AVN200 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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VSI recommends that you download the most recent version of this Manual from www.vsicam.com.

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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

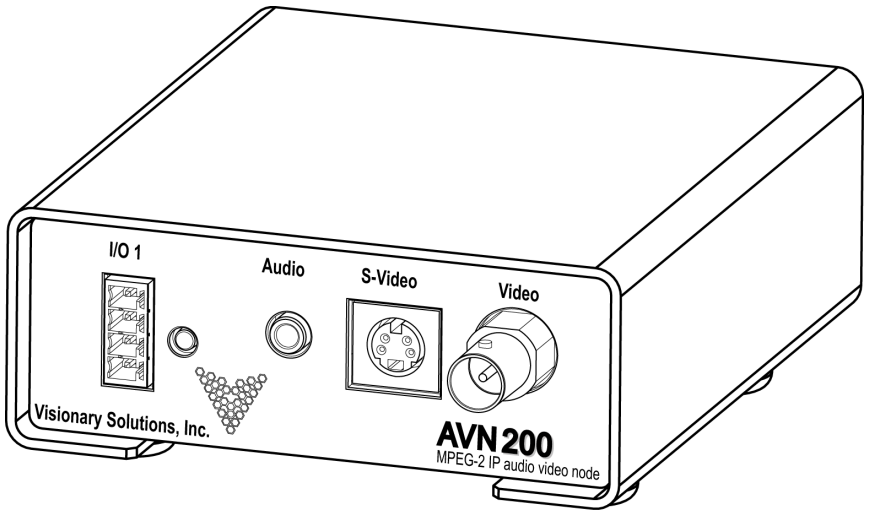
Should this equipment require warranty service you may obtain specific information on how to obtain this service by directly contacting Visionary Solutions, Inc., or the reseller who sold you this equipment.

Contents

Chapter 1 Introduction

Visionary Solutions, Inc., introduces the AVN200, 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 AVN200 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 AVN200 runs independently of any other server. To stream and view live S-Video, all that is needed is an AVN200 encoder and any standards-compliant MPEG-2 decoder (hardware or software). The AVN200 is easy to access and configure by any of four methods: PackeTV™, Console Menus, Browser Interface, or the AVN Control Protocol (API). TCP/IP, HTTP, and other Internet-related protocols are supported.

- **PackeTV™ Manager.** Three PackeTV™ Manager software decoder licenses are included with the AVN200. This multifunction application works in conjunction with the AVN200, enabling live viewing, recording, and extensive AVN200 control and configuration. With username and password control, administrators can select and lock an AVN200's properties for added security. Peripheral devices such as PTZ (pan, tilt, zoom) cameras can also be controlled.

- **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 AVN200 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-232 or RS-422 cable.

- **External Device Connections.** The AVN200 connectors include two digital inputs, one digital output, one serial RS-232 port, one RJ-45 LAN Ethernet port, and one full-duplex RS-422 port. These ports allow the AVN200 to interface with a variety of external devices, such as Pan/Tilt/Zoom (PTZ) devices, doorbells, switches, and alarm relays.

- **Audio and Video Inputs.** The AVN200 audio and video inputs include one BNC composite video input for connecting a CCTV camera, one S-Video input for connecting S-Video cameras or other video equipment, and one stereo audio input for line level sources.

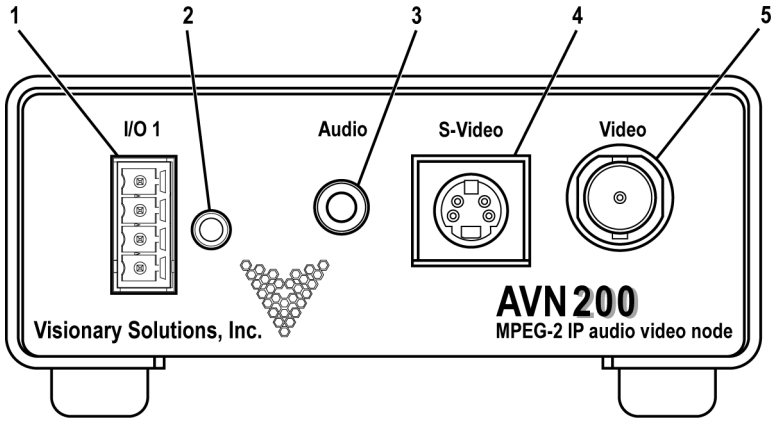
- **Security.** Administrators can create and modify accounts for authorized users, as well as allow anonymous viewing.

- **Forward Error Correction.** The AVN200 has Forward Error Correction (FEC) capability on the outgoing video stream. This feature enables the PackeTV™ software to check for and recover lost packets while continuing to produce smooth output video.

- **Closed Captioning (CC).** VSI supports both ATSC EIA-608 and EIA-708 standards in the AVN200 encoder 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 AVN200 then 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.

1.2 Product Description

1.2.1 AVN200 Front Panel



1. I/O Terminal Block 1. This terminal block provides the physical interfaces to two digital inputs, one digital output, and GND. Used for connecting external devices. Refer to *Chapter 9 Unit Connections* for connection details.

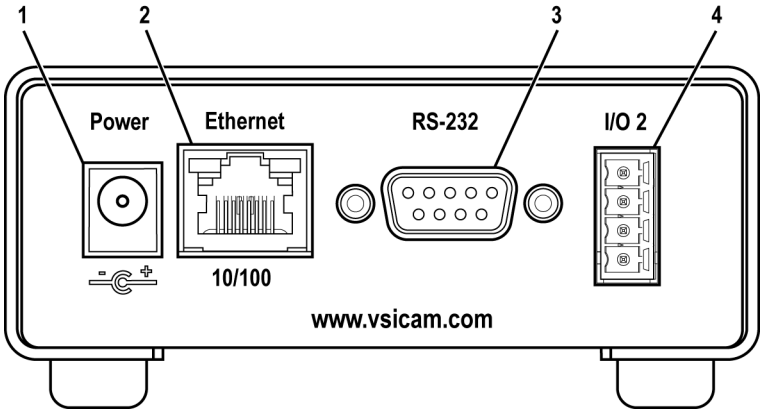
2. Factory Reset button. Restores the settings on the AVN200 to factory default settings. Refer to *7.4 Factory Default Settings* for instructions on using the Factory Reset button.

3. Audio connector. A 1/8 inch connector for line level audio input.

4. S-Video connector. Provides input for a Y/C video cable.

5. Video connector. Provides input for a 75-Ohm coax BNC video cable.

1.2.2 AVN200 Rear Panel



1. Power Supply Connector. A +3.3 VDC, 2 Amps, center positive connector.

2. Ethernet Connector. An RJ-45 network connector.

3. RS-232 Serial Connector. Used for connecting general purpose RS-232 devices.

4. I/O Terminal Block 2. This terminal block provides the physical interface to RS-422 (full-duplex) devices (typically PTZ). Refer to *Chapter 9 Unit Connections* for connection details.

1.2.3 Shipping Inventory

Your AVN200 is shipped with the following:

- One AVN200
- One AC power supply adapter
- One Audio cable (1/8 in. to 2 x RCA), male-to-male, 6 feet
- One Video cable (RCA to RCA), male-to-male, 6 feet
- One RCA-to-BNC adapter, female-to-male
- One S-video cable, male-to-male, 6 feet
- 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
- Two Phoenix connectors

Chapter 2 Installing the AVN200

2.1 Hardware Installation

The minimum connections to the AVN200 should include a video source connected to either the BNC Video input or the S-Video input, an AC power adapter connected to the Power Supply connector, and an RJ-45 LAN connection to the Ethernet connector.

To connect the AVN200:

1. Connect a video source to either or both of the BNC Video connector (for composite video) and S-Video connector. If you are using a composite video source with an RCA output connector, use an RCA-to-BNC adapter (included) to connect the video to the AVN200.

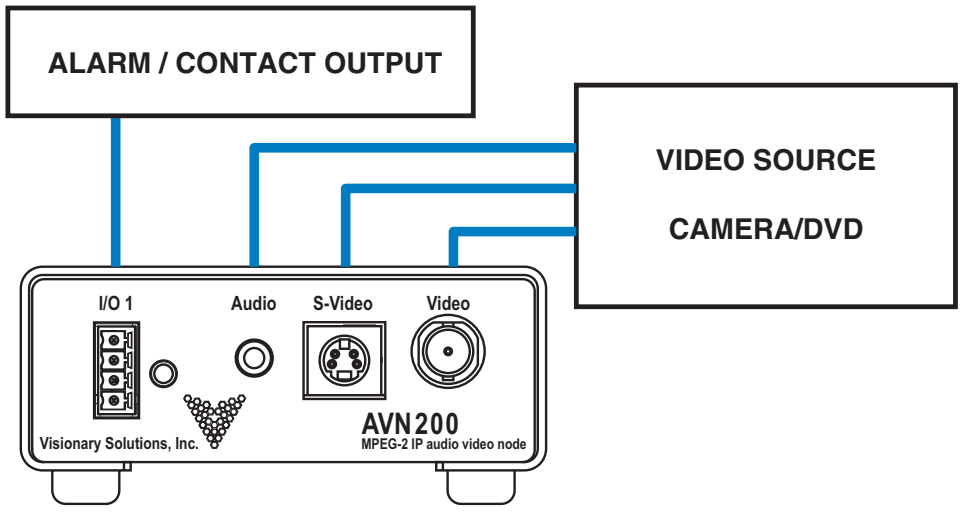
2. Connect an Ethernet cable to the Ethernet RJ-45 connector. The other end of the Ethernet cable should be connected to a switch or hub on your LAN network.

3. Connect the AC power adapter power cable (included) to the AVN200 Power Supply connector.

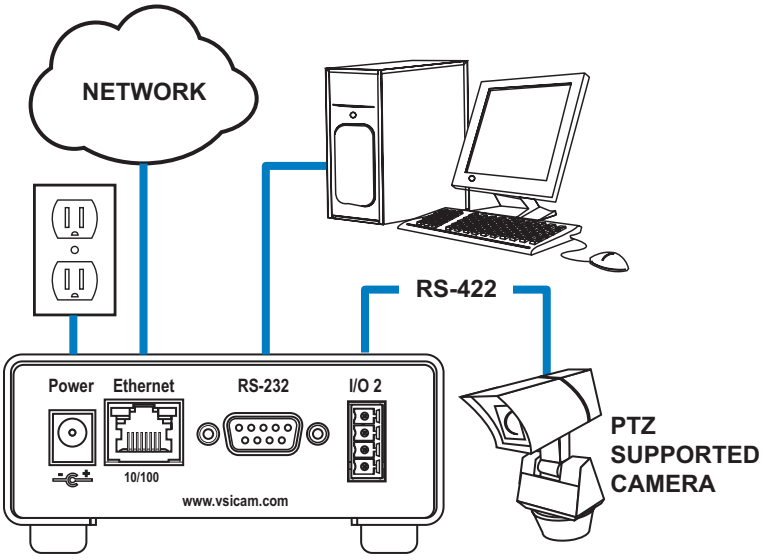
4. For digital input/output connections, connect wires to a Phoenix connector and plug into the I/O Terminal Block 1 (see pinout diagram in *Chapter 9 Unit Connections*).

5. For RS-422 connections, connect wires to a Phoenix connector and plug into the I/O Terminal Block 2 (see pinout diagram in *Chapter 9 Unit Connections*).

2.1.1 AVN200 Front Panel Connection Diagram



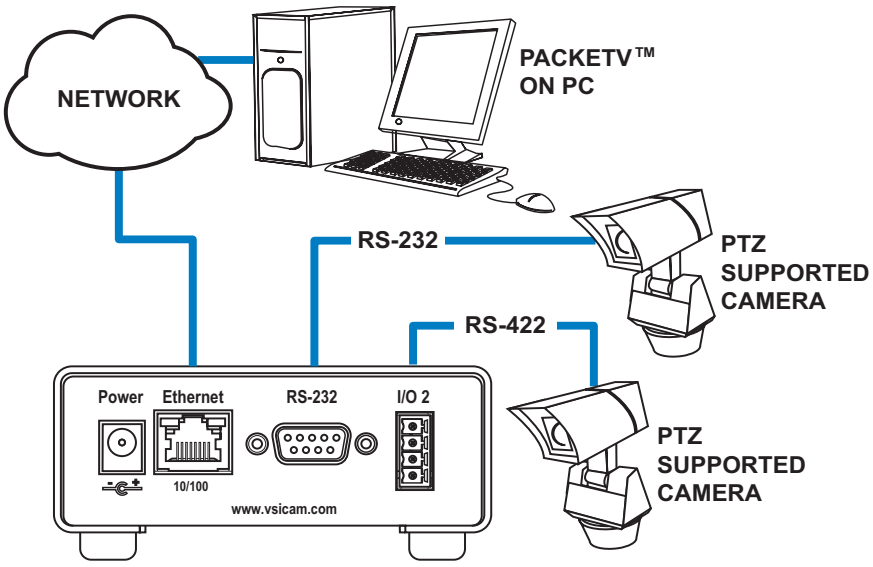
2.1.2 AVN200 Rear Panel Connection Diagram



2.2 Connecting Pan/Tilt/Zoom Cameras

The following diagram illustrates how the AVN200 connects to your computer, network, video cameras, and/or PTZ device.

2.2.1 AVN200 PTZ Connection Diagram



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

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 Using the Administrative Privileges

Any function that is modified or that is stopped or started using the Administrative Username and Password must also use the Administrative Username and Password in order to modify or control that function. The administrative user has the capability of overriding all controls and actions of an AVN200.

3.1 Video Lock On/Off

The Administrative Username and Password can be used to turn the Video Lock feature On (using the PackeTV™ Manager), which prevents non-administrative users from starting the unit. In order to start a stream, turn the Video Lock feature Off using the Administrative Username and Password, then proceed as normal.

An AVN200 that was started by an administrative user cannot be stopped by a non-administrative user. An administrative user can always override a non-administrative user.

3.2 Unicast Sessions

If an administrative user starts a Unicast video stream, only an administrative user can stop the Unicast stream (refer to the *PackeTV™ Manager User's Manual*).

If a non-administrative user starts a Unicast stream, an administrative user can override the setting and stop the Unicast stream.

3.3 Changing the Administrative Username and Password

The AVN200 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 AVN200's Administrative Username and Password, depending upon your connection method:

1. If you have a serial connection to the AVN200, you can use the HyperTerminal program that is one of the Accessories that comes with Windows. Refer to *3.3.1 Connecting With a HyperTerminal Session* below.

2. If you are able to connect to your AVN200 over the network, you have the option of opening a Telnet session to access your AVN. Refer to *3.3.2 Connecting With a Telnet Session* below.

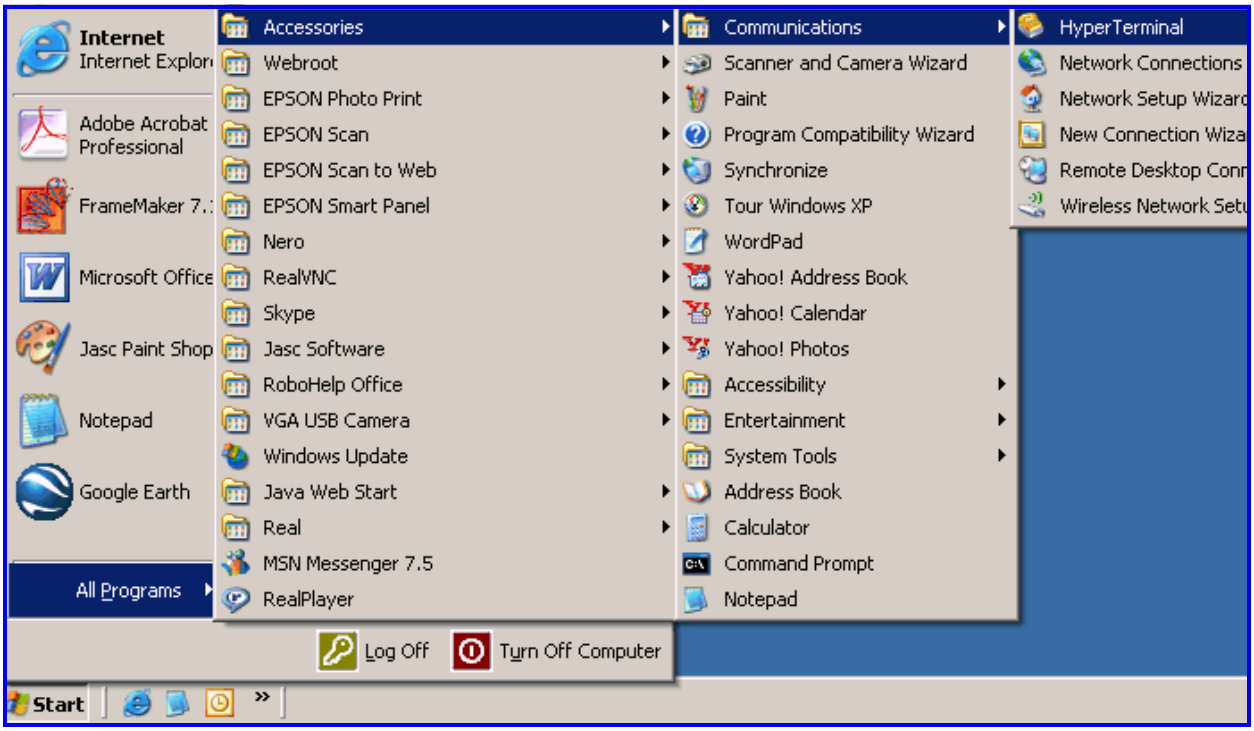
3.3.1 Connecting With a HyperTerminal Session

Note: *If you do not have HyperTerminal installed, go to the Windows Control Panel> Add or Remove Programs> Add/Remove Windows Components, and install it from there.*

1. Connect a serial cable to the RS-232 port on the AVN200 and to a serial COMM port on your PC (typically the COM1 port).

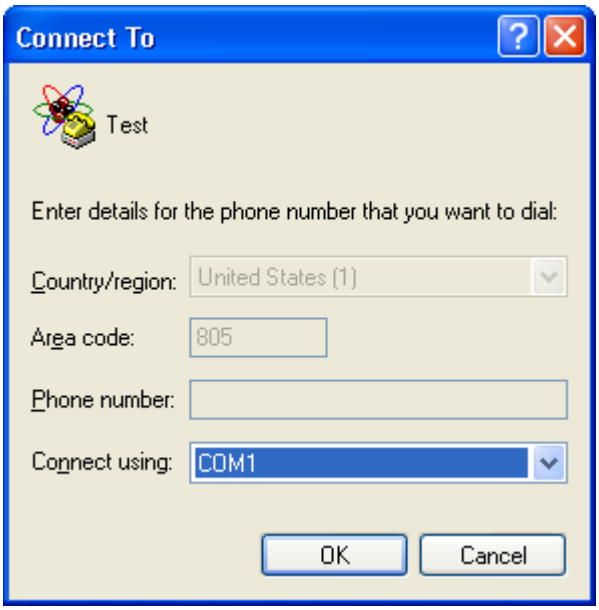
Note: *The AVN200 uses a white DB9-M to DB9-F NULL serial cable.*

2. On your PC, go to the Windows **Start** button, select **Programs** > **Accessories** > **Communications** > **HyperTerminal**.

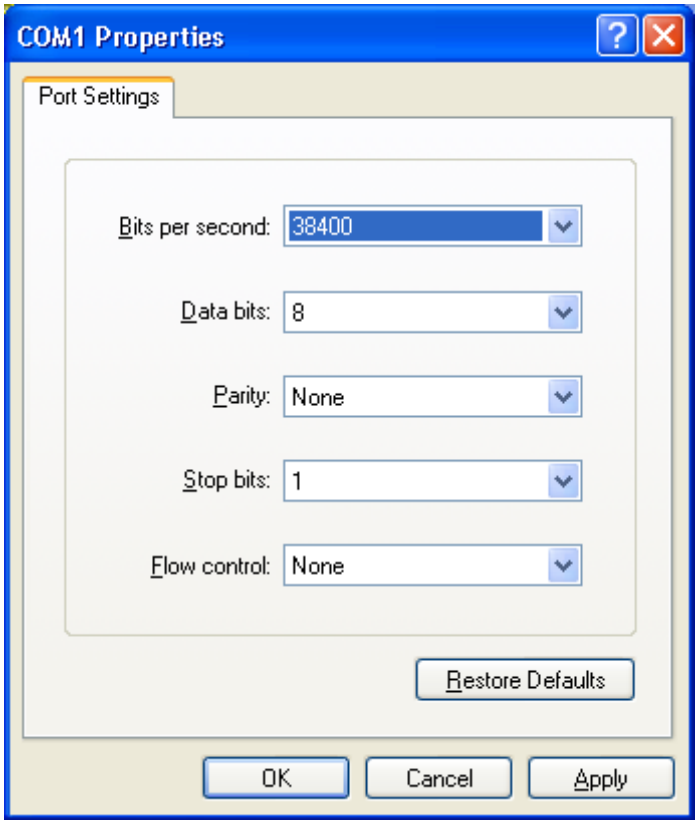


3. The program will prompt you to describe your connection the first time you connect. Enter a name for the connection. You can also select an icon to create a short cut on your desktop and save these settings for when you launch HyperTerminal at a future time.

4. Specify the port that you are connected to on your PC (typically COM1 or COM2).



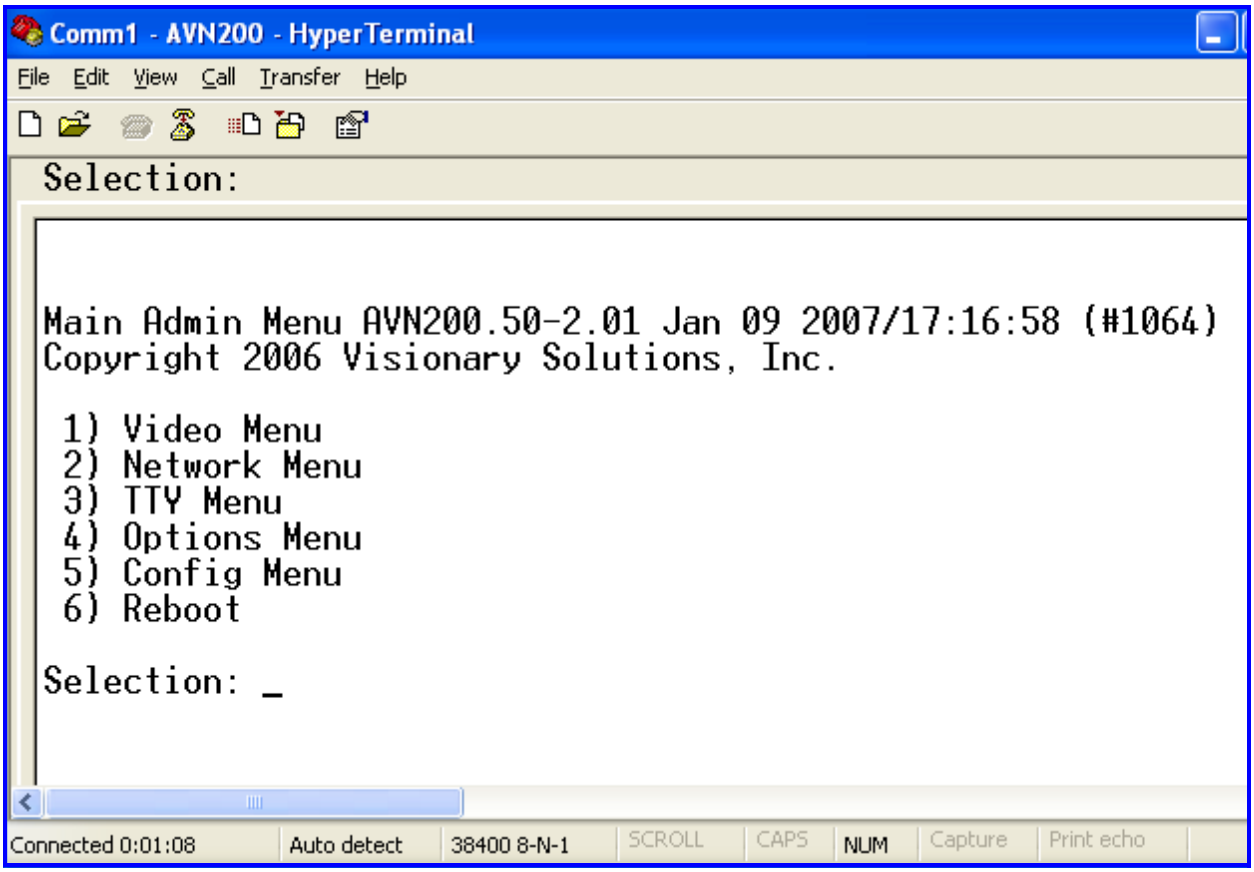
5. Configure the Port Settings as below in order to communicate with the AVN200.



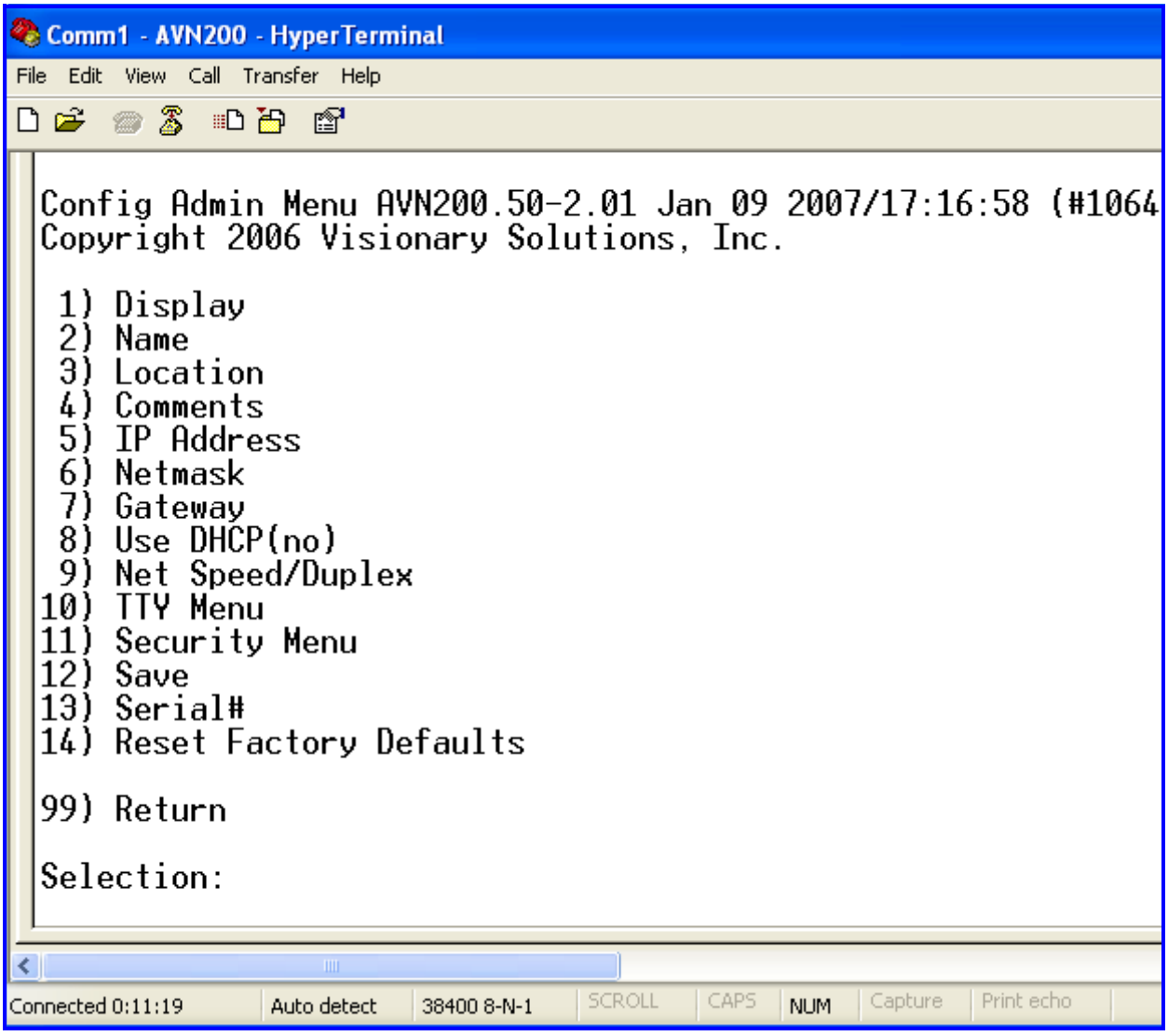
6. Once you have finished entering the configuration changes, click **OK**. The screen should go blank.

7. Power on your AVN200. The Main Admin Menu prompt will display on your monitor.

8. Select the Config Menu. Type **5** and press **Enter**.

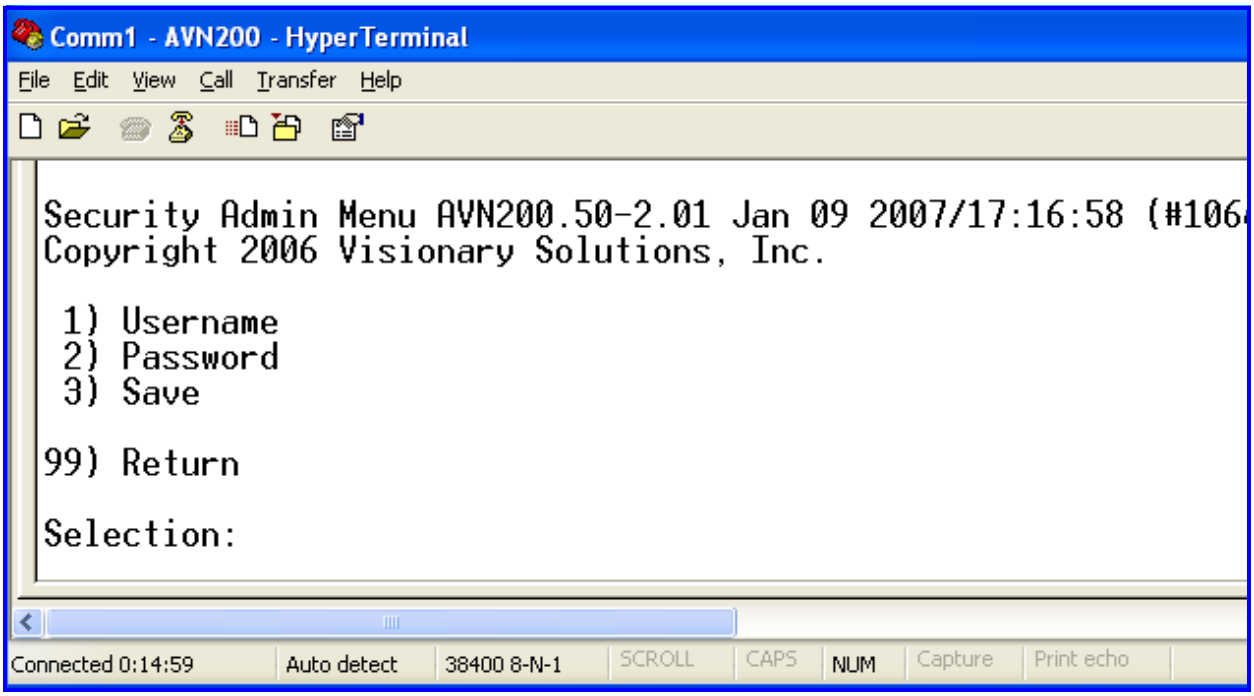


9. Select the Security Menu. Type `11` and press **Enter**.



10. 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.*



11. 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.

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

13. Exit HyperTerminal and continue installing your AVN200.

3.3.2 Connecting With a Telnet Session

Note: *For users that will connect to an AVN200 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 AVN200 that you want to connect to. For example: **`telnet 192.168.1.90.`**

2. Enter the Administrative Username of the AVN200.

3. Enter the Administrative Password of the AVN200. 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 AVN200 menus. Follow Steps 8 through 12 from *3.3.1 Connecting With a HyperTerminal Session*.

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 AVN200 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 AVN200 has Dynamic Host Configuration Protocol (DHCP) turned on as the factory default. If your network has a DHCP server on it, the AVN200 will automatically acquire an IP address.

To view your AVN200's IP address, and ensure that it is properly connected to your network, follow these steps:

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

2. Locate the AVN200 in question by its serial number. The DHCP-assigned IP address will be listed.

If you do not see the AVN200 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*.

If the AVN's firmware version is pre-1.47, update the firmware to the latest version, refer to the *PackeTV™ Configuration Utility User's Manual*, *Updating the Firmware* section.

4.4 Static IP Configuration

If the AVN200 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 AVN200 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 AVN200, follow these steps:

1. Launch PackeTV™ 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 the *PackeTV™ Configuration Utility User's Manual*.

4.5 Viewing the AVN200 on the Network

If you have difficulty finding the AVN200 on your network, you may need to check the DHCP setting and/or the AVN200's IP properties.

1. Check to see if you can view the AVN200 on your network:

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

    b. If the AVN200 you are expecting is not listed, verify that the correct network is listed in the Network drop-down list.

2. Check the AVN200's firmware version. Firmware versions that are pre-1.47 may not always respond correctly to the Discover command and should be updated. Refer to the *PackeTV™ Configuration Utility User's Manual*, *Updating the Firmware* section.

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

4. 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.

5. If you still do not see the AVN200 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 *3.3.1 Connecting With a HyperTerminal Session* or *3.3.2 Connecting With a Telnet Session* to change the IP Address, Netmask, and/or Gateway properties of the AVN200 and then return it to the desired location.

If you still do not see the AVN200 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 AVN200

The AVN200 has four control interfaces that you can use to operate and configure the AVN units:

- PackeTV™ (Manager and Configuration Utility) – using GUI-based programs installed on a Windows-based PC.
- Console Menus – using a terminal emulation program such as HyperTerminal or Telnet.
- Browser Interface – using a browser.
- AVN Control Protocol Application Programming Interface (AVNCP API) – available upon request from Visionary Solutions, Inc.

The Console Menus and the Browser Interface may be the preferred choice for users who like to use advanced configuration settings, while the PackeTV™ Manager and/or PackeTV™ Configuration Utility may be the choice for users who prefer a GUI interface in configuring their AVN200. A user will have nearly the same access to the AVN200's functionalities using any of the four interface options.

5.1 PackeTV™ Software Applications

PackeTV™ Manager is an optionally supplied software interface used to control and monitor the AVN200 and its video stream on Windows-based PCs. Upon launching the PackeTV™ Manager, the Options dialog box appears. After you have made your selections, the main menu bar allows you to select any of the monitoring options until you exit PackeTV™ Manager.

Refer to the *PackeTV™ Manager User's Manual* for information about using PackeTV™ Manager.

PackeTV™ Configuration Utility is a free software interface used to configure and control the AVN200 and its video stream on Windows-based PCs. It has a Mass Configuration dialog that enables the configuration of encoder settings on multiple AVN units at one time.

Refer to the *PackeTV™ Configuration Utility User's Manual* for information about using PackeTV™ Configuration Utility.

5.2 AVN200 Console Menus

To access the AVN200's Console Menus, establish either a HyperTerminal or Telnet session.

Refer to *3.3.1 Connecting With a HyperTerminal Session* or *3.3.2 Connecting With a Telnet Session* for connection instructions.

Refer to *Chapter 6 Using the Console Menus* for information about the Console Menus and their functionality.

5.3 AVN200 Browser Interface Menus

The AVN200 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 AVN200's IP address.

2. Click **Enter/Go**. The AVN200's Web Management page will display.

3. Enter the Username and Password of the AVN200 and click the **Login** button. The AVN200'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.

The AVN Control Protocol (API) is available upon request from Visionary Solutions, Inc. (www.vsicam.com) and is also available to all Beta Testers through the special Beta Testers web page.

Chapter 6 Using the Console Menus

To access the AVN200's Console Menus, establish either a HyperTerminal or Telnet session. Refer to *3.3.1 Connecting With a HyperTerminal Session* and *3.3.2 Connecting With a Telnet Session* for connection instructions.

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

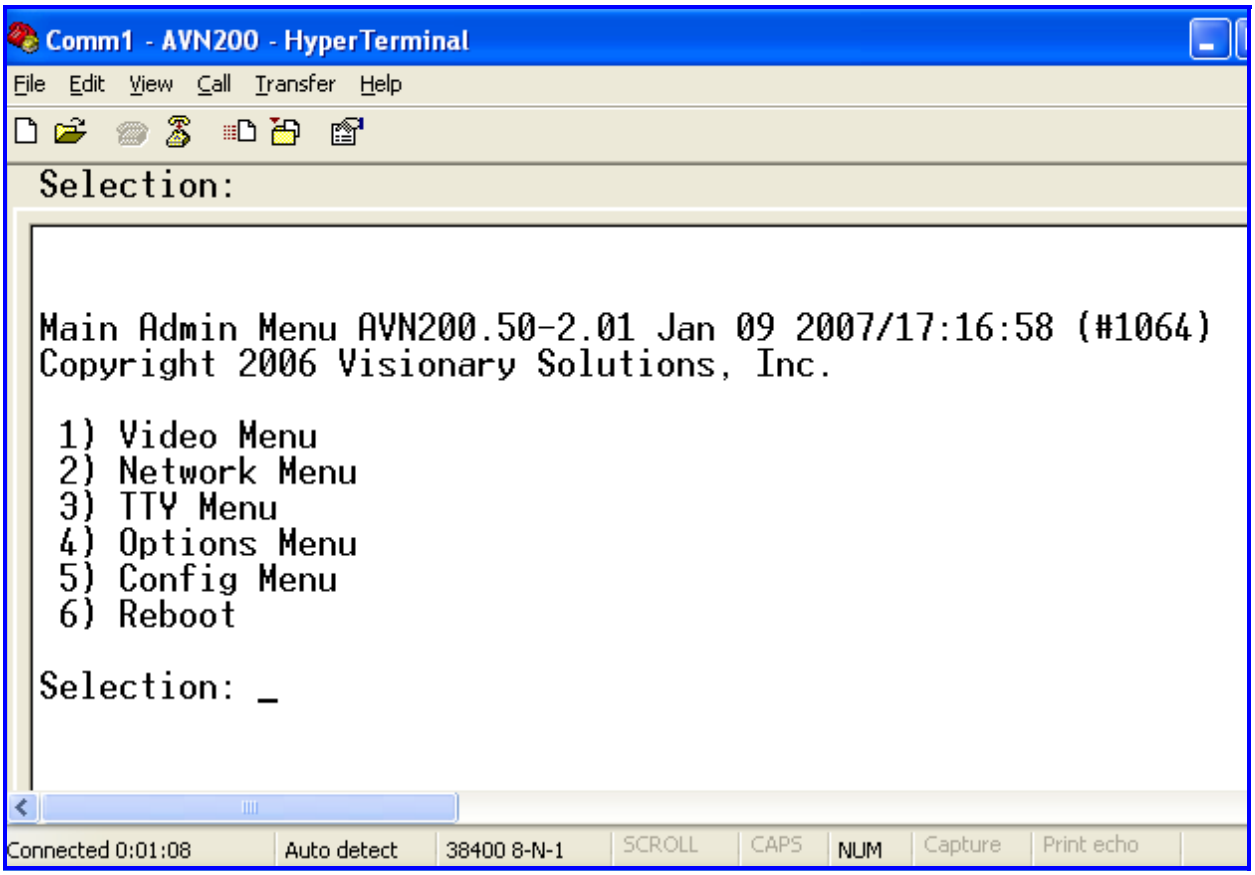
It is important to understand how the AVN200 handles changes made using the Console Menus.

Although all changes made in the Console Menus 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.

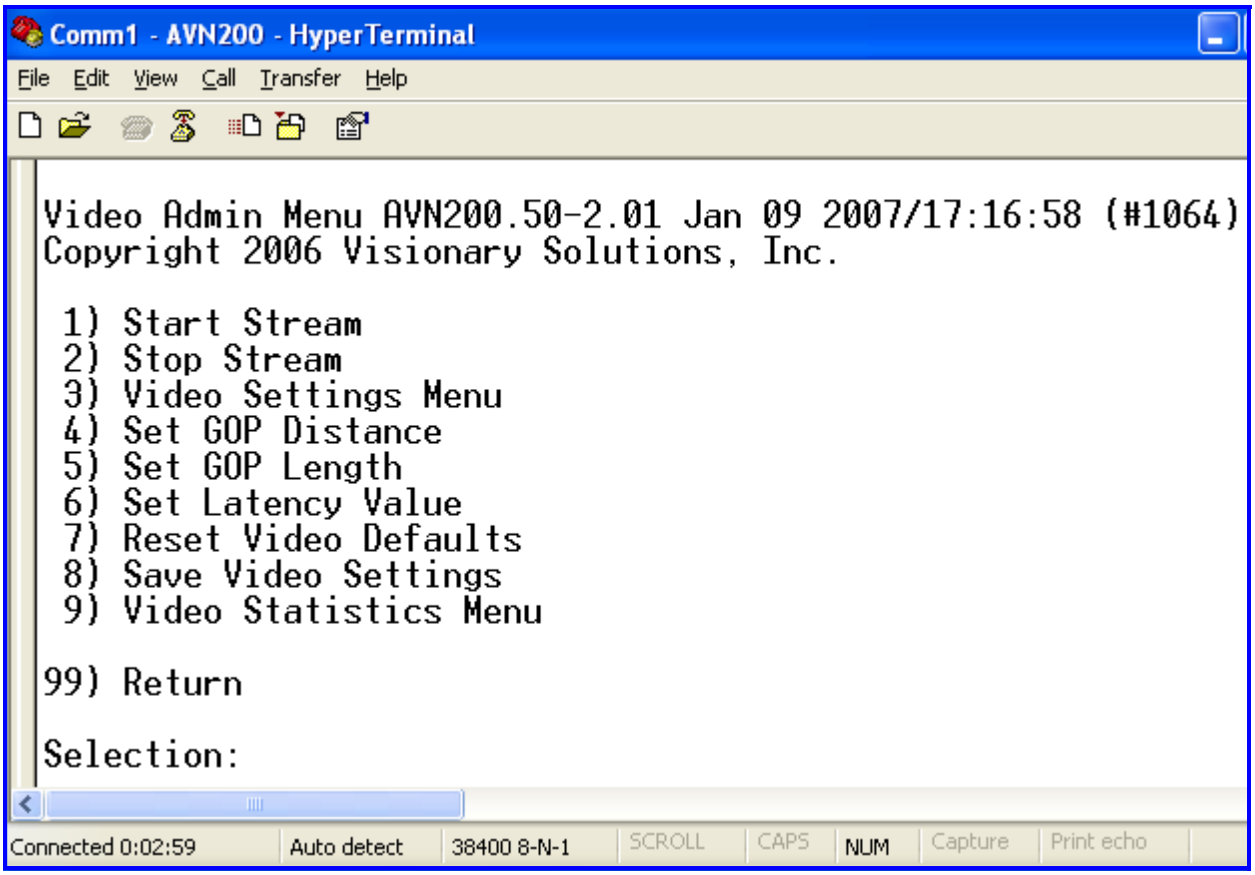
The following is a brief description of the options available using the AVN200 Console menus.

6.1 Main Admin Menu



1) Video Menu – displays the Video Admin Menu.
2) Network Menu – displays the Network Admin Menu.
3) TTY Menu – displays the TTY Admin Menu.
4) Options Menu – displays the Options Admin Menu.
5) Config Menu – displays the Config Admin Menu.
6) Reboot – causes the AVN200 to reboot. All changes stored in Flash will take effect.

6.2 Video Admin Menu



1) Start Stream – starts the AVN200 stream with stored values. If you attempt to start an AVN200 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 AVN200 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 *Chapter 11 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 *Chapter 11 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.

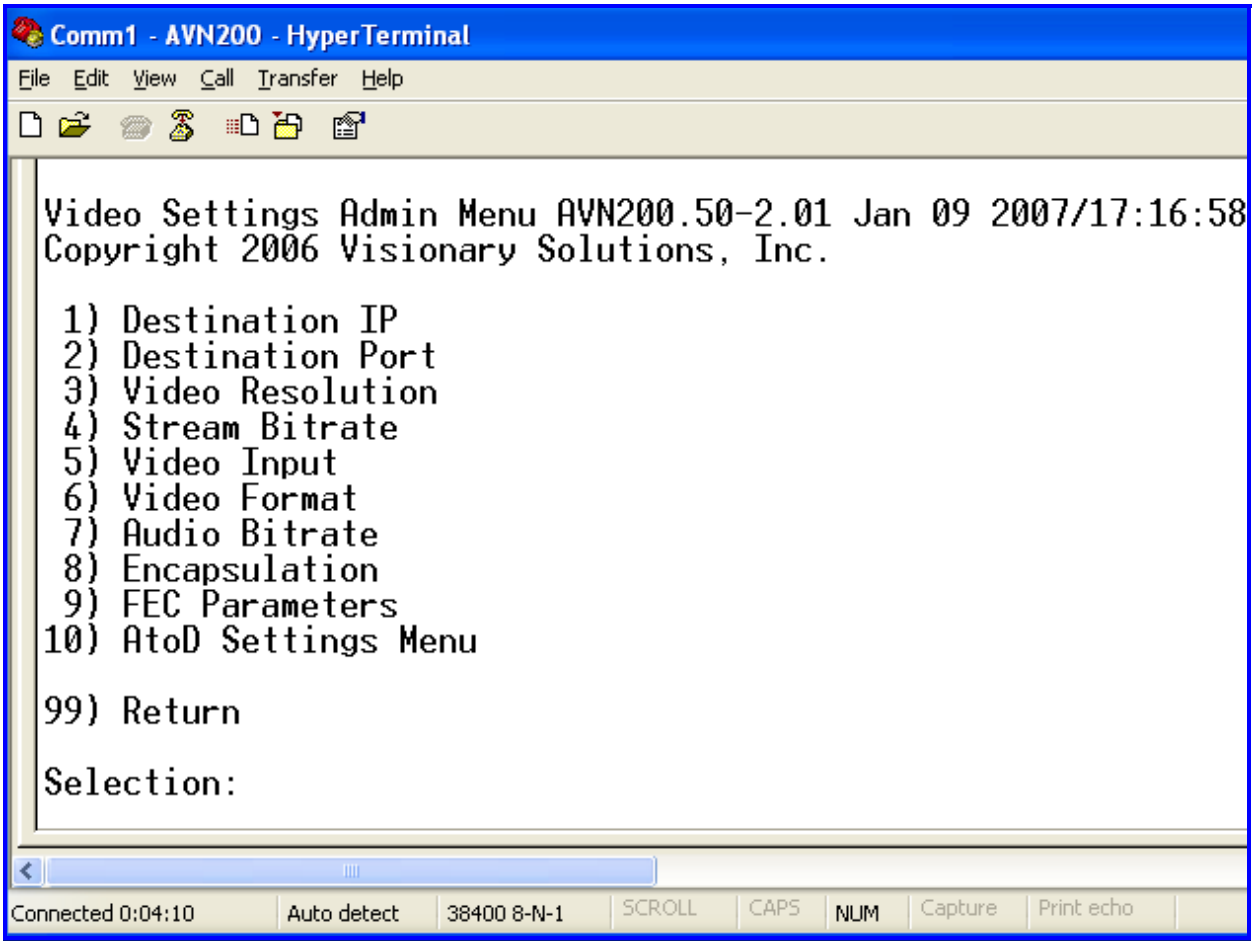
7) Reset Video Defaults – resets all video settings to default values.

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

9) 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 Admin 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.

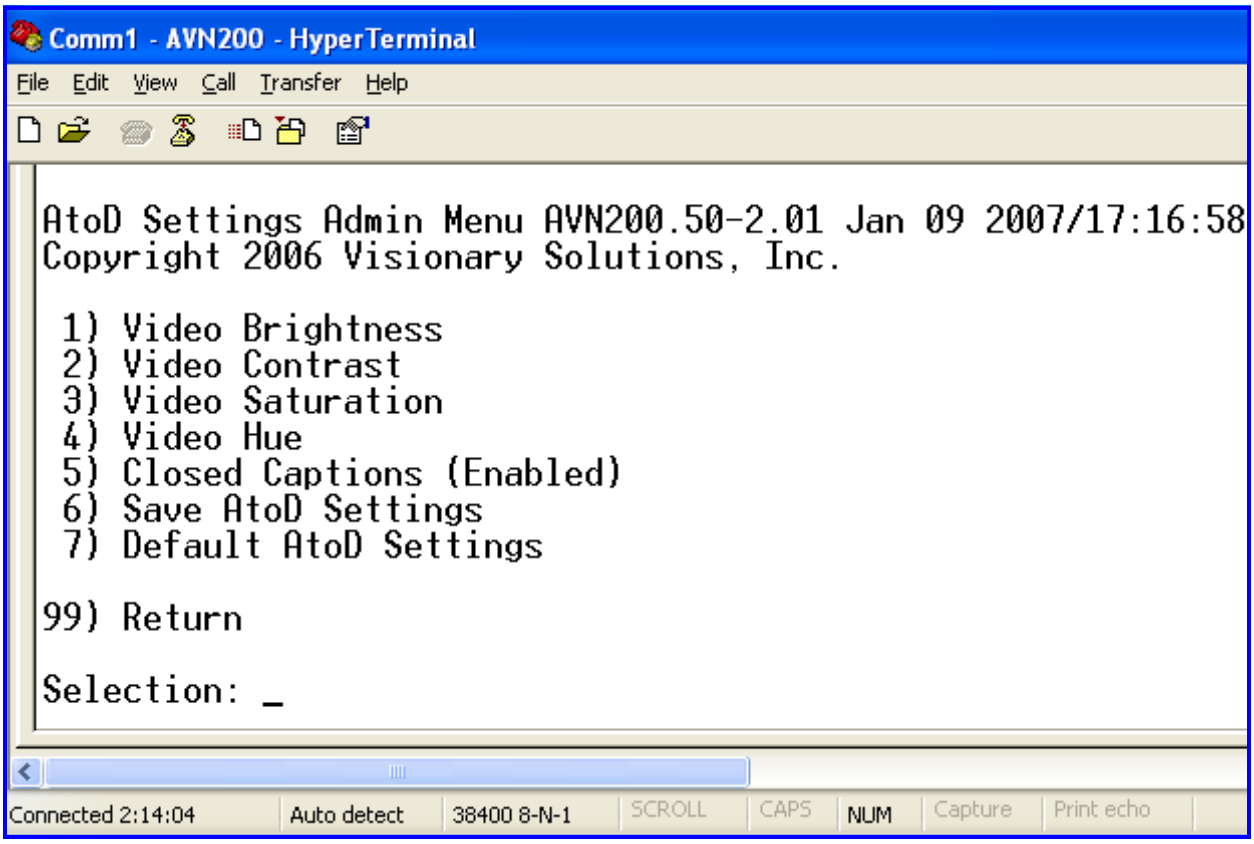
7) Audio Bitrate – sets the audio bitrate.

8) Encapsulation – sets the stream encapsulation type.

9) FEC Parameters – sets the FEC parameters.

10) AtoD Settings Menu – displays the AtoD 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.

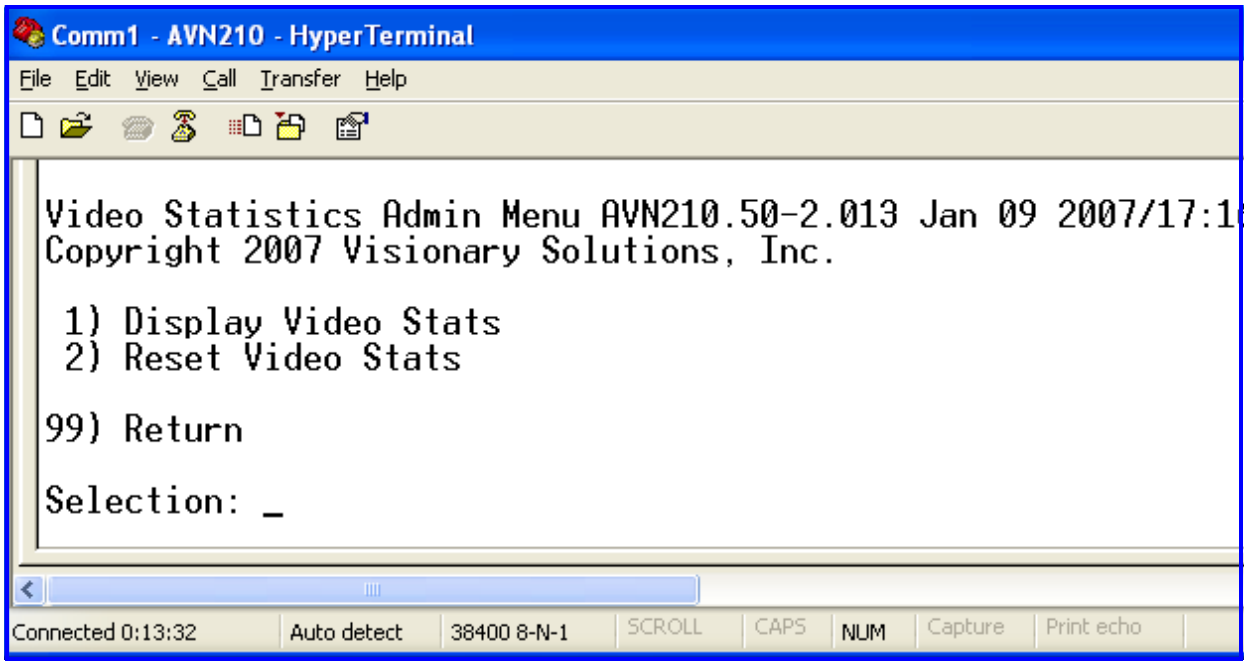
4) Video Hue – sets the hue.

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.

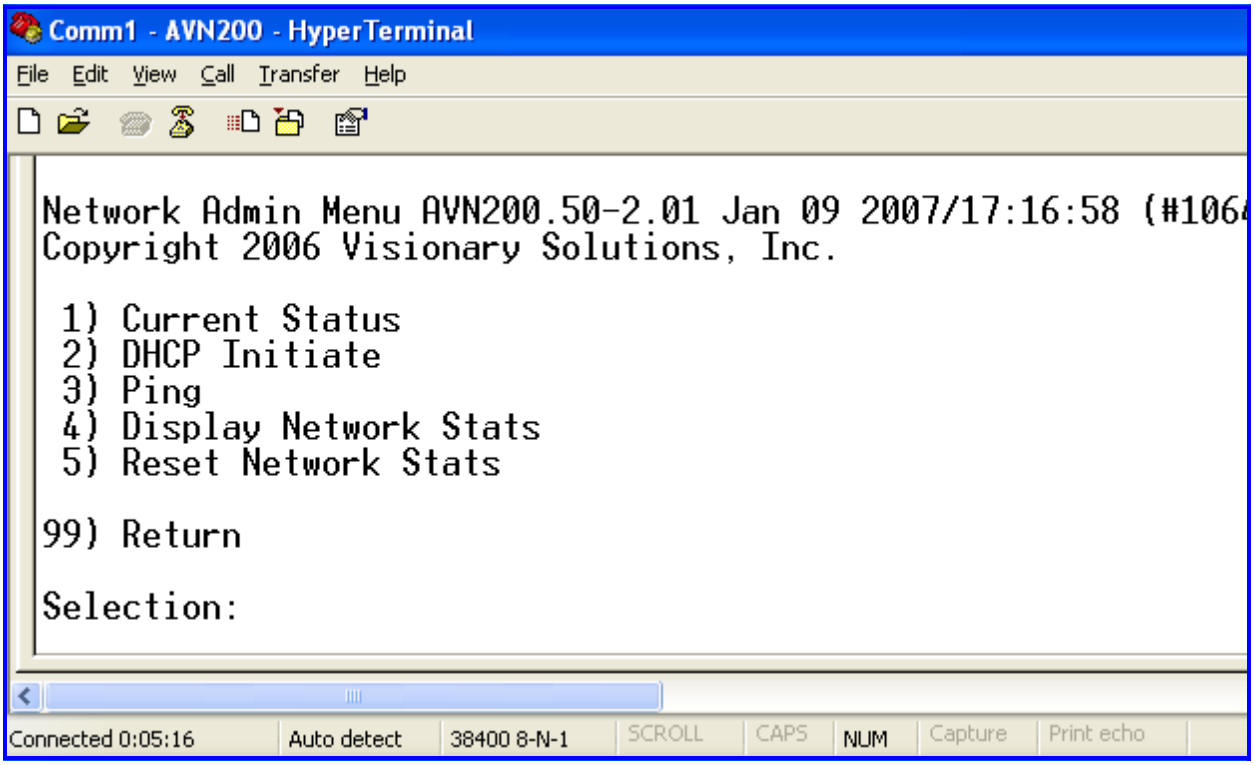
6.2.2 Video Statistics Admin Menu



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

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

6.3 Network Admin Menu



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

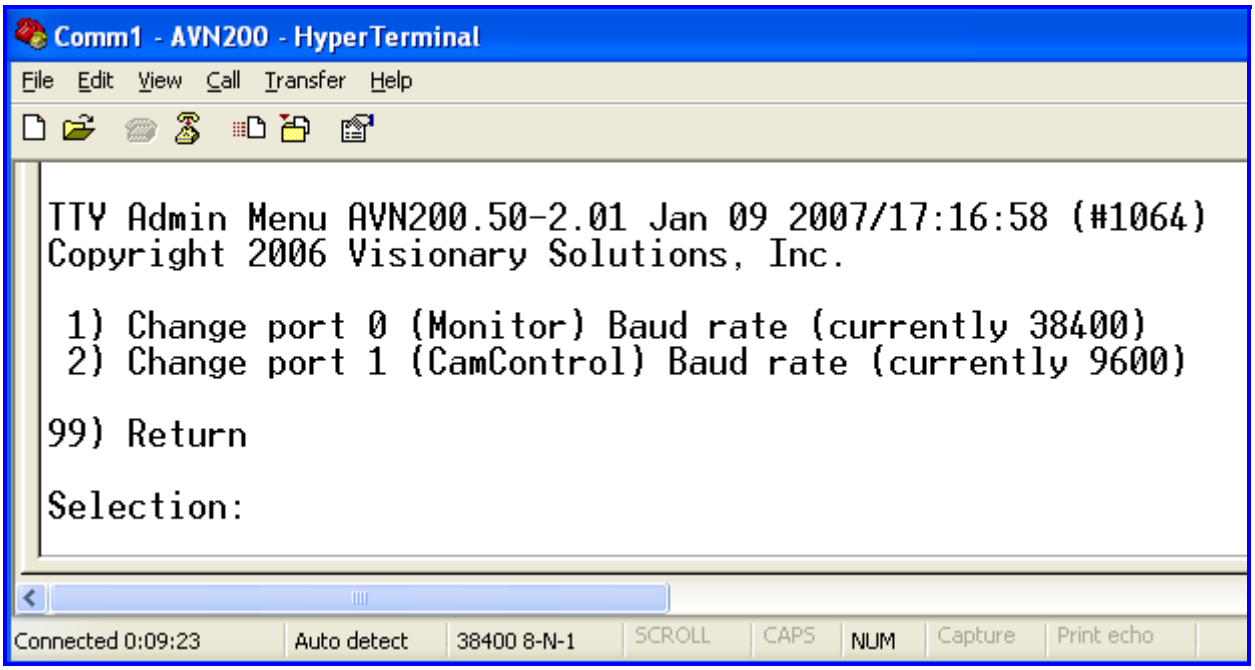
2) DHCP Initiate – displays the Port, Protocol, and Task numbers.

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.

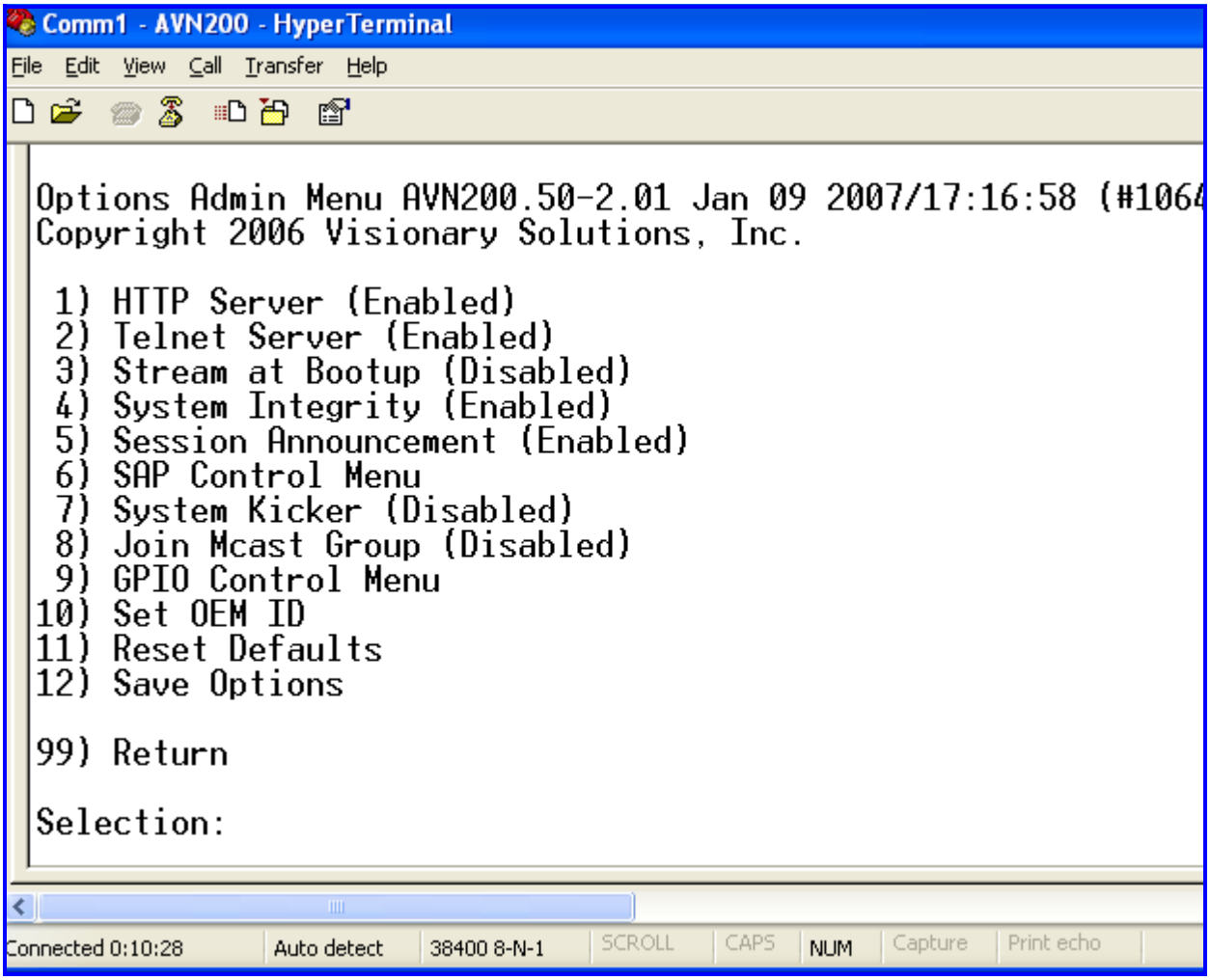
6.4 TTY Admin Menu



1) Change port 0 (Monitor) Baud rate (currently 38400) – sets the baud rate. Valid values must be multiples of 1200.

2) Change port 1 (CamControl) Baud rate (currently 9600) – sets the baud rate. Valid values must be multiples of 1200.

6.5 Options Admin Menu



1) HTTP Server – enables and disables HTTP server.
2) Telnet Server – enables and disables TelnetServer.
3) Stream at Bootup – enables and disables Stream at Bootup mode.
4) System Integrity – enables and disables System Integrity testing.
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.

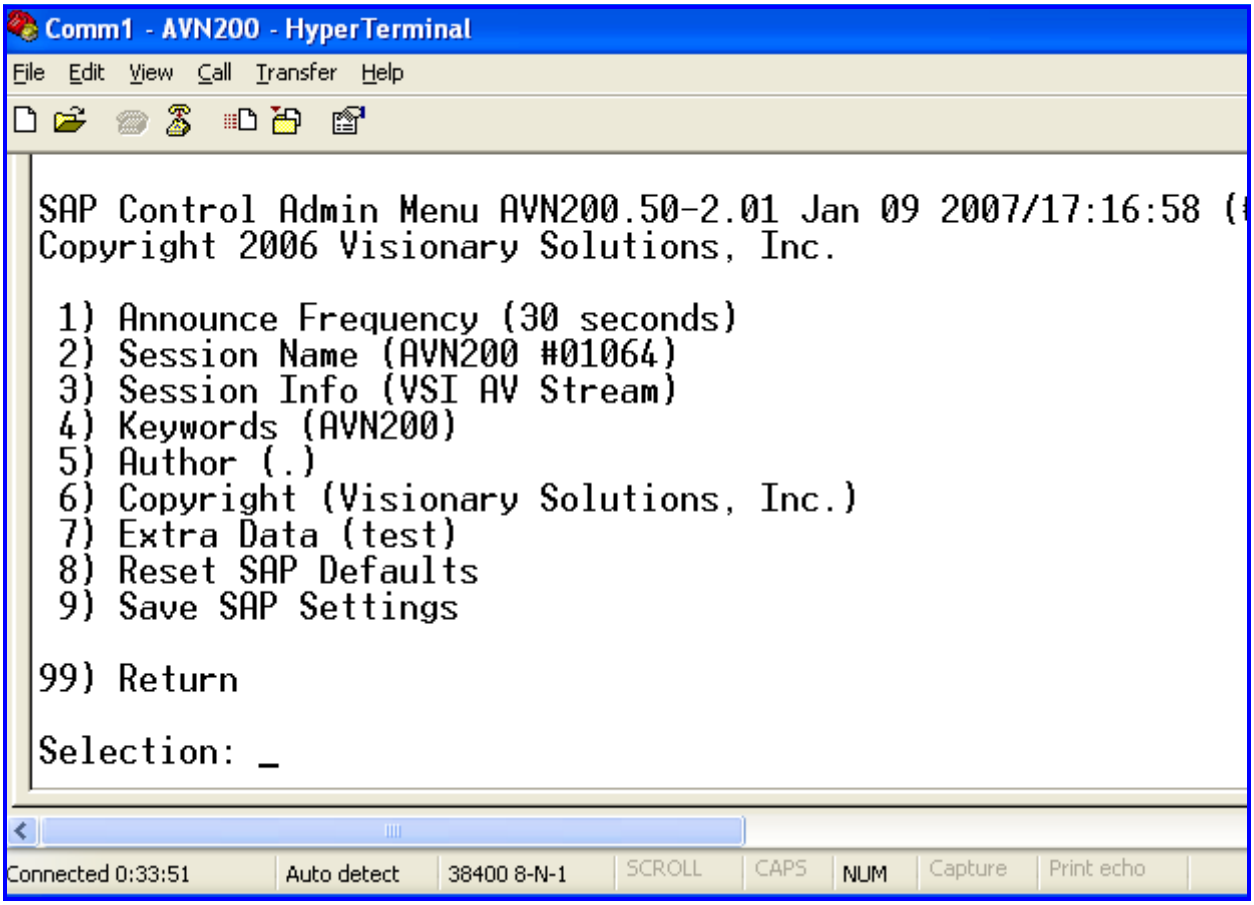
9) GPIO Control Menu – displays the GPIO Control Menu.

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.

2) Session Name – sets the session's name.

3) Session Info – sets the session's info string.

4) Keywords – sets the session's keywords.

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

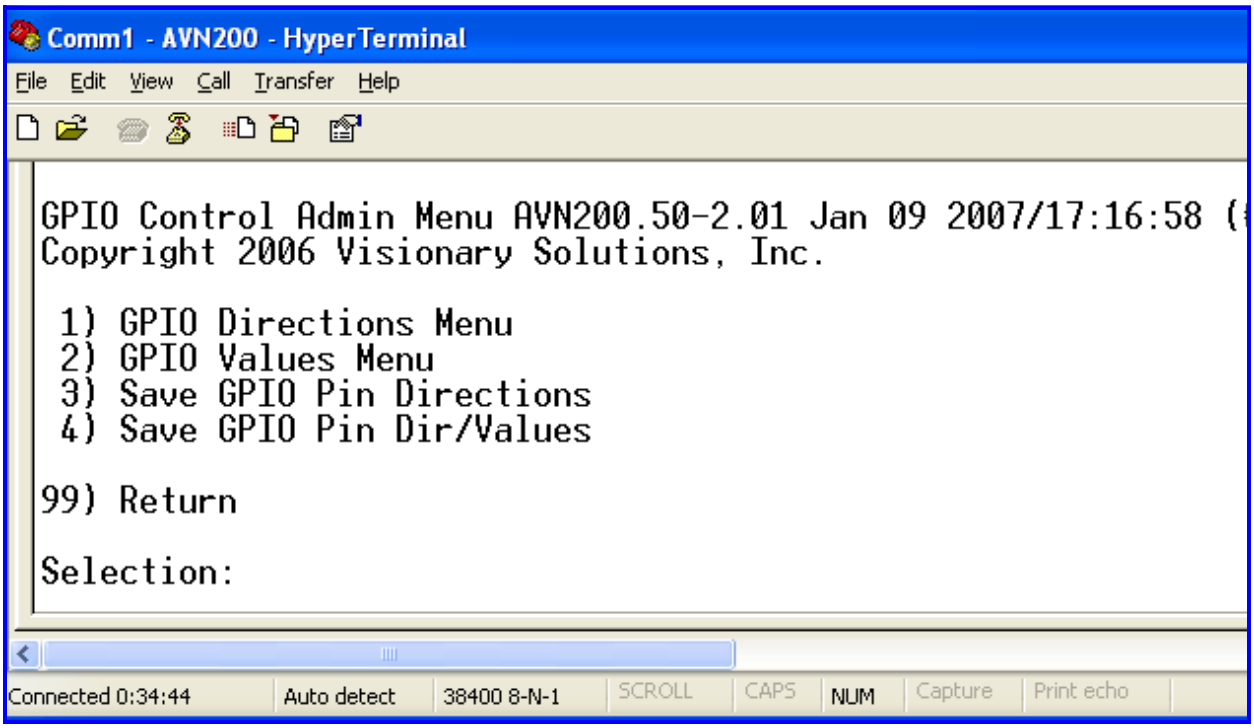
6) Copyright – sets the session's copyright string.

7) Extra Data – sets the session's extra data string.

8) Reset SAP – resets the SAP to default values.

9) Save SAP – saves the current SAP values.

6.5.2 GPIO Control Menu



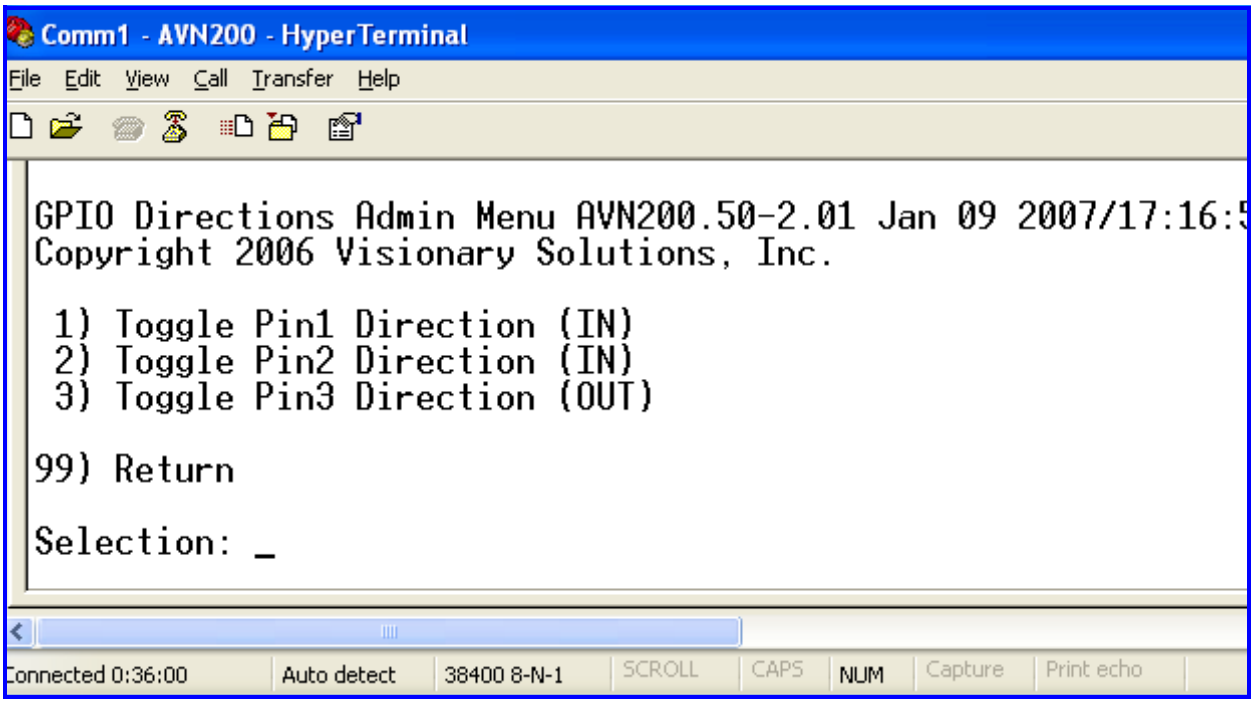
1) GPIO Directions Menu – displays the GPIO Directions Menu.

2) GPIO Values Menu – displays the GPIO Values Menu.

3) GPIO Pin Directions – saves the GPIO pin directions.

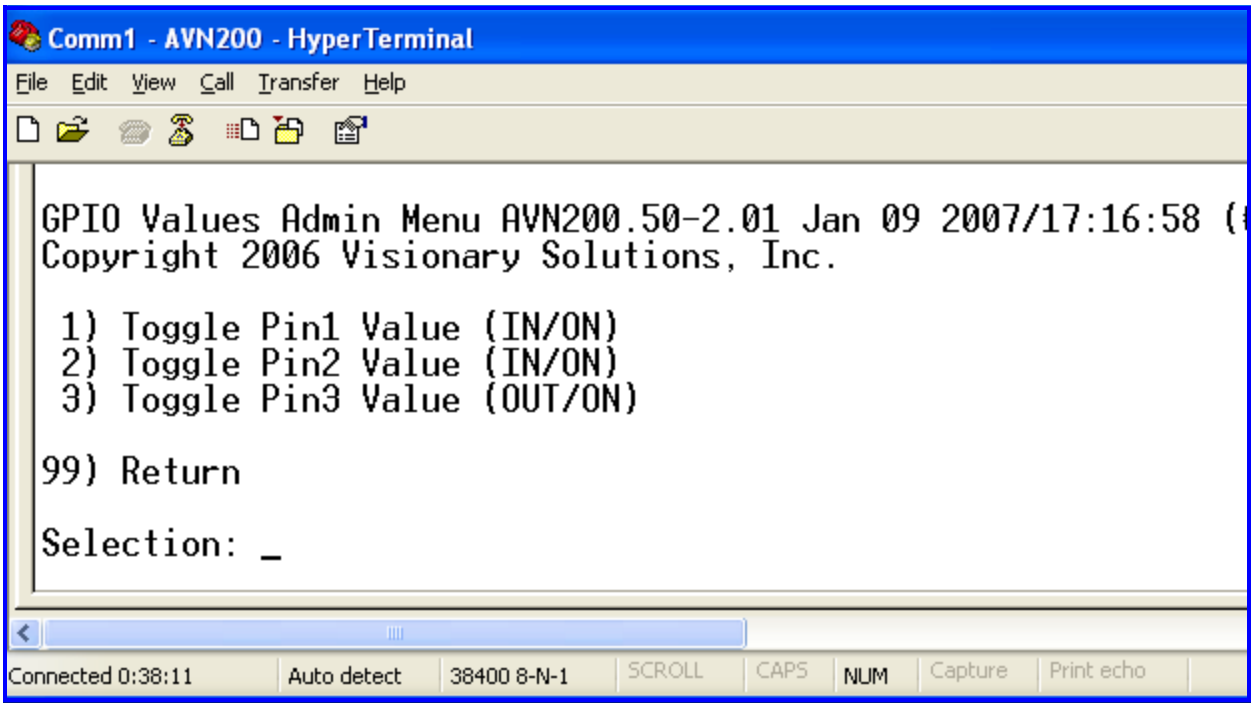
4) Save GPIO Pin Dir/Values – saves the GPIO pin directions and values.

6.5.2.1 GPIO Directions Menu



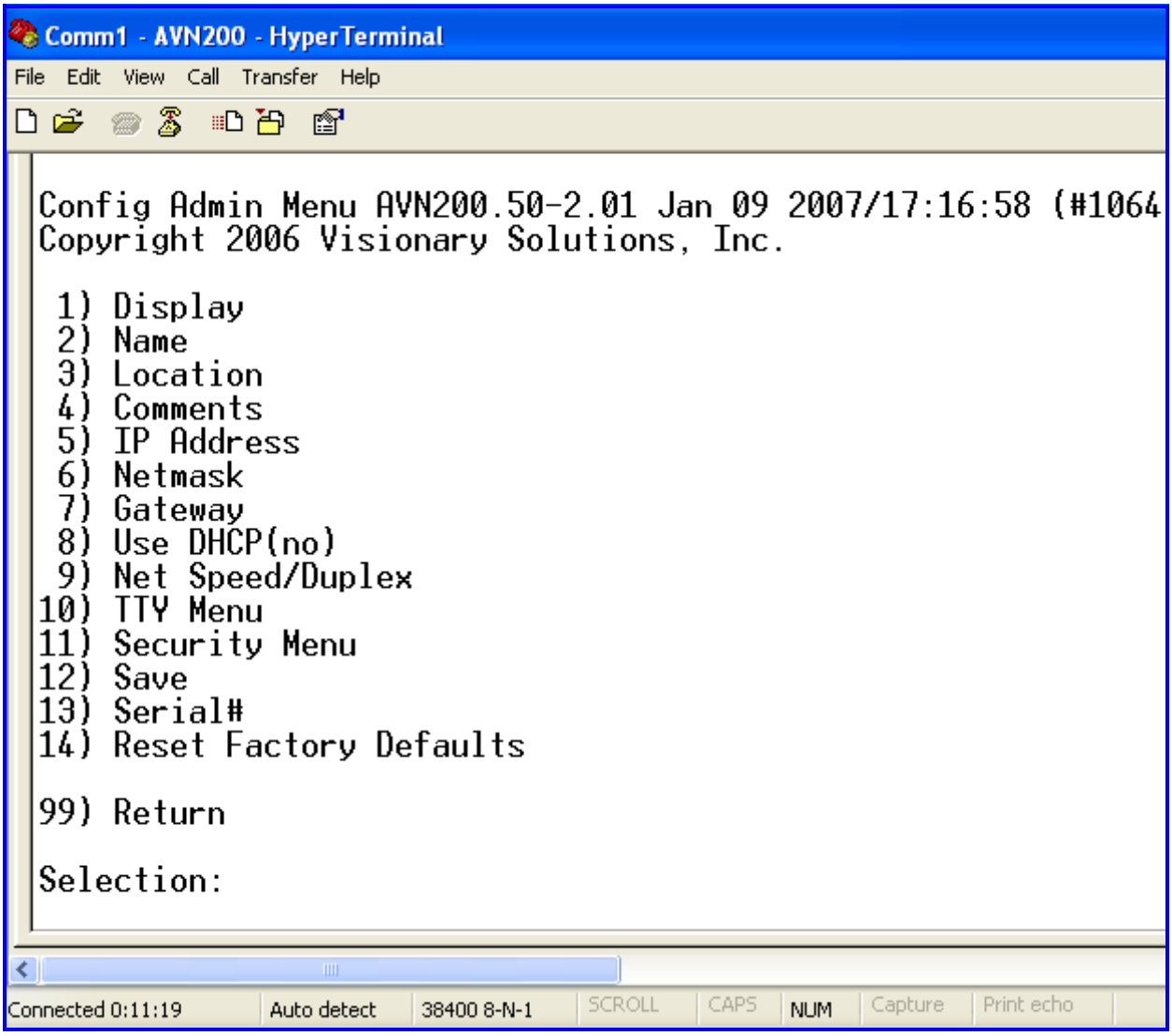
1) Toggle Pin1 Direction – toggles Pin 1's direction (In/Out).
2) Toggle Pin2 Direction – toggles Pin 2's direction (In/Out).
3) Toggle Pin3 Direction – toggles Pin 3's direction (Out Only).

6.5.2.2 GPIO Values Menu



1) Toggle Pin1 Value – toggles Pin 1's value if set to output (On or Off).
2) Toggle Pin2 Value – toggles Pin 2's value if set to output (On or Off).
3) Toggle Pin3 Value – toggles Pin 3's value if set to output (On or Off).

6.6 Config Admin Menu



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

2) Name – allows an optional string to describe the AVN200, which will display in the AVN200 Web Management page.

3) Location – allows an optional string to describe the AVN200, which will display in the AVN200 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) TTY Menu – displays the TTY Menu.

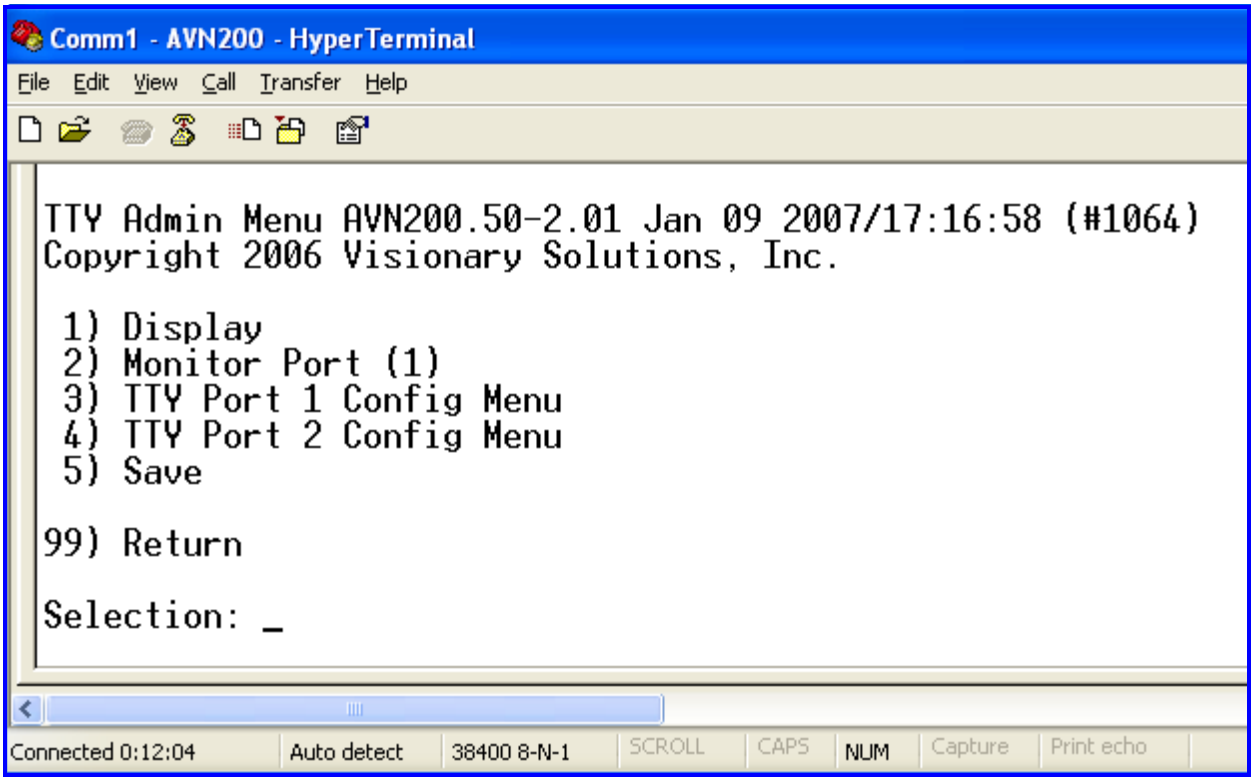
11) Security Menu – displays the Security Menu.

12) Save – saves current configuration settings to Flash.

13) Serial # – displays the serial number.

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

6.6.1 TTY Admin Menu



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

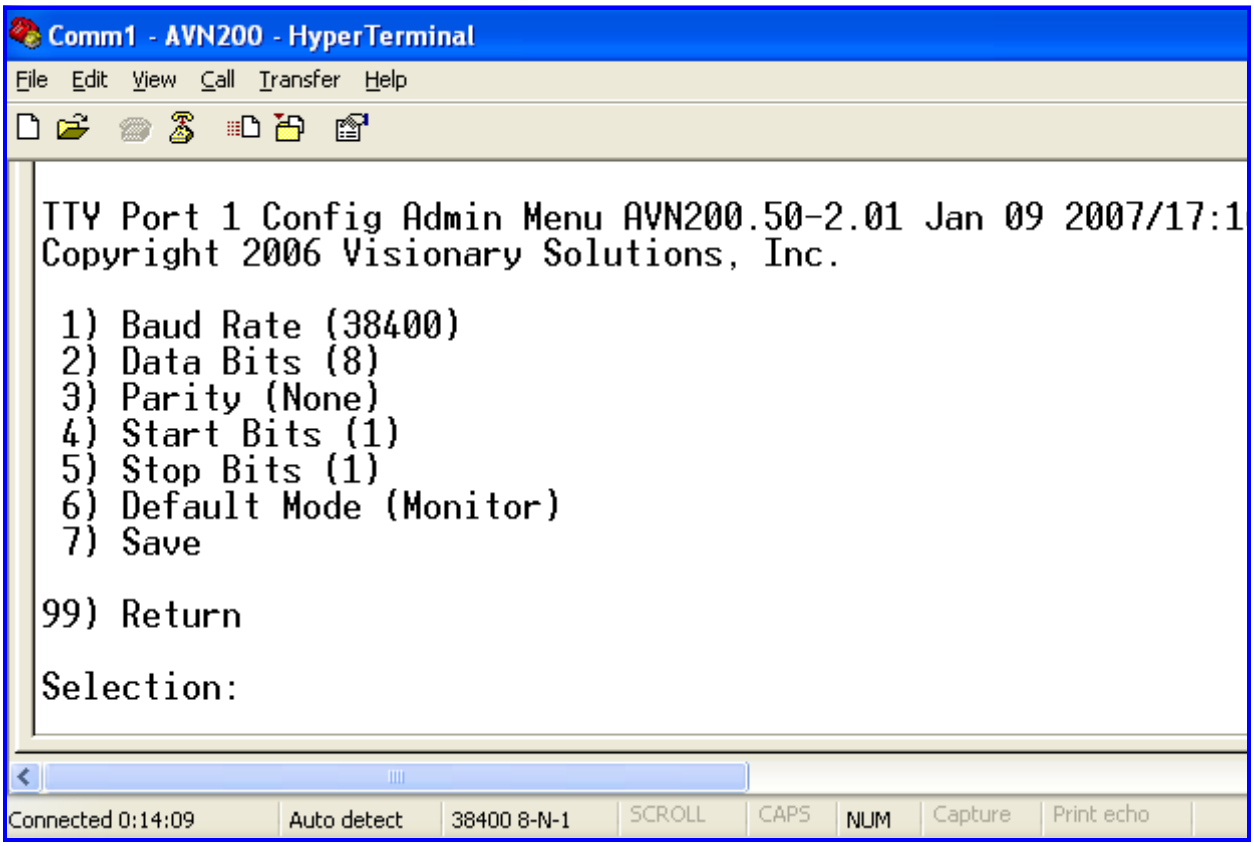
2) Monitor Port – sets which port to use for the monitor.

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

4) TTY Port 2 Config Menu – displays the TTY Port 2 Config Menu.

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

6.6.2 TTY Port 1 Config Admin Menu



1) Baud Rate – set the ports baud rate.

2) Data Bits – sets the data bits.

3) Parity – sets the parity.

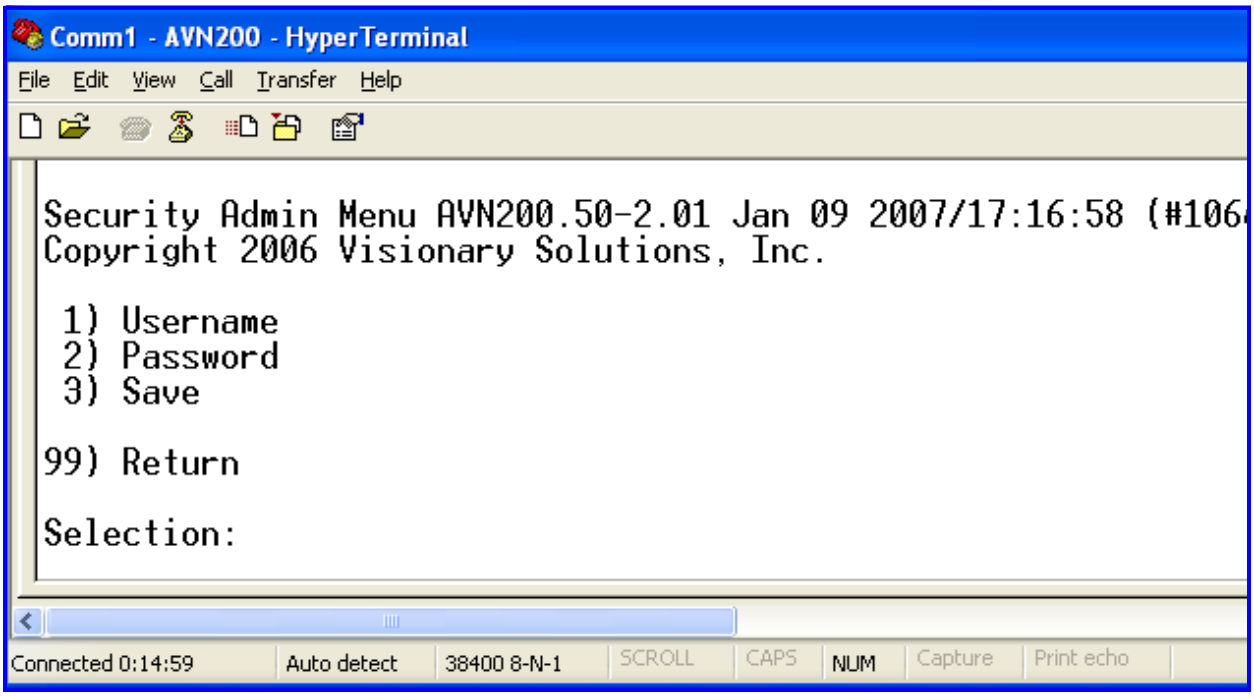
4) Start Bits – sets the start bit.

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 Admin 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 AVN200 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 menu. From the Video Admin Menu (see *6.2 Video Admin 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 *Chapter 11 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 AVN200 is running software older than AVN2XX_1_75, it can be easily upgraded. Go to the following link, www.vsicam.com/index.php?p=iptv_updates, and follow the instructions on how to download the new image and on how to use the PackeTV™ 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 AVN200 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 AVN200's IP address.
2. Click **Enter/Go**. The AVN200's Web Management Login page will display.
3. Enter the Username and Password of the AVN200 and click the **Login** button. The AVN200's Browser Interface pages will display.

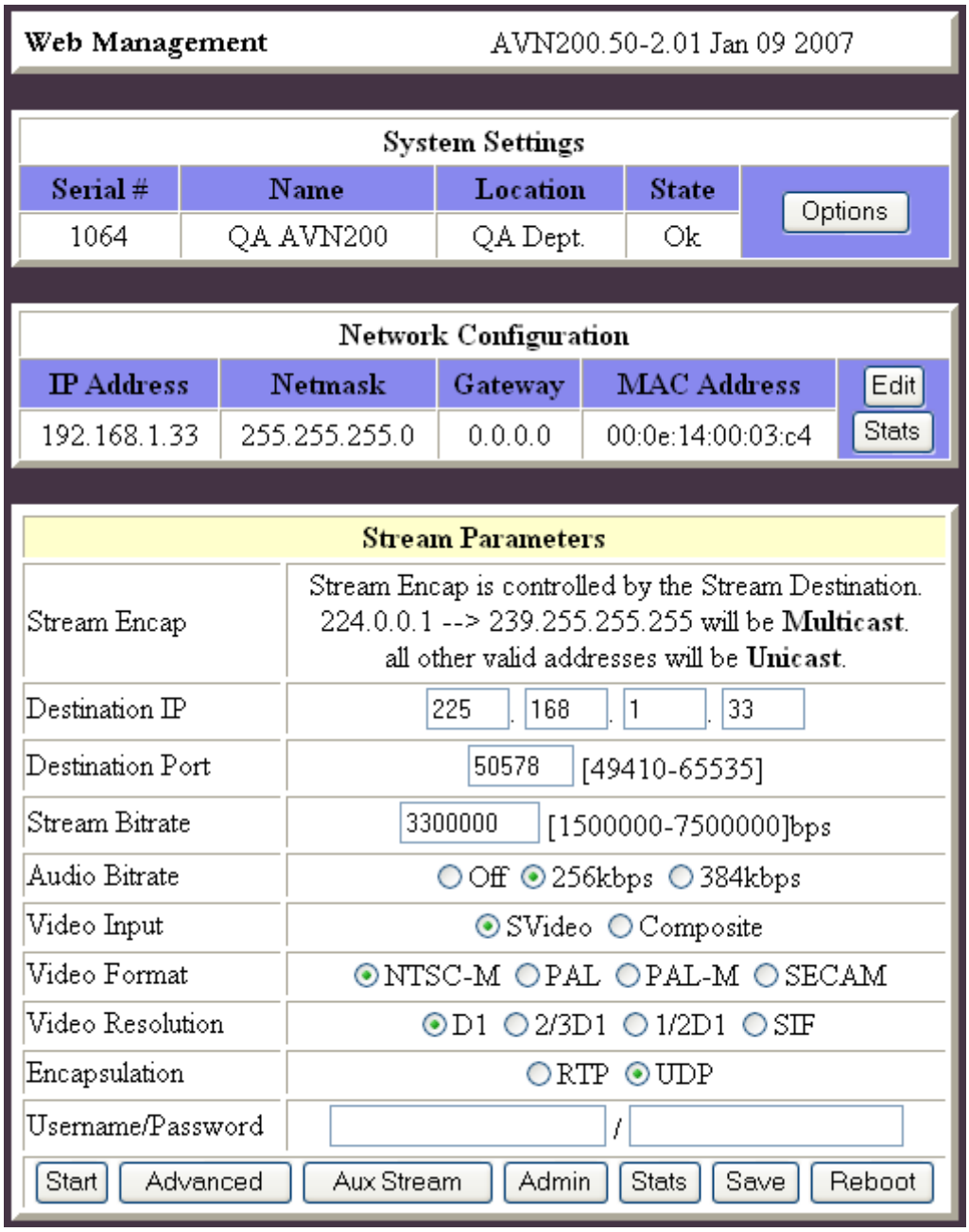
7.1 Browser Interface Menu Tree

The main Web Management page consists of three sections: the System Settings section, the Network Configuration section, and the AVN200 Parameters section. From these sections, you can access the following additional menus:

System Settings group/section	→	the Options button opens the Systems Options page
Network Configuration section	→	the Edit button opens the IP Configuration page
	→	the Stats button opens the Network Stats page
AVN200 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 AVN200 Web Management page displays the firmware version and the date it was installed at the top of the page. Where you see AVN200.50-***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.

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 AVN200 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.

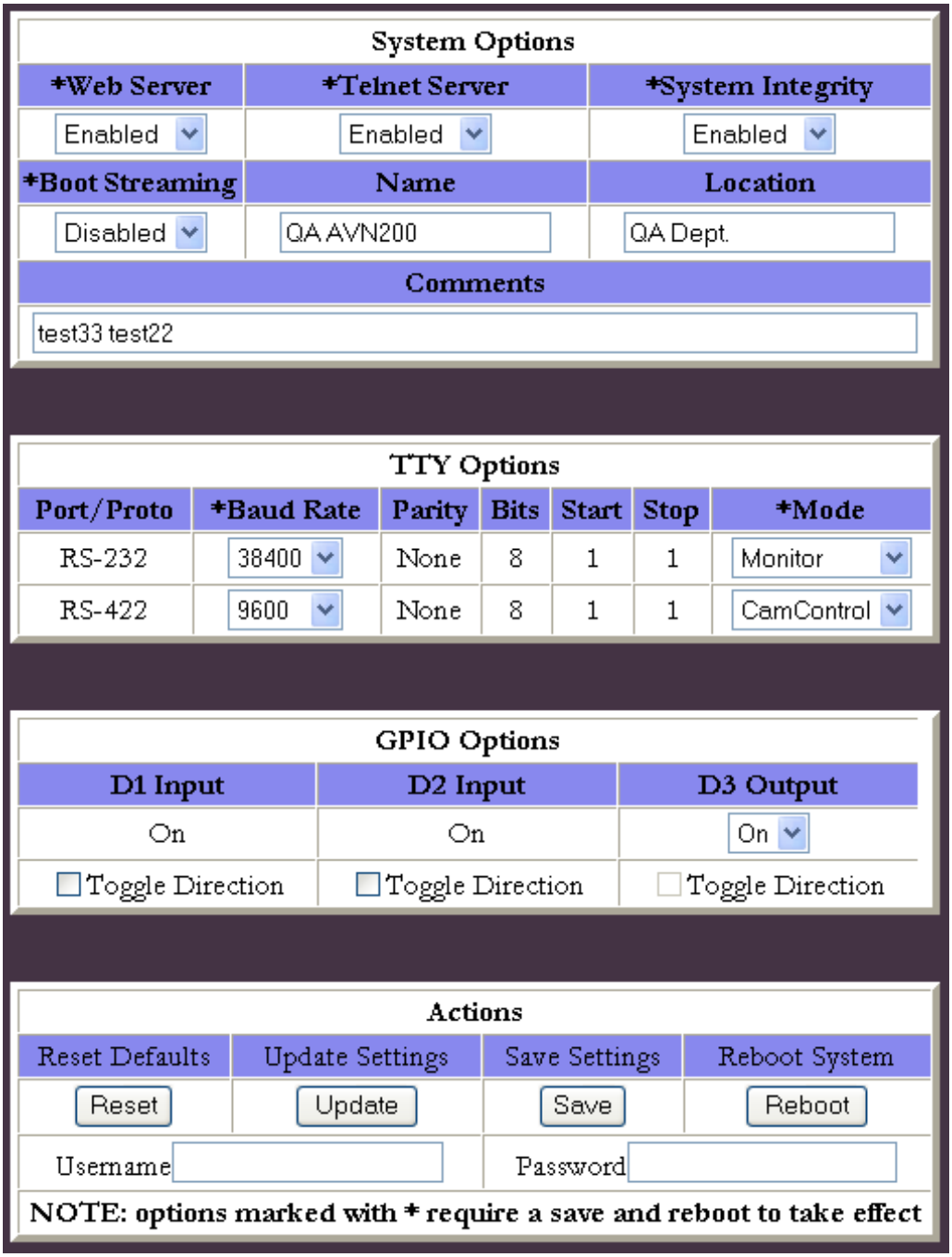
14) **Admin** – with a valid Username/password, this button opens the Modify Username/Password dialog.

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

16) **Save** – saves all AVN200 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.

4) Boot Streaming – displays the current Boot Streaming functionality. Allows this feature to be enabled and disabled.

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 two AVN ports. 0/RS-232 and 1/RS-422.

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 GPIO Options Section

1) D1 – displays the current state of D1, Input or Output, and if Output whether it is On or Off. Toggle Direction checkbox changes the direction (Input/Output).

2) D2 – displays the current state of D2, Input or Output, and if Output whether it is On or Off. Toggle Direction checkbox changes the direction (Input/Output).

3) D3 – displays the current state of D3, fixed as Output, and whether the Output is turned On or Off. Since D3 is fixed as Output, the Toggle Direction checkbox, if present, is disabled.

7.3.4 Actions Section

1) **Reset** – causes all the System Options, TTY Options, and Digital Inputs/Output options to be reset to factory default values.

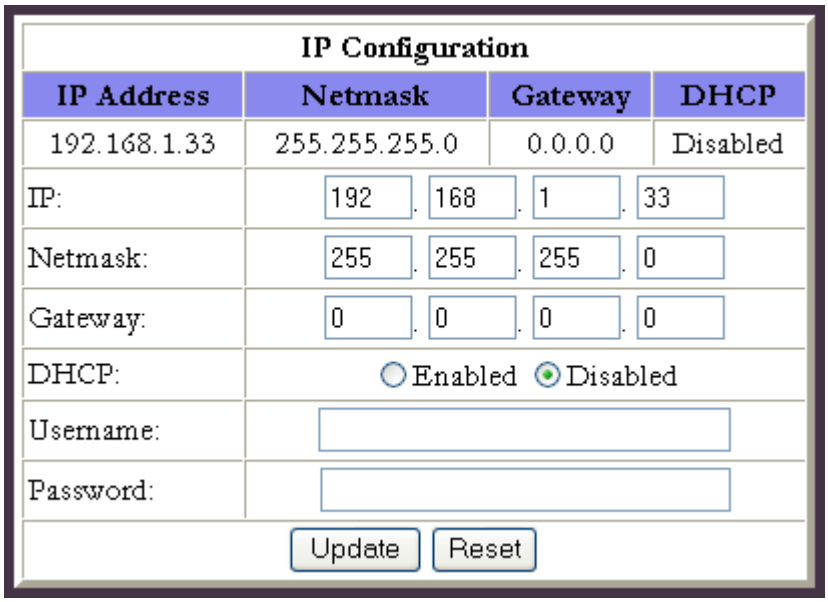
2) **Update** – causes all the System Options, TTY Options, and Digital Inputs/Output options to be saved to memory. These changes take effect immediately but will not be saved across an AVN reboot. If the AVN is streaming, the new settings will not take effect until the stream is stopped and restarted.

3) **Save** – causes all the System Options, TTY Options, and Digital Inputs/Output 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 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.

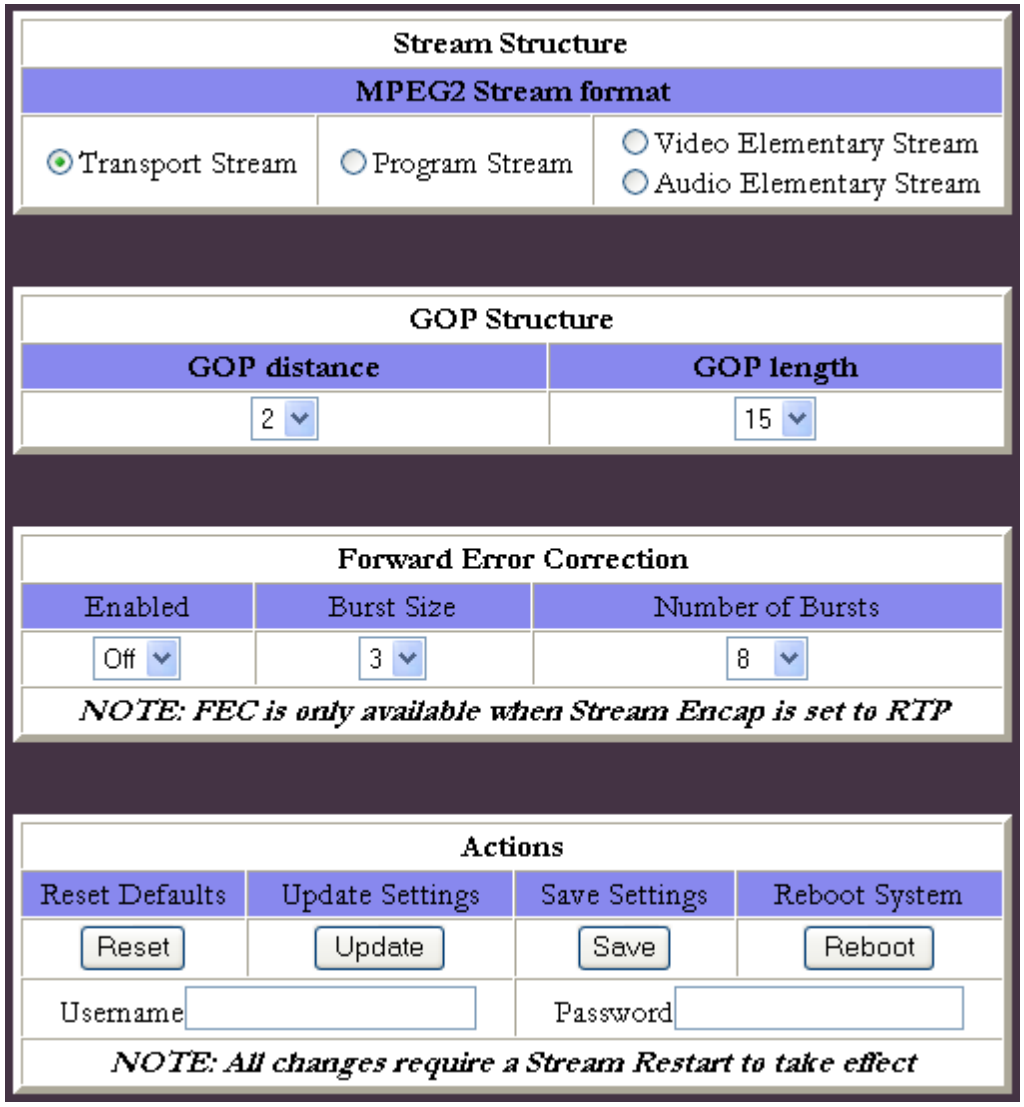
8) **Update** – causes all the IP Configuration settings to be saved to Flash. After a successful Update, the AVN must be rebooted for the changes to take effect.

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.

7.5 Network Statistics Page

Network Statistics	
Incoming Packets	**Outgoing Packets**
In Octets: 36293033	Out Octets: 298178
Unicast: 166	Unicast: 314
Multicast: 4178	Multicast: 5658
Broadcast: 368368	Broadcast: 2
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	

7.6 Advanced Page



7.6.1 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.

7.6.2 GOP Structure

1) GOP Distance – displays the current GOP Distance and allows the value to be edited. See *Chapter 11 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 *Chapter 11 Group of Pictures (GOP)* for information on valid GOP settings.

7.6.3 Forward Error Correction

1) Enabled – displays the current FEC mode (On or Off) and enables the setting of this mode.

2) Burst Size – displays the current Burst Size and allows this value to be set. Refer to the *PackeTV™ Manager's User's Manual* for more information on FEC.

3) Number of Bursts – displays the current Number of Bursts allows this value to be set. Refer to *Advanced Dialog Box* for more information on FEC.

7.6.4 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.

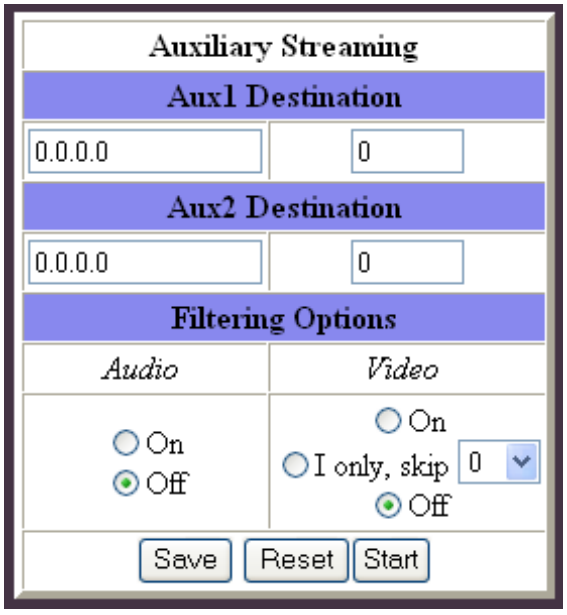
2) **Update** – saves all the current Advanced Settings to memory. These changes take effect immediately but will not be saved across an AVN reboot.

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.

7.7 Auxiliary Stream Page



This page allows the AVN200 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 these values to be changed.

2) Aux2 Destination – displays the destination IP address and port for Auxiliary Stream 1 and allows these values 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 *Chapter 11 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.

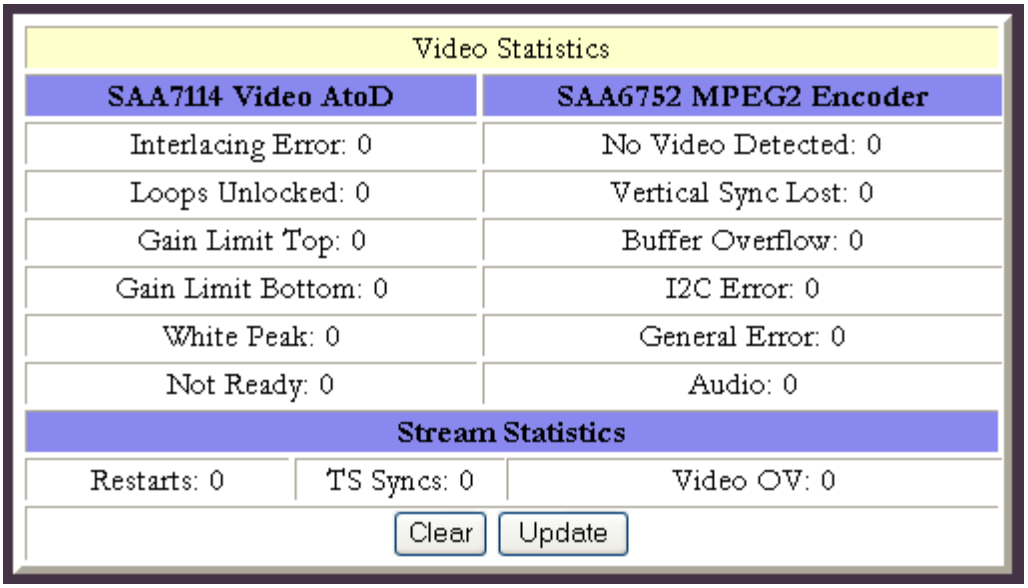
7.8 Modify Username / Password Page

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.

7.9 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 AVN200.

8.1 Checking the Firmware

It is important to know the version of the AVN200 firmware in order to troubleshoot the unit. To find the firmware version of your AVN200, select one of the following methods:

1. From the PackeTV™ Manager menu bar, click **Help**> **Get AVN Version**. A dialog box will appear listing all the AVNs on the network. Find the AVN unit by serial number or IP address to determine the firmware version. Refer to the *PackeTV™ Manager User's Manual* for more details on the Get AVN Version dialog.

2. From the PackeTV™ Configuration Utility's main dialog, search the AVNs on Network list for the AVN, by serial number or IP address, to determine the firmware version. Refer to the *PackeTV™ Configuration Utility User's Manual* for more information.

3. From the AVN200 Console Menus, the firmware version is shown on all of the menus in the first line of text after the menu title. Where you see AVN200.50-***x.xx***, ***x.xx*** will be the firmware version.

4. From the AVN200 Browser Interface pages, the firmware version is shown at the top of the Main Page. Where you see AVN200.50-***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/index.php?p=iptv_documentation.
- Find answers to resolved problems in the FAQ database. Search by product, category, or phrases. Go to www.vsicam.com/index.php?p=faq.
- Report problems to VSI support staff by sending an email to:avntech@vsicam.com.
- Visit the Customer Support section of the VSI web site at www.vsicam.com.

8.3 Pinging Your IP Address

By sending a packet to the IP address of the AVN200 and waiting for a reply, you can determine whether the AVN200 is accessible on your network.

To test your IP Address:

1. From your PC, open a command prompt window (Window's Start menu, Run…, type **command**). This will open a console window.

2. At the prompt, type **ping xxx.xxx.xxx.xxx**, where *xxx.xxx.xxx.xxx* is the IP address of the unit you would like to connect to. You should see something like the following on your screen:

```
C:\>ping 192.168.1.89
Pinging 192.168.1.89 with 32 bytes of data:
Reply from 192.168.1.89: bytes=32 time=1ms TTL=64
Reply from 192.168.1.89: bytes=32 time<1ms TTL=64
Reply from 192.168.1.89: bytes=32 time<1ms TTL=64
Reply from 192.168.1.89: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.89:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

This message would indicate that your PC was able to talk to the AVN200, that timely responses were received to each of the 4 ping packets that were sent, and that there was 0% packet loss.

If there is a problem with the network settings, you would expect to see a message like the one below:

```
C:\>ping 192.168.1.90
Pinging 192.168.1.90 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.90:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

This message would indicate that all the packets timed out, that there were no responses, and 100% packet loss. This would point to a problem with the network due to either improper software configuration or a physical network error.

8.4 Factory Default Settings

This procedure provides a way to reset the AVN200 configurations back to the factory default settings, which may be necessary or desirable in certain circumstances.

You can return the AVN200 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 Admin 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 AVN200 will automatically reset to default IP address 192.168.1.253.

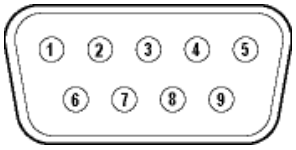
Chapter 9 Unit Connections

9.1 The D-Sub Connector

One 9-pin D-SUB connector provides an RS-232 port physical interface. The connector is used for accessory equipment, such as stand-alone PTZ devices for the remote positioning of connected video cameras.

A diagram of the RS-232 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



9.2 I/O Terminal Blocks 1 and 2

There are two 4-pin I/O Terminal Blocks. The I/O Terminal Block 1 is located on the front panel and the I/O Terminal Block 2 is located on the rear panel. The terminal blocks provide the interfaces for one digital output, two digital inputs, an RS-422 connector, and ground.

The following tables describe the pinouts and interfaces for the terminal blocks.

9.2.1 I/O Terminal Block 1 Connector Pinouts

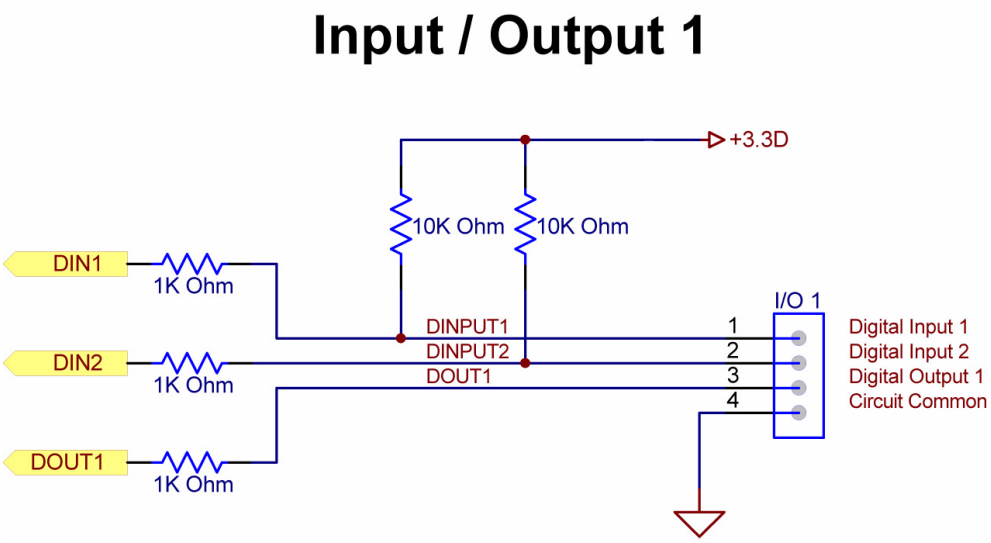
Pin	Function	Description
1	D1 Input/Output	To assert, connet to GND.
2	D2 Input/Output	To assert, connect to GND.
3	D3 Output	High = +3.3 VDC, Low = GND.
4	GND	

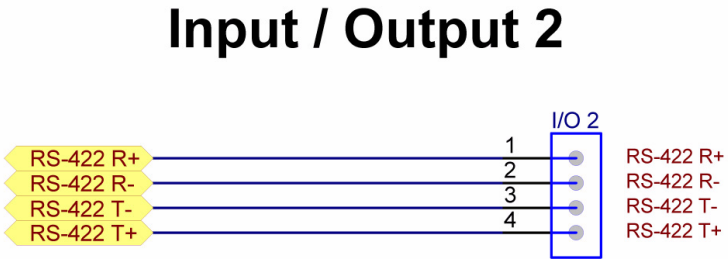
9.2.2 I/O Terminal Block 2 Connector Pinouts

9.2.3 Full Duplex RS-422 Interface

Pin	Function	Description
1	RS-422 R+	Receive +
2	RS-422 R–	Receive –
3	RS-422 T–	Transmit –
4	RS-422 T+	Transmit

9.3 Schematic Diagram





Chapter 10 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 2 audio encoding at 256 kbps or 384 kbps. Default PID = 301.

Network connection:

- One RJ-45 connector, twisted pair cable. 10baseT or 100baseTX Fast Ethernet.

Serial connector:

- One RS-232 9-pin D-SUB connector, maximum transmission rate 115 kbps.

Terminal Bock Connectors:

- One RS-422 Full Duplex connector.
- One Digital I/O connector, maximum transmission rate 250 kbps.

Audio Inputs:

- One connector for in-line stereo or mono signal.
- Line Level Input: Maximum level 1 Vrms.

Video Inputs:

- One 75-Ohm BNC connector for composite video. NTSC and PAL.
- One S-Video connector. NTSC and PAL.

Power Supply: +3.3 VDC, 2 Amp

Physical Dimensions:

- Height:1.8 in. (4.5 cm)
- Width: 3.9 in. (9.6 cm)
- Length: 4.8 in. (12.1 cm)
- Weight: 0.75 lb (0.34 kg).

Chapter 11 Group of Pictures (GOP)

11.1 AVN GOP Environment

The Group of Pictures (GOP) in the AVN200 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 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).

11.2 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 AVN200, access the Console Menu (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 AVN200 Web Management page under the Options button.

Chapter 12 Virtual Serial Channels

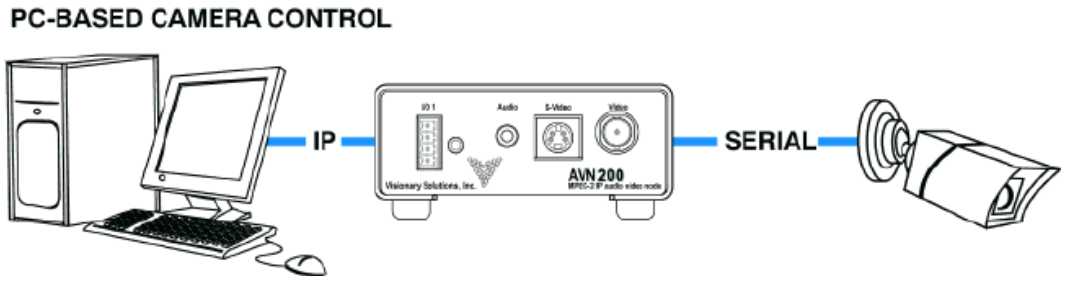
In addition to its regular features, the AVN200 can also be used to connect to any remote serial device. This capability extends the distance that a serial connection can achieve over the Internet. The AVN200 has two physical serial ports which can be used for a variety of applications. There is a 9 pin RS-232 interface, as well as a 4 pin RS-422 interface. Either interface can be set to one of the modes of operation described below. The AVN200 interface can be set to one of the modes of operation described below.

12.1 Channel Modes

12.1.1 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 AVN unit over a HyperTerminal type interface.

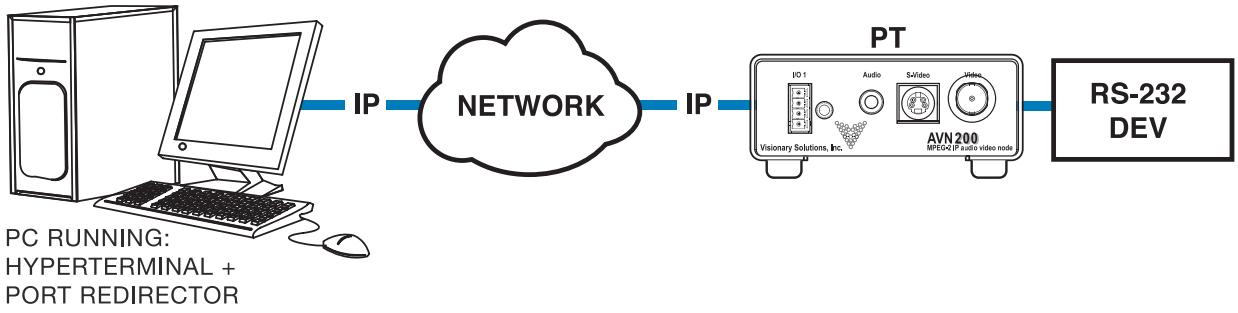
This is the default mode for the RS-422 interface, and both interfaces can be set to this mode simultaneously. This mode creates a unidirectional bridge between a physical serial port and a Layer 4 transport port (TCP/UDP). The AVN200 will listen on a particular TCP/UDP port, and when data is received by the port the AVN200 will forward the data physically over the selected serial port. The return path (return serial data) is not forwarded in this mode.



12.1.2 Passive Tunnel Mode

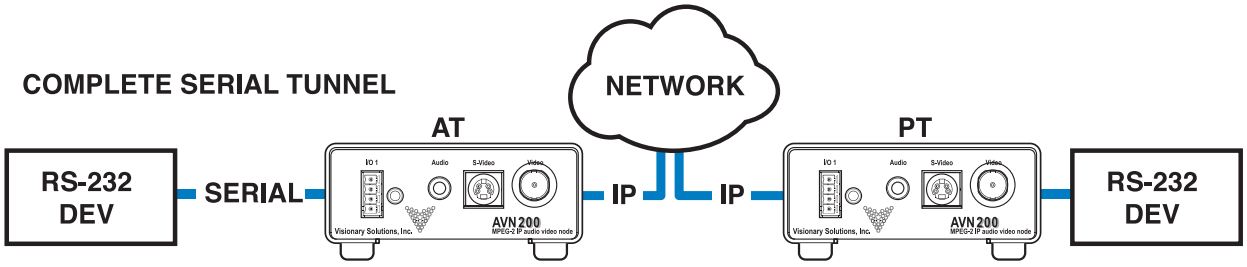
This mode is similar to Camera Control mode with the exception that it will create a bi-directional bridge between the physical serial port and a Layer 4 transport port. In addition to data being received by the TCP/UDP port being forwarded out the serial interface, data is also forwarded in the opposite direction. This mode is labeled passive because, in this mode, the AVN200 will act as a server awaiting a connection from a client.

PC SERIAL TUNNEL



12.1.3 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 AVN200 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 AVN200 in Passive Tunnel mode.)



12.1.4 Disabled Mode

Selecting this mode makes the interface unusable.

12.2 Selecting Modes

The AVN200 modes are accessed from the Console Menus. For instructions on how to access the Console Menus, refer to *Chapter 6 Using the Console Menus*. To select a mode:

1. From the console Main Admin Menu, select 5) Config Menu, 8) 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 Admin Menu.
5. From the Main Admin Menu, select 6) Reset. You must reboot the AVN200 for the changes to take affect.

Chapter 13 Safety and Compliance Information

Only use the power supply that is provided with the unit.

Unit Rating:

 **Caution**: 3.3Vdc, 2A

Power Supply Rating:

 **Caution**: 100-240V~, 50-60 Hz, 0.5A

Fuse Rating:

No user accessible fuse.

Glossary of Terms

AAC	Advanced Audio Coding
AC	Alternating Current
AFF	Adaptive Frame/Field per Picture
AT	Active Tunnel
ATSC	Advanced Television Systems Committee
AUX	Auxiliary
AV	Audio Video
B Frames	Bidirectional Frames (pictures)
BNC	Bayonet Neill-Concelman (connector)
CC	Closed Captioning
CCTV	Closed Circuit Television
CD	Compact Disc
cm	centimeter
CPU	Central Processing Unit
CVBS	Composite Video Broadcast Signal
DHCP	Dynamic Host Configuration Protocol
ESD	Electrostatic Discharge
FEC	Forward Error Correction
fps	frames per second
FTP	File Transfer Protocol
GND	Ground
h.264	Video compression standard, also known as MPEG-4 AVC (Advanced Video Coding) or MPEG-4 Part 10
GPIO	General Purpose Input/Output
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)
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
SMTP	Simple Mail Transfer Protocol
TTL	Time to Live (IP)
UDP	User Data Protocol
VBI	Vertical Blanking Interval
VDC	Volts Direct Current
Vrms	Volts Root Mean Square