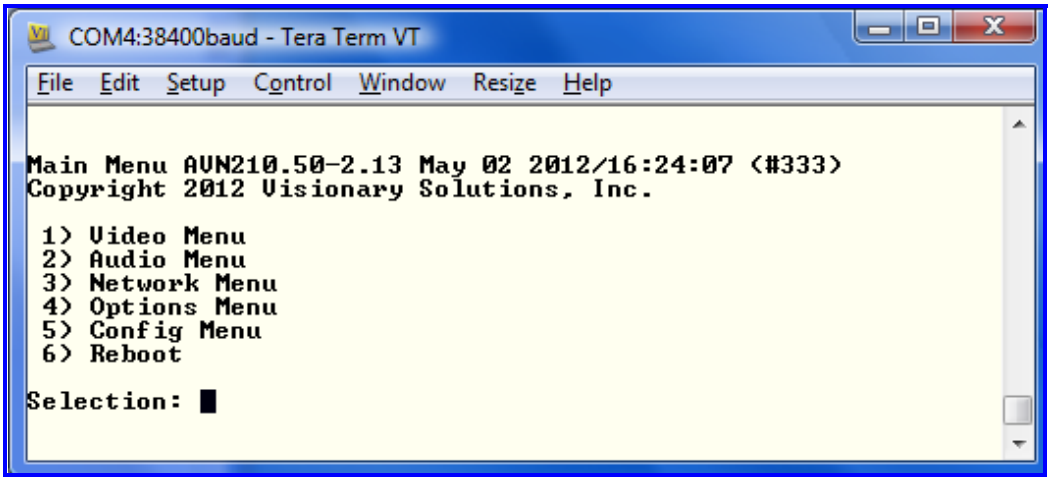
It is important to understand how the AVN210 handles changes made using the Console Interface.

Although all changes made in the Console Interface are immediately written to memory, some of the changes will only take effect after they are saved and the unit is rebooted. Selecting the Save option will cause the changes to be saved to Flash, and after a reboot those saved values will be used.

When making changes in the Video Settings Admin Menu, changes will take effect immediately. If the stream is stopped and restarted, the new settings will be used for the new stream. However, unless the Save option is selected, the changes will not be saved after a reboot.

The following is a brief description of the options available using the AVN210 Console Interface.

6.1 Main Menu



1) Video Menu – displays the Video Admin Menu.

2) Audio Menu displays the Audio Admin Menu.

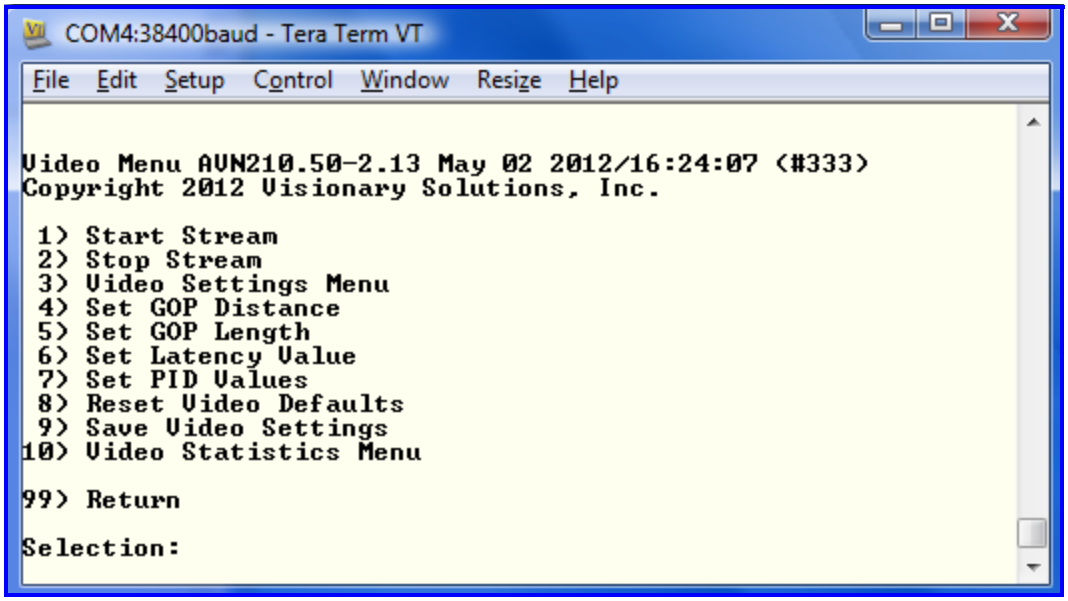
3) Network Menu – displays the Network Admin Menu.

4) Options Menu – displays the Options Admin Menu.

5) Config Menu – displays the Config Admin Menu.

6) Reboot – causes the AVN210 to reboot. All changes stored in Flash will take effect.

6.2 Video Menu



1) Start Stream – starts the AVN210 stream with stored values. If you attempt to start an AVN210 stream that does not have a valid video source and system integrity testing is enabled, the console window will display the streaming text saying "Video Source Not Connected". If that happens, Type **2** and press Enter, to Stop Stream and regain use of the console menus. Using the Scroll Lock key on most keyboards also stops the streaming text.

2) Stop Stream – stops the AVN210 stream.

3) Video Settings Menu – displays the Video Settings Menu.

4) Set GOP Distance – sets the Video GOP distance. Valid values range from 0 to 3. See *10.3 Group of Pictures (GOP)* for more information on GOP, including recommended settings.

5) Set GOP Length – sets the Video GOP length. Valid values range from 1 to 19. See *10.3 Group of Pictures (GOP)* for more information on GOP, including recommended settings.

6) Set Latency Value – sets the values for how long buffers can be held in memory before transmission. This is an advanced setting. Improperly

set values can result in unusable encoding. Please see *6.7 Low Latency Information* for more information.

7) Set PID Values – sets the PMT, PCR, VID, and AUD PID values. This is an advanced feature and should only be changed by users with specific needs.

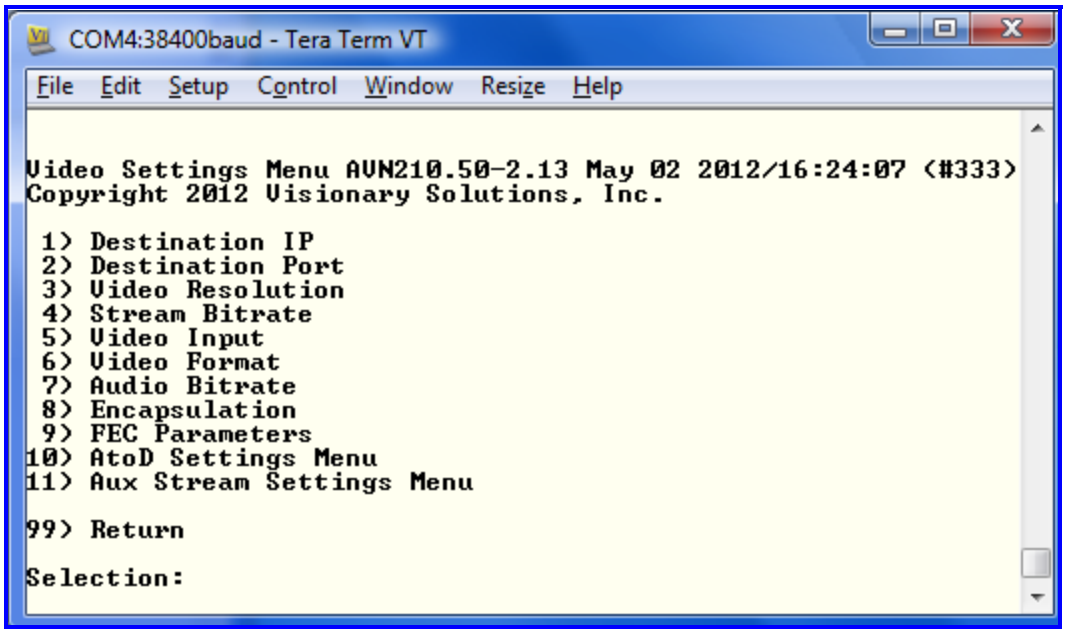
8) Reset Video Defaults – resets all video settings to default values.

9) Save Video Settings – saves the current video settings to Flash.

10) Video Statistics Menu – displays the Video Statistics Menu.

99) Return – Use this command to navigate up the console menus back to the Main Admin Menu.

6.2.1 Video Settings Menu



1) Destination IP – sets the destination IP address.

2) Destination Port – sets the destination/UDP port number.

3) Video Resolution – sets the resolution.

4) Stream Bitrate – sets the stream bitrate.

5) Video input – sets the video input type.

6) Video Format – sets the video format type.

7) Audio Bitrate – sets the audio bitrate.

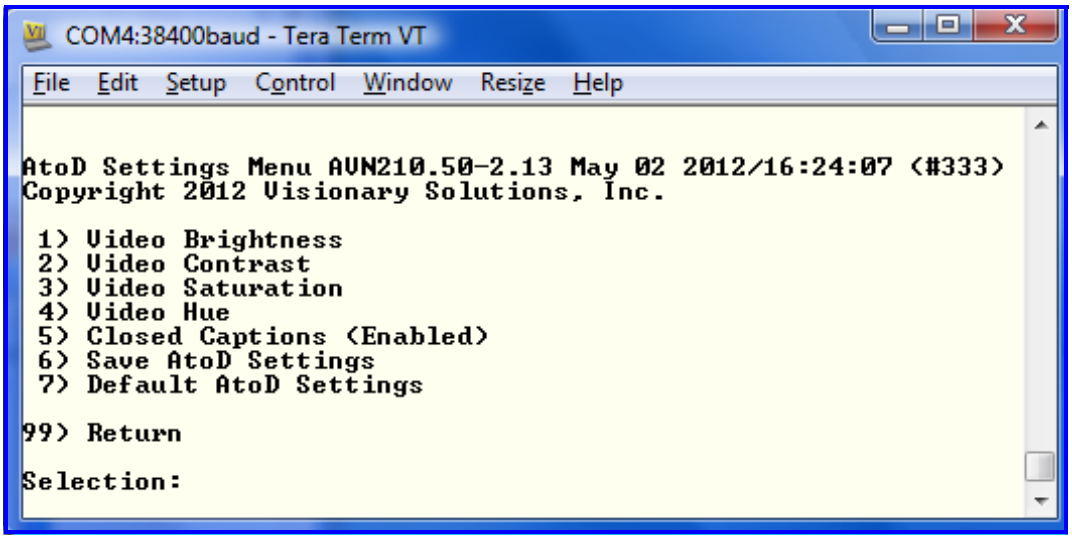
8) Encapsulation – sets the stream encapsulation type.

9) FEC Parameters – No longer supported in the AVN2XX product line.

10) AtoD Settings Menu – displays the AtoD Settings menu.

11) Aux Stream Settings Menu – displays the Aux Stream Settings menu.

6.2.1.1 AtoD Settings Menu



1) Video Brightness – sets the brightness.

2) Video Contrast – sets the contrast.

3) Video Saturation – sets the saturation.

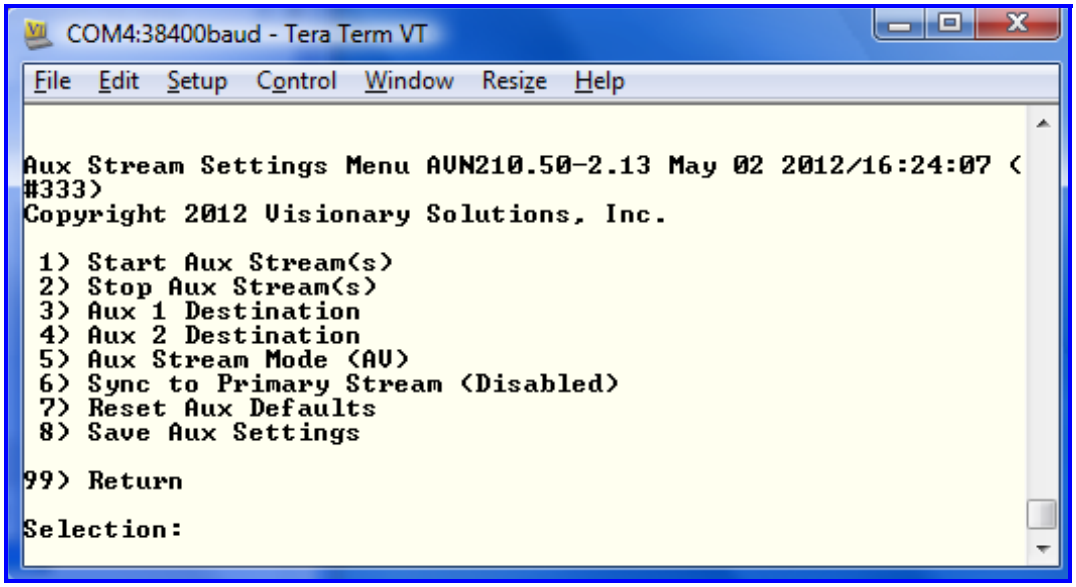
4) Video Hue – sets the hue.

5) Closed Captions – enables and disables closed captioning.

6) Save AtoD Settings – saves the AtoD settings.

7) Default AtoD Settings – sets the AtoD settings to their default values.

6.2.1.2 Aux Stream Settings Menu



1) Start Aux Stream(s) – starts all configured auxiliary streams.

2) Stop Aux Stream(s) – stops all auxiliary streams.

3) Aux 1 Destination – sets the Aux 1 stream's destination address (IP address and port).

4) Aux 2 Destination – set the Aux 2 stream's destination address (IP address and port).

5) Aux Stream Mode – sets the auxiliary stream modes. These modes affect both Aux 1 and Aux 2 streams and allow audio and or video to be enabled or disabled. Disabling both disables the auxiliary streams.

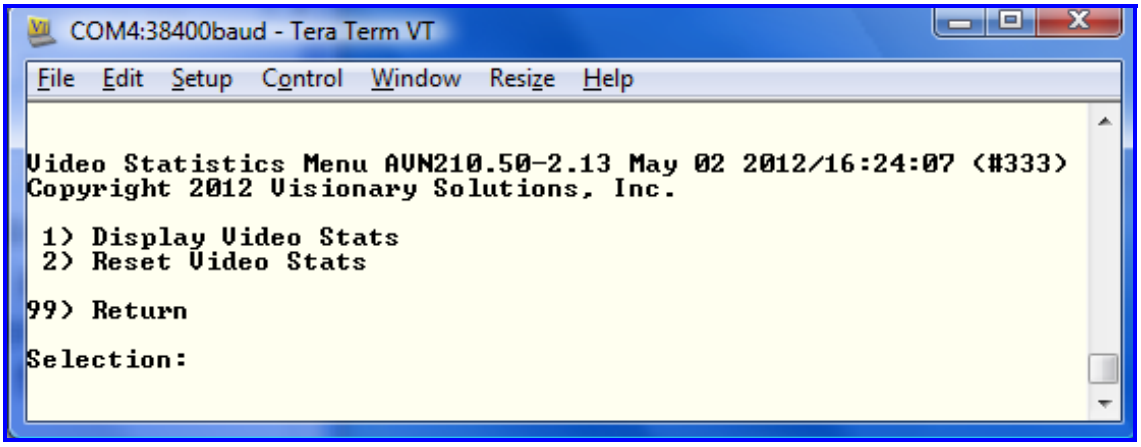
6) Sync to Primary Stream – enables and disables the Sync to Primary Stream option. When enabled, both auxiliary streams will be stopped and started when the primary encoder stream is stopped or started. When disabled, the auxiliary streams require a separate start command from the console menu or browser interface to begin streaming.

Note: The auxiliary streams can only run when the primary stream runs, regardless of the Sync to Primary Stream option.

7) Reset Aux Settings – resets all Aux Stream Settings back to the default values.

8) Save Aux Settings – saves all current Aux Stream Settings to Flash.

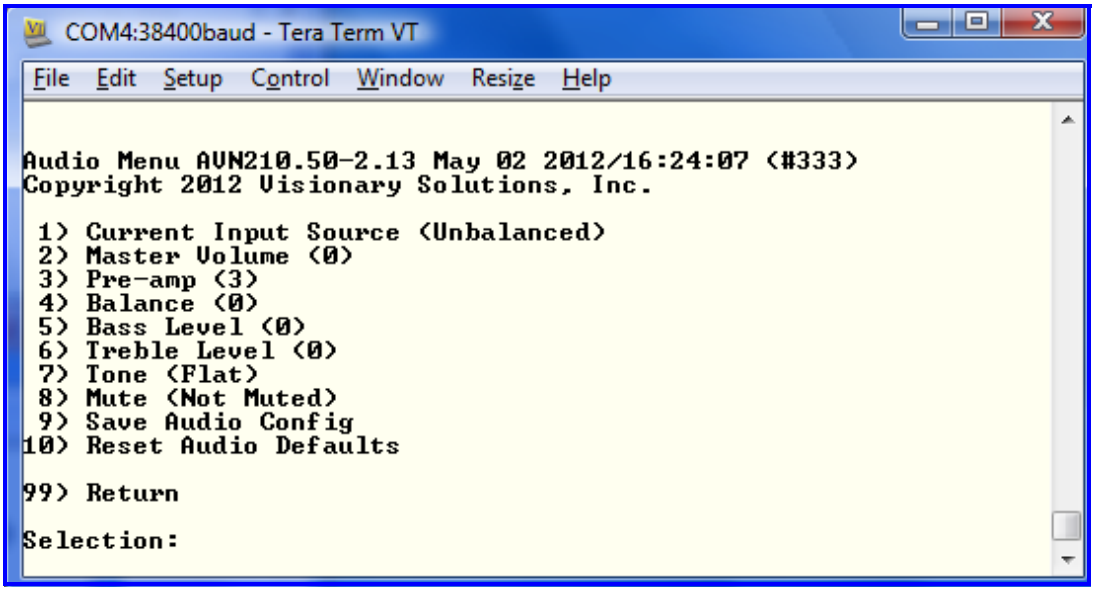
6.2.2 Video Statistics Menu



1) Display Video Stats – displays the current video statistics.

2) Reset Video Stats – resets all of the video statistics.

6.3 Audio Menu



1) Current Input Source – sets the audio input source. Choices are Balanced or Unbalanced.

2) Master Volume – sets the volume. The valid range is from -45 (quiet) to 16 (loudest).

Warning: If the volume is set too high audio, clipping will occur.

3) Pre-amp – sets the pre-amp level. The valid range is from 0 (no pre-amplification) to 8 (maximum pre-amplification).

4) Balance – sets the balance. The valid range is from -10 (all left) to 10 (all right).

5) Bass Level – sets the bass level. The valid range is from 0 (no bass boost) to 15 (max bass boost). The bass level is affected by the tone setting (see Tone).

6) Treble Level – sets the treble level. The valid range is from 0 (no treble boost) to 3 (most treble boost). The treble level is affected by the tone setting (see Tone).

7) Tone – sets the scale of the Bass and Treble values with regards to boosting. If set to Flat, no boosting of Bass or Treble occurs regardless of the Bass and Treble values set. If set to Minimum, the Bass and Treble values have a boosting effect but the scale of the values is not set to its maximum. If set to Maximum, the Bass and Treble values are fully scaled allowing the maximum boost possible.

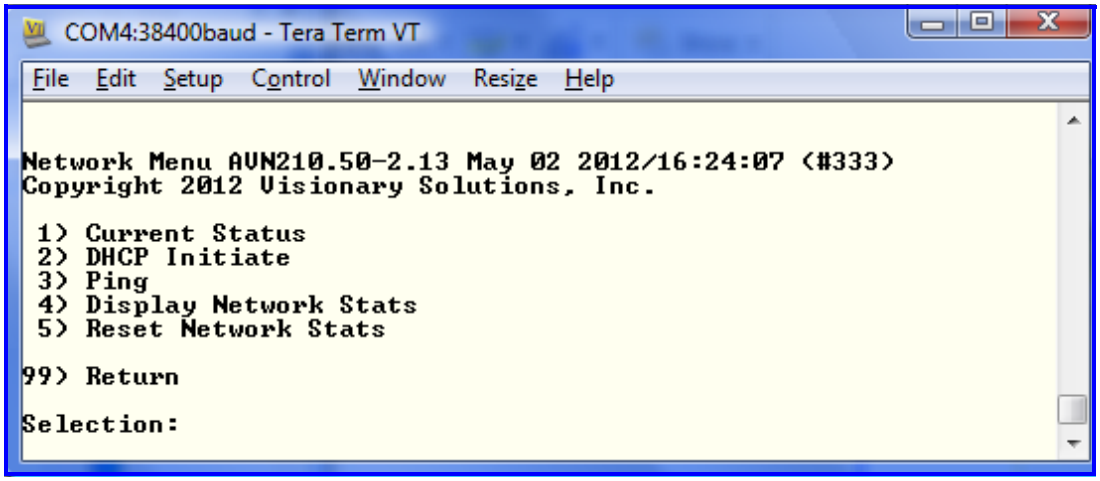
8) Mute – prevents audio input from being sent to the encoder. This does not lower the overall stream bitrate, however, as the encoder simply encodes silence.

Warning: Changing the Pre-amp level will likely cause audio clipping to occur.

9) Save Audio Config – saves the current audio settings.

10) Reset Audio Defaults – resets the AVN210 to default audio settings.

6.4 Network Menu



1) Current Status – displays current the Ethernet Port, Hardware Address, IP Address, Netmask, Gateway, Broadcast, Network address, Link status, Speed, and Duplex settings.

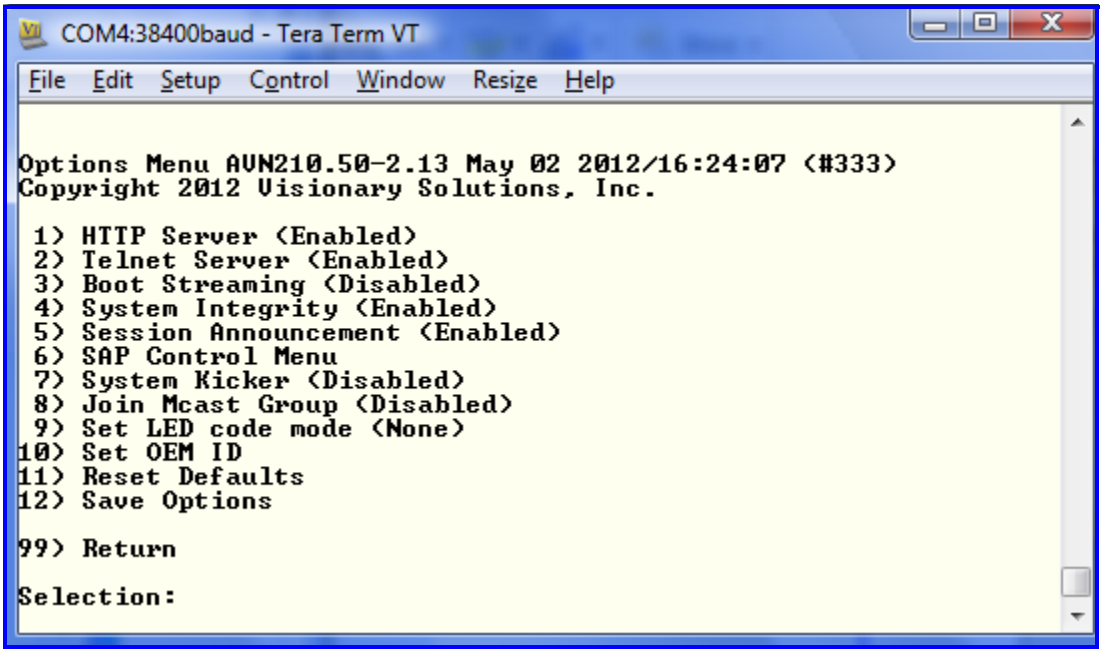
2) DHCP Initiate – displays the Port, Protocol, and Task numbers.

3) Ping – "pings" a given IP address with a specified size and number of packets, and a VLAN ID. Uses the default values for Count, Len, and VLAN ID to do a standard ping test.

4) Display Network Stats – displays the Port number, Destination, Netmask and Gateway IP routes.

5) Reset Network Stats – resets the Port number, Destination, Netmask and Gateway IP routes to the factory defaults.

6.5 Options Menu



1) HTTP Server – enables and disables HTTP server.

2) Telnet Server – enables and disables Telnet Server.

3) Boot Streaming – enables and disables Boot Streaming mode. When enabled, the encoder attempts to start streaming after powering on or rebooting once the specified delay is reached. The default value is 5 seconds. For example, if the Boot Streaming is set to 30 seconds, the encoder will start streaming if a valid input is provided 30 seconds after the unit powers on or is rebooted.

4) System Integrity – enables and disables System Integrity testing. When enabled, the input source is monitored for quality. If errors are detected the stream is stopped. When errors are no longer detected, streaming is automatically resumed.

5) Session Announcement – enables and disables SAP.

6) SAP Control Menu – displays the SAP Control Menu.

7) System Kicker – enables and disables the System Kicker. The System Kicker feature allows for timed restart of stream set in minutes or hours.

8) Join Mcast Group – enables and disables Join Mcast Group. This option is only used for encoders on some networks where a mulitcast group has no joining members and may cause the stream to be "flooded" to all ports. By joining its own multicast group, the encoder is able to prevent this. Most networks do not have this issue and do not require this option to be enabled.

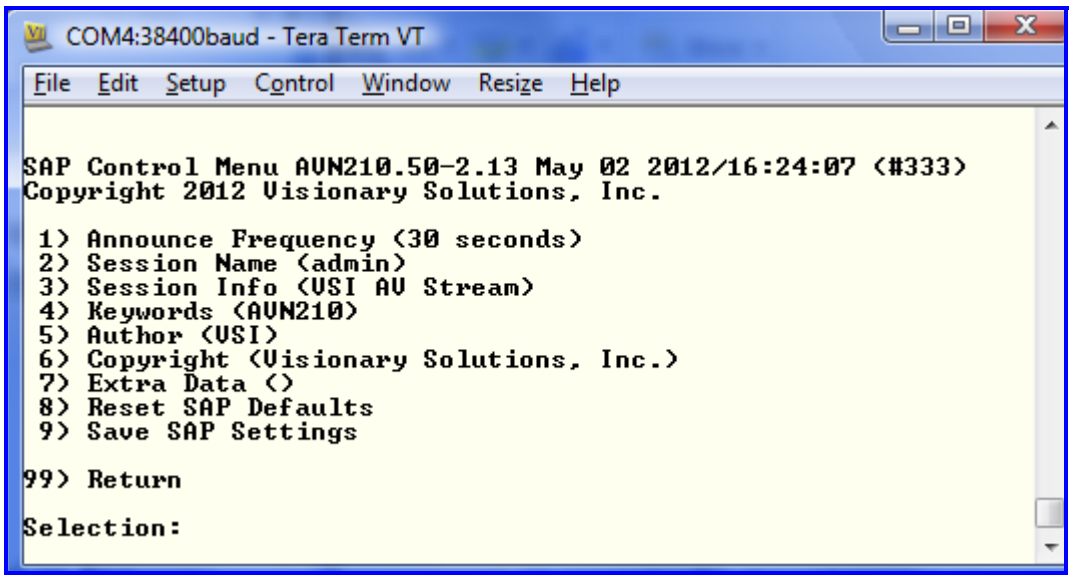
9) Set LED Code Mode – sets the LED code mode. Refer to *8.5 AVN210 Advanced Audio Testing and Diagnostics*.

10) Set OEM ID – allows the setting of the Product ID/Version and Company Copyright information that is displayed above all console menus.

11) Reset Defaults – resets all Option menu items to default values.

12) Save Options – saves the current Options selections to Flash.

6.5.1 SAP Control Menu



1) Announce Frequency – sets the session's announcement frequency attribute. This setting determines how often the encoder announces its SAP data on the network.

2) Session Name – sets the session's name attribute. The session name is most often what is displayed by devices monitoring SAP.

3) Session Info – sets the session info attribute.

4) Keywords – sets the session's keywords attribute.

5) Author – sets the session's author attribute.

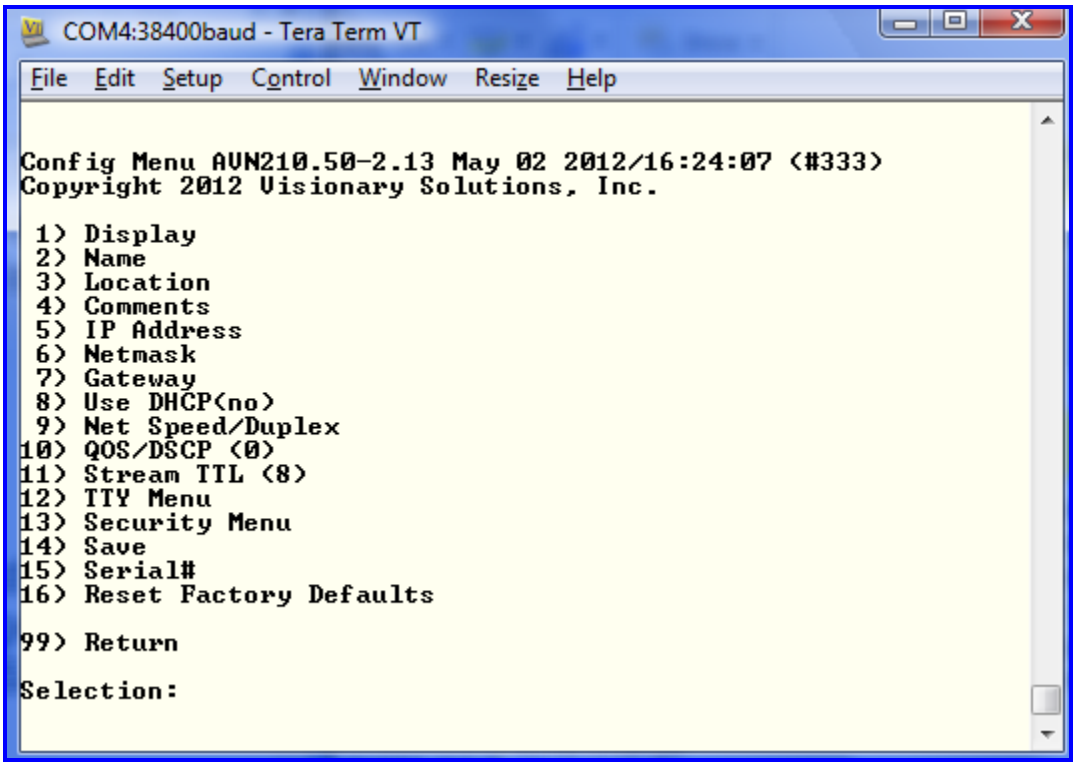
6) Copyright – sets the session's copyright attribute.

7) Extra Data – sets the extra data field. **WARNING** – the extra data field is for advanced users only! Leave blank unless you have specific knowledge about SAP and need to use this field. Improperly formatted data will cause SAP to not work.

8) Reset SAP Defaults – resets all SAP settings back to default values.

9) Save SAP Settings – saves all SAP settings to Flash.

6.6 Config Menu



1) Display – displays the Port, Hardware Address, IP Address, Netmask and Gateway IP addresses.

2) Name – allows an optional string to describe the AVN210, which will display in the AVN210 Web Management page.

3) Location – allows an optional string to describe the AVN210, which will display in the AVN210 Web Management page.

4) Comments – allows an optional string for user notes regarding the AVN.

5) IP Address – sets the IP address.

6) Netmask – sets the Netmask.

7) Gateway – sets the Gateway IP address.

8) Use DHCP – displays whether DHCP is being used (yes or no) and allows this property to be changed.

9) Net Speed/Duplex – allows the setting of Network Speed. The default is AutoNegotiate and it is not recommended to manually set the network speed.

10) QOS/DSCP – sets the Quality Of Service (QOS)/Differentiated Services Code Point (DSCP) value. This value controls the stream QOS through a Network.

    P0:P2 are precedence bits (0-7, 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 six bits of the TOS byte in the IP Header may also be used.

11) Stream TTL – sets the Time-To-Live (TTL) value. This value 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 range is 0-255 and the default value is *8.

12) TTY Menu – displays the TTY Menu.

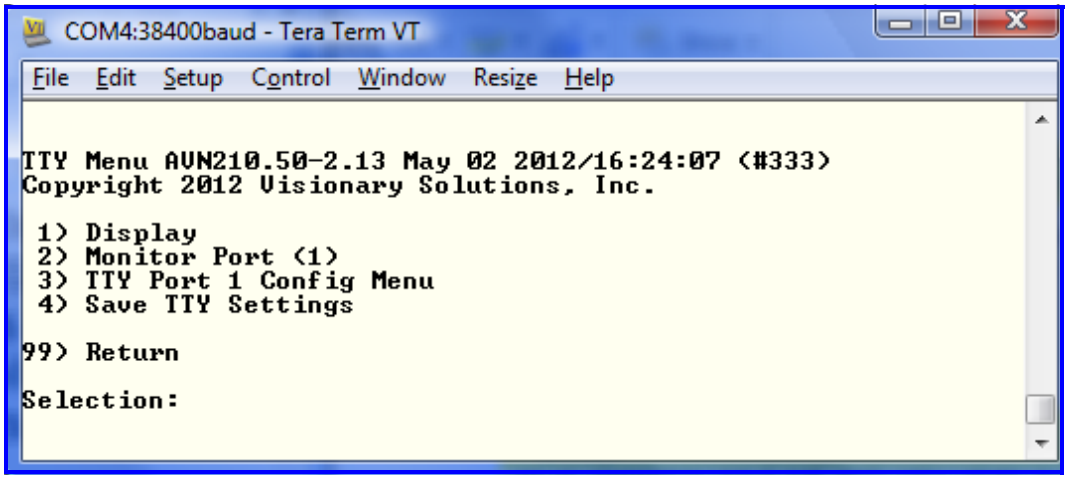
13) Security Menu – displays the Security Menu.

14) Save – saves current configuration settings to Flash.

15) Serial # – displays the serial number.

16) Reset Factory Defaults – resets the AVN configuration settings to the factory default settings.

6.6.1 TTY Menu



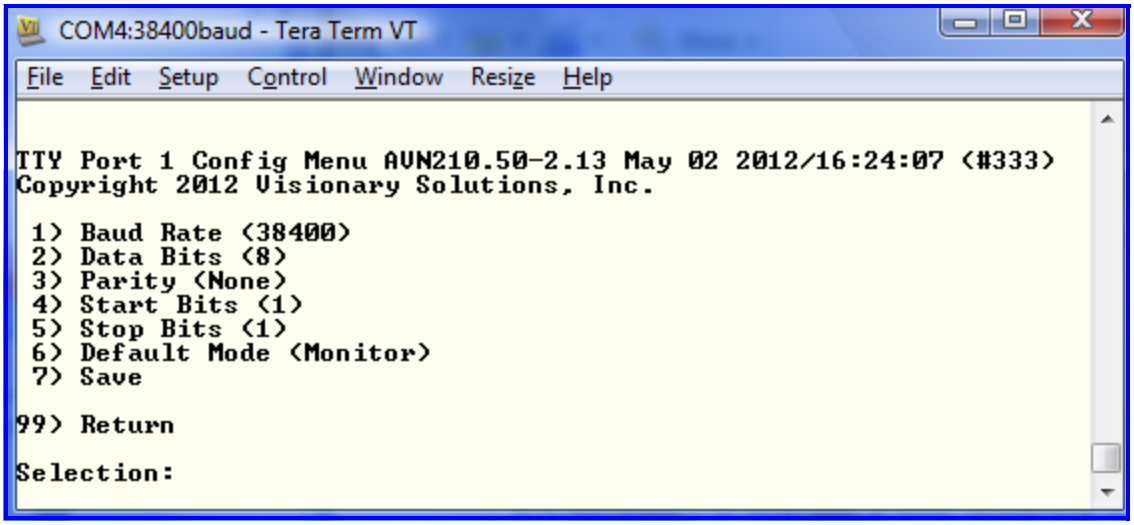
1) Display – displays the Port, Baud Rate, Parity, Bits, Start, Stop and Mode of both ports.

2) Monitor Port – sets which port to use for the monitor.

3) TTY Port 1 Config Menu – displays the TTY Port 1 Config Menu.

4) Save – saves the current port configurations to Flash.

6.6.2 TTY Ports 1 & 2 Config Menu



1) Baud Rate – set the ports baud rate.

2) Data Bits – sets the data bits.

3) Parity – sets the parity.

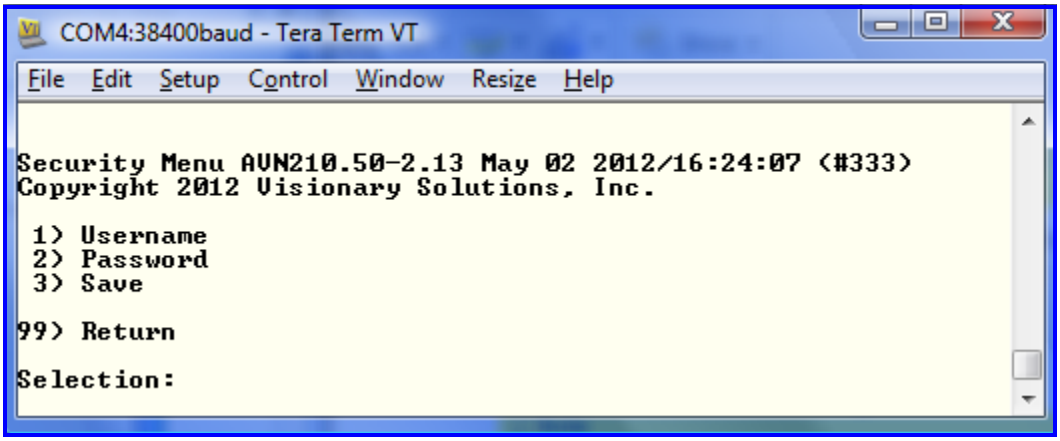
4) Start Bits – sets the start bit.

5) Stop Bits – sets the stop bit.

6) Default Mode – sets the port mode.

7) Save – saves the current port configuration values to Flash.

6.6.3 Security Menu



1) Username – sets the Username.

2) Password – sets the Password.

3) Save – saves the new Username and Password values to Flash. You must still select 6) Reboot from the Main Admin Menu. You must reboot the AVN210 in order to cause the new values stored in Flash to take effect.

6.7 Low Latency Information

Beginning with software version AVN2XX_1_75, the AVN unit can be configured for optimized latency settings via the Console Interface. From the Video Admin Menu (see *6.2 Video Menu*) there are three possible settings, that, in addition to the bandwidth setting, control the latency of the stream. The GOP Distance and Length (see *10.3 Group of Pictures (GOP)*) determine the presence and distribution of frame types (I,P,B), and the Latency Value setting controls how long buffers can be held in memory before transmission.

The recommended settings for Highest Quality/Low Latency optimization for PTZ or Teleconferencing applications are as follows:

GOP Distance: 2

GOP Length: 8

Latency Value: 100

Stream Bitrate: 5.5 Mbps

If your AVN210 is running software older than AVN2XX_1_75, it can be easily upgraded. Go to the following link, www.vsicam.com/_update/avn2xx-firmware-updates/, and follow the instructions on how to download the new image and on how to use the AVN2XX Configuration Utility to perform the update to one or multiple units.

Chapter 7 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.*

The AVN210 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 AVN210's IP address.
2. Click **Enter/Go**. The AVN210's Web Management Login page will display.
3. Enter the Username and Password of the AVN210 and click the **Login** button. The AVN210's Browser Interface pages will display.

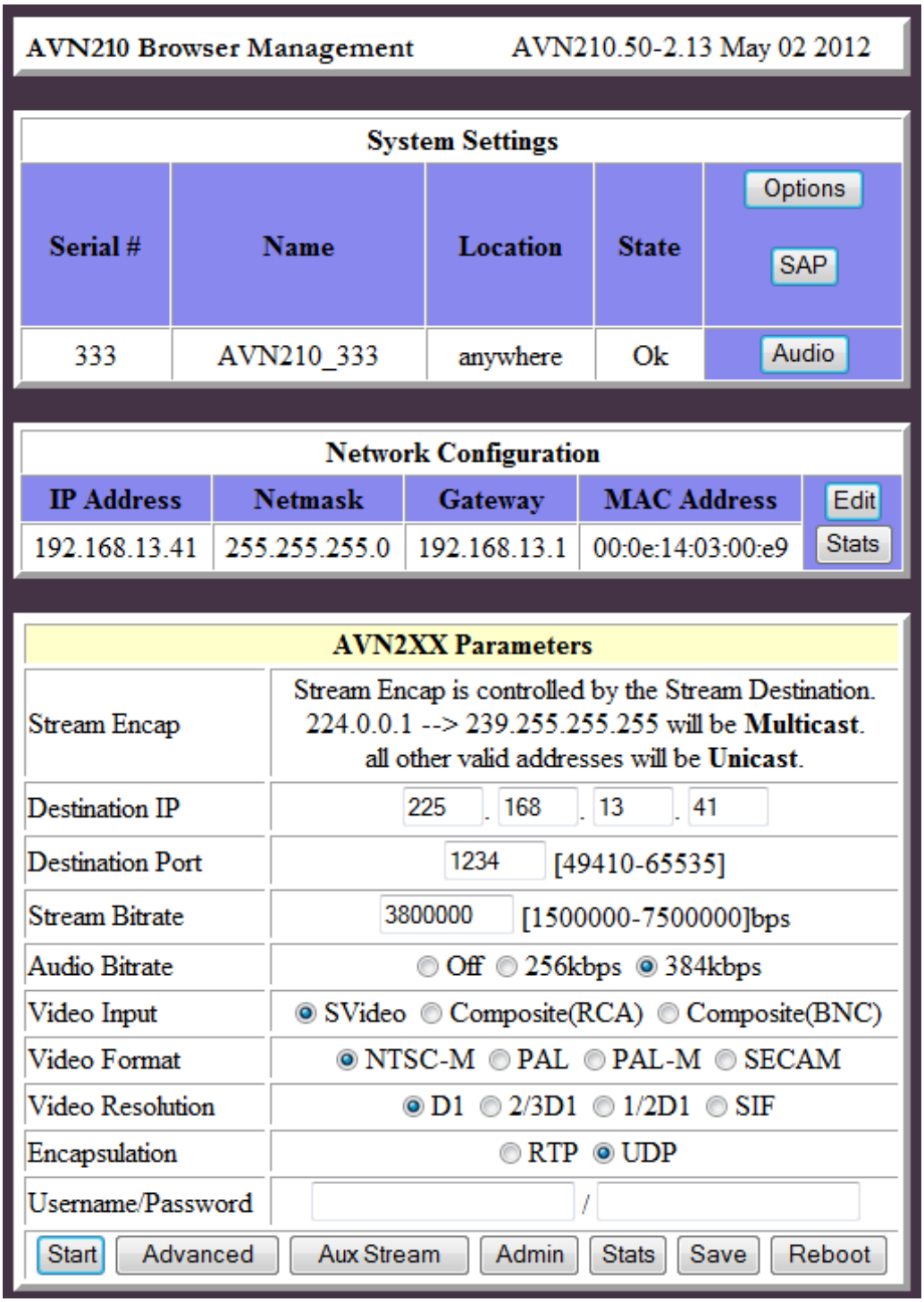
7.1 Browser Interface Menu Tree

The main Web Management page consists of three sections: the System Settings section, the Network Configuration section, and the AVN210 Parameters section. From these sections, you can access the following additional menus:

System Settings group/section	→	the Options button opens the Systems Options page
	→	the SAP button opens the SAP Settings page
	→	the Audio button opens the Audio Configuration page
Network Configuration section	→	the Edit button opens the IP Configuration page
	→	the Stats button opens the Network Stats page
AVN210 Parameters section	→	the Advanced button opens the Advanced page
	→	the Aux Stream button opens the Auxiliary Streaming page
	→	the Admin button opens the Modify Username/ Password page
	→	the Stats button opens the Video Stats page

7.2 Main Page

The AVN210 Web Management page displays the firmware version and the date it was installed at the top of the page. Where you see AVN210.50-***x.xx***, ***x.xx*** will be the firmware version.



7.2.1 System Settings Section

1) Serial # – displays the Serial Number of the AVN.

2) Name – displays the Name of the AVN. This is a user defined field and can be set from the System Options page.

3) Location – displays the Location of the AVN. This is a user defined field and can be set from the System Options page.

4) State – displays the current State of the AVN. Possible States are OK and Needs Reboot.

5) **Options** button – brings up the System Options page.

6) **SAP** button – brings up the SAP Settings page

7) **Audio** button – brings up the Audio Configuration page.

7.2.2 Network Configuration Section

1) IP Address – displays the AVN's current IP address.

2) Netmask – displays the AVN's current Netmask.

3) Gateway – displays the AVN's current Gateway IP address.

4) MAC Address – displays the AVN's MAC address.

5) **Edit** button – opens the IP Configuration menu.

6) **Stats** button – opens the Network Stats menu.

7.2.3 Stream Parameters Section

1) Stream Encap – provides details on how the Destination IP unit is controlling the stream.

2) Destination IP – displays the current Destination IP address and allows this value to be changed.

3) Destination Port – displays the current Destination Port and allows this value to be changed.

4) Stream Bitrate – displays the current Stream Bitrate and allows this value to be changed.

5) Audio Bitrate – displays the current Audio Bitrate and allows this value to be changed.

6) Video Input – displays the current Video Input and allows the editing of this property.

7) Video Format – displays the current Video Format and allows this value to be changed.

8) Video Resolution – displays the current Video Resolution and allows this value to be changed.

9) Encapsulation – displays the current Encapsulation selection and allows this value to be changed.

10) Username/Password – Username/Password values are required for Reboot and other AVN Administrative privileges.

11) **Start/Stop** – starts or stops the AVN stream. When starting a stream, the current AVN210 Parameters values are used.

12) **Advanced** – opens the Advanced page.

13) **Aux Stream** – with a valid Username/password, this button opens the Auxiliary Stream page.

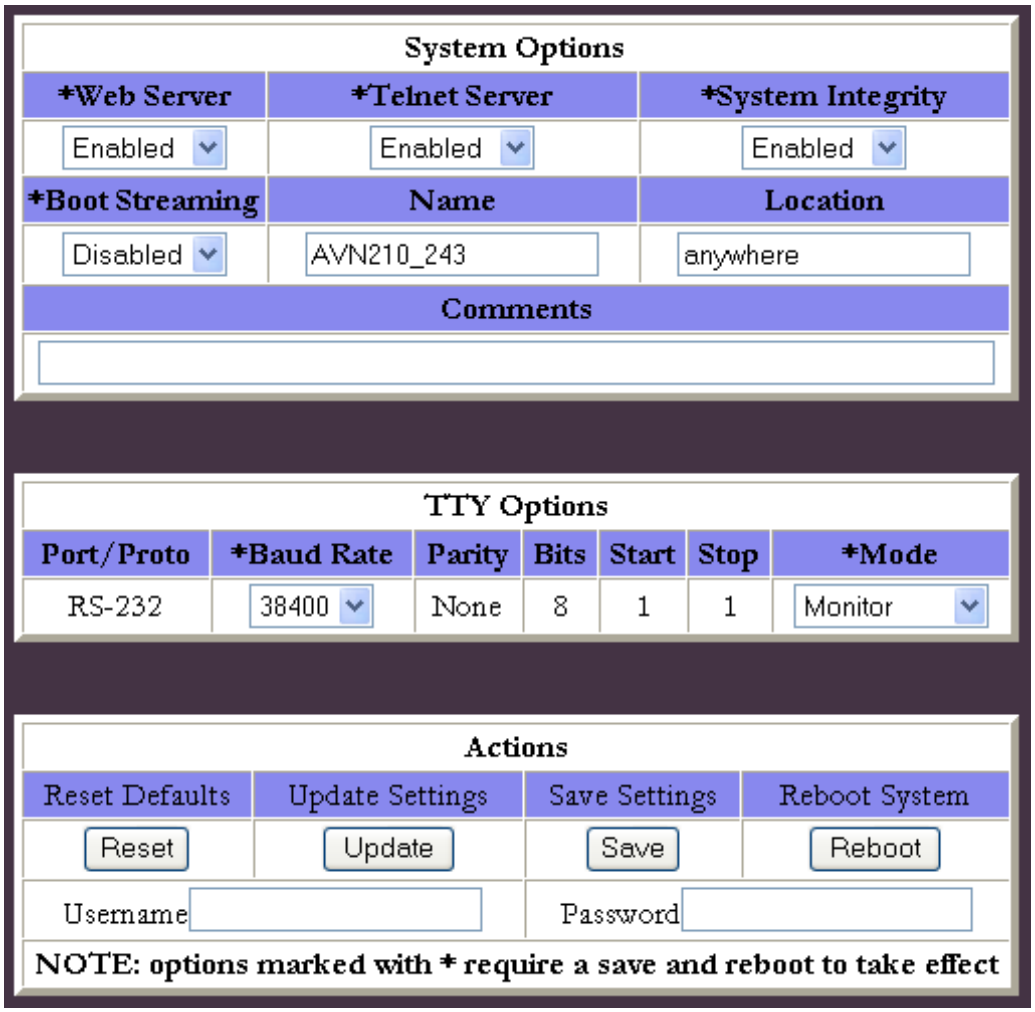
14) **Admin** – with a valid Username/password, this button opens the Modify Username/Password dialog.

15) **Stats** – opens the Video Stats page.

16) **Save** – saves all AVN210 Parameter section values to memory. If the AVN is streaming, the new settings will not take effect until the stream is stopped and restarted.

17) **Reboot** – reboots the AVN and will cause any changes that were saved to Flash to take effect.

7.3 System Options Page



7.3.1 Systems Options Section

1) Web Server – displays the current web server functionality. Allows this feature to be enabled and disabled.

2) Telnet Server – displays the current Telnet Server functionality. Allows this feature to be enabled and disabled.

3) System Integrity – displays the current System Integrity server functionality. Allows this feature to be enabled and disabled. When enabled, the input source is monitored for quality. If errors are detected, the stream is stopped. When errors are no longer detected, streaming is automatically resumed.

4) Boot Streaming – displays the current Boot Streaming functionality. Allows this feature to be enabled and disabled. When enabled, the encoder attempts to start streaming after powering on or rebooting

once the specified delay is reached. The default value is 5 seconds. For example, if the Stream at Bootup is set to 30 seconds, the encoder will start streaming if a valid input is provided 30 seconds after the unit powers on or is rebooted.

5) Name – displays the current AVN Name and allows this value to be changed.

6) Location – displays the current AVN Location and allows this value to be changed.

7) Comments – displays the current AVN Comments and allows this value to be changed.

7.3.2 TTY Options Section

1) Port/Proto – displays the AVN port. 0/RS-232.

2) Baud Rate – shows the current Baud Rate for each port and allows this value to be changed.

3) Parity – shows the current Parity for each port.

4) Bits – shows the current Bits for each port.

5) Start – shows the current Start bit for each port.

6) Stop – shows the current Stop bit for each port.

7) Mode – shows the current Mode for each port and allows this value to be changed.

7.3.3 Actions Section

1) **Reset** – causes all the System Options and TTY Options to be reset to factory default values.

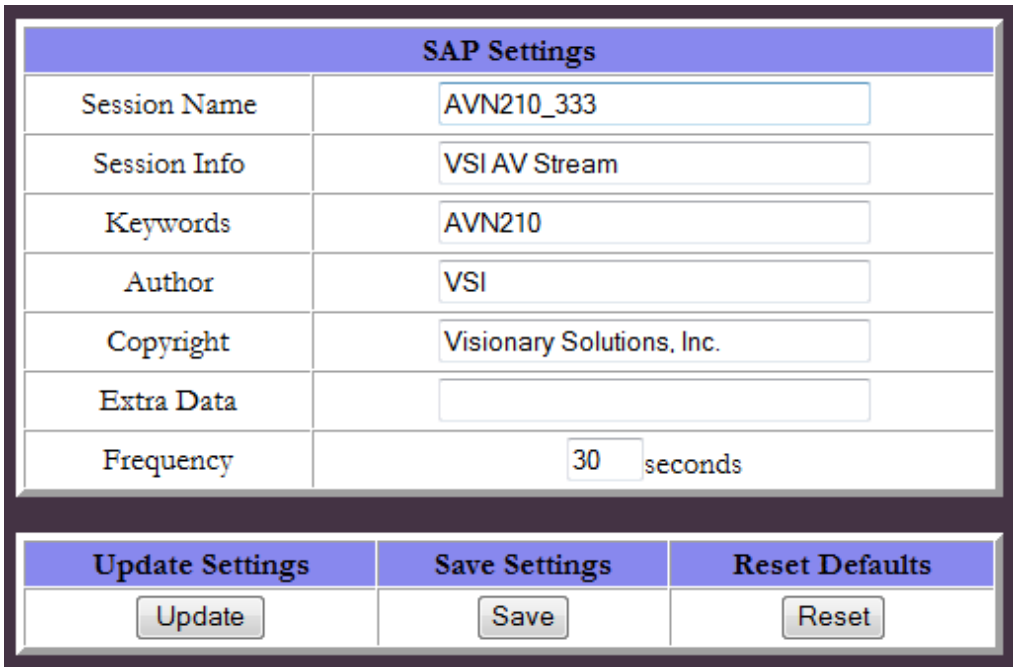
2) **Update** – causes all the System Options and TTY Options to be saved to memory. These changes take effect immediately but will not be saved across an AVN reboot. If the AVN is streaming, the new settings will not take effect until the stream is stopped and restarted.

3) **Save** – causes all the System Options and TTY Options to be saved to Flash. Note: changed fields marked with an asterisk (*) do not take effect immediately and require an AVN reboot.

4) **Reboot** – causes the AVN to reboot.

5) Username/Password – Username/Password values are required for Reboot and other AVN Administrative privileges.

7.4 SAP Settings Page



1) Session Name – sets the session's name attribute. The session name is most often what is displayed by devices monitoring SAP.

2) Session Info – sets the session info attribute.

3) Keywords – sets the session's keywords attribute.

4) Author – sets the session's author attribute.

5) Copyright – sets the session's copyright attribute.

6) Extra Data – sets the extra data field. **WARNING** – the extra data field is for advanced users only! Leave blank unless you have specific knowledge about SAP and need to use this field. Improperly formatted data will cause SAP to not work.

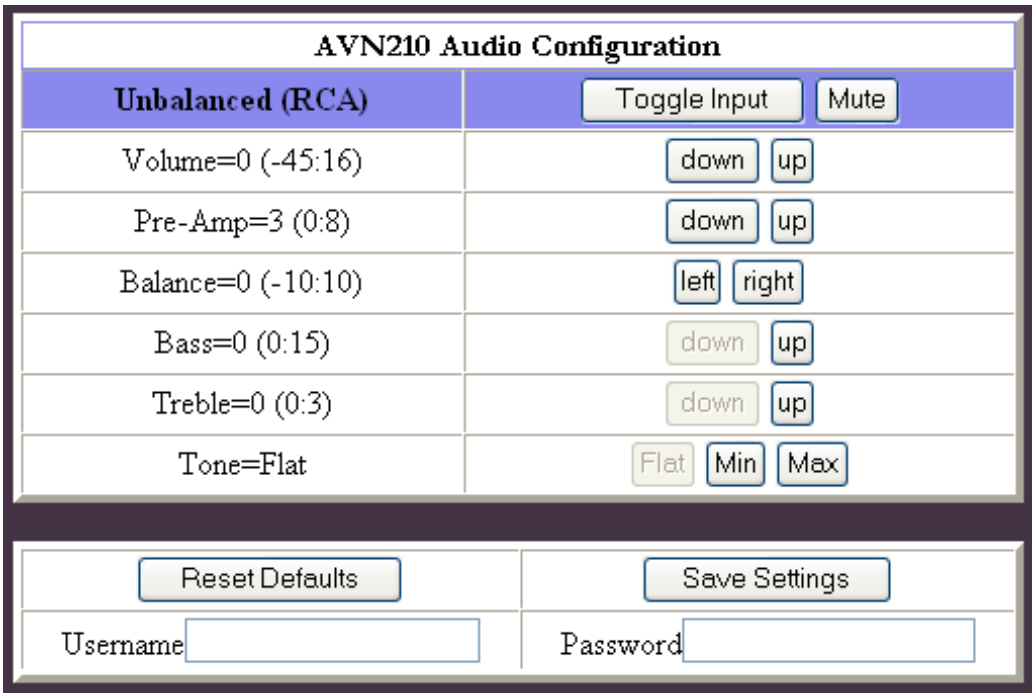
7) Frequency – sets the session's announcement frequency attribute. This setting determines how often the encoder announces its SAP data on the network.

8) **Update** – updates all SAP settings to Flash.

9) **Save** – saves all SAP settings to Flash.

10) **Reset** – resets all SAP settings back to default values.

7.5 Audio Configuration Page



1) Balance – **Toggle Input** toggles between unbalanced RCA and balanced XLR audio input type. **Mute** prevents audio input from being sent to the encoder.

2) Volume – set the initial volume from -45 (quiet) to 16 (loudest).

3) Pre-Amp – sets volume of analog input from 0 (no Pre-Amp) to 8 (most Pre-Amp).

4) Balance – sets the balance from -10 (all left) to 10 (all right).

5) Bass – sets the bass level from 0 (no bass boost) to 15 (max bass boost).

6) Treble – sets the treble level is from 0 (no treble boost) to 3 (most treble boost).

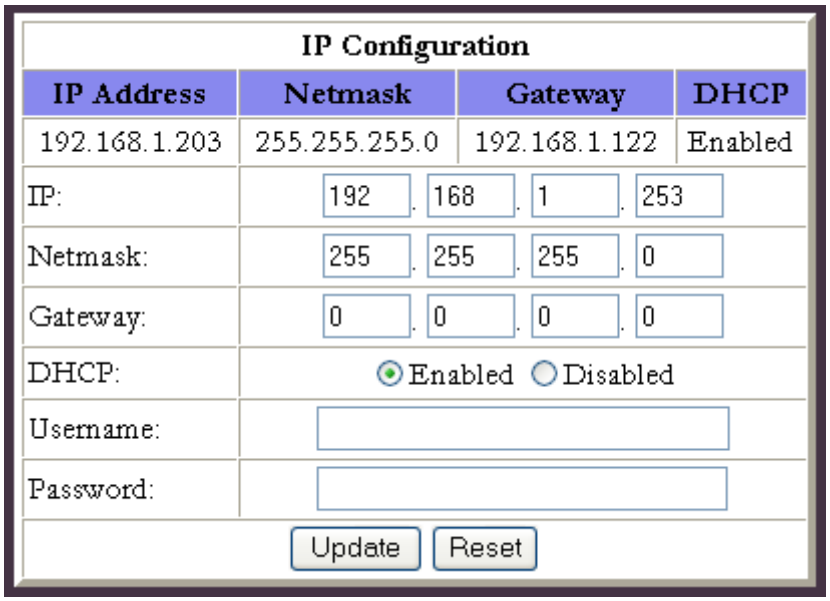
7) Tone – Sets the scale of the Bass and Treble values with regards to boosting.

8) **Reset Default** – resets all the AVN210 Audio settings to default values.

9) **Save Settings** – saves all the AVN210 Audio setting values.

10) Username/Password – Username/Password values are required to adjust the AVN210 audio settings.

7.6 IP Configuration Page



1) IP Address | Netmask | Gateway | DHCP header – displays the AVN's current IP Configuration settings.

2) IP – displays the IP address that is used when DHCP is disabled and allows the address to be changed.

3) Netmask – displays the Netmask that is used when DHCP is disabled and allows the address to be changed.

4) Gateway – displays the Gateway that is used when DHCP is disabled and allows the address to be changed.

5) DHCP – displays the current DHCP mode and allows the mode to be changed.

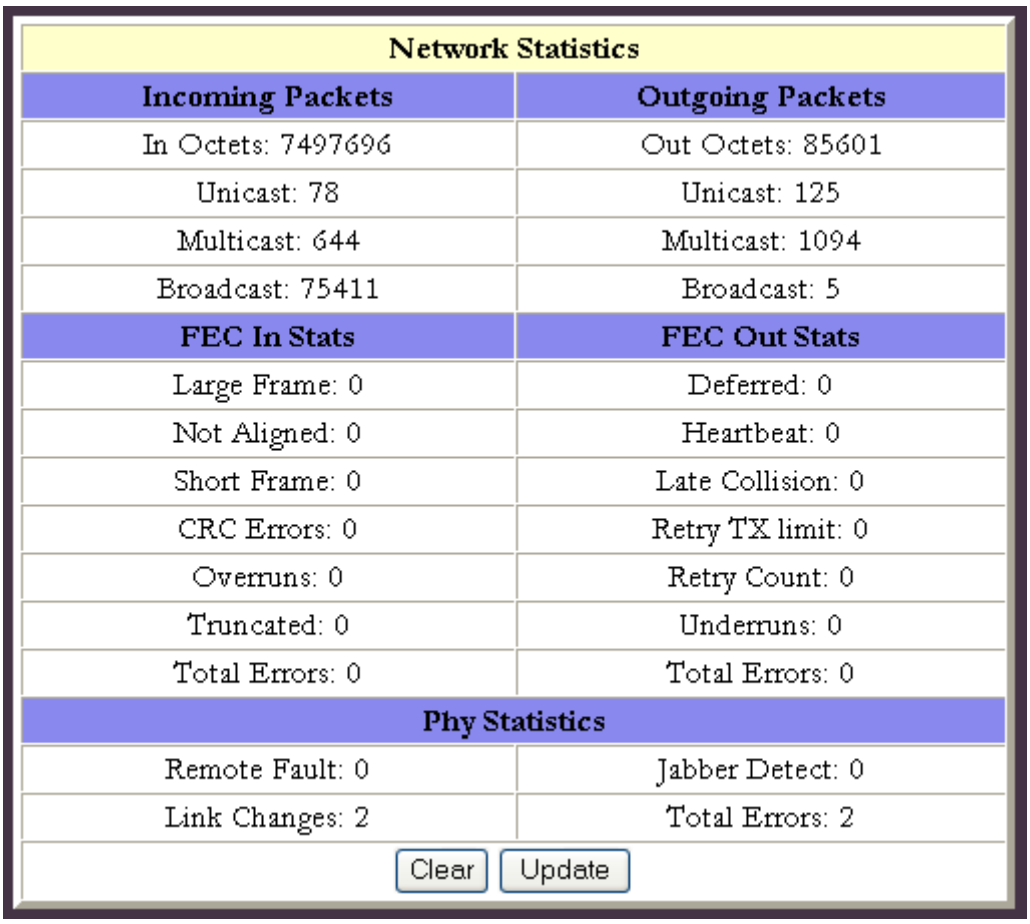
6) Username – enter the Username associated with the AVN, which is required for IP configuration.

7) Password – enter the Password associated with the AVN, which is required for IP configuration.

8) **Update** – causes all the IP Configuration settings to be saved to Flash. After a successful Update, the AVN must be rebooted for the changes to take effect.

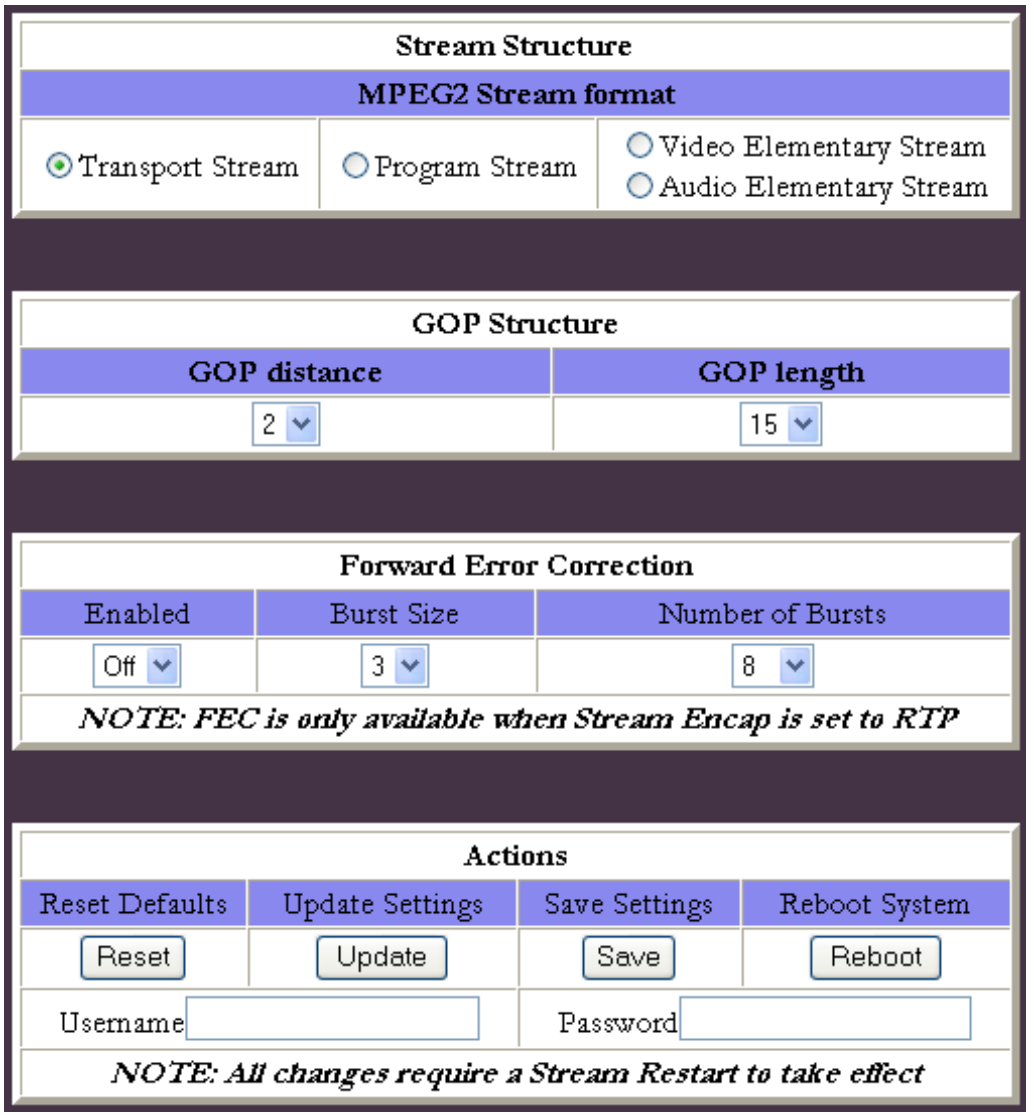
9) **Reset** – This does NOT cause the IP Configuration values to be reset to factory default values, but only resets the values that were displayed when the menu was first opened.

7.7 Network Statistics Page



Network Statistics	
Incoming Packets	**Outgoing Packets**
In Octets: 7497696	Out Octets: 85601
Unicast: 78	Unicast: 125
Multicast: 644	Multicast: 1094
Broadcast: 75411	Broadcast: 5
FEC In Stats	**FEC Out Stats**
Large Frame: 0	Deferred: 0
Not Aligned: 0	Heartbeat: 0
Short Frame: 0	Late Collision: 0
CRC Errors: 0	Retry TX limit: 0
Overruns: 0	Retry Count: 0
Truncated: 0	Underruns: 0
Total Errors: 0	Total Errors: 0
Phy Statistics	
Remote Fault: 0	Jabber Detect: 0
Link Changes: 2	Total Errors: 2
Clear Update	

7.8 Advanced Page



7.8.1 Stream Structure

1) Transport Stream – sets the stream's structure to a Transport Stream.

2) Program Stream – sets the stream's structure to a Program Stream.

3) Video Elementary Stream – sets the stream's structure to a Video Elementary Stream.

4) Audio Elementary Stream – sets the stream's structure to a Audio Elementary Stream.

7.8.2 GOP Structure

1) GOP Distance – displays the current GOP Distance and allows the value to be edited. See *10.3 Group of Pictures (GOP)* for information on valid GOP settings.

2) GOP Length – displays the current GOP Length and allows the value to be edited. See *10.3 Group of Pictures (GOP)* for information on valid GOP settings.

7.8.3 Forward Error Correction (no longer supported)

FEC for the AVN210 was developed by a third party in a proprietary format that is no longer supported by VSI.

7.8.4 Actions

1) **Reset** – resets all the Advanced setting values to factory default values. If the AVN is streaming the new settings will not take effect until the stream is stopped and restarted.

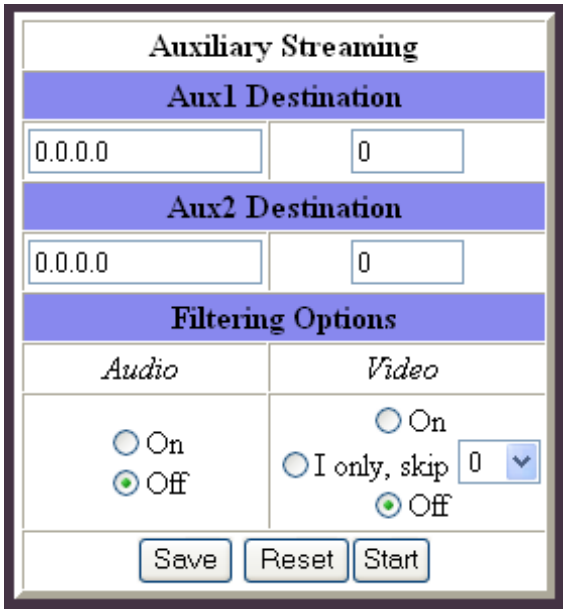
2) **Update** – saves all the current Advanced Settings to memory. These changes take effect immediately but will not be saved across an AVN reboot.

3) **Save** – saves Advanced settings to Flash and requires an AVN reboot to take effect.

4) **Reboot** – causes the AVN to be rebooted.

5) Username and Password – Username/Password values are required for Reboot and other AVN Administrative privileges.

7.9 Auxiliary Stream Page



This page allows the AVN210 to send an auxiliary stream to one or two separate destinations. These auxiliary streams can have special filtering options which allow them to send only Audio, only Video, both Audio and Video, and special Video filtering allowing only a certain number of I Frames to be streamed.

1) Aux1 Destination – displays the destination IP address and port for Auxiliary Stream 1 and allows the value to be changed.

2) Aux2 Destination – displays the destination IP address and port for Auxiliary Stream 2 and allows the value to be changed.

3) Filtering Options:

   Audio – allows the Audio to be turned On or Off for the Auxiliary streams.

   Video – allows the Video data for the Auxiliary streams to be either turned On, Off, or streamed with only a specified number of I Frames. As the number of skipped I Frames increase the bandwidth decreases, but the pause between images, and thus video quality, goes down. For more information on I Frames refer to *10.3 Group of Pictures (GOP)*.

4) **Save** – saves the current auxiliary settings.

5) **Reset** – causes the auxiliary settings to be returned to their default values.

6) **Start** – causes the auxiliary streams to be started.

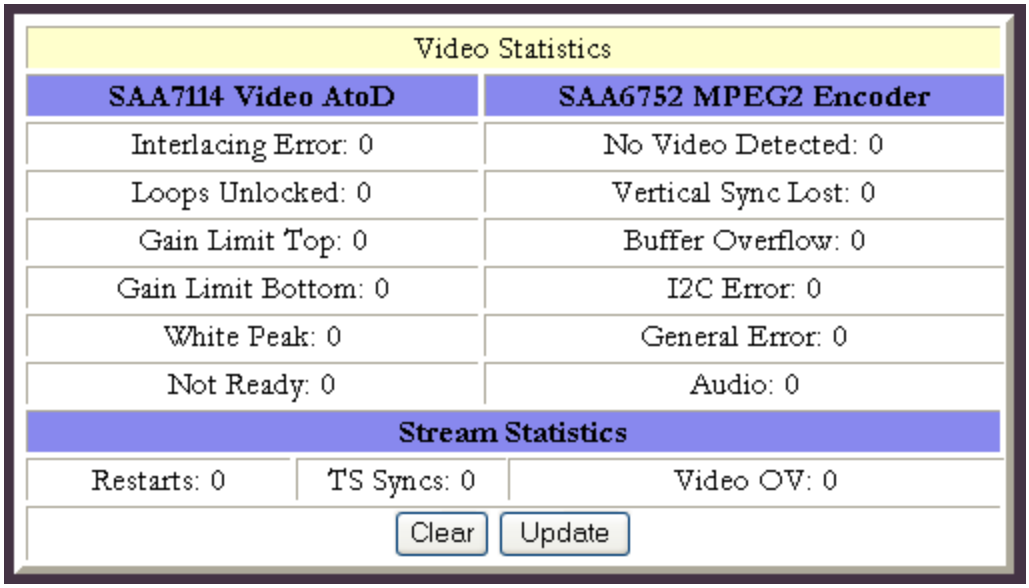
7.10 Modify Username / Password Page

1) Username – displays the current Administrative Username value and allows it to be changed.

2) Password – enter the new Administrative Password for the AVN.

3) **Update** – updates the AVN's administrative Username/Password values to the newly specified ones.

7.11 Video Statistics Page



1) **Clear** – resets all of the values to zero.

2) **Update** – displays the AVN's current video statistics since the **Clear** button was last selected.

Chapter 8 Troubleshooting

This section provides useful information to help you to resolve any difficulty you might have with your AVN210.

8.1 Checking the Firmware

It is important to know the version of the AVN210 firmware in order to troubleshoot the unit. To find the firmware version of your AVN210, select one of the following methods:

1. From the AVN210 Console Interface, the firmware version is shown on all of the menus in the first line of text after the menu title. Where you see AVN210.50-***x.xx***, ***x.xx*** will be the firmware version.

2. From the AVN210 Browser Interface pages, the firmware version is shown at the top of the Main Page. Where you see AVN210.50-x.xx, x.xx will be the firmware version.

8.2 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.

8.3 AVN210 Power

If the AVN210 does not power up when plugged in and turned on, please check the fuses.

While the AVN210 is **UNPLUGGED**, gently remove the red plastic cover next to power socket. For fuse information, refer to *10.2 Safety and Compliance Information*.

8.4 Factory Default Settings

This procedure provides a way to reset the AVN210 configurations back to the factory default settings, which may be necessary or desirable in certain circumstances.

You can return the AVN210 to the Factory Default settings one of two ways:

1. Using the hardware option, press and hold the **Factory Reset** button for 3 seconds; or

2. Using the software option, go to the Config Admin Menu (refer to section *6.6 Config Menu*), select the Reset Factory Defaults option and press **ENTER**.

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 AVN210 will automatically reset to default IP address 192.168.1.253.

8.5 AVN210 Advanced Audio Testing and Diagnostics

A set of four LED indicators are provided on the AVN210 as user configurable operational indicators. These LEDs are always green in color. They can be set by the user into different modes to provide a visual indication of a specific operation that is important to the user to or to be used in resolving configuration/setup problems. (can we reference the Manager or do they call VSI support?)

These LEDs are labeled CODE3, CODE2, CODE1, and CODE0. The mode settings for these LEDS can be controlled through any of the AVN210's user interfaces. Descriptions of what these LEDs indicate in the different mode settings are provided below.

None Indicates that no test signals are being generated.

Video This mode provides more detailed information on the video processing components of the system.

CODE3: Indicates the status of the analog video and the front end analog to digital converter. It illuminates when a valid video signal is detected on the selected interface, and indicates that the Analog to digital converter is working properly.

CODE2: Indicates the status of the MPEG2 encoder. It illuminates when error free video is being received and the encoder is operational.

CODE1: Indicates the streaming state of the AVN210. It illuminate when the AVN210 is currently set for streaming video.

CODE0: Indicates the encoding status and rate of the AVN210. It will blink to indicate that the unit is currently encoding video, and will blink at a speed relative to the encoding bit rate.

Audio This mode is used to provide more detailed information about the Audio status. It can indicate when audio clipping is detected, which in turn indicates that audio distortion has occurred due to excessive signal levels.

CODE3: Not used.

CODE2: Not used.

CODE1: Indicates if an audio clip was ever detected since streaming on the unit started. It will turn off when the stream is started and turn on if an audio clip is detected. Once it is on it will remain on until the stream is stopped and restarted.

CODE0: Indicates that an audio clip was detected during the last poll interval.

Network

This mode provides more detailed information about the Network/Ethernet connection.

CODE3: Indicates Transmit activity. It will toggle when Ethernet transmit activity is detected.

CODE2: Indicates Receive activity. It will toggle when Ethernet receive activity is detected. This will blink for any receive activity, not just for traffic destined for the AVN210.

CODE1: Indicates the status of the Ethernet interface. It illuminates to indicate that the Ethernet MAC and PHY are operating error free.

CODE0: Indicates the link status (but not speed). It illuminates when an Ethernet link of any speed is detected.

Uptime Status

This mode is used to indicate the proper operation of the video encoding since the start of stream. It can be used to determine that the unit has remained in error free operation since streaming began. All four LEDs should illuminate green once an error free encoding stream has started.

When an error is detected, the LED associated with the failing function will turn off and remain off.

CODE3: Will turn off if an error is detected in the analog video, or if the Analog to Digital converted video receives an error.

CODE2: Will turn off if and error is detected in the encoder.

CODE1: Will turn off if a network error is detected on the Ethernet.

CODE0: Will turn off if the AVN210 ever restarts on its own due to a critical video or system error.

Error Code

This mode is used to debug specific problems or to provide an operational indication that may be encountered in the instance of user specific applications. System information will be presented as a 4 bit binary number. This mode is to be used only by advanced users working with our technical support staff.

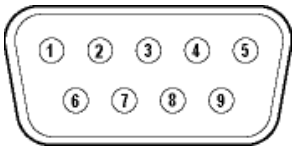
Chapter 9 Unit Connections

9.1 The D-Sub Connector

One 9-pin D-SUB connector provides an RS-232C port physical interface. The connector is used for accessory equipment.

A diagram of the RS-232C connector and pin assignment table are shown below.

Pin	Function
1	CD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



Chapter 10 Technical Information

10.1 Technical Specifications

Hardware Architecture: Phillips EMPRESS MPEG-2 compression chip and a Motorola PowerPC Processor.

MPEG-2 Stream Information:

- Video
  - — Real-time MPEG-2 encoding compliant to Main Profile at Main Level (MP@ML) for 625 and 525 interlaced line systems. Default PID = 300
- Audio
  - — MPEG-1 Layer II audio encoding at 256 kbps or 384 kbps. Default PID = 301

Audio Inputs:

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

Video Inputs:

- — One BNC connector for composite video. NTSC and PAL
- — One RCA 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 RS-232 9-pin D-SUB connector, maximum transmission rate 115 kbps

Power Supply: 100V-240V AC, 0.25 Amp, 50/60 Hz

Physical Dimensions:

- — Height: 1.7 in. (4.3 cm)
- — Width: 19.0 in. (48.3 cm)
- — Length: 10.0 in. (25.4 cm)
- — Weight: <5.0 lb (<2.27 kg)

: **Environmental**:

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

10.2 Safety and Compliance Information

Safety Approval:

CE, UL Listed I.T.E. E257717

Rating Information:

Caution: 85-265V~, 50-60 Hz, 0.5A

Fuse Rating:

Caution: 250V, 0.25A, T

Fuse Replacement Caution:

Caution: For continued protection against fire, replace fuse with same type and rating.

Caution: Double pole/neutral fusing.

10.3 Group of Pictures (GOP)

10.3.1 AVN GOP Environment

The Group of Pictures (GOP) in the AVN210 environment is defined by Distance and Length as follows:

The GOP frame distance determines the type and frequency of the order of individual frames. A single frame can be an Intracoded Frame (I Frame), a Predicted Frame (P Frame), or Bidirectional Predicted Frame (B Frame). The type and order of frame is determined by the frame distance.

For example:

Distance = 0 would be I Frames only. (I I I I I I I I...)

Distance = 1 would be I and P Frames. (IPP....PPIPP...)

Distance = 2 would be all frames. (IBP...BP..)

Distance = 3 would be all frames with many B Frames (IBBP...BBP)

Distance 3 would yield the highest compression, distance 0 would have the most detail.

The second parameter in question is the GOP Frame Length. The length defines the number of frames in a single repeating GOP structure. In the case where distance = 0, the length has no real effect because there are only I Frames in the GOP to begin with. In the other cases the length will define how many of each frame will appear in the structure before it repeats.

If distance = 1 and length = 2, the GOP structure will be a repeating pattern like "IP IP IP IP IP". If distance = 1 and length = 3, the GOP structure will be a repeating pattern like "IPP IPP IPP", and for length = 4 then "IPPP IPPP IPPP". The same is true for distances 2 and 3, as the length will determine the number of frames between I Frames.

The following is a list of potential values:

Distance = M, Length = N

Real Closed GOP: M,N (2,3 2,5 2,7 2,9 2,11 2,13 2,15 2,17 2,19 3,4 3,7 3,10 3,13 3,19)

Non-Editable GOP: M,N (2,4 2,6 2,8 2,10 2,12 2,14 2,16 2,18 3,6 3,9 3,12 3,15 3,16 3,18)

All other configurations are undefined (not necessarily bad or illegal, just undefined).

10.3.2 Modifying the AVN's GOP Settings

The factory default values are: M = 2, N = 15. For lower latency video transmission, the following setting is recommended: M = 2, N = 3, this will reduce encode latency from approximately 200 ms to approximately 100 ms.

To modify the GOP settings in an AVN210, access the Console Interface (via Serial connection or Telnet) and go to the Options menu. The Options menu provides two GOP configuration items: Set GOP Distance and Set GOP Length.

Use these menu options to set the values to the appropriate setting and then save the options to store the settings to the flash. The GOP settings can also be viewed and set from the AVN210 Web Management page under the Options button.

10.4 Virtual Serial Channels

In addition to its regular features, the AVN210 can also be used to connect to any remote serial device . This capability extends the distance that a serial connection can achieve over the Internet. The AVN210 has a 9 pin RS-232 physical serial port interface which can be used for a variety of applications. The interface can be set to one of the modes of operation described below. The AVN interface can be set to one of the modes of operation described below.

10.4.1 Channel Modes

10.4.1.1 Monitor Mode

This is the default mode for the RS-232 interface, and only one interface can be set to this mode at a time. Monitor mode is used for console based communication to the AVN210 unit using a terminal emulation program.

10.4.2 Camera Control Mode

This mode creates a unidirectional bridge between a physical serial port and a Layer 4 transport port (TCP/UDP). The AVN210 will listen on a particular TCP/UDP port, and when data is received by the port the AVN210 will forward the data physically over the selected serial port. The return path (return serial data) is not forwarded in this mode.

10.4.2.1 Passive Tunnel Mode

This mode is similar to Camera Control mode with the exception that it will create a bi-directional bridge between the physical serial port and a Layer 4 transport port. In addition to data being received by the TCP/UDP port being forwarded out the serial interface, data is also forwarded in the opposite direction. This mode is labeled passive because, in this mode, the AVN210 will act as a server awaiting a connection from a client.

10.4.2.2 Active Tunnel Mode

This mode is similar to the Passive Tunnel (PT) mode in that it also creates a bi-directional bridge between a physical serial port and a Layer 4 transport port. An AVN configured for Active Tunnel (AT) mode will act as the client in the virtual tunnel setup procedure. The Active unit will have to specify where to connect to. Ideally it should connect to the IP and port of an AVN210 in Passive Tunnel mode.

10.4.2.3 Disabled Mode

Selecting this mode makes the interface unusable.

10.4.3 Selecting Modes

The AVN modes are accessed from the Console Interface menus. For instructions on how to access the Console Interface, refer to *Chapter 6 Using the Console Interface*.

To select a mode:

1. From the console Main Menu, select 45) Config Menu, 12) TTY Menu, then either 3) or 4), depending upon which port you are changing, then finally 6) Default Mode.
2. Type in the name of the mode you are selecting and click Enter.
3. Select 7) Save to save the new mode.
4. Move back up the menu tree by selecting 99) Return until you return back to the Main Menu.
5. From the Main Menu, select 6) Reset. You must reboot the AVN210 for the changes to take affect.

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