

VB4000-5000-6000 Series Network Video Appliances

VB4000-5000-6000 v3.3
Administrator Guide



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This equipment carries the CE mark and is UL listed in the U.S. and Canada. This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC rules, Class A for OC-3C Interface, Class A for the SDI Interface. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Classe A respecte toutes les exigences de règlement sur le matériel brouilleur du Canada.

About VBrick Systems

Founded in 1997, VBrick Systems, an ISO 9001 certified vendor, is a privately held company that has enjoyed rapid growth by helping our customers successfully introduce mission critical video applications across their enterprise networks. Since our founding, VBrick has been setting the standard for quality, performance and innovation in the delivery of live and stored video over IP networks—LANs, WANs and the Internet. With over 20,000 video appliances installed across over 1,000 IP networks world-wide, VBrick is the recognized leader in reliable, high-performance, easy-to-use networked video solutions.

VBrick is an active participant in the development of industry standards and continues to play an influential role in the Internet Streaming Media Alliance (ISMA), the MPEG Industry Forum, and Internet2. In 1998 VBrick invented and shipped the world's first MPEG Video Network Appliance designed to provide affordable DVD-quality video across the network. Since then, VBrick's video solutions have grown to include Video on Demand, Management, Security and Access Control, Scheduling, and Rich Media Integration. VBrick solutions are successfully supporting a broad variety of applications including distance learning and training, conferencing and remote office communications, security, process monitoring, traffic monitoring, business and news feeds to the desktop, webcasting, corporate communications, collaboration, command and control, and telemedicine. VBrick serves customers in education, government, healthcare, and financial services markets among others.

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Preface

This **VB6000-5000-4000 v3.3 User Guide** is written for anyone who will be using or configuring a VB6000 Series VBrick appliance. This includes system administrators, network technicians, and anyone who will be using or configuring a VBrick network video appliance. VBrick encoder and decoder appliances are available in industry standard MPEG-2, MPEG-4, and other formats. MPEG-2 appliances are used for delivering low delay, DVD quality video over high bandwidth networks. MPEG-4 appliances are used for delivering low delay television quality video over low and medium bandwidth networks. These products are available in one and two channel configurations, as well as a combination encoder/decoder that delivers two-way interactive video (MPEG-2 and MPEG-4). An optional hard drive allows the video to be recorded at the source.

Organization

<u>Getting Started</u>	Explains the basics. Provides general configuration recommendations as well as how to cable the appliance and connect it to the network.
<u>Streaming Video Basics</u>	Explains some of the fundamentals behind the technology including compression techniques, network concepts, serial port passthrough, and other video basics.
<u>VBrick Management Tools</u>	Explains how to configure the appliance using a variety of management tools. These include the IWS web interface, Telnet, SNMP, the command line, and the IR remote control.
<u>MPEG-2 Configuration</u>	Explains how to configure MPEG-2 video appliances using the IWS web interface.
<u>MPEG-4 Configuration</u>	Explains how to configure MPEG-4 video appliances using the IWS web interface.
<u>ATM Configuration</u>	Explains how to configure Asynchronous Transfer Mode video appliances using the IWS web interface.
<u>SDI Configuration</u>	Explains how to configure Serial Digital Interface video appliances using the IWS web interface.
<u>System Status</u>	Explains all of the detailed status information available about the network, the encoder, the decoder, the hard drive, etc.
<u>Diagnostics</u>	Explains how to run a variety of onboard diagnostics including ping, traceroute, and decoder color bars.
<u>Maintenance</u>	Explains how to use various maintenance functions. These reading and saving all configuration parameters and changing user names and passwords.

<u>Maintenance Mode</u>	Explains maintenance mode and how it is used to recover if errors occur during or after a firmware download.
<u>VBStar</u>	Explains how to use this MPEG-2 appliance with a hard drive to record and pump high-quality video throughout your network.
<u>Command Line</u>	Explains how to configure an appliance from the command line using HyperTerminal or Telnet when an Internet connection is not available.
<u>VB6000 Reference</u>	Provides back panel drawings, COM port pinouts, and other useful information.

Font Conventions

Arial bold is used to describe dialog boxes and menu choices, for example: **Start > All Programs > VBrick**

`Courier fixed-width font` is used for code elements (C++, HTML) as well as filenames, directories, etc.

Bold Courier fixed-width font is used to indicate user input in keyboard commands, scripts, etc.

Web addresses are displayed as hyperlinks in the format: <http://www.VBrick.com>

Italics are used to emphasize specific words or phrases.

Getting Started

Topics in this chapter

[Overview](#)

[Quick Start](#)

[System Updates](#)

[VBSSM](#)

Overview

Congratulations on your purchase of VBrick System's MPEG-2 and/or MPEG-4 video networking product. VBrick Systems provides high-quality video and audio encoders and decoders. VBrick also provides software decoding on any PC through StreamPlayer or StreamPlayer Plus software. The result is video that can be obtained from any source—whether a live camera feed, DVD or VCR—and sent over a network (or LAN). This video can then be decoded by a hardware appliance or Set Top Box and displayed on a television monitor, or it can be decoded through StreamPlayer Plus software and displayed on any PC connected to the same network. The VBrick appliance is based on a modular platform that allows a variety of models consisting of MPEG-2 and MPEG-4 compression algorithms along with optional network interfaces (such as SDI, OC-3 ATM and hard drive for storage). This user guide is intended to cover all models and provide instructions on initial setup and advanced parameter configuration.

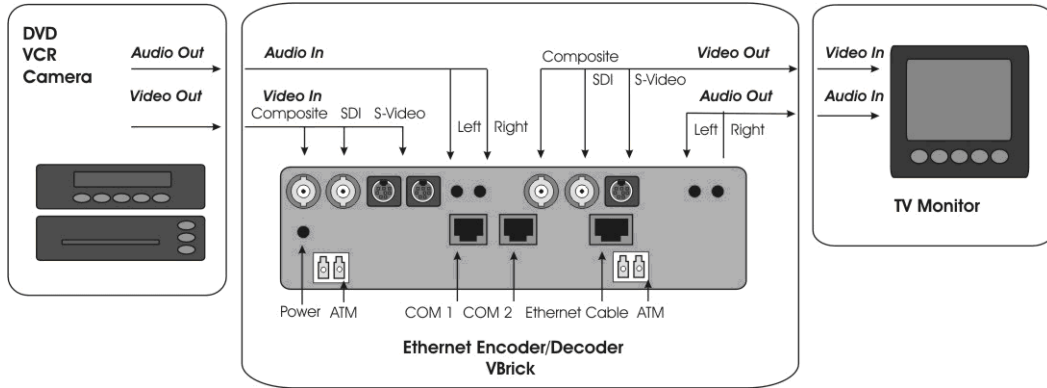
Note The VBrick appliance consists of different hardware models, distinguished by the last digit of the part number -xxx0 or -xxx1/-xxx2 (see [Status: User Information > Main Board](#)). When the part number is -xxx1/-xxx2 there can also be differences based on the PLX EEPROM revision 1 or 2-and-higher (see Status: Encoder Status or Status: Decoder Status). Where differences occur, they are noted in the text.

Quick Start

Connect Cables to the Appliance

1. Unpack the VBrick appliance. Each shipment comes with:
 - VBrick appliance.
 - Power supply.
 - A CD-ROM that contains release notes, the Admin Guide, and sample software applications.
 - A serial port cable and adapter.
 - An IR Remote Control unit.

- A cable and adapter kit, which includes an Ethernet cable.
2. Connect the cables from a VBrick to an audio/video source and destination.
 - a. Using a BNC or S-video cable, connect a video source, such as a video camera, DVD, or VCR output to the Composite, BNC or *optional* SDI Video In connector on the rear of the VBrick (Slot 1). Also connect Left and Right audio from the source to the Left and Right VBrick Audio In connectors.



- b. Connect a video monitor to the Video Out BNC, S-Video or SDI connector on the rear of the VBrick (Slot 2). Make sure the TV monitor is set to video mode. To see if the TV monitor is in the correct mode, you can connect the video source directly to the TV monitor. Also connect the VBrick Left and Right Audio out connectors to the monitor or to amplified external speakers.
- c. Insert Ethernet Cable RJ-45 connector into the Ethernet Port.
- d. Insert the Power Connector into the receptacle on the rear of the VBrick and plug the power supply into a 110/220 VAC power source. Once power is applied to the appliance a self-test will be initiated and the front panel LCD will illuminate.
- e. The green power LED on the VBrick will illuminate, and the LCD display will begin displaying status messages during self-test and boot-up (under a minute).
- f. During a portion of the initial power-on sequence, a color bar test will appear on the monitor. You should see a Solid Network Link Light and flashing Activity Light.

Attach Appliance to the Network

Configuring a Static IP Address

The following steps explain how to connect a VBrick to a network with a static IP address, either using the enclosed IR Remote Control device or a PC connected to the VBrick via a serial connection and HyperTerminal.

Using the IR Remote Control Unit to Configure IP Address

Note Use the * button for the decimal point and the left/right buttons to erase. Aim the remote at the Front Panel IR Port and press "Local Edit" on the remote control.

- ▼ To configure an IP address with the IR remote:
 1. The display on the front of the VBrick will request the password.
 2. Enter the password. The default password is 23646 ("admin" numerically) and **Select**.

3. Press **Select** to bypass an entry or leave it as it is. Entering 9 ("y" numerically) will enable DHCP, 6 ("n" numerically) will Disable DHCP and Select to accept the configuration statement. Disabling will allow for manual setting of the IP Address.

Note: If DHCP is selected the VBrick will search for and attempt to receive its IP Address and Subnet Mask from the DHCP server. If the DHCP server supplies the Gateway Address or DNS server address, these parameters will replace the user entered Gateway and DNS settings. If the DHCP server does not provide Gateway information, and if a Gateway is required for your network, it will be necessary to manually enter a Gateway IP address.

A message on the LCD will indicate the appliance is searching for the server. If no server is located the search will timeout after approximately two minutes. The unit will not be accessible until the search either completes or times out. If a DHCP server is not located, the unit will come up in Limited Run mode with the IP address of 172.17.5.5. The LCD screen on the front of the VBrick will indicate a DHCP failed message and then read **VBrick Systems** and continue to cycle through screens, one of which is the configured IP Address. If it is necessary to configure a static IP address, it must be performed while the unit is operating in Limited Run mode. During the time the VBrick is searching for DHCP, the appliance can not be accessed.

After 15 minutes, the VBrick will automatically reset and again attempt to acquire an address from the DHCP server. If DHCP is successful, the monitor will display the VBrick logo in the lower right corner, and audio and video will be present.

4. The screen will show an existing IP Address. To configure a new IP address, enter the address using the remote control keypad, replacing the existing digits. Use the * button for the decimal point and the left/right button to erase characters entered in error. Enter **Select** after the address is entered.
5. Enter a subnet mask and enter **Select**.
6. Enter a gateway address (if required) and enter **Select**. The box reboots with IP address, subnet mask, and Gateway configured.
7. Connect the VBrick to another VBrick over the network using an Ethernet switch. For unicast, the destination IP Address of one VBrick should be the IP Address of the other VBrick. Make sure the respective destination and receive ports also match.

Note: It is recommended that the Integrated Web Server (IWS) be used to configure and manage the appliance once the IP Address is established.

Using HyperTerminal to Configure IP Address

- ▼ To configure a static IP address using HyperTerminal:

1. Connect an ASCII terminal (e.g. HyperTerminal, shipped with Windows 95/98/2000/NT/XP) from the RJ-45 serial port (COM2) on the rear of the VBrick to the COM port of the computer or terminal device (usually COM1).
2. From the Windows start menu, go to **Start > Programs > Accessories > Communications > HyperTerminal**.

The port setting is 9600, 8-bit, 1-stop, no parity, flow control = none. The VBrick is a DTE and the provided serial adapter cable and connector provide connectivity from the VBrick COM2 to the PC COM1 or COM2.

3. Press **Enter** to display the Login window.

-
4. The default Login and Password is **admin** (case sensitive). Type **admin** and enter for both Login and Password.
 5. Type **e 2** to become the active Editor. Pressing **?** displays the VBrick menu. Make configuration changes as desired.
 6. Change the IP Address of the device manually so that it will be recognized on the network to which it is connected: If the network is not running DHCP, Type **c nt 3 xxx.xxx.xxx.xxx** where xxx is the IP Address (or use the default).
 7. Enter a subnet mask. For example type **c nt 4 xxx.xxx.xxx.xxx**.
 8. Enter a gateway address if required. For example type **c nt 5 xxx.xxx.xxx.xxx** and **9**. Enter **Apply** to implement these changes and confirm with **y**. The box reboots with IP address, subnet mask, and Gateway configured.
 9. Connect the VBrick to another VBrick over the network using an Ethernet switch. For unicast, the destination IP Address of one VBrick should be the IP Address of the other VBrick. Make sure the respective destination and receive ports also match.

System Updates

VBrick appliances are shipped with PC applications to allow for easy upgrade (All release material should be installed on a PC running Internet Explorer 5.5 or higher and using Service Pack 2 or higher.) Once the release is installed, the upgrade tools become available in the VBrick program group, located under Start > Programs. **The upgrade procedure can be invoked by using either the VBDownload application or the VBDirectory application.** Either application can be used as the starting point for updating the appliance's flash memory. (TCP/IP FTP transport services are used for this.) Using VBDirectory is an easier method as it allows users to choose the appliances by name instead of IP addresses. When VBrick appliances are not accessible to VBDirectory, the VBDownload application must be used. All saved configuration parameters are preserved when you upgrade your VBrick. There is no need to reconfigure the unit after the upgrade other than to take advantage of new features in the release. The upgrade process does require the unit to be reset, so it is important that your configuration be saved prior to the upgrade if you want to preserve the settings.

Part of the process takes place during the first boot after the upgrade of a new release. During this time you must avoid powering off the unit. This process may take 2-15 minutes and may include an automatic reboot of the unit. You can tell that the VBrick is ready for operation when you are able to login via IWS or CLI. VBrick recommends against loading a previous version of code. Some new features can cause problems for old code versions. For example, if DHCP is enabled and you load a previous version of code that does not support DHCP, the VBrick will fail to start and you will need to return the unit to the factory for repair. Before loading a previous version of code, it is highly recommended that all parameters be set to defaults.

Installing a System Update

▼ To upgrade a VBrick appliance:

1. Run the release executable (SetupVB6000_x_x_x.exe) to install the release on your PC. It is recommended that you accept the default destination folder for the release which is Program Files\VBrick\VBrick6000\Download\ReleaseVx_x_x.

2. The setup programs for VBDownload and for VBDirectory will automatically run after the release files have been extracted. Follow the on-screen instructions to complete the installation.
3. For tips on VBDirectory usage, follow Steps 4–6 otherwise go to Step 7.
4. From your Start menu, go to **Programs > VBrick > VBDirectory** to start the management utility. The VBDirectory program should start and open a window, showing all VBrick appliances that are available for upgrade.
5. Select the device to be updated by highlighting the name, and then select the UpGrade button. (If the user name and password are not set properly, a dialog box will appear after this step. Configure the username and password (under the **Edit Username/Password** button) to the appliance's username and password.)
6. The VBDownload application will start after a few moments. If VBDirectory is configured for Manual Download, (default setting under UpGrade preferences) go to Step 9. If set for Automatic Download operation, VBDownload will begin downloading the image to the appliance, automatically. Go to Step 11.
7. From the **Start** menu, go to **Programs > VBrick > VBDownload** to start the download utility.
8. Type in your VBrick's IP address, login name, and password (The default login name is admin and the default password is admin, case sensitive).
9. If you installed the release to the default directory, that directory will be selected automatically. Otherwise, Browse to the directory that contains the unzipped files from the release package.
10. Press **OK** to start the download. Since the default mode of VBDownload is Intelligent the utility will query the VBrick to determine which release components need to be downloaded. Press **OK** to allow VBDownload to upgrade the suggested components.
11. When the download completes, reboot the VBrick using the **Reset Unit** radio button (or the **Reset** button on the IR remote).
12. Please note that part of the upgrade takes place during the first boot after the download, which can cause that boot to take up to 15 minutes. You can tell that the VBrick has completed the upgrade and is ready for operation when you can login via IWS or CLI, or when its name entry re-appears in VBDirectory.

Note To verify the download has successfully installed, check the Release Revision in IWS. Go to **Status > System Information > Release Revision**.

VBSSM

VBrick Security and Surveillance Monitoring devices are video only—no audio. The VBSSM-MP2 (MPEG-2) and VBSSM-MP4 (MPEG-4) encoders are ideal for security and surveillance applications where full motion, high-quality video is required in a cost effective product. The VBSSM is a compact, rugged and reliable video network appliance that supports temperature ranges from -20 to 70°C. The VBSSM encoder accepts NTSC/PAL video, compresses it in realtime and transmits the video digitally over an IP network. The video is then displayed on TV monitors using numerous MPEG decoders, Set Top Boxes or on PCs through desktop decoder software such as VBrick's StreamPlayer. VBSSM devices provide the following features:

- Full motion, high resolution DVD quality video.
- IP Unicast or Multicast for streaming applications.
- Integral web server for configuration and management.
- Low delay encoding for end-to-end camera control - pan, tilt and zoom.
- Utilizes Layer III QoS – Diff Serv for prioritizing video over IP networks.
- Video encoding rates configurable from 8 Kbps to 15 Mbps.
- Transport and Elementary stream support.
- Provides closed captioning with text insertion.
- Optional – video camera with pan, tilt and zoom.
- Optional – 19 in. rack mount adapter (holds two across).

Table 1. VBSSM Models †

Model	Configuration	Description
9170-4200-000x	VBSSM-MP2	Ruggedized single channel MPEG-2 encoder.
9171-4200-000x	VBSSM-MP4	Ruggedized single channel MPEG-4 encoder with audio. Same enclosure as VBSSM-MP2.
9172-4400-000x	VBSSM-MP2/4	MPEG-2 or MPEG-4. This device has a different enclosure with a single video input that supports two channels. It also supports RS-422 passthrough. VBSSM-MP2 does not.
9174-4200-000x	VBSSM-MP4	No audio.
9175-4200-000x	VBSSM-MP4	With audio.

† See [VB6000 VBSSM](#) on page 218 for rear panel drawings.

Streaming Video Basics

Topics in this chapter

[Video](#)

[MPEG-2 Audio](#)

[Network](#)

[Typical Applications](#)

[Accessories](#)

[Serial Port Passthrough](#)

[Billboard](#)

[Picture-in-Picture](#)

[Embedded Web Browser](#)

Video

It is important that the source of the video to be encoded and networked be of the highest possible quality in order to avoid using unnecessary bandwidth to transport source video artifacts, distortion, etc. If using a camera, exercise common sense; good lighting and a steady camera will improve overall performance. Cameras, VCR tape players, DVD players, and live television broadcast feeds from a TV tuner can all be used as video sources. VBrick supports standard video via BNC connectors, or S-Video via mini-DIN connectors. BNC-to-RCA adapters are readily available if RCA type cables are used.

Note Where possible VBrick recommends using S-Video or optional SDI. S-Video output from the VBrick to S-Video Input on the monitor yields the best video quality and the Billboard, Program and Conference Guides will be much clearer.

MPEG-2

MPEG-2 (Moving Picture Experts Group) is a standard method of transmitting digital video and sound in a compressed format that uses less bandwidth than the traditional analog method. MPEG-2 is the de-facto standard in the digital TV world. MPEG-2 gives high resolution, scalability and handling of interlaced video for digital video above approximately 2 Mbps. It allows for an excellent picture and allows multiple channels at various bit rates to be multiplexed into a single data stream. It was officially adopted by ISO and has the catalog number ISO 13818-1.

MPEG-2 Encoder Compression

Understanding I, B, P Frames, Delay, and Synchronization

In compressed video, each frame is compressed using a "lossy" compression scheme that takes advantage of the fact that the human eye does not detect certain types of visual information loss. MPEG compresses files based on I, B, P frames, which contain information from previous pictures and predictions about future pictures in a Group of Pictures (GOP). An **I-Frame** is a full video picture. Because it is likely that a future frame will be similar to a past frame (for example, it is likely that the sky will still be on the top of the frame and that it will still be blue), it is possible to predict portions of a future frame. **P-Frames (Predictive)** reference the nearest previous I-frame. Video data that contains only I and P frames requires less bandwidth than video that contains only I-Frames for comparable quality.

With I-Frames and P-Frames being generated, it is possible to place the P-Frame some number of frames away from its reference I-Frame, and calculate the contents of the frames in between using both the I-Frame and the P-Frame as references. These frames are called **B-Frames** and are bi-directional (i.e. they are based on a predicted future frame and on a past frame). Also note that B-Frames are based only on I-Frames and P-Frames, never on past B-Frames, so errors are not propagated. VBricks can be configured to produce I-Frames only, I and P-Frames only, or I, B and P-Frames. In terms of bandwidth usage, I-Frames use the most, B-Frames require the least. It follows then that I-Frames contain the most information and B-Frames contain the least information.

Group of Pictures (GOP)

The collection of I, B, and P frames makes up a Group of Pictures (GOP). The selection of GOP parameters is a trade-off between bandwidth usage, picture quality, sensitivity to transmission errors, and delay. An extended GOP will be more sensitive to transmission errors than a small GOP because any error can affect the entire GOP. It is possible to configure the GOP several ways, for example, I only, IP, IBP, IBBP, etc.

Reference Distance

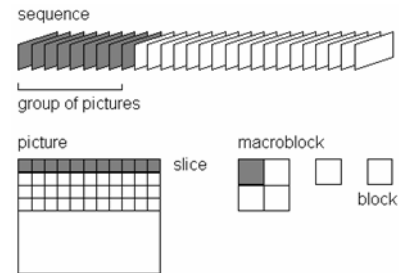
Reference Distance and Intrapicture Distance are set in Configuration: Encoder > Video. The **Reference Distance** defines the number of consecutive B pictures there are between an I or P picture and then next I or P picture:

1. No B picture
2. One B picture between I or P pictures
3. Two B pictures between I or P pictures

The **Intrapicture Distance** can be set between 1 and 19 (default is 15) for MPEG-2. The value refers to the number of P or B frames between I frames and defines the Group of Pictures (GOP).

Interrelationship

Table 1 [Reference Distance Settings](#) illustrates various combinations Reference Distance settings (up to 3) and GOP Length (up to 19). The GOPs are shown in display order. More P and B frames increase the compression ratio; however, B frames increase the overall delay. In



general, it is best to choose the highest compression ratio and then try lower ratios (e.g. lower reference distance) if the video experiences transmission problems.

In operation, a P-Frame will be generated and transmitted before the B-Frame. An MPEG decoder must, therefore, reorder the incoming frame to display the I-B-P frames in the correct order. This is done using "presentation time stamps" created by the MPEG encoding and multiplexing process. This reordering process requires one or more frames be held in the decoder buffer, waiting its turn for display, therefore increasing the delay. At 30 frames per second, each frame requires approximately 33 milliseconds. Synchronized audio is also compressed using MPEG, and is multiplexed with the video to create an MPEG Transport Stream.

Note Operation with the DSL4000 requires B frames for correct audio/video synchronization.

Table 1. Reference Distance Settings

GOP Length (N)	Reference Frame Distance		
	1	2	3
1	†	†	†
2	IP	†	†
3	IPP	IBP	†
4	IPPP	BIBP	IBBP
5	IPPPP	IBPBP	†
6	IPP . . PP	BIBPBP	BBIBBP
7	IPP . . PP	IBP . .BP	IBBPBBP
8	IPP . . PP	BIBP . .BP	†
9	IPP . . PP	IBP . .BP	BBI . .BBP
10	IPP . . PP	BIBP . .BP	IBBP . .BBP
11	IPP . . PP	IBP . .BP	†
12	IPP . . PP	BIBP . .BP	BBI . .BBP
13	IPP . . PP	IBP . .BP	IBBP . .BBP
14	IPP . . PP	BIBP . .BP	†
15	IPP . . PP	IBP . .BP	BBI . .BBP
16	IPP . . PP	BIBP . .BP	IBBP . .BBP
17	IPP . . PP	IBP . .BP	†
18	IPP . . PP	BIBP . .BP	BBI . .BBP
19	IPP . . PP	IBP . .BP	IBBP . .BBP

† Undefined

MPEG-2 Delay

This discussion is relevant only for encoder models ending in -xxx1/-xxx2: Low delay mode is primarily recommended for conferencing applications. Various video artifacts appear when content with rapid scene changes is encoded at low data rates in low delay mode. The reference distance is restricted to 1 (no B frames) in low and medium delay modes. If the Intrapicture distance is set to 1 (all I frames), video disruptions are minimized, but picture quality is degraded. With other GOP settings, picture quality is improved, but video disruption may occur on scene changes. At approximately 6 Megabit video rates and above, video disruption will not occur, depending on content. In low delay mode, delay will be in the range of 180 - 190 milliseconds. Video instability is eliminated at medium and high delay modes regardless of settings. Delay is approximately 350 milliseconds in medium delay mode and 450 milliseconds in high delay mode. Delay is set in the Configuration: Encoder > Transport. The default setting for Delay Mode is set to High.

MPEG-2 Audio

High quality Stereo or Mono audio, fully synchronized with video, may instantly be transported across the network. VBrick supports 44.1 and 48 kHz sample rates, and data rates between 192 and 384 Kbps. If the model number ends in -xxx0, the sampling rate can be 44.1 kHz or 48 kHz. If the model number ends in -xxx1/-xxx2 the sampling frequency is set at 48 kHz. If the model ends in -xxx0, the transmission rate can be 192, 256 and 384 Kbps. If the model ends in -xxx1/-xxx2 the audio bit rate can be 256 or 384 Kbps. Audio input and output is standard line-level, as would be found on a conventional VCR. VBrick offers AudioMate microphone for high quality conference room audio with integral echo cancellation. For video conferencing applications, appropriate audio conference equipment such as amplifiers, microphones, and echo control equipment is required.

MPEG-4

Moving Picture Experts Group MPEG is a standard method of transmitting digital video and sound in a compressed format that uses less bandwidth than the traditional analog method. MPEG-4 Part 2 is widely used for distribution of video in the enterprise, on the Internet, and in mobile applications. VBrick supports a subset of the MPEG-4 Part 2 standard called Simple Profile. Simple Profile offers optimal interoperability with MPEG-4 from multiple vendors. MPEG-4 provides moderate resolution and offers scalability for digital video up to approximately 2 Mbps.

MPEG-4 Encoder Compression

MPEG-4 Part 2 Simple Profile video compression uses many of the same basic compression features as MPEG-2 discussed above. There are several significant differences worth mentioning. This protocol does not support B frames. Although B frames offer some compression benefits, more modern compression schemes such as MPEG-4 gain only marginal benefits from B frames. In addition B frames always add additional latency since reordering is required on transmission. This protocol does not have a fixed GOP structure. I frames are inserted either at a configured rate or when the protocol itself determines that the scene has changed sufficiently such that it is more efficient to insert an I frame.

MPEG-4 Audio

VBrick's MPEG-4 appliances offer AAC-LC compressed audio. This compression algorithm is the industry-standard method for audio to accompany MPEG-4 video streams. VBrick

supports Stereo, Mono, and Dual audio for MPEG-4. Sample rates between 8 kHz and 48 kHz and data rates between 8000 and 320000 bits/sec are supported to allow transmission over a wide variety of media ranging from low-speed Internet delivery to high-speed LANs.

Network

A number of features address video stream handling across networks, including:

- Assigning multicast addresses.
- Host Names.
- Insuring network Quality of Service by controlling the level of priority a service or source receives while traveling through a network (DiffServ).
- The ability to PING other VBricks.
- Video Stream Handling:
 - Accommodating video packets that arrive in an "out of sequence" arrangement (Packet Ordering).
 - Compensating for IP network jitter conditions (Jitter Queue).

Assigning Multicast Addresses

Many factors must be considered when designing a multicast address infrastructure since Ethernet switch implementations can significantly vary between vendors. Furthermore, multicast addressing techniques rely on an Ethernet to IP Address mapping rule, which does not guarantee a unique physical address. In fact, it is possible to create multicast addresses that differ from an IP perspective, but overlap when presented to the Ethernet network. Addresses created in this situation can cause significant network and operational problems.

Specifically, multiple IP Addresses are mapped into the same physical layer address. For example, all IP multicast addresses with the same or differing first octet, and the second octet differing by exactly 128, map to the same physical address (226.5.5.4, 227.5.5.4, and 228.133.5.4 all map to the same physical address).

Another factor to keep in mind when assigning multicast addresses is that 224.x.x.x is a range containing reserved addresses, particularly in the range 224.0.0.x. For example, 224.0.0.1 is the 'all hosts' multicast address and 224.0.0.2 is the 'all routers' reserved address. Other 224.0.0.X numbers are reserved for RIP, OSPF, DVMRP, etc. Here are some recommended rules for multicast IP Address assignment:

1. Do not use 224 in the first octet since many of these are reserved.
2. Use a digit between (225-239) for the first octet and standardize on it for each network.
3. In the second octet, either use numbers from 1-127, or 129-255, do not mix the ranges on a given network.

IP Address Configuration using Host Names

This feature provides VBricks the ability to unicast to one another, recognizing each other by Host Name instead of IP address. This is especially useful when appliances are running DHCP, since IP addresses can change between being rebooted, whereas Host Names remain the same unless manually changed by the user. IP Address configuration using Host Names is also supported in ATM models configured for IP over ATM. The Host Name of each ATM interface is derived in software, by appending -ATMx to the "Ethernet Host Name" of the

appliance, where x is the interface entry number in the ATM table (refer to the Configuration:Network > ATM screen). For example, there might be an ATM interface Host Name that looks like: vbHost-ATM1. This is the Host Name of the first interface in the ATM table in which "vbHost" is the "Ethernet Host Name" of the appliance.

Each IP address that can be configured using Host Names has an **Address Mode** parameter. This configuration parameter allows the user to specify how the address is to be configured: IP Address or Host Name. If **Address Mode** is set to "Host Name", the IP address field becomes a status field and is used to report the IP Address of the configured Host Name. Likewise, if **Address Mode** is set for "IP Address", the Host Name field is used to report the Host Name of the configured IP Address. If the configured IP address is multicast, the Host Name field will be blank. The following rules apply:

- The following addresses can be configured using Host Names:
 - Encoder network destination address
 - Pump network destination address
 - Decoder network receive address
 - Recorder network receive address
 - Passthrough dedicated address
- Multicast addresses cannot be configured using Host Names.
- The **Management SAP Transmit** parameter of the referenced VBrick has to be set to **Enabled** for this feature to work.
- The Host Name feature does not work if the appliance is in edit mode. Please exit Edit mode when finished configuring the appliance.

IP Differentiated Services (Diffserv)

Type of Service settings control the level of priority a service or source receives while traveling through a network. VBrick supports setting the IP TOS (Type of Service) in accordance with RFC-791, RFC-1112 and RFC-2474 (Differentiated Services Field in the IPv4 Header). The user may set the Type of Service field in the IP header to any value, decimal 0 to 255.

111	Network Control
110	Internetwork Control
101	CRITIC/ECP
100	Flash override
011	Flash
010	Immediate
001	Priority
000	Routine
Bit 3	0 = Normal delay 1 = Low delay

Bit 4	0 = Normal throughput 1 = High throughput
Bit 5	0 = Normal reliability 1 = High reliability
Bits 6–7	Reserved for future use.

Example

To set the Type of Service to all 0's enter 0. To set the Type of Service to all 1's, enter 255. IP Differentiated Services redefine how the historical TOS field is used. Diffserv allows IP networks to provide certain Quality of Service features. Note: If uncertain as to whether the network supports TOS or Diffserv, VBrick recommends setting the TOS to the default value of 0.

VBrick Video Stream Handling

Packet Ordering is the process of accommodating video packets that are arranged "out of sequence" when they arrive. This feature optimizes the quality of video in networks that are less stringently engineered. The condition of packets arriving "out of sequence" can occur for several reasons. These might include networks having redundant or overlapping routes, routing table instability problems, local area networks that are not properly switched, or excessive wide area networking (WAN) delays. Through buffering, the VB6000 re-arranges the delivery of packets to the decoder, so they are received as an ordered set. Enabling the Packet Ordering feature adds up to 85 milliseconds of additional delay between the encoded stream and the decoded stream. Packet Ordering can be enabled or disabled in Configuration: Decoder > Network section of IWS.

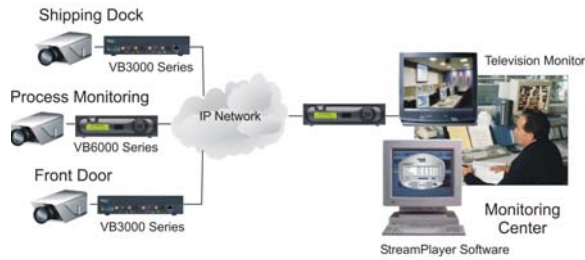
Network Jitter

The Jitter Queue compensates for IP network jitter conditions by imposing a slight delay between the arrival of video packets at the VB6000 and rendering of packets to the decoder. The process of jitter compensation involves the creation of a buffer that temporarily stores all packets before they are presented to the decoder. The Jitter Queue uses elastic storage capability within the buffer, which allows for up to 85 milliseconds of delay variation between video packets. Enabling the Jitter Queue feature adds 85 milliseconds of additional delay between the encoded stream and the decoded stream. The Jitter Queue is enabled or disabled in Configuration: Decoder > Network section of IWS.

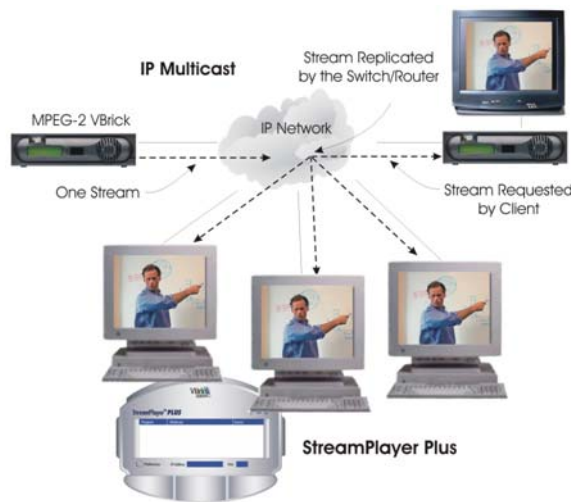
Typical Applications

Ethernet IP

Ethernet VBricks operate over standard 100Base-T Ethernet. Unlike ATM or private T1/E1 networks where QoS (Quality of Service) is assured, it is important that the network is engineered to accommodate the constant payload such that data is delivered between VBricks without delay, and that the load does not degrade network performance. In general, operating over Ethernet Switches that are not oversubscribed provides adequate bandwidth and QoS. For streaming video (e.g. one-way "broadcast") applications, latency in the network is much less of an issue than for two-way full duplex conference applications.



VBricks send and receive MPEG video via UDP/IP at 1 to 15 Mbps (plus audio and overhead). Assuming each VBrick is on a separate 100Base-T segment, less than 10% of the segment's capacity can be used. Video can be transmitted point-to-point between VBricks for two-way conferencing or video can, using IP multicast, be broadcast to an unlimited number of TV's connected to VBricks; and to an unlimited number of PC's that are using the VBrick StreamPlayer or StreamPlayer Plus software. Note: the network must be IP Multicast capable for multicast streaming applications.

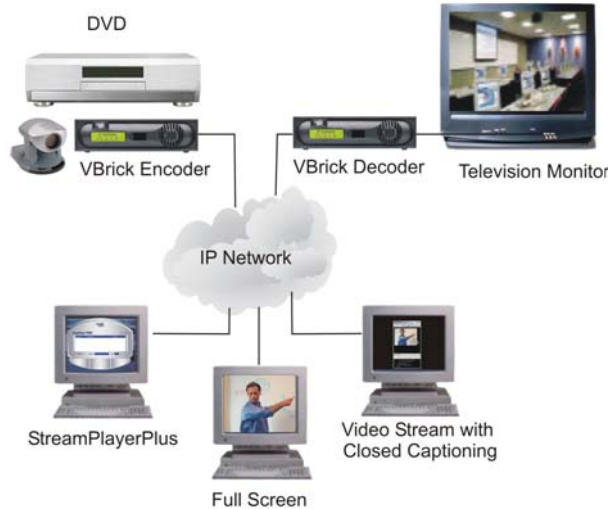


One-Way Broadcast and Desktop Streaming

VBrick 4xxx and 62xx models provide a powerful streaming broadcast and desktop streaming solution. Each VBrick is capable of multicasting live video IP streams to an unlimited number of desktop clients in a given network. "Live" VBricks in the network automatically announce a user-definable program name of the video source to all of the VBricks and StreamPlayer or StreamPlayer Plus™ applications that are operational across the network. A VBrick announcement is known as a SAP, or Session Announcement Protocol, as defined by the IETF standard committee and set forth in RFC 2974. The StreamPlayer or StreamPlayer Plus applications allow users to view content using an ordinary PC. Each StreamPlayer or StreamPlayer Plus application identifies the program name by the transmitted SAP, which displays all currently available VBrick video. With StreamPlayer, the user selects a stream for viewing by selecting the transmitted SAP from the VBrick, which identifies the video in the program guide. On a television monitor, a user can select the appropriate VBrick SAP program name through the use of the provided remote control device.

This illustration shows a VBrick in a network multicasting live video traffic to other VBrick appliances as well as to the desktop clients using StreamPlayer or StreamPlayer Plus. The program stream is displayed on the desktop client and the user can view the stream in real

time. This application can be expanded to include previously recorded material such as training tapes and pre-recorded VHS tapes. Since the Session Advertisement Protocol, or SAP, containing the name of each program are small and are only sent periodically, they have practically little or no impact on the network bandwidth.

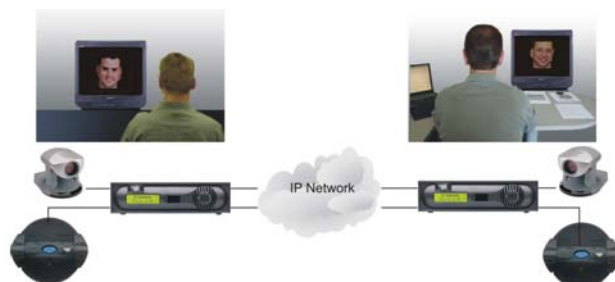


Two-way interactive Conferencing

For two-way interactive conferencing applications, appropriate audio conference equipment such as amplifiers, microphones, and echo control equipment is required. Contact VBrick for accessories. VBrick 6200's enable automatic two-way television via IP unicast. Each VBrick in the network automatically announces its "name" to other VBricks in the network and displays a conference guide on a TV screen. The conference guide indicates who is available for a conference. It is only necessary to select from the list of names to establish a two-way video communications.



These illustrations show how the conference system works. In the example, two VBricks are connected to an IP network, with each VBrick assigned a Calling Name. Each VBrick sends its name, along with IP Address information, onto the network. Each VBrick also receives a list of available names from the network. Using the IR Remote Control, each VBrick can see a list of the available names, plus whether they are free or busy. To place a call, select the party and when the call is answered, a two-way, private, unicast video conference is established.



Because the name advertisements are small and only sent periodically, they have practically no impact on the network. These advertisements are typically sent to a default multicast address, but may be configured to be broadcast or configured to be sent to any valid IP Address. Once the call is established, the calling party may "ring" the other end to get their attention, if desired.

- Several configuration options are available:
- Enable/Disable Conference.
- Enable/Disable Ringer.
- Auto answer – the party receiving the call does not have to answer. The VBrick automatically receives the call and two-way video is instantly available.
- Manual Answer – the party receiving the call must answer it before the call is established.
- How often to advertise the Call Name.
- The address on which to advertise the Call Name.
- Two-way interactive conferencing may be initiated from the IR remote handheld device.

Accessories

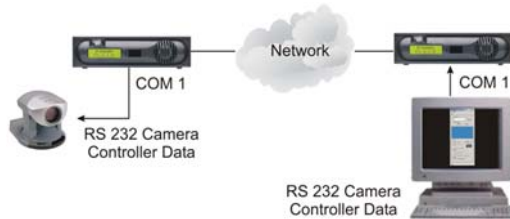
VBrick units have a number of optional hardware accessories, including the AudioMate microphone, remote control devices and cameras. These work directly with VBrick appliances or through the use of ActiveX control software, also available from VBrick. For information about microphones, cameras and other VBrick hardware accessories, please contact VBrick directly. ActiveX controls for cameras and other software accessories are also available from VBrick.

Serial Port Passthrough

When configured properly, VBricks provide full duplex, end-to-end transparent passthrough of user data from one VBrick to another, or to other IP devices. Two serial ports are provided, each independently supporting this feature. COM1 is dedicated to Passthrough. COM2 is normally used for management control, but may be configured to support Passthrough, depending on the VBrick hardware revision. Each serial port operates at its configured baud rate (e.g. 110 to 115.2K bps). See [Configuration: Passthrough](#) on page 66 for configuration details. Some common applications include:

- Remote control of a camera, pan-tilt-zoom.
- Remote control of a security door lock.
- Low speed data transport.
- Data collaboration between PCs.

Note Passthrough mode is used to send control information from one VBrick to another and may not support sustained data at higher data rates.



How Passthrough Works

VBrick appliances are able to receive data on a particular TCP/IP port and transparently output that data to a serial port. Conversely, any data input to a serial port can be passed through to other devices connected to that TCP/IP port. Devices include other VBricks or special applications connected to the appropriate TCP/IP port. This feature is called "Serial Port Passthrough." COM1 is assigned port 4439 while COM2 uses port 4414. A typical application is for two VBricks connected to each other's TCP/IP port 4439. In this case, characters typed into a terminal program attached to one VBrick's serial port appear on a terminal program attached to the other VBrick's serial port. In this case, the TCP/IP network serves as an intermediary between the serial ports of two VBrick appliances.

To enable "Serial Port Passthrough" configuration settings must be selected. First it is necessary to decide if the appliance will be designated as an Initiator or Responder of Passthrough connections. If configured as an Initiator it will continuously attempt to setup a Passthrough connection to other devices. When configured as a Responder it will accept up to 64 connections from Initiator appliances. It is possible to Disable Passthrough Mode, so that the VBrick neither initiates nor responds to Passthrough requests. If a VBrick is set to be an Initiator, a Destination must be selected. The appliance will use the destination information when trying to establish a connection. The destination can be set as one of the following:

- Dedicated
- Remote COM1 using Slot1 Video endpoint
- Remote COM2 using Slot1 Video endpoint
- Remote COM1 using Slot2 Video endpoint
- Remote COM2 using Slot2 Video endpoint.

Dedicated	means that the initiator will attempt to make a Passthrough connection to the Dedicated Address and Port configured by the user. Please note that the Dedicated Address Port configuration parameters are used only when the initiator destination is set to Dedicated. The Dedicated Address can either be configured using IP Address or Host Name. The Dedicated Address Mode parameter is used to specify whether the IP Address or Host Name will be used. If the Dedicated Address Mode is set to Host Name, the Dedicated Address is configured using the Dedicated Host Name parameter. Likewise, if the Dedicated Address Mode is set to IP Address, the Dedicated Address is configured using the Dedicated IP Address parameter.
Slot1 Video Endpoint Slot2 Video Endpoint	use address information that is configured for the device in that slot. If the device in that slot is an encoder, the initiator will attempt to establish a Passthrough connection to the unicast Destination IP Address configured as Destination 1 for that slot. Note: Passthrough is supported using Destination 1 only; Destination 2 has no meaning for the Passthrough operation. If the device is a decoder, the initiator will attempt to establish a Passthrough connection with the address configured as the Decoder Receive IP Address and Port. The receive address can be either multicast or unicast.
Remote COM1 Remote COM2	are as implied. This selection determines which serial port will be accessed on the Responder appliance. In "Slot1 or Slot2 Video Endpoint" cases, the Passthrough port for the Remote/ Responder appliance's COM1 port is 4439. Access to the remote appliance's COM2 uses port 4414.

Since the medium used for setting up Passthrough connections is a generic TCP/IP port, any IP device that is prepared to connect to a VBrick's port can be considered as a Passthrough Initiator. The VBrick Responder appliance will not know the exact nature of the device at the other end of the port. For example, a generic Telnet client configured to connect to a VBrick on port 4439 will cause a VBrick "Responder" to start sending data from it's serial port, using the connection it accepted from the Telnet client.

If the appliance is configured as an "Initiator" and the Responder appliance has Passthrough disabled or is not on the network it will continue to try to establish a connection. A VBrick appliance must be configured as a Responder to accept Passthrough connections initiated by other devices. In addition to the Initiator versus Responder selection, the serial port operation settings must be entered to establish a connection, baud rate, stop bits etc.

Note Once a Passthrough connection is established between VBricks the actual flow of data is symmetric between the ends of the connection. That is, the behavior of the serial ports with respect to typed characters will appear to be the same at both ends, Initiator and Responder.

Serial Port Passthrough: Telnet Feature

As mentioned in the previous section, either serial port can be accessed over Ethernet via a Telnet client. A VBrick appliance configured as a Passthrough Responder will accept a connection request to TCP ports 4439 (COM1) and 4414 (COM2). The request can come from a Telnet client or other PC application. Any data sent by the PC to TCP ports 4439 and 4414 will be delivered out of the VBrick serial ports and any data present on the VBrick serial port will be sent to the connected PC.



If multiple Telnet sessions are active on one VBrick (each VBrick supports up to 64 sessions), the data from the VBrick will be sent to all connected PC's, and the data received by the VBrick from the PC's will be delivered on the serial port. If multiple Telnet sessions are active and each is sending data to the VBrick, the data delivered by the RS-232 port will be a mix of characters presented in the order they were received (e.g. the data from all the senders is bridged together). This feature provides a method to broadcast alarm status or other information to multiple locations.

Billboard

The Billboard feature allows you to display text and/or graphics on a TV monitor. The displayed billboard can span multiple pages with each page displayed for a specified period of time. Some uses of the billboard feature are to announce a daily calendar of events, directions to a particular conference room or even a slide presentation in conjunction with displayed video. VBrick models 62xx, 52xx and 53xx have a built in mini-browsers that support viewing limited HTML pages. The pages can either be kept inside the VBrick as part of the file system, or can be located on a remote HTTP server. Each page of the billboard is laid out as an HTML page with text and graphics created using the HTML tags supported. If billboard is to be supported on a remote server, the appliance requires read access to the HTTP server and may need to be configured. See [Configuration: Billboard](#) on page 44 for configuration details.

Picture-in-Picture

(PIP) VBrick Decoder Picture-in-picture (PIP) is a video display mode in which a small video image is superimposed on a quadrant or smaller area of a video screen. This small image or window can be opened in order to display a second video input source on a monitor. The MPEG-2 decoder provides picture-in-picture capability, which allows the input from the local encoder to be displayed on the local decoder's output. This is a useful capability when using the appliances in video-conferencing mode by allowing the near-end user to view him/herself in a small window while simultaneously viewing the far end. *Note that PIP can only be used to*

display local encoder input and is available for encoder/decoder models only. PIP does not operate when closed captioning is enabled.

Note If closed captioning is enabled while PIP is enabled, closed captioning will not be displayed on the monitor until PIP is disabled.

Embedded Web Browser

VBrick appliances have an embedded Web Browser that allows users to display HTML pages on the decoder's output (i.e.: a monitor). This is a powerful tool that can be used for data collaboration across a network during video conferences. The web browser is a great tool for allowing data collaboration between remote sites. Benefits and features include:

- It allows for exchange of .jpg, and .gif images and .html pages.
- Images or pages can reside inside the box (in flash memory) or on an external web server.
- It can be turned ON or OFF through "Billboard" key in both the IWS and on the remote control.
- It operates with VBrick's SCAT program, allowing instant capture of Windows desktops and transferring that image to a VBrick (or to any Web server).

Example 1

An HTML page and graphic image resides in flash. This is by default and when shipped from the factory an HTML page example is loaded into flash memory. It will display several .JPG images automatically when the billboard is turned On. There are 4 HTML pages with each having a JPG image inside of it. HTML page 1 points to page 2, page 2 points to page 3, etc. This is how the "page flipping" effect is created. The URL to enter that will make this happen is:

`-File:///./BB01/VB_1.HTM`

Example 2

An HTML page or image can reside on a PC. Your PC must be set up as a Web Server! This is actually easier than you think since Microsoft provides a PWS (Personal Web Server) application that takes 5 minutes to install. Once installed you can place either an HTML page or image (JPG, BMP, GIF, etc) into the web server directory (wwwroot) on the PC and point the MPEG-2 browser to it. An example of a URL is that makes this happen is:

`-http://172.16.3.148/image.jpg (example, use your own IP Address)`

Example 3

An HTML page can reside on the WWW. You must enter a Gateway IP Address, primary server IP Address and default domain extension in the Configuration: Network page on the IWS. Note that many WWW HTML pages use java that the VBrick browser does not understand. In this case the billboard will display an error message and may (or may not) display some of the HTML page. Examples of URL's that make this happen are:

`http://www.VBrick.com` or `http://www.yahoo.com`

`http://www.VBrick.com` or `/billboard/navigation.htm`

VBrick Management Tools

Topics in this chapter

[Overview](#)

[Using the IR Remote Control](#)

[Front Panel Edit with the IR Remote](#)

[Using IWS](#)

Overview

The Integrated Web Server (IWS) configuration tool is an intuitive GUI based management tool and VBrick recommends that it be used as the primary means of managing VBrick appliances.

- ▼ Use one of the following methods to manage a VBrick:
 1. The IWS Integrated Web Server allows quick and secure control through the VBrick's IP interface. See [Using IWS](#) on page 29.
 2. Front Panel Editing with the use of the IR remote control device. See [Front Panel Editing with the IR Remote Control](#) on page 22.
 3. CLI Command Line Interface management through the VBrick's COM2 serial port. See [Command Line](#) on page 211.
 4. CLI Command Line Interface through Telnet. See [Connecting with Telnet](#) on page 212.
 5. SNMP commands through VBrick's IP interface, including SNMP Traps.
 6. VBSDK. VBrick provides an SDK that lets third-part developers build custom applications to manage VBricks using HTML or compiled applications. See the *VBrick SDK User Guide* for detailed information.
 7. VBDirectory. VB6000 software (Release 2.0 and higher) ships with VBDirectory, an application that facilitates finding and accessing all VBricks on a network. A major feature of this application is that it acts as a user-friendly front-end for IWS. For more information, see the *VBDirectory User Guide*.

Note There is only one active editing session allowed at any time in a single appliance. In IWS it is possible to exit a session which still in Edit mode. Other users then must determine whether or not to log off the previous editor. For that reason, it is recommended that all editing sessions be ended directly. Telnet, CLI and SNMP log the Editor off when the program is exited.

Integrated Web Server

The main card has an embedded Web Server that allows the user to manage VBricks by configuring appliances from an external browser. This allows network managers to remotely

configure and monitor the appliances from virtually anywhere in the world. Currently, only Microsoft Internet Explorer is supported and other browsers may not give acceptable results. Netscape is not actively supported though many of the features may work. VBrick Systems recommends using Internet Explorer 5.5, Service Pack 2 or better. The user connects to IWS by pointing to the IP Address (e.g. <http://172.17.5.5>.) of the VBrick appliance and logging in. IWS is one of several ways a user can manage the VBrick appliance; however it is the intuitive and easiest to use. IWS Menus and parameters are described in [Using IWS](#) on page 29.

Front Panel Editing with the IR Remote Control

The Front Panel Edit feature allows you to use the remote control and the front panel display to change the following parameters: DHCP Enable/Disable, Codec IP, Subnet Mask, Gateway IP, Receive IP, Receive Port, Destination IP, Destination Port and Show/Hide the IP Address. This is the easiest way to get a VBrick parameters up and running on a network. See [Front Panel Edit with the IR Remote](#) on page 27 for details.

VBDirectory

VBrick provides a management application called VBDirectory that provides quick reference and access to all VBrick Appliances on a network. VBDirectory is installed with each new software release and is also available as a free download from the [VBrick](#) website. To access VBDirectory, go to **Start > Programs > VBrick > VBDirectory**. This directory tool will identify VBricks on the network running code 2.0.0 and higher. It is not backwards compatible with previous versions of code. For more information about this tool, please refer to the *VBDirectory User Guide*.

Command Line Interface (CLI)

The VBrick appliance can be configured using a standard ASCII terminal or terminal emulator program connected to the serial port (COM 2) on the rear of the appliance. Simple English commands configure all functions and features. Each command that can be found in the IWS is also present in the CLI, however the IWS is recommended for ease of management. Both the Telnet and HyperTerminal interfaces are referred to as CLI or Command Line Interface. For more information see [Command Line](#) on page 211.

Telnet

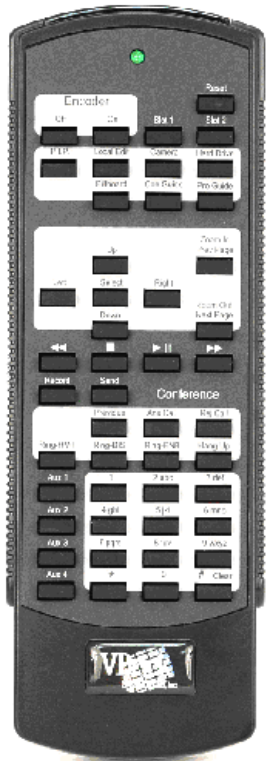
Ethernet VBricks can be managed remotely via industry-standard Telnet. The same suites of menus that are displayed on a local terminal are instantly available over an IP network. VBrick uses the standard Telnet port (23). Telnet uses the same commands as Command Line Interface (CLI). Both the Telnet and HyperTerminal interfaces are referred to as CLI or Command Line Interface. For more information see [Command Line](#) on page 211.

Simple Network Management Protocol (SNMP)

The VBrick appliance can also be configured and managed through its MIB, which is provided on request. Various SNMP management tools are available to issue SNMP based commands to the appliance. The command structure is similar to CLI and Telnet. It is necessary to become the active editor and apply the changes before they take effect in the appliance. Note that the SNMP community strings are the usernames.

Using the IR Remote Control

VBrick appliances support features provided through an optional hand held IR (infrared) remote control. The IR remote enables users to access VBrick appliance functions and control functions with simple program commands. Front Panel Edit options are model dependent. For example, a dual encoder will allow editing of two destination IP Addresses and ports. The IR remote control has limited functionality. If enabled, you can use the IR remote control to set the IP address and perform certain other functions. Use the * button for the decimal point and the **Left** and **Right** buttons to erase entries. Aim the remote at the sensor on the front panel IR Port of the encoder. To enable or disable the IR remote, go to Configuration: System > General > IR Enable. The remote is enabled by default.








- Reset – Reset the VBrick. The appliance will reboot.
- Encoder Off/On – Turns the encoder off for privacy.
- Slot 1, Slot 2 – Selects which slot is to be controlled via the remote. This is relevant for dual encoder and dual decoder models only.
- PIP – Turns PIP Off/On. This is relevant for encoder/decoder models only.
- Local Edit – Used for Front Panel Edit.
- Camera – Used for Camera control, when applicable. Not supported in current release.
- Hard Drive – Displays the "Play" guide.
- Billboard – Displays the Billboard.
- Con Guide – Displays the Conference Guide.
- Pro Guide – Displays the Program Guide.
- Up – Function Dependent.
- Down – Function Dependent.
- Left – Function Dependent.
- Right – Function Dependent.
- Select – Function Dependent.
- Zoom In / Prev Page – Function Dependent.
- Zoom Out / Next Page – Function Dependent.
- <<, n, > ||, >> – Rewind, fast Forward, etc.
- Record – Starts recording to the hard drive. Screen indication is a red record icon.
- Send – Initiates an FTP transfer to a pre-configured destination.
- Conference
- Previous – Toggle to previous call.
- Ans Call – Answer a call.
- Rej Call – Reject a call.
- Ring RMT – Ring the remote.
- Ring DIS – Disable local ringer.
- Ring ENB – Enable local ringer.
- Hang Up – Disconnect a conference.
- Aux 1 – 4 Unused.

Controlling VBrick Features


When the VBrick is operational, you can use the IR Remote to control certain VBrick features such as VBStar Record, Picture in Picture, the Billboard, the Conference Guide, and the Program Guide. There are five icons in use that appear on the monitor display on the screen with Billboard, Conference Guide, and Program Guide.

Table 1. VBrick Icons

Icon	Description
	Handcuffs – Indicates that there is a user in Edit mode.
	Smiley face – Waiting for display.
	Traffic Light – Too much activity. Pause and try again
	Red Circle – Record.
	Yellow Square– Stop.


Picture In Picture

PIP can be turned on and off on the Configuration: Decoder > Picture in Picture page in IWS.

	<p>PIP – Displays Picture-in-picture. Toggles between display off and on. When the PIP is on the screen and neither the Program Guide, Conference Guide, or Front Panel Edit Functions are in use, the following function dependent keys are enabled on the IR remote control:</p> <ul style="list-style-type: none"> • Up – PIP to upper left corner • Down – PIP to lower right corner • Left – PIP to lower left corner • Right – PIP to upper right corner • Select – PIP to center Conferencing
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Billboard

Billboard can be enabled or disabled through IWS (Configuration: Billboard). For information on how to create and use Billboard pages, see [Creating a Billboard](#) on page 46

	<p>Billboard – Display listing of .htm "billboard" pages available in the VBrick appliance. Files must be FTPed to the correct folder in order to be seen. Pressing Billboard again toggles to start/stop display.</p>
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Conference Guide

The IR remote control of Conferencing can be enabled or disabled on the Configuration: Conferencing > Conferencing Setup page in IWS.



Conference – Lists the VBricks set up to receive video conferencing. Pressing Conference Guide again toggles to start/stop display. There are two modes for Conference Guide. The first brings up a list of users on the monitor. The following actions are possible in that mode:

- Up – Scroll up through the selections.
- Down – Scroll down through the selections.
- Prev Page – Page up.
- Next Page – Page down.
- Select – Attempt to connect to the highlighted user.

Once a connection is made, the second mode makes the following selections possible:

- Previous – Toggle to previous call.
- Ans Call – Answer a call.
- Reject Call – Reject a call.
- Ring Rmt – Ring the remote.
- Ring-DIS – Disable local ringer.
- Ring-ENB – Enable local ringer.
- Hang Up – Disconnects a conference.

Program Guide



Pro Guide – Lists all programs emitting Program Guide advertisements and currently available on the network. Pressing Pro Guide again toggles to start/stop display.

Pro Guide + Select – Chooses the program to play. Pressing Pro Guide again toggles to start and stop the display.

- Selecting Pro Guide allows you to make the following selections. Once you have made a selection, depressing the Program Guide button removes the menu from the screen.
- Up – Scroll up through the selections.
- Down – Scroll down through the selections.
- Select – Plays the selected program.
- Left – Plays the previous program selection in the Program Guide list.
- Right – Plays the next program selection in the Program Guide list.
- Prev Page – Page up.
- Next Page – Page down.
- Record – Selects Record Guide.

Controlling a VBStar

The following functions are available using the handheld IR Remote Control when you have an MPEG-2 VBStar with a decoder:

Table 2. Using the IR Remote *with* a VBStar Decoder

Button	Description
Record	Press the Record button to start recording the stream that is currently playing on the TV. Press the Record button again to stop recording.
Send	Press the Send button to start an FTP transfer of the last recorded file.
Hard Drive	Press the Hard Drive button to access the Play Guide. The Play Guide shows a list of files available on the VBStar for playback. When the Play Guide is displayed the following buttons are available: <ul style="list-style-type: none">• Select – Start local TV playback of the highlighted file or move to the highlighted directory.• Up – Scroll up through the selections.• Down – Scroll down through the selections.• Prev Page – Scroll up one page.• Next Page – Scroll down one page.• Hard Drive – Press the Hard Drive button to hide the Play Guide.
Pro Guide + Record	Press the Pro Guide Button to access the Program Guide. When the Program Guide is displayed press the Record button to access the Record Guide. The Record Guide lists all programs emitting program guide advertisements that are available on the network. When the Record Guide is displayed the following buttons are available: <ul style="list-style-type: none">• Select – Start a dedicated record of the highlighted program. (The program playing on the TV is not affected.)• Up – Scroll up through the selections.• Down – Scroll down through the selections.• Prev Page – Scroll up one page.• Next Page – Scroll down one page.• Record – Press the Record button to hide the Record Guide.
Hard Drive + Send	Press the Hard Drive button to access the Play Guide. When the Play Guide is displayed press the Send button to access the FTP Guide. The FTP Guide shows a list of files available on the VBStar for FTP. When the FTP Guide is displayed the following buttons are available: <ul style="list-style-type: none">• Select – Start an FTP transfer of the highlighted file or move to the highlighted directory or choose FTP servers.• Up – Scroll up through the selections• Down – Scroll down through the selections• Prev Page – Scroll up one page• Next Page – Scroll down one page• Send – Press the Send button to hide the FTP Guide.

The following IR functions are available on an MPEG-2 VBStar model without a decoder:

Table 3. Using the IR Remote *without* a VBStar Decoder

Button	Description
Record	Press the Record button to start recording. The recorder must have been preconfigured with an address and port. Press the Record button again to stop recording.
Send	Press the Send button to start an FTP transfer of the last recorded file.

Front Panel Edit with the IR Remote

The Front Panel is the LCD display on the front of the unit. Front Panel Edit is generally used by a system administrator during initial installation. Certain keys (see below) on the IR remote control can be used to set configuration parameters. Front Panel Edit may be invoked by pressing **Local Edit** key on the remote control. The default password is **23646** (which is admin, numerically). Press the **Select** key to enter. IR remote control of Local Edit is set in IWS under Configuration: System > General > IR Enable. Entering the operator password (default = **operator**) will not allow changing the IP Address, Subnet Mask, or Gateway IP. Entering the administrator password (default = **admin**) allows changing all of the configurable parameters.

Table 4. Front Panel Edit Keys

Key	Description
Up	Terminate String from Cursor
#	Terminate String From Cursor.
*	Period (.) used in IP Addresses.
Down	Back Space.
Left	Shift Cursor to the left.
Right	Shift Cursor to the right.
Select	Change current setting and continue to next setting.
Next Page	Don't Change current setting and continue to next setting.
Numbers	Numbers for editing.
Letters	Letters for password and for responses. "6" corresponds to "n" for a no response, "9" corresponds to "y" for a yes response.

Table 5. Front Panel Error Codes

Error Message	Description
Edit in Progress	Edit session in progress; Sign off any SNMP/CLI/IWS edit sessions.
Syntax Err 1	Syntax Error.
Syntax Err 2	Syntax Error.

Error Message	Description
Out of Range	Value out of range.
Invalid Gateway	Invalid Gateway Address or conflict with Gateway Address.
Invalid IP16	Attempt to enter IP with host ID equal to 0.
Invalid IP17	Attempt to enter broadcast address as IP.
Invalid IP37	IP Address conflicts with ATM address.
Used Port	Port in use.
Assigned Port	Port has been assigned.
Invalid Mask23	Subnet mask makes IP Address a broadcast address.
Invalid Mask24	Subnet mask makes Gateway Address a broadcast address.
Invalid Mask25	Subnet mask makes Gateway Address invalid.
Other Errors	Retry Later. If error persists, contact VBrick Support Services.

Note that the options in the following table vary depending on the VBrick model.

Table 6. Front Panel Dialog Windows

Dialog Window	Description
Password	At this screen use the letter keys to enter in the current password followed by the select key. Entering the operator password will not allow you to change the IP Address, Subnet Mask, or Gateway IP. Entering the case sensitive administrator password (admin) allows you to change all of the configurable parameters.
DHCP	Enable/Disable. If you enable DHCP (Dynamic Host Configuration Protocol) the VBrick will reboot and attempt to obtain a dynamic IP Address (6 = no, disable; 9 = yes, enable).
Box IP Addr	This screen will display the current IP Address of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key.
Subnet Mask	This screen will display the current Subnet Mask of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key.
Gateway	This screen will display the current Gateway of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key. If the Box IP, Subnet Mask or Gateway IP has been modified and there are no errors reported on the front panel, the VBrick will now reboot.

Dialog Window	Description
Slot x Dest IP	This screen will display the current Destination IP Address for slot x of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key.
Slot x Dest Port	This screen will display the current Destination Port for slot x of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key. If the Destination IP or Destination Port has been modified and there are no errors reported on the front panel, the VBrick is now using the new settings.
Slot x Rcv IP Addr Screen	This screen will display the current Receive IP Address for slot x of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key.
Slot x Rcv Port Screen	This screen will display the current Receive Port for slot x of the VBrick. If the current setting does not need to be modified press the select key. Otherwise enter in the correct value followed by the select key. If the Receive IP or Receive Port has been modified and there are no errors reported on the front panel, the VBrick is now using the new settings.
Show BoxIP	This will allow the enabling or disabling of the scrolling IP Address on the Front Panel Display of the VBrick appliance for security (6 = no, 9 = yes).

Using IWS

The VBrick WM Appliance has an Integrated Web Server (referred to throughout this document as IWS) that lets you manage VBrick configuration from an external browser. This allows network managers to remotely configure and monitor the appliances from virtually anywhere in the world. Currently, only Microsoft Internet Explorer is supported; other browsers (for example Netscape) may not give acceptable results. VBrick recommends using Internet Explorer 5.5, Service Pack 2 or better. You connect to IWS by pointing to the IP Address (for example: <http://192.168.5.5>.) of the VBrick appliance and logging in. (Note that passwords passed between client and server are encrypted.) IWS is one of several ways you can manage the VBrick encoder (you can also use the Command Line Interface) but it is the most intuitive and easiest to use. You can use VBDirectory to start IWS without having to remember VBrick IP addresses.

Note To login to a VB6000 Series VBrick with a browser, you must have Session Cookies and Active Scripting enabled. Depending on your browser version, these settings are in the **Security** or **Privacy** tabs in Internet Options. If either option is disabled, a correct username and password will refresh the screen without login. If Active Scripting cannot be enabled, check with your system administrator to see if it was disabled at the server level. To avoid having the IWS window closed when accessing a different VBrick, go to Tools > Internet Options > Advanced and *uncheck* the **Reuse windows for launching shortcuts** check box.



Figure 1. Login Page

▼ To login to IWS:

1. Enter the IP address of the VBrick in the address bar.
2. Login to IWS with a username and password, then click the **Log In** button. (Note that Usernames and Passwords are case sensitive).⁴

Table 7. Levels of Authority

User Level	Default User Name	Default Password	Privileges
Administrator	admin	admin	Read, diagnostics, edit, change passwords.
Operator	operator	operator	Read, diagnostics, edit.
Diagnostics	diagnostics	diagnostics	Read, diagnostics.
Public	public	public	Read.

Welcome Screen

A successful Login displays the Welcome screen shown below which indicates the login name and the appliance IP address.



Figure 2. Welcome Page

Menu Options

The basic menu options are shown below. The top menu bar is available at all times. The left column contains configuration options. Configuration Options affect selection of individual pages. *Different configurations appear depending on how the appliance is configured.* Selections are hardware dependent. For instance, dual decoders do not have an encoder selection. ATM, SDI and MPEG-4 equipped units have some differences for encoders, decoders, or both. Network Appliances may be configured with a single encoder or with dual encoders. Consequently the screens you see in IWS will vary depending on whether the encoder has one or two slots. A appliance includes Configuration options unique to the hard drive, including Pump, Recorder and FTP options. It also contains different Status pages and Diagnostic settings. In addition, configuration options are network dependent. Network Configuration selections are different when configured for an ATM or Ethernet Network.

Option	Description
Configuration	Used to configure all appliance settings.
Status	Used to monitor status of main board and the encoder.
Diagnostic	Used to troubleshoot appliances.
Maintenance	Used for providing overall appliance information, managing usernames and passwords, and reading or writing configuration files from or to the VBrick appliance.

Option	Description
Help	Provides on-line help. Internet access is necessary to use this function.
Home	Hot button to return to Home page.
Logout	Logs you out of the system.

Making Changes

In order to change configuration settings in the VBrick encoder, you must log in so that multiple users cannot change parameters simultaneously. By clicking on the button labeled **Begin Edit**, you become the editor and the message Edit Session In Progress is displayed on the front panel of the appliance. *Only one user may be in Edit mode at any time.* Any user may end the editing session of any other user using IWS or CLI, regardless of login level—admin or operator. As a best practice, you should click **Begin Edit**, make changes and then **Save Config** and **End Edit** so as not to interfere with other users.

Note All configuration screens have a **View** mode and an **Edit Mode**. All screens in this document are shown in **Edit Mode**, that is *after* you click **Begin Edit**.

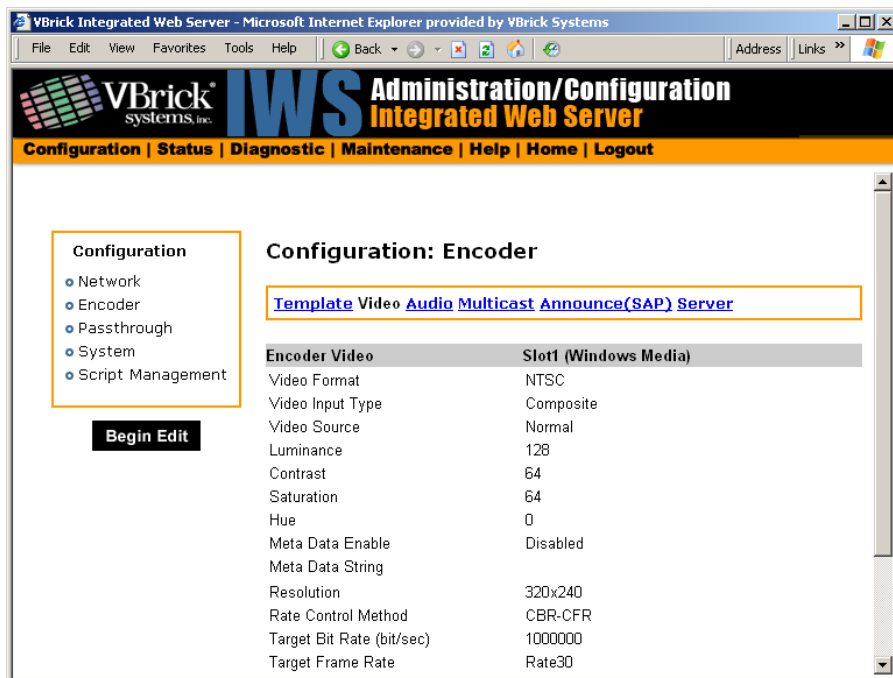


Figure 3. View Mode

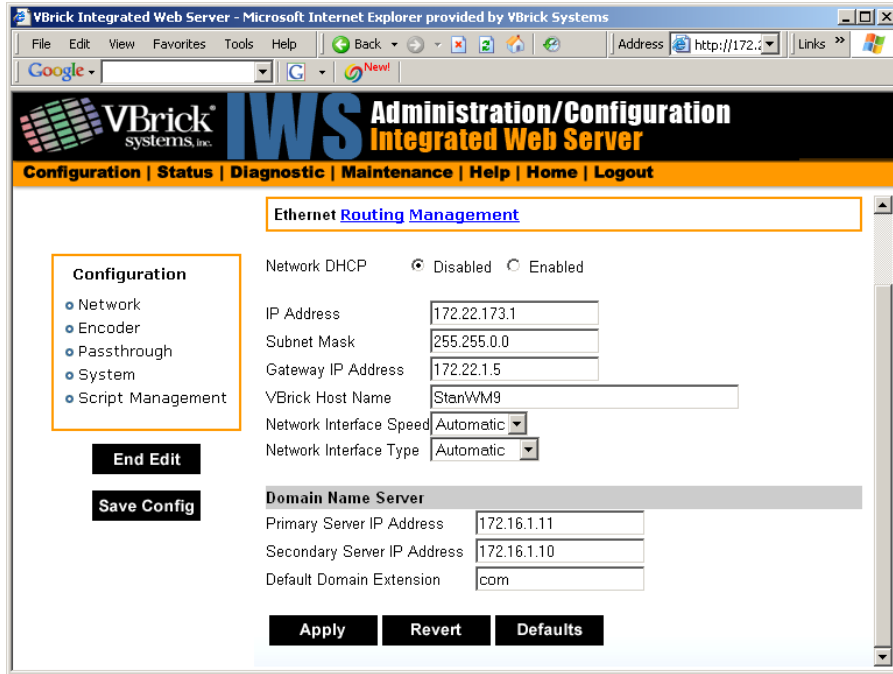
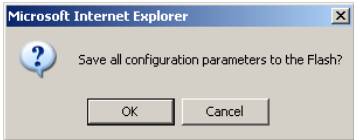


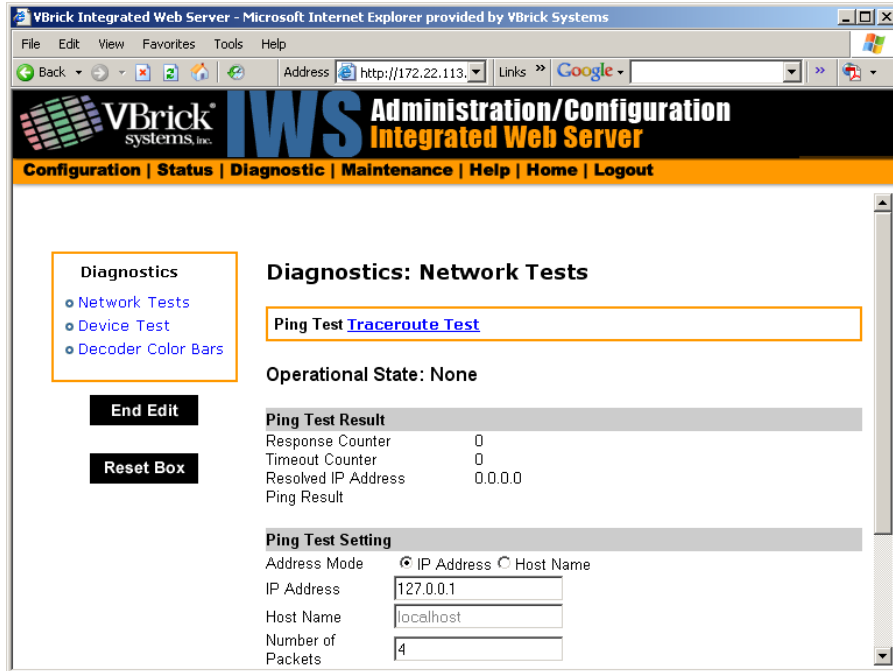
Figure 4. Edit Mode

End Edit	Ends the editing session and displays View mode.
Save Config	 <p>Writes all applied changes to flash memory. If you do not click Save Config after editing, any changes you made are lost if the appliance loses power or is reset.</p>

If the browser is closed after entering the Edit Mode, Editing will not be ended. Therefore, a second user can't know if the first user has simply forgotten to log off or is still engaged in editing. After an hour of inactivity, Edit Mode times out, whether the browser is open on the desktop or closed without ending the Edit session. In IWS, the **Logout** button on the right side of the menu bar ends editing and logs you out of the application.

Rebooting

- ▼ To to reset the VBrick appliance do one of the following:
 1. Power the VBrick appliance up and down by removing and reinserting the power cord.
 2. Press the **Reset Box** button on the Integrated Web Server in any of the selections under **Diagnostic**. This button is only available while in the **Edit** mode.



3. Use the **Reset** button on the optional IR remote control device if the IR feature has been enabled in the Configuration: System section of IWS.

Logout

Pressing **Logout** on the navigation bar exits from IWS and ends any editing sessions. If you have purchased a VBStar appliance, the link to view the hard drive content from the Integrated Web Server launches an additional Internet Explorer window. After logging out of the IWS, it is a good idea to close all Internet Explorer windows and exit Internet Explorer.

MPEG-2 Configuration

Topics in this chapter

[MPEG-2 Overview](#)

[Configuration: Network](#)

[Configuration: Billboard](#)

[Configuration: Decoder](#)

[Configuration: Encoder](#)

[Configuration: Pump](#)

[Configuration: Recorder](#)

[Configuration: FTP File Transfer](#)

[Configuration: Conferencing](#)

[Configuration: Passthrough](#)

[Configuration: System](#)

[Configuration: Video On Demand](#)

[Configuration: Script Management](#)

MPEG-2 Overview

The basic VBrick MPEG-2 appliance consists of one or more of the following components. Note that the screens you see in IWS will vary depending on the model and how the appliance is configured.

1. A main controller card with the following:
 - 10/100Base-T Ethernet network interface.
 - Two slots for encoder and/or decoder boards.
 - One slot for an ATM interface card. An ATM OC-3C interface adapter module allows the transport of audio/video streams ATM-based networks.
2. Optional Interfaces:
 - MPEG-2 encoder.
 - SDI Serial Digital interface for encoders and decoders.
 - Text insertion module.
 - MPEG-4 encoder.
 - MPEG-4 decoder.
 - VBStar which includes a hard drive and FTP.

Note VBrick appliances have a number of optional hardware accessories, including the AudioMate microphone, Remote Control, and Cameras. These work directly with VBrick appliances or through the use of ActiveX control software, also available from VBrick.

Table 1. IWS Configurable Options

Option	Applicable Model
Network	All VBrick models. <ul style="list-style-type: none"> Ethernet. ATM (see ATM Configuration).
Billboard	Only on models which have decoders.
Decoder	Single or dual: <ul style="list-style-type: none"> Ethernet MPEG-2. Ethernet MPEG-4. ATM MPEG-2 (see ATM Configuration). SDI MPEG-2 (see SDI Configuration).
Encoder	Single or dual: <ul style="list-style-type: none"> Ethernet MPEG-2. Ethernet MPEG-4 (see MPEG-4 Configuration). ATM MPEG-2 (see ATM Configuration). SDI MPEG-2 (see SDI Configuration). Text insertion.
Pump	VBStar models only (see VBStar).
Recorder	VBStar models only (see VBStar).
FTP File Transfer	VBStar models only (see VBStar).
Conferencing	Encoder and decoder combination models only.
Passthrough	All VBrick models.
System	All VBrick models.
Video on Demand	Decoder models only.
Script Management	All VBrick models.

Optimizing MPEG-2 Performance

VBrick appliances are designed to accommodate a variety of configurations. Options such as Hard Disk record and playback, FTP file serving capability and ATM networking are fully meshed together, supporting a diverse set of applications. VBrick unit's configuration choices enable the widest range of features and capabilities and are designed to provide the user with a high degree of flexibility. In some extreme cases, users can create configurations that exceed the normal processing capacity of the unit causing it to not perform optimally. VBrick units provide statistical counters and status variables indicating current device utilization and can even be configured to report SNMP trap alarm conditions when these situations occur.

Corrective action usually involves the reduction of a video rate or disabling a channel, easily performed via the IWS or CLI user interface. Under abnormal operating conditions, VBrick units provide total system protection against any integral damage and guarantee management connectivity via IWS or CLI.

In general, MPEG-2 video quality improves when video rate is increased. Significant video quality improvements are noticeable when moving between 1.2 and 5 megabits per second video rates. The video quality improvement becomes less noticeable when moving from medium rates to higher video rates (from 5–9 Mbps.) with most of the improvement occurring only during high motion video scenes. In essence, video quality is very subjective and relates to other components such as the response of the human eye, the quality and original content and signal, and the quality of the decoder and monitor. As a general rule, use the lowest video rate that best suits the application.

The following information represents guidelines for product configuration limitations, with regard to specific unit types. When configuring VBrick units, close attention must be paid to the total transport rate of all sources both entering and exiting the unit. In most cases the sum of all entering and exiting MPEG-2 data traffic should be closely monitored and kept to a minimum whenever possible. Once a configuration is decided upon and applied to the unit, the user can check the status of processor and device load via the IWS or CLI. The CPU utilization and overloaded status variables are an excellent indication on the overall unit's health. If the CPU utilization is high or the overloaded condition is occurring, the user may simply reduce video transport rates and re-run the test. As a part of regular maintenance, users should periodically check the CPU utilization, overloaded and buffer full count status variables to ensure the unit remains within its operating limits.

MPEG-2 Configuration Recommendations

- Maintain video rates at optimum levels. High rates do improve quality. VBrick recommends rates that use the lowest possible rate which gives acceptable quality. For MPEG-2, rates between 5 and 7 MBPS exhibit excellent video quality.
- Avoid setting the transport rate manually. Use the automatic transport rate calculation mode (default operation).
- The maximum MPEG-2 transport rate of 17 megabits per second should be used judiciously.
- When using the hard drive, especially for recording, keep other device functions to a minimum to avoid discontinuities in the recorded content.
- Recording high video rate streams consumes hard drive space and limits the recording duration significantly. Additionally, high video rate streams require faster hard drive access times and are more prone to video dropouts.
- Periodic re-formatting of the hard drive will improve overall disk performance by reducing disk fragmentation, much like a computer behaves.
- Hard drive pump and record functions are designed to be mutually exclusive. When operating at medium to low rates it may be possible for the hard drive to pump and record simultaneously but it is not recommended.
- Encoding from and sending to multiple destinations consumes additional system resources. Furthermore, a 4300 VBrick unit with dual encoders is capable of sending 4 streams but will not be able to sustain operation at the highest transport rates.
- Native ATM encapsulation mode has additional rate constraints and processing overhead due to its small packet size.

- Increasing the IP video packet size improves overall performance both in Ethernet and IPoA Modes. Please check with your network administrator first before deciding on what's size is best for your network.

Absolute Maximum Transport Rates

This table provides the absolute maximum transport rates for given configurations.

Table 1. Max Transport Rate by Configuration

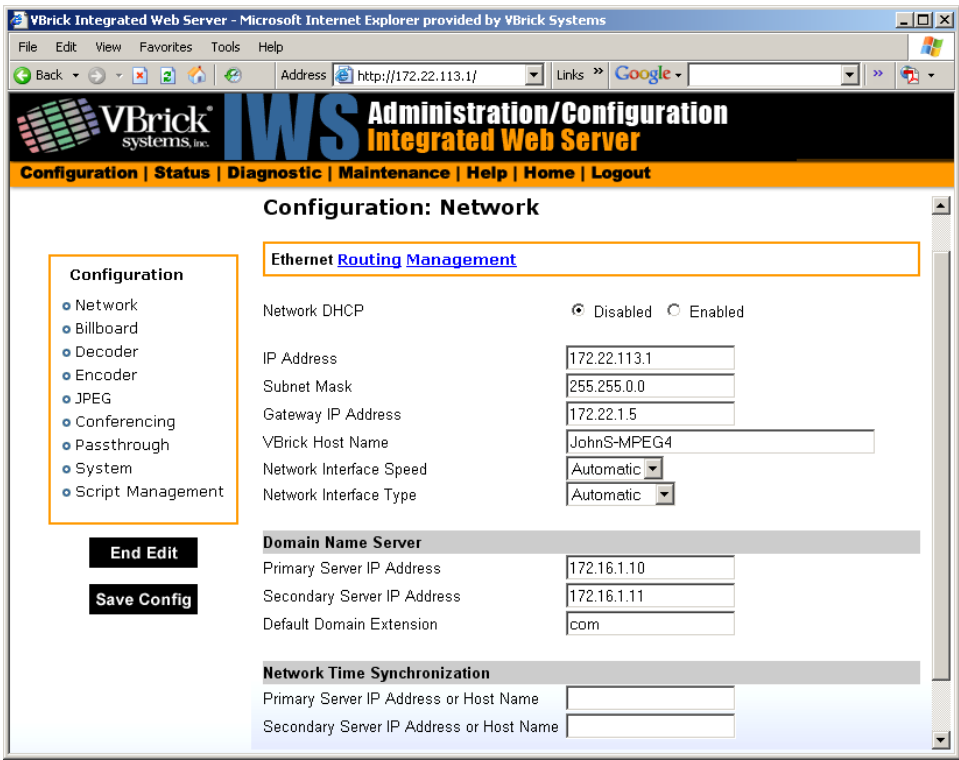
Model	Dest1, Dest2 Slot #1	Decoder Slot#2	ATM Mode	Recorder	FTP Active	Player / Pump
6200	17,0	17		0	No	0
6200	15,15	15		0	No	0
6200	13,0	13		13	No	0
6200	12,0	12		12	Yes	0
6200	11,0	11		0	No	11
6200	9,0	9		0	Yes	9
6200	11,11	11		11	No	0
6200	10,10	10		0	No	10
4300	17,0	17,0		0	No	0
4300	11,11	11,11		0	No	0
4300	13,0	13,0		13	No	0
4300	11,0	11,0		0	No	11
4300	9,9	9,9		9	No	0
4300	8,8	8,8		0	No	8
5300	17	17		0	No	0
5300	13	13		13	No	0
5300	14	14		0	No	14
531x/532x	17	17	IPoA	N/A	N/A	N/A
531x/532x	17	17	Native	N/A	N/A	N/A
431x/432x	17,0	17,0	IPoA	N/A	N/A	N/A
431x/432x	12,12	12,12	IPoA	N/A	N/A	N/A
431x/432x	14,0	14,0	Native	N/A	N/A	N/A
431x/432x	8,8	8,8	Native	N/A	N/A	N/A
621x/622x	17,0	17	IPoA	N/A	N/A	N/A
621x/622x	12,12	12	IPoA	N/A	N/A	N/A
621x/622x	13,0	13	Native	N/A	N/A	N/A

Model	Dest1, Dest2 Slot #1	Decoder Slot#2	ATM Mode	Recorder	FTP Active	Player / Pump
621x/622x	9,9	9	Native	N/A	N/A	N/A

Note All values are shown in Mbps. A rate of 0 indicates "off" condition. Configurations other than the above may operate at higher rates than indicated. IWS operation may become sluggish due to its lower system priority.

Configuration: Network

Configuration: Network > Ethernet



Network DHCP	Dynamic Host Configuration Protocol – (Enable, Disable). On Ethernet models, if DHCP is enabled, the VBrick gets its IP Address or Network Timer Server and Subnet Mask from the DHCP server. If the DHCP server supplies the Gateway Address or DNS server address, these parameters will replace the user entered Gateway and DNS Time Server settings. If DHCP is enabled and the VBrick cannot obtain an IP address from the server, the VBrick will start in limited run mode after two minutes, using its default IP Address of 172.17.5.5. After 15 minutes, it will automatically reset and again attempt to acquire an address. The LCD screen on the front of the VBrick will indicate a DHCP failed message. Note: The VBrick appliance requires a minimum DHCP lease length of 8 minutes to work, however it is recommended to extend the lease time to what is maximally available via the network to avoid disruptions.
IP Address	IP Address of the VBrick.
Subnet Mask	Subnet mask for the VBrick address.
Gateway IP Address	Gateway IP Address for communicating across distinct network segments.
VBrick Host Name	The Host Name defaults to the Media Access Control (MAC) address, a hardware address that uniquely identifies each node of a network. The VBrick's Host Name acts to identify the VBrick to various network applications including DHCP, SNMP and VBrick application tools. Note: <i>The Host Name syntax can be a maximum of 18 characters, the first character must be a letter and the rest can be letters, numbers or hyphens.</i>
Network Interface Speed	<p>Note: The settings for Interface Speed and Interface Type are interdependent. They must both be set to Automatic or they must both be set manually. Manual settings should be used only in the rare case when the VBrick is attached to network equipment that does not support auto negotiation. The VBrick's capabilities may be limited when its Ethernet link is at 10 Mbps and/or Half Duplex. If auto negotiation fails, the VBrick defaults to 10Mbit, half duplex and attempts "parallel detection," an alternative way to sense speed. Status parameters are available on the network status screen to indicate the state of the link and the current configuration of the Ethernet hardware. In auto mode, they reflect the results of the negotiation and in manual mode they follow the configuration options.</p> <p>(10Mb, 100Mb, Automatic). This allows the Ethernet interface of the VBrick to be manually forced to 100 Mbps or 10 Mbps. The default setting is Automatic which enables auto negotiation in the VBrick so it will automatically match its speed setting to the speed of the switch or hub to which it is attached. Automatic is the default and recommended setting.</p>

Network Interface Type	Half-Duplex/Full-Duplex/Automatic. This allows the Ethernet interface of the VBrick to be manually forced to Full Duplex or Half Duplex. The default setting is "Automatic" which enables auto negotiation in the VBrick so it will automatically match its duplex setting to that of the switch or hub that it is attached to. Automatic is the default and recommended setting. In order for the Network Auto Negotiate feature to work effectively, the Ethernet switch must also support auto negotiation. A manually configured switch will only allow the VBrick to discover the connection speed—not the mode (full or half duplex).
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Domain Name Server

Primary Server IP Address	This is the primary server used for DNS.
Secondary Server IP Address	This is the secondary server used for DNS.
Default Domain Extension	This is the domain name used for DNS. Note that you can use the default (blank) values for these items.

Network Time Synchronization

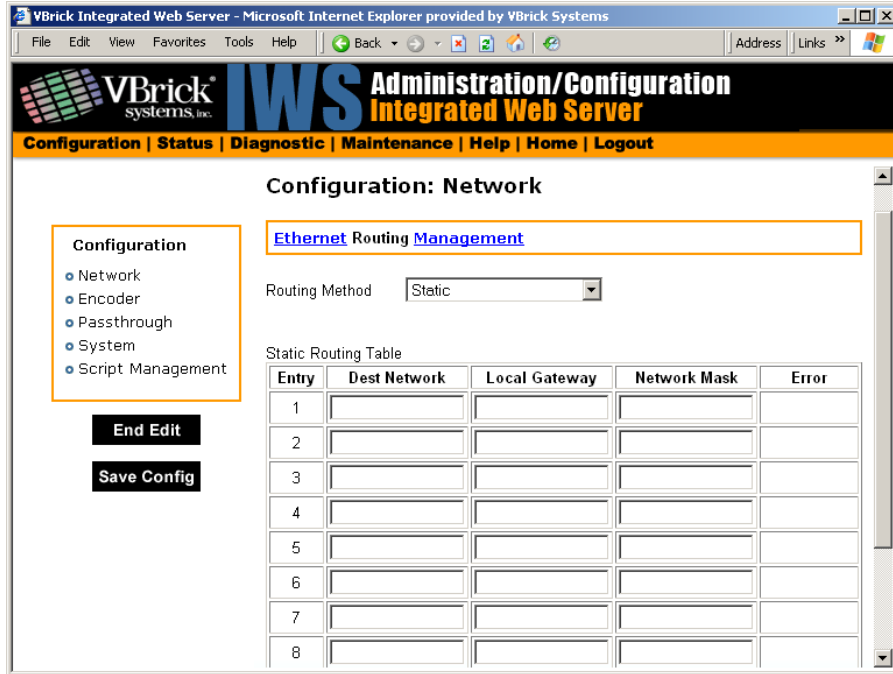
These fields are used to synchronize network time using the host name or IP address of a known server to provide a synchronized time for all appliances in the network. To enable **Network Time Synchronization** after these parameters are set, go to [Configuration: System > General](#) on page 70 and check the box.

Note To Network Administrators. DHCP Option 4 is used by the DHCP server to return SNTP server addresses. This option must be enabled in the DHCP server for these addresses to be returned to the VBrick. If the DHCP server configuration is unknown, it is recommended that the address(es) be manually entered since the DHCP server-supplied address will always override a manually-entered address.

Primary Server IP Address or Host Name	Primary host name (VBrick Host Name or DNS Host Name) or IP address of valid SNTP server providing time synchronization. A blank field indicates the server address will be acquired via the DHCP server only if the Network DHCP field above is checked.
Secondary Server IP Address or Host Name	Secondary host name (VBrick Host Name or DNS Host Name) or IP address of valid SNTP server providing time synchronization. A blank field indicates the server address will be acquired via the DHCP server only if the Network DHCP field above is checked.

Configuration: Network > Routing

The MPEG-2 Appliance requires no routing configuration for the vast majority of network uses. Use these settings only in those rare cases when your network requires advanced routing features in the appliance.



Routing Method

This selects which routing method will be used: Changes made to the Routing Method will require a reset of the box.

- Static – Allows routes entered in the static routing table to be automatically applied to the internal routing tables, after a power-up.
 - RIP Version 1 – Configures the VBrick to listen to RIP announcements. Routes are dynamically added per RIP specification.
 - RIP Version 2 Broadcast – Configures the VBrick to listen to RIP version 2 announcements. In this mode, RIP will perform classless routing based upon subnet mask.
 - RIP Version 2 Multicast – Configures the VBrick to listen to RIP version 2 announcements that are sent in multicast mode. Both broadcast and multicast announcements are processed.
-

Static Routing Table	<p>This table provides for user defined routing entries.</p> <ul style="list-style-type: none"> • Destination Network – Enter the destination address to be manually routed. • Local Gateway IP – Enter the Gateway to be used, when the forwarding destination address is as specified. • Network Mask – Sets the network mask to be associated with the destination address. • Error – This read-only field is used to report field entry error related to the route.
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Configuration: Network > Management

These parameters define information used in the SAPs emitted by the VBrick, which are received by the VBDirectory management tool (see the *VBDirectory User Guide*) and other VBrick applications such as the ETV Portal Server.

The screenshot shows the VBrick Integrated Web Server Administration/Configuration interface. The page title is "Configuration: Network" and the sub-section is "Ethernet Routing Management". The interface includes a navigation menu on the left with options: Configuration, Network, Encoder, Passthrough, System, and Script Management. The main content area contains the following fields and controls:

- Group Name:** A text input field.
- Unit Number:** A text input field with the value "1".
- Management SAP:** A section containing several parameters:
 - Transmit Enable:** Radio buttons for Disabled and Enabled (Enabled is selected).
 - SAP Timeout:** A text input field with the value "90".
 - Retransmit Time:** A text input field with the value "10".
 - Time To Live:** A text input field with the value "32".
 - Type Of Service:** A text input field with the value "0".
 - IP Address:** A text input field with the value "224.2.133.134".
 - Port:** A text input field with the value "9876".

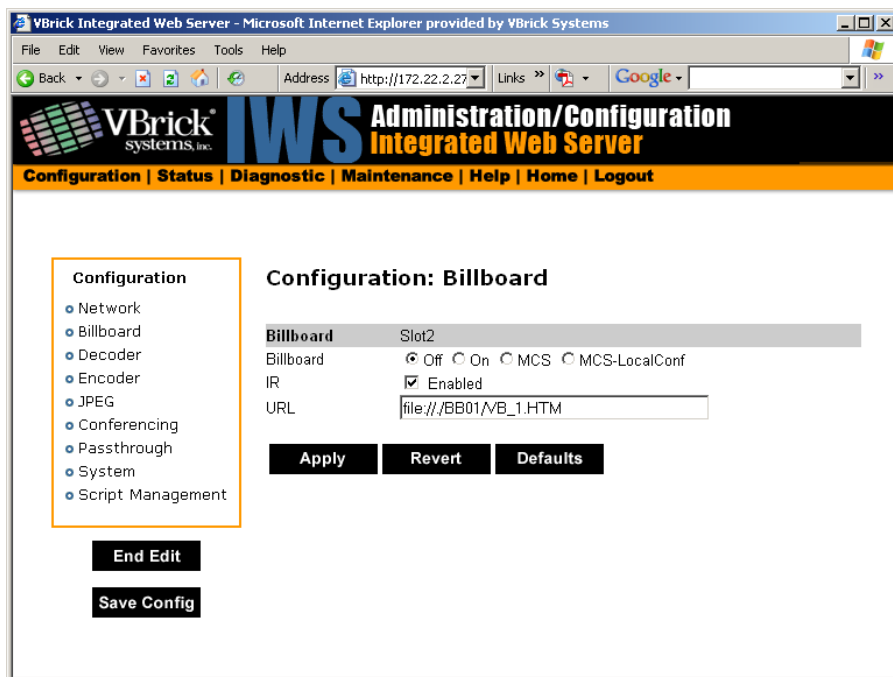
At the bottom of the form, there are three buttons: "Apply", "Revert", and "Defaults".

Group Name	Optional. This parameter defines the Group Name. It is included in the Management SAPs used by VBDirectory. It is used for organizing VBricks into groups to simplify use of VBDirectory.
Unit Number	Optional. The appliance unit number (range 0–2147483647) is used to identify each VBrick in a group.
Management SAP	Used by VBDirectory or MCS to detect the unit for the purpose of remote management. The following parameters apply.
Transmit Enable	This parameter controls the transmission of the Management SAPs (Enable or Disable).
Retransmit Time	This parameter defines the Management SAP Retransmit Time.

Time to Live	The number of hops (between routers) for which a Management SAP is valid on the network.
Type of Service	The TOS (Type of Service) can be configured in the IP header to establish packet priority in the network.
IP Address	This parameter defines the Destination IP Address for Management SAPs.
Port	This parameter defines the Destination Port for Management SAPs.

Configuration: Billboard

The Billboard feature allows you to display text and/or graphics on a TV monitor. The displayed billboard can span multiple pages with each page displayed for a specified period of time. Some uses of the billboard feature are to announce a daily calendar of events, directions to a particular conference room or even a slide presentation in conjunction with displayed video. VBrick models 62xx, 52xx and 53xx have a built in mini-browsers that support viewing limited HTML pages. The pages can either be kept inside the VBrick as part of the file system, or can be located on a remote HTTP server. Each page of the billboard is built using an HTML page with text and graphics created using the HTML tags supported. If billboard is to be supported on a remote server, the appliance requires read access to the HTTP server and may need to be configured. The following URL example shows the default page pre-configured by VBrick.



On/Off	Turn Billboard on or off.
MCS	Reserved for future use; MPEG-4 only. Sends all IR Remote commands to the browser for processing except for Reset, Slot 1 and Slot 2.

MCS-LocalConf	Reserved for future use; MPEG-4 only. Sends all IR Remote commands to the browser for processing except for Reset, Slot 1, Slot 2, Previous, Ans Call, Rej Call, Ring-RMT, Ring-DIS, Ring-ENB, and Hang Up.
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Using the Billboard

Billboard may be invoked in several ways. Either use the PC browser to communicate with the VBrick Integrated Web Server (see separate section) to apply the billboard and turn it on and off, or press the Billboard key on the optional remote control to toggle it on and off. Use of the remote can be enabled or disabled through the configuration. Using IWS (or the VBrick SDK) an administrator can turn on a particular billboard remotely, and prevent anyone else from using a remote to toggle it on/off. If you have a dual decoder system, the remote has keys to select between two decoders.

By turning the billboard on/off, the saved URL is invoked and the browser will attempt to display the resulting page. The URL can be configured to be a local file with the prefix 'file://' or point to remote server with the prefix http://. The default billboard is assumed to be a file located within the VBrick file system, file:///BB01/VB_1.HTM. If the billboard URL points to a file within the VBrick, the filename has to follow the DOS 8.3 filename convention (i.e. limited file name length). The valid extensions supported by the billboard are .HTM, .JPG, .GIF, and .BMP. It is common for the billboard pages to have an .HTM extension. Remote URLs are restricted to 255 characters.

Billboard FTP

It is possible to use FTP (File Transfer Protocol) to modify the contents of one of the pre-configured Bulletin Board files resident on the VBrick. Use the browser to FTP files, or any of the many FTP applications. Enter in the browser window:

FTP : //xxx.xxx.xxx.xxx (where x is the IP address of the VBrick appliance).

Use the Username and Password (default is case sensitive admin, admin) to login to the VBrick. BB01 through BB16 are directories established to receive Billboard content. It is possible to cut and paste new contents to a Billboard location from a file located anywhere on the network or on the computer. To view the contents on the VBrick, change the URL in the Billboard Section of the Integrated Web Server. In this example, the URL for the new file in IWS Configuration: Billboard would read: <file:///BB03/atm.gif>.

Billboard URLs

A URL for the billboard is much like a URL on the Internet. URLs can be local or remote, and typically point to the source of the billboard to be displayed.

Local URL

A local URL points to a file within the VBrick, which can be downloaded to the VBrick using a FTP utility program. All local URLs begin with: file://. There are sixteen pre-configured directories to place custom billboards inside the VBrick. The billboard directories are named BB01 to BB16.

Example 1

A single page billboard is placed in BB01. It requires one image file. The billboard page is named VB_1.HTM. The URL, which is not case sensitive, to enter in the Billboard URL box is: file:///./BB01/VB_1.HTM

Example 2

A multi-page billboard is placed in BB01. It requires four image files, one for each page. The billboard pages are named VB_1.HTM, VB_2.HTM, VB_3.HTM, and VB_4.HTM. Each file is connected to the next page within the html file using the legal syntax. The URL to enter in the Billboard URL box is: file:///./BB01/VB_1.HTM

Remote URL

Example 1

A single page billboard on a remote server with IP Address 172.16.2.79. The name of the billboard file is VB_1.HTM. The resulting URL is therefore: http://172.16.2.79/VB_1.HTM

Example 2

A single page on a remote server called www.VBrick.com. The folder name is "billboards". The name of the billboard file is VB_1.HTM. The resulting URL is therefore:
http://www.VBrick.com/billboards/VB_1.HTM

Billboard File Types

The file types supported are html (.htm), JPEG (.jpg), GIF (.gif) and windows bitmap (.bmp). Progressive GIF and JPEG are not supported. For the mini-browser to display the images, the images have to be BMP, GIF, or JPG. Dynamically generated web pages are supported as long as the output is pure HTML and uses HTML tags that are part of the set as described below. The server side engine must generate the page. JavaScript and VBScript are not yet supported. Functions that require these features, like "mouseover", or "onclick" are not supported.

Creating a Billboard

A billboard that fits on one screen (640 x 480 resolution) can be created using the following HTML tags:

A	DIR	H3	IMG	PRE
AREA	DL	H4	INPUT	SCRIPT
B	DT	H5	LI	SELECT
BASE	EM	H6	MAP	SMALL
BIG	FONT	HR	MENU	STRONG
BLOCKQUOTE	FORM	HTML	META	STYLE
BODY	FRAME	TH	NOBR	TABLE
BR	FRAMESET	TITLE	NOFRAMES	TD
CAPTION	HEAD	TR	OL	TEXTAREA
CENTER	H1	U	OPTION	UL
DD	H2	I	P	

The billboard text generated by the browser is Times Roman. The Font sizes supported are to . Background color and images are also supported. The standard HTML 16 color palette can be referred to by name, and other colors will be matched to the nearest color of a standard 232-color template. When creating billboards, please test your billboard for effect on all types of monitors on which it is going to be presented. S-Video output and Composite output from the V-Brick are supported.

Video Input

S-Video output from the VBrick to S-Video Input on the television yields the best picture to the TV monitor. If you do have S-Video input into your television set, it is recommended you use the S-Video output from the VBrick to the television. Most televisions also support composite input. The overlay image as used in the billboard can sometimes have the effect of "flicker" if the font is too small and used on a regular television. This is a product of the output video signal and the television. On higher-grade monitors, the effect is significantly reduced.

Font Sizes

It is recommended that font size 5 be used on the billboard. The VBrick has two types of video output signals. If S-Video out is used, the picture is significantly better than the Composite out. Text and graphics tend to appear sharper and do not flicker in S-Video as much as they do in the composite out. If a flickering effect makes your font unreadable, make it larger. Making the font bold or will reduce the effect of the flicker.

- The drawing area for Billboard is about 600X400 pixels.
- With a font size of 7, 8 lines of text fit on the screen.
- With a font size of 6, 13 lines of text lines fit on the screen.
- With a font size of 5, 18 lines of text fit on the screen.

Transparent Background

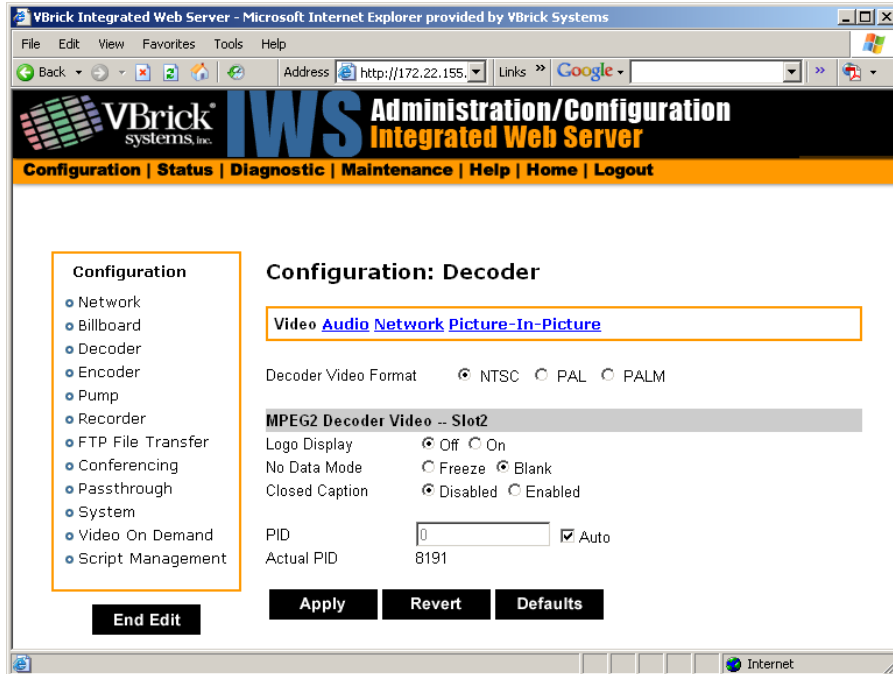
A web page can be created with a transparent background. The video will show through and any text or images will appear on top of the video. A custom META tag is used to support this feature. In the <HEAD> portion of the HTML page, enter the following. The chosen background color will then be overwritten by the transparent color.

```
<META HTTP-EQUIV="TRANSPARENT" CONTENT="YES" >
```

Configuration: Decoder

Configuration: Decoder > Video

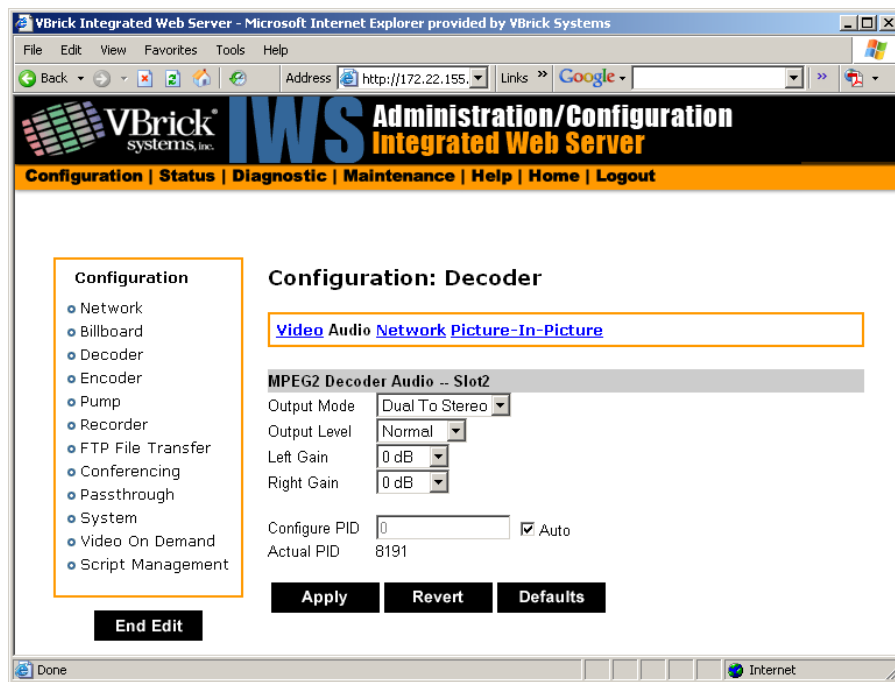
The VBrick decoder is used to uncompress MPEG streams and display them on a TV or monitor.



Decoder Video Format	The format can be configured to be NTSC (30fps), PAL (25fps) or PAL-M (30fps). PAL-M is a video format standard used in Brazil. The main difference between PAL and PAL M is a lower resolution (525 lines instead of 625) and a higher frame count (30 frames per second at 60Hz versus 25 frames per second at 50Hz). <i>Note: Changing and applying this parameter will cause the VBrick to reset.</i>
Logo Display	Lets you display the VBrick logo on the decoder output (monitor). VBrick provides a Logo Customization Utility (available on the website) if you want to create an individualized logo.
No Data Mode	This allows setting the screen for a decoder with no video input to having either the last screen appear either frozen or blank.
Closed Caption	This setting enables or disables closed captioning. Closed Captioning does not operate when the Picture in Picture feature is selected. It is necessary to disable PIP. In SIF mode only CC1 and CC2 are valid. CC3 and CC4 fields are not supported.
PID	MPEG-2 transmits its data in packets of 188 bytes each. At the start of each packet is a packet package identifier (or PID) that identifies the data stream associated with that packet. Because the MPEG-2 data stream might contain multiple video programs, the decoder has to choose a particular video channel to play. The PID selection provides that feature. If the user selects the automatic option, the first video PID identified will be used to select the video channel.
Actual PID	Actual PID being played. This read-only parameter is of interest when the user selects automatic. A value of 8191 indicates the PID has not yet been established.

Configuration: Decoder > Audio

The audio selection provides for the control and configuration of the decoded audio stream.



Output Mode	<p>The audio output mode can be one of five possible settings as shown below. Stereo directs the incoming left audio channel to the left output, and the incoming right audio channel to the right output. Mix combines the left and right audio channels and directs the combined output to both the left and right audio channels. Left selects the input left audio channel and sends it to both the left and right output channels. Right selects the input right audio channel and sends it to both the left and right output channels. Mute suppresses audio output. The Dual to options are only operational on an input stream that was encoded in Dual audio mode; otherwise, the Output Mode is determined by the corresponding audio encoder setting.</p> <ul style="list-style-type: none"> • Dual to Stereo • Dual to Mix • Dual to Left • Dual to Right • Mute
Output Level	<p>Hardware-dependent; not shown on all models. Changes the range of values for Left and Right Gain.</p> <p>Normal – 14 dB to -48 dB (+14 to -48 on some decoder models). Alternate – 8 dB to -54 dB (+14 to -48 on some decoder models).</p>
Left Gain	Used to adjust volume. Default = 0.
Right Gain	Used to adjust volume. Default = 0.

Configure PID	MPEG-2 transmits its data in packets of 188 bytes each. At the start of each packet is a packet identifier (or PID) identifies the data stream associated with that packet. Because the MPEG-2 data stream might contain multiple audio programs, the decoder has to choose a particular audio channel to play. The PID selection provides that feature. If the user chooses the automatic PID option, the first audio PID detected will be used to select the audio channel.
Actual PID	Actual PID being played. This read-only parameter is of interest when the user selects automatic. A value of 8191 indicates the PID has not yet been established.

Configuration: Decoder > Network

These parameters are decoder level IP parameters that instruct the decoder which IP stream to decode on TV monitors.



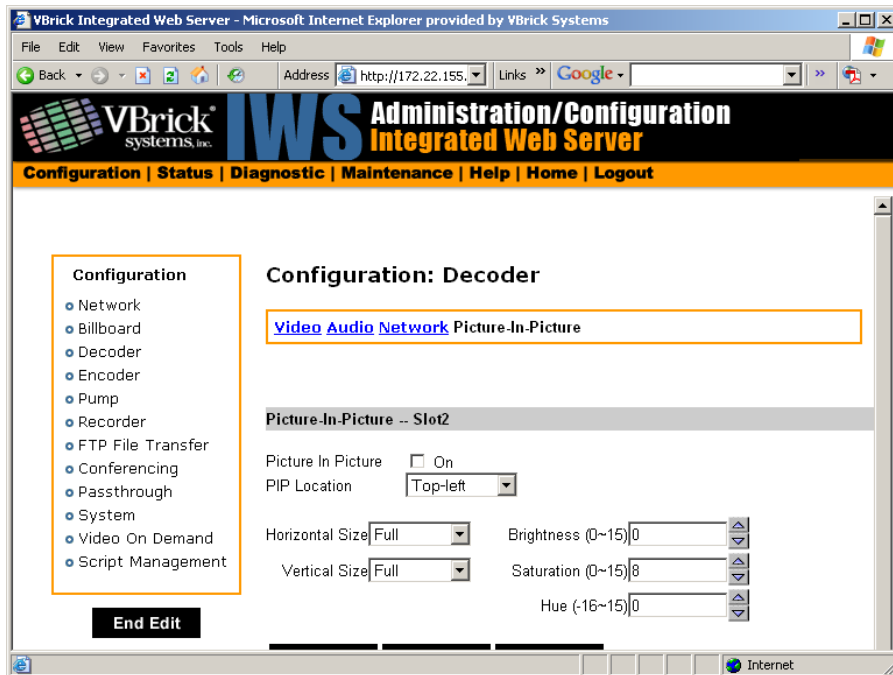
Receive Enable	Controls whether the decoder receives the video from the network.
Receive Address Mode	Allows the user to specify how the receive address will be configured: IP address or Host Name.
Receive Host Name	Sets the source for video by using the Host Name. This parameter can be used only for a unicast source.

Receive IP Address	In multicast mode, this parameter defines the IP address of the stream to be decoded and displayed. In unicast mode, this parameter is optional. If left blank, the decoder will accept all data received on the receive IP port. If set, decoder will communicate with any VBrick that has the encoder "unicast poll" option set, and instruct it not to transmit it's stream unless this VBrick has this receive IP Address.
Receive Port	The receive port designates what local IP/UDP port is assigned to listen for incoming video.
Receive Mode	This read-only parameter informs the operator whether the selected receive IP Address is Unicast or Multicast.
Packet Ordering	The identification number in the IP header determines IP packet ordering. The packet ordering feature lets the VBrick re-order packet fragments as they arrive. If you disable packet ordering, the out-of-order packets are simply discarded. Packet ordering may increase latency and can add up to 100 ms of additional delay.
Jitter Queue	Delay jitter is defined as the variation of the delays with which packets traveling on a network connection reach their destination. During exceptionally long periods of delay, a large quantity of video packets will be buffered in the network. When the situation that caused the delay is resolved, the buffered frames will be burst, as a group, to the decoder. The handling of delay jitter is then a problem of having enough buffering in the decoder to handle a long delay, allowing the video to seem uninterrupted, and enough capacity in the buffer to handle the subsequent burst that follows once the delay has terminated. Typically, long delays in the network are associated with packet loss. No amount of buffer at the VBrick will correct packet loss. When first enabled, the jitter Q buffers 85ms of the video stream. Once the jitter Q has been filled, the jitter queue meters out the buffered video to the decoder at a rate equal to the rate of the video stream. The jitter queue is drawn down during times of packet drought, allowing the video to seem uninterrupted, but is large enough to handle the subsequent 85ms burst of packets that result once the drought is over. The impact of enabling the jitter queue is that a 85ms delay is imposed on the video stream.
SAP IR Program Guide	Enables or disables the ability of the operator to select the program guide feature from his IR remote control.
SAP Timeout	If SAP Timing method is fixed, this provides a configurable timeout for program guide selections, in seconds. If no SAP is received within the timeout period, the entry is removed from the table of available programs. If SAP Timeout is variable, the entries are removed from the program table as per RFC 2974 (Refer to Configuration: System > General).

SAP Category	<p>This string can contain one or more category keywords that will limit the video streams displayed by the Program and Conference Guides. Keywords should be separated by spaces. Note that characters are ASCII and can only be lowercase. The total of all keywords in the string is 36 characters including spaces. If the Decoder's category string contains both the keywords "Math" and "Science," only video streams whose encoders have one or more of these keywords assigned, or those that contain no keyword, will be available to this Decoder. The Encoder's Category is established on the Configuration: Encoder > SAP menu screen of IWS.</p> <p>Note also the wildcard character * is supported at the very end of keywords only. It is only valid if one or more additional characters of any type follow the last non-wildcard character. Note that * with spaces on both sides will display all streams. Having no category defined (default) displays all streams.</p>
SAP IP Address	The receive IP address used to populate the Program Guide. This is typically set to the Announce Program Guide SAP of the encoder.
SAP Port	The receive IP port used to populate the Program Guide. This is typically the port number of the encoder.

Configuration: Decoder > Picture-In-Picture

This menu allows the user to configure the Picture-In-Picture parameters on the decoder output. The Picture in Picture feature is only available for encoder/decoder VBrick appliances.



Picture in Picture	By checking the Box this will enable the Picture-In-Picture display.
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PIP Location	Picture-In-Picture can be any of the following 5 locations: top left, top right, bottom left, bottom right and center.
PIP Horizontal Size	The Picture-In-Picture horizontal size can be changed to any of the following 4 sizes – full, half, quarter, thumbnail.
PIP Vertical Size	The Picture-In-Picture vertical size can be changed to any of the following 4 sizes: full, half, quarter, thumbnail.
Brightness	(0 – 15) The luminance is the information about the varying light intensity of an image, is best described as brightness. Default = 0.
Saturation	(0 – 15) The saturation is the spectral purity or intensity of a color. Default = 8.
Hue	(-16 to +15) The hue is the attribute by which a color may be identified within the visible spectrum. Hue refers to the spectral colors of red, orange, yellow, green blue and violet. Default is 0. Adding hue reduces the saturation. Note that the Picture in Picture display will override the display of Closed Caption Text.

Configuration: Encoder

Configuration: Encoder > Transport

The screenshot shows the VBrick IWS Administration/Configuration Integrated Web Server interface. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.155.:". The page has a navigation menu with links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Configuration: Encoder" and contains a sub-section for "MPEG2 Encoder Transport -- Slot1". The configuration parameters are as follows:

Parameter	Value
Transport Rate	0 <input checked="" type="checkbox"/> Auto
Actual Transport Rate	1763000
Transport Content	Video + Audio
Delay Mode	High Delay
Audio PID	36
Video PID	33
PCR PID	34
Destination2 Stream Type	Transport

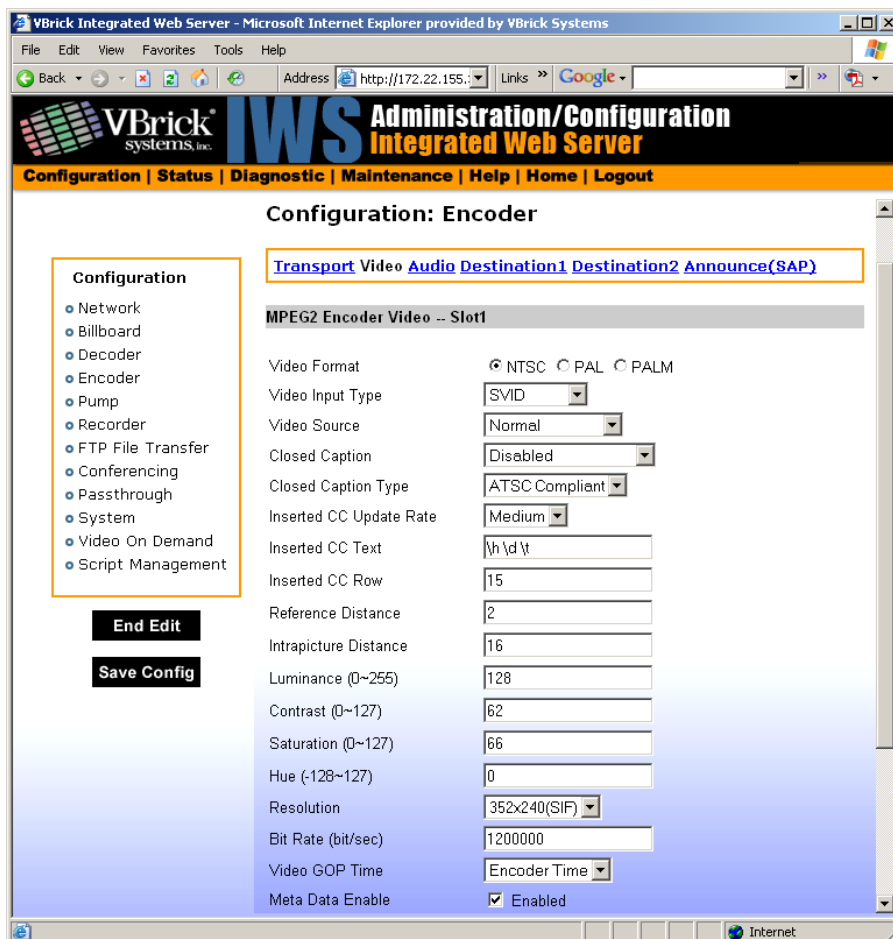
There is an "End Edit" button at the bottom of the configuration area.

Transport Rate	This option allows selection of the actual transport rate for the MPEG-2 transport stream transmitted from this encoder. If Auto is selected, the VBrick will choose an appropriate conservative transport rate, which will allow any video interval to be clearly transmitted. <i>If you enter a rate that is less than the combined video, audio and over-head an error message will be displayed indicating that the rate selected is too low.</i>
Actual Transport Rate	This read-only parameter provides the actual transport stream rate. It is of particular interest when the automatic option is selected above. Even if a transport rate is explicitly selected, the actual transport rate will differ from the selected rate since only certain rates are supported.
Transport Content	If the model number ends in -xxx1/-xxx2, the user can choose the transport content to be Video + Audio, Video only or Audio only. If the model number ends in -xxx0, the option is not displayed and video and audio always comprises the transport content.
Delay Mode	If the model number ends in -xxx1/-xxx2, the delay mode can be set to Low, Medium or High Delay. If the model number ends in -xxx0, the delay mode can be set to Low or High Delay. In low and medium delay modes, the Reference Distance is forced to 1 (no B frames). Low delay reduces latency but may also reduce video stability, depending on video content. If minimum latency is not an issue in the application, high delay will maximize video stability. Default Delay Mode is set to High Delay.
Audio PID	MPEG-2 transmits its data in packets of 188 bytes each. At the start of each packet is a packet identifier (or PID) that identifies the data stream associated with that packet. It is possible that a non-VBrick decoder may only accept audio streams with a certain PID setting. If so, then this feature allows compatibility with these decoders.
Video PID	MPEG-2 transmits its data in packets of 188 bytes each. At the start of each packet is a packet identifier (or PID) that identifies the data stream associated with that packet. It is possible that a non-VBrick decoder may only accept video streams with a certain PID setting. If so, then this feature allows compatibility with these decoders.
PCR PID	MPEG-2 transmits its data in packets of 188 bytes each. At the start of each packet is a packet identifier (or PID) that identifies the data stream associated with that packet. It is possible that a non-VBrick decoder may only accept PCR (Program Clock Reference) streams with a certain PID setting. If so, then this feature allows compatibility with these decoders. Note that certain decoders may require the PCRs to be embedded in the video stream. If so, these decoders are not compatible with the VBrick encoder.

Destination 2 Stream Type	The user can configure the appliance to transmit an Elementary stream as a secondary stream. A video ES, or video elementary stream, consists of all the video data for a sequence, including the sequence header and all the subparts of a sequence. A Transport stream contains both video and audio.
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Configuration: Encoder > Video

These parameters are used to configure the Encoder video settings. The encoder video and audio configurations change if the appliance has an SDI, Serial Digital Interface. Please refer to [SDI Configuration](#) on page 137 for more information.



Video Format	The format can be configured to be NTSC (30fps), PAL (25fps) or PAL-M (30fps). (The PAL-M feature is supported on models ending in xxx1 or higher.) PAL-M is a video format standard used in Brazil. The main difference between PAL and PAL-M is a lower resolution (525 lines instead of 625) and a higher frame count (30 frames per second at 60Hz versus 25 frames per second at 50Hz).
Video Input Type	The input can be changed to accept either S-video or composite (BNC). Note: VBSSM models do not support S-video.

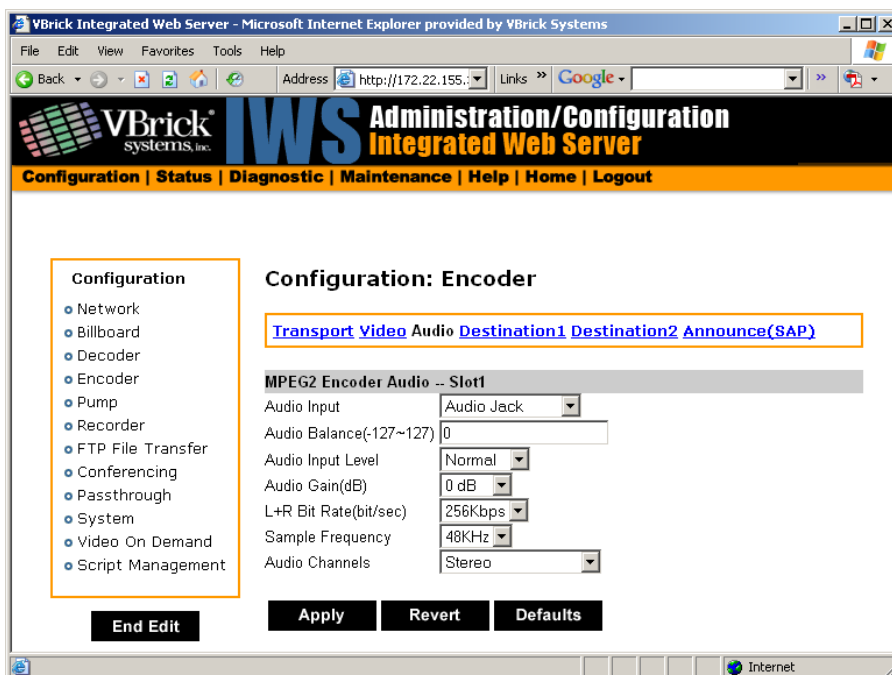
Video Source	<p>This enables the user to select the bandwidth for tracking the video input.</p> <ul style="list-style-type: none"> • Normal – Select for stable sources such as SDTV, DVD or camera. • High Jitter – Select for unstable sources such as VCR or VTR.
Closed Caption Enable	<p>Disables or enables closed captioning. It is recommended that Closed Caption be disabled unless required by an application. Default = disabled. Does not apply to models ending in -xxx0.</p> <ul style="list-style-type: none"> • Disabled – Default. • Video CC Enabled – Reads the embedded video closed captioning text. • Inserted CC Enabled – Inserts the user defined text set in the Closed Caption Text field.
Closed Caption Type	<p>Sets the Closed Caption Type to either ATSC Compliant or Alternate Format. When set to ATSC compliant, the type conforms to ATSC specification a53. When set to the Alternate Format, the type conforms to a proprietary method. Does not apply to models ending in -xxx0.</p>
Inserted CC Update Rate	<p>Sets the rate with which the closed captioning field gets updated for the box (default is medium). Only works when Inserted CC is enabled. Does not apply to models ending in -xxx0.</p> <ul style="list-style-type: none"> • Slow – When set to slow, the inserted closed captioning field will be updated every 60 seconds. • Medium – When set to medium, the closed captioning field will update every 20 seconds. • Fast – When set to fast, the closed captioning field will update every 5 seconds.
Inserted CC Text	<p>Sets the text that is inserted into the closed captioning field of the encoded stream (default is "inserted string" \h \d \t \c). Only works when Inserted CC is enabled. Does not apply to models ending in -xxx0. Note: The maximum number of characters supported is 32 (including the Host Name, Date and Time). No double quotes "", less than <, or greater than > symbols are allowed as part of the configuration string. If the whole string does not display on the screen the default string can be organized to have the Host Name (/h) last. The special strings are:</p> <p>\h or \H - Host Name \d or \D - Current Date \t or \T - Current Time \c# or \C# - Set Color (where # = the number corresponding to color): 0 = White, 1 = Green, 2 = Blue, 3 = Cyan, 4 = Red, 5 = Yellow, 6 = Magenta.</p>

Inserted CC Row	Sets the position on the screen where the text defined in the Closed Caption Text field will appear in the decoded video. Can be set from 1 through 15, where 1 indicates the top of the screen and 15 indicates the bottom of the screen (default is 15), when Inserted CC is enabled. Does not apply to models ending in -xxx0.
Reference Distance	For models ending in -xxx1/-xxx2, this enables a user to set the difference between consecutive reference frames within a group of pictures (GOP). The values available are 1 to 3 (default value is 2). If the Encoder Transport Delay setting is low or medium, the value must be 1. Does not apply to models ending in -xxx0.
Intrapicture Distance	Enables the user to set the distance between consecutive I frames within a Group Of Pictures (GOP). The values available are 1 to 19 (default value is 16). Does not apply to models ending in -xxx0.
Luminance	0 to 255. Default = 128. The luminance is the information about the varying light intensity of an image, which is best described as brightness.
Contrast	0 to 127. Default = 62. The contrast is the range of light-to-dark values of an image that are proportional to the voltage differences between the black and white levels of the signal.
Saturation	0 to 127. Default = 66. The saturation is the spectral purity or intensity of a color.
Hue	Range is -128 to 127. Default= 0. The hue is the attribute by which a color may be identified within the visible spectrum. Hue refers to the spectral colors of red, orange, yellow, green blue and violet. Adding hue reduces the saturation.
Resolution	For models ending in -xxx0, the video resolution can be adjusted to be Full D1, 2/3 D1, 1/2 D1. For models ending in other than -xxx0, the video resolution can be Full D1, 2/3 D1, 1/2 D1 or 352x240 (SIF). Note that D1 resolution is not recommended at video encode rates below 5 Mbps. In SIF mode only closed captioning CC1 and CC2 in the menu settings of the video display are valid (TV menu monitor settings) CC3 and CC4 fields are not supported.
Bit Rate	The encoder's bit rate can be adjusted from 1 Mbps to 10 Mbps for models ending in -xxx0. For models ending in other than -xxx0, the bit rate can be adjusted from 1.2 Mbps to 15 Mbps.

Video GOP Time	<p>The hours, minutes and seconds for the GOP time, the creation time of the MPEG video stream. Can be set to one of three selections:</p> <ul style="list-style-type: none"> • Encoder Time (default) • GMT Time • Local Time <p>Note: Within the GOP header of the video stream is a Time Stamp, in hours, minutes and seconds. If the receiving application uses this time stamp, it is desirable to configure the encoder to insert a real time of day in either local or GMT time. If no application is using this data, the setting should be left at Encoder Time, which merely uses the time elapsed since the encoder hardware was last reset.</p>
Meta Data	<p>When Metadata is enabled a new field will appear on the screen allowing the operator to insert metadata strings into the video as User Data. The normal use of metadata is to allow accompanying synchronized URL references to displayed in rich media applications. The VBrick StreamPlayer has the capability of extracting the metadata references and presenting them to an appropriate application. Contact VBrick for details.</p>

Configuration: Encoder > Audio

Models ending in other than -xxx0 may contain different types of audio hardware. The difference can be identified by physical differences in the audio connectors or by the revision number identified in Status: Encoder/Decoder Status – PLX EEPROM Revision E. The model identified as PLX EEPROM Revision 1 has black plastic collars around the L/R audio jacks. The model identified as PLX EEPROM Revision 2 has metal screw-on collars. Where features differ between the models, the differences are noted. For example, certain VBSSM models do not support audio (see Table 1 [VBSSM Models](#) † for details).



Audio Input	Input can be from an Audio Jack (1/8" mini-phono jack) or from Microphone DIN (AudioMate microphone). The default setting is Audio Jack.
Audio Balance	-127 to 127. Sets audio balance between left and right channels. Zero is balanced. 127 sends audio to right channel only; -127 to left channel.
Audio Input Level	Hardware-dependent; not shown on all models. See Audio Gain field for more details. <ul style="list-style-type: none"> • Normal – 7 to –53 dB and mute. • Alternate – 12 to –48 dB and mute.
Audio Gain (dB)	This setting controls the audio level of the encoder. It is model dependent: <ul style="list-style-type: none"> • On models ending in –xxx0 the settings are from 3 to –60 dB and mute. The default setting is 0 dB. A setting of 3 is equivalent to full volume, -60 effectively mutes the encoder audio. • On models ending in –xxx1/–xxx2 the settings differ based on the Status: Encoder > PLX EEPROM Revision number: If the Encoder PLX EEPROM Revision is 1, the settings are from 3 to –48 dB and mute. The default setting is 0 dB. A setting of +3 is equivalent to full volume and -60 effectively mutes the encoder audio. If the EEPROM PLX EEPROM Revision is 2 or higher and the Audio Input Level is set to Normal, the settings are from 7 to –53 dB and mute. The default setting is 0 dB. A setting of 7 is equivalent to full volume, -53 effectively mutes the encoder audio. If the Audio Input Level is set to Alternate, the settings are from 12 to –48 and mute. The default setting is 0 dB. A setting of 12 is the equivalent of full volume, -48 effectively mutes the encoder.
L+R Bit Rate	The transmission rate of the audio stream. If the model ends in -xxx0, the transmission rate can be 192, 256 and 384 Kbps **If the model ends in -xxx1/-xxx2 the audio bit rate can be 256 or 384 Kbps.
Sample Frequency	Frequency at which the audio is sampled at the encoder. If the model number ends in -xxx0, the sampling rate can be 44.1 KHz or 48 KHz. If the model number ends in -xxx1/-xxx2 the sampling frequency is 48 KHz.

Audio Channels

Model dependent. (If the EEPROM Revision is 2 or higher, changing the Audio Channel setting affects the Sample Frequency.)

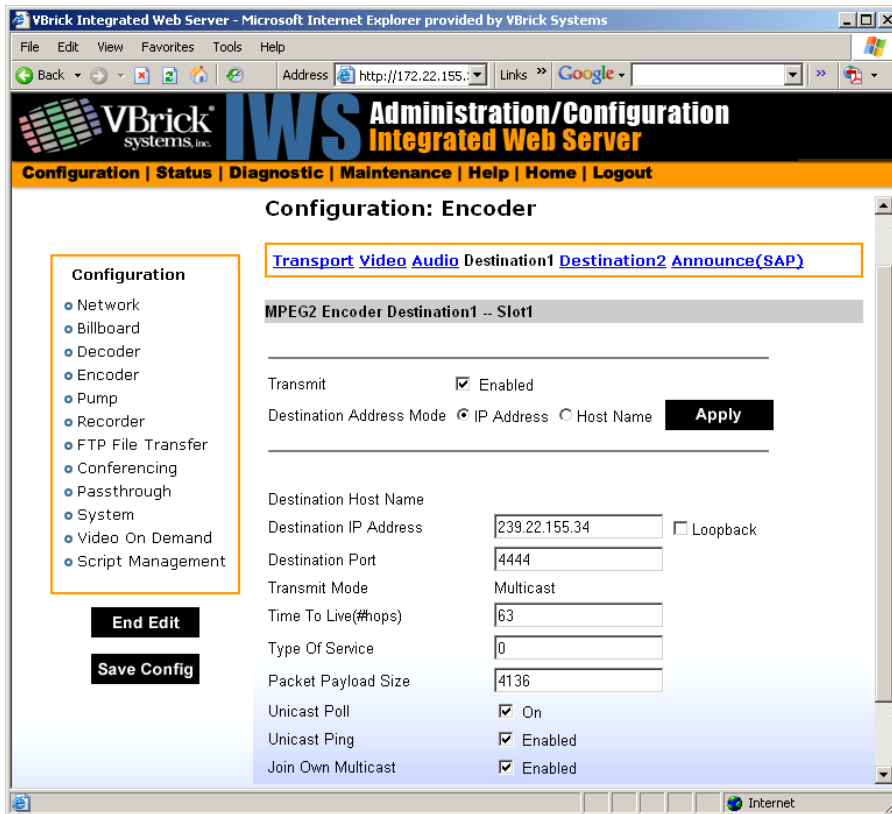
- If the model number ends in -xxx0, the parameter can be set to Stereo, Mono and Dual. The default setting is Stereo.
- If the model number ends in -xxx1/-xxx2, the settings are dependent on the PLX EEPROM revision Number:
- If the EEPROM Revision is 1, this parameter can be set to Stereo and Mute. The default setting is Stereo.
- If the EEPROM Revision is 2 or higher, the parameter can be set to Stereo, Mono (left to stereo) or Mute. Default = Stereo.

Stereo – Stereo directs the input left channel to the left channel in the audio stream and the input right channel to the right channel in the audio stream.

Mono (left to stereo) – Mono directs the left input channel to both the left and right channel.

Mono (left only) – This option allows only the left input channel to be carried in the stream. Output is to the left channel only.

Configuration: Encoder > Destination 1 & 2



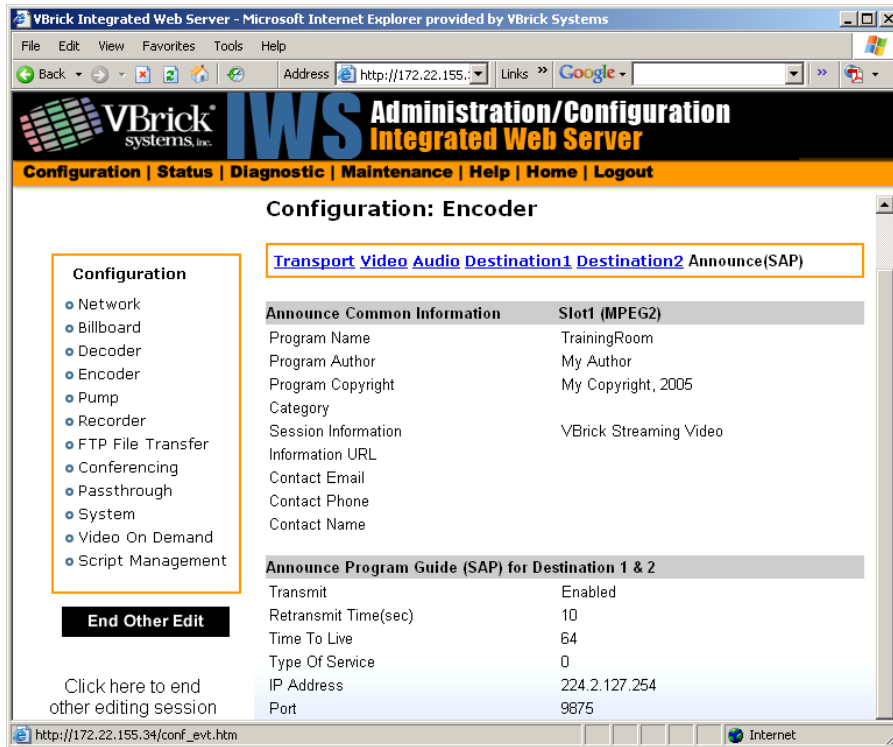
Transmit Enable

Controls whether the primary encoder output is to be transmitted to the network.

Destination Address Mode	Allows the user to specify how the destination address will be configured: IP address or Host Name.
Destination Host Name	Sets the source for video to be received using Host Name of the source. It can be used only for a unicast source.
Destination IP Address	This is the Destination IP Address of the encoded video. When this is a multicast address, the transmit mode is also set to multicast. Similarly, if this is a unicast address, the transmit mode is also set to unicast.
Destination Port	This is the destination IP port of the network device that will be receiving the encoded video.
Transmit Mode	This read-only parameter informs the operator whether the encoder is transmitting the video stream in Unicast or Multicast mode.
Video Time to Live	The number of hops (between routers) for which an IP packet is valid on the network.
Video Type of Service	The TOS (Type of Service) can be configured in the IP header to establish packet priority in the network.
Unicast Poll	This parameter is used to instruct the VBrick to poll whether the unicast destination VBrick is configured to accept this stream. If the unicast destination VBrick is not configured to accept this stream, this VBrick will not send the stream. This feature is designed to eliminate unwanted unicast video traffic across the network.
Packet Payload Size	Controls the amount of MPEG data within each UDP packet. The default value is 4136. Since Ethernet networks are limited to a packet size of 1500 bytes, multiple IP packets are required to span one UDP packet. When choosing a packet payload size, special attention must be paid to the network capability and topology. The allowed range is 1316 to 8872 bytes per packet, even numbers only. The VBrick will not produce fragmented packets at or below a payload size of 1472.
Unicast Ping	Feature for primary destination can be enabled, disabled. If the VBrick is designated to transmit a transport stream to any destination (whether another VBrick or not) in unicast mode, this parameter is used to instruct the VBrick to ping the destination periodically to test connectivity before sending the stream. If Unicast Ping is not enabled, and the destination goes off-line, the unicast stream may be broadcast to all destinations on the network, flooding the network. This feature should only be disabled if the network has a particular requirement that makes it unworkable.
Join Own Multicast	Some network equipment requires that a multicast source (such as a VBrick encoder) join its own multicast group. This feature is enabled by default and has no adverse affect on equipment that is fully multicast compliant.

Configuration: Encoder > Announce (SAP)

Contains parameters used to change the SAP (Session Announcement Protocol) advertisements. SAPs are advertisement packets that are transmitted by the VBrick to other VBricks and to StreamPlayer Plus software on a PC. They are used to identify streams present in the network.



The screenshot shows a web browser window displaying the VBrick Integrated Web Server Administration/Configuration interface. The page title is "Configuration: Encoder". The main content area is titled "Configuration: Encoder" and contains a navigation menu on the left and a main configuration area on the right. The navigation menu includes options like Network, Billboard, Encoder, Pump, Recorder, FTP File Transfer, Conferencing, Passthrough, System, Video On Demand, and Script Management. The main configuration area is divided into two sections: "Announce Common Information" and "Announce Program Guide (SAP) for Destination 1 & 2".

Configuration: Encoder

[Transport](#) [Video](#) [Audio](#) [Destination1](#) [Destination2](#) [Announce\(SAP\)](#)

Announce Common Information

Slot1 (MPEG2)	
Program Name	TrainingRoom
Program Author	My Author
Program Copyright	My Copyright, 2005
Category	
Session Information	VBrick Streaming Video
Information URL	
Contact Email	
Contact Phone	
Contact Name	

Announce Program Guide (SAP) for Destination 1 & 2

Transmit	Enabled
Retransmit Time(sec)	10
Time To Live	64
Type Of Service	0
IP Address	224.2.127.254
Port	9875

[End Other Edit](#)

Click here to end other editing session

Announce Common Information

Program Name	<p>The string providing the name of the stream associated with this SAP. This SAP text shows up in the Program Guide for other VBrick products. Default is \H Program x (where x is 1 or 2, for slot1 or slot2). Note: All of the Common Information fields support replacement characters. <i>The replacement text is only shown in the SAP message at the destination decoder.</i> The fields are replaced by the actual information as explained below.</p> <ul style="list-style-type: none"> • \H or \h – Host Name of VBrick appliance. When the default entry is used, the VBrick is identified by the default Host Name (set in IWS in the Network: Ethernet section), and will be identified as such on the network, see the StreamPlayer software example below. • \B or \b – If the unit is a VBStar, this is the Base Name of the file being pumped by the Hard Drive Pump. • \F or \f – If the unit is a VBStar, this is the control name of the File being pumped. The control name is a combination which consists of 25 characters from the directory name, 25 characters from the base name, 3 digits containing the file extension and the punctuation (53 total characters maximum). If the directory portion is not present, this is the base name of the file being pumped.
Program Author	A string in the SAP that can be used to identify the author. Default is "My Author."
Program Copyright	A string in the SAP that can be used to identify the copyright information. Default is "My Copyright."
Category	<p>An encoder can have a SAP Category string. This string consists of one or more keywords separated by spaces. Each category keyword represents a tag associated with the Encoder's video stream. Decoders can be configured to display in their Program and Guides only video streams tagged by specific category keywords or those containing no keyword. The string(s), used by the Decoder, is set on the Decoder/Network screen. Note: Characters are ASCII and are case sensitive. The total of all keywords in the string is 36 characters including spaces.</p>
Session Information	A string identifying VBrick SAP Session Information. See Program Name field for a description of replace characters (\h, \b or \f). Appears on Program Guide. Default is "VBrick Streaming Video".
Information URL	Informational text.
Contact Email	Informational text.
Contact Phone	Informational text.
Contact Name	Informational text.

SAP for Destination 1 and/or 2

Transmit	Enables or disables the transmission of the SAP.
Retransmit Time	If SAP Timing is fixed, this is the time (in seconds) between transmissions of SAPs (1 – 9999). If SAP Timing is variable, the actual retransmit time as per RFC 2974 is reported back. Please refer to Configuration: System > General.
Time to Live	The number of hops (between routers) for which an IP packet is valid on the network.
Type of Service	The TOS (Type of Service) can be configured in the IP header to establish SAP packet priority in the network.
SAP IP Address	The receive IP address used to populate the Program Guide. This is typically set to the Announce Program Guide SAP of the encoder.
SAP Port	The receive IP port used to populate the Program Guide. This is typically the port number of the encoder.

Note SAP information appears in the Program Guide field displayed in other VBrick products, such as StreamPlayer and StreamPlayer Plus.

Configuration: Pump

See [VBrick Pump](#) on page 196.

Configuration: Recorder

See [VBrick Recorder](#) on page 199.

Configuration: FTP File Transfer

See [VBrick FTP File Transfer](#) on page 206.

Configuration: Conferencing

Conferencing is a feature that allows a user to set up a two-way video conference using the IR Remote Control. This screen provides the configuration of the necessary parameters.



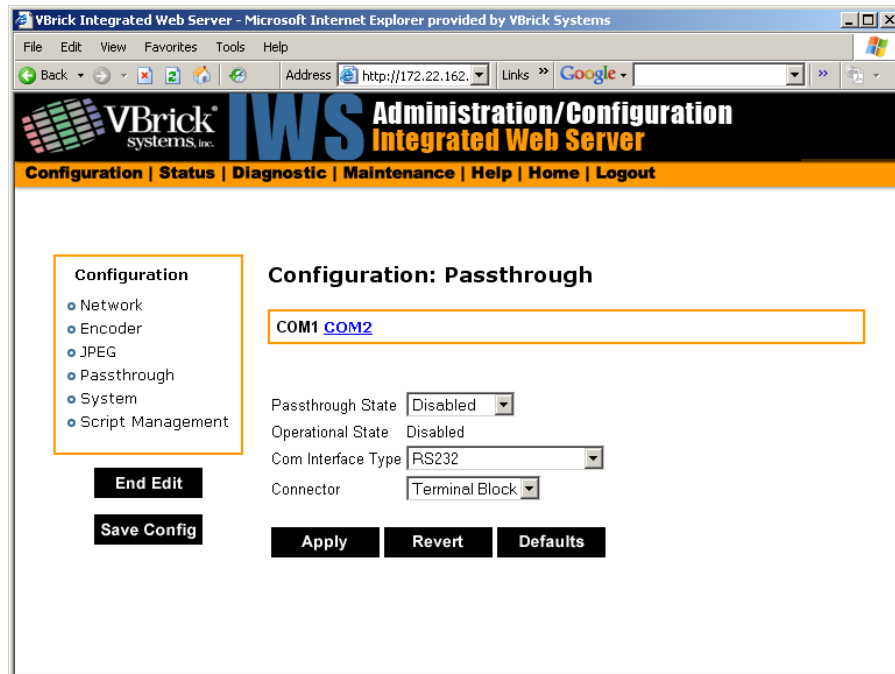
Conferencing Setup	This option enables/disables the ability of a user to initiate a conference using an IR remote control unit. Disabled prevents this VBrick from appearing on the Conference Guide of other VBricks.
Conferencing Accept	If Manual , the called party on this VBrick must explicitly accept the call with the IR remote control. If automatic, the call will be accepted without any action on the part of the called party.
Local Ringer	Used to enable/disable the ringer.
Conference End Display Mode	Allows the choice of what is displayed when the conference ends. Display either Picture-in-Picture (with the local encoder view) or a Blank Screen.
Local Ringer IR	If Enabled, the ringer may be enabled or disabled via the IR remote by the user (operator) of this VBrick. If disabled, the local operator cannot change the state of the ringer. It will remain as set above in "local ringer".
Conferencing Name	Used to configure the name of the user (operator) of this VBrick. This is the name, which will appear on the conference guide screen used to set up the conference. The default entry is \h or \H, which identifies the unit by the Host Name of VBrick appliance.
SAP IP Address	The SAPs for Conference Call setup are sent to this destination IP Address.
SAP Port	The SAPs for Conference Call setup are sent to this destination IP/UDP port.
SAP Retransmit Time	Allows setting the SAP retransmit time.

Configuration: Passthrough

The TCP/IP network can serve as an intermediary between two VBricks and their serial ports or between a PC application sending IP packets and a VBrick's serial port. Passthrough can be configured using addresses on Ethernet or using addresses on ATM. Passthrough on COM2 is only available on VBricks with a CPLD (programmable logic device) Version greater than 21. (To check the CPLD, go to **Status > System Information > CPLD Version**.) *If the IWS screens do not provide a COM1 or COM2 selection at the top of the Passthrough screen, the VBrick defaults to COM1.* This feature supports a wide range of serial applications. See [Serial Port Passthrough](#) on page 16 for more information. Note that RS-232/422/485 end-to-end control is initiated by enabling or disabling Passthrough. The Passthrough port for COM1 is 4439; the port for COM2 is 4414.

Note COM2 is a dual purpose interface. At the factory default it can be used as a serial connection to the VBrick Command Line Interface (CLI) tool for configuration purposes. When configured for Passthrough, the CLI feature is used for camera control.

Configuration: Passthrough > COM1



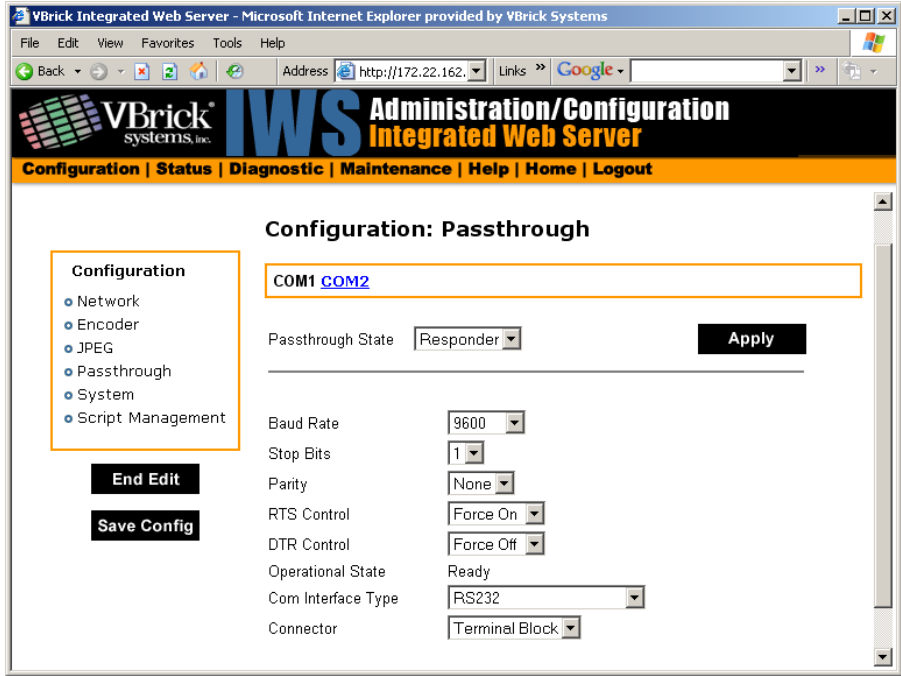
Passthrough State

Used to enable/disable Passthrough. Three states are possible:

- Disabled – The VBrick will neither initiate nor respond to Passthrough setup requests.
 - Responder – In this case the VBrick will accept a connection request (up to 64 connection requests) from another VBrick set as an Initiator or from a PC camera control application.
 - Initiator – In this case it will continuously attempt to automatically initiate a Passthrough connection to the remote destination.
-

Operational State	Describes the current status of a Passthrough connection, including error conditions, if any. Refer to the Network Status Section. This will display "Active" if in Passthrough mode.
COM Interface Type	Describes the COM interface connector. (RS422/485 options are displayed only if main board has a Part Number ending in xxx3. See Status: User Information > Main Board.) <ul style="list-style-type: none"> • RS232 – standard RS-232 serial port connector. • RS422/485 – RS-422/485 4-wire serial port connector. • RS422/485 (Terminated) – RS-422/485 with terminal block.
Connector	This option is only displayed if the main board has a Part Number with xxxx-xx30-xxx3. See Status: User Information > Main Board. <ul style="list-style-type: none"> • Terminal Block – screw-down wire connector. This option is provided in addition to standard RJ-45 connectors. Use either connector. Terminal block pinouts are described in RS-422/485 (COM 1/COM2) on page 219. • RJ45 – standard RJ-45 8-wire connector.

Passthrough State: Responder



Baud Rate	Rate can be set to the following (Default = 9600): 110, 300, 600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, 115200.
Stop Bits	Number of stop bits for Passthrough port (1 or 2).
Parity	None, Even, Odd.

RTS Control	Force Off, Force On or Automatic. If automatic, the control will be on when Passthrough is active. DTR and RTS are available for COM2 only for those VBrick models whose last digit is 3 or higher. Under no conditions are RTS or DTR controls passed through end-to-end. All control handling is local.
DTR Control	Force Off, Force On or Automatic. If automatic, the control will be On when Passthrough is active. See note above.
Operational State	Describes the current status of a Passthrough connection, including error conditions, if any. Refer to the Network Status Section. This will display "Active" if in Passthrough mode.
COM Interface Type	Describes the COM interface connector. (RS422/485 options are displayed only if main board has a Part Number ending in xxx3. See Status: User Information > Main Board.) <ul style="list-style-type: none"> • RS232 – standard RS-232 serial port connector. • RS422/485 – RS-422/485 4-wire serial port connector. • RS422/485 (Terminated) – RS-422/485 with terminal block.
Connector	This option is only displayed if the main board has a Part Number with xxxx-xx30-xxx3. See Status: User Information > Main Board. <ul style="list-style-type: none"> • Terminal Block – screw-down wire connector. This option is provided in addition to standard RJ-45 connectors. Use either connector. Terminal block pinouts are described in RS-422/485 (COM1/COM2) on page 219. • RJ45 – standard RJ-45 8-wire connector.

Passthrough State: Initiator

The screenshot shows the VBrick IWS Administration/Configuration web interface. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.162.". The page header includes the VBrick logo and "IWS Administration/Configuration Integrated Web Server". The navigation menu includes "Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout".

The main content area is titled "Passthrough State" and has a dropdown menu set to "Initiator". Below this, there are several configuration sections:

- Destination:** A dropdown menu set to "Dedicated" with an "Apply" button.
- Dedicated Address Mode:** Radio buttons for "IP Address" (selected) and "Host Name".
- Dedicated Host Name:** A text input field.
- Dedicated IP Address:** A text input field.
- Dedicated Port:** A text input field containing "4439".
- Baud Rate:** A dropdown menu set to "9600".
- Stop Bits:** A dropdown menu set to "1".
- Parity:** A dropdown menu set to "None".
- RTS Control:** A dropdown menu set to "Force On".
- DTR Control:** A dropdown menu set to "Force Off".
- Operational State:** A dropdown menu set to "No Dedicated IP Address".
- Com Interface Type:** A dropdown menu set to "RS232".
- Connector:** A dropdown menu set to "Terminal Block".

At the bottom left, there are two buttons: "End Edit" and "Save Config".

Destination	<ul style="list-style-type: none"> Remote COM1 using Slot1 Video Endpoint. This means that all serial data originating at the COM1 port being configured is sent to the COM1 port of the VBrick identified as the Slot1 video source (if Slot1 is a decoder) or to the Slot1 video destination VBrick (if Slot1 is an encoder). Dedicated. When Passthrough State is set as Initiator and the Destination is Dedicated, the VBrick appliance (whose serial port is the destination of this COM port) can be configured and identified using either an IP address or a host name. Remote COM2 using Slot1 Video Endpoint. Slot 1 Destination 1 only. Same as above except Initiator destination is COM2.
Baud Rate	Rate of Passthrough port. Rate can be set to the following (Default = 9600): 110, 300, 600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, 115200.
Stop Bits	Number of stop bits for Passthrough port (1 or 2).
Parity	None, Even, Odd.
RTS Control	Force Off, Force On or Automatic. If automatic, the control will be on when Passthrough is active. DTR and RTS are not available for COM2. Under no conditions are RTS or DTR controls passed through end-to-end. All control handling is local. DTR and RTS are not available for COM2.
DTR Control	Force Off, Force On or Automatic. If automatic, the control will be On when Passthrough is active. Not available on COM2. See note above.
Operational State	Describes the current status of a Passthrough connection, including error conditions, if any. Refer to the Network Status Section. This will display Active if in Passthrough mode.
COM Interface Type	Describes the COM interface connector. (RS422/485 options are displayed only if main board has a Part Number ending in xxx3. See Status: User Information > Main Board.) <ul style="list-style-type: none"> RS232 – standard RS-232 serial port connector. RS422/485 – RS-422/485 4-wire serial port connector. RS422/485 (Terminated) – RS-422/485 with terminal block.
Connector	This option is only displayed if the main board has a Part Number with xxxx-xx30-xxx3. See Status: User Information > Main Board. <ul style="list-style-type: none"> Terminal Block – screw-down wire connector. This option is provided in addition to standard RJ-45 connectors. Use either connector. Terminal block pinouts are described in RS-422/485 (COM 1/COM2) on page 219. RJ45 – standard RJ-45 8-wire connector.

Dedicated Address Mode

When the Passthrough State is set as Initiator and the Destination is Dedicated, the VBrick appliance can be configured and identified using either an IP address or Host Name.

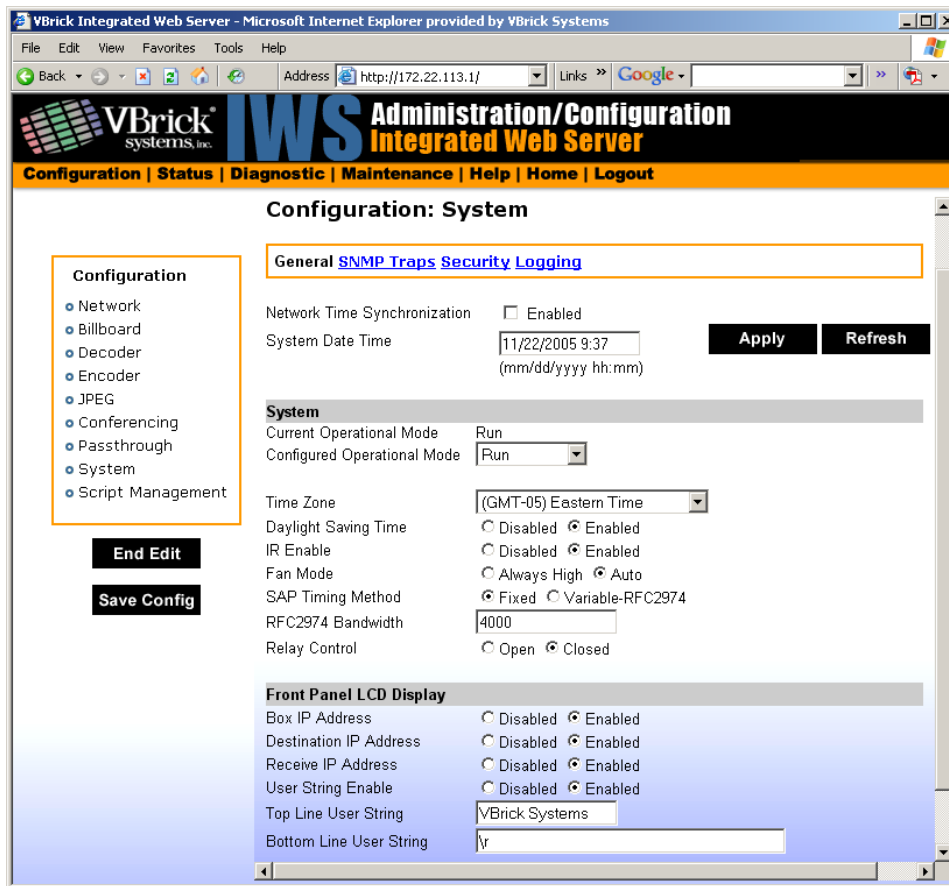
Configuration: Passthrough > COM2

Passthrough settings for COM2 are a subset of COM1. See [Configuration: Passthrough > COM1](#) for complete details. As noted, DTR and RTS are not available for COM2. Under no conditions are RTS or DTR controls passed through end-to-end. All control handling is local.

Configuration: System

This menu allows the user to set-system related parameters.

Configuration: System > General



Network Time Synchronization	Enabled or Disabled. If enabled, the System Date Time field is inactive. See Network Time Synchronization on page 41 to set host name or IP address of time server. <i>You must set these parameters before you can enable Network Time Synchronization on this window.</i>
System Date Time	Set system date and time in mm/dd/yyyy hh:mm format.

System

Current Operational Mode	Indicates the current operational mode of the VBrick. The following modes are supported. Note: Changing the Operational Mode automatically reboots the VBrick.
Configured Operational Mode	Indicates the configured operational mode of the VBrick. The following modes are supported: <ul style="list-style-type: none"> • Run Mode – Normal operation. • Diagnostics – User selected mode for running certain VBrick diagnostics.
Time Zone	Select from list: (GMT-12) Eniwetok – (GMT +12) Auckland.
Daylight Savings Time	Enabled or Disabled.
IR Enable	Enable or Disable the IR remote control. This is the master enable and disable for the IR across all functions.
Fan Mode	This option allows a user to either force the fan always high or to automatically cycle on and off based on measured temperature. Default = Automatic. Note: This option is only available on VBrick models with a main board assembly whose last four digits are 0206 or higher.
SAP Timing Method	Fixed or Variable - If fixed, the SAP timing will operate as defined in the encoder, decoder and pump screens with fixed SAP transmission and timeouts. If variable is selected, the entire VBrick will use SAP timing as defined in RFC 2974. For most applications, Fixed Timing should be used.
RFC2974 Bandwidth	Allows setting the SAP bandwidth allocation in Bits per second. This setting is used only when the Timing Method is set to Variable.
Relay Control	This option allows forcing the relay connection to Open or Closed. Note: This option is only available on VBricks with a main board assembly whose last four digits are 0205 or higher.

Front Panel LCD Display

These settings will be displayed for approximately 6 seconds. After 6 seconds the LCD will display the current release, IP address, hostname plus transmit and receive addresses.

Box IP Address	Enable or Disable the Box IP Address display on the Front Panel Display.
Destination IP Address	Enable or Disable the Destination IP Address display on the Front Panel Display.
Receive IP Address	Enable or Disable the Receive IP Address display on the Front Panel Display.
User String Enabled	Enable or Disable the text displayed on the front panel LCD of the VBrick appliance can be user defined.

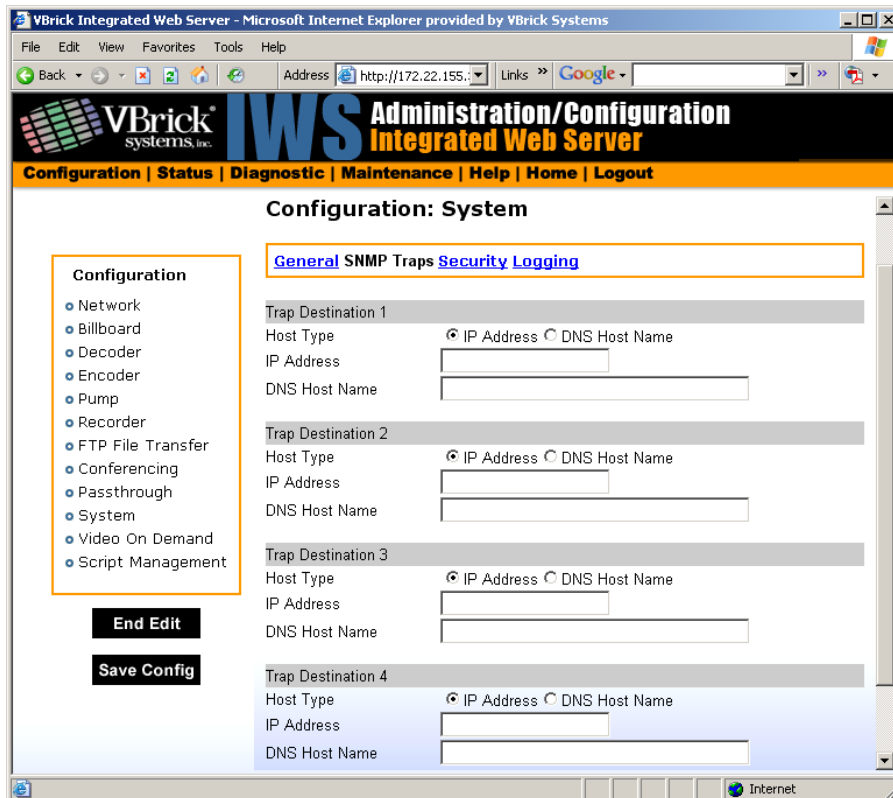
Top Line User String	The top line can support up to 16 characters. (characters in excess of 16 will scroll across the display for the bottom line).
Bottom Line User String	The bottom line up to 40 characters.

Configuration: System > SNMP Traps

SNMP Traps are a subset of the SNMP management component of the VBrick. Use of any element of the SNMP management system requires use of an SNMP browser or SNMP manager application (not supplied). The SNMP MIB, which formally defines the SNMP interface to the VBrick, is contained within the install directory of the VBrick release or from the VBrick . The two MIB files are `VBrick_box2.mib` and `VBrick_reg.mib`. *The default installation directory is one of the following:*

`Program Files\VBrick\Wm9\Download\ReleaseVxx_xx_xx`
`Program Files\VBrick\VB6000\Download\ReleaseVxx_xx_xx`

Traps are SNMP base messages used by SNMP elements to report changes in statuses or alarm conditions to remote SNMP management entities. Traps are generally used to alert network administrators of potential equipment problems or other noteworthy events. Two types of information are conveyed in the trap mechanism: Events and Alarms. Events Traps are sent every time the monitored event occurs. Events have only one state. Alarms are events having two states, Active and Clear. When the alarm condition is first detected, an alarm active trap is emitted. Alarms are considered active until the condition cleared and the alarm clear trap is emitted.



Trap Destination IP Address (1–4)	The IP Addresses of SNMP management stations to which traps are to be sent. The SNMP management application should be active on these stations in order to receive a number of SNMP Traps, which are supported by the VBrick. Enterprise-specific traps listed in order of trap identification number are shown in the following table.
-----------------------------------	---

Table 2. Trap Summary Tables

Number	Description (Event or Alarm Trap)
1	There is loss of video input on slot1 Encoder (models ending in -xxx1/-xxx2).
2	The loss of video input on slot1 Encoder failure has cleared.
3	There is loss of video input on slot2 Encoder (models ending in -xxx1/-xxx2).
4	The loss of video input on slot2 Encoder failure has cleared (models ending in -xxx1/-xxx2).
5	The box has started up in Run mode.
6	The box has started up in Diagnostics mode.
7	The box has started up in Limited Run mode.
8	The box has received a reset request from an administrator.
9	There is a fan failure.
10	The fan failure is recovered.
11	The temperature of the unit is out of range. Will be sent when the unit's internal temperature becomes too high or too low.
12	The temperature out of range condition has cleared.
13	The 24 volts power supply failure.
14	The 24 volts power supply failure has cleared.
15	The 12 volts power supply failure.
16	The 12 volts power supply failure has cleared.
17	The 5 volts power supply failed.
18	The 5 volts power supply failure has cleared.
19	The 3.3 volts power supply failed.
20	The 3.3 volts power supply failure has cleared.
21	The 2.5 volts power supply failed.
22	The 2.5 volts power supply failure has cleared.
23	There is a Real Time Clock battery failure.
24	The unit has been configured to transmit and/or receive video streams beyond its capability.

Number	Description (Event or Alarm Trap)
25	Signifies the overloaded unit is recovered to normal.
26	A component on the main board failed Power On Self Test (POST).
27	The ATM card failed Power On Self Test (POST).
28	The encoder card in slot 1 failed Power On Self Test (POST).
29	The encoder card in slot 2 failed Power On Self Test (POST).
30	The decoder card in slot 1 failed Power On Self Test (POST).
31	The decoder card in slot 2 failed Power On Self Test (POST).
32	A loss of Sync condition is currently active, on the physical ATM interface A.
33	The loss of Sync condition on the physical ATM interface A has cleared.
34	A loss of Sync condition is currently active, on the physical ATM interface B.
35	The loss of Sync condition on the physical ATM interface B.
36	Loss of Frame condition is currently active, on the physical ATM interface A.
37	The loss of Frame condition on the physical ATM interface A has cleared.
38	A loss of Frame condition is currently active, on the physical ATM interface B.
39	The loss of Frame condition on the physical ATM interface B has cleared.
40	The transmission convergence (TC) sublayer is actively reporting A loss of Cell Delineation condition on the physical ATM interface A.
41	The transmission convergence (TC) sublayer is no longer reporting A loss of Cell Delineation condition on the physical ATM interface A.
42	The transmission convergence (TC) sublayer is actively reporting A loss of Cell Delineation condition on the physical ATM interface B.
43	The transmission convergence (TC) sublayer is no longer reporting A loss of Cell Delineation condition on the physical ATM interface B.
44	There is a problem with the SDI input of slot 1 encoder.
45	The problem with the SDI input of slot 1 encoder has cleared.
46	There is a problem with the SDI input of slot 2 encoder.
47	There is no longer any problem with the SDI input of slot 2 encoder.
48	An overbooked (excessive traffic) condition on the ATM OC3 physical interface is currently active.
49	The overbooked (excessive traffic) condition on the ATM OC3 physical interface has cleared.
50	An overbooked (excessive traffic) condition on the ATM virtual interface 1 is currently active.

Number	Description (Event or Alarm Trap)
51	The overbooked (excessive traffic) condition on the ATM virtual interface 1 has cleared.
52	An overbooked (excessive traffic) condition on the ATM virtual interface 2 is currently active.
53	The overbooked (excessive traffic) condition on the ATM virtual interface 2 has cleared.
54	An overbooked (excessive traffic) condition on the ATM virtual interface 3 is currently active.
55	The overbooked (excessive traffic) condition on the ATM virtual interface 3 has cleared.
56	An overbooked (excessive traffic) condition on the ATM virtual interface 4 is currently active.
57	The overbooked (excessive traffic) condition on the ATM virtual interface 4 has cleared.
58	An overbooked (excessive traffic) condition on the ATM virtual interface 5 is currently active.
59	The overbooked (excessive traffic) condition on the ATM virtual interface 5 has cleared.
60	An overbooked (excessive traffic) condition on the ATM virtual interface 6 is currently active.
61	The overbooked (excessive traffic) condition on the ATM virtual interface 6 has cleared.
62	An overbooked (excessive traffic) condition on the ATM virtual interface 7 is currently active.
63	The overbooked (excessive traffic) condition on the ATM virtual interface 7 has cleared.
64	An overbooked (excessive traffic) condition on the ATM virtual interface 8 is currently active.
65	The overbooked (excessive traffic) condition on the ATM virtual interface 8 has cleared.
66	All the available free space on the hard disk has been exhausted. Attempts to store new information to the disk will fail. This trap is emitted whenever available space falls below 100 MB. The recorder automatically stops after this trap is sent.
67	Unrecoverable hard drive or hard drive subsystem failure
68	Error in establishing ILMI connectivity with ATM network
69	The error in establishing the ILMI connectivity with ATM network has cleared
70	The ATM SAAL layer has become failed

Number	Description (Event or Alarm Trap)
71	The ATM SAAL layer has recovered
72	The ATM SVC TerminationPoint1 failed to connect to the remote system
73	The ATM SVC TerminationPoint1 has successfully connected to the remote system
74	The ATM SVC TerminationPoint2 failed to connect to the remote system
75	The ATM SVC TerminationPoint2 has successfully connected to the remote system
76	The ATM SVC TerminationPoint3 failed to connect to the remote system
77	The ATM SVC TerminationPoint3 has successfully connected to the remote system
78	The ATM SVC TerminationPoint4 failed to connect to the remote system
79	The ATM SVC TerminationPoint4 has successfully connected to the remote system
80	Network Time Sync Server Down.
81	Network Time Sync Server Up.

Configuration: System > Security

The screenshot shows the VBrick Integrated Web Server Administration/Configuration interface. The browser window title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.155.". The page header includes the VBrick logo and "IWS Administration/Configuration Integrated Web Server". A navigation bar contains links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Configuration: System" and has a sub-section for "General SNMP Traps Security Logging". The configuration options are:

- External Telnet Server: Disabled Enabled
- External FTP Server: Disabled Enabled
- External IWS: Disabled Enabled
- External SNMP: Disabled Enabled

Below these options is a text input field for "IWS Server Port" with the value "80". At the bottom of the configuration area are three buttons: "Apply", "Revert", and "Defaults". A separate "End Edit" button is located at the bottom left of the main content area.

Note If you disable Telnet, FTP, IWS, and SNMP, the only way to manage (and re-enable) these parameters is to connect a PC to the VBrick with a serial cable and use the Command Line Interface (CLI). You should never disable all the network management interfaces if you are using COM2 for serial passthrough.

External Telnet Server	Default = Enabled. Disabled will prevent Telnet sessions to the server.
External FTP Server	Default = Enabled. Disabled will prevent FTP sessions to the server including downloading to the VBrick. Note that this feature must be enabled to upgrade the appliance firmware using VBDownload.
External IWS	Default = Enabled. Disabled will prevent you from managing the VBrick from a web browser using the IWS application.
External SNMP	Default = Enabled. Disabled will prevent you from using an external MIB browser to view or write parameters.
IWS Server Port	Specifies the listener port for management and HTTP connections. Default = 80. Typically port 80 is the default value used by PC web browsers. To access a different HTTP port, the remote IWS client user would specify the URL as follows: <code>http://IPaddress:port</code> where <code>IPaddress</code> = VBrick IP address or hostname, and port.

Improving Security

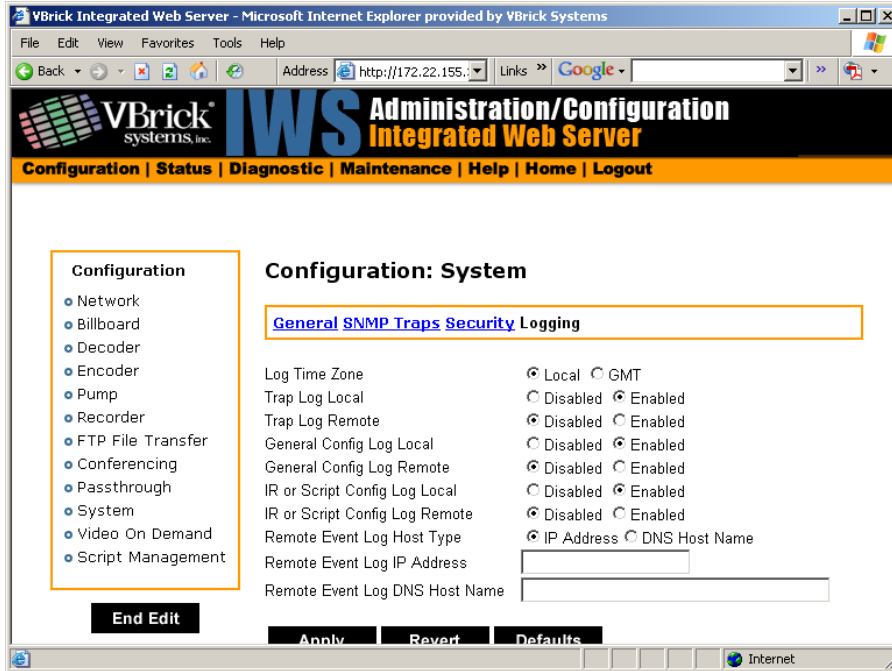
You can improve security by (1) blocking unauthorized attempts to login and access a device and (2) by reducing exposure to malicious software attacks. The most common vulnerability is related to user accounts and passwords. After a successful installation, you should immediately change the default passwords. Many attacks come from within an organization and this helps to minimize the risk. The IWS login is generally secure since it utilizes encryption techniques to hide usernames and passwords from network spyware.

Malicious software covertly attaches itself to unsuspecting devices. These programs are generally designed to compromise personal information or to create system havoc. Since the VBrick appliance uses an industrial-grade operating system, it is less susceptible to malicious software and unlikely to be a target of programs designed to attack PC-based systems like Microsoft, Linux, and others. However, you can still take additional steps to minimize risk. VBrick tries to make installation as simple and quick installation and many features are automatically enabled by default even though you may not need them. You can selectively disable unneeded features to reduce vulnerability. Another common problem is Denial of Service (DoS) attacks. A DoS sends floods of packets to an unsuspecting remote system in an attempt to disrupt or stop normal operation. These unsuspecting remote systems are typically discovered using ICMP or ping. It is standard industry practice to block all ICMP and ping requests from off-net foreign hosts. This is typically done in a centralized location using router/firewall technology which is more successful and cost effective than resolving the issue at each host.

Configuration: System > Logging

Certain log events are captured and can be viewed locally. This local log is saved in volatile memory and hold the most recent 20 entries. See [Status: System Log](#) on page 162 for

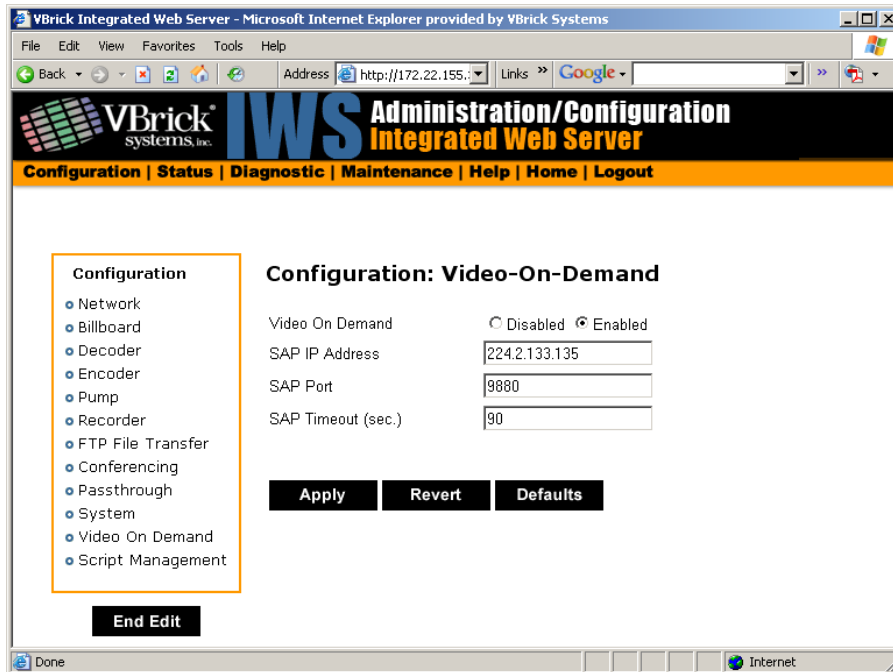
examples of log information. To save log information indefinitely, it is recommended that remote logging be utilized. Remote servers generally offer ample storage and offer the additional benefit of collecting log information from several VBricks simultaneously. When logging externally, specify either the IP address or hostname a server that is configured to receive SNMP traps on port 162 into the Remote Event Log IP Address or Remote Event Log DNS Host Name fields.



Log Time Zone	Specifies the time zone (Local or GMT) that is used for logged events.
Trap Log Local	If Enabled, displays trap events in the local log.
Trap Log Remote	If Enabled, sends trap event notices to a remote host.
General Config Log Local	If Enabled, displays configuration changes in the local log.
General Config Log Remote	If Enabled, sends configuration change notices to a remote host.
IR or Script Config Log Local	If Enabled, displays IR or script-generated configuration changes in the local log.
IR or Script Config Log Remote	If Enabled, sends IR or script-generated configuration changes to a remote host.
Remote Event Log Host Type	Identify remote event log server by host name.
Remote Event Log IP Address	Identify remote event log server by IP address.
Remote Event Log DNS Host Name	Host name of remote event log server.

Configuration: Video On Demand

This screen is used to configure the capability of the VBrick to support VBrick's legacy Video on Demand server (VBVoD). This is *not* the VoD server used with VBrick's ETV Portal Server.



Video On Demand	Enables or Disables the Video-on-Demand capability of the VBrick appliance. When enabled, the user will be able to view Video-on-Demand SAPs in the Program Guide. If authorized, the user will be able to select Video-on-Demand SAPs and access the Video-on-Demand features of the VoD server sending the SAP. If disabled, the user will not see Video-on-Demand SAPs in the Program Guide.
SAP IP Address	The IP Address for Video-on-Demand SAPs Default value is 224.2.133.135 (as shown).
SAP Port	The Port for Video-on-Demand SAPs Default value is 9880 (as shown).
SAP Timeout	The Video-on-Demand SAP timeout, in seconds. Default value is 90 (as shown).

Note The values of the SAP IP Address and Port must correspond to the values set on the VBVoD servers sending Video-on-Demand SAPs. If the values of the SAP IP Address or Port are changed without changing the values on the VoD servers, Video-on-Demand SAPs will not be received even if when Video-on-Demand is enabled.

Configuration: Script Management

The VBrick appliance can be set up to use serial (COM1) Pins 7 and 8, or 0 through 9 on the IR Remote as input events to trigger the VBrick to run scripts. The script files execute certain commands using VBrick SDK parameters to activate certain functions within the VBrick appliance. There are a total of four possible input events (COM1 Pin8 Low, COM1 Pin8 High, COM1 Pin7 Low, COM1 Pin7 High) and ten possible input events using the IR Remote, each with one associated script file. When a script containing configuration commands is executed, it executes an automatic **End Edit** followed by a **Begin Edit**. This will terminate an active editing session in IWS.

Note For examples of how to use the VB6000 event triggering feature to control a VBrick with an external switch, see [Event Triggering](#) on page 221.

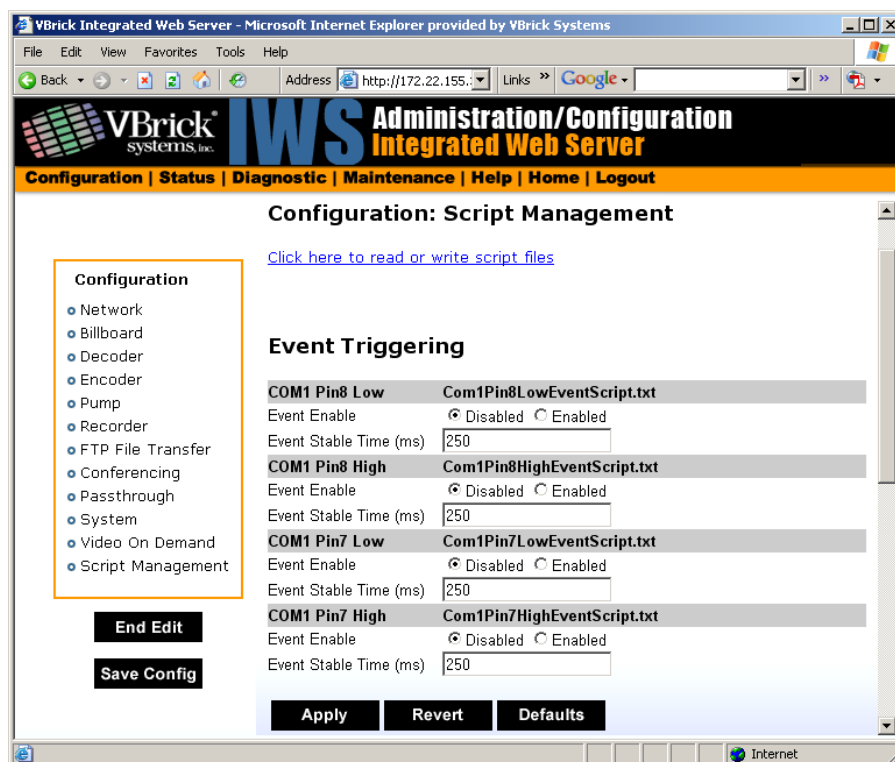


Figure 5. Script Management – Part 1

Click here to read or write ...	Login to the VBrick via FTP and manage script files. Requires a valid user name and password.
Event Enable	Allows the user to Enable / Disable Event Triggering for each input event.
Event Stable Time	Allows the user to enter the amount of time in milliseconds that each input event has to be stable at the active level before the script will be executed.

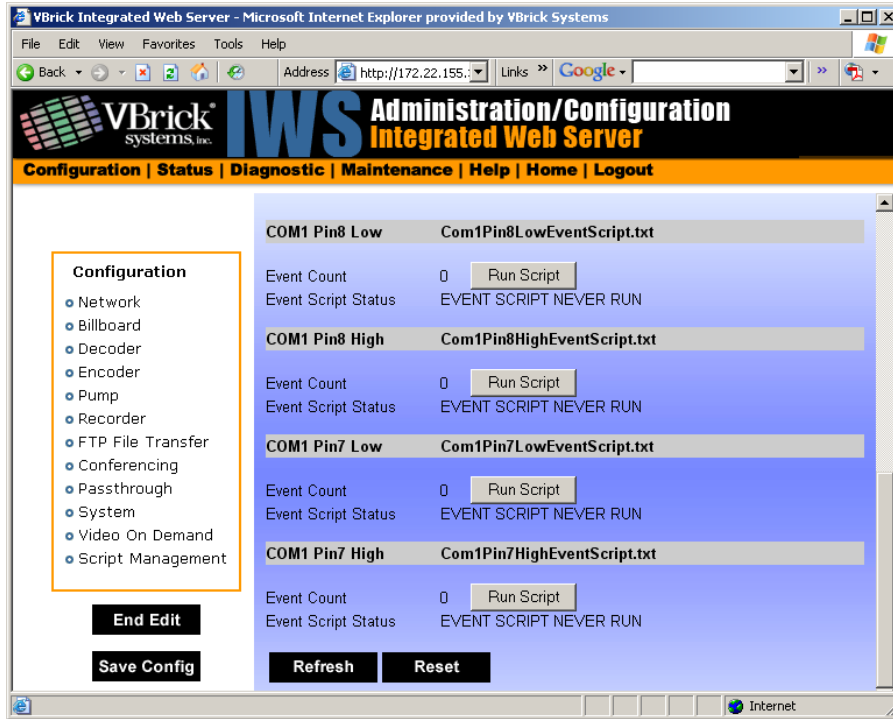


Figure 6. Script Management – Part 2

Event Count	Displays the number of times each input event has occurred.
Event Script Status	Displays current status information for each event script.
Run Script	These buttons allow the user to run each script without needing the input event.

IR Remote Scripts

IR Remote Control scripts are enabled by simply placing a file named `irNScript.txt` (where `N` is a number between 0 and 9) in the script directory of the unit. For example naming the following script `ir0Script.txt` will enable the 0 on the IR remote to trigger the unit to run the script.

Sample VBrick Script

```
vbrickSlot2EncoderNetworkTransmitEnable = 2 // set enable slot 2 encoder transmit
vbrickSlot2EncoderNetworkApplySet = 2 // apply above encoder network set
* // end of a group
```

```
vbrickHDRRecorderControlMode = 1 // set recorder to user controlled mode
vbrickHDRRecorderControlIrEnable = 1 // disable recorder ir control
vbrickHDRRecorderControlName = event1record.mpg // set recorder file name
vbrickHDRRecorderControlDuration.value = 30 // set recorder duration to 30 seconds
vbrickHDRRecorderControlBatchEnable = 1 // set recorder batch to disabled
vbrickHDRRecorderControlApplySet = 2 // apply above recorder control sets
* // end of a group
```

```
vbrickHDRRecorderControlFtpEnable = 1 // disable auto ftp after record
```

```
vbrickHDRRecorderControlApplySet = 2 // apply above recorder control set
vbrickHDRRecorderNetworkReceiveType = 1 // set recorder receive type to ip address
vbrickHDRRecorderNetworkReceiveIpAddr = 239.22.129.3 // set recorder receive ip
address
vbrickHDRRecorderNetworkReceivePort = 4443 // set recorder receive port
vbrickHDRRecorderNetworkApplySet = 2 // apply above recorder network sets
* // end of a group

vbrickHDRRecorderOperationStart = 2 // start recording
* // end of a group

wait = 5000 // wait for 5000 milliseconds
* // end of a group

vbrickSlot1EncoderNetworkTransmitEnable = 2 // set enable slot 1 encoder transmit
vbrickSlot1EncoderNetworkApplySet = 2 // apply above encoder network set
* // end of a group
```

Scripting Notes

- * denotes end of group.
- Each group can have a maximum of six sets.
- Each group must have apply sets for all normal sets.
- Wait state will be alone in a group.
- There is no clear command.
- Script commands must start in column 1.
- There is no chaining of scripts.
- Comments will start with / and can be a line or the end of a command.
- All scripts are executed in a strictly serial manner by a single task.
- While executing a script it is possible to miss a double change of any event.

MPEG-4 Configuration

Topics in this chapter

[Introduction](#)

[MPEG-4 Overview](#)

[Configuration: Network](#)

[Configuration: Billboard](#)

[Configuration: Decoder](#)

[Configuration: Encoder](#)

[Configuration: JPEG](#)

[Configuration: Conferencing](#)

[Configuration: Passthrough](#)

[Configuration: System](#)

[Configuration: Script Management](#)

Introduction

Screens vary with individual hardware configurations. This list contains items that do not appear on every unit; for instance, the screens that appear with a model containing dual encoders will not be the same as a model containing an encoder with one MPEG-2 decoder, etc. Configurations may include:

- Network – All VBrick models
- Billboard – Only on models which contain Decoders (Include MCS future feature extensions)
- Decoder – Single or dual or Hybrid MPEG-2/MPEG-4 models
- Encoder – Single or dual
 - Hybrid MPEG-2/MPEG-4 models
 - MPEG-4
 - RTP Network (Realtime Transport Protocol Network)
 - RTSP Server (Realtime Streaming Protocol Server)

MPEG-4 Overview

MPEG-4 is a method for packaging pictures (video) and sounds (audio) so they can be sent from a computer or VBrick to another computer over a network connection. The VBrick approach provides quality video while using fewer resources than other methods. Also, since MPEG-4 is an internationally recognized standard, it can be viewed by many hardware and

software products available on the market, including many free video player products. The encoder conforms to the MPEG-4 standard, and in addition supports the Internet Streaming Media Alliance (ISMA) implementation specification for MPEG-4. This specification makes it easier for MPEG-4 products from different companies to work together. An MPEG-4 encoder interoperates using ISMA Profile 0 when it is set up to do so, in order to provide this broad compatibility. If desired, the profile can be changed to enable the encoder to produce better quality pictures and sound than can be achieved using ISMA Profile Level 0. Profiles are set in the Configuration: Encoder > Video section of IWS.

In order to provide the ability to see the video and hear the audio using MPEG-4, there has to be a delivery method. VBrick uses the industry standard delivery method called RTP/RTCP (Realtime Transport Protocol/Realtime Transport Control Protocol) to transport MPEG-4 audio and video information. The design behind delivering MPEG-4 through RTP/RTCP requires that the audio/video presentation be divided into three different information streams (one for video, audio and closed captioning) that are re-combined when received by an MPEG-4 player to recreate the original presentation. Sending information from a video camera, or any video source, across the country over the Internet is easy using MPEG-4. After the video and audio is packaged and the RTP/RTCP delivery method is determined, the final requirement is that the destination location be set to receive the information or stream. The following section suggests four ways that users can accomplish this using VBrick software and a VBrick encoder appliance.

Configuration: Network

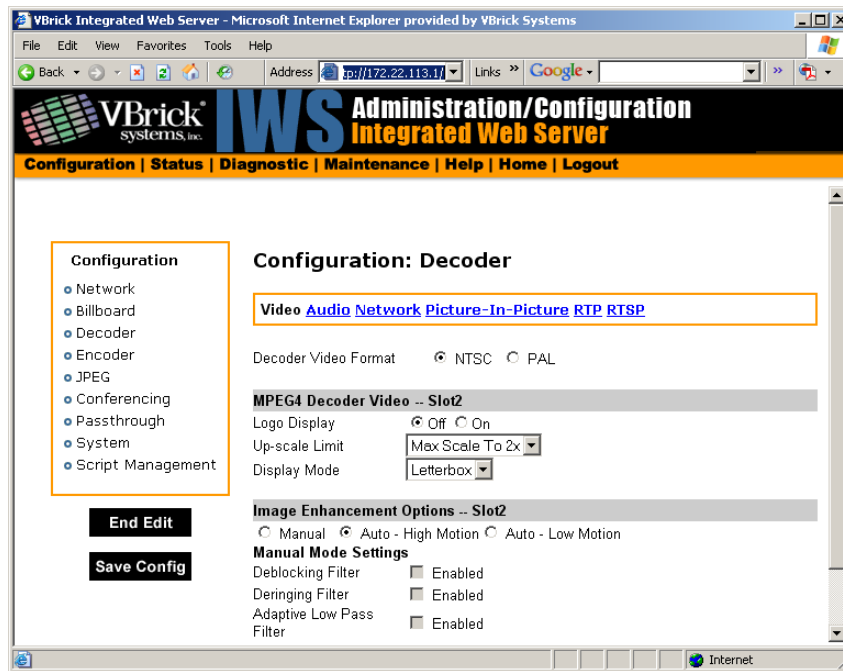
See MPEG-2 [Configuration: Network](#) on page 39.

Configuration: Billboard

See MPEG-2 [Configuration: Billboard](#) on page 44.

Configuration: Decoder

Configuration: Decoder > Video



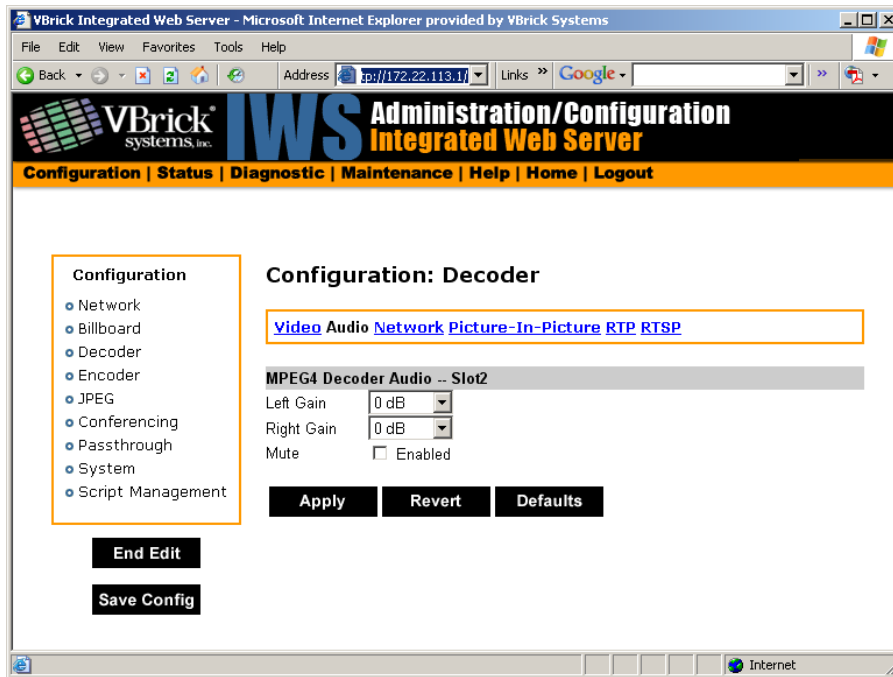
MPEG4 Decoder Video

Video Format	The format can be configured to be NTSC (30fps) or PAL (25fps).
Logo Display	Allows the user to display the VBrick logo on the decoder output (monitor). The logo.htm file located in the LOGO directory in flash allows the user to configure a customized logo. The file is simple HTML and supports local or remote GIF and JPG files. HTML is used to provide transparency, blending and placement of the logo.
Upscale Limit	The decoder can resize (scale) the received video image from the encoder to one of 3 choices – full screen, max scale to 2X and max scale to 4X.
Display Mode	The decoder can display the received video in one of three modes: Letterbox, Crop, Stretch. This option is rarely used as VBrick encoded video is produced in 4:3 format.

Image Enhancements

There are several auto enhancement options that the decoder can apply to help improve the quality of the video being displayed. The auto modes will remove filtering for higher rate streams where the filtering will reduce detail. A manual mode is also provided to allow the user to fine-tune the video. The de-blocking filter reduces macro-blocking, the de-ringing filter reduces the noise commonly seen around the edges of a video object and the low pass filter reduces high frequency noise. A combination of De-blocking and De-ringing, and adaptive low pass filters can only be set in manual mode.

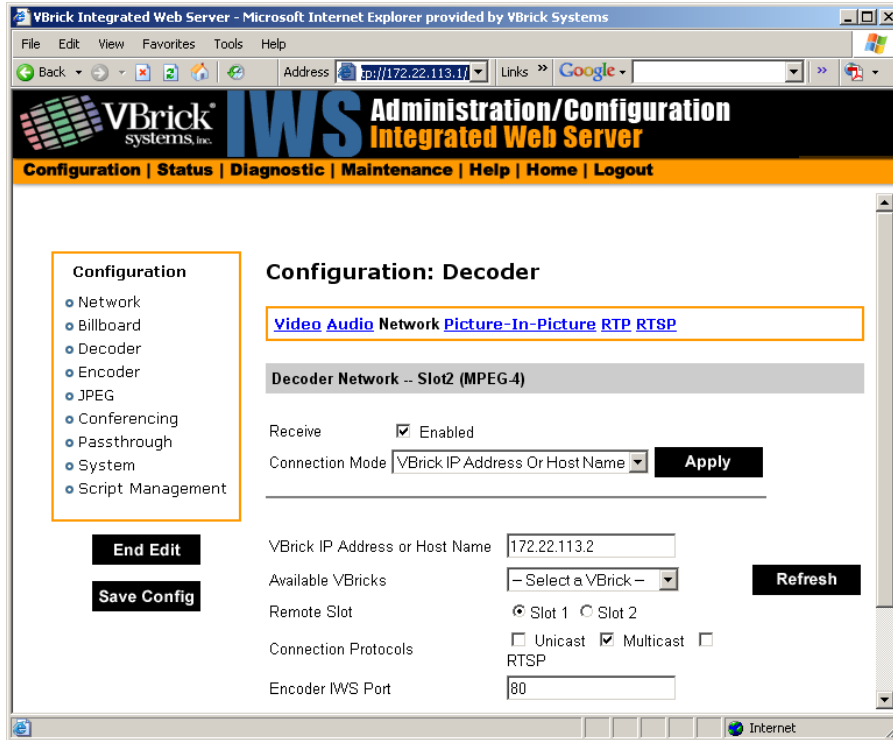
Configuration: Decoder > Audio



Left Gain	Used to adjust audio output gain (volume). Range is +12 to -34.5. Default is 0.
Right Gain	Used to adjust audio output gain (volume). Range is +12 to -34.5. Default is 0.
Mute	Used to mute the audio output to the TV or monitor.

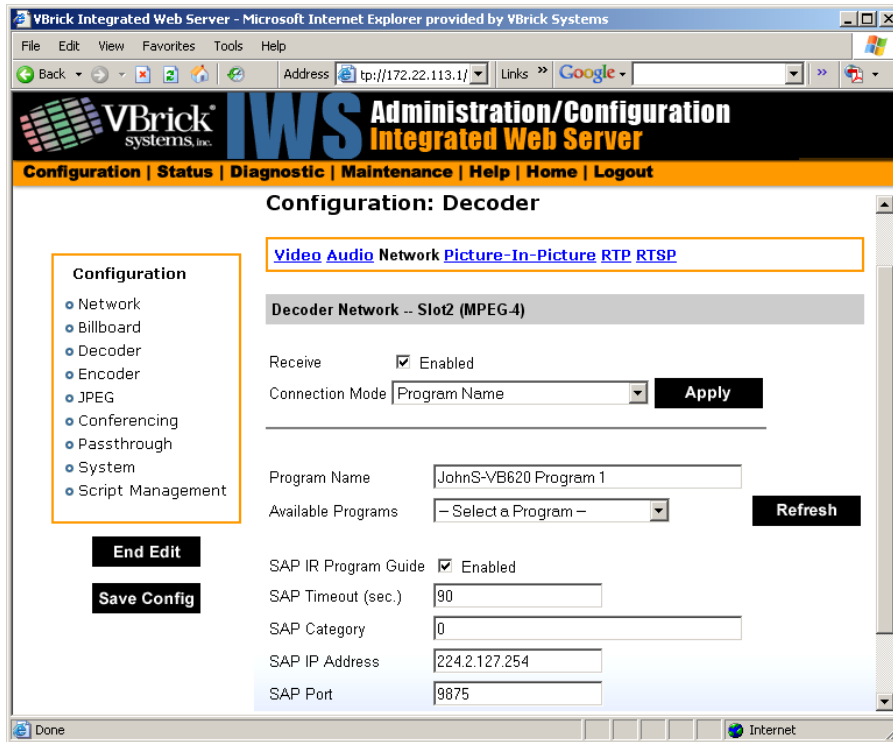
Configuration: Decoder > Network

The decoder connection mode automatically configures the page to display the appropriate options for each of the modes. The one shown below reflects **VBrick IP Address or Hostname** mode and its associated settings. All connection modes include the ability to disable reception via the **Receive** checkbox.



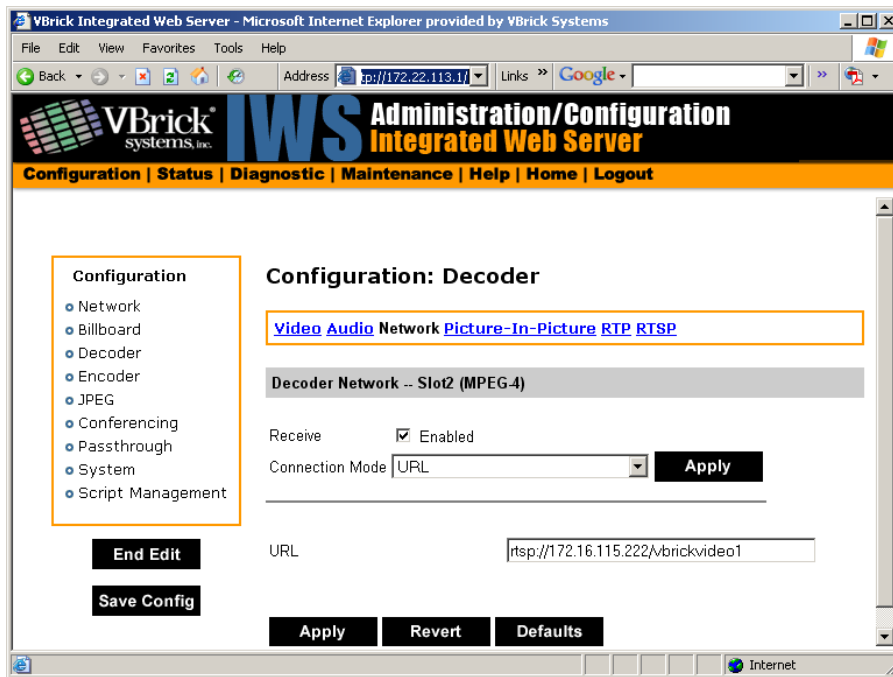
Receive	This option enables or disables the decoder.
Connection Mode	There are several choices for telling the decoder how to connect to a stream. In order to make other options visible you will need to select the Connection Mode you want to use and click Apply . The VBrick IP Address or Hostname mode when applied gives you a drop-down list called Available VBricks that will list all available encode sources. See examples that follow for other Connection Modes.
Remote Slot	The unit may contain dual decoders so you must select the appropriate slot which represents decoder #1 or decoder #2.
Connection Protocols	The VBrick can connect to the encode source in three ways: Unicast, Multicast, RTSP. The VBrick decoder will attempt to connect in this order. Once the connection is established, if for some reason the connection is lost, the decoder will attempt to reconnect automatically. Note: When tuning to an encoder that is unicasting to this decoder via a Firewall/ NAT, only the unicast option should be enabled. Address resolution behind a NAT/Firewall may make it difficult for the decoder to match the sender's IP address. Selecting only Unicast will help alleviate the issue.
Encoder IWS Port	The decoder will try to extract the SDP information from the host using an HTTP get. The host may not be running on port 80 to supply the HTTP based SDP and may be running on a different port. Management SAP information may contain the host's HTTP port. The port value in the SAP overrides the configured HTTP port through this parameter when requesting HTTP data from the device.

Connection Mode: Program Name



Connection Mode	Program Name. In this example the decoder will try to connect to the encoder with the program name "JohnS-VB620 Program1."
Available Programs	A drop-down list for available programs is automatically created from other active devices on the network.
SAP IR Program Guide	A program guide of available streams can be displayed on the TV or monitor using the IR remote.
SAP Timeout	This is the amount of time before a transmitted SAP will automatically timeout on the network.
SAP Category	Certain streams can be protected by being transmitted with a category string e.g. "financial." VBrick decoders will not see these protected streams unless this unique string is entered in the SAP category field. Note: Characters are ASCII and are case sensitive. The total of all keywords in the string is 36 characters including spaces.
SAP IP Address	This will be the address that the SAP information is transmitted on.
SAP Port	This will be the port that is associated with the SAP IP address.

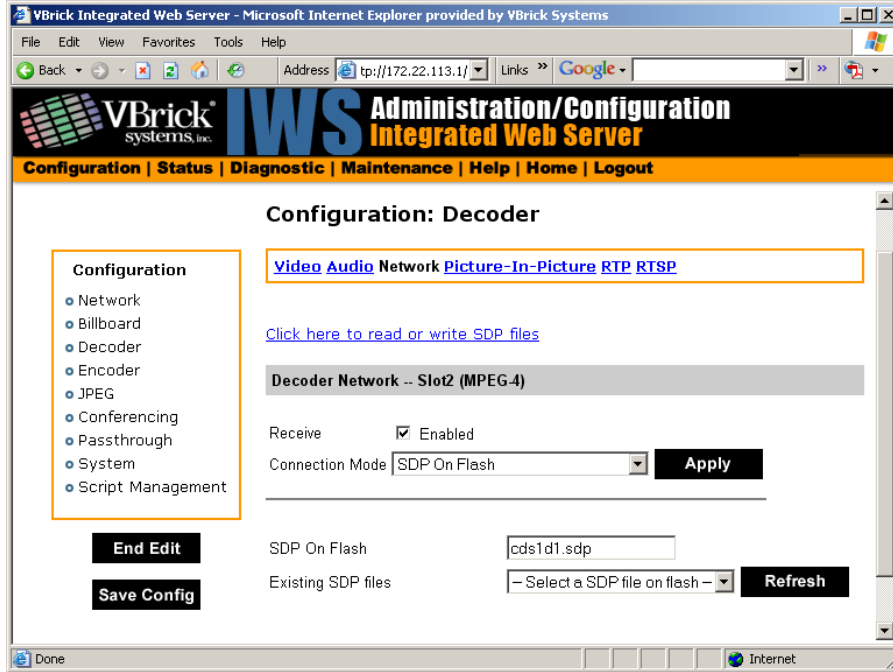
Connection Mode: URL



Connection Mode	<p>URL. In this example the decoder will try to connect to the server according to the URL defined here. This URL could be that of the MP4 VBrick encoder or a Darwin server (for example). The encoder needs to be specified by its IP Address or Fully Qualified Domain Name. If you point this to an NXG Server the RTSP Location is case sensitive (i.e. /brian/The-Others). Some Legal URL examples include:</p> <pre>rtsp://192.168.1.4/vbrickvideo1 rtsp://frodo.vb.loc/brian/The-Others http://192.168.1.4/vbs1d1.sdp</pre>
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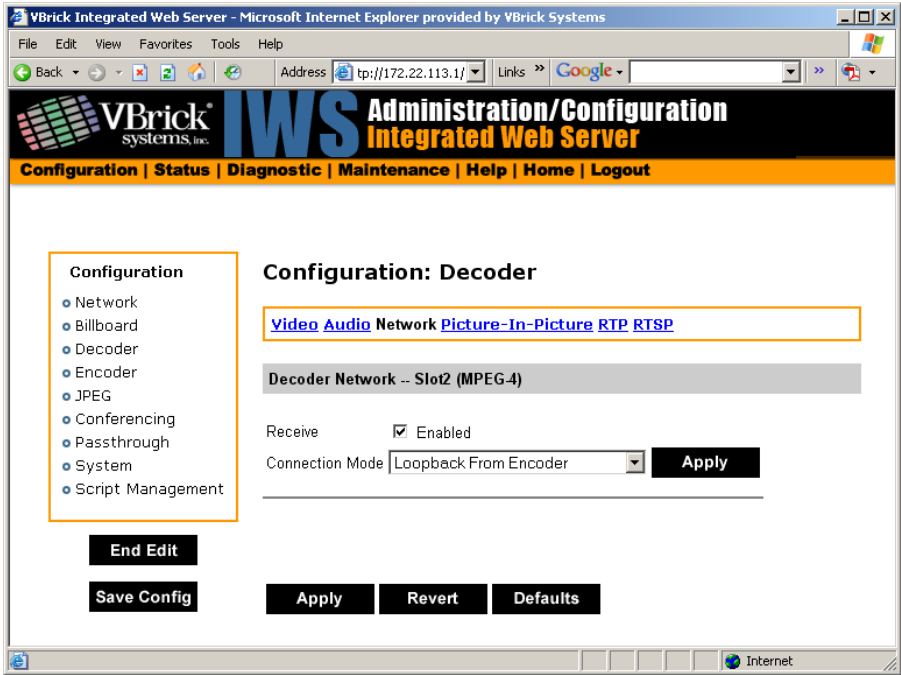
Connection Mode: SDP on Flash

SDP (Session Description Protocol) files contain information about the format, timing, and authorship of the streamed media. SDP files are created on the VBrick appliance during streaming. In most cases the SDP file should not be modified manually; however, under some circumstances that might be necessary. If the streamed file changes, the SDP file can be deleted and re-created. An SDP file is not saved with an extension (*.sdp) so that Internet Explorer will *run* the file rather than allowing it to be saved. You can add the .sdp extension manually if it needs to be recognized by non-VBrick decoders.



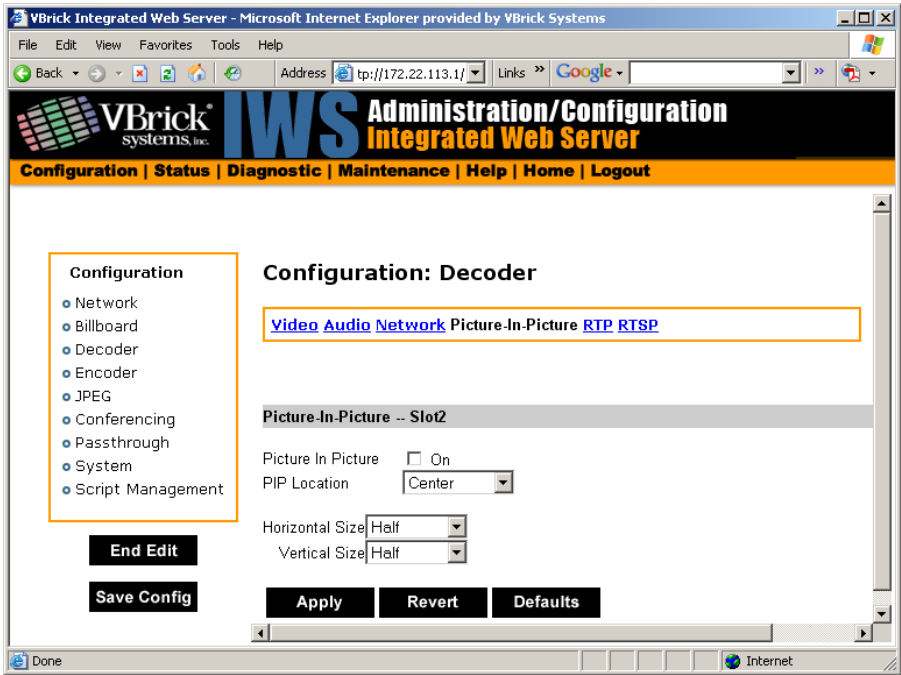
Connection Mode	SDP on Flash. In this example the decoder will try to connect to the encoder defined in the SDP file located in the decoder's flash memory.
Existing SDP Files	The user/administrator can browse the SDP files that are located in the decoder's flash memory and selects one to use from the drop-down list.
Click here to read or write SDP files	This will launch an external FTP window used to access the flash memory SDP files in the decoder's flash memory. Username and password are both "admin" by default.

Connection Mode: Loopback from Encoder



Connection Mode Loopback from Encoder - In this example the decoder will display video from the local encoder (option only valid if encoder is present, i.e. VB6200 encoder/decoder model).

Configuration: Decoder > Picture-In-Picture



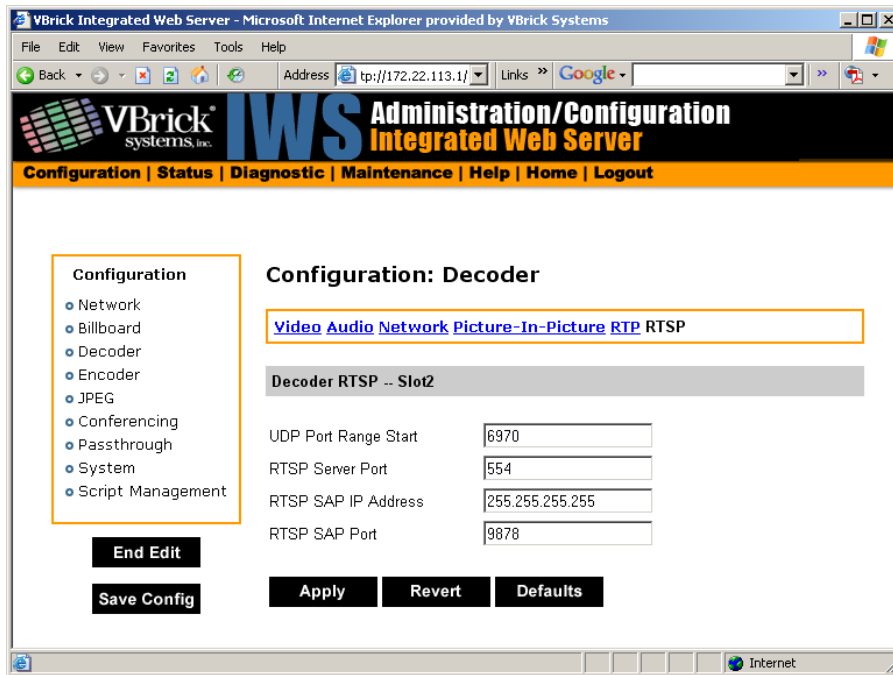
Picture in Picture	On/Off. This will enable or disable the Picture-In-Picture display.
PIP Location	Picture-In-Picture can be any of the following 5 locations - top left, top right, bottom left, bottom right and center.
PIP Horizontal Size	The Picture-In-Picture horizontal size can be changed to any of the following 4 sizes – full, half, quarter, thumbnail.
PIP Vertical Size	The Picture-In-Picture vertical size can be changed to any of the following 4 sizes – full, half, quarter, thumbnail.

Configuration: Decoder > RTP



Program Stream Selection	The decoder can be configured to request an audio-only, video-only or closed caption stream.
Time in Jitter Queue	The jitter queue is a buffer which will fill up in case of network latency. This is helpful when connecting over networks which exhibit non-linear data transmission such as the public internet. The jitter queue is adjustable. The higher the value, the more jitter the decoder can handle but at the cost of overall latency (delay). The range is from 0 to 5000 msec. Default is 250ms. See Status: Decoder Status > Network on page 151 for details about Jitter Queue Underflow and Jitter Queue Overflow .
RTCP Receiver Reports	When enabled, the decoder client will send RTCP receiver reports to the server. This is sometimes used as a keep-alive for the server.

Configuration: Decoder > RTSP



UDP Port Range Start	The decoder will negotiate with the server which ports are to receive multimedia presentation material. To receive a presentation which has audio, video and cc, 6 ports are required, (two ports for each media type). The start range is 6970 (default) and can be modified by via this setting.
RTSP Server Port	The decoder uses this TCP port when initiating an RTSP session to an RTSP video server. Normally, this port called the control port and is 554.
RTSP SAP IP Address and Port	The decoder listens for RTSP URL information advertised in SAP format, on the address specified by this parameter. Generally, the encoders send out SAPs with their RTSP URL information using the address 255.255.255.255 (broadcast to the local subnet). Included with RTSP SAP IP Address configuration, is a Port parameter, also configurable. The SAPs received on this IP address/port are included in the list of program names on the decoder network page when in program name mode, as well as on the program guide as displayed on the TV monitor.

Configuration: Encoder

Configuration: Encoder > Template

Selectable templates have been preconfigured to fit many applications. There are always trade offs when selecting encoder settings. In general, the finer the resolution detail and smoother the motion, more resources are used and the larger the file (when stored). The optimum is to

display the finest detail and smoothest motion possible given the amount of network resources available to both the sender and to the viewer who is receiving the video streams.

Note When choosing a Template, if the parameters of the Template don't match the current video parameter settings, there will be a note to that effect under the selection box stating, Parameters do not match template.

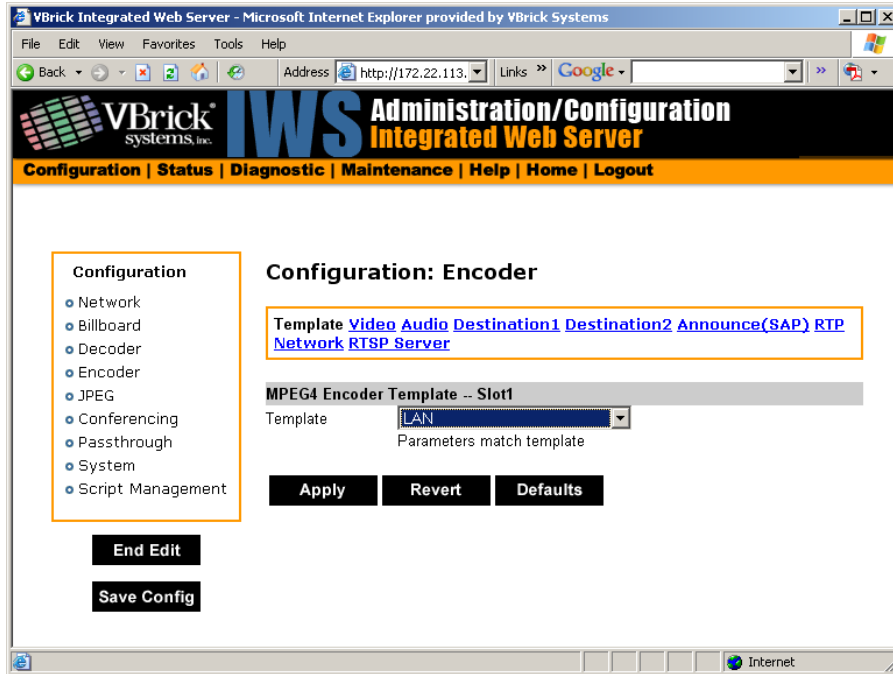
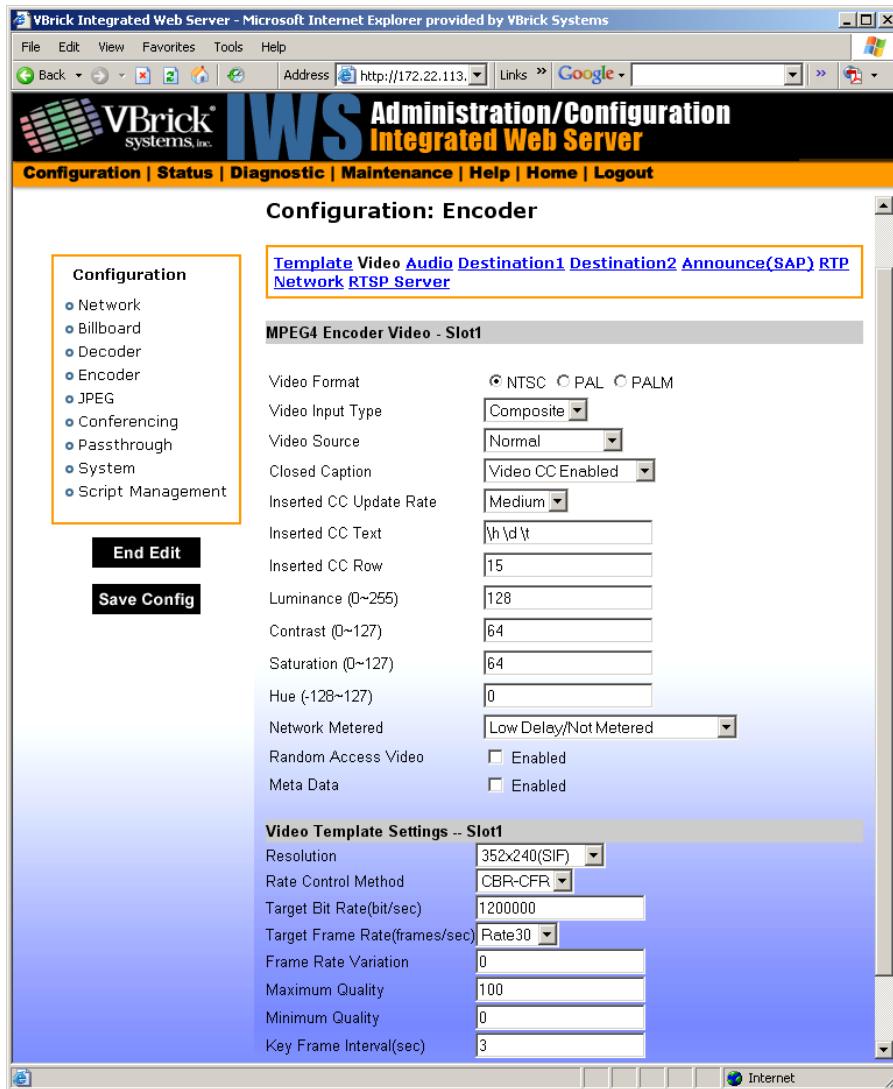


Table 1. Templates Table

Template Name	Total System Bit Rate (Kbps)	Video Target Bit Rate (Kbps)	Major Video Encoding Settings	Key Frame Interval	Audio Target Bit Rate (Kbps)	Major Audio Encoding Settings
LAN	1500	1200	CBR-CFR, SIF, 30 FPS	3	128	48 kHz 2 channels
Cable/DSL 200K High Motion	200	150	CBR-VFR, 256x192, 15 FPS	5	32	24 kHz 1 channels
Cable/DSL 200K Low Motion	200	148	CBR-VFR, 256x192, 10 FPS	5	32	24 kHz 1 channels
Cable/DSL 128K High Motion	128	78	CBR-VFR, 192x144, 15 FPS	6	32	24 kHz 1 channels
Cable/DSL 128K Low Motion	128	80	CBR-VFR, 256x192, 7.5 FPS	6	32	24 kHz 1 channels
Modem 56K	50	20	CBR-VFR, 128x96, 5 FPS	10	8	8 kHz 1 channel

Configuration: Encoder > Video



MPEG4 Encoder Video

Video Format	The format can be configured to be NTSC (30fps) ,PAL (25fps) or PALM (30fps). PAL-M is a video format standard used in Brazil. The main difference between PAL and PAL-M is a lower resolution (525 lines instead of 625) and a higher frame count (30 frames per second at 60Hz versus 25 frames per second at 50Hz).
Video Input Type	The input can be changed to accept either S-video or composite (BNC). Note that model 9174-4200 (VBSSM) does not support S-Video.
Video Source	This enables the user to select the bandwidth for tracking the video input. <ul style="list-style-type: none"> • Normal – Select for stable sources such as Cable, DVD or camera. • High Jitter – Select for unstable sources such as VCR or VTR.

Closed Caption	<p>This setting disables or enables closed captioning (default is disabled). It is recommended that Closed Caption be disabled unless required by an application.</p> <ul style="list-style-type: none"> • Disabled • Video CC Enabled – Reads the embedded video closed captioning text. • Inserted CC Enabled – Inserts the user defined text set in the Closed Caption Text field.
Inserted CC Update Rate	<p>This sets the rate with which the closed captioning field gets updated for the box (default is medium). Only works when Inserted CC Enabled is selected for Closed Caption above.</p> <ul style="list-style-type: none"> • Slow – When set to slow, the inserted closed captioning field will be updated every 60 seconds. • Medium – When set to medium, the closed captioning field will update every 20 seconds. • Fast – When set to fast, the closed captioning field will update every 5 seconds.
Inserted CC Text	<p>For models ending in -xxx1/-xxx2, this sets the text that is inserted into the closed captioning field of the encoded stream (default is "inserted string" \h \d \t \c). Only works when Inserted CC Enabled is selected for Closed Caption above. Enter any string up to a maximum of 32 characters (including the Host Name, Date and Time). No double quotes, less than <, or greater than > symbols are allowed. Special codes can be substituted for the text in a string as follows:</p> <ul style="list-style-type: none"> • \h or \H – Host Name. • \d or \D – Current Date. • \t or \T – Current Time. • \c# or \C# – Set Color (where # = the number corresponding to color). 0 = White, 1 = Green, 2 = Blue, 3 = Cyan, 4 = Red, 5 = Yellow, 6 = Magenta
Inserted CC Row	<p>For models ending in -xxx1/-xxx2, this sets the position on the screen where the text defined in the Closed Caption Text field will appear in the decoded video. Can be set from 1 through 15, where 1 indicates the top of the screen and 15 indicates the bottom of the screen (default is 15), when Inserted CC is enabled.</p>
Luminance	<p>0–255. Default = 128. The luminance is the information about the varying light intensity of an image, which is best described as brightness.</p>
Contrast	<p>0–127. Default = 64. The contrast is the range of light-to-dark values of an image that are proportional to the voltage differences between the black and white levels of the signal.</p>
Saturation	<p>0–127. Default = 64. The saturation is the spectral purity or intensity of a color.</p>

Hue	128–127. Default = 0. The hue is the attribute by which a color may be identified within the visible spectrum. Hue refers to the spectral colors of red, orange, yellow, green blue and violet. Note that adding hue reduces the saturation.
Network Metered	If you select Low Delay/Not Metered , frames of audio/video/CC are sent as soon as they are encoded. This may result in substantial network traffic burstiness since certain encoded frames such as video key frames are much larger than other frames. If Medium Delay/Network Metered is selected, the encoder smooths the transmission of the audio/video/CC resulting in less burstiness from a network traffic perspective. However, this results in jitter, that is, relative displacement of the content from a timing perspective. This forces end-to-end latency to increase. Note that for VBrick decoders, even if the Time in Jitter Queue is set low, the fact that the encoder is metering the data results in an automatic increase in the target latency to three seconds. Also, the jitter queue may automatically be adjusted to almost 3 seconds, if the encoder that it is tuned to is experiencing heavy RTSP client utilization. The encoder automatically informs the decoder to adjust the jitter queue upwards to accommodate the additional traffic load. Once the traffic load diminishes the encoder will re-inform the decoder to reduce the jitter queue delay, automatically. The VBrick StreamPlayer PC decoders also increase buffer/latency if the encoded stream is metered. We recommend use of the Low Delay setting if interactive end-to-end behavior is required. We recommend the use of Metering if the bandwidth in transmission path is constrained.
Random Access Video	If this option is enabled; additional header fields are added to the encoded stream providing the capability for certain third-party video-only decoders to decode the video stream without externally supplied SDP information.
Meta Data	When Metadata is enabled a new field will appear on the screen allowing the operator to insert metadata strings into the video as User Data. The normal use of metadata is to allow accompanying synchronized URL references to displayed in rich media applications. The VBrick StreamPlayer has the capability of extracting the metadata references and presenting them to an appropriate application. Contact VBrick for details.

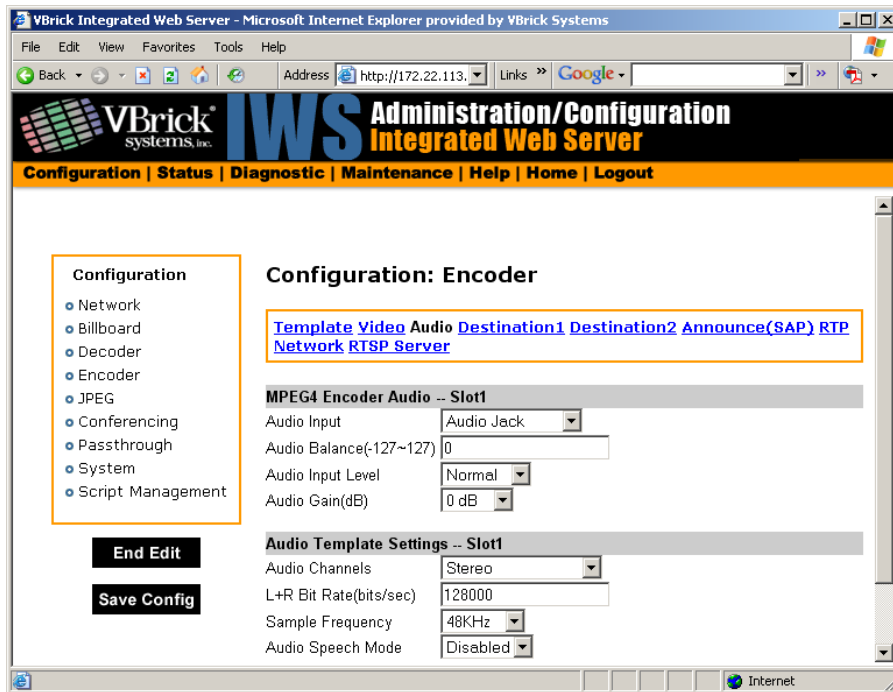
Video Template Settings

The following video settings are affected by choosing a Template in the Configuration: Encoder > Template section of IWS. For more about templates, see Table 1 on page 94. The following video settings are affected by a Template setting.

Resolution	<p>The pixel Width and Height of viewed video on the PC screen (Width by Height). Regardless of whether the transmission is NTSC or PAL, the following resolutions are possible:</p> <ul style="list-style-type: none"> • 320 x 240 • 256 x 192 • 192 x 144 • 128 x 96 • 64 x 48 <p>If NTSC or PAL-M is selected, the following resolutions are available:</p> <ul style="list-style-type: none"> • 352 x 240 (SIF) • 176 x 128 (QSIF) <p>If PAL is selected, the following resolutions are available:</p> <ul style="list-style-type: none"> • 384 x 288 • 352 x 188 (CIF) • 176 x 144 (QCIF)
Rate Control Method	<p>The selections are shown below. The interrelations between these terms are complex. Use of VBR should be restricted to controlled environments where significant burstiness in the achieved bit rate is acceptable. Not all players and/or networks may handle high levels of burstiness. Default is CBR-CFR. The abbreviations refer to:</p> <ul style="list-style-type: none"> • CBR – Constant Bit Rate. • VBR – Variable Bit Rate. • CFR – Constant Frame Rate. • VFR – Variable Frame Rate.
Target Bit Rate	<p>Bits/second. This number represents how much data the VBrick will send out each second to carry video to an MPEG-4 player. The word target is used because the VBrick can vary its bit rate slightly in response to the amount of detail in the movie or camera output. The discussion of Rate Control Method has more detail. Note that bit rate determines how much data the VBrick sends in one second to contain one second of the video or camera output. The more data the VBrick sends in one second, the more clearly the details of the movie will be seen on an MPEG-4 player. It is not always possible to send the most possible data, since that requires a large network "pipe" (connection). The trade off is the level of detail in the video with the use of smaller network connections. The difference between "constant" and "variable" bit rate is that if "constant" is chosen, then the VBrick will make a strong effort to ensure that the chosen bit rate is reached as often as possible. The "variable bit rate" setting allows the VBrick to change how much data it uses in a second (within limits of course), so that less complex scenes can be sent using fewer bits.</p>

Target Frame Rate	<ul style="list-style-type: none"> • NTSC: Rate30, Rate20, Rate15, Rate10, Rate7.5, Rate6, Rate5, Rate3, Rate2 and Rate1. Default = Rate30. • PAL: Rate 25, Rate20, Rate12.5, Rate10, Rate5, Rate2.5, Rate1. Default = Rate25. <p>This number represents how many frames the VBrick will send out each second to carry the video to an MPEG-4 player. The word target is used because the VBrick can vary its frame rate slightly in response to the amount of motion in the movie or camera output. The discussion of Rate Control Method goes into this in more detail.</p> <p>Frame rate is the number of "frames" the VBrick sends in a second for an MPEG-4 player to display. Moving pictures are made up of a rapid series of "still" pictures that move so fast that the "illusion" of motion is produced. A frame is one such "still" picture. Regular TV programs in the U.S. run at about 30 frames in a second; and the more frames presented in a second; the smoother the motion contained within the video will appear. Encoding and transmitting a frame requires the use of data, so that, when considering a particular bit rate, sending more frames demands that each frame contain fewer fine details. Similar to bit rate, the difference between "constant" and "variable" frame rate is that if "constant" is chosen, then the VBrick will make a strong effort to ensure that the chosen frame rate is reached as often as possible. The "variable frame rate" setting allows the VBrick to change how many frames it uses in a second (within limits of course), so that rapid motion can play more smoothly.</p>
Frame Rate Variation	<p>Default = 0 (maximum smoothness). This number indicates to the VBrick exactly how much it is allowed to vary its frame rate in trying to reach its target bit rate. Decreasing this number means that motion will appear smoother, but that the target bit rate will not be met as closely. This option is used only VFR mode.</p>
Minimum Quality	<p>This number tells the VBrick appliance never to lose details in the video beyond a certain level. Increasing the minimum quality ensures that more detail will be seen, but that the trade off is that the target bit rate and frame rate will not be met as closely.</p>
Maximum Quality	<p>This number tells the VBrick appliance never to include details finer than a given level. Lowering the number can be useful for sending less data when the subject matter of the video has little need for very high "fidelity".</p>
Key Frame Interval	<p>In seconds. This interval allows an MPEG-4 player to "sync up" with a video stream already in progress by providing basic anchoring and orienting data. If "key frames" are sent less frequently, it will take longer for the video to begin playing after an MPEG-4 player is started on a PC. Key Frames use up a lot of data, lowering the amount of data available to carry the details of the video, so VBrick appliances are often set up to send key frames at infrequent intervals.</p>

Configuration: Encoder > Audio



Note In Edit mode, the settings that are affected through template settings (set in the Configuration: Encoder > Template) are set apart on the bottom portion of the screen.

MPEG4 Encoder Audio

Audio Input	Input can be from an Audio Jack (1/8" mini-phono jack) or from Microphone DIN (AudioMate microphone). Note that audio attenuation is relevant only if the 1/8" mini-phono jacks are used. Note that model 9174-4200 (VBSSM) does not support audio.
Audio Balance	-127 to 127. Default = 0. This setting controls the balance the output level between the left and right audio channels, a value of -127 mutes the right channel and a value of 127 mutes the left. A value of 0 distributes audio levels equally between the left and right channels.
Audio Input Level	Normal or Alternate. Default = Normal. Sets the audio level for the encoder audio jack input. When set to normal, the audio inputs accept a 4-volt peak-to-peak maximum signal. When set to alternate, the audio inputs accept an 8-volt peak-to-peak maximum signal.
Audio Gain	This setting controls the audio level of the encoder. When the Audio Input Level is set to Normal, the settings are from 7 to -53 dB and mute. The default is 0 dB. A setting of 7 is full volume and -53 effectively mutes the encoder. When the Audio Input Level is set to Alternate, the settings are from 12 to -48 dB and Mute. The default is 0 dB. A setting of 12 is full volume and -48 effectively mutes the encoder.

Audio Template Settings

The following audio settings can be changed by choosing a Template setting in the Configuration: Encoder > Template section of IWS. For more about templates, see Table 1 on page 94. The following settings are affected by a Template setting.

Audio Channels	<p>The audio output mode can be configured to 1 of 3 possible settings:</p> <ul style="list-style-type: none"> • Stereo – Stereo directs the input left channel to the left channel in the audio stream and the input right channel to the right channel in the audio stream. • Mono (left to stereo) – Mono directs the left input channel to both the left and right channel. • Mono (left only) – This option allows only the left input channel to be carried in the stream. Output is to the left channel only.
L+R Bit Rate (bits/sec)	<p>The value can be set in 2 K increments from 8K to 320K (8000 to 320000 in increments of 2000). The default value is 256,000 bps. This is the audio encoding bit rate of the audio stream. If the Encoder Audio Output is set to stereo or mono, the value can be set from 16000 to 320000. The sampling rate is based on the per channel bit rate:</p> <ul style="list-style-type: none"> • Up to 12000, the sampling rate is set to 8kHz. • 12000 to 30000, the sampling rate is set to 16kHz. • 30000 to 40000, the sampling rates is set to 24kHz. • Greater than 42000, the sampling rate is set to 48kHz. <p>Example. A stereo output bit rate of 48000 uses a sampling rate of 16kHz (the per channel bit rate is 24000). A mono output bit rate 48000 uses a sampling rate of 48k; only one channel is being transmitted.</p>
Sample Frequency	<p>Frequency at which the audio is sampled at the encoder. Settings include 8, 16, 24, 44.1 and 48 KHz. The default is 48 KHz.</p>
Audio Speech Mode	<p>Applications that are low-bit rate (8 to 12kbps) voice only will benefit from speech mode enabled. This will help reduce any reverb effects. In all other applications (such as music or voice bit-rates greater than 12kbps) this mode should be disabled.</p>

Configuration: Encoder > Destination 1 & 2

Using Unicast

With one encoder, it is possible to send Unicast video and audio to two separate locations using the Configuration: Encoder > Destination 1 and/or Destination 2 parameters. The parameters on these two pages allow the same video and audio streams to be sent to two independent destinations. Each destination is configured for a pair of ports, one for video and another for audio. To send Unicast, enter the IP Address of the computer to which video is sent into the **Destination IP Address** field.

Using Multicast

To send Multicast, use the same Destination1 and Destination2 settings, but enter a valid Multicast address in the "Destination IP Address" field.



Video Transmit Enable	Controls whether the primary encoder video output is to be transmitted to the network.
Audio Transmit Enable	Controls whether the primary encoder audio output is to be transmitted to the network.
Closed Caption Transmit Enable	Controls whether the primary encoder closed captioning is to be transmitted to the network.
Total Bit Rate	Bits per second. This parameter reports the calculated total system bit rate, in bits per second. It includes video and audio (if enabled) along with packet header overhead.

Get SDP	<p>SDP, or Session Description Protocol files, contain information about the format, timing, and authorship of the streamed media. SDP files are created on the VBrick appliance during streaming. In most cases the SDP file should not be modified manually; however, under some circumstances that might be necessary. If the steamed content changes, the SDP file can be deleted and re-created.</p> <p>When the SDP file is saved, it is not saved with an extension (*.sdp). The reason is that if the file has an extension, Internet Explorer will run the file instead of allowing it to be saved. If it is necessary for the file to be recognized by non-VBrick decoders, the .sdp extension can be added manually.</p>
Destination IP Address or Host Name	<p>This is the Destination IP Address or DNS Host Name of the encoded video. When the Loopback is enabled the IP Address is set to 127.0.0.1, disable Loopback in order to change this field. The Host Name should be the Fully Qualified Domain Name. If the name is not available to the system it will use the Destination IP Address of 127.0.0.1. When this is a Multicast address, the transmit mode reports Multicast. Similarly, if this is a Unicast address, the transmit mode reports Unicast.</p> <p>Note: The Host Name is resolved using the primary or secondary domain name server set in Network: Configuration. 127.0.0.1 is used if it cannot be resolved, or if the entry for DNS is blank.</p>
Destination IP Address	<p>This read-only parameter informs the operator of the IP Address for the DNS Host Name input into the Destination IP Address or Host Name Field.</p>
Video Destination Port	<p>This is the destination IP port of the network device that will be receiving the encoded video.</p>
Audio Destination Port	<p>This is the destination IP port of the network device that will be receiving the encoded audio.</p>
Closed Caption Destination Port	<p>This is the destination IP port of the network device that will be receiving the encoded closed captioning.</p>
Closed Caption Aus per RTP packet	<p>This is the number of frames of closed caption frames (access units) that are placed in each RTP packet. Since each closed caption frame is small, if multiple Aus are placed in a single RTP packet the bandwidth efficiency is improved at the cost of additional latency.</p>
Transmit Mode	<p>This read-only parameter informs the operator whether the encoder is transmitting the video stream in Unicast or Multicast mode.</p>
Time to Live	<p>The number of hops (between routers) for which an IP packet is valid on the network.</p>
Type of Service	<p>The TOS (Type of Service) can be configured in the IP header to establish packet priority in the network.</p>

Unicast Ping	Feature for primary destination can be enabled, disabled. If the VBrick is designated to transmit a transport stream to any destination (whether another VBrick or not) in Unicast mode, this parameter is used to instruct the VBrick to ping the destination periodically to test connectivity before sending the stream. If Unicast Ping is not enabled, and the destination goes off-line, the Unicast stream may be broadcast to all destinations on the network, flooding the network. This feature should only be disabled if the network has a particular requirement that makes it unworkable.
Join Own Multicast	Some network equipment requires that a Multicast source (such as a VBrick encoder) join its own Multicast group. This feature is enabled by default and has no adverse affect on equipment that is fully multicast-supported.
Disable Transmit on Video Input Problem	Stop sending and free up bandwidth if there is an interruption for any reason in video input.

Configuration: Encoder > Announce (SAP)

The screenshot shows the VBrick Integrated Web Server Administration/Configuration interface. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The page header includes "VBrick systems, Inc. IWS Administration/Configuration Integrated Web Server" and a navigation menu with "Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout".

The main content area is titled "Configuration: Encoder". On the left, there is a "Configuration" sidebar with a tree view containing: Network, Billboard, Decoder, Encoder (selected), JPEG, Conferencing, Passthrough, System, and Script Management. Below the sidebar are "End Edit" and "Save Config" buttons.

The main configuration area is titled "Configuration: Encoder" and contains a link: [Template Video Audio Destination1 Destination2 Announce\(SAP\) RTP Network RTSP Server](#). Below this is a section for "MPEG4 Announce Common Information -- Slot1" with the following fields:

Program Name	My Program 1
Program Author	My Author
Program Copyright	My Copyright 2005
Category	
Session Information	VBrick Streaming Video
Information URL	
Contact Email	
Contact Phone	
Contact Name	

Below this is a section for "Announce Program Guide (SAP) for Destination 1 & 2 -- Slot1" with the following fields:

Transmit	<input checked="" type="checkbox"/> Enabled
Retransmit Time(sec)	10
Time To Live	64
Type Of Service	0
Format	<input checked="" type="radio"/> VBrick Legacy <input type="radio"/> ISMA Compliant
IP Address	224.2.127.254
Port	9875
Send Announce(SAP) to Unicast Destinations	<input type="checkbox"/> Enabled

MPEG4 Announce Common Information

Program Name	<p>The string providing the name of the stream associated with this Session Announcement Protocol, or SAP. This SAP text shows up in the Program Guide for other VBrick products. Default is \H Program x, (1 or 2, for slot1 or slot2). Both Program Name and Session Information allow special character strings to be inserted automatically into these fields. This is true for encoding entries, slot 1 encoders, slot 2 encoders and, when installed, the Hard Drive Pump. The symbol "\" followed by any other letter is dropped and replaced by the letter.</p> <ul style="list-style-type: none"> \H or \h – Host Name of Vbrick appliance. When the default entry is used, the Vbrick is identified by the default Host Name, and will be identified as such on the network, see the StreamPlayer software example below.
Program Author	A string in the SAP that can be used to identify the author. This appears in the Windows Media player and others. Default is "My Author."
Program Copyright	A string in the SAP that can be used to identify the copyright information. Default is "My Copyright."
Category	An encoder can have a SAP Category string. This string consists of one or more keywords separated by spaces. Each category keyword represents a tag associated with the Encoder's video stream. Decoders can be configured to display in their Program and Conferencing guides only video streams tagged by specific category keywords or those containing no keyword. The string(s), used by the Decoder, is set on the Decoder/Network screen. Characters are printable text and are case sensitive. The total of all keywords in the string is 36 characters including spaces.
Session Information	A string identifying VBrick SAP Session Information that appears on Program Guide (See StreamPlayer example on the next page). Default is "VBrick Streaming Video".
Information URL	Informational text.
Contact Email	Informational text.
Contact Phone	Informational text.
Contact Name	Informational text.

Announce Program Guide (SAP) for Destination 1 & 2

Transmit	Enables or disables SAP transmission. Default = enabled.
Retransmit Time	Seconds. 1 – 9999. Default = 10. If SAP Timing is fixed, this is the time in seconds between SAP transmissions. If SAP Timing is variable, the actual retransmit time, as per RFC 2974, is reported. Please refer to Configuration: System > General.

Time to Live	The number of hops (between routers) for which an IP packet is valid on the network.
Type of Service	The TOS (Type of Service) can be configured in the IP header to establish SAP packet priority in the network.
SAP Format	Legacy, or ISMA Compliant. Default is Legacy. Note that transmitted SAPs can be compressed or uncompressed. When set to Legacy, the SAP message is not compressed and does not contain an initial object descriptor. This setting is optimized to be compatible with previously released VBrick SAP transmissions. The ISMA Compliant setting contains iod and is compressed. SAPs are optimized for compliance with ISMA standards. When set to ISMA Compliant, the program guide will not operate correctly on MPEG-1 version 2.5.0 or earlier and MPEG-2 VBricks version 2.1.0 or earlier.
IP Address	The IP address SAP information is sent out to the network.
Port	The port SAP information is sent out to the network.
Send Announce (SAP) to Unicast Destinations	Forward SAP announcements to all unicast destination addresses which are configured on the Encoder > Network pages (i.e. Destination 1 & 2)

Configuration: Encoder > Text Insertion

This window lets you configure text messages that overlay the video stream during encoding. The message you configure here will be displayed and refreshed as the stream is decoded. You can configure a blink style, refresh rate, transparency, and other options. You can create and enable five pre-configured messages.

The screenshot shows the VBrick Integrated Web Server Administration/Configuration interface. The main content area is titled 'Text Insertion - Slot2'. It contains the following configuration options:

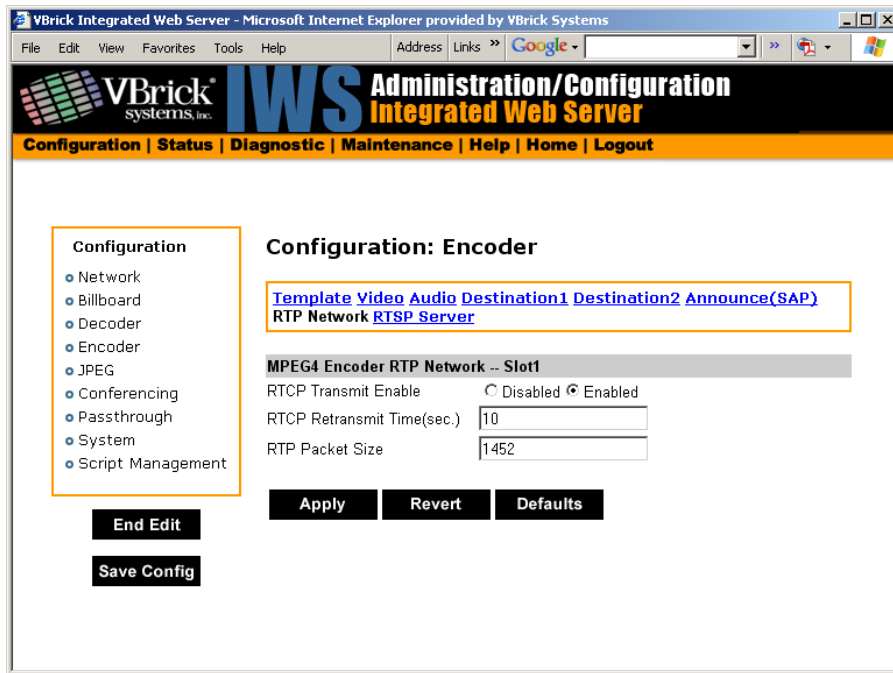
- Blinking Style: Normal (dropdown menu)
- Refresh Interval(sec): 1 (text input)
- Blending Option: 63 (text input)

Below the configuration options are buttons for 'End Edit', 'Save Config', 'Apply', 'Revert', and 'Defaults'. A table below these buttons lists five pre-configured text messages:

Line	User String	Vertical Position	Horizontal Position	Display Enable	Error
1	keep those.. \h \d \t.	11	0	Disabled	
2	dogies rolling along rawhide..	12	0	Disabled	
3	well, it's two for the money	13	0	Disabled	
4	and four for the show...	14	0	Disabled	
5	three to get ready, so go baby go..	15	0	Disabled	

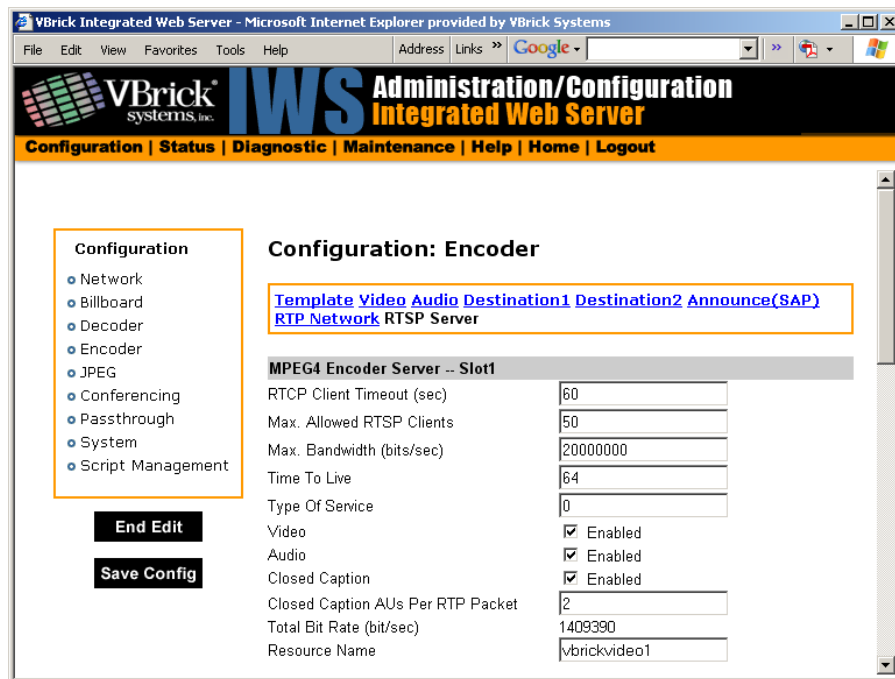
Blinking Style	<p>Blinking must be enabled (\s1) or disabled (\s0) using a standard operator in the User String field (see below).</p> <ul style="list-style-type: none"> • Normal – Default. Black on white. • Inverted – White on black.
Refresh Interval	<p>1–30 seconds. Specifies how often to repaint the text message. Default = 10. Note that what appears as "flickering" may occur when blinking is coincident with the refresh interval.</p>
Blending Option	<p>0–63. Specifies the opacity of the text. At 63 the text is solid (non-transparent). Default = 63.</p>
Line	<p>One line number for each message. You can save a maximum of five different messages.</p>
User String	<p>36 characters maximum. This is the actual text message that will be displayed and refreshed at the interval specified above. You can use any combination of alphanumeric and special characters. The following standard operators are supported in the text message.</p> <ul style="list-style-type: none"> • \s1 – Blinking on. • \s2 – Blinking off. • \h – The VBrick Host Name on Configuration: Network page. • \t – The time in HH:MM:SS format. • \d – The date in MM:DD:YY format. <p>Example: \d \s1 Accident on I 95 \s0 \t will display the message 11:10:05 Accident on I 95 14:55:22 with Accident on I95 blinking. To avoid conflicts between fields that refresh automatically (\h, \t, \d) and /s1 which controls blinking, be sure to enable blinking at least once on every line where blinking is desired.</p>
Vertical Position	<p>1–16. The screen is divided into 16 vertical lines for messages. Line 1 is at the top; Line 8 is in the middle of the screen.</p>
Horizontal Position	<p>1–16. The screen is divided into 16 horizontal lines where messages can start. Line 1 is at the extreme left side of the screen.</p>
Display Enable	<p>Indicates whether the message is enabled or disabled. Only one message can be enabled at a time.</p>
Error	<p>Displays validation and other errors.</p>

Configuration: Encoder > RTP Network



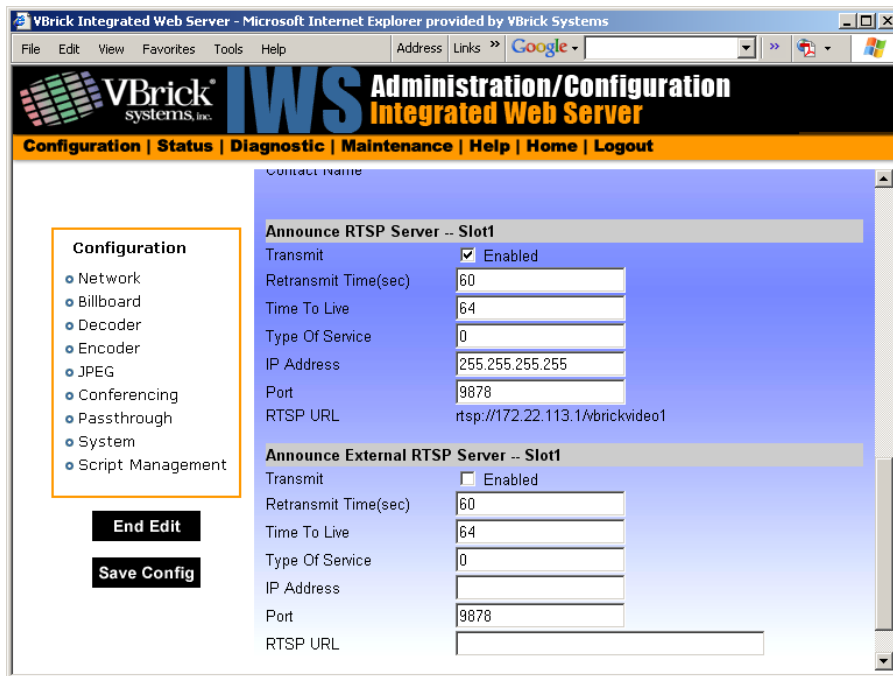
RTCP Transmit Enable	Default = Enable. The RTP standard protocol contains an RTCP, or Real-time Transport Control element allowing both a VBrick and the PCs that are receiving video from that VBrick to carry on communication concerning the quality and stability of the video that is being sent. Enable allows RTCP sender reports to be sent from the VBrick.
RTCP Retransmit Time	If the RTCP Transmit is enabled, this setting tells the VBrick how often (in seconds) to send the reports.
RTP Packet Size	When choosing an RTP Packet Size, special attention must be paid to the network capability and topology. The allowed range is 1000 to 1472 bytes per packet, in four byte increments only.

Configuration: Encoder > RTSP Server



RTCP Client Timeout	This is the number of seconds that the VBrick will wait before it decides that an MPEG-4 player that was playing its video or audio is no longer viewing or listening. Zero means wait forever—no timeout.
Max. Allowed RTSP Clients	This is maximum number of MPEG-4 players that can view video or audio from the same VBrick at the same time using the RTSP method. Default for the allowed RTSP clients is 50. This may be increased, but overall system performance may degrade as this number is increased. It is recommended that if the Max Allowed Clients is increased, the configuration should be tested to assure proper operation. Although a maximum of 200 clients can be configured, only 100 HTTP tunneled clients are supported because each tunneled client requires 2 TCP sessions.
Max. Bandwidth	This is the maximum amount of data that the VBrick will generate at any time using RTSP. If the total calculated by adding together the data in all the video and audio streams that have been started using RTSP. When this maximum is reached, no additional MPEG-4 players will be allowed to use the RTSP method. Default for the allowed RTSP bandwidth is 20Mbits/second. This may be increased, but overall system performance may degrade as this number is increased. It is recommended that if the max bandwidth is increased, the configuration should be tested to assure proper operation.
Time to Live	The number of hops (between routers) for which an IP packet is valid on the network.

Type of Service	The TOS (Type of Service) can be configured in the IP header to establish packet priority in the network.
Video	If this is disabled no video can be seen using RTSP.
Audio	If this is disabled no audio can be heard using RTSP.
Closed Caption	If this is disabled no closed captioning can be seen can be heard using RTSP.
Closed Caption AUs Per RTP Packet	This is the number of frames of closed caption frames (access units) that are placed in each RTP packet. Since each closed caption frame is small, if multiple AUs are placed in a single RTP packet the bandwidth efficiency is improved at the cost of additional latency.
Total Bit Rate	This is the maximum amount of data the VBrick will generate at any time using RTSP. It's the total calculated by adding together the data in all the video/audio/cc streams (including network overhead) that have been started using RTSP. When this maximum is reached, no additional MPEG-4 players will be allowed to use the RTSP method.
Resource Name	The name used in an RTSP URL to locate a particular stream.



Announce RTSP Server	This section is used to announce the RTSP streams to the local network allowing viewable RTSP SAPs in programs like StreamPlayer Plus. The unit must be on the same segment of the network or the Router must be configured to retransmit broadcast in order for the SAPs to be accessible using the IP Address 255.255.255.255.
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Announce External RTSP Server	This section is used to announce RTSP streams to a Network device outside of the broadcast domain.
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Configuration: JPEG



This window lets you configure an MPEG-4 encoder with an attached camera that takes JPEG snapshots at a specified interval. Depending on the application, the snapshot can be displayed in a web page in realtime or FTPed to an server for archive storage. Type the following URL in a browser to display the captured image in a web page. In this example, the URL contains the folder location of the JPEG file for each encoder (if there are dual encoders.) `vbs1` or `vbs2` indicates the slot number of the encoder. Click **F5** to refresh image.

<http://172.22.123.23/vbs1Snapshot.jpg>

JPEG Configuration

The following fields enable image capture and specify the capture interval and compression quality. Note that if you change any of these parameters for a live encoder stream, there will

be a momentary (10 seconds or less) loss of video. (For JPEG capture status, see [Status: JPEG Status](#) on page 159.)

Image Capture Enable	Check this box to enable image capture. Default = disabled.
Image Capture Interval	1–600 seconds. Specify the interval at which images are captured. Default = 5.
JPEG Compression Quality	0–100. Values over 80 marginally affect image quality and may impact other system resources. For best results, experiment with the output and choose the lowest value that provides acceptable image quality. Default = 80.

JPEG FTP Configuration

The following fields determine how the JPEG images are handled with respect to an FTP server.

Transfer Mode	<ul style="list-style-type: none"> • Archive – Default mode. Each image is saved as a separate file up to the value in Max Number of Files on Server. After the maximum, the files begin to overwrite. • Single Image – Only one image is saved and overwritten on the server.
IP Address or Name of Server	IP address or machine name of FTP server. Default = blank.
File Name on Server	<p>Archive mode – This is the base file name to which incremental numbers are appended. If the base file name is <code>VBrick1-</code> for example, the captured images will be named <code>VBrick1-1</code>, <code>VBrick1-2</code>, and so on.</p> <p>Single Image – A .jpg extension will be appended to the base file name. Default = blank.</p>
Max Number of Files on Server	1–1000000. The maximum number of files that will be saved on the FTP server. Default = 200.
Path on Server	Folder name where images are saved on FTP server. Default = root.
FTP User Name	FTP user name. Default = UserName.
FTP Password	FTP password. Default = UserPassword (hidden).
FTP Account	FTP server account login. Default = AccountName.
Max FTP Duration	1–60 seconds. Default = 60. After a server interruption, the time to wait before closing the connection and trying again.

Configuration: Conferencing

See MPEG-2 [Configuration: Conferencing](#) on page 64.

Configuration: Passthrough

See MPEG-2 [Configuration: Passthrough](#) on page 66.

Configuration: System

See MPEG-2 [Configuration: System](#) on page 70.

Configuration: System > Security

The screenshot shows the VBrick IWS Administration/Configuration web interface. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The page has a navigation menu with links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Configuration: System" and contains a sub-menu with links for General, SNMP Traps, Security, and Logging. The Security configuration page is active, showing the following settings:

- External Telnet Server: Disabled Enabled
- External FTP Server: Disabled Enabled
- External IWS: Disabled Enabled
- External SNMP: Disabled Enabled
- RTSP Server Port:
- HTTP Tunneling Port:
- IWS Server Port:

Buttons for "End Edit", "Save Config", "Apply", "Revert", and "Defaults" are visible at the bottom of the configuration area.

External Telnet Server	Enabled, Disabled. Default = Enabled.
External FTP Server	Enabled, Disabled. Default = Enabled.
External IWS	Enabled, Disabled. Default = Enabled.
External SNMP	Enabled, Disabled. Default = Enabled.
RTSP Server Port	Specifies the listener port for RTSP connections. Default = 554.
HTTP Tunneling Port	Specifies the port used for HTTP Tunneling. This feature allows RTSP connections to be sent as TCP rather than UDP, it is recommended to use port 80 when doing this. Default = 8080.

IWS Server Port	Specifies the listener port for management and HTTP connections. Default = 80. When the remote IWS user (client) specifies the http syntax, the port value is generally omitted. Typically port 80 is the default value used by browsers. As a matter of consistency, the VBrick default IWS Server Port value is also defaulted to 80. To access a different HTTP port, the remote IWS client user would specify the URL as follows: http://IPaddress:port where IPaddress = VBrick IP address or hostname, and port. This feature is often useful for an MPEG-4 system, where HTTP tunneling is used to traverse firewalls. The IWS server port is moved to another location (ex. 8080) and the HTTP Tunneling port is set to 80. See MPEG-2 Configuration: System > Security on page 76 for list of features to improve security.
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Configuration: Script Management

See MPEG-2 [Configuration: Script Management](#) on page 80.

ATM Configuration

Topics in this chapter

[Introduction](#)

[Configuration: Network](#)

[Configuration: Billboard](#)

[Configuration: Decoder](#)

[Configuration: Encoder](#)

Introduction

VBrick network appliances operate over Ethernet or ATM (Asynchronous Transfer Mode) networks. This section covers only the information that is particular to ATM operation. The VB4000-5000-6000 series of VBrick MPEG-2 network appliances has a native Ethernet network port that is used to provide connectivity to IP-based networks. This allows compressed Audio/Video streams to be transmitted and received over Ethernet networks using IP Protocol, just as with non-ATM VBrick appliances. An additional, integrated ATM OC-3 interface allows the transport of Audio/Video streams over both public and private ATM-based networks. The optical OC-3 interface allows the VB6000 family of MPEG-2 appliances to utilize either single-mode or multi-mode fiber facilities, depending upon the type of transceiver ordered with the unit. The user may selectively transport video over the OC-3 or Ethernet port by selecting the appropriate Network Interface Address.

Dual OC-3 Interface

The dual OC-3 interface is an extension to the VB4000-5000-6000 product family designed to extend ATM capabilities and provide a wider range of applications. The VB6000's two independent OC-3 interface ports are factory set in either multi- or single-mode fiber operation. This industry standard capability allows for interoperability with the widest range of equipment and user configurations. The VB6000 Dual OC-3 interface module allows two fully operational, OC-3/ATM connections. ATM traffic that arrives into each port is transmitted out the other port. Each VB6000 equipped with Dual OC-3 extends ATM connectivity to additional OC-3/ATM devices via the second port. This capability allows "daisy-chaining" of units, eliminating ATM switches in the field or the central site. This conserves ATM ports, and eliminates the need to provide a spare OC-3/ATM port when deploying the VB6000 into new applications

The VB6000 with Dual OC-3/ATM capability allows numerous appliances to be cascaded together and is only limited by the usable output bandwidth. This supports private dark fiber applications using the single-mode fiber optical interface. This repeater-less capability extends the reach of interconnected appliances to the distance supported by the installed transceiver. No additional



ATM switches, ports, or fiber optic repeater hardware is required to support this capability, making it ideal for far-end remote applications. VB6000s can also extend remote LAN connectivity over ATM to other devices in the same vicinity via the Ethernet, possibly eliminating the need for additional edge routing and/or bridging equipment.

MPEG-2 over ATM

VBrick supports two modes of MPEG-2 over ATM. In the first case, MPEG-2 is encapsulated in IP packets, and then those packets are delivered over ATM using IP over ATM (IPoA) per RFC-1483/1577. The approach allows IP-based devices to interoperate with the VBrick. The second method is "native" MPEG-2 over ATM per the ATM Forum recommendations. This approach does not include the IP layer and is used for interoperability with legacy systems or where IP is not otherwise needed. Both approaches use AAL5.

Multiple Audio/Video streams from a dual Encoder model can be transmitted over a single VCC or separate VCCs, in IP over ATM format or Native ATM mode, respectively. When set for IPoA, the Audio/Video stream is first encapsulated in IP. The IP encapsulation process is then followed by SNAP/LLC PDU encapsulation using the AAL5 method as defined by the IETF's RFC 1483. This method allows Layer 3 IP routing and switching equipment to transparently forward video frames as packets across any hybrid network (where hybrid refers to a mixed IP/ATM network environment). Additionally, since VB6000 appliances can have both Ethernet IP and ATM IP interfaces, they can easily share video content with each other.

When operating in Native ATM mode, video is encapsulated using methods described by the ITU-T specification H.222.1. This method is compatible with many broadcasters and is often used in pure ATM networks that do not support Layer 3 IP services. In either method, multiple ATM virtual channels allow distribution of video streams to different locations from the same appliance, with each having their own video quality metrics and ATM traffic contracts.

Video Encapsulation

VBrick allows users to choose between different methods of formatting digital video for transport over the ATM network. Both require ATM Layer 2 transport but each services different end-user applications:

- IPoA – IP over ATM, as specified by the IETF (Internet Engineering Task Force). The IP over ATM method is found in backbones where traffic converges over IP. These networks are generally used for corporate Intranets, most commonly in the enterprise area. Video transported over IP has the distinct advantage of being able to converge seamlessly with data in existing corporate networks. Compatibility across the widest variety of interface styles makes this method attractive in many applications. IP over

ATM service is configurable to operate in either Constant Bit Rate (CBR) or Unassigned Bit Rate (UBR).

- Native ATM – MPEG over AAL5, as specified by the ITU (International Telecommunications Union). This method is referred to as Native ATM. It is primarily used in the broadcast industry, and has gained acceptance in native ATM networking environments. Native ATM always operates in CBR mode. Note that neither of these options has an effect on Ethernet links.

Traffic Shaping

The ability to transmit video over ATM using the VBrick MPEG codec allows remote locations to feed video content over a wide-area fiber network. ATM cells allow a universal method of wide-area interconnection preferred by many carriers. The universal ability of ATM to handle all types of traffic--data, voice and video, providing billing information, prioritization, and bandwidth allocation, make it ideal for many commercial and mission-critical applications. VBrick's MPEG-2 4000, 5000 and 6000 series ATM codecs can directly terminate an ATM OC3/155 mbps fiber link, without additional hardware, allowing video to be transported over a long range through a single mode fiber. In order to do this, The VBrick's ATM cell stream needs to be conditioned so that the cell transmission is relatively consistent and predictable. ATM Ports accepting incoming traffic usually allocate a maximum bandwidth allowance, or cell rate, for each user. These allocations, called traffic contracts, define the characteristics of the cell allowance and relate to user circuit charges. Cell traffic above the contract may be discarded at any point within the ATM network.

VBrick's traffic shaping grooms outgoing individual ATM cell rates to fit within traffic models defined by the ATM Forum. Each video stream is shaped and constrained to a maximum cell rate, known as Peak Cell Rate (PCR), when operating in Constant Bit Rate (CBR) mode. VBrick users can configure each IP over ATM connection to a specific Peak Cell Rate, which is maintained on each virtual path/virtual connection (VP/VC). Each connection is provisioned with a Peak Cell Rate at or above the values configured within the ATM module. In order to closely match user requirements with switch capabilities, the ATM Forum has defined well-defined contract metrics. These metrics are converted into Classes of Service:

- UBR – Unspecified bit rate. The UBR method is straightforward from a configuration perspective. It works reasonably well in most cases; however, it lacks the deterministic attributes required when operating over a public ATM service. IP over ATM service is configurable to operate in UBR or CBR.
- CBR – Constant bit rate. CBR is the most predictable (and most costly) class of service carriers offer. It is highly deterministic and guarantees cell delivery and delay properties. It is ideally suited for video applications where high quality is paramount. Native ATM always operates in CBR mode.
- VBR – Variable bit rate and ABR – available bit rate. These classes of service are used in more legacy applications such as voice and packet services and are not generally used for transportation of digital video.

Since MPEG transport streams consist of a reasonably steady flow of ATM cells, either a CBR or UBR is most suitable. CBR traffic shaping allows users to manage bandwidth utilization more effectively and allows a wider range of applications for the VB6000 series platform.

Traffic Contract Settings

ATM circuits within the VB6000 are built in differently, depending on their intended use:

- IPoA circuits are established during power-up. For every IP interface entry that exists in the ATM table, a VP/VC is created with the settings specified. Any reconfiguration automatically causes the parameters to be saved and imposes a box reboot.
- Native ATM circuits are established when the encoder is set to transmit.
- Circuit topology changes are dynamically re-applied when the relevant encoder parameters are changed, including video and audio rates as well as network destination parameters.

Switched Virtual Circuits (SVCs)

In a network, a switched virtual circuit, or SVC, is a temporary virtual circuit that is established and maintained only for the duration of a data transfer session. A permanent virtual circuit, or PVC, is a continuously dedicated virtual circuit. A virtual circuit is one that appears to be a discrete, physical circuit available only to the user but that is actually a shared pool of circuit resources used to support multiple users as they require the connections. The VBrick video appliance, when equipped with ATM/SVC software, employs Automatic Configuration Procedures as defined by the ATM forum (ILMI Interface Specification V4.0, Sept 1996). To connect the VBrick appliance to a Public UNI service connection may require the use of an intermediary ATM switch device.

Configuration: Network

Configuration: Network > Ethernet

See MPEG-2 [Configuration: Network > Ethernet](#) on page 39.

Configuration: Network > ATM

When an ATM interface is present, the ATM selection contains the following table. This table allows a user to bind an IP Address to an ATM VCC. Multiple entries allow users to pre-allocate circuits for segregation of video paths. The IP Address and IP Mask fields define additional IP interface assignments within the VBrick appliance, allowing Audio/Video and Ethernet or Serial Passthrough traffic routing, to and from different sites (via different ATM circuits) by an IP selection process.

Configuration: Network

[Ethernet](#) [ATM](#) [ATM SVC](#) [Ethernet Access](#) [Routing](#) [Management](#)

ATM VPI

Host Name	IP Address	IP Mask	VCI	QOS Mode	Contract PCR	Min. PCR	Error
CD-MPEG2-249-ATM-ATM1	172.23.30.2	255.255.255.0	32	UBR	323	323	
CD-MPEG2-249-ATM-ATM2	172.23.32.2	255.255.255.0	33	UBR	323	323	
		255.255.255.0	34	UBR	323	323	
		255.255.255.0	35	UBR	323	323	
		255.255.255.0	36	UBR	323	323	
		255.255.255.0	37	UBR	323	323	
		255.255.255.0	38	UBR	323	323	
		255.255.255.0	39	UBR	323	323	

SVC Software Key

Signaling Enable Disabled Enabled

Host Name	The Host Name or, if that is not assigned, the MAC address of the ATM unit.
IP Address	The virtual connection's IP address.
IP Mask	The filter that defines the scope of the IP address.
VPI	This is the Virtual Path Identifier for the ATM connection used for the transmission of encoded MPEG video to the Secondary destination (see note below).
VCI	This is the Virtual Circuit Identifier for the virtual connection. It can be used for the transmission of encoded MPEG video or as a general purpose IP connection.
QOS Mode	Indicates whether QOS is set to UBR (Unspecified Bit Rate) or CBR (Constant Bit Rate). Set in ATM, Ethernet Access.
Contract PCR	(0 -> 200151, in 323 cell increments). This Contract Peak Cell Rate entry allows a manager to set the PCR (Peak Cell Rate) value in cells per second for ATM service category for the corresponding virtual circuit. The value may be rounded to the next 323 cell multiple.
Minimum PCR	Read only field. The minimum PCR (Peak Cell Rate) in cells per second for the ATM virtual circuit (VCI).

Error	Validation error in configuration.
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Once addresses, masks and VCIs are entered into the table, any of the entries can be used for configuring sources and destinations in the Encoder, Decoder or Passthrough menu screens. With all models of Encoders and Decoders, the entries allocate resources that are later used to designate transmit and receive stream flows, solely based upon IP Address selection processing. The above table is used, in a sense, to "steer" the data flow to and from Encoders, Decoders, and Passthrough applications into or from the appropriate VCC: the traffic is then transported across the ATM network to the correct device at the other end of the VCC. Upon power-up, the VBrick device will browse the Network ATM table (shown above) and look for valid (non-zero) IP Address entries. The VCI entry associated with any given IP table entry is used as envelope information within the ATM network. When the VBrick appliance is forwarding an IP stream (for example, Audio/Video using IPoA or Passthrough data) the VCI is loaded from the table, based upon the IP destination address, and embedded into the ATM cell header. The ATM network requires this cell header for proper routing.

When the user selects the above table for editing the IP Address, IP Mask and ATM VPI/VCI (commonly referred to as ATM VCC), fields are singularly input, with validation of the entries taking place when the "Apply" button is invoked. Validation ensures no overlapping IP network assignments among table entries or the IP interface. All ATM QOS (Quality of Service) contract parameters are set in the ATM network equipment when an ATM PVC is established. Since individual circuit planning may vary, please contact the service provider for details. When specifying service parameters, a contracted bit rate needs to be specified for optimum video performance. Many ATM parameters are often specified in cells-per-second. The following formula is included for reference:

Video Transport rate * 1.15/8*48 = cells per second CBR (Constant Bit Rate)

This calculation allows for a 15% headroom/margin to allow for ATM network performance variances. As a general rule, approximately 3000 cells per second is needed for each 1 megabyte of transport rate.

Note If the sum of all configured VCIs exceeds the maximum ATM limit an error message indicates that the user must reconfigure the VCI circuits to reduce the overall cell egress rate. In the case of OC3, the physical limit is 353000 cells per second. The VB6000 indicates the Minimum PCR requirement for a given VCI. This allows the user to approximate utilization prior to setting the Peak Cell Rate. The required PCR variable is updated whenever related parameters are changed. The VB6000 automatically scans open ATM connections and approximates their utilization, based on the parameters shown in the following table.

Table 1. Calculating Peak Cell Rate

ATM Usage	Input Parameters for Calculating Required PCR
Native ATM	Transport Rate + AAL5 Overhead
IPoA	Transport Rate + Other traffic (i.e. SAP, Telnet, Http, FTP, Passthrough/TCP, unicast poll, ping) + IP Overhead + AAL5 Overhead
Ethernet over ATM	Max Bandwidth setting + IP overhead + AAL5 overhead

When the user re-configures any ATM/IP interface operating in the CBR mode, the device automatically calculates the Minimum PCR for that VCI. If the Contract PCR setting for the circuit cannot support the circuit topology change (based upon the Minimum PCR requirement), an error will occur. Network status includes the minimum PCR value for each IPoA circuit and a status variable that indicates that a particular IPoA circuit is currently set over its limit.

Note When multiple VBricks are daisy-chained through the dual OC-3 interface and configured to operate in IPoA mode, each must contain a unique VPI/VCI value and, in Native ATM mode, each encoder destination must have a unique VPI/VCI value.

Example

If VBricks A, B and C are daisy-chained, VBricks A and B can have an entry in their network ATM configuration tables for VPI=0/VCI=100 (set in Configuration: Network > ATM and Configuration: Network > Ethernet Access). Connection C to B requires B to have a different VPI/VCI value to return to C. Likewise connection C to A requires a different entry. Failure to configure VPI/VCI circuits with unique values can cause virtual circuit collisions when VBricks contend for the same VPI/VCI connection, causing undesirable operation and loss of connectivity.

Enabling SVC Software

The VBrick ATM appliance has optional support for ATM SVC mode. This software must be purchased separately from VBrick. Once purchased, you will be provided with a key to enable this functionality. The SVC feature is only supported on VBricks with a main board part number (see [Status: User Information > Main Board](#)) that ends in a 2 or higher. The **SVC Software Key** field is not editable on unsupported boards.



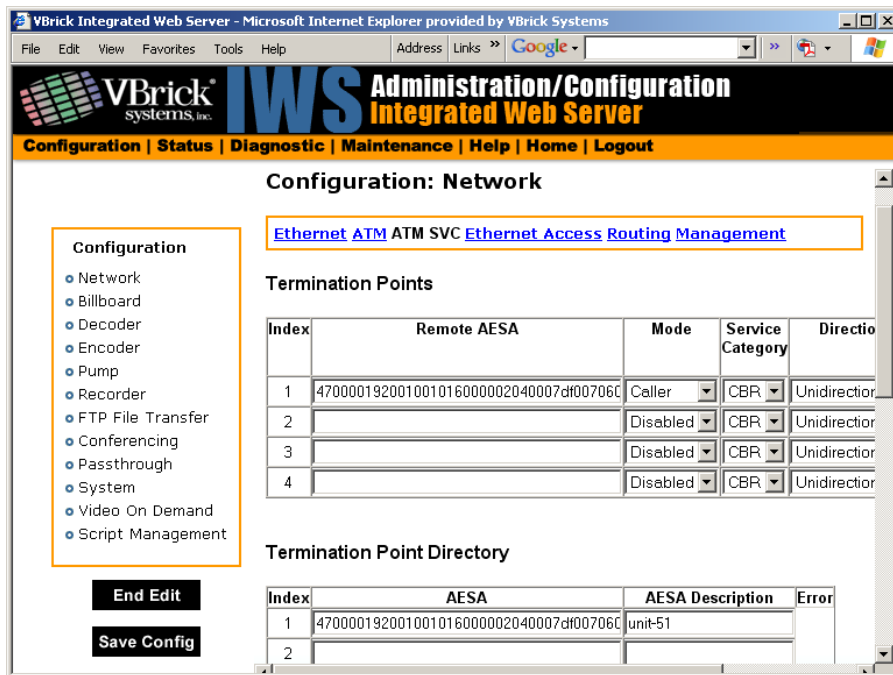
SVC Software Key	In edit mode, this field is used to input a key supplied by VBrick when the SVC option is purchased.
Signaling Enable	Enable, disable (default = enabled). This allows the manager to enable or disable the ILMI (Interim Local Management Interface), and ATM (Asynchronous Transfer Mode) signaling. Signaling enable/disable requires a box reset. Note that Signaling Enable has no effect if an SVC Software Key is not installed.

Configuration: Network > ATM SVC

- ▼ To set up SVCs:
 1. The encoder and/or decoder must be set to "Native ATM" encapsulation mode in order to be bound to an SVC.
 2. The setting for decoders is located in Configuration: Decoder > Network.

3. The setting for encoders is located in Configuration: Encoder > Destination 1 or 2.
4. ATM signaling has to be enabled with a valid SVC software key in Configuration: Network > ATM.
5. ATM signaling is enabled in Configuration: Network > ATM SVC. As with all IWS setting, once ATM signalling is enabled, it must be Applied to take affect. If the status has been changed from disabled to enabled, applying the setting reboots the appliance and saves the setting in flash so that when the appliance is next rebooted, the setting will remain enabled.

Note The status of ATM signaling and ILMI is available in Status: Network > ATM Signaling. The Trap log is available in Status: Network > System Log (Traps).



Termination Points

Index	The row index is the SVC Termination Point number. A maximum of four SVC entries are supported.
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Remote AESA	<p>The ATM End Station Address Contains up to 40 hexadecimal digits. It contains the configured ATM AESA address associated with the remote node. This address is comprised of the following fields concatenated together. In the above IWS screen example the addressing would be as follows:</p> <ul style="list-style-type: none"> • the ATM switch prefix from ILMI [47000019200100101600000204] • the Ethernet address of the VBrick [0007df008da1] • the TP destination index, (selector ID) [02] <p>When Mode is set to Caller, this field must contain the remote AESA to call. When calling another VBrick, the selector ID indicates the row in the SVC table at the remote location. When Mode is set to Listener: If this object is left blank then the SVC will receive a call from any address; otherwise, the VBrick will only accept a call from the specified AESA address.</p>
Mode	<ul style="list-style-type: none"> • Caller – Initiate the SVC call and continuously retry the until successfully established; if a connected SVC on this index is released, then the call will be continuously retried. • Listener – Wait for an SVC call attempt for this index from a remote AESA if specified. Otherwise accept the SVC call from any node. • Disabled – Not available for initiation or termination of an SVC. Incoming SVC call attempts for this index would be rejected.
Service Category	<p>UBR (Unspecified Bit Rate) or CBR (Constant Bit Rate). When set to UBR, the unspecified bit rate traffic contract is requested from the ATM network. When this object is set to CBR, constant bit rate traffic contract is requested from the ATM network. In CBR mode, the quality of service (QOS) parameters are defined as follows:</p> <ul style="list-style-type: none"> • Maximum cell transmit delay = 200ms • Maximum cell delay variation = 3ms • Maximum cell loss ratio = $3 * 10^{*-7}$ • The peak cell rate (PCR) is calculated based on the stream rate.
Direction	<p>This object allows the manager to configure the direction of data flow for this SVC termination point:</p> <ul style="list-style-type: none"> • Bidirectional indicates that this SVC will be used for two-way communications across the ATM network as would be the case where an encoder and a decoder were communicating over a single SVC connection. • Unidirectional indicates that this SVC will be used for one-way communications across the ATM network. In this case, the SVC can be used by either an Encoder or Decoder node. Typically, one end of the SVC would be bound to an encoder and the other end, bound to a decoder.

Reverse Transport Rate	Bit rate (bps) for a unidirectional SVC (1000000 to 17000000 bps). This field allows the manager to configure the reverse transport rate associated with the SVC. The Reverse transport rate is only required when the SVC is unidirectional and assigned to a decoder which is responsible for initiating the call. In all other cases, the value in this field is ignored. Note: The value of the Reverse Transport Rate should be set equal to or greater than the expected transport rate from the encoder.
Error	Validation error in configuration.

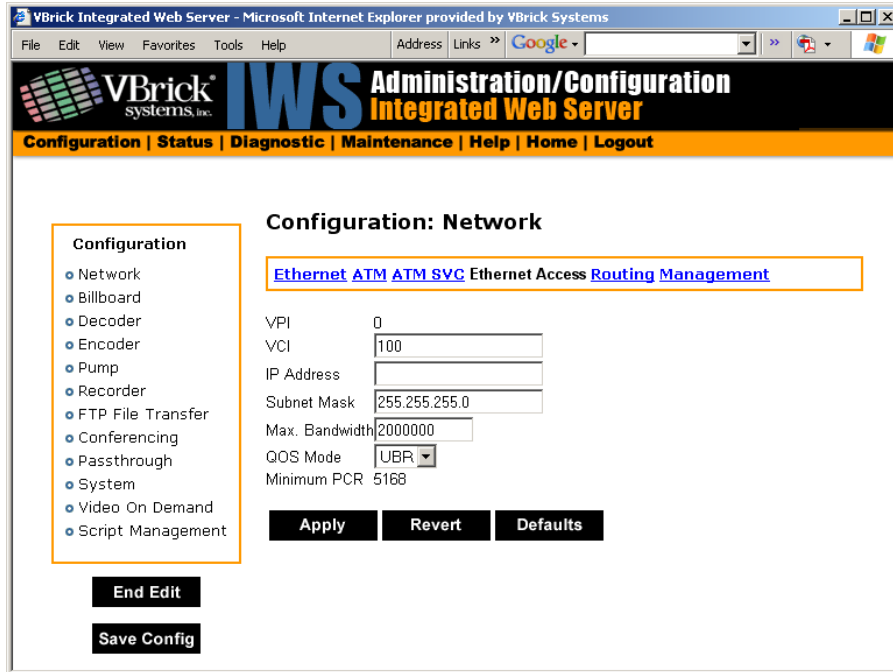
Termination Point Directory

This table is a placeholder for AESA addresses. It is purely for convenience to the user as a way of retaining specific addresses that are of particular interest. This table may be left blank as it has no affect on operation.

Index	The row index for the VBrick ATM SVC Termination Point Directory Please note that the row index is this table is not to be confused with the row index in the Termination Point Configuration table.
AESA	A table of 20 AESA addresses and their descriptions. AESAs from this table can be used to configure VBrick ATM SVC TP Remote Addresses for a SVC termination point in the VBrick ATM SVC TP Configuration Table by a simple mouse drag and drop operation.
AESA Description	ATM End Station Address Description. This optional field is used for informational purposes to describe the AESA address. It accepts up to 20 characters made up of letters, numbers, or hyphens only. Duplicate AESA addresses and duplicate AESA descriptions are not allowed in the TP Directory table. The remote AESA field in the SVC TP Configuration and the AESA fields in the TP Directory tables must be contain valid ATM address formats. The first byte of these fields should be 0x39, 0x45, 0x47, 0x49.
Error	Validation error in configuration.

Configuration: Network > Ethernet Access

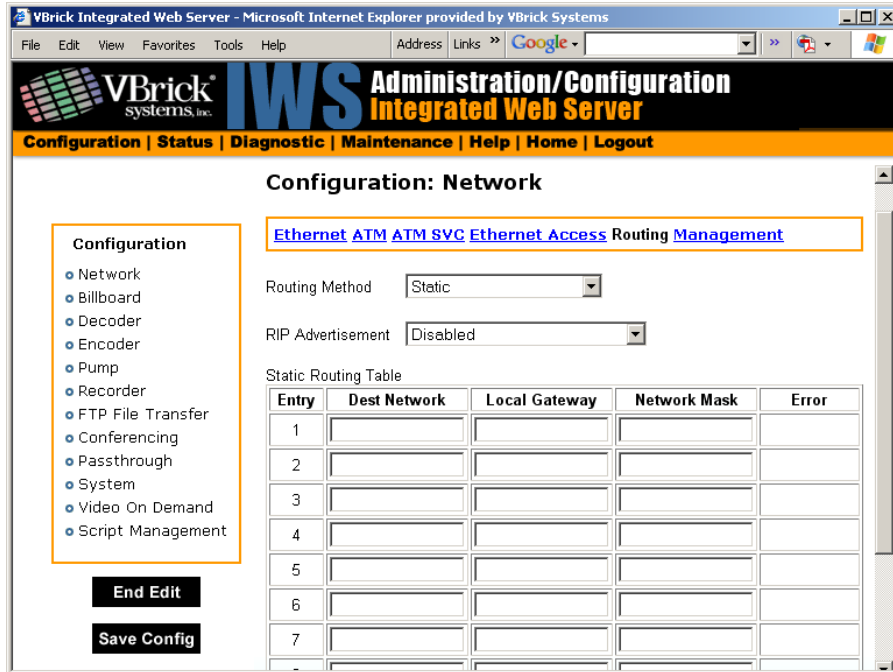
Ethernet over ATM allows remote VB6000 appliances to extend remote LAN connectivity via the ATM Network. Traffic from the Ethernet LAN is routed through the VBrick appliance and passed towards the ATM link, based upon the destination address within the packet. In turn, traffic from the ATM link is forwarded to the Ethernet LAN in the same fashion. Configuration parameters in this section allow the users to provision a separate VCI and IP Address for this feature. In addition, a bandwidth limiter is configurable from 500 Kbps to 3 Mbps, which allows the VBrick appliance maintain to high-video quality when remote Ethernet over ATM traffic attempts to place high bandwidth demands on the appliance or service line.



VPI/VCI	The Virtual Circuit Identifier and Virtual Path Identifier used for the Ethernet Access virtual connection.
IP Address	IP Address of the ATM interface used for Ethernet over ATM traffic.
Subnet Mask	Subnet mask of the ATM interface used for Ethernet over ATM traffic.
Maximum Bandwidth	The peak transfer rate allowed by the VBrick through the Ethernet access link, in bits per second (500000 to 3000000).
QoS Mode	Sets the ATM Quality of Service (QoS) mode service category for the virtual circuit. It can be set to UBR (Unspecified Bit Rate) or CBR (Constant Bit Rate).
Minimum PCR	The minimum required PCR (Peak Cell Rate) in cells per second for the ATM virtual circuit (VCI) for the ATM virtual circuit (VCI).

Configuration: Network > Routing

This screen provides configuration for an operator who wishes to allow packets to pass between the Ethernet Port and the ATM Ethernet Access Interface. IP Routing can be statically defined or provided by RIP (Routing Information Protocol).



Routing Method

This selects which routing method will be used:

- Disabled – Inhibits both the automatic and manual routes from being added to the routing tables.
- Static – Allows routes entered in the static routing table to be automatically applied to the internal routing tables, after a power-up.
- RIP Version 1 – Configures the VBrick to listen to RIP announcements. Routes are dynamically added per RIP specification.
- RIP Version 2 Broadcast – Configures the VBrick to listen to RIP version 2 announcements. In this mode, RIP will perform classless routing based upon subnet mask.
- RIP Version 2 Multicast – Configures the VBrick to listen to RIP version 2 announcements that are sent in multicast mode. Both broadcast and multicast announcements are processed.

RIP Advertisement

The Routing Information Table Controls the route advertisements that are periodically issued on models with an ATM interface.

- Disabled – Prevents all route advertisements from being issued.
- Enabled for Ethernet Interfaces – VBrick route advertisements are periodically issued on Ethernet Interfaces, including both Ethernet and Ethernet Access ports. Route information pertaining to IP interfaces set aside for video are not advertised.
- Enabled for ATM/IP Interfaces – VBrick route advertisements are periodically issued for includes all interfaces including Ethernet and ATM/IP.

Static Routing Table

To view the Internal Routing Tables, go to [Status: Network Status > Routing](#) on page 145.

Destination Network	Enter the destination address to be manually routed.
Local Gateway IP	Enter the Gateway to be used, when the forwarding destination address is as specified.
Network Mask	Sets the network mask to be associated with the destination address.

Configuration: Network > Management

See MPEG-2 [Configuration: Network > Management](#) on page 127.

Configuration: Billboard

See MPEG-2 [Configuration: Billboard](#) on page 44.

Configuration: Decoder

Configuration: Decoder > Video

See MPEG-2 [Configuration: Decoder > Video](#) on page 47.

Configuration: Decoder > Audio

See MPEG-2 [Configuration: Decoder > Network](#) on page 50.

Configuration: Decoder > Network

VBrick allows users to choose between different methods of formatting digital video for transport over the ATM network, IP or Native ATM. Both require ATM Layer 2 transport but each services different end-user applications. **Encapsulation Mode** is an additional parameter that will be available on models that support ATM, and defines the encapsulation method for transmission of video data.

- IPoA – See [Encapsulation Mode IP](#) on page 128. IP over ATM, specified by the IETF (Internet Engineering Task Force). When configured as IP, video traffic is encapsulated within the IP (Internet Protocol). This method is suitable for both Ethernet and ATM network connections. The IP over ATM method is useful in backbones where traffic converges over IP. Video transported over IP has the distinct advantage of being able to converge seamlessly with data in existing Internet Protocol networks. IP selects the IETF IP over ATM routed encapsulation method recommended by RFC 1483.
- Native ATM – See [Encapsulation Mode Native ATM](#) on page 130. MPEG over AAL5, specified by the ITU (International Telecommunications Union). This method is referred to as Native ATM. It is primarily used in the broadcast industry, and has gained acceptance in native ATM networking environments. If Native ATM is selected, video traffic formatted per ITU-T H.222.1 specification, which describes MPEG video encapsulation using AAL5. Native ATM is only supported on an ATM network. Neither option has an effect on Ethernet Transmissions.

Encapsulation Mode IP

The screenshot shows the VBrick IWS Administration/Configuration web interface. The main content area is titled "Decoder Network -- Slot2 (MPEG-2)". Under the "Receive" section, the "Enabled" checkbox is checked. The "Encapsulation Mode" is set to "IP" in a dropdown menu. The "Receive Address Mode" is set to "IP Address" with radio buttons. The "Apply" button is visible. Below this, the "Receive Host Name" field is empty. The "Receive IP Address" field contains "239.25.123.141". The "Receive Port" field contains "2141". The "Interface IP Address" dropdown is set to "Any-Active". The "Receive Mode" is set to "Multicast". The "Packet Ordering" and "Jitter Queue" checkboxes are unchecked. The "SAP IR Program Guide" checkbox is checked. The "SAP Timeout (sec.)" field contains "90". The "SAP Category" field is empty. The "SAP IP Address" field contains "224.2.127.254". The "SAP Port" field contains "10000". On the left, a "Configuration" menu lists various options, and "End Edit" and "Save Config" buttons are at the bottom.

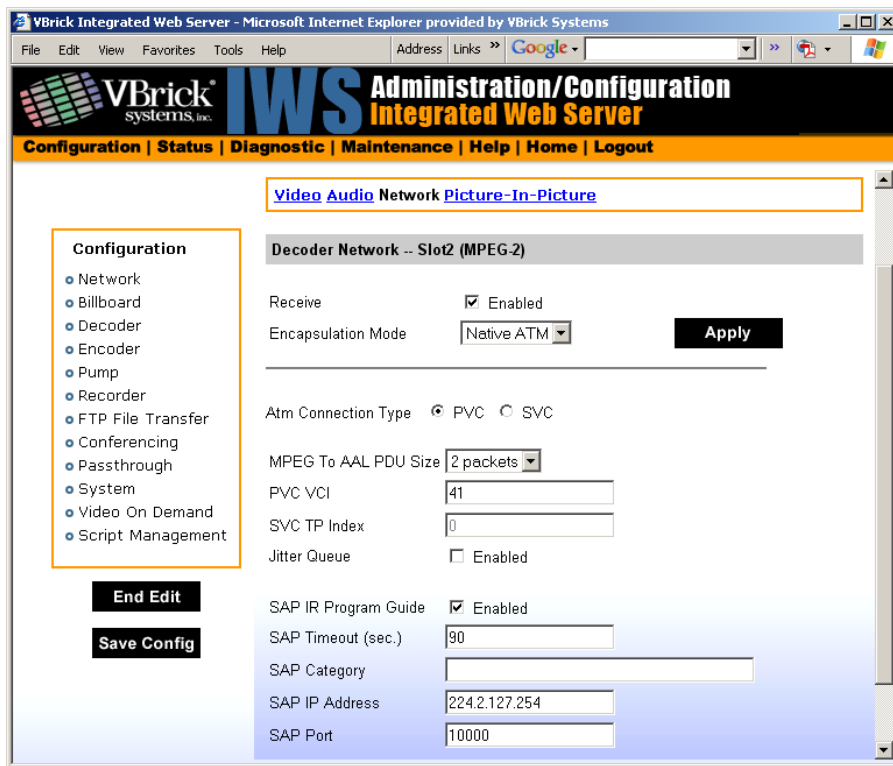
Receive Enable	This object allows the manager to control whether the decoder receives video from the network.
Encapsulation Mode	IP over ATM, specified by the IETF (Internet Engineering Task Force). When configured as IP, video traffic is encapsulated within the IP (Internet Protocol). This method is suitable for both Ethernet and ATM network connections. The IP over ATM method is found in backbones where traffic converges over IP. This represents an additional parameter on models that support ATM. IP selects the IETF IP over ATM routed encapsulation method recommended by RFC 1483. If the Encapsulation mode is set to IP, the following parameters are valid.
Receive Address Mode	Allows the user to specify how the receive address will be configured: IP address or Host Name.
Receive Host Name	Sets the source for video to be received using Host Name of the source. It can be used only for a unicast source.
Receive IP Address	The address embedded in the IP packet, which carries the Audio/Video/CC traffic. This field is used as a mechanism to filter and select from multiple Audio/Video streams. Dual Decoder models can have multiple multicast streams that share the same Receive IP Address and protocol port.
Receive Port	Sets the UDP video receive port.

Interface IP Address	This entry defines the network Interface IP Address to be used for the reception of recorded MPEG video. The Interface IP Address association relates to the ATM VCC shown in the Network ATM translation table. This is the IP Address and corresponding ATM VCC, which instructs the VBrick appliance to receive the Audio/Video stream from a particular IP interface. In ATM models, it can be used to select between any ATM VCC and Ethernet interface. If the user selects a valid multicast Receive IP Address, the Interface IP is presented as a drop-down box containing all the available IP interface entries. Among the choices are all ATM IP entries, the Ethernet IP value and the Any choice. This field should be set to Any .
Receive Mode	The decoder network receive mode. If the appliance is set to a unicast IP Address or to blank, this setting will indicate unicast. If set to a multicast IP Address, this will indicate multicast.
Packet Ordering	Disabled or Enabled. Toggles IP packet ordering. The identification number in the IP header determines IP packet ordering. Out of order packets are discarded prior to being given to the decoder. Some sources of video may not utilize the identification number field in a consistent manner and therefore the packet ordering feature may need to be disabled.
Jitter Queue	Delay jitter is defined as the variation of the delays with which packets traveling on a network connection reach their destination. During exceptionally long periods of delay, a large quantity of video packets will be buffered in the network. When the situation that caused the delay is resolved, the buffered frames will be burst, as a group, to the decoder. The handling of delay jitter is then a problem of having enough buffering in the decoder to handle a long delay, allowing the video to seem uninterrupted, and enough capacity in the buffer to handle the subsequent burst that follows once the delay has terminated. Typically, long delays in the network are associated with packet loss. No amount of buffer at the VBrick will correct packet loss. When first enabled, the jitter Q buffers 85ms of the video stream. Once the jitter Q has been filled, the jitter queue meters out the buffered video to the decoder at a rate equal to the rate of the video stream. The jitter queue is drawn down during times of packet drought, allowing the video to seem uninterrupted, but is large enough to handle the subsequent 85ms burst of packets that result once the drought is over. The impact of enabling the jitter queue is that a 85ms delay is imposed on the video stream.
Program Guide	Enabled or Disabled. Determines whether or not SAP text can be displayed in the Program Guide using the handheld IR remote control unit.
SAP Timeout	This object allows a manager to set the receive SAP timeout, in seconds. (1 – 9999, default is 90).

SAP Category	The keywords for filtering received SAPs. Characters are ASCII and are case sensitive. The total of all keywords in the string is 36 characters including spaces.
SAP IP Address	The receive IP address used to populate the Program Guide. This is typically set to the Announce Program Guide SAP of the encoder.
SAP Port	The receive IP port used to populate the Program Guide. This is typically the port number of the encoder.

Encapsulation Mode Native ATM

These parameters are relevant on models that support ATM. Native ATM selects the ITU-T H.222.1 method, supporting MPEG over AAL5.



Receive	Enabled or Disabled.
Encapsulation Mode	Native ATM. If the Encapsulation Mode is set to Native ATM, the following parameters are valid:
ATM Connection Type	<ul style="list-style-type: none"> • PVC – Specifies that the ATM service type is PVC. Service connection parameters are determined by the PVC's VPI/VCI. • SVC – Specifies that the ATM service type is SVC. Service connection parameters are determined at call setup time and are relayed to the AESA . When ATM Connection Type is set to SVC, the SVC termination point index is used to associate the decoder connection to the table entry as configured under Configuration: Network > ATM SVC.

MPEG to AAL PDU Size	This selects the AAL5 PDU, or protocol description unit size, for transmission over the ATM network when the Native ATM Encapsulation Mode is selected. This is set to 2 packets (376 bytes).
PVC VCI	This sets the VCI value to be used, for transmission over the ATM network when the Native ATM Encapsulation Mode is selected.
SVC TP Index	Termination Point Index. Binds the decoder to an entry in the Termination point table. 0 = disabled; 1–4 = enabled. See description for Remote AESA in Termination Points on page 122.
Jitter Queue	Delay jitter is defined as the variation of the delays with which packets traveling on a network connection reach their destination. During exceptionally long periods of delay, a large quantity of video packets will be buffered in the network. When the situation that caused the delay is resolved, the buffered frames will be burst, as a group, to the decoder. The handling of delay jitter is then a problem of having enough buffering in the decoder to handle a long delay, allowing the video to seem uninterrupted, and enough capacity in the buffer to handle the subsequent burst that follows once the delay has terminated. Typically, long delays in the network are associated with packet loss. No amount of buffer at the VBrick will correct packet loss. When first enabled, the jitter Queue buffers 85ms of the video stream. Once the jitter Queue has been filled, it meters out the buffered video to the decoder at a rate equal to the rate of the video stream. The jitter queue is drawn down during times of packet drought, allowing the video to seem interrupted, but is large enough to handle the subsequent 85ms burst of packets that result once the drought is over. The impact cost of enabling the jitter queue is that a 85ms delay is imposed on the video stream.
SAP IR Program Guide †	Disabled or Enabled. Determines whether or not SAP text can be displayed in the Program Guide using the handheld IR remote control unit.
SAP Timeout †	This object allows a manager to set the receive SAP timeout, in seconds. (1 – 9999, default is 90).
SAP Category †	The keywords for filtering received SAPs. Characters are ASCII and are case sensitive. The total of all keywords in the string is 36 characters including spaces.
SAP IP Address	The receive IP address used to populate the Program Guide. This is typically set to the Announce Program Guide SAP of the encoder.
SAP Port	The receive IP port used to populate the Program Guide. This is typically the port number of the encoder.

† These fields are relevant when the Encapsulation Mode is IP.

Configuration: Decoder > Picture in Picture

See MPEG-2 [Configuration: Decoder > Picture-In-Picture](#) on page 52.

Configuration: Encoder

Configuration: Encoder > Transport

See MPEG-2 [Configuration: Encoder > Transport](#) on page 53.

Configuration: Encoder > Video

See MPEG-2 [Configuration: Encoder > Video](#) on page 55.

Configuration: Encoder > Audio

See MPEG-2 [Configuration: Encoder > Audio](#) on page 58.

Configuration: Encoder > Destination 1 & 2

VBrick allows users to choose between different methods of formatting digital video for transport over the ATM network, IP or Native ATM. Both require ATM Layer 2 transport but each services different end-user applications. **Encapsulation Mode** is an additional parameter that will be available on models that support ATM, and defines the encapsulation method for transmission of video data.

- IPoA – See [Encapsulation Mode IP](#) on page 128. IP over ATM, specified by the IETF (Internet Engineering Task Force). When configured as IP, video traffic is encapsulated within the IP (Internet Protocol). This method is suitable for both Ethernet and ATM network connections. The IP over ATM method is useful in backbones where traffic converges over IP. Video transported over IP has the distinct advantage of being able to converge seamlessly with data in existing Internet Protocol networks. IP selects the IETF IP over ATM routed encapsulation method recommended by RFC 1483.
- Native ATM – See [Encapsulation Mode Native ATM](#) on page 130. MPEG over AAL5, specified by the ITU (International Telecommunications Union). This method is referred to as Native ATM. It is primarily used in the broadcast industry, and has gained acceptance in native ATM networking environments. If Native ATM is selected, video traffic formatted per ITU-T H.222.1 specification, which describes MPEG video encapsulation using AAL5. Native ATM is only supported on an ATM network. Neither option has an effect on Ethernet Transmissions.

Encapsulation Mode IP

The screenshot shows the VBrick IWS Administration/Configuration Integrated Web Server interface. The main configuration area is titled "MPEG2 Encoder Destination1 -- Slot1". The configuration options are as follows:

- Transmit:** Enabled
- Encapsulation Mode:** IP (selected from a dropdown menu)
- Destination Address Mode:** IP Address, Host Name
- Destination Host Name:** (empty text field)
- Destination IP Address:** 239.22.123.249 (text field), Loopback
- Destination Port:** 2249 (text field)
- Interface IP Address:** 172.22.123.249 Active (dropdown menu)
- Transmit Mode:** Multicast
- Time To Live(#hops):** 63 (text field)
- Type Of Service:** 0 (text field)
- Packet Payload Size:** 4136 (text field)
- Unicast Poll:** On
- Unicast Ping:** Enabled
- Join Own Multicast:** Enabled

Buttons for "End Edit" and "Save Config" are located at the bottom left of the configuration area. An "Apply" button is located next to the Encapsulation Mode dropdown.

Transmit	Enabled or Disabled. Instructs the Encoder to transmit or not transmit.
Encapsulation Mode	IP (IPoA). IP over ATM, specified by the IETF (Internet Engineering Task Force). When configured as IP, video traffic is encapsulated within the IP (Internet Protocol). This method is suitable for both Ethernet and ATM network connections. This represents an additional parameter on models that support ATM. IP selects the IETF IP over ATM routed encapsulation method recommended by RFC 1483. If the Encapsulation Mode is set to IP, the following parameters are valid.
Destination Address Mode	Allows the user to specify how the destination address will be configured: IP address or Host Name.
Destination Host Name	Sets the source for video to be received using Host Name of the source. It can be used only for a unicast source.
Destination IP Address	This is the Destination IP Address of the encoded video. When this is a multicast address, the transmit mode is also set to multicast. Similarly, if this is a unicast address, the transmit mode is also set to unicast.
Destination Port	This is the destination UDP port of the network device that will be receiving the encoded video.

Interface IP Address	This entry defines the network Interface IP Address to be used for the transmission of recorded MPEG video. (The entry is relevant only if the transmit destination is multicast; otherwise the field is greyed out.) The Interface IP Address association relates to the ATM VCC shown in the Network ATM translation table. This is the IP Address and corresponding ATM VCC used over which audio/video/cc streams are transmitted. In ATM models, it can be used to select between any ATM VCC and Ethernet interface. If the user selects a valid multicast Receive IP Address, the Interface IP is presented as a drop-down box containing all the available IP interface entries. Among the choices are all ATM IP entries and the Ethernet IP value.
Transmit Mode	This read-only parameter informs the operator whether the encoder is transmitting the video stream in Unicast or Multicast mode.
Time to Live	The number of hops (between routers) for which an IP packet is valid on the network.
Type of Service	The TOS (Type of Service) can be configured in the IP header to establish packet priority in the network.
Packet Payload Size	Controls the amount of MPEG data within each UDP packet. The default value is 4136. Ethernet networks are limited to a packet size of 1400 bytes and multiple IP packets are required to span one UDP packet. This is not the case with ATM which uses AAL5 where the maximum packet size accommodates the maximum configurable transport packet size. The allowed range is 1316 to 8872 bytes per packet—even numbers only. Note: When operating over ATM using the video over IP method of distribution, the maximum IP Packet Payload Size recommended is shown in Table 2 Calculating IP Packet Payload Size below.
Unicast Poll	This parameter is used to instruct the VBrick to poll whether the unicast destination VBrick is configured to accept this stream. If the unicast destination VBrick is not configured to accept this stream, this VBrick will not send the stream. This feature is designed to eliminate unwanted unicast video traffic across the network.
Unicast Ping	Feature for primary destination can be enabled, disabled. If the VBrick is designated to transmit a transport stream to any destination (whether another VBrick or not) in unicast mode, this parameter is used to instruct the VBrick to ping the destination periodically to test connectivity before sending the stream.
Join Own Multicast	Some network equipment requires that a multicast source (such as a VBrick encoder) join its own multicast group. This feature is enabled by default and has no adverse affect on equipment that is fully multicast compliant.

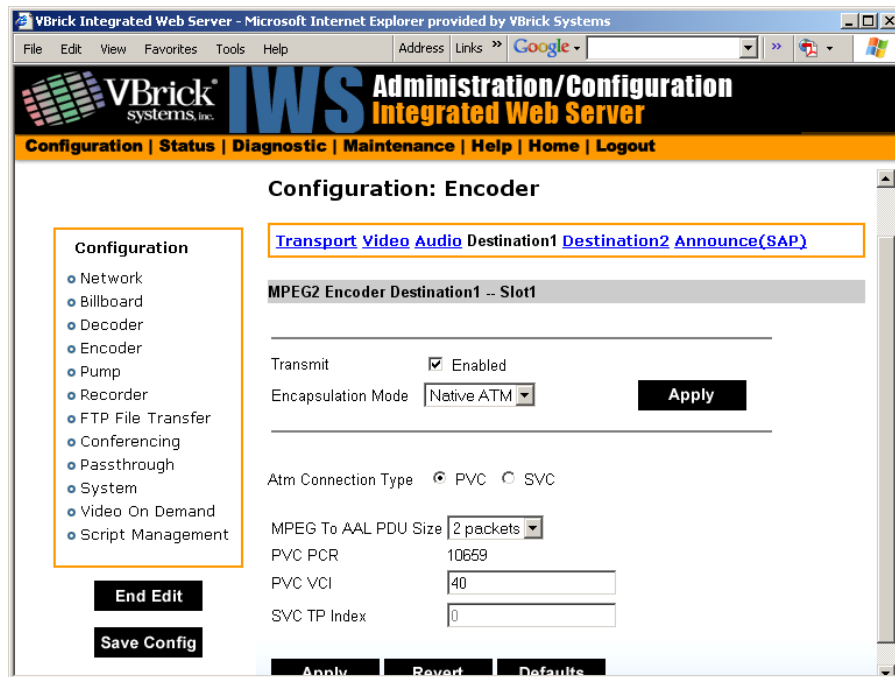
Data rates less than 4 MB (transport) generally work better with a reduced packet size. The following table shows recommended packet sizes for optimal performance.

Table 2. Calculating IP Packet Payload Size

Actual Transport Rate (Auto or Manual)	Recommended Packet Size	Notes
2000000	1316 (Minimum Size)	Less than default value
Less than 3000000	2256	Less than default value
Less than 3400000	3572	Less than default value
Less than 4000000	4136	Default value
Less than 5000000	4888	Or use default value
Less than 6000000	6204	Or use default value
Less than 7000000	7332	Or use default value
All other values	8872 (Maximum Size)	Or use default value

Encapsulation Mode Native ATM

When operating over ATM networks, Native ATM selects the ITU-T H.222.1 encapsulation method, which specifies MPEG over AAL5. The following screen reflects the valid parameters when Native ATM is selected.



Transmit

Enabled or Disabled. Instructs the Encoder to transmit or not transmit.

Encapsulation Mode	Native ATM. MPEG over AAL5, specified by the ITU (International Telecommunications Union). This method is referred to as Native ATM. If Native ATM is selected, video traffic formatted per ITU-T H.222.1 specification, which describes MPEG video encapsulation using AAL5. Native ATM is only supported on an ATM network. If the Encapsulation Mode is set to Native ATM, the following parameters are valid.
ATM Connection Type	<ul style="list-style-type: none"> • PVC – Specifies that the ATM service type is PVC. Service connection parameters are determined by the PVC's VPI/VCI. • SVC – Specifies that the ATM service type is SVC. Service connection parameters are determined at call setup time and are relayed to the AESA. When ATM Connection Type is set to SVC, the SVC termination point index is used to associate the encoder connection to the table entry as configured under Configuration: Network > ATM SVC screen.
MPEG to AAL PDU Size	This selects the AAL5 PDU, or protocol description unit size, for transmission over the ATM network when the Native ATM Encapsulation Mode is selected. This is set to 2 packets (376 bytes).
PVC PCR	Peak cell rate being transmitted over the circuit.
PVC VCI	This sets the VCI value to be used, for transmission over the ATM network when the Native ATM Encapsulation Mode is selected.
SVC TP Index	Termination Point Index. Binds the decoder to an entry in the Termination point table. 0 = disabled; 1–4 = enabled. See description for Remote AESA in Termination Points on page 122.

Configuration: Encoder > Announce (SAP)

See MPEG-2 [Configuration: Encoder > Announce \(SAP\)](#) on page 62.

SDI Configuration

Topics in this chapter

[Introduction](#)

[Configuration: Encoder](#)

[Configuration: Decoder](#)

Introduction

Serial Digital Interface, or SDI, is mainly used in the professional industry and is based on the principal standard for broadcast television and the motion picture industries. Reliable, flexible and cost-effective video transport is critical to the video transmission industry, which provides state-of-the-art transport services for broadcast networks, content producers, entertainment programmers, news agencies and sportscasters throughout the world. SDI provides users the best available video quality with virtually no latency.

The Serial Digital Interface Encoder is a module that plugs into the encoder card, allowing the broadcast industry standard 270 Mbps serial signal to be converted to MPEG-2. The Serial Digital Interface input module accepts the Society of Motion Picture and Television Engineers industry-standard, SMPTE 259M-C compliant signals at 270 Mbps. The standard specifies a Serial Digital Interface (SDI) for digital video equipment operating at either the 525-line, 60 Hz or 625-line, 50 Hz video standard. After VBrick's MPEG-2 conversion, the compressed video can be transported and utilized over a standard IP or ATM network.

The SDI module extracts AES/EBU or non-AES/EBU audio from Group 1 channels 1 – 4 from the incoming 270 Mbps data stream. These audio channels are embedded into the SDI video stream and occupy space in the horizontal and vertical blanking interval. These four channels are extracted into two SDI stereo streams of audio. SDI 1-2 contains the stereo channels 1 and 2 from Group 1 of the embedded audio. SDI 3-4 contains the stereo channels 3 and 4 from Group 1 of the embedded audio. The SDI hardware can select either channels 1 and 2, or channels 3 and 4 from the SDI stream. Audio embedded in Groups 2, 3, and 4 of the SDI stream will not be extracted. If desired, the user may bypass any embedded SDI audio and provide analog audio input at the VBrick encoder. The SDI input module is available with model numbers ending in -x101, -x111, -x102, -x112.

The Serial Digital Interface output module is similar to the SDI input module; however, the output module provides an SDI signal to the end-user. The SDI output module plugs into the decoder card, allowing MPEG-2 to be converted to the broadcast industry standard SMPTE 259M-C, 270 Mb/s serial signal, or SDI. The SDI output module operates at either the 525-line, 60 Hz or 625-line, 50 Hz video standard. The decoder module does not provide EDH, or Error Detect Handling.

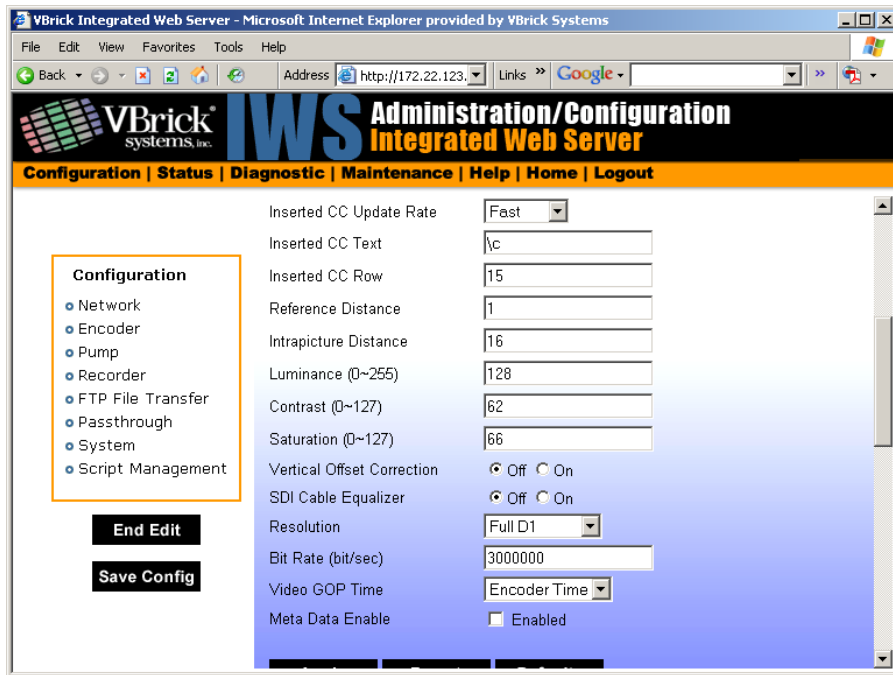
The SDI output module multiplexes one group containing channels 1 and 2 of stereo (L/R) audio into the serial video stream. Also included is the "standard" implementation of channel status, provided for professional or broadcast use per AES3-1992 (r1997). The user may still

utilize the analog video and audio available at the decoder output while simultaneously using the SDI output module. The SDI output module is available with model numbers ending in –x110, –x011, –x111, –x010, –x012, –x112.

Configuration: Encoder

Configuration: Encoder > Video

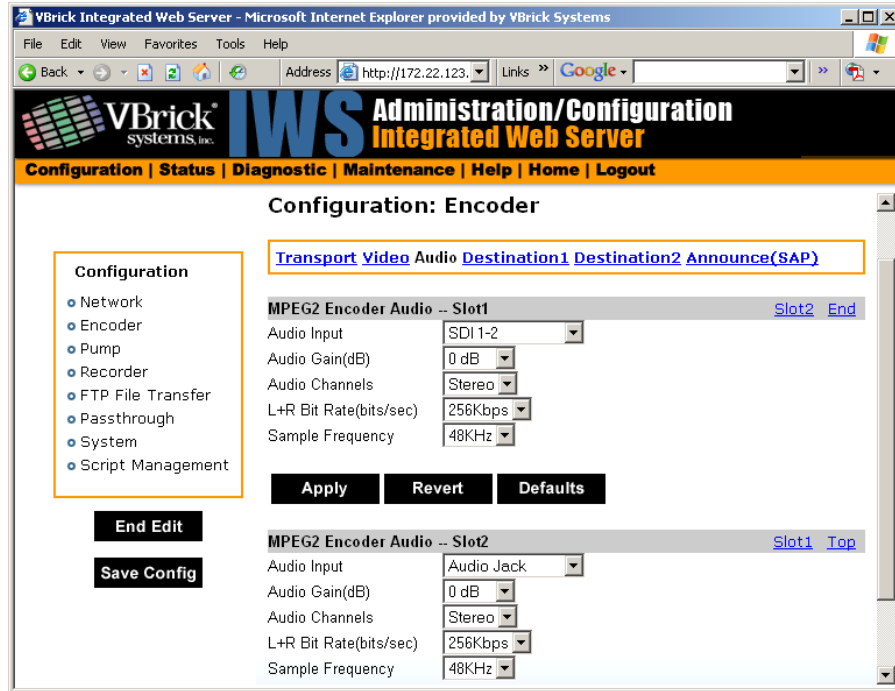
These parameters are used to configure the encoder video settings. The SDI (Serial Digital Interface) is only available on –xxx1/–xxx2 equipped units (see Status: User Information for part number). Several additional configuration parameters are available with SDI models. For SDI equipped units, everything is the same as for VBrick models ending in –xxx1/–xxx2, except for the fields shown below. Note that the Hue field is not available with SDI.



Vertical Offset Correction	This setting controls vertical offset correction for SDI appliances.
SDI Cable Equalizer	This setting allows selection of SDI Cable Equalizer settings. If set to on, the SDI Cable Equalizer maintains SDI signal quality when SDI cables have a length greater than 10 meters.

Configuration: Encoder > Audio

The encoder video and audio configurations for an SDI (Serial Digital Interface) equipped appliance are only available on a model ending in part number –xxx1/–xxx2 (see Status: User Information for part number). These parameters are used to set the SDI Encoder Audio Input settings. For SDI equipped units, everything is the same as for the models ending in –xxx1/–xxx2, except for the fields below.



SDI Audio Input	Input can be through 1/8" mini-phonon jack, from AudioMate, or from within the SDI data using SDI 1-2 or SDI 3 -4.
Audio Gain	If SDI 1-2 or SDI 3-4 is chosen as the audio input, the audio gain settings have no effect.

Configuration: Decoder

The SDI decoder does not display any additional fields in the Integrated Web Server. If an SDI board is present, connecting to the output will produce SDI out of the appliance. When a VBrick encoder is optioned with SDI video input with PIP enabled the video that will be displayed in the PIP screen will originate only from the standard NTSC video inputs and not from the SDI input. Note that closed captioning is not supported with SDI.

System Status

MPEG-2 and MPEG-4 only. (For ATM status windows, see [Status: System Information \(ATM\)](#) on page 166.) The Status menu lets you view information and status relative to the VBrick appliance. The **Refresh** button allows the user to update the statistics to display the most current values. A **Reset** button is also present on some screens, allowing a user to reset all statistic counters.

Topics in this chapter

[Status: System Information](#)

[Status: Network Status](#)

[Status: Decoder Status](#)

[Status: Encoder Status](#)

[Status: Hard Drive Status](#)

[Status: JPEG Status](#)

[Status: RTSP Server Status](#)

[Status: System Log](#)

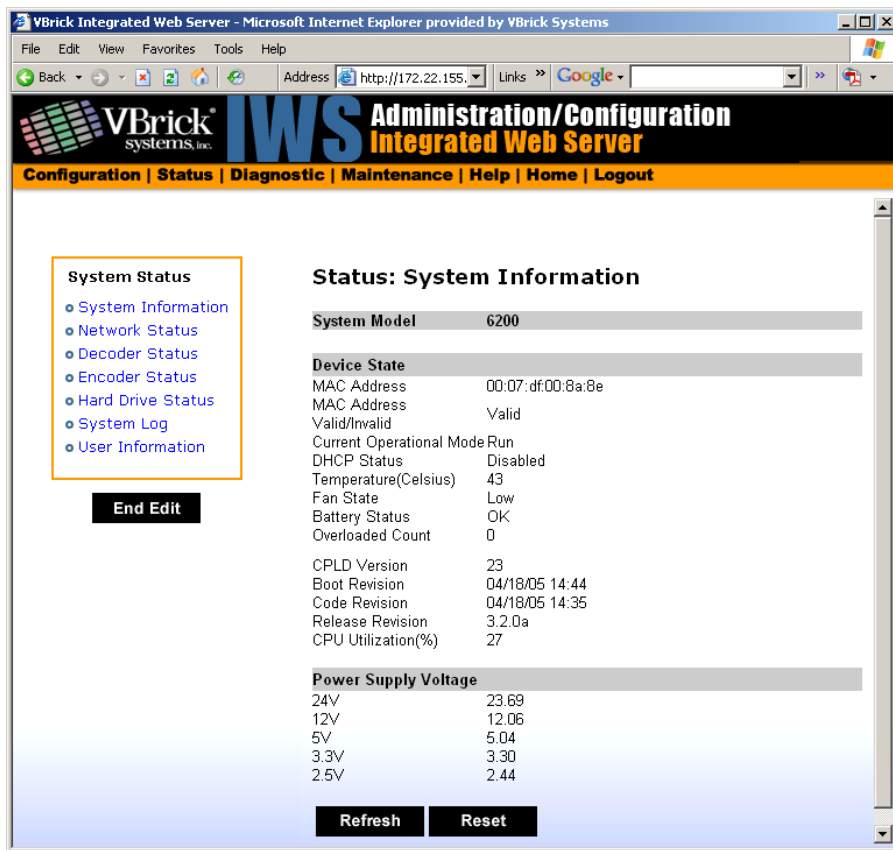
[Status: User Information](#)

[Status: System Information \(ATM\)](#)

[Status: Network Status \(ATM\)](#)

Status: System Information

MPEG-2 and MPEG-4 only. This menu allows the user to view vital system information. Some of this information represents parameters describing the VBrick as shipped; others provide information concerning the current VBrick operation.



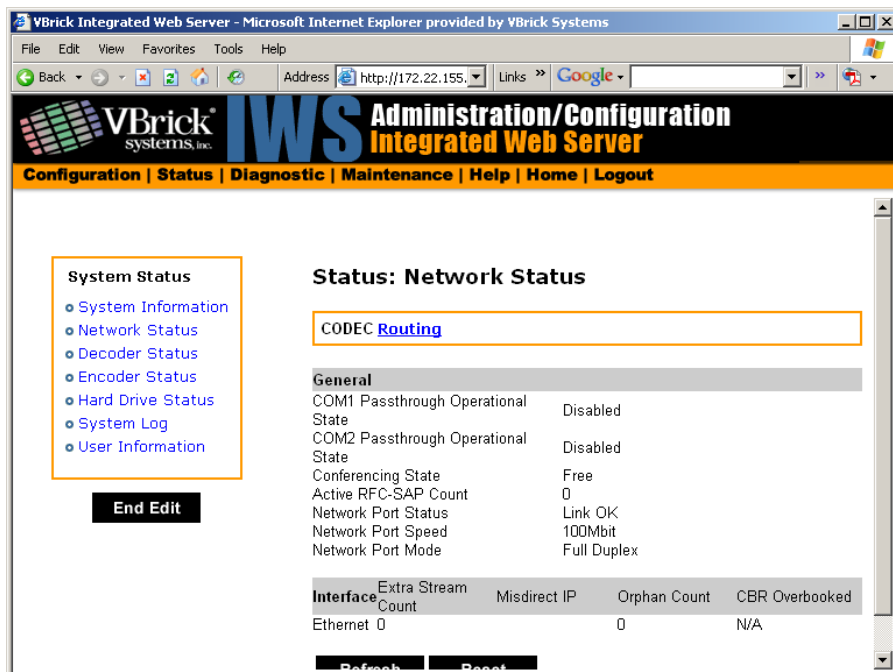
System Model	Displays the model number of the appliance.
MAC Address	Displays the MAC (Media Access Control) address of the appliance.
MAC Address Valid	Verifies that the MAC address is valid.
Current Operational Mode	<p>Indicates the current operational mode of the VBrick. The following modes are supported:</p> <ul style="list-style-type: none"> • Run Mode – Normal operation. • Diagnostics – User selected mode for running certain VBrick diagnostics. • Limited Run Mode – Limited operational mode (not selectable). Normally occurs if a hardware problem exists within the VBrick but it can still partially operate. • Overloaded Mode – Limited operational mode (not selectable). This mode occurs when the VBrick is configured to handle more video than its operational capacity. It automatically reconfigures itself to allow continued remote and local management. If this occurs, the VBrick needs to be reconfigured to reduce the number of streams and/or data rates. Under this condition, the appliance temporarily reduces video traffic in order to maintain IWS functionality.

DHCP Status	Dynamic Host Configuration Protocol – Ethernet models only. Enabled/Disabled. Possible DHCP Status values: <ul style="list-style-type: none"> • Disabled • Succeeded • Failed • Succeeded without Subnet Value – No subnet value given; generated from IP address. • Succeeded with Invalid Subnet Value – Invalid subnet value given; generated from IP address. • Failed over Backplane – Device number invalid in backplane. • Failed, Invalid Device Unit – Network interface device number invalid. • Failed Invalid Cookie – Network interface inoperable. • Failed, Bind Failed – DHCP server not available or appliance not connected to network. • Failed, Out of Memory – Appliance is out of memory. Indicates a severe condition. • Failed, Parameter Get Failed – Couldn't retrieve a DHCP parameter needed/requested. • Failed, Invalid Boot File – Invalid boot file specified. Indicates a severe condition. • Failed, Invalid Retrieved IP address assigned by the server is not a valid unicast address.
Temperature	Displays the temperature of the appliance (Celsius).
Fan State	Displays the state of the fan as Not Operational, High or Low .
Battery Status	OK or Failed.
Overloaded Count	Provides a count of the number of times the box has entered the Overloaded state.
CPLD version	Displays the Main Board programmable device version number.
Boot Revision	Displays the date of the last boot revision.
Code Revision	Displays the date of the last code revision.
Release Revision	Displays the release version number.
CPU Utilization%	The percentage of the Central Processor in use at this time.
Power Supply Voltage	Displays the measured voltages present and provided to the VBrick (24V, 12V, 5V, 3.3V 2.5V).

Status: Network Status

Status: Network Status > Codec

This menu allows the user to view various network-level conditions. (For ATM status windows, see [Status: System Information \(ATM\)](#) on page 166.)



General

COM1/COM2 Passthrough Operational State	<p>The current operational state of COM1/COM2 serial Passthrough port. There will be a conflict if the slot selected through the Passthrough Destination parameter has neither an encoder nor a decoder present; or has an encoder with a multicast destination; or has an encoder with no configured destination. The possible values are:</p> <ul style="list-style-type: none"> • Disabled • Enabled Active • Enabled Conflict No Enc Or Dest • Enabled Conflict Enc Multi Dest • Enabled Conflict Enc No Dest • Enabled Internal Error • Enabled Rejected • No Dedicated IP Addr
Conferencing State	<p>This setting indicates the unicast call state of the encoder.</p> <ul style="list-style-type: none"> • Free – Available for a conference. • Busy – The VBrick is currently engaged in a conference. • Disabled – The conference feature has been disabled. • Unknown – The VBrick is in a transition state.
Active RFC-SAP Count	<p>This is the number of SAP sessions the appliance is currently listening to for the purpose of RFC 2974-compliant SAP timing. This field displays values when SAP timing is configured for RFC 2974 mode.</p>
Network Port Status	<p>The status of the Ethernet network interface: Link OK or No Link.</p>

Network Port Speed	The speed of transmission for the Ethernet network interface: 10Mbit or 100Mbit .
Network Speed Mode	The mode of transmission for the Ethernet network interface: Full Duplex or Half Duplex .

Interface

This section reports the existence of any undesired video streams being received by the VBrick. The reporting is made for each IP interface, individually. On Ethernet Models, only one interface exists.

Extra Stream Count	Number of unexpected video streams being received on this interface.
Misdirect IP Address	The IP Address of the appliance transmitting one of the extra video streams received on this interface.

Status: Network Status > Routing

This display screen allows the user to view the Internal Routing Tables.

The screenshot shows the VBrick Integrated Web Server (IWS) Administration/Configuration page. The main content area is titled "Status: Network Status" and contains a "CODEC Routing" section. Below this is a "Dynamic Routing Table" with the following data:

Destination Network	Local Gateway IP	Network Mask
0.0.0.0	172.22.1.5	0.0.0.0
127.0.0.1	127.0.0.1	255.255.255.255
172.16.2.72	172.22.1.5	255.255.255.255
172.16.130.21	172.22.1.5	255.255.255.255
172.16.130.22	172.22.1.5	255.255.255.255
172.22.0.0	172.22.155.34	255.255.0.0
172.28.1.51	172.22.1.5	255.255.255.255
224.2.127.254	172.22.1.5	255.255.255.255
224.2.133.133	172.22.1.5	255.255.255.255
224.2.133.134	172.22.1.5	255.255.255.255
239.22.155.36	172.22.1.5	255.255.255.255

Destination Network	Defines a target network (or device) that can be contacted via the system. A value of 0.0.0.0, is used to indicate a default routing entry. The 127.0.0.1 is always present and identifies the loopback route.
Local Gateway IP	Defines the intermediary network device (or entity) which is responsible for IP forwarding to the given destination network specified in the first column.

Network Mask

Defines the destination network's address scope specified in the first column. Mask bits which are zeros, identify the host portion of the address space. Bits that are "ones" identify the network portion.

Status: Network Status > Network Time

The screenshot shows a web browser window titled "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "172.22.113.1". The page header includes the VBrick logo and "IWS Administration/Configuration Integrated Web Server". A navigation bar contains links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Status: Network Status" and features a sidebar with a "System Status" menu containing links for System Information, Network Status, Decoder Status, Encoder Status, JPEG Status, RTSP Server Status, System Log, and User Information. The "Network Time" section is highlighted with an orange box. It includes a "CODEC Routing Network Time" input field, a "Network Time Synchronization" section with "Last Successful Update" and "Network Time Client State" (Idle), a "Primary Network Time Server" section with "Successful Update Counter" (0), "Failed Update Counter" (0), and "Current Server Status" (Server Standby), and a "Secondary Network Time Server" section with similar statistics. "End Edit", "Refresh", and "Reset" buttons are also visible.

Status: Decoder Status

MPEG-2 Decoder Status

This menu lets you view vital Decoder statistics. As you **Refresh**, the **Source IP Address** and **Bytes Transferred** fields are updated. If you see decoder sync, lost sync count, non-video packets and unexpected fragments counts increase you should investigate your network.

Decoder Status	Slot2
Decoder State	Normal Run
Receive State	Receive enabled
Transport Rate	7815114
Source IP Address	172.17.132.100
Bytes Transferred	2231273444
Buffer Full Count	0
Decoder Sync. State	In Sync.
Lost Sync. Count	73
Packets Received	64403336
Non Video Packet	0
Unexpected Fragments	0
Packet Ordering	Disabled
Jitter Queue Status	Disabled
Audio Micro-code Revision	Rev. 2.30
Video Micro-code Revision	Rev. 3.4
FPGA Revision	1.06.0 02/09/01 09:21
CPLD Revision	11
Decoder Aux. CPLD Revision	?
BIOS EEPROM Revision	?

Decoder State	<ul style="list-style-type: none"> • Displays decoder state from the decoder standpoint. • Idle • Setup Transport • Setup PCR And PID • Wait For STC Interrupt • Look For STC Active • Setup Elementary Streams • Setup Elementary Decoders • Audio STC Access Error • Normal Run • Start Channel Change • Wait On Both Audio Channels Change • Wait On Audio 1 Channel Change • Wait On Audio 2 Channel Change • Video Drain Command • Wait On Video Drain • Restart Video And Audio • Illegal • Wait For PID Interrupt • Transport Buffers Drain State • Wait On Transport Time Out
Receive State	Displays the detailed state of the decoders receive operation.
Transport Rate	The measured transport rate received by this decoder.
Source IP Address	The IP Address of the video source.

Bytes Transferred	The number of receive bytes transferred.
Buffer Full Count	The number of times the decoder buffer filled to capacity.
Decoder Sync State	Indicates whether the MPEG-2 transport layer has achieved its synchronization. Most likely indicates a configuration or network problem.
Lost Sync Count	The number of times the decoder has acquired synchronization with the transport stream (see note under Unexpected Fragments).
Packets Received	The count of IP packets received.
Non Video Packet	The count of packets directed to this decoder, which are not part of the video stream.
Unexpected Fragments	The number of mis-ordered packets received. Each VStar product maintains a statistical report on Unexpected Fragments received from a particular video stream. If multiple devices in the same unit (i.e. decoder or hard disk) are tuned to the same stream, the Unexpected Fragments count on slot 1 is used exclusively to report statistical results.
Packet Ordering	Packet ordering status. Packet ordering is temporarily disabled under conditions, such as the IP ID is not increasing or disabled, or the access method does not support reordering. Packets arriving over Ethernet can be reordered but those over ATM cannot.
Jitter Queue Status	The Status of the jitter Q. It is generally equal to the value of the Jitter Queue of the decoder with the following exception: if a variable transport (video, audio and idle frames included) rate stream is being decoded then the jitter queue will be temporarily disabled. The Jitter Queue will be re-enabled when the decoder senses that a video stream of fixed rate transport is being received.
Audio Micro-code Revision	The revision of the audio microcode on the decoder chip.
Video Micro-code Revision	The revision of the video microcode on the decoder chip.
FPGA Revision	The revision of the FPGA chip on the decoder daughter card.
CPLD Revision	The revision level of the CPLD on the decoder daughter card.
PLX EEPROM Revision	The revision level of the PLX EEPROM on the decoder daughter card.

MPEG-4 Decoder Status

This window shows the general status of decoder's connection mode, video and audio.

Status: Decoder Status > General

Use this status window to verify your connection between an encoder and a decoder.

Connection

Connection Mode	Set in Configuration: Decoder > Network .
Connection State	Indicates the state of the connection to the encoder: <ul style="list-style-type: none"> • Connected – The decoder is connected to the encoder and is receiving packets associated with the program. • Connecting – The decoder is in the process of connecting to the encoder. • Disabled – The decoder is disabled. Receive is not enabled on the Configuration: Decoder > Network page. • Stopped – A user has stopped or paused the decoder.

Retry Reason	If the decoder is not connected, a connection to the encoder was not established or has failed. See Status: System Log > Config on page 162 for more details.
Retry Count	Total attempted retries. For a failed connection, the decoder will automatically attempt a reconnect every five seconds.
Session Origin	Derived from SDP file. The IP address, VBrick Host Name, or DNS name of the encoder. If the Connection Mode is VBrick IP Address or Hostname , the slot number is appended.
Program Name	Derived from SDP file. The program name for the stream this decoder is receiving.
Program Information	The program information in the SDP file for the stream this decoder is receiving. Default is "VBrick Streaming Video."
Target Latency	Defines the decoder latency which the software is attempting to maintain. A primary factor in determining the target latency is the configured Time in Jitter Queue (see Configuration: Decoder > RTP on page 92.) The entered value may be increased by the decoder software if it determines that an unacceptable viewing experience will result from maintaining that target latency. Any of the following factors may result in an increased target latency: a metered VBrick encoder source, difficulty in synchronizing audio and video, or excessive jitter of the encoded stream.
Connection Duration	Length of time the current connection has been active.
Connection Protocol	The protocol being used for this connection: Multicast, Unicast, or RTSP.

Video

Source Video Resolution	The source video resolution for the video stream this decoder is receiving.
Source Pixel Aspect Ratio	The source pixel aspect ratio for the video stream which this decoder is receiving. Possible values are PAL, NTSC, Square, 4:3, and 16:9.
Displayed Video Resolution	The video resolution for the video stream, after scaling, being displayed by this decoder.
Measured Video Frame Rate	The video frame rate for the video stream being displayed by this decoder.
Target Video Bit Rate	The estimated video bit rate from the encoder for the video stream this decoder is receiving. If the video stream is metered by the encoder, there will be an indication (metered, jittered, or unspecified) appended to the end of the bit rate.
Measured Video Bit Rate	The measured bit rate for the video stream being displayed by this decoder.

Video Frames Decoded	The number of frames decoded for the video stream being displayed by this decoder.
Bad Video Frames	The number of video frames that could not be decoded.
Key Frames Decoded	The number of key frames decoded.

Audio

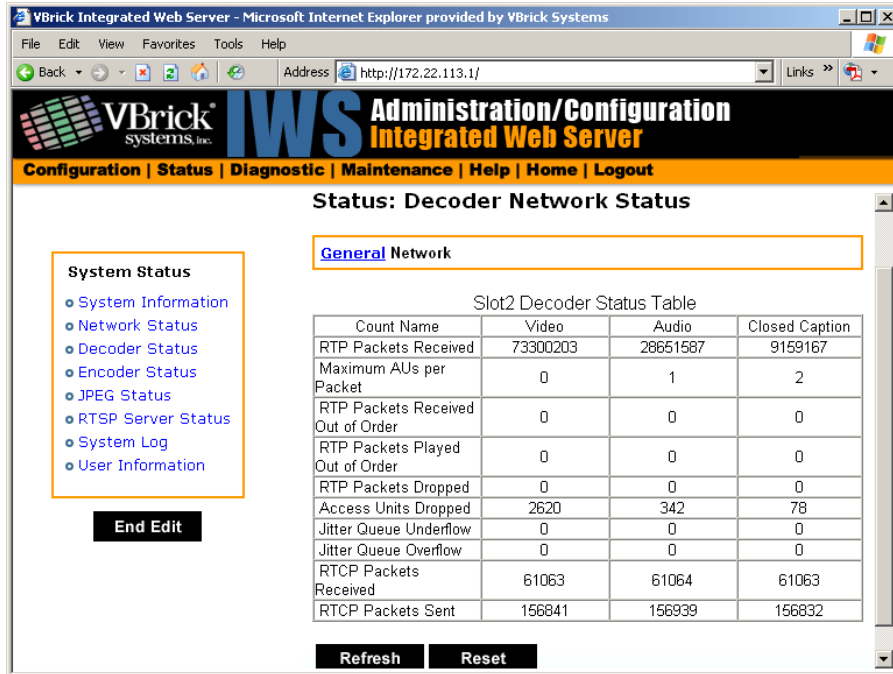
Audio Format	The format for the audio stream this decoder is receiving in the format: xxx/<Stereo, Mono> where xxx is the Sample Frequency (see Audio Template Settings). For example: 48000/Stereo
Target Audio Bit Rate	The estimated audio bit rate from the encoder for the audio stream this decoder is receiving.
Measured Audio Bit Rate	The measured bit rate for the audio stream being played by this decoder.
Audio Frames Decoded	The number of frames decoded for the audio stream being played by this decoder.
Bad Audio Frames	The number of audio frames that could not be decoded.

Closed Caption

Measured CC Bit Rate	Reports the measured bit rate for the closed caption stream displayed by the decoder.
CC Frame Rate	Reports the frame rate for the closed caption stream displayed by the decoder

Status: Decoder Status > Network

This status window provides packet statistics for the connection.



RTP Packets Received	The number of RTP packets received.
Maximum AUs per Packet	Maximum access units per RTP packet. The video maximum is 0 or 1; the audio maximum varies by source; the closed caption maximum is set in the encoder.
RTP Packets Received Out of Order	The number of RTP packets received that were out of order.
RTP Packets Played Out of Order	The VBrick decoder also uses the Jitter Queue to correct packets that are received out of order. If the packet statistics indicate a significant number of RTP Packets Played Out of Order you may be able to improve video and audio quality by increasing the setting in Configuration: Decoder > RTP > Time in Jitter Queue. If you see RTP Packets Played Out of Order , even with a large Time in Jitter Queue setting, the network is losing packets.
RTP Packets Dropped	The number of RTP packets dropped.
Access Units Dropped	The number of access units dropped by the RTP receiver. AU packets may be automatically adjusted to account for differences in timing between the encoder and decoder.
Jitter Queue Underflow	The VBrick decoder has an adjustable Time in Jitter Queue to protect against depletion by network jitter (see <u>Configuration: Decoder > RTP</u> on page 92). If the packet statistics indicate a significant number of Jitter Queue Underflow counts you should increase the setting in Configuration: Decoder > RTP > Time in Jitter Queue to allow the decoder to handle more network jitter.

Jitter Queue Overflow	An overflow occurs when there is an overflow in the buffer capacity of the VBrick.
RTCP Packets Received	The number of RTCP packets received.
RTCP Packets Sent	The number of RTCP packets sent.

Status: Encoder Status

This menu allows users to view vital Encoder statistics. As you **Refresh** you should see **Transmit State – Transmitting** and the **IP Bytes Transferred** count should increment. If this does not happen check your VBrick's encoder configuration or network.

MPEG-2 Encoder Status

The screenshot shows the VBrick Integrated Web Server (IWS) Administration/Configuration page. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.155.". The page has a navigation menu with "Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout". The main content area is titled "Status: Encoder Status". On the left, there is a "System Status" menu with options: System Information, Network Status, Decoder Status, Encoder Status (selected), Hard Drive Status, System Log, and User Information. Below the menu is an "End Edit" button. The main content area displays three tables:

General		Slot1
Encoder State		Running
Micro-Code Revision		84410368
FPGA Revision		18.0.0 02/12/03 10:05
PLX EEPROM Revision		2

Destination1		Slot1
Transmit State		Not Transmitting
IP Bytes Transferred		278636680
Buffer Full Count		0
IP Packets Sent		70400

Destination2		Slot1
Transmit State		Not Transmitting
IP Bytes Transferred		0
Buffer Full Count		0
IP Packets Sent		0

Encoder State	Displays encoder state as running or not running.
Micro-Code Revision	Displays the encoder micro-code revision.
FPGA Revision	Displays the FPGA revision number.
PLX EEPROM Revision	Displays the EEPROM revision number.
Transmit State	Displays Transmitting or Not Transmitting .
IP Bytes Transferred	Number of bytes sent across the network
Buffer Full Count	Displays any full buffer counts that occur.
IP Packets Sent	Displays the number of packets sent across the network.

MPEG-4 Encoder Status

System Status

- System Information
- Network Status
- Decoder Status
- Encoder Status
- JPEG Status
- RTSP Server Status
- System Log
- User Information

End Edit

General	Slot1
Encoder State	Running
Encoder-Code Revision	10/25/05 12:49
FPGA Revision	2.1.18 02/04/05 11:22
PLX EEPROM Revision	2

Video	Slot1
Bit Rate	1018121
Frames Per Second	29
Frames Encoded	10292764
Frames Dropped	0
Buffer Full Count	0

Audio	Slot1
Bit Rate	126648
Frames Encoded	16098711
Frames Dropped	0
Buffer Full Count	0

Destination1	Slot1
Transmit State	Transmitting
IP Bytes Transferred	1943531523
IP Packets Sent	62540931

Destination2	Slot1
Transmit State	Not Transmitting
IP Bytes Transferred	0
IP Packets Sent	0

General

Encoder State	Displays encoder state as running or not running.
Micro-Code Revision	Displays the encoder micro-code revision.
FPGA Revision	Displays the FPGA revision number.
PLX EEPROM Revision	Displays the EEPROM revision number.

Video

Bit Rate	Displays the video bit rate.
Frames per Second	Displays the number of frames per second.
Frames Encoded	Displays the number of frames encoded.
Frames Dropped	Displays the number of frames dropped in the counted frames.
Buffer Full Count	Displays how many times the buffer full count has been reached.

Audio

Bit Rate	Displays the audio bit rate.
Frames per Second	Displays the number of frames per second.
Frames Encoded	Displays the number of frames encoded.
Frames Dropped	Displays the number of frames dropped in the counted frames.
Buffer Full Count	Displays how many times the buffer full count has been reached.

Destination and Slot

Transmit State	Transmitting, not transmitting.
IP Bytes Transferred	Number of bytes transferred from the encoder daughter card to the main board.
Buffer Full Count	Displays any full buffer counts that occur.
IP Packets Sent	Displays the number of packets sent.
Refresh	The screen is static. Use the Refresh button to updates the screen to display current information.

Status: Hard Drive Status

MPEG-2 and VBStar only.

Status: Hard Drive Status > General

The screenshot shows a web browser window displaying the VBrick Integrated Web Server Administration/Configuration interface. The page title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.155.1" and the search bar contains "172.22.113.1". The main navigation bar includes links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The "Status" section is expanded, showing a sidebar with links for System Information, Network Status, Decoder Status, Encoder Status, Hard Drive Status (selected), System Log, and User Information. The "Hard Drive Status" section is titled "Status: Hard Drive Status" and contains a "General Pump Recorder" section. Below this, a table displays the following information:

Disk Type	TOSHIBA MK6022GA
Free Space	36498 (MegaBytes)
Video File Count	15
Read Errors	0
Write Errors	0
Open Errors	0
Write Retries	0
Read Retries	0
Failed Retries	0

At the bottom of the page, there are buttons for "End Edit", "Refresh", and "Reset".

Disk Type	This variable contains the Hard Drive model number as reported by the hard drive firmware.
Free Space	Amount of remaining space on the hard drive.
Number of Files	Number of files on the hard drive.
Read Errors	The count of reported block read failures.
Write Errors	The count of reported block write failures.
Open Errors	The count of reported file open failures.
Write Retries	The number of retries that have been attempted for block write operations.
Read Retries	The number of retries that have been attempted for block read operations.
Failed Retries	The count of all failed retries for read <u>or</u> write operations.

Status: Hard Drive Status > Pump

The screenshot shows the VBrick IWS Administration/Configuration web interface. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.155.". The page has a navigation menu with "Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout".

On the left, there is a "System Status" sidebar with the following links: System Information, Network Status, Decoder Status, Encoder Status, Hard Drive Status, System Log, and User Information. Below the sidebar is an "End Edit" button.

The main content area is titled "Status: Pump Status" and contains a "General Pump Recorder" section. Below this, there are two tables:

General	
Pump State	Running
Pump Bit Rate	4684119
Pump Duration	3599 (sec.)
Current File	NASAShuttleLanding2005.mpg

Network	
Transmit State	Transmitting
IP Bytes Transferred	2021426276
Buffer Full Count	0
IP Packets Sent	38530405

At the bottom of the main content area, there are "Refresh" and "Reset" buttons.

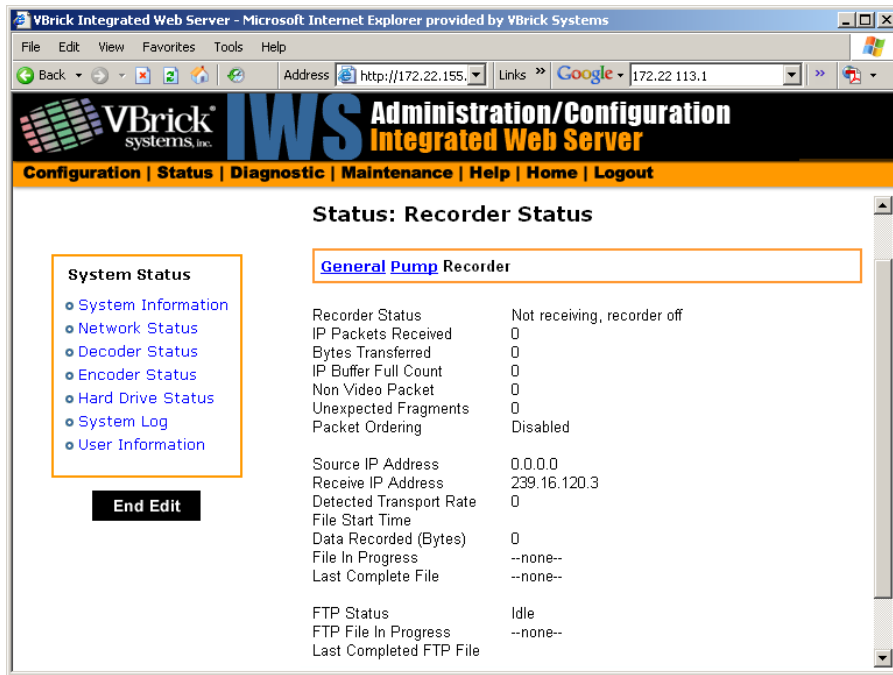
General

Pump State	Stopped Running Fast Forward Fast Fast Forward Slow Paused Rewind Fast Rewind Slow Hard Drive Failed No Batch File	Hard Drive Unformatted File Not Found File Cannot Be Opened Invalid File Failed To Get Length Failed To Get Bit Rate Error Sending Message
Pump Bit Rate	The bit rate, in bits per second, of the stream being pumped.	
Pump Duration	The duration, in seconds, of the stream being pumped.	
Current File	Name of the file currently being transferred.	

Network

Transmit State	Displays whether the pump is transmitting or not transmitting.
IP Bytes Transferred	The number of transmit bytes of the UDP packets sent to the primary destination.
Buffer Full Count	The number of times the Hard Drive buffer has filled to capacity for the primary data stream.
IP Packets Sent	The number of UDP packets sent to the primary destination.

Status: Hard Drive Status > Recorder



Recorder State	Failed Stopped, never started Stopped, by user Stopped, Disk Full Stopped, File Size Limit Stopped, FTP Overrun Stopped, Duration Complete	Stopped, Unformatted Stopped, IO Error Stopped, File Is Pumping Running, From Power Up Running, Scheduled Running, User Initiated
IP Packets Received	The number of IP Packets received.	
Bytes Transferred	The number of received bytes transferred across the internal bus.	
IP Buffer Full Count	The number of times the hard drive buffer has been filled to capacity.	
Non Video Packet	The number of non-video packets received.	
Unexpected Fragments	The number of mis-ordered packets received.	
Source IP Address	The IP Address of the video source.	
Receive IP Address	The configured receive IP address. If unicast, this is the same as the source IP and address.	
Detected Transport Rate	The measured transport rate received by the recorder.	
File Start Time	Allows viewing the start date/timestamp for current or most recent file.	

Data Recorded	Bytes. Current file size of the file being recorded set to “0” if recording is not in progress.	
File in Progress	Name of the file currently being recorded.	
Last Completed File	Name of the last file recorded.	
FTP Status	Transfer in Progress Idle Invalid FTP Server Invalid User Name Invalid User Password	Local File Open Error Socket Open Failure Transfer Failure Socket Quit Failure
FTP File in Progress	Name of the file being transferred to the FTP server.	
Last Completed FTP File	Name of the last file that was sent to the FTP server.	

Status: JPEG Status

MPEG-4 only. Displays JPEG image capture status if enabled. See [Configuration: JPEG](#) on page 111 for more about configuration.

The screenshot shows the VBrick IWS Administration/Configuration interface in a Microsoft Internet Explorer browser window. The address bar shows the URL <http://172.22.113.1>. The page title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The main content area is titled "Status: JPEG Status" and contains a table of parameters for Slot1.

General	Slot1
Video Resolution	352x240(SIF)
Number Of Images	0
Number Of Images Transferred	0
Average Time To Create a JPEG Image(msec)	0
Average Time To Transfer a JPEG Image(msec)	0
Transfer Status	Disabled
JPEG File Name	
Date/Time Of Capture	

On the left side of the page, there is a "System Status" menu with the following options: System Information, Network Status, Decoder Status, Encoder Status, JPEG Status (highlighted), RTSP Server Status, System Log, and User Information. Below the menu is an "End Edit" button. At the bottom of the status table, there are "Refresh" and "Reset" buttons.

Video Resolution	Resolution of snapshots determined by the configuration of the associated MPEG-4 encoder. One of the following: SIF (352x240) QSIF (160x120) CIF (352x288) QCIF (176x144) 384x288 320x240 256x192 192x144 128x96 64x48
Number of Images	Number of images captured since capture was enabled.
Number of Images Transferred	Number of images transferred since capture was enabled. If the number of snapshot transfers is lower than the number of snapshots, the create time plus the transfer time is likely greater than the configured snapshot interval.
Average Time to Create ...	Milliseconds. Average time to create each snapshot over the last 10 snapshots.
Average Time to Transfer ...	Milliseconds. Average time to transfer the snapshots from the VBrick to the server over the last 10 transfers.
Transfer Status	<ul style="list-style-type: none"> • Success – compressed snapshot successfully transferred to the server. Waiting to capture another image. • Transfer in progress. • Timeout – Transfer failure due to timeout. Indicates a network error, server error, or error in configuring the snapshot FTP page. • Rejected – Transfer failure due to invalid user name or password. • Aborted – Not enough space on server. • Disabled – Snapshot capture is disabled.
JPEG File Name	Name of .jpg file being transferred to server.
Date/Time of Capture	Date and time of last successful capture.

Status: RTSP Server Status

Status: RTSP Server Status > General

MPEG-4 only.

System Status

- System Information
- Network Status
- Decoder Status
- Encoder Status
- JPEG Status
- RTSP Server Status
- System Log
- User Information

Status: RTSP Server Status

General [Slot 1 Details](#)

RTSP Server	Slot1
Current Number of Client Sessions	0
Maximum Number of Client Sessions	2
Current Bandwidth Used(bits/sec)	0
Maximum Bandwidth Used(bits/sec)	2656000

End Edit Refresh Reset

Current Number of Client Sessions	Displays current number of sessions.
Maximum Number of Client Sessions	Displays the maximum number of sessions that have been simultaneously operating since the status was reset. This setting enables control of the maximum number of RTSP clients allowed. Currently a unit can support up to 120. A value of 0 disables the RTSP server.
Current Bandwidth Used	Displays the current bandwidth used in bits per second.
Maximum Bandwidth Used	Displays the maximum bandwidth used at any point in time since status was reset.

Status: RTSP Server Status > Details

The screenshot shows the VBrick IWS Administration/Configuration interface in Microsoft Internet Explorer. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.113.1". The page header includes the VBrick logo and "IWS Administration/Configuration Integrated Web Server". A navigation bar contains links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Status: Slot1 RTSP Server Details". On the left, a "System Status" sidebar lists: System Information, Network Status, Decoder Status, Encoder Status, JPEG Status, RTSP Server Status, System Log, and User Information. Below this is an "End Edit" button. The main content area has a "General Slot1 Details" section with a "Refresh" button. Below that is a "Slot1 RTSP Server Session Detail" table with columns for IP Address, Transport, State, Start Date, Start Time, Video (Sending, Port/Channel, Packets Sent), and Audio (Sending, Port/Ch:). The table is currently empty.

Status: System Log

Status: System Log > Config

This log contains a list of the latest VBrick configuration changes.

The screenshot shows the VBrick IWS Administration/Configuration interface in Microsoft Internet Explorer. The browser title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.113.1". The page header includes the VBrick logo and "IWS Administration/Configuration Integrated Web Server". A navigation bar contains links for Configuration, Status, Diagnostic, Maintenance, Help, Home, and Logout. The main content area is titled "Status: System Log". On the left, a "System Status" sidebar lists: System Information, Network Status, Decoder Status, Encoder Status, JPEG Status, RTSP Server Status, System Log, and User Information. Below this is an "End Edit" button. The main content area has a "Config System Event Traps System Info" section. Below that is a table with the following log entries:

config:172.29.1.50:operator:11/14/2005 12:17:38LOC Login Attempt PASSED
config:172.22.2.67:operator:11/14/2005 12:17:19LOC Login Attempt PASSED
config:172.28.1.51:operator:11/14/2005 12:15:55LOC Login Attempt PASSED
config:172.22.2.113:admin:11/14/2005 12:10:37LOC Login Attempt PASSED
config:172.29.1.50:operator:11/14/2005 12:10:34LOC Login Attempt PASSED
config:172.22.2.67:operator:11/14/2005 12:10:15LOC Login Attempt PASSED
config:172.28.1.51:operator:11/14/2005 12:08:52LOC Login Attempt PASSED
config:172.29.1.50:operator:11/14/2005 12:03:30LOC Login Attempt PASSED

Status: System Log > System Event

The system event log contains reports of system events within the VBrick. These events may occur during normal operation and include reports of successful and unsuccessful attempts to access video sources by the local decoder and access to the local encoder using RTSP.

The screenshot shows the VBrick IWS Administration/Configuration web interface. The browser window title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.113.1". The page header includes the VBrick logo and navigation links: Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout. The main content area is titled "Status: System Log". On the left, there is a "System Status" sidebar with links to System Information, Network Status, Decoder Status, Encoder Status, JPEG Status, RTSP Server Status, System Log, and User Information. Below the sidebar is an "End Edit" button. The main log area contains a list of system events, each with a timestamp and details:

- SYSEVENT:11/14/2005 10:52:56LOC RTSP:Slot1 'TEARDOWN', IP:172.16.130.21, url:vbrickvideo1'
- SYSEVENT:11/14/2005 10:52:55LOC RTSP:Slot1 'PAUSE', IP:172.16.130.21, url:vbrickvideo1'
- SYSEVENT:11/14/2005 10:36:46LOC RTSP:Slot1 'TEARDOWN', IP:172.16.2.225, url:vbrickvideo1'
- SYSEVENT:11/14/2005 10:36:45LOC RTSP:Slot1 'PAUSE', IP:172.16.2.225, url:vbrickvideo1'
- SYSEVENT:11/14/2005 10:36:42LOC RTSP:Slot1 'PLAY', IP:172.16.2.225, url:vbrickvideo1'
- SYSEVENT:11/14/2005 10:36:42LOC RTSP:Slot1 'SETUP', IP:172.16.2.225, url:vbrickvideo1/trackID=12'
- SYSEVENT:11/14/2005 10:36:42LOC RTSP:Slot1 'SETUP', IP:172.16.2.225, url:vbrickvideo1/trackID=11'
- SYSEVENT:11/14/2005 10:36:42LOC RTSP:Slot1 'DESCRIBE', IP:172.16.2.225, url:vbrickvideo1'

Status: System Log > Traps

This log contains all of the SNMP traps generated by the box whether or not the traps have been emitted.

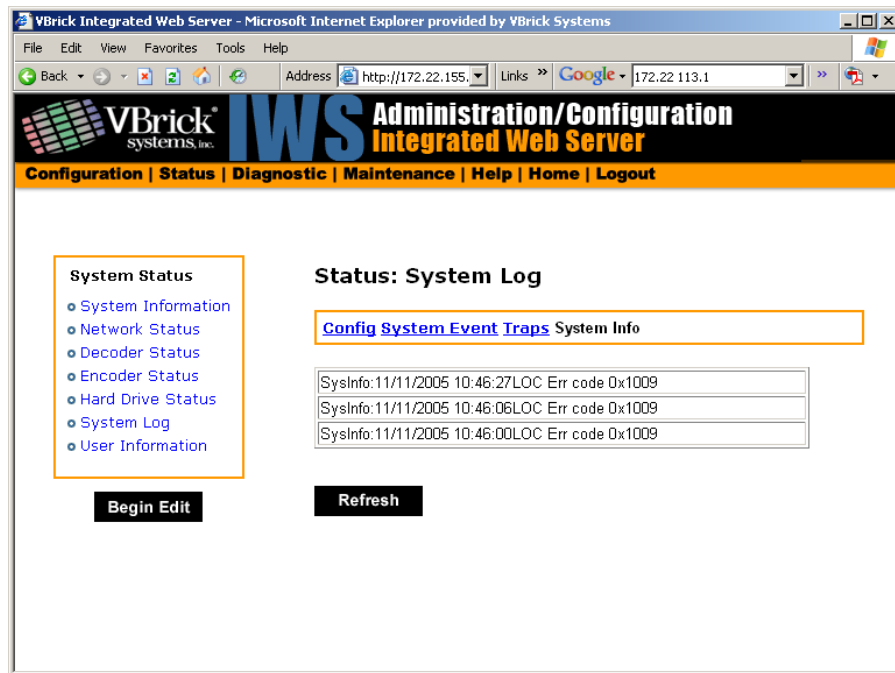
The screenshot shows the VBrick IWS Administration/Configuration web interface. The browser window title is "VBrick Integrated Web Server - Microsoft Internet Explorer provided by VBrick Systems". The address bar shows "http://172.22.113.1". The page header includes the VBrick logo and navigation links: Configuration | Status | Diagnostic | Maintenance | Help | Home | Logout. The main content area is titled "Status: System Log". On the left, there is a "System Status" sidebar with links to System Information, Network Status, Decoder Status, Encoder Status, JPEG Status, RTSP Server Status, System Log, and User Information. Below the sidebar is an "End Edit" button. The main log area contains a single trap entry:

trap:11/10/2005 15:47:29LOC startUpRunMode

Below the trap entry is a "Refresh" button.

Status: System Log > System Info

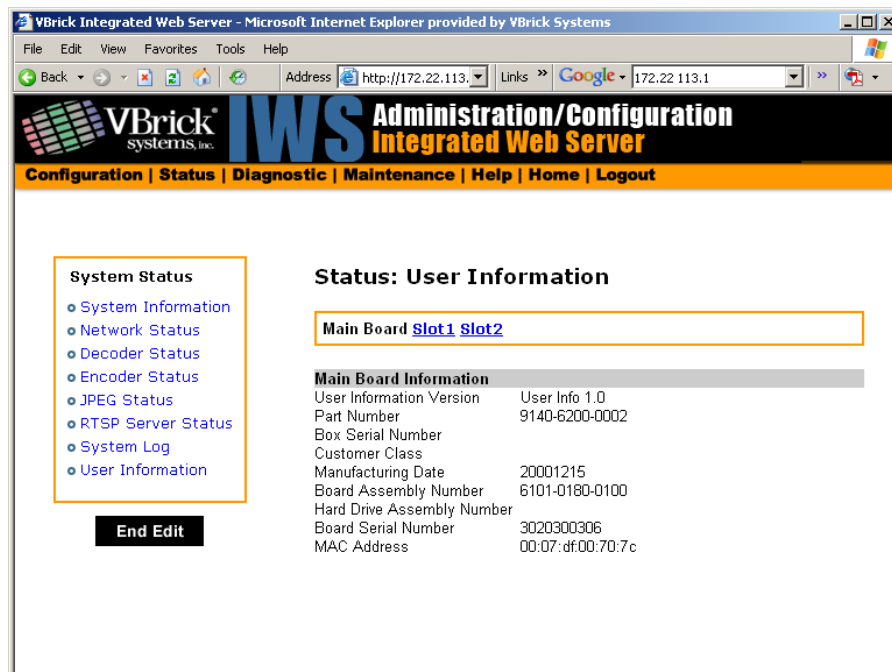
This log contains unexpected behaviors detected by the VBrick software. Normally this log is used by VBrick Customer Support to help debug possible system malfunctions.



Status: User Information

Status: User Information > Main Board

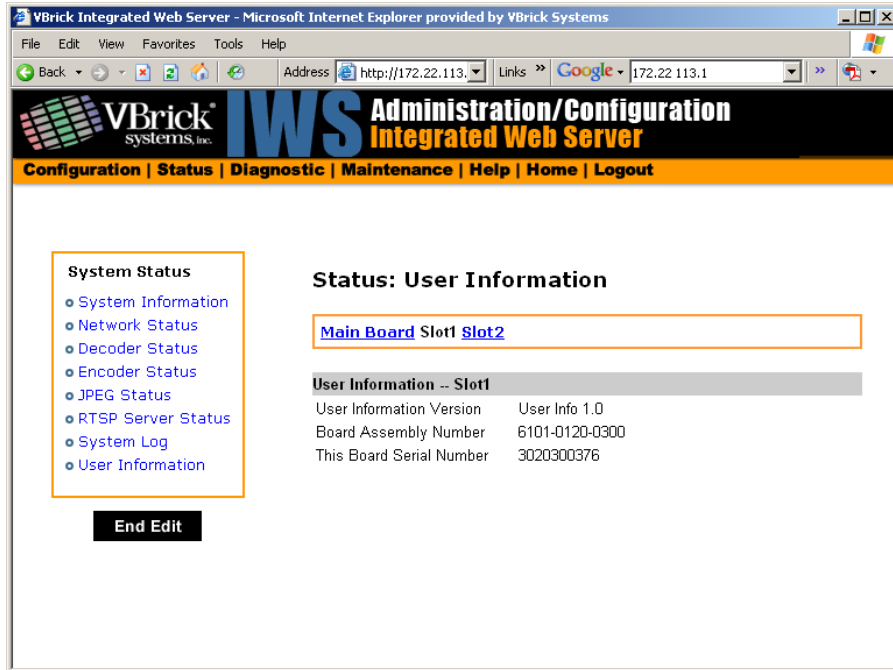
This menu allows the user to view factory set information regarding the main board.



User Information Version	As displayed.
Part Number	As displayed.
Box Serial Number	As displayed.
Customer Class	As displayed if any.
Manufacturing Date	As displayed.
Board Assembly Number	As displayed if any.
Power Assembly Number	As displayed if any.
Hard Drive Assembly Number	As displayed if any.
Lot number	As displayed if any.
Board Serial Number	As displayed.
MAC Address	As displayed.
Upgrade Date	Last upgrade date, if any (format is yyyyymmdd, where yyyy = four digit year, mm = two digit month, dd = 2 digit day).

Status: User Information > Slot1/2/3/4

This menu allows the user to view factory set information relative to the slots in the appliance.



User Information Version	As displayed.
Board Assembly Number	As displayed.
Lot Number	As displayed if any.
Main Board Serial Number	As displayed.
This Board Serial Number	As displayed.

Status: System Information (ATM)

This menu allows the user to view vital system information. Some of this information represents parameters describing the VBrick as shipped; others provide information concerning the current VBrick operation.

Status: System Information

System Model 6221

Device State

MAC Address 00:07:df:00:8d:a1
 MAC Address Valid
 Valid/Invalid
 Current Operational Mode Run
 Temperature(Celsius) 47
 Fan State High
 Battery Status OK
 Overloaded Count 0

CPLD Version 23
 ATM CPLD Version 0x84
 Boot Revision 11/11/05 17:55
 Code Revision 11/11/05 15:23
 Release Revision 3.3.0a
 CPU Utilization(%) 14

Power Supply Voltage

24V 23.98
 12V 11.94
 5V 5.04

ATM CPLD Version | Displays the ATM Board programmable device version number.

Status: Network Status (ATM)

Status: Network Status > Codec

Status: Network Status

CODEC [ATM Routing](#) [ATM Signaling](#) [ATM SVC](#) [Network Time](#)

General

COM1 Passthrough Operational State Disabled
 COM2 Passthrough Operational State Disabled
 Conferencing State Free
 Active RFC-SAP Count 0
 Network Port Status Link OK
 Network Port Speed 100Mbit
 Network Port Mode Full Duplex

Interface	Extra Stream Count	Misdirect IP	Orphan Count	CBR Overbooked
Ethernet	0		0	N/A
ATM1	0		0	Cleared
ATM2	0		0	Cleared
ATM3	0		0	Cleared
ATM4	0		0	Cleared
ATM5	0		0	Cleared
ATM6	0		0	Cleared
ATM7	0		0	Cleared

General

COM1/COM2 Passthrough Operational State	The current operational state of COM1/COM2 serial Passthrough port. There will be a conflict if the slot selected through the Passthrough Destination parameter has neither an encoder nor a decoder present; or has an encoder with a multicast destination; or has an encoder with no configured destination. The possible values are: <ul style="list-style-type: none"> • Disabled • Enabled Active • Enabled Conflict No Enc Or Dest • Enabled Conflict Enc Multi Dest • Enabled Conflict Enc No Dest • Enabled Internal Error • Enabled Rejected • No Dedicated IP Addr
Conferencing State	This setting indicates the unicast call state of the encoder. <ul style="list-style-type: none"> • Free – Available for a conference. • Busy – The VBrick is currently engaged in a conference. • Disabled – The conference feature has been disabled. • Unknown – The VBrick is in a transition state.
Active RFC-SAP Count	This is the number of SAP sessions the appliance is currently listening to for the purpose of RFC 2974-compliant SAP timing. This field displays values when SAP timing is configured for RFC 2974 mode.
Network Port Status	The status of the Ethernet network interface: Link OK or No Link .
Network Port Speed	The speed of transmission for the Ethernet network interface: 10Mbit or 100Mbit .
Network Speed Mode	The mode of transmission for the Ethernet network interface: Full Duplex or Half Duplex .

Interface

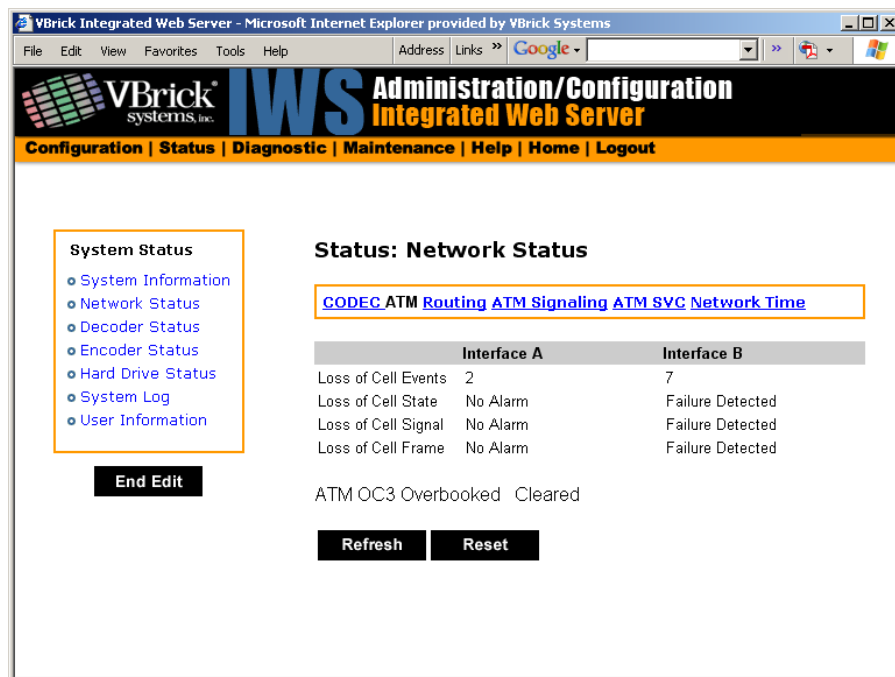
This section reports the existence of any undesired video streams being received by the VBrick. The reporting is made for each IP interface, individually. On Ethernet Models, only one interface exists.

Extra Stream Count	Number of unexpected video streams being received on this interface.
Misdirect IP Address	The IP Address of the appliance transmitting one of the extra video streams received on this interface.
Orphan Count	When the VBrick receives UDP datagrams that are segmented into multiple IP datagrams; and the first IP datagram of the UDP datagram is not received, the orphan counter increments.

CBR Overbooked	The reported overbooked condition for ATM circuits. ATM1 – ATM8 are used to reference ATM table entries as shown in the Configuration: Network > ATM screen.
----------------	--

Status: Network Status > ATM

This menu allows the user to view various ATM error conditions.



Loss of Cell Events	The number of times the Out of Cell Delineation (OCD) events occur. If seven consecutive ATM cells have Header Error Control (HEC) violations, an OCD event occurs. A high number of OCD events may indicate a problem with the ATM network or cabling.
Loss of Cell State	This variable indicates if there is an alarm present for the TC Sublayer. The Failure indicates that a Loss of Cell Delineation (LCD) failure state has been declared for the TC (Transmission Convergence) Sub-layer. Transition from failure to the no alarm state occurs when 6 consecutive ATM cells are received with valid HEC, followed by about 10 seconds of acceptable working signal.
Loss of Cell Signal	A Loss of Signal condition is reported when signal is not present on the physical layer ATM port (Alarm, No Alarm).
Loss of Cell Frame	A loss of Frame condition is reported when framing is not present on the physical layer ATM port (Alarm, No Alarm).
ATM OC3 Overbook	This indicates whether more traffic has been configured on the ATM interface than its capacity. If the status is other than "Cleared," the VBrick must be reconfigured to lessen the required bandwidth.

Status: Network Status > ATM Signaling

This menu allows the user to view various ATM error conditions.



ILMI Status

State	<p>This parameter reports the ILMI (Interim Local Management Interface) state.</p> <ul style="list-style-type: none"> • If disabled, signaling has been disabled in configuration settings • If initialized, it indicates a transitional state. ILMI has been initialized, and waiting to be connected to the network side. • If connected, ILMI has been connected with the network side (ATM switch). • If disconnected, there is an error in communicating with the remote ILMI. • If regComplete, Address Registration Completed successfully.
Prefix	<p>This object reports the network prefix associated with the ATM network to which the VBrick is attached. The length of this object is 13 bytes (hexadecimal digits). This entry is not valid if ILMI state is not in RegComplete.</p>

Network Address	This field is comprised of the concatenation of a 13 byte network prefix, the 6 byte MAC address of the VBrick's Ethernet controller and a selector byte of 0. This object reports the ATM End System Address of the VBrick. This entry is not valid if ILMI state is not in RegComplete. Note that a remote user can connect an SVC to one of the local VBrick's entries in the Termination Point Configuration Table (refer to Configuration: Network > ATM SVC), by setting the selector byte from 1 to 4.
Signaling Variant	X indicates the ATM signaling protocol variant. It can be UNI 3.1, UNI 4.0 or Unknown. This entry is not valid until the ILMI state is in RegComplete. If signaling is disabled, the prefix and network address fields would be empty. ILMI state will indicate "disabled" and the signaling variant indicates "unknown".

SAAL Status

State	<p>SAAL (Signaling ATM Adaptation Layer) state can be one of the following:</p> <ul style="list-style-type: none"> • Disabled – SVC is disabled in the configuration settings. • Wait for Setup – Waiting for an incoming SVC setup (if mode is set to Listener). • Initiate Call – SVC call was initiated and waiting for a response from the network side (if mode is set to either Caller or Caller Repeat). • Wait for Bind – Waiting for a bind message from the either the encoder or decoder (if unidirectional) or both (if bidirectional). • Wait for Connect – Waiting for a connect after the call is initiated. • Connected – SVC is successfully established (active). • Call Rejected – SVC call was rejected either by the destination or by the network for various reasons (In Cause Code field displays reason for call rejection). • Released – An active connection was released.
-------	---

The following statistics are valid only if signaling is enabled.

PDU's Transmitted	This parameter indicates the number of sequenced data messages transmitted (not including retransmissions).
PDU's Received	This parameter indicates the number of sequenced data messages received.
PDU's Retransmitted	This parameter indicates the number of sequenced data messages retransmitted.
Errored PDU's	This parameter indicates the number of received PDU's that included content errors or were received during an invalid state.
Connection Failures	This parameter indicates the number of times the SAAL layer went down.

Signaling Status

Setups Received	This parameter indicates the number of setup messages received Setups Transmitted – This parameter indicates the number of setup messages transmitted
Unavailable Routes Received	This parameter indicates the number of Release, Release Complete, or Status messages received with cause code indicating unavailable route: <ul style="list-style-type: none"> • Unallocated number • No route to spec trans net • No route to dest
Unavailable Resources Received	This parameter indicates the number of Release, Release Complete, or Status messages received with a cause code indicating a resource failure: <ul style="list-style-type: none"> • VPCI VCI not available • Cell rate not available • Network out of order • Temporary failure • No VPCI VCI available • Resource unavail unspecified reason • QOS unavailable, UCR not avail UNI 30 • Cap not pres available • Server option not available unspecified
Unavailable Resources Transmitted	This parameter indicates the number of Release, Release Complete, or Status messages transmitted with a cause code indicating a resource failure. Please refer to the description of Unavailable Resources Received (above).
Called Party Failures Received	This parameter indicates the number of Release, Release Complete, or Status messages received with a cause code indicating a called party error. Cause codes include: <ul style="list-style-type: none"> • User busy • User not responding • Call rejected • Number changed • User rejects all calls with calling line identification restriction • Destination out of order • Normal unspecified • Incompatible destination
Called Party Failures Transmitted	This parameter indicates the number of setup messages rejected due to called party failures. Please refer to the description of Called Party Failures Received (above).

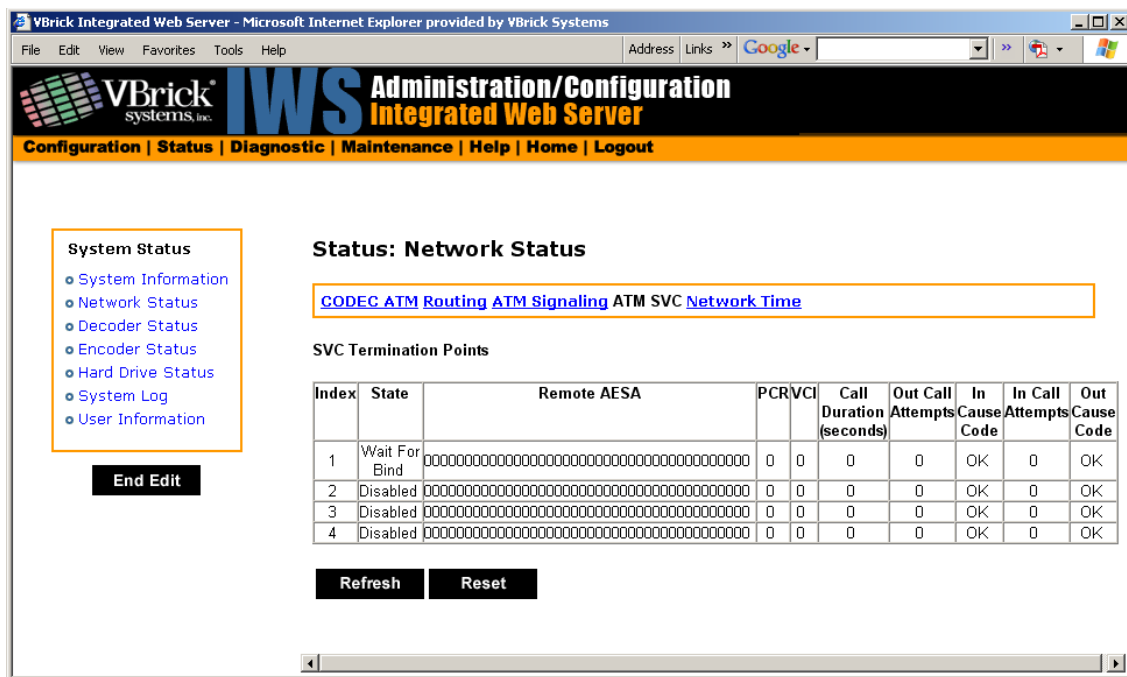
Miscellaneous Errors Received	<p>This parameter indicates the number of Release, Release Complete, or Status messages received with a cause code indicating a call reference length error, call reference flag incorrectly set to 1 on receive, call reference unknown on received Release Complete, Setup received for call already in progress:</p> <ul style="list-style-type: none"> • VPCI VCI unavailable • VPCI VCI assign failure • Invalid call reference value • Identity channel does not exist • Invalid endpoint reference • Mandatory IE is missing • Message type does not exist or not implemented • IE does not exist or not implemented • Invalid IE contents • Message not compatible with call state • Incorrect message length • Unspecified protocol error
Miscellaneous Errors Transmitted	<p>This parameter indicates the number of miscellaneous error messages transmitted. Please refer to the description of Miscellaneous Errors Received for causes of error messages (above).</p>
Timer Expired Received	<p>This parameter indicates the number of Release, Release Complete, or Status messages received with a cause code indicating a timer timeout.</p>
Timer Expired Transmitted	<p>This parameter indicates the number of Release, Release Complete, or Status messages transmitted with a cause code indicating a timer timeout.</p>
Restarts Received	<p>This parameter indicates the number of restarts received.</p>
Restarts Transmitted	<p>This parameter indicates the number of restarts transmitted.</p>
Calling Party Failures Received	<p>This parameter indicates the number of Release, Release Complete or Status messages received with a cause code indicating a calling party error:</p> <ul style="list-style-type: none"> • Invalid number format • Access information discarded • Bearer cap not authorized • Bearer cap not implemented • Unsupported combination of traffic parameters • AAL parameters cannot be supported • Invalid transport network selected

Calling Party Failures Transmitted

This parameter indicates the number of Release, Release Complete or Status messages transmitted with a cause code indicating a calling party error:

- Invalid number format
- Access information discarded
- Bearer cap not authorized
- Bearer cap not implemented
- Unsupported combination of traffic parameters
- AAL parameters cannot be supported
- Invalid transport network selected

Status: Network Status > ATM SVC



Index

Status Index.

State

Can be one of the following:

- Disabled – SVC is disabled in the configuration settings.
- Wait for Setup – Waiting for an incoming SVC setup (if mode is set to Listener).
- Initiate Call – SVC call was initiated and waiting for a response from the network side (if mode is set to either Caller).
- Wait for Bind – Waiting for a bind message from the either the encoder or decoder or both (depends on the direction).
- Wait for Connect – Waiting for a connect after the call is initiated.
- Connected – SVC is successfully established (active).
- Call Rejected – SVC call was rejected either by the destination or by the network for various reasons (cause code field displays reason).

Released	An active connection was released.
Remote AESA	Displays the remote AESA(ATM End Station Address). ATM address of the remote VBrick.
PCR	Peak Cell Rate.
VCI	The Virtual Circuit Identifier for the ATM virtual connection used for the transmission of encoded MPEG video to the Secondary destination.
Out Call Attempts	Number of outgoing call attempts (calls initiated from this index)
In Cause Code	Cause code received for outgoing call attempts.
Call Duration	Duration of the call in seconds (if call is in connected state).
In Call Attempts	Number of incoming call attempts for this index.
Out Cause Code	Cause code. Sent for incoming call attempts for this index.

Table 3. Codes for both Cause Code and Out Cause Code

Message	Description
No Route To Dest	Invalid or unreachable or if the SVC TP on the destination VBrick is disabled.
User Busy	SVC TP on the destination VBrick (remote AESA) is busy
Unsupported Combination Of Traffic Parameters	Mismatch in the transport rate on one side and the reverse transport rate on the other side.
Service Or Option Not Available, Unspecified	SVC direction mismatch between the two sides. For example, one end may be configured as bidirectional and the other end as unidirectional.
Resource Unavailable Unspecified	SVC TP on the remote AESA may not have the encoder and/or decoder bound to the TP.
Call Rejected	Incoming call is rejected due to call collision (two VBricks calling each other simultaneously)
No User Responding	SVC TP on the destination (remote AESA) is not responding.
Normal Call Clearing	A connected call was released normally due to manual release of the SVC
Temporary Failure	Temporary failure conditions in the ATM network such as VPI/VCI allocation failure or VPI/VCI assignment failure.
Normal Unspecified	Remote AESA configured on the destination does not match the remote AESA on the source (calling address) or Unspecified error conditions in the network or at the destination.
User Not Member Of Cug	Remote AESA configured on the destination does not match the remote AESA on the source (calling address)

Message	Description
Dest Out Of Order	ATM signaling down either on the source (local) or destination VBrick

Diagnostics

Topics in this chapter

[Overview](#)

[Diagnostics: Network Tests](#)

[Diagnostics: Device Test](#)

[Diagnostics: Decoder Color Bars](#)

[Diagnostics: Hard Drive](#)

Overview

There are two groups of diagnostics: Low Level Hardware Diagnostics and User Diagnostics. Low Level diagnostics are run in **Diagnostics** mode. User diagnostics are run in normal **Run** mode. (The **Configured Operational Mode** is set in Configuration: System as described below.) You must be in **Diagnostics** mode to run Hard Drive Check Disk and Device Test POST Tests. You can run all other tests from Run mode.

Note Since running in **Diagnostics** mode interrupts the passing of video, be sure to return the appliance to the **Run** mode in order to return the appliance to its normal operational state.

▼ To change between normal **Run** mode and **Diagnostics** mode:

1. Log in with Administrator or Operator Privilege. The default login Username and Password is **admin/admin** or **operator/operator** (case sensitive).
2. Go to the **Configuration: System** screen.
3. Click **Begin Edit**.
4. Set **Configured Operational Mode** as required.
5. Click **Apply Changes**.
6. The VBrick will then automatically save the changes and reset.

Low-Level Hardware Diagnostics

These are tests that test the hardware integrity of the VBrick appliance board and are not often used. If they are necessary, the tests can be set for continuous operation or for a certain number of test loops, and run at low or high intensity. Note that depending on the model, a low intensity test sequence may take 5-15 seconds per test sequence; a high intensity test sequence can take 5-15 minutes or more.

User Diagnostics

There are two user diagnostics: the Decoder Color Bar test and Data Tests. The decoder color bar test is a simple test that generates color bars at the video decoder and outputs them in the place of video. It can be used to test basic decoder operation and the monitor. Data tests are used primarily to test the integrity of a network connection between two VBricks. A loopback test takes all data received at the video IP port and retransmits the data to the configured transmit IP destination. A loopback test may be used to observe the quality of the video data after looping back at the destination. A loopback test is available only for encoder-decoder models and is bi-directional. If appliance "A" is set in "loop back," it will return any stream back to the originator.



Cell tests allow generation of a known data pattern and checking of the integrity of the data pattern on reception. This test is often useful to verify a network service line before video deployment. The transmit encoder generates the pattern and the receive decoder checks the pattern. Statistics indicating good packets and identifying bad packets are provided in the receive appliance. If you are using encoder-decoder models, the preferred method for running cell tests is to initiate and terminate the test on one VBrick and to put the other VBrick into loopback. The encoder can be configured to send a test pattern to any decoder that receives and performs integrity checks. The network destination address in both the encoder and decoder screens is used to direct all test packet data across the network. For this test scenario, the test may be run in a timed mode or continuously. Statistics are updated on the IWS page when you click the **Refresh** button.

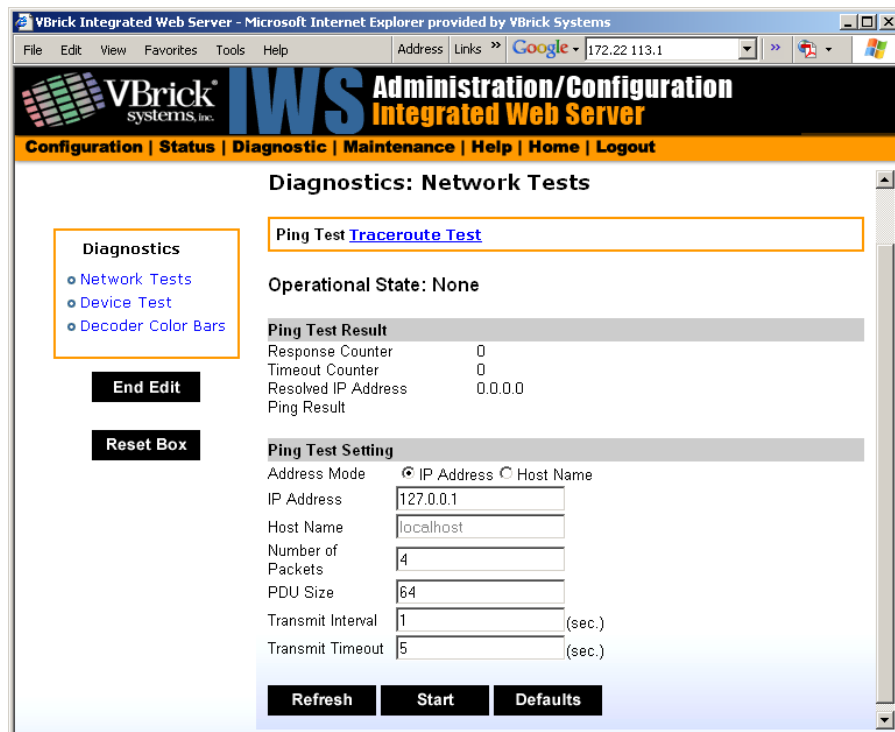
Cell test is available for encoder-decoder, encoder only, and decoder only appliances. In this mode the encoder VBrick transmits the data pattern and the decoder VBrick receives and validates the data pattern. In this mode the following steps are recommended. No timed or continuous option is available for this test mode.

- Turn on transmit
- Turn on receive
- Turn off receive
- Turn off transmit

Diagnostics: Network Tests

Diagnostics: Network Tests > Ping Test

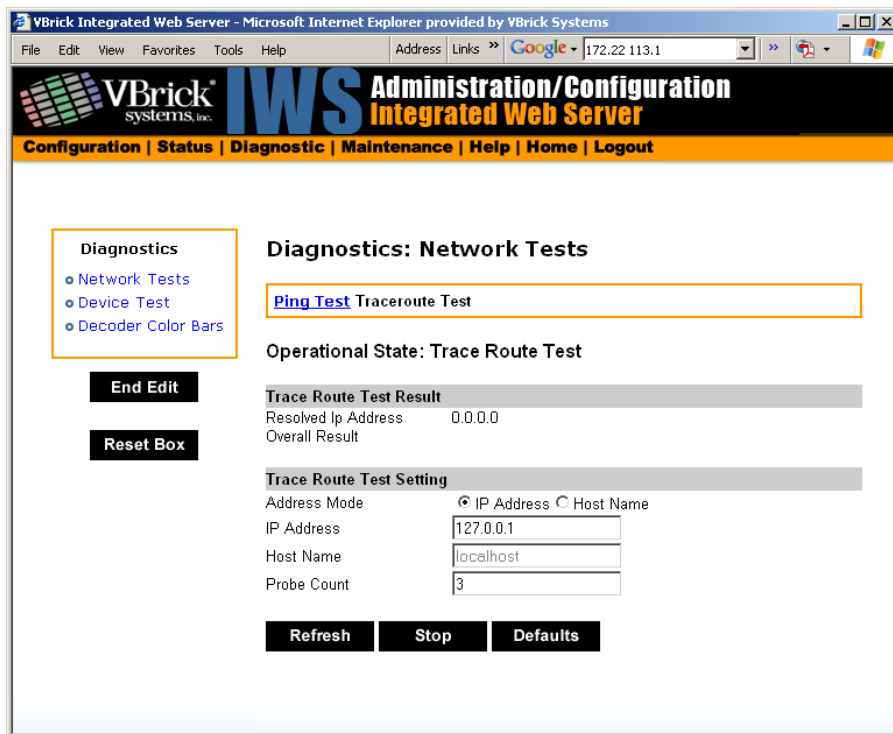
This menu allows the user to initiate a data test from one VBrick to another. To Ping another VBrick, it's necessary to enter Edit mode. Enter the IP address and Test Settings and select the **Start** button. The Operational State will read **Ping Test**. After the test is completed, use the **Refresh** button to display the results of the test. The results of the test will be displayed in the top portion of the screen. If the test is interrupted by pressing the Stop button, the results of the test prior to termination will be displayed.



Address Mode	IP Address or Host name. Cannot be blank even if the Address mode is set to Host <ul style="list-style-type: none"> • IP Address – Enter IP Address, if desired, • Host Name – Enter Host Name.
Number of Packets	Number of packets to send for the test (default is 4).
PDU	Protocol Description Unit size of packets, in bytes (default is 64).
Transmit Interval	In seconds (default is sending the packets in 1 second intervals).
Transmit Timeout	The length of time, in seconds, before the test times out, in the event the target device fails to respond.

Diagnostics: Network Tests > Trace Route Test

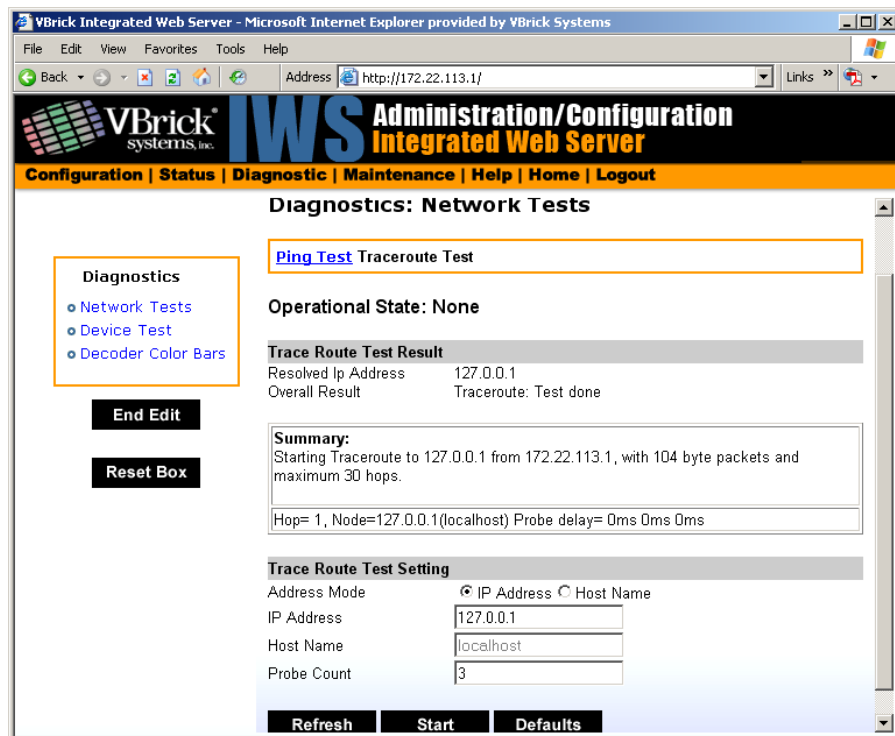
The Internet is a large and complex aggregation of network hardware, connected together by gateways. Tracking the route packets follow or finding a gateway where the packets are being discarded is difficult. The Trace Route test attempts to trace the route an IP packet follows to a specified Internet host. This test utilizes the Time To Live (TTL) field in the IP header to allow intermediate nodes to be "discovered" via Internet Control Message Protocol (ICMP). Intermediate hops are discovered by launching probe packets with a small TTL and then listening for an ICMP Time Exceeded reply from a gateway. Use **Refresh**, **Start/Stop**, and **Default** to run the test.



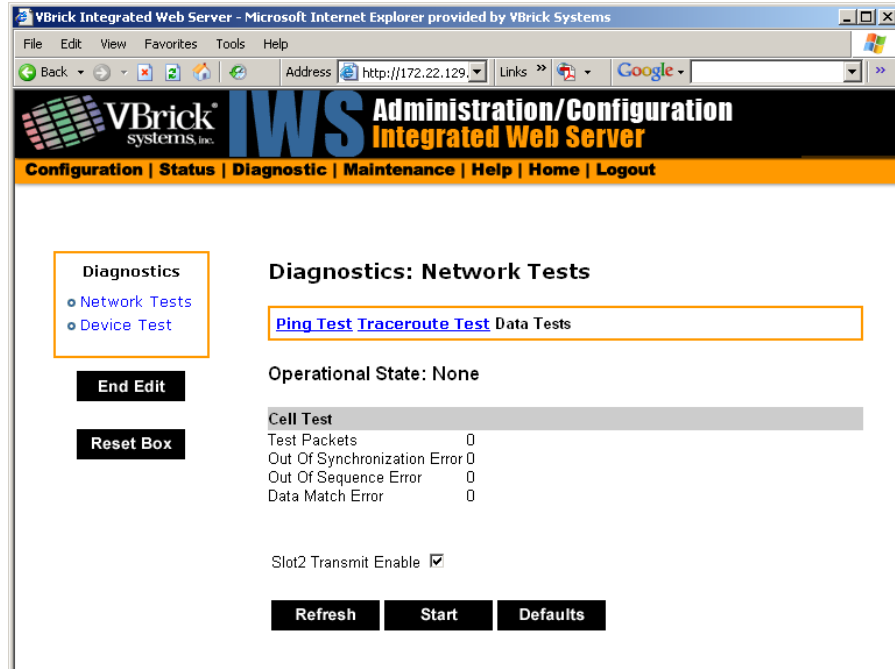
Operational State	The currently selected test.
Address Mode	Check the box indicating whether the target address is an IP Address or Host Name.
IP Address or Host Name	Enter the information in the corresponding box.
Probe Count	Can be set from 3 to 20. The default setting is 3. This setting is the number of probe packets sent to a host at each hop.

Trace Route Test Results

The results of the test appear at the top of the screen. The results include the Resolved IP Address of the Destination Host Name. When the test is finished or stopped, the Overall Result will display the result of the test, such as "Test Done," or "Max hops (=30) Finished," or "Test Stopped," etc. An entry shows the hop number, which is equal to the TTL, IP address (and Host Name if available) of the gateway, and round trip time of each probe. If the probe answers are received from different gateways, the address of each responding system will be shown. If there is no response within a 5 second timeout interval, a "*" is printed for that probe. If the result string exceeds 255 characters, the string will be terminated by ending it with "Too Long."



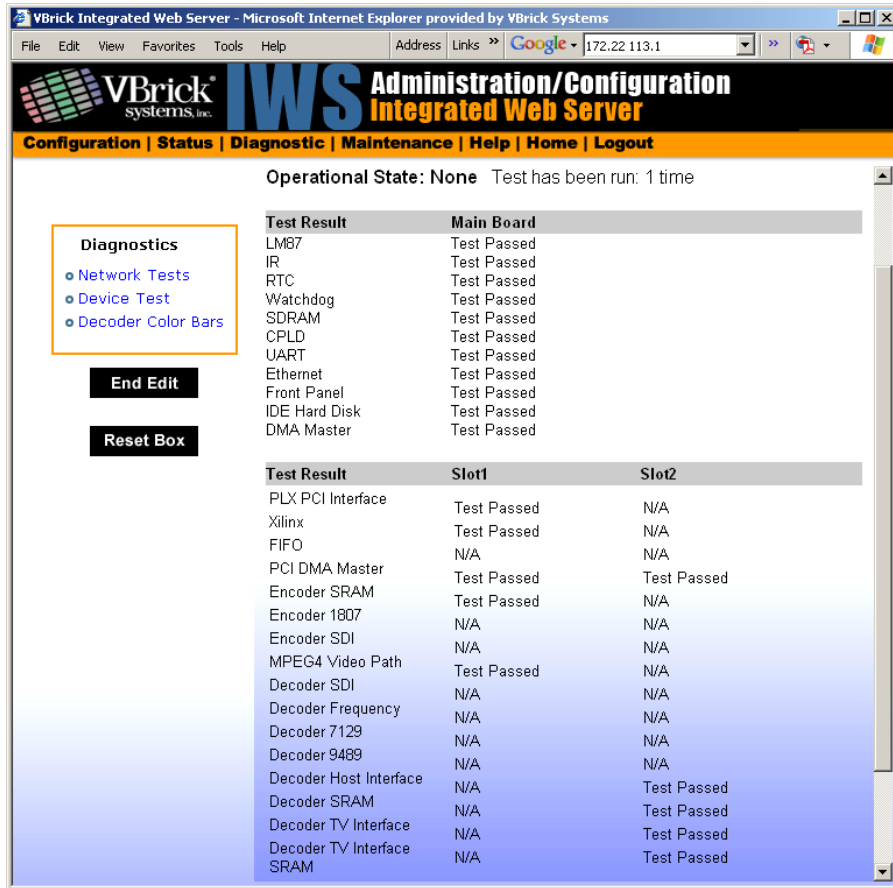
Diagnostics: Network Tests > Data Test



Diagnostics: Device Test

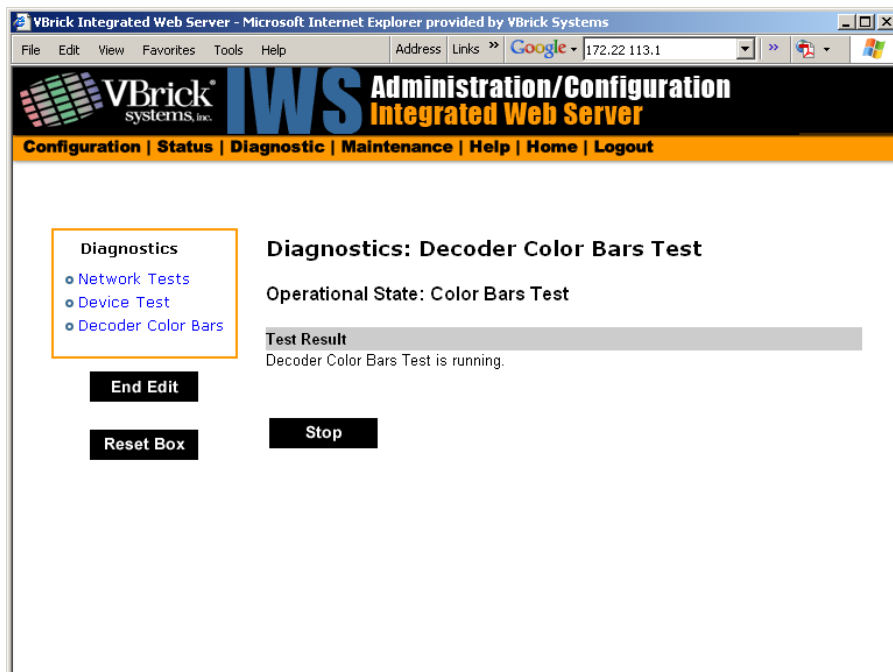
This screen shows the results of the Power-On Self Test, which is automatically run when the VBrick is reset or powered on. Other than that, running this test allows the operator to test

the hardware integrity of the VBrick appliance board by running the test one or more times or by setting the test for continuous operation or for a certain number of test loops. This test is not often used. It is necessary to be in Diagnostic mode before running these tests. Enter Diagnostic mode from the **Configuration > System** screen. Don't forget to return to **Run** mode after the tests are run. You must be in **Edit** mode before you can run this test. Test Results include **Pass, Fail, Not Present**.



Diagnostics: Decoder Color Bars

This is the test for displaying the color bar pattern on the display.



Diagnostics: Hard Drive

MPEG-2 VBStar only.



Maintenance

Topics in this chapter

[Maintenance: Device Information](#)

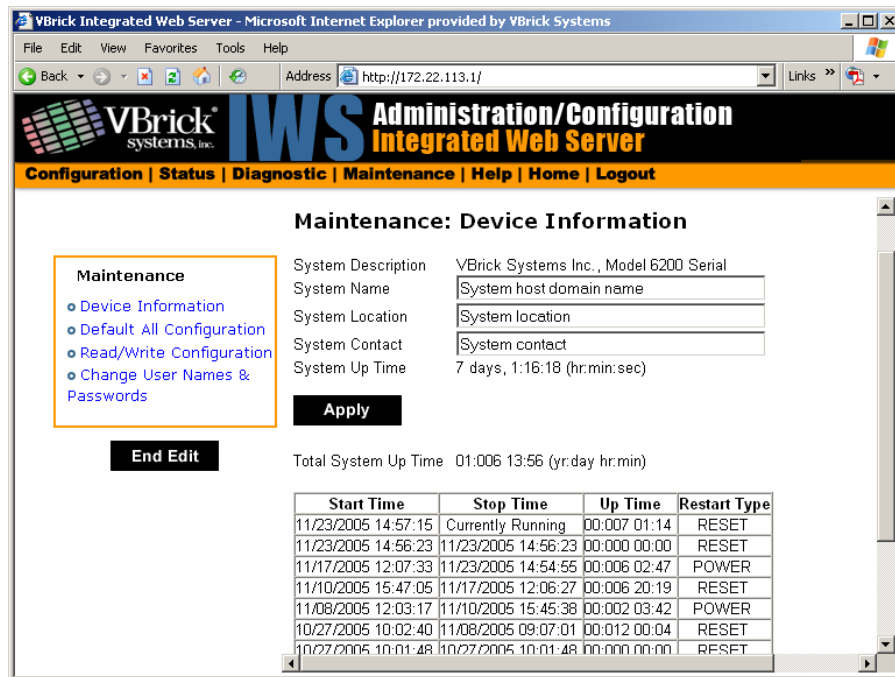
[Maintenance: Default All Configuration](#)

[Maintenance: Read/Write Configuration](#)

[Maintenance: Change Usernames & Passwords](#)

Maintenance: Device Information

The device information menu allows the user to set various system information. These parameters are often used in SNMP managed networks.



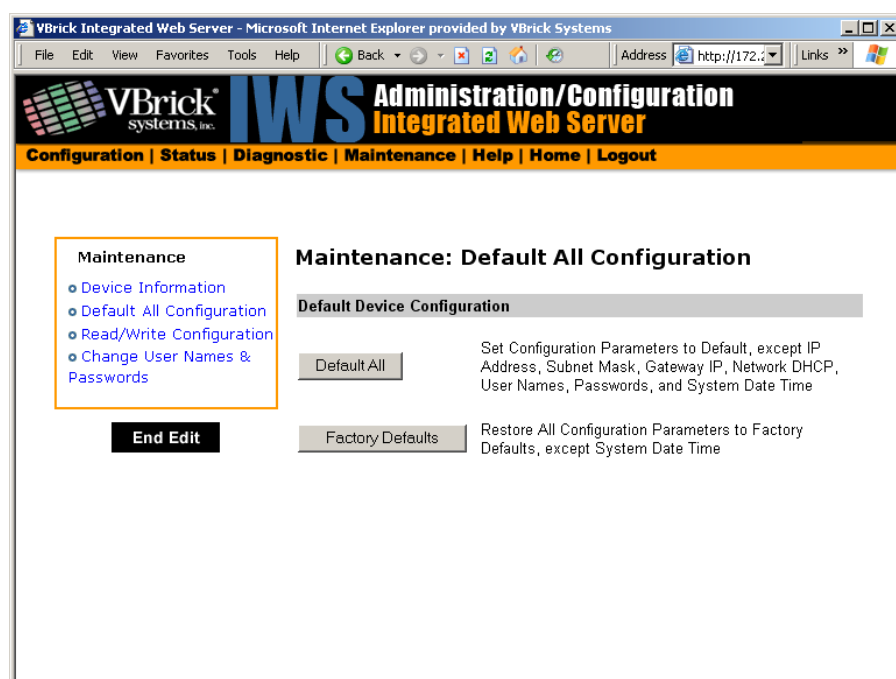
System Description	Company name, model and serial number of appliance.
System Name	Name of the system (for example Hall 23-B).
System Location	Location of system (for example Washington Building).
System Contact	Contact name.
System Up Time	Displays the time elapsed since the last system reset or power cycle.

Total System Up Time	Displays the total time that the unit has been powered up.
----------------------	--

Note The Device Information table creates a date and time stamp for every power or reset event. When SNTP is enabled, the unit must reboot to synchronize time with the SNMP server time. If the time moves dramatically forward (or backward), a discontinuity may appear in the device table because of the SNTP time correction.

Maintenance: Default All Configuration

This menu allows the user to default all the configuration parameters of the VBrick.

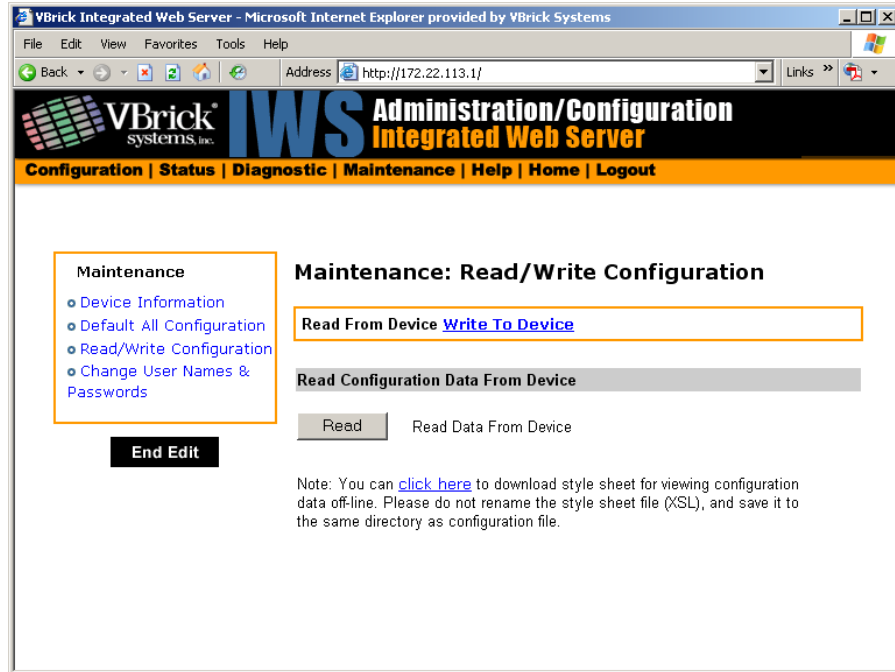


Default All	Sets all parameters except IP address, Subnet Mask, Gateway IP, User Names, Passwords and System Date Time.
Factory Defaults	Sets all parameters to factory defaults with the exception of System Date and Time.

Maintenance: Read/Write Configuration

Maintenance: Read/Write > Read From Device

Read/Write Configuration menu allows the user to read configuration parameters from the VBrick to a file, as well as write configuration parameters from a file to the VBrick. The file is an .xml file. Internet Explorer is the assumed browser.



Read Configuration Data from Device

Users can read all the configuration parameters from the VBrick by clicking the **Read** button on the screen. After clicking on the button, an xml document with all the configuration parameters will pop up. The xml document can then be saved to the PC as an .xml file using **File > Save As**. To view this file offline, the user must download the style sheet (see **click here** on the screen) to the same directory as the saved file. Do not change the name of the style sheet. It should always be saved as `cfgdata.xsl`.

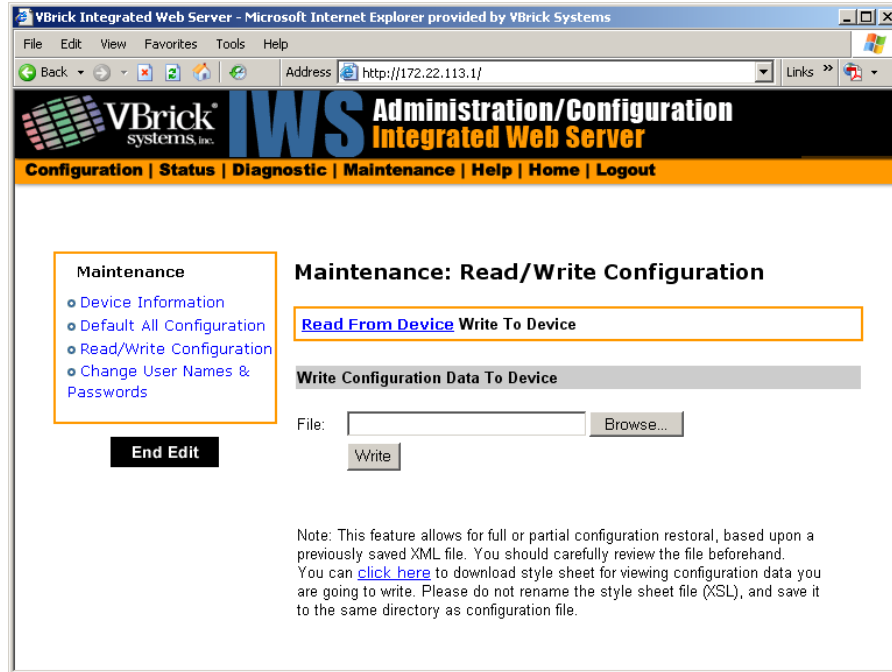
System Model : 4200
 Device IP : 172.22.173.1
 Device VBrick Hostname : StanWM9
 Release Rev : 191.0.7
 Created Date : 8/3/2005 15:16
 User Information Version : User Info 1.0
 User Information Part Number : 9190-4200-0002
 User Information Box Serial Number : 01070500568
 User Information Customer Class :
 User Information Manufacturing Date : 20050725
 User Information Board Assembly Number : 6101-0180-0403
 User Information Power Assembly Number :
 User Information Hard Drive Assembly Number :
 User Information Lot Number :
 User Information Board Serial Number : 3040501787
 User Information MAC Address : 00:07:df:01:50:c3
 User Information Upgrade Date :
 Slot_1 User Information:
 User Information Version: User Info 1.0
 Board Assembly Number: 6101-0200-0000
 This Board Serial Number: 3060500415
 (Configuration Data)

Ethernet_Network Configuration:	
Network DHCP	Disabled
IP Address	172.22.173.1
Subnet Mask	255.255.0.0
Gateway IP Address	172.22.1.5
VBrick Host Name	StanWM9
Network Interface Speed	Automatic
Network Interface Type	Automatic
Primary Server IP Address	172.16.1.11
Secondary Server IP Address	172.16.1.10
Default Domain Extension	com

Routing Configuration:	
Routing Method	Static
RIP Advertisement	Disabled
Destination Network1	0.0.0.0
Local Gateway IP1	0.0.0.0
Network Mask1	0.0.0.0

Maintenance: Read/Write > Write To Device

This menu allows the user to write configuration parameters from a file to the VBrick. On a successful write, all parameters will be saved to flash and the appliance will reboot. Only administrator level users and above have **Write** privileges.



Write Configuration Data to Device

- ▼ To write configuration parameters to the VBrick from an .xml file:
 1. Click the **Browse** button to select the configuration file to be written to the appliance.
 2. This line must be at the top of the configuration file:

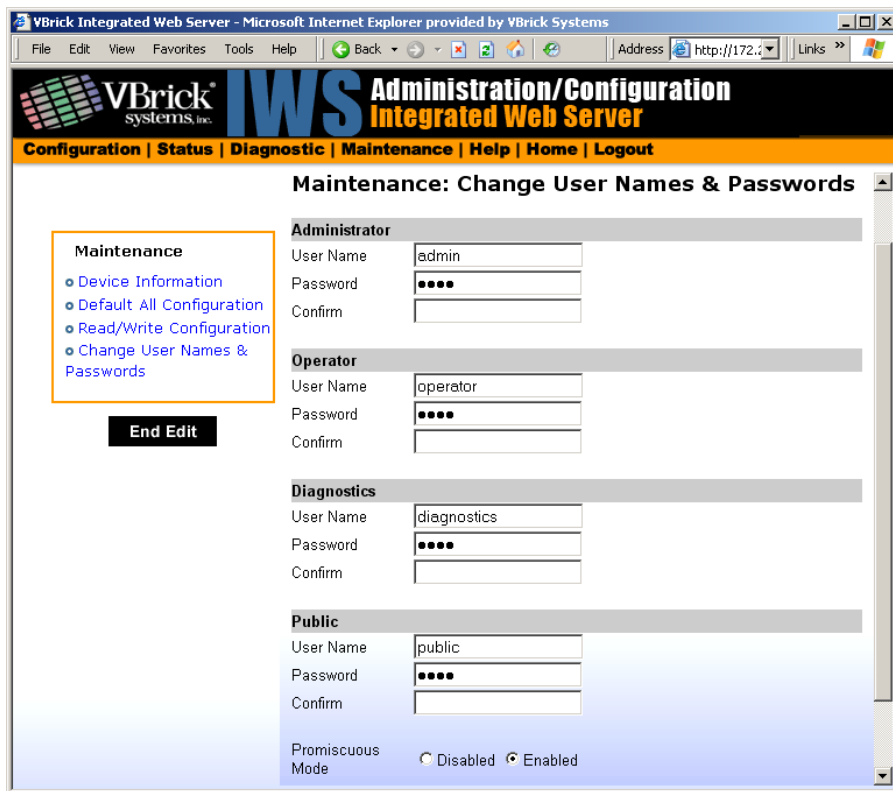
```
<?xml-stylesheet type="text/xsl" href="cfgdata.xsl"?>
```

It is recommended that the above line be never deleted from any of the saved configuration files. Without the above line, the configuration parameters cannot be viewed in a tabular form. Click on the **Write** button to write the selected file to the VBrick. The configuration parameters will be saved to Flash and the appliance will reboot. In the event of a validation error, a message will appear on the screen. Click on "Errors" to view error messages that might have caused the validation failure.

- ▼ To create a configuration file:
 1. Read configuration From the VBrick and save as an .xml file. See [Read Configuration Data from Device](#) above.
 2. Use any text editor, preferably an xml editor to make changes to the file. The user can change the "values" field as well as delete objects as necessary. Make sure the right data types are used. For example if a parameter takes integer values, do not enter a string. Also IP Address parameters must have the right IP syntax. Enter "0.0.0.0" to enter a null IP. Blanks and null strings are not valid IP Addresses.

Maintenance: Change Usernames & Passwords

This page lets an Administrator change usernames and passwords for security purposes.



User Name	Enter desired user name.
Password	Enter desired password.
Confirm	Confirm new password entry. Note: Appliance will then inform the user and perform a reboot.
Promiscuous Mode	This mode is used in conjunction with VBrick supplied ActiveX controls. In promiscuous mode, no login or password is required. When using the associated ActiveX components in this mode, either the login password should be set to blank, (" ") or to the legal administrated login/password. If promiscuous mode is disabled, the legal administrator login/password must be entered when configuring or using these controls.

Table 4. Default User Names and Passwords

User Level	Default User Name	Default Password	Authority
Administrator	admin	admin	Read, diagnostics, edit, change password, network and routing.
Operator	operator	operator	Read, diagnostics, edit.
Diagnostics	diagnostics	diagnostics	Read, diagnostics.
Public	public	public	Read

Maintenance Mode

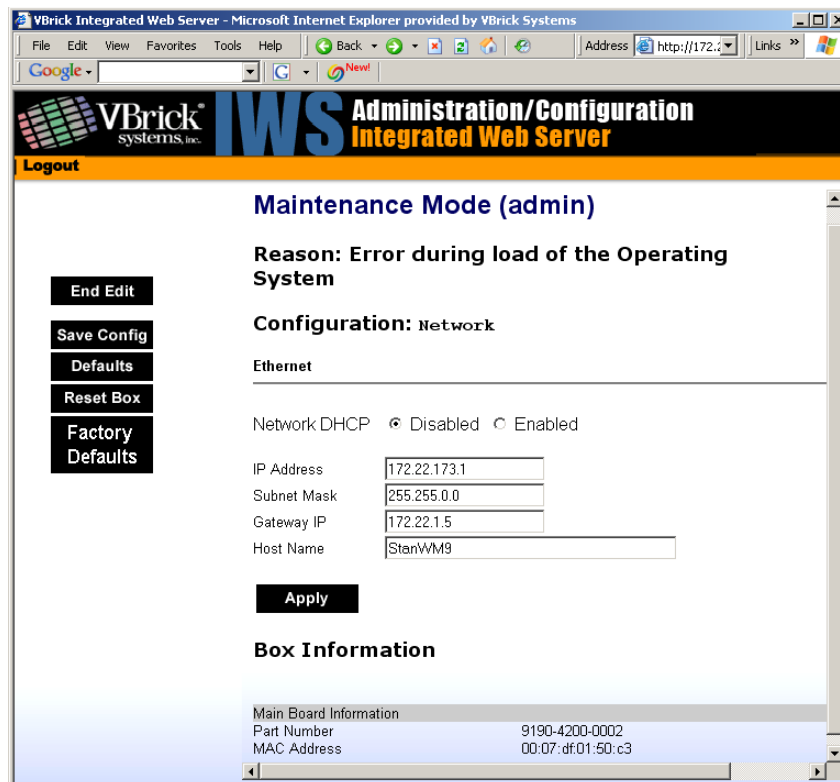
Overview

Maintenance Mode is automatically launched when the software on the VBrick does not boot. Maintenance Mode runs from a reduced functioning kernel that provides a limited CLI and IWS interface. The Maintenance Mode interfaces provide minimal configuration capabilities. Maintenance Mode can also be used as a means of downloading new firmware. *If your appliance enters maintenance mode during or after a firmware download you can simply rerun the download and reset the appliance to return to normal run mode.* Maintenance Mode is an operational mode that in which a VBrick runs with a reduced subset of code. It normally happens only when a power failure occurs during a software download. It provides limited capacity of the IWS interface to manage some parameters of the VBrick appliance. Note that security is maintained in Maintenance Mode, so the user must be at administrator level to change the parameters.

Topics in this chapter

[Overview](#)

[Maintenance Mode CLI Operation](#)



DHCP Enable/ Disable	If DHCP is enabled the VBrick must get it's IP address and Subnet Mask from the DHCP server. If the DHCP server supplies the Gateway address or DNS server address, these parameters will replace user-entered parameters.
IP Address	IP address associated with the Ethernet interface of the VBrick.
Subnet Mask	Subnet mask for the VBrick Ethernet IP address.
Gateway IP Address	Gateway IP address for communicating across the Ethernet segment attached to the VBrick.
Host Name	On Ethernet models, this is used for DHCP Client Host Name. The Host Name defaults to the Media Access Control address, a hardware address that uniquely identifies each node of a network. Host Name can be 18 characters maximum and the first character must be a letter. The remaining characters can be letters, numbers or hyphens.

Maintenance Mode Features

- Provides support for the download and upgrade of software via VBDownload.
- Supports limited IWS and CLI for configuration and diagnosis.
- Local access of the VBrick is supported through COM 2 on the rear of the box, refer to the section on Command Line Interface (CLI) in Chapter 10 for details.
- Remote configuration is supported over Ethernet or IP over ATM. In addition, Maintenance mode will configure these interfaces according to the parameters specified in Full Feature Mode.
- Previously configured Usernames and Passwords are remembered in Maintenance Mode.
- Maintenance Mode contains the ability to change the IP parameters for the Ethernet port.
- Maintenance Mode contains the ability to set the configuration parameters to defaults.
- Maintenance Mode contains the ability to reboot the VBrick.

Maintenance Mode Limitations

- Neither video nor audio can be sent or received while in Maintenance Mode.
- Only the Ethernet IP parameters can be changed while in Maintenance Mode.
- SNMP is not supported.
- Unlike IWS and CLI operations in Full Feature Mode, Maintenance Mode IWS and CLI do not automatically save and reboot when the network parameters are changed. In Maintenance Mode, after the user initiates changes and then applies them, it is necessary to manually save and reboot the appliance. Command Line Interface (CLI) in Maintenance Mode does not support the Global Editing Commands: be, en and sh.

Maintenance Mode Indicators

There are three indicators that show when you are in Maintenance Mode:

- If you enter Maintenance Mode, the front panel display (LCD screen) will read Maintenance Mode xx", on the top line and the IP Address in the second line, "xx" indicating the reason for being in Maintenance Mode.

- If you log into the Integrated Web Server (IWS), the screen indicates the appliance is in maintenance mode and the reason.
- The Telnet and/or Command Line Interface (CLI) prompt after you login is `VBMainMode>` and displays one of the following codes.

Code 10	Operating system failed to load or the flash is corrupted.
Code 20	Critical system files are missing or corrupted.
Code 30	The Hardware Watchdog has failed.
Code 50	Invalid Flash parameters found, defaults used.
Code 60	Corrupted Bootline, default used.
Code FF	Application failed to start up successfully either because of the configuration or another problem. The VBrick appliance will enter Maintenance Mode if the appliance does not boot properly on four consecutive attempts.

Maintenance Mode CLI Operation

After logging into Maintenance Mode as the Administrator, the `VBMainMode>` prompt is displayed and one or more of the following command sequences can be issued. By design, in Maintenance Mode, after the user initiates changes and applies, it is necessary to manually save and reboot.

▼ To use CLI commands in Maintenance Mode:

1. Make all desired changes, in any sequence, using the commands in Table 5.
2. When done type `commit` to apply the changes.
3. Type `save` to save the configuration.

Table 5. CLI Commands

Command	Description	Entry
<code>e 2</code>	To start the editor mode. This command must be entered prior to any other command.	Type <code>e 1</code> to display editor status.
<code>exit</code> <code>or</code> <code>exit</code>	To leave the current menu level and move up through the menu system.	
<code>rb</code>	Reset the VBrick	Enter <code>y</code> (yes to reset).
<code>sd</code>	Set the configuration parameters to factory defaults, except the Ethernet IP parameters	Confirmation is requested.
<code>sfd</code>	Set the configuration parameters to factory defaults, including the Ethernet IP parameters	Confirmation is requested.

Command	Description	Entry
<code>c nt 5 x</code>	To enable or disable DHCP	1 – Disable DHCP 2 – Enable DHCP
<code>c nt 6 xxx</code>	To edit the IP Host Name. The default is the Media Access Control (MAC) address, a hardware address that uniquely identifies each node of a network.	The Host Name can be a maximum of 18 characters; the first character must be a letter and the last character a number. The middle characters can be letters, numbers or hyphens.
<code>c nt 2 yy.yy.yy. yy</code>	To edit the IP address	Where yy.yy.yy.yy is the new IP address.
<code>c nt 3 zz.zz.zz. zz</code>	To edit the Sub Net Mask	Where zz.zz.zz.zz is the new subnet mask associated with the Ethernet interface.
<code>c nt 4 vv.vv.vv. vv</code>	To edit the IP Gateway address	Where vv.vv.vv.vv is the IP address of the IP gateway.
<code>c nt 1</code>	Displays the IP parameters	
<code>s ui m 1</code>	Displays Board User Information.	The User Information contains the part number and Ethernet MAC address of the VBrick.
<code>c nt a</code>	Apply the changes	Must be issued prior to save.
<code>sv</code>	To save the configuration	Enter y (yes to save).

VBStar

Topics in this chapter

[Introduction](#)

[VBStar Pump](#)

[VBStar Record](#)

[VBStar FTP File Transfer](#)

[VBStar Status](#)

Introduction

A VBStar is an MPEG-2 appliance with a hard drive; an industry-first MPEG-2 video compression and transport appliance. Capacity depends on the video bit rate. For example, a 60 GB internal drive easily holds more than 24 hours at the bit rate of 5.5 Mbps and below and hard drives continue to get larger. Refer to the specifications for your current hard drive.



Through its "store-and-forward" mechanism, VBStar transports DVD-quality video over wide-area networks. It extends existing video capabilities in education, government, surveillance and transportation. With VBStar, educational lectures, corporate messages, sales training and technical information can be encoded and recorded and the video sent – all in one step – for on-demand viewing from any location, on site or off. Live camera video can be recorded to disk and transferred to another VBrick over the Internet to a remote monitoring location for near real-time viewing.

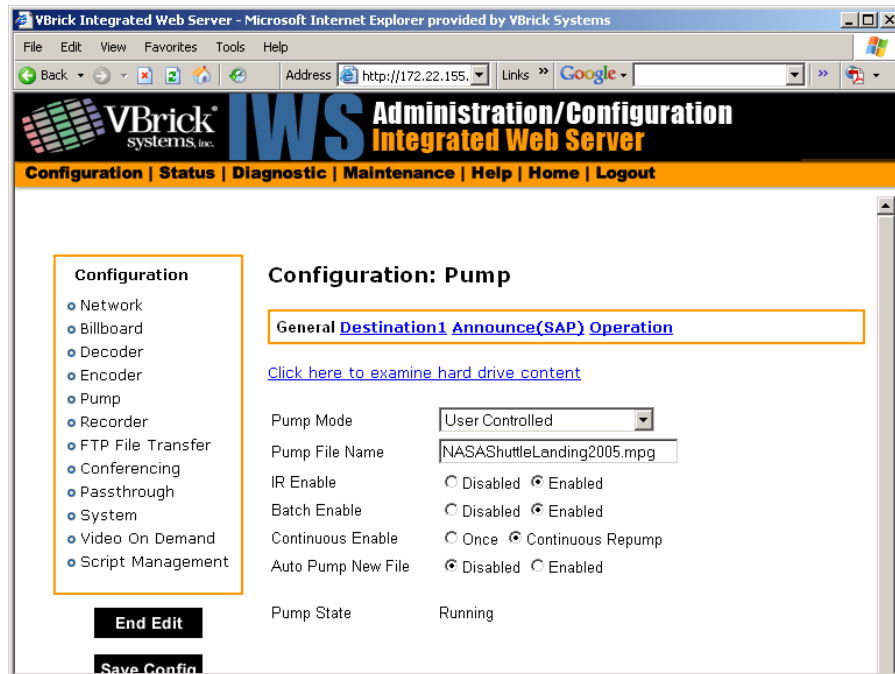
A simple remote control command enables users to record video from any source, save MPEG-2 video to an internal disk, and send it to a VBrick appliance anywhere in the world over an IP or ATM network. VBStar also has Serial Digital interface capability for those in the broadcast arena. The video can be viewed on any TV or computer monitor. VBStar includes advanced features that allow users to record one stream while viewing another. Available with

both an encoder and a decoder, VBStar includes a hard drive for internal storage and on-screen recording and playback guides, all managed through the IR remote control. An on-screen icon indicates when a recording is in progress. VBStar combines digital television recording, networking and video storage with an MPEG-2 video server in one compact package. VBStar provides efficient, robust and feature-rich MPEG video storage and playback capabilities. Through its record and FTP capability, VBStar eliminates the reliance on broadband networks, including Quality of Service requirements. A VBStar encoder allows recording and playing audio and high quality 30-frame per second MPEG video streams on desktop PC's and Television monitors located anywhere in the world.

VBStar Pump

MPEG-2 video can be played directly from the internal hard disk or streamed from the VBrick to an unlimited number of desktops over an Ethernet/IP. The term "Pump" is used in connection with VBStar screens to indicate that video stored on the hard drive may be transmitted similar to the way VBrick delivers live video. Any file selected using any of the management interfaces can be sent to any address on the network. To view the file locally, it is necessary to specify the file and enter an appropriate multicast or unicast address into the pump destination address field. A file may be pumped in batch mode or single file mode. The designated file or batch may be pumped once or continuously. The file may also be pumped automatically as soon as it is received through FTP.

Configuration: Pump > General

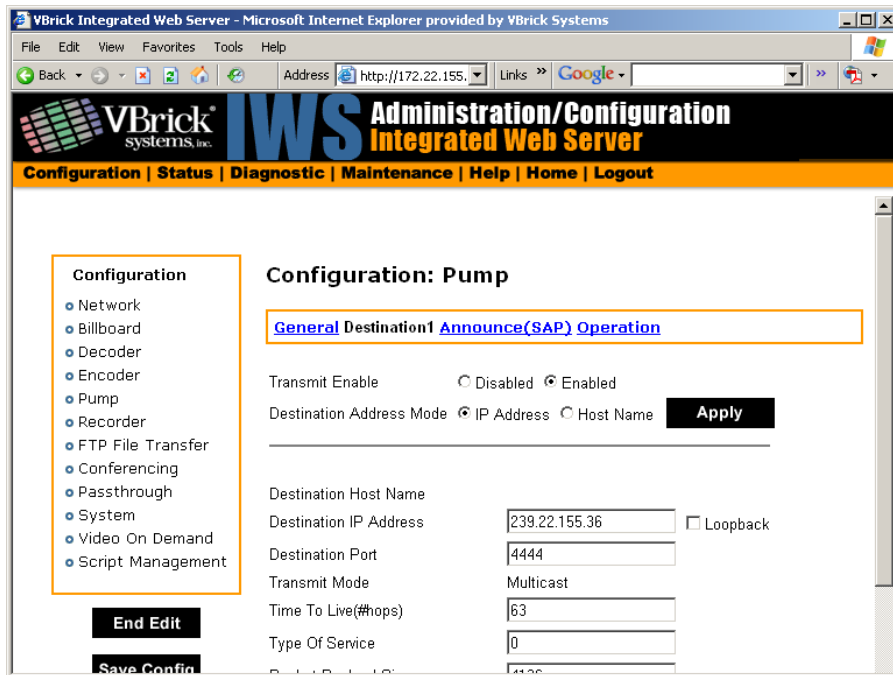


Pump Mode	Used to set the stream to be controlled manually or to automatically start at the VBStar Power-Up.
-----------	--

Pump File Name	<p>This is the file that will "Pump". In batch mode, the Batch Base File Name is usually entered as the Pump File Name, the batch files will be played from the lowest numbered through the highest number. If a batch file name is entered with a particular batch file number, the file will be pumped using that file as the starting point. Any missing files in the series will be skipped and the next sequential file will play.</p> <p>Example: If files test1.mpg through test15.mpg exist and the user specifies test5.mpg, test5.mpg through test15.mpg will be played. After playing test15.mpg, test5.mpg will be played again, even though lower numbers of the file exist.</p>
IR Enable	Is used to enable or disable the use of IR Controller to "Pump" the specified stream.
Batch Enable	If enabled, a series of files in a batch will be played sequentially. If disabled, only a single file will be played.
Continuous Enable	If Once is selected the selected file or batch will play through to completion and stop. If Continuous Repump is selected, the selected file or batch sequence will be continuously played until the stop button is pressed or a different file is selected. When the file or batch has completed playing it wraps to the beginning and plays again.
Auto Pump New File	<p>Can be enabled or disabled to allow any file to be automatically pumped on FTP reception. If batch mode is enabled, any file with the identified base name will be pumped on FTP reception. If batch mode is not enabled, any file FTP'd to the disk will be pumped on reception. Some special cases of operation following an FTP onto the hard drive.</p> <ul style="list-style-type: none"> • If both Batch Mode is enabled and Continuous Enable is Continuous Repump, the FTP'd file that belongs to the series is played when its turn is reached. If it is not part of the series, it is not played. • If Batch Mode is enabled and Continuous Enable is Once, all files will be played. If the FTP'd file belongs to the series and has a greater index than the last file played, then the FTP'd file is played. Otherwise nothing happens. • If Batch Mode is disabled and Continuous Enable is Continuous Repump. The current file completes, and the new file is played continuously. • If Batch Mode is disabled and Continuous Enable is Once. The current file will be completed and the FTP'd file will start.
Pump State	Is a read only field that lets you know if the Pump is running or stopped.

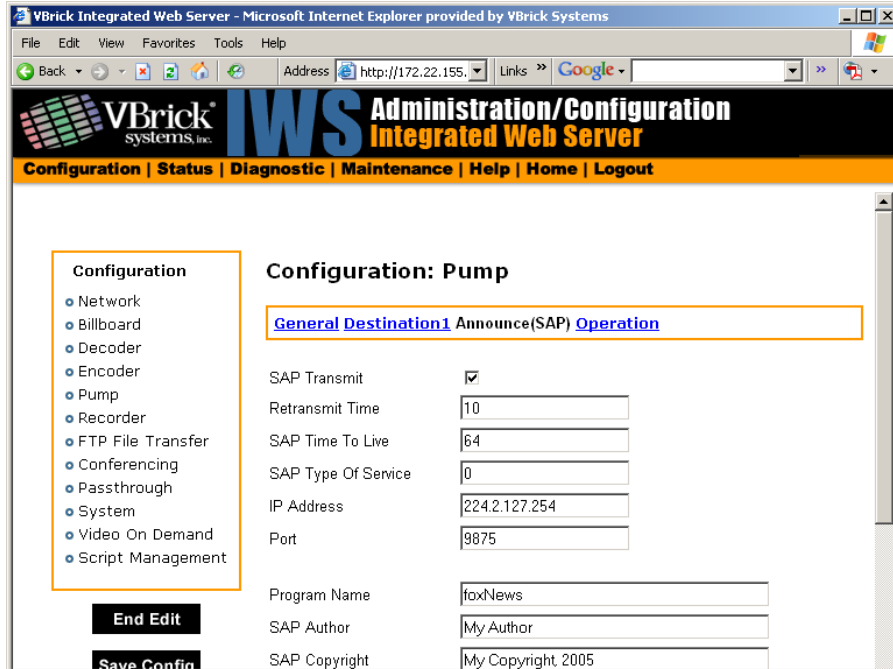
Configuration: Pump > Destination 1

See MPEG-2 [Configuration: Encoder > Destination 1 & 2](#) on page 60.



Configuration: Pump > Announce (SAP)

See MPEG-2 Configuration: Encoder > Announce (SAP) on page 62.



Configuration: Pump > Operation

This screen shows you the status of your Pump and allows you to manually Start, Stop and Pause the current Pump. Use the Refresh to update the status.



VBStar Record

Files may be recorded in batch or single file mode. Either way, a file can be recorded using a specific time Duration or Continuous.

Filename Syntax Rules

Hard drive features are designed to support a root directory and one level of subdirectory when the hard drive is used for VBStar functions, such as Record, Pump, Playback, and Automatic and Manual FTP. Filenames for Recording are set on the Configuration: Recorder > General page in IWS. The syntax for a file name, including the directory name, is limited to 56 characters, consisting of a combination of the directory name, the file name and the backslash. For example: `d:\directoryname\filename.ext`. The following syntax rules apply.

- One sub-directory level is allowed.
- 56 total characters are allowed, including up to 25 in the directory name and up to 25 in the file name.
- Only 25 characters are allowed in the directory name. Note: \ " : * ? > < | [] are invalid characters.
- Only 25 characters are allowed in the file name (of which 23 can be entered by a user). The last two characters are reserved for an index number from 1-99 to support the option of batch mode. The restriction on the root filename exists even if batch mode is not enabled to allow a switch to batch mode without requiring a change to the filename.
- The extension (.ext) has a maximum three characters, only alphanumeric. The default extension is .mpg. The allowable extensions are .mpg, .m2g, .m2t and .m2v.

Recording Batch Files

Batch mode records video in pieces. It allows a VBrick to transfer segments of a conference, event, training session, or any video, to a remote VBrick, while continuing to record. Batch processing minimizes the delay inherent with store-and-forward video, providing MPEG-2 video in near-real time. Batch file names are created in the Recorder: General section of IWS. A batch file is one of a group of files that are handled as a single entity. The Configured File Name is the base file name of the batch, for instance filename.mpg. Two digits are reserved at the end of the base file name to signify the index number of the batch file. Index numbers are assigned to the base file name from 1–99 as files are recorded (filename1.mpg through filenamexx.mpg).

When VBStar creates a file for batch record, two files are created; the first is the file currently being recorded, and the second is the next index file, readied to receive data. Video is recorded into a batch file until the batch duration time is reached, or 4 GB, whichever comes first. When the first file is full, the new file becomes the target of the record operation. In batch mode, if the batch base file name is used as the "Recorder File Name," the first file recorded will be numbered one greater than the most recent file recorded. For instance, if test.mpg is selected as the Recorder File Name, the batch file numbering will start at test1.mpg; if test1.mpg, test2.mpg and test3.mpg exist, and the Recorder File Name is still set at test.mpg, the new recording will start at test4.mpg. If the Recorder File Name is set at to particular index number, such as test2.mpg, the first file to be recorded will be test2.mpg and the batch recording will increment from that number.

Note The maximum batch file size is 4 GB. If an attempt is made to record files using the maximum file size (4 GB) in the maximum number of batch files (99), the files can exceed the hard disk drive storage capacity. If the files are large, it might be best to set a Batch Wrap Point.

Batch Wrap Point and Record Duration

A Batch Wrap Point sets the number of files to be recorded. When the specified number of files has been created, the previously recorded batch files will be deleted and recorded over, starting from the earliest file. For example, if a Batch Wrap Point is set to 10, and test.mpg is the Recorder File Name, the files will be recorded from test1.mpg, test2.mpg, up to test10.mpg.

Batch File Recording can be set to a specific number of seconds or Continuous. If Batch is enabled and set to Continuous, when the maximum number of batch files is reached, recording will record over the files previously recorded, starting from the first file. As one file is being recorded, the next index file is deleted to get ready to receive data (from 1 to 99). For example, if the wrap point is set to 10 and a batch file name is specified as test5.mpg, the files will be recorded (or recorded over) starting at test5.mpg and increment until test10.is reached. When the number of files reaches the Batch Wrap Point of 10, the files will be recorded over starting with test1.mpg.

Note If VBStar encounters an interruption in file transfer during batch recording, the file being recorded and the next file will both be affected. The file in the process of being replaced will be partially recorded. The next sequential file that was deleted to get ready for receiving data will be missing.

Configuration: Recorder > General



<p>Click here to examine ...</p>	<p>Opens an Internet Explorer FTP session window. See Configuration: Recorder > Operation on page 204 for more information.</p>
<p>Recorder Mode</p>	<ul style="list-style-type: none"> • User Controlled – The user controls when to record files via any of the following methods: IWS, CLI, IR Remote, SDK, or SNMP. • Start Record on Power-up – When the appliance is powered up the files will begin being transferred. • Recorder Schedule – Files will be recorded at a scheduled time.
<p>IR Enable</p>	<p>Enables or disables only the Record and Send buttons on the Infrared handheld remote control device. The master enable/disable for all functions is in Configuration: System > General.</p>

Recorder File Name	The root name of the file to be recorded. The VBStar recorder can automatically use current date, current time, and/or host name when it creates a new file. Use this feature by configuring the filename to contain any of the following strings in any order. <ul style="list-style-type: none"> • >h or >H – Host Name. • >d or >D – Current Date. • >t or >T – Current Time.
Recorder Source	Defines the source of video for record. When Dedicated is selected as the Recorder source, the Network option screen appears as a selection. The Network selections allow the user to set parameters necessary to record video from a particular Receive IP address and Port. If a slot is selected as the Recorder Source, the Network screen does not appear and whatever video is being received by the designated decoder is recorded. <ul style="list-style-type: none"> • Dedicated – Indicates that the settings are read from the VBStar settings on the Configuration: Recorder > Network page is IWS. • Decoder Slot # – Indicates that the settings are set for a specific Decoder Network Configuration. When a Slot # is specified, the Network option does not appear since it has no affect.
Recorder Schedule	Format: mm/dd/yyyy hh:mm. Date and time to start an Ethernet recording.
Record Duration	The length in seconds of the entire recording session, or Continuous.
Batch Enable	Disabled or Enabled. If enabled, the recorder will create a series of files and the files will be numbered incrementally.
Batch Duration	The length of each batch file in seconds or Maximum. The minimum length is 30 seconds.
Batch Wrap Point	Sets the number of batch files that will be recorded before "wrapping over" the previously recorded files (from lowest to highest batch number).
Auto FTP after Record	Disabled or Enabled. If enabled, the file is automatically FTPed when the recorded file is completed.
New File on Channel Change	Determines whether or not the Hard Drive starts a new file upon channel change while recording.
OSD Recorder Indicators	Selecting will show indicators that will appear on the attached TV screen indicating a record session is in progress. This is a decoder function.

FTP Server Enable

1 to 8 servers are available for FTP. The parameters for these servers are set in the Configuration: FTP File Transfer > Server menu screen of IWS. When more than one server is enabled, the appliance will transfer the newly recorded file to each of the enabled servers, up to a maximum of eight.

Since FTP transfer can be a slower process than the recording process, it is possible to overrun the FTP queue, especially if many servers are enabled. Also, if operating in Batch record mode and the recorder attempts to open a new file that has not been completely transferred, the recorder will stop. The Failure condition is noted in the Recorder Status menu.

Configuration: Recorder > Network

The Network configuration tab is only displayed if you select **Dedicated** for **Recorder Source** on the previous Configuration: Recorder > General page.



Receive Address Mode	Allows the user to specify how the receive address will be configured: IP address or Host Name.
Receive Host Name	The source for video to be received by using Host Name of the source. This parameter can be used only for a unicast source.
Receive IP Address	In multicast mode, this parameter selects the receive IP Address for the Recorder. In unicast mode, this parameter is optional. If left blank, the Recorder will accept all data received on the receive IP port. If set, the Recorder will communicate with any VBrick having the encoder "unicast poll" option set and instruct it not to transmit its stream unless the encoding VBrick has the selected receive IP Address.
Receive Port	The receive port designates what local IP port is assigned to listen for incoming video.
Receive Mode	This read-only parameter informs the operator whether the selected receive IP Address is Unicast or Multicast.

Packet Ordering

Toggles the state IP packet ordering. The identification number in the IP header determines IP packet ordering. Out of order packets are discarded prior to being given to the decoder. Generally, when packet ordering is enabled, the VBrick will store the out of order packets and attempt to reassemble the entire datagram. Some sources of video may not utilize the identification number field in a consistent manner and therefore the packet ordering feature may need to be disabled.

Configuration: Recorder > Operation



Click here to examine ...

This link opens an Internet Explorer FTP session window. The link to view the hard drive content from the Integrated Web Server spawns an additional Internet Explorer window. After logging out of the IWS, it is a good idea to close all Internet Explorer windows and exit Internet Explorer. Note that it is not possible to view the VBrick's hard disk when running Microsoft Internet Explorer on Windows NT. Due to a limitation in Windows NT, Internet Explorer FTP is not invoked.

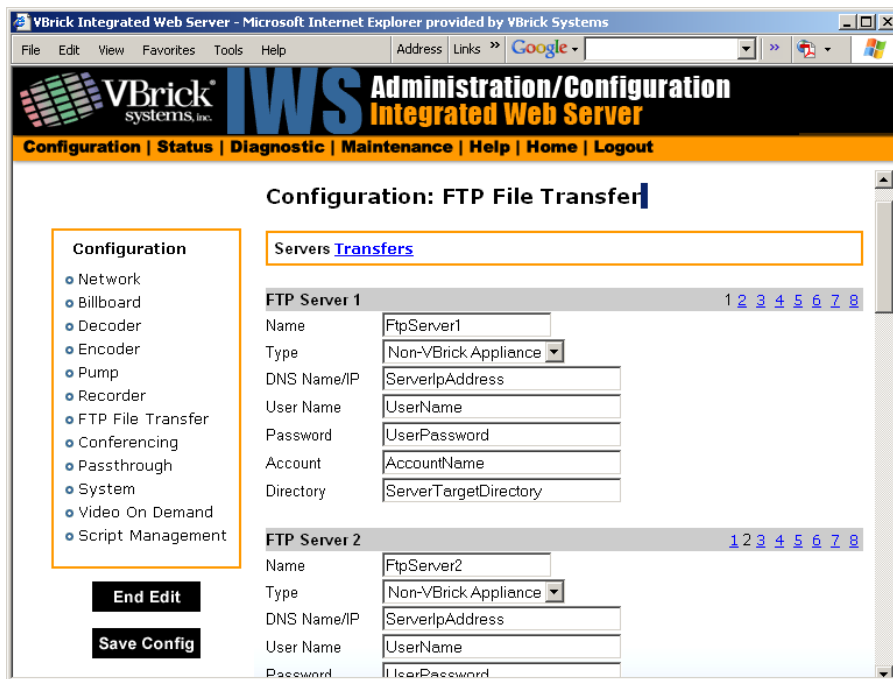
Recorder State	Displays the state of the recorder. Values can be Failed Stopped, never started Stopped, by user Stopped, Disk Full (less than 100 MB remains) Stopped, File Size Limit (approximately 4 GB) Stopped, FTP Overrun Stopped, Duration Complete Stopped, Unformatted Stopped, IO Error Stopped, File Is Pumping Running, From Power Up Running, Scheduled Running, User Initiated
Recorder Mode	Reports the Recorder mode, User Controlled, Start Record on Power-up, or Scheduled.
User Controlled	The user controls which files to record and send to which configured server.
Start Record on Power-up	When the appliance is powered up, the recorder will automatically start.
Scheduled	The files will start recording at the scheduled time.
Receive IP Address	The address of the video source. If unicast, this is the same as the sender's source IP address.
Recorder File Name	File name to be recorded.
File Start Time	Starting time of the recording.
Data Recorded	Reports the number of bytes currently recorded.
File in Progress	Name of the file currently being recorded.
FTP Status	The status of the Hard Drive FTP send. Values can be: Transfer in Progress Idle Invalid FTP Server Invalid User Name Invalid User Password Local File Open Error Socket Open Failure Transfer Failure Socket Quit Failure

File in Progress	<p>Name of the file currently being sent to the FTP destination server(s).</p> <ul style="list-style-type: none"> • Last Complete FTP File – Name of the last completed file sent via FTP. • Operation Functions Buttons: • Start Recorder – Starts recording selected file (s) to the Hard Drive destination. • Stop Recorder – Stops recording selected file (s). • FTP Auto Send – FTP last recorded file via enabled servers. • Refresh – Refreshes the content of this screen.
Last Completed File	The name of the last completed file. In a batch file, this is the last indexed file completed.

VBStar FTP File Transfer

Configuration: FTP File Transfer > Servers

Up to eight servers are available and can be simultaneously selected. When more than one Server is enabled, the appliance will transfer the newly recorded file to each of the enabled servers, up to a maximum of eight. Since FTP transfer can be a slower than the recording process, it is possible to overrun the FTP queue, especially if many servers are enabled. Also, if operating in Batch record mode and the recorder attempts to open a new file that has not been completely transferred, the recorder will stop. The failure condition is noted in the Recorder Status menu.



FTP Server 1–8

Name	Ftpserver1 through Ftpserver8.
Type	<p>VBrick or Non-VBrick Appliance.</p> <ul style="list-style-type: none"> • VBrick Appliance – When sending to a VBrick appliance, the serving VBrick must select the D: directory. The configuration of VBrick Appliance automatically adds D: to the path name or to any other configured folder or as part of the Directory entry. If no folder is specified, all files will be transferred to the D: directory. Additionally, subfolders may be specified. • Non-VBrick Appliance – A non-VBrick appliance setting allows a destination server to select its own path name, based on account user name and password. In this case, the Directory setting may be used to specify any sub-folder on the server.
DNS Name/IP	The DNS server name or IP address for the FTP server. It accepts up to 20 characters. The Host Name/IP must be a DNS Host Name.
User Name	The FTP server user's account name.
Password	The password required to access the FTP server. Optional entry. Accepts up to 20 characters. The FTP User Name and Password must be set up properly on the remote FTP server. If they are not entered the same as what is set up on the server, the VBrick will be unable to connect and perform the transfer.
Account	The account name required to access the FTP server. Optional entry.
Directory	This object allows a manager to switch to a different directory within the FTP server after login. Optional entry. Accepts up to 64 characters. Anonymous FTP is not supported.

Configuration: FTP File Transfer > Transfers

Eight servers are available to be separately set for FTP File Transfer. Server parameters are entered in the Configuration: FTP File Transfer > Servers menu screen of IWS.



FTP Status

Current File	The filename of the current file being FTPed.
Destination	FTP server name from server configuration page.
State	The current state of the Hard Drive. Values can be: <ul style="list-style-type: none"> • Transfer in Progress • Idle • Invalid FTP Server • Invalid User Name • Invalid User Password • Local File Open Error • Socket Open Failure • Transfer Failure • Socket Quit Failure
Size	Size of the file to be sent.

Rate	Transmitted data rate of the file being FTPed.
Transfer	Current amount transferred.
Last Queue Operation	File added OK; or File removed OK; or blank.

FTP Queue Operation

Changes to the entries on the screen do not take effect until you select an action button (Add to FTP Queue, Remove from FTP Queue or Flush Queue).

Directory	The target directory located on the server. See notes under sending to VBrick and non-VBrick appliances in the previous IWS screen.
File	Name of the File from the hard drive.
Batch	The batch filename of an individually indexed batch file. If a whole batch is to be FTP'd, File should be set to the base name of that batch and this object is to be set to Entire Batch.
Destination	The server to which the file or files is to be transferred. Servers are configured in the Servers section of the same page.
Add to FTP Queue	Adds the selected file or the batch of files, as indicated by to the FTP file and Batch drop-down box. FTP transfer starts immediately after operation.
Remove from FTP Queue	Allow the file to be removed from the FTP transfer queue.
Flush Queue	Removes all the current files from FTP transfer queue. It also makes any changes made to the variables of this group operational before performing this flush action, so that the values of variables in this group represent the actual values used by the VBrick.

VBStar Status

For a description of all VBStar Status screens, see [Status: Hard Drive Status](#) on page 155.



Command Line

The Command Line Interface is used to manage configuration parameters for the appliance. It is based upon the same command structure as the IWS. Regardless of whether CLI is accessed through HyperTerminal (shipped with Windows) or through Telnet, the command structure is the same. This chapter gives a brief overview of the CLI operation assuming most users will typically use IWS for configuration.

Note Telnet (as well as FTP, IWS, and SNMP) can be disabled for security purposes. If you cannot login to the appliance, check that Telnet is enabled. Go to Configuration: System > Security > External Telnet Server.

Topics in this chapter

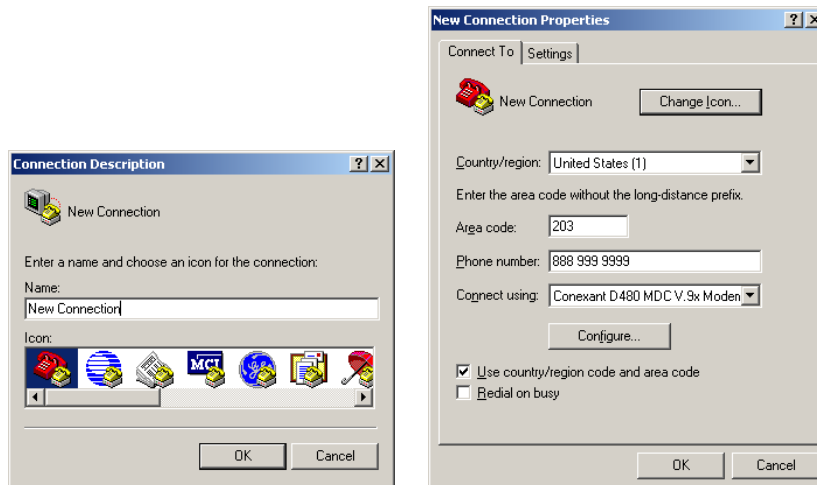
[Connecting with HyperTerminal](#)

[Connecting with Telnet](#)

[Editing Configuration Parameters](#)

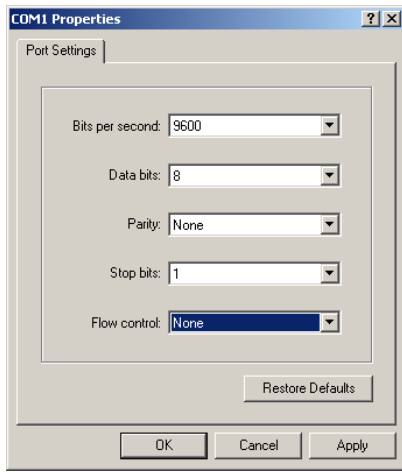
Connecting with HyperTerminal

VBrick's command line interface is simple, intuitive, and menu driven. Connect the included cable (which provides a standard 9-pin serial connection) from the serial port of the computer to the VBrick's COM2 RJ45 connector. To access the VBrick using HyperTerminal go to **Start > Programs > Accessories > Communication > HyperTerminal**. Connect through your computer's Communications Port (usually COM1).



Upon connection to a terminal (9600 bps Async, 8-bit, no parity, flow control = none), a prompt for login (username) and password will be displayed. (Ethernet VBricks also support

Telnet. The display is identical to that of a local terminal.) Login and password are case sensitive (admin). Once logged in, the main menu will appear by typing a question mark (?) at the VBrick> prompt.

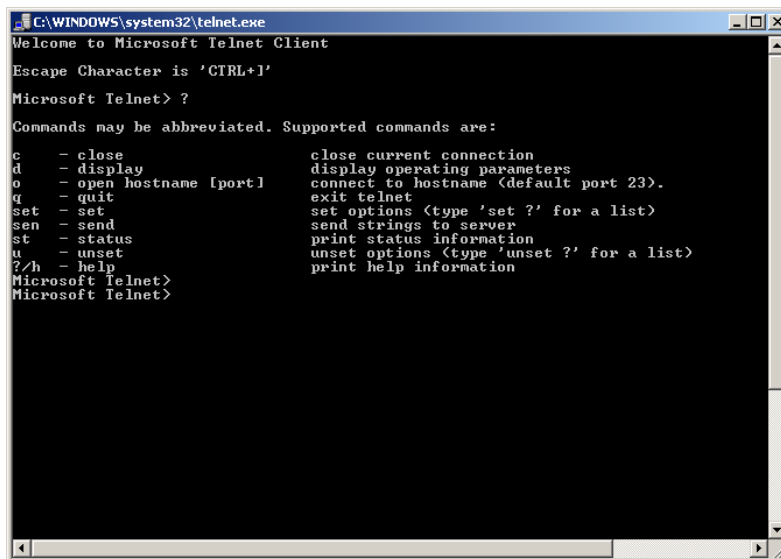


Connecting with Telnet

Ethernet VBricks can be managed remotely via industry-standard Telnet. The same suites of menus that are displayed on a local terminal are instantly available over an IP network. VBrick uses the standard Telnet port.

▼ To login using Telnet.

1. Go to **Start > Run** and type **telnet** to open a Telnet window.
2. Type **?** and press Return to display the menu options.



3. Type **open <ip_address>** using the IP address of the WM Appliance.
4. Enter the Login name and Password. Default is admin and admin.
5. At the VBrick prompt, type **?** to display the top-level commands.

```

Telnet 172.22.173.1
Login:admin
Password:

VBrick>
C      : Configuration
D      : Diagnostics
E      : Begin or End Editing
M      : Maintenance
S      : Status

VBrick>

```

Using Global Commands

There are some Global Commands that can be used with both CLI and Telnet. Global Commands are accepted at any menu level. For example, to browse to a menu selection and make a change, you can type **be** or **beginedit** command instead of navigating back to the editing menu.

Table 1. Global Commands

Command	Shortcut
<code>beginedit</code>	<code>be</code>
<code>endedit</code>	<code>ee</code>
<code>exit</code>	<code>ex</code>
<code>logout</code>	<code>lo</code>
<code>showeditor</code>	<code>sh</code>
<code>help</code>	<code>h</code>

Resetting or Rebooting the VBrick

You must be the active Editor to reset the VBrick. You can use the Global Editing commands to become the active Editor in Telnet, just as you can in CLI. The reset control is in the Diagnostic menu (D/RB).

Navigating the Top-Level Commands

```
Telnet 172.22.173.1
Login:adminadmin
Password:
Login:admin
Password:
UBrick>
C      : Configuration
D      : Diagnostics
E      : Begin or End Editing
M      : Maintenance
S      : Status
UBrick> c
Options:
CF     : Conferencing Options
E1     : Slot1 Encoder Options
ET     : Event Triggering Options
LG     : Logging options
MS     : Management SAP Options
NT     : Ethernet Network Options
P1     : COM1 Passthrough Options
P2     : COM2 Passthrough Options
RT     : Routing Table Options
SC     : Security Options
SS     : System Options
ST     : SNMP Trap Options
SU     : Save configuration to flash
UBrick:Config >
```

The general format is **Command /Option/ Option** (not case-sensitive). Entering a question mark (?) at any level will display available options. First level command options are:

- C – Configuration
- D – Diagnostics
- E – Begin or End Editing
- M – Maintenance
- S – Status

For example, entering C will display available [Configuration Options](#). Entering S will display available status options, etc. To exit from any level to the previous level, type **exit** or **ex** at the prompt. **Ctrl-Z** will always take you to the top level; **?** or **dir** will display the available options.

Editing Configuration Parameters

Only one user can be in Edit mode at any time. It is advised that users Begin Edit, make changes and End Edit so as not to interfere with other users. It is possible for a user to leave IWS while still in the edit mode which leaves a subsequent user with the dilemma of choosing whether or not to log off the first user. A second user may log off the first individual without knowing if the first user is still engaged in editing or has simply forgotten to log off. At the top level you may enter **e** for available options and enter the selection on a separate line or if you know the option number, you may enter the selection and option with a space. After a **Return** the system will respond with [Command Complete](#).

- VBrick> e 1 – Displays editing status.
- VBrick> e 2 – Begin/End editing.

If the appliance is being edited through a different interface, you will get a [Command Complete](#) response even though you did not become the active editor. The only way you can make sure

you are the active editor is when you Display `Editing Status` and the display is `admin`. If the field is blank you are not the active Editor. In Edit mode `Command Complete` means the command has been executed. When changing other parameters, it is necessary to apply the command before the parameter will be changed in the VBrick. There are also global commands that enable editing for use when you are within the file structure.

`be` – Begin edit

`en` – End edit

`sh` – Show editing status

Setting and Changing Parameters

When entering and changing parameters, (other than the Edit command), `Command Complete` indicates that the user has entered an appropriate command not that the command has been carried out. In order to initiate the change it is necessary to use `Apply` and it must be used at the correct Command Level. The system will then respond `Command Complete`, this time meaning that the command has been executed. It is necessary to enter the parameter being changed along with the entry. Don't forget that the command will not be executed until it is "applied".

Users may navigate to lower level commands through the correct command line entries and change parameters if you enter `Apply` at the correct level. For example, if you are changing the Logo display off or on, you may progress through menu entries to the correct level:

1. `?`
2. `d2` (Slot 2 decoder options)
3. `v` (Slot 2 decoder video options)
4. `slot 2 decoder video options` (1 off, 2 on)
5. `Apply`

or if you know precisely which parameter to alter, you can enter a single line command string to accomplish the same action as in the steps above:

`VBrick> c d2 v 4 2` – enters the command to turn the Logo on.

`VBrick> c d2 v Apply` – Executes the command.

Note `Apply` must be entered at the correct level. The user has entered the correct Command String, the Command appears to be completed. In reality, the Logo still appears on the screen until `apply` is entered. Again, `apply` cannot be entered as part of the command line. The exception to this is entries being toggled, as the Edit entry. You can either Begin or End Editing. There are no other valid states.

Selecting Parenthetical Items

Where applicable in changing parameters, the acceptable entries are in parenthesis. The correct text string or number to enter corresponding to the parameter to change is given first. To see what it is currently set at, check display In the following example, the audio sampling frequency can be set to either 44.1KHz or 48KHz.

```

Telnet 172.22.173.1
IM      : Slot1 encoder template options
U      : Slot1 encoder video options

UBrick:Config:Encoder Slot1 > a

Options:
1      : Display slot1 encoder audio options
2      : Set slot1 encoder audio sampling frequency
3      : Set slot1 encoder audio bit rate
4      : Set slot1 encoder audio target bit rate
5      : Set slot1 encoder audio channels
6      : Set slot1 encoder audio input
7      : Set slot1 encoder audio input level
8      : Set slot1 encoder audio gain
9      : Set slot1 encoder audio balance
10     : Set slot1 encoder audio speech mode
Apply  : Apply slot1 encoder audio options
Default: Set slot1 encoder audio options to default
Revert : Revert slot1 encoder audio options

UBrick:Config:Encoder Slot1:Audio > 1

Slot1 Encoder Audio --
Audio Input Level  : Normal
Audio Gain        : 0 dB
L+R Bit Rate(bit/sec): 128000
Sampling Frequency : 48KHz
Audio Channels    : Stereo

UBrick:Config:Encoder Slot1:Audio > 2

Options:
Encoder audio sampling frequency (48-48KHz, 44-44.1KHz)

UBrick:Config:Encoder Slot1:Audio > 2
UBrick:Config:Encoder Slot1:Audio >

```

Setting System Date and Time

The system date and time is set under Configuration, System Options. To set the System Date and Time in CLI, you must enclose the changes with double quotes (" "), such as "3/15/2002 13:53" otherwise the changes are ignored. You can change the system date and time through the menu entry: Configuration (c), System Options (ss), 3, and entering: `"mm/dd/yyyy hh:mm"` or as a one line entry: `c ss 3 "mm/dd/yyyy hh:mm"`

Other Editing Keys

Type `help edit` to display a list of other editing keys.

```

Telnet 172.22.173.1
Slot1 Encoder Audio --
Audio Input Level  : Normal
Audio Gain        : 0 dB
L+R Bit Rate(bit/sec): 128000
Sampling Frequency : 48KHz
Audio Channels    : Stereo

UBrick:Config:Encoder Slot1:Audio > 2

Options:
Encoder audio sampling frequency (48-48KHz, 44-44.1KHz)

UBrick:Config:Encoder Slot1:Audio > 2
UBrick:Config:Encoder Slot1:Audio > help edit

Available editing keystrokes

Delete current character.....Ctrl-d
Delete text up to cursor.....Ctrl-u
Delete text after cursor.....Ctrl-k
Move to beginning of line.....Ctrl-a
Move to end of line.....Ctrl-e
Get prior command from history.....Ctrl-p
Get next command from history.....Ctrl-n
Move cursor left.....Ctrl-b
Move cursor right.....Ctrl-f
Move back one word.....Esc-b
Move forward one word.....Esc-f
Convert rest of word to uppercase.....Esc-c
Convert rest of word to lowercase.....Esc-l
Delete remainder of word.....Esc-d
Delete word up to cursor.....Ctrl-w
Transpose current and previous character....Ctrl-t
Enter command and return to root prompt....Ctrl-z

UBrick:Config:Encoder Slot1:Audio >

```

VB6000 Reference

Topics in this chapter

[Current Models](#)

[Interfaces](#)

[Event Triggering](#)

[Syntax Rules](#)

Current Models

VB6000



Figure 1. Model 6200 – Rear View

VB6000 ATM



Figure 2. Model 6200 ATM – Rear View

MPEG-2 uses SFF/LC connector. The SFF/LC connector is smaller and can be confused with the MRTJ connector used by some other manufacturers (i.e. 3Com), but cannot physically be connected to the SFF/LC interface. (MRTJ) looks similar to an RJ45 connector

but with 2 optical "pins" instead of the 8 copper pins.) The SFF/LC connect cannot be used with ST type cable connectors.

VB6000 VBSSM

For more about the Security and Surveillance, and Monitoring appliance, see [VBSSM](#) on page 5.

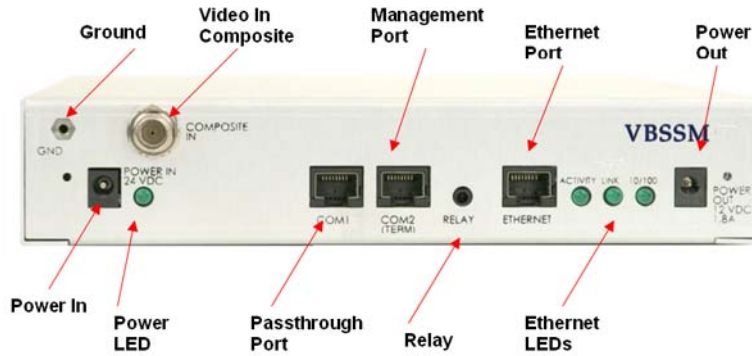


Figure 3. Model 9174-4200 VBSSM – Rear View (single input, single encoder)

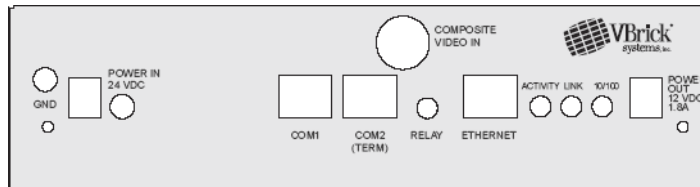


Figure 4. Model 9172-4400 VBSSM – Rear View (single input, dual MPEG-2/4 encoder)

Interfaces

Passthrough Port Interfaces (COM 1/COM2)

The COM 1 port presents a standard DTE interface on an RJ-45 connector. The Passthrough Port is used to pass control information between VBrick appliances over the network. The serial port operates at a default rate of 9.6Kbps, Async, 8-Bit, No Parity, Controls = None.

Table 1. RS-232 Pinouts

Pin	Function	Direction
1 †	RTS Request to Send	Output
2 †	DTR Data Terminal Ready	Output
3	TXD Send Data	Output
4	Ground	Common
5	Ground	Common
6	RXD Receive Data	Input

Pin	Function	Direction
7 †	DSR Data Set Ready	Input
8 †	CTS Clear to Send	Input

† COM2 for -xxx2 boards does not have control signals RTS, D'TR, DSR, and CTS.

The COM 2 port presents a standard DTE interface on an RJ-45 connector. This port may be used for management or for Passthrough. An RJ-45 to DB9 straight-through cable may be used to connect directly to most serial ports on laptop PC's. The serial port operates at a rate of 9.6Kbps Async, 8-Bit, No Parity. The VBrick appliance comes with a cable to attach this port to a standard 9-pin serial adapter. The Terminal Block option is identified by xxxx-xx30-xxx3 part number on main board.

RS-422/485 (COM 1/COM2)

RS-422/485 pinouts are shown below. For wiring use twisted pair 24 AWG Gauge shielded cable.

Table 2. RS-422/485 Pinouts

Pin	Description
1	TD(+)
2	N/C
3	TD(-)
4	optional gnd/common or n/c ‡ GND (connected to cable shielded)
5	optional gnd/common or n/c ‡ GND (connected to cable shielded)
6	RD(-)
7	N/C
8	RD(+)

Optional Power Connector

There is an optional alternate power connector on Terminal Block Board. Pin 1 is on Left side (rear view). Pin 1 is Alternate Power In (+), pin 2 is GND (-). The alternate power is 24 VDC, 3A, 24AWG wire gauge (same requirement as the main power cube input). Warning: Do not connect both Main power in (24VDC power cube) and the Alternate Power IN via the Terminal Block Board at the same time.

Ethernet Port

The Ethernet port is a standard 10/100Base-T RJ-45 that is auto-sensing.

Power In Entry Interface

The power entry interface supplies 24VDC to the VBrick from an external power supply.

Power Out Exit Interface

The power exit interface supplies 12VDC from the VBrick for the purpose of camera power.

Video-In and Video-Out (Composite)

The composite interface is a standard BNC connector.

Pin	Description
1	Luma/Chroma
2	Ground

Video-In and Video-Out (S-Video Interface)

The S-Video interface is a standard mini-DIN connector.

Pin	Description
1	Ground
2	Ground
3	Luma
4	Chroma
5	Ground
6	Ground

AudioMate In

The AudioMate In port is designed for use with VBrick's echo canceling microphone. It uses a special mini-DIN connector and cable that is available from VBrick Systems.

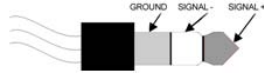
Signal Levels

The audio and video input and output levels are standard unbalanced, "line level."

Signal	Description
Audio	1 V P-P
Video	1 V P-P

Audio In and Audio Out

The Audio ports are designed for use with a 1/8" mini plug. Cables are available for both balanced and unbalanced applications from electronics specialty stores (e.g. Radio Shack®) and from VBrick Systems. For balanced operation, use a cable with a mini stereo plug (Ground, - Signal, +Signal, High Impedance Input, 600 Ohm Output).



For standard, unbalanced, operation use a cable with a mini mono plug (Ground and + Signal, High Impedance).



Analog Input

Configuration	Two channel Stereo	
Input Connectors	2 Stereo mini-jacks	
Input Configuration	Balanced or Unbalanced	
Input Load Impedance	100k ohms	
	Unbalanced	Balanced
Maximum input level	3.1 V pp (+3dBu)	1.5 V pp (-3 dBu)
Nominal input level	1.5 V pp (-3 dBu)	0.775 V pp (-9dBu)

MPEG-2 Optical Loss Budget

MPEG-2	Receiver Sensitivity	Transmit Power
MM (maximum reach 3 km)	-32 dBm	-19 to -14 dBm
SM (intermediate reach 15 km)	-28 dBm	-15 to -8 dBm
SM (long reach 1310nm 40 km)	-34 dBm	-5 dBm
SM (long reach 1550nm 80 km)	-34 dBm	-5 dBm

Video Resolution

Video Resolution	NTSC	PAL
Full D1	720 x 480	720 x 576
2/3 D1	480 x 480	480 x 576
1/2 D1	352 x 480	352 x 576
SIF	352 x 240	352 x 288

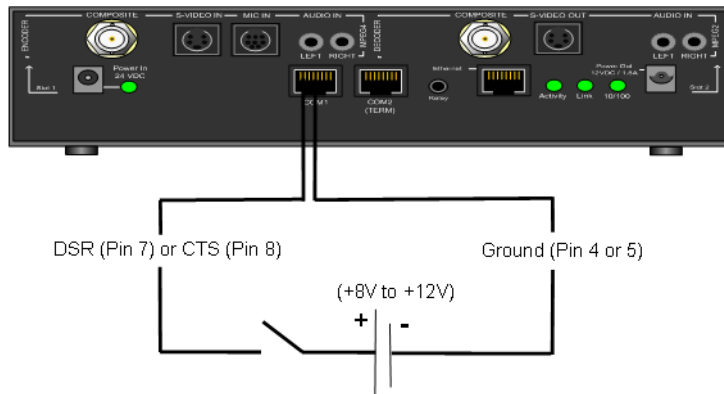
Event Triggering

The VB600 event triggering feature lets you use an external switch to control the function of the VBrick. This section provides some examples of how to use this feature. In all the examples, a high event is triggered when the switch is closed and a low event is triggered when the switch is opened. The event trigger inputs on the VBrick recognize a *high* voltage

anywhere above +8 volts DC with an upper limit of +12 volts. A *low* voltage is anything at or below 0 volts DC with a lower limit of -12 volts. The event can also be configured to run a script on Pin7 or Pin 8 depending on how the connection is configured in [Configuration: Script Management](#) on page 80.

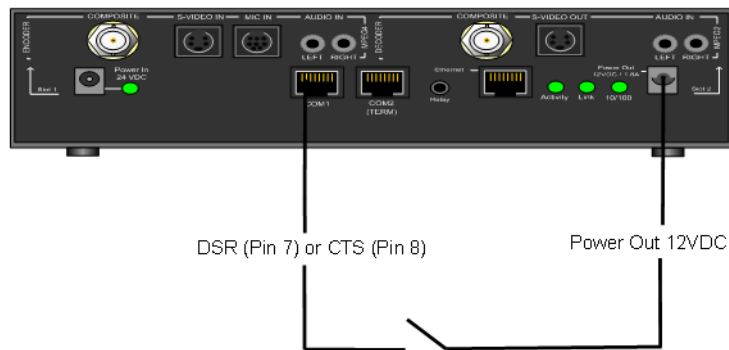
Example 1

Connect an external power supply (+8V to +12V) and a switch directly to the ground pin and an event pin of the COM1 port on the VBrick.



Example 2

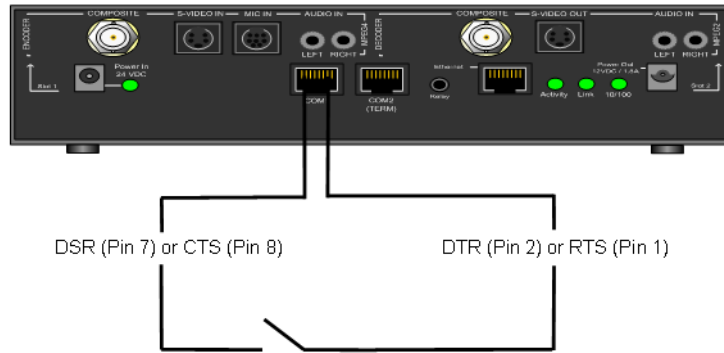
Connect the +12V Power Output of the VBrick through a switch to the event pin on the COM1 port.



Example 3

Connect COM1 output pin (pin1 RTS or pin2 DTR) through a switch to a COM1 event pin. For this method to work, you must force the desired output pin (RTS or DTR) to On via IWS:

- ▼ To force the desired output pin to On:
 1. Go to the [Configuration: Passthrough](#) page in IWS.
 2. Change COM1 **Passthrough State** to **Responder** and click Apply.
 3. Change **RTS/DTR Control** to **Force On** and click Apply.
 4. Change COM1 **Passthrough State** to **Disabled** and click Apply.
 5. Click **Save Config** when done.



Syntax Rules

The following table shows the syntax rules for various configurable parameters in IWS.

Table 1. Parameter Syntax Rules

Parameter	Syntax Rules
Configuration: Network > Host Name	18 characters First character letter Last character letter or digit Only letters, digits or hyphens allowed in string
Configuration: Network > Host Name (ATM)	When operating units equipped with ATM, shorten the name length to allow for additional characters that are automatically appended for IPoA circuits. In this case, the Host Name should not exceed 13 characters.
Configuration: Network > Domain Name	255 characters
Configuration: Network > Management, Management SAP Group Name	40 characters, no double quotes "", less than <, or greater than >
Configuration: Billboard > URL	255 characters (file://.b/bb01/VB_1.HTM)
Configuration: Decoder > Network, Receive Host Name	Host Name Syntax Rules: 18 characters First character letter Last character letter or digit Only letters, digits or hyphens allowed in string
Configuration: Decoder > Network, SAP Category	36 characters, no double quotes "", less than <, or greater than >
Configuration: Encoder > Destination 1/2, (Slot1/2) Destination Host Name	Host Name Syntax Rules: 18 characters First character letter Last character letter or digit Only letters, digits or hyphens allowed in string

Parameter	Syntax Rules
Configuration: Encoder > Video, Closed Caption Text (only on models ending in –xxx1)	32 characters, no double quotes “”, less than <, or greater than >
Configuration: Encoder > SAP, Text	40 characters, no double quotes “”, less than <, or greater than >
Configuration: Encoder > SAP, Category	36 characters, no double quotes “”, less than <, or greater than >
Configuration: Encoder > SAP, Author	30 characters, no double quotes “”, less than <, or greater than >
Configuration: Encoder > SAP, Copyright	30 characters, no double quotes “”, less than <, or greater than >
Configuration: Encoder > SAP, Session Info	24 characters, no double quotes “”, less than <, or greater than >
Configuration: Pump > General, Pump File Name	56 characters, \ “ : * ? > < [] are invalid characters
Configuration: Recorder > General, Recorder File Name	56 characters, \ “ : * ? > < [] are invalid characters
Configuration: Recorder > General, Recorder Schedule	16 characters (mm/dd/yyyy hh:mm)
Configuration: System > General, System Date and Time	16 characters (mm/dd/yyyy hh:mm)
Configuration: FTP File Transfer > Servers, Name	20 characters, no double quotes “”, less than < or greater than >
Configuration: FTP File Transfer > Servers, Host Name/IP	64 characters, no double quotes “”, less than < or greater than >
Configuration: FTP File Transfer > Servers, User Name	64 characters
Configuration: FTP File Transfer > Servers, Password	20 characters
Configuration: FTP File Transfer > Servers, Account	64 characters
Configuration: FTP File Transfer > Servers, Directory	64 characters, no double quotes “”, less than <, or greater than >
† Configuration: FTP File Transfer > Transfer Options, Add Files to FTP Queue	56 characters, \ “ : * ? > < [] are invalid characters
† Configuration: FTP File Transfer > Transfer Options, Remove Files from FTP Queue	56 characters, \ “ : * ? > < [] are invalid characters

Parameter	Syntax Rules
Configuration: Conferencing > Conferencing Name	40 characters, no double quotes "", less than <, or greater than >
Configuration: Passthrough > Passthrough State, Initiator, Destination > Dedicated, Dedicated Host Name	Host Name Syntax Rules: 18 characters First character letter Last character letter or digit Only letters, digits or hyphens allowed in string
Maintenance: Change User Names and Passwords, Administrator User Name	20 alphanumeric
Maintenance: Change User Names and Passwords, Administrator Password	20 alphanumeric
Maintenance: Change User Names and Passwords, Operator User Name	20 alphanumeric
Maintenance: Change User Names and Passwords, Operator Password	20 alphanumeric
Maintenance: Change User Names and Passwords, Diagnostics User Name	20 alphanumeric
Maintenance: Change User Names and Passwords, Diagnostics Password	20 alphanumeric
Maintenance: Change User Names and Passwords, Public User Name	20 alphanumeric
Maintenance: Change User Names and Passwords, Public Password	20 alphanumeric

- † You cannot set this parameter in IWS. You must select from an existing list. To add a file using CLI, you must enter the name using the correct syntax. To remove a file using CLI, type the parameter exactly as it exists.



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