vbrick encoder

Vbrick Encoder

vbrick encoder v4.x
Getting Started Guide

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CE Vbrick declares that this product conforms to the following certificate standards for electromagnetic emissions when installed according to the manufacturer's specifications: EN 55022:2006; EN 55024:1998, A1:2001, A2:2003; EN 61000-3-2:2005; EN 61000-3-3:1995, A1:2001, A2:2005.

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11. Vbrick iPhone App

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Getting Started Guide

Getting Started documentation topics explain initial set up and installation of a Vbrick 9000 Encoder. Management tools and descriptions of some of the fundamental concepts behind encoder technology are available. How to launch the VBAdmin management interface to configure the encoder and control encoder functions is also covered.

Chapter and Topic Organization

Online help may be used as reference material or how-to materials for specific use cases.

For best results, please familiarize yourself with the way the information is organized.

If you find errors or omissions, click the e-mail icon in the upper-right corner of this window or send your feedback to documentation@vbrick.com

Introduction	Lists specifications and describes features and functions of the encoder.
Quick Start Installation	Provides general configuration recommendations as well as how to cable the encoder and connect it to the network.
Rack Mount Shelf and Blade Setup	Explains how to set up and configure a Rack Mount Shelf that houses from 1 to 11 blade encoders.
Software Upgrade	Explains how to upgrade the encoder's software when a new version is released.
Management Tools	Overview of the management configuration tools available for the encoder. These include the VBAdmin Web interface, Telnet, SNMP, and the command line.
VBAdmin	How to access the VBAdmin application to manage Vbrick configuration from an external Web browser.
Command Line Interface	How to configure an encoder from the command line using Telnet or HyperTerminal (when an Internet connection is not available).
Web Services	How to use the standards-based SOAP interface to programatically interface to the encoder.
Streaming Video Basics	Explains some of the fundamentals behind encoder technology including compression techniques, network concepts, serial port passthrough, and other video basics.
Vbrick iPhone App	How to use an iPhone application to check parameters and run scripts.
Vbrick 9000 Series Reference	Provides back panel drawings, COM port pinouts, LED descriptions, and other miscellaneous information.

Introduction

Encoder Overview

The Vbrick 9000 Encoder/Decoder enables anyone to encode video from an uncompressed source—such as a camera or TV broadcast—and stream it live onto a network for viewing on PCs, MACs, tablets, televisions, or smartphones. The encoder is the first portable device that streams 1080p60 HD video from multiple sources at the same time—and the first line of encoders to support up to four channels of HD video. The Vbrick 9000 Decoders deliver high-quality, low latency video with exceptional performance, ease-of-use, and flexibility. The decoder is fully compatible with encoders and supports single or dual channel HD decoding at either 1080p or 720p resolutions (or decodes up to D1 resolution at lower data rates).

Building upon more than a decade of experience in engineering the most widely deployed enterprise encoders, the Vbrick encoder sets a new benchmark in H.264 encoding performance. Based on purpose-built hardware and running a real-time operating system, this unique encoder approach combines encoding, networking, stream serving and recording functions to deliver unmatched price-performance and ease-of-use.
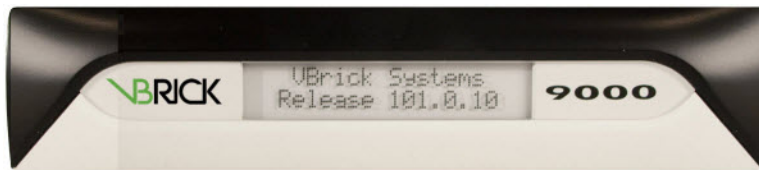
Applications

- Television Distribution – Deliver selected television channels—including news and financial programming—to an unlimited number of desktops and displays across your existing LAN, WAN or IP network. There is no need for extra cabling or a dedicated network and you can reduce TV headend rack space by 75%.
- Telemedicine – Use the most advanced encoding standards, highest resolution, and highest frame rate available to watch intricate operations and other medical procedures—applications where image quality cannot be compromised.
- Surveillance and Monitoring – Oversee roadways, seaports, factory floors and security borders; survey battlefield situations and maintain situation awareness with an unprecedented level of video quality ensuring access to detailed and accurate information.
- Digital Signage – Deploy signage economically by encoding the content once and distributing over your network to cost-effective set-top boxes. Feed an unlimited number of digital signs with four different HD sources using a single encoder.
- Meeting and Event Broadcasts – Deliver high-impact, rich media event broadcasts. Reach a large audience of customers, constituents, employees and others over the corporate network and the Internet to communicate a uniform message.

- Extending Videoconferencing – If you already have a videoconferencing solution, Vbrick's encoder can leverage your investment by extending its reach. Your videoconferencing suite, combined with our streaming technology, becomes a mini-broadcast studio, enabling you to reach a much wider audience.
- Broadcasting Live to the Internet – Combine the flexibility and reliability of Vbrick's encoder with the global reach of Vbrick's Online Streaming Services (OSS).

Encoder Features and Benefits

- Capture High Definition Video – Encode and stream HD 720p and 1080p video at 60 frames-per-second, the highest frame rate available from standard video sources. This provides incredible video quality at bandwidths of 1 Mb/sec and up.
- Capture Multiple Video Sources on a Single Encoder – Dual-channel and quad-channel models simultaneously encode and stream HD video from multiple sources in a single encoder, leading to economical deployments and space savings of up to 75%.
- Manage the Encoder Easily and Securely – Control and monitor the encoder with Vbrick's iPhone application. Integrate into any IT infrastructure with a rich set of management protocols and options that let you manage, configure and lock down the encoder. Use Vbrick's VBAdmin tool to configure and monitor the encoder. Use command line interface over Telnet, SSH, or serial port to configure the encoder.
- Transport Video Over a Wide Variety of Network Transport Protocols – Video streams are compatible with Adobe Flash™ Player, Microsoft Silverlight, Microsoft Windows Media™ Player, Apple QuickTime and other players. Network friendly operation – meaning everything from streaming with the most appropriate bit rates to the inclusion of advanced features like persistent push – allows Vbrick encoder streams to tunnel through firewalls and traverse any network.
    - Note: Windows Media Player will play streams from the 9000 if both H.264 codec (for video) and AAC codec (for audio) are installed. Currently, Vbrick does not provide this codec.
- Integrate into a Complete Enterprise IP Video Platform – Vbrick's encoder works seamlessly with our VEMs Mystro™ media management solution and the entire Vbrick Enterprise Video Architecture (VEVA). By making video accessible, personal and scalable, VEMS Mystro eliminates multiple barriers to the adoption of enterprise IP video.
- Multicast, Unicast and Serve from the Same Device – Use multicast technology to reach an unlimited number of users on your LAN or push video over point-to-point unicast connections to reach remote locations and CDNs. Serve and support hundreds of players that request video directly from a single encoder.

Decoder Features and Benefits

- Dependable embedded operating system and dedicated decoding hardware delivers highest reliability for mission-critical applications.
- HD video output is ideal for large displays and video backhaul applications.
- Flexible networking and bandwidth options allow placement anywhere in the network.
- Create high density installation using decoder blades in a rack mount chassis.
- Efficient H.264 codec delivers the highest video quality at the lowest bandwidth.
- Low latency enables near real-time applications and two-way video.

Device Specifications

Encoder Specifications

Table 1. Encoder Specifications

Video Encoder (Standard Definition)	• H.264 Encoding
	  - Input format: 1080p50/60, 1080i50/60, 720p50/60, 576i/p, 480i/p, many PC resolutions.
	  - Encoded resolutions: 4:3 Aspect Ratio Resolutions: D1 (720x480, 720x576), SIF (NTSC), QSIF (NTSC), CIF (PAL), QCIF (PAL), 400x304, 384x288 (PAL), 640x480, 320x240, 128x96, 192x144
	  - 16:9 Aspect Ratio Resolutions: 656x368, 512x288 (PAL), 256x144
	  - Video Frame Rates: 2, 3, 5, 6, 7.5, 10, 15, 30 fps (NTSC), 2.5, 5, 12.5, 25, 50 (PAL)
	  - Constant Bit Rate / Constant Frame Rate
	  - User-defined key frame interval
	  - Rates: 32Kbps – 20Mbps
	  - Baseline, Main, and High profile
	• Inputs: HDMI/Component, HDMI/VGA, or SD/HD/3G-SDI/Composite/HDMI/Component
	• Rate control
	• Deblocking filter
	• Entropy Coding: CAVLC, CABAC

Video Encoder (High Definition)	• H.264 Encoding
	  - High Definition input formats: 1080p50/60, 1080i50/60, 720p50/60, 576i/p, 480i/p, many PC resolutions.
	  - Encoded resolutions: 16:9 Aspect Ratio Resolutions: All standard definition resolutions listed above, plus 960 x 544, 720p (1280 x 720p), 1080p (1920 x 1080)
	  - Video Frame Rates: 2, 3, 5, 6, 7.5, 10, 15, 30 fps (NTSC), 2.5, 5, 12.5, 25 (PAL), 50, 60 fps
	  - Constant Bit Rate / Constant Frame Rate
	  - User-defined key frame interval
	  - Rates: 32Kbps – 20Mbps
	  - Baseline, Main, and High profile
	• Inputs: HDMI/Component, HDMI/VGA, or SD/HD/3G-SDI/Composite/HDMI/Component
	• Rate control
	• Deblocking filter
	• Entropy Coding: CAVLC, CABAC

Audio Encoder	• AAC-LC and AAC-HE Encoding
	  - Sample Frequency 8 Khz to 48 Khz
	  - Rates: 8 Kbps to 256 Kbps
	  - Audio Modes: Stereo, Mono
	  - Inputs: Stereo Unbalanced at line, microphone or high headroom input levels, and microphone via analog audio inputs. Digital audio can also come through the HDMI input. Stereo Balanced through optional XLR cable on SDI/Composite/HDMI/Component models
	• Audio Processing:
	  - Automatic Volume Control (AVC) with configurable attack and release rates and minimum/maximum levels
	  - Noise Gate with configurable threshold
	  - Configurable gain from -96dB to 10dB

Push	• IIS Smooth Streaming to Microsoft IIS Server • 25 concurrent unicast and multicast destinations • Automatic Unicast/RTSP Announce • RTP • Transport Stream • RTMP
Server	• Live multicast server • Live streaming server—up to 200 concurrent live streams
Ethernet Network	• 10/100/1000 Mbps Ethernet via RJ-45, Static, or DHCP • Auto sense Full / Half duplex
Protocols	Unicast / Multicast, DiffServ (QoS), UDP / IPv4 and IPv6 / RTSP / RTCP / RTP / HTTP / RTSP Interleave / IGMP / MPEG-2 Transport Stream / Automatic Unicast (RTSP ANNOUNCE) / HTTPS Management / SSH / RTMP / IIS Smooth Streaming / FEC
Traffic Shaping	• RTP Metering • CBR Transport Stream • VBR Transport Stream with configurable latency
KLV Metadata	• LDS received over the serial port or IP and multiplexed into transport stream (one channel over IP, up to two channels over serial) • CoT over serial port or IP converted to LDS and multiplexed into transport stream (one channel over IP, up to two channels over serial)
Management	• Two serial ports for local maintenance and data transport • Management Web Pages over HTTP or HTTPS • SNMP, ssh, telnet • soap/xml Web Service • iPhone application • Front panel display on Enterprise Models
Dimensions	Encoder: 1.75" x 8.1" x 8.75"
Weight	2 pounds
Temperature Range	• Industrial Encoder: 0 to +70 degrees Celsius • Enterprise Encoder: 0 to +50 degrees Celsius
Power	Input: 100 to 240 VAC, 50 / 60 Hz, Output: 24V DC, 5A
Regulatory	FCC Part 15, CE

Decoder Specifications

Table 1. Decoder Specifications

Transport and Networking Protocols	• H.264 in RTP • Receive streams: 32Kbps to 20Mbps • Unicast or Multicast over RTP/UDP • IGMP • Autotune streams from Vbrick Encoders
Video Decoder	• H.264 Baseline, Main, and High Profile • Streaming resolution and frame rates up to 1080p60 • Scaling from any input resolution and frame rate to match output resolution and framerate • Configurable letter box or stretch to screen aspect ratio • 4:3 and Widescreen 16:9 Frame Aspect Ratios • Output Resolutions: 1080p, 1080i, 720, 576p, 576i, 480p, 480i • Output frame rates: 60, 59.94, 50, 30, 29.97, 25
Audio Decoder	AAC-LC, AAC-HE
Video Outputs	• Analog: Composite and YPbPr component video • Digital: SD/HD/3G-SDI, HDMI • HDMI, SDI connectors mounted directly on encoder/blade • Breakout cable to BNC connectors for Analog Audio, Composite Video, and Component Video
Audio Outputs	• Analog: Stereo Line Level Unbalanced BNC, Balanced XLR (through optional XLR cable) • SDI audio • HDMI Audio
Network Connectivity	• 10/100/100 Ethernet • Auto senses Full/Half Duplex • Static IP address or DHCP
Management	• Management Web Pages over HTTP or HTTPS from integrated Web server • SNMP • soap/xml Web Service • ssh • telnet • iPhone app • RS-232/422 • Front panel display on Enterprise Models
Dimensions	Decoder: 1.75" x 8.1" x 8.75"
Power Supply Input	100 to 240 VAC, 50 / 60 Hz, Output: 24V DC, 5A
Regulatory Approvals	FCC Part 15, CE
Protocols	Unicast/Multicast, DiffServ (QoS), UDP, IPv4 and IPv6, RTP, SAP, IGMP, HTTP/HTTPS Management, SSH
Maintenance/Control Port	Two serial ports for local maintenance and data transport
Weight	2 pounds
Operating Temperature Range	• Industrial Decoder: 0 to +70 degrees Celsius • Enterprise Decoder: 0 to +50 degrees Celsius

Options	XLR audio cable

Table 2. Rack Mount Chassis Specifications

Rack Mount Chassis	• Height: 14", 8 rack units • Depth: 11", Allows for two rack mount chassis mounted back-to-back • Weight: 46.7 pounds fully loaded • Maximum Channel Density: 88 channels in 8U of rack space with back to back chassis mounting • Operating Temperature Range: 0 to 40C • Storage Temperature Range: -20 to 70C • Regulatory Compliance UL: FCC Part 15 Class A, CE, RoHS (5 of 6) • Cooling Capacity: 50W per blade with one failed fan • Hot Swap: Power Supplies, Fan Tray, Encoder Blades, Air Filter Media • AC Power: 485 watts per power supply, 47 to 63Hz, 8 amps at 90-132VAC, 4 amps at 180-264VAC
Grounding	• ESD wrist strap included with ground connection to chassis for user blade insertion/removal • Chassis ground connection lug
LEDs	• - Power Supply Failure LED (for each supply and for enclosure) • - Fan Status LED • - Fan Tray Hot Swap LED
Alarm	Audible Alarm on Power Supply Failure

Table 3. Supported Browsers

Browser (Using VBAdmin)	Version
Microsoft Internet Explorer	9.0 or higher
Mozilla Firefox	26.0 or higher
Chrome	31.0 or higher
Safari	6.1 (mac) or higher

Table 4. Recommended Encoder Players

Player †	Vendor	Notes
QuickTime 7.0	Apple	If not installed, download application from Apple Website.
VLC 1.0.1	VideoLAN	Not fully tested or supported by Vbrick.

† Use version shown or higher.

Table 5. Recommended Desktop Requirements

- Ethernet LAN with Multicast IGMP Version 2
- Windows XP (SP3), Vista, Windows 7, Windows 8
- Mac OS X 10.3 (Power PC)
- Mac OS X 10.4 (Intel-based PC)
- 750 MHz Pentium III processor (Windows)
- 128 MB RAM
- SVGA video card 640x480, 256 colors or better
- Windows or Macintosh-compatible sound device
- Minimum 5 MB hard disk space for installation
- Microsoft DirectX Media 8.1 or higher
- Microsoft Windows Media Player 9.0 (Windows XP), 11 (Vista, Windows 7)
  - Note: Windows Media Player will play streams from the 9000 if both H.264 codec (for video) and AAC codec (for audio) are installed. Currently, Vbrick does not provide this codec.
- Vbrick StreamPlayer 5.2 or Apple QuickTime 7.0
- Vbrick VBDirectory 5.4

Quick Start Installation

The following topics explain how to quickly set up and configure the Vbrick 9000 Encoder. The information here is also contained and is interchangeable with the *Quick Start Guide* that comes packaged with the encoder. Either may be used.

Before proceeding, open the box and inspect the components. Each shipment comes with the components in the table below.

Vbrick 9000 Encoder	Number
Vbrick 9000 Encoder	1 per order
Quick Start Guide	1 per order
Power supply and cable	1 per encoder
Serial cable and adapter	1 per encoder
Ethernet cable	1 per encoder
HDMI cable and adapters	1 per channel
A/V breakout cables	1 per slot

The encoder is shipped with all appropriate cables and connectors. The encoder(s) you purchased may vary slightly from the illustration(s) depicted below but the basic elements are common to all encoders regardless.

Figure 1. Quad Channel Encoder (no SDI)

Figure 2. Dual Channel Encoder (with SDI)

Part	Description
HDMI	High Definition Multimedia Interface that transmits uncompressed digital data.

Part	Description
A/V	Attach Vbrick "breakout" cable with color-coded (Y, Pb, Pr) component connectors.
SDI	Serial Data Interface typically used for broadcast-grade streaming video.
Power In 24 VDC	Power input. LED illuminates when power is applied.
Ethernet	RJ-45 connector. Connect to the network.
COM1/COM2	• COM1 is used with HyperTerminal for encoder configuration. • COM2 is used for Serial Port Passthrough or KLV metadata.
USB	Use to attach an external storage device.

Environmental Considerations for Encoder Installation

Airflow and ventilation are primary concerns when considering where to install an encoder. Each encoder has slots and openings to guard against overheating and guarantee reliable performance.

Keep in mind the following:

- Never block encoder slots or openings or cover them when placing it in a cabinet, rack, or shelf.
- Never place an encoder inside a built-in enclosure such as a bookcase; unless proper ventilation and airflow is available.
- In all cases, the encoder must be separated from other products by at least two inches on each side and at least four inches above and below in order to provide maximum airflow and circulation.
- The encoder should never be placed on top or near any heat-radiating product or equipment.
- The encoder should not be used near water sources or high-humidity areas. Side ventilation provides the best air circulation. There are vents on each side of the encoder and a fan that provides circulation.
- If encoders are rack-mounted in a cabinet and air flow is blocked, you may need to provide a vent hole or a notch on the side of the rack that is roughly equal in size to the vents on the encoder.
- You need to make sure there is at least two inches of space between the encoder and the edge of the rack if it is rack-mounted.

> **Note:** If you are mounting the device on a wall or ceiling, the best option is an open shelf or an open mount. Poor ventilation can affect performance and may cause the encoder to fail prematurely.

Mounting Best Practices for Encoder Installation

In general, encoders are designed for rooms that are comfortable for humans (approx. 70°F or 21°C) with adequate airflow and ventilation as noted. Wall mounting will typically block the side vents and is not recommended. Mounting above a drop ceiling is also discouraged. Ceiling spaces have little protection against heat, cold, dust, etc.

Some common practices to avoid include:

- Attempts to "hide" encoders in enclosed areas.
- Closed cabinets with poor air circulation or no air circulation.
- Encoders mounted too close to other heat sources or other electrical devices.

Quick Start Installation Steps

Use the topics listed below, in the order shown, to quickly set up your encoder. This information may also be found on the *Quick Start Guide* that is provided with your encoder.

Step 1: Connect Audio and Video Connectors

The audio and video connectors allow the encoder to receive audio and/or video from an input source such as a video camera or a DVD player. (If you have a rack mount shelf, be sure to install any encoder blades before performing this step. See: Install Blade Encoders)

1. Connect the video. On the back panel, connect one end of the Vbrick-provided "breakout" cable to the Micro-D15 A/V connector in Slot 1.
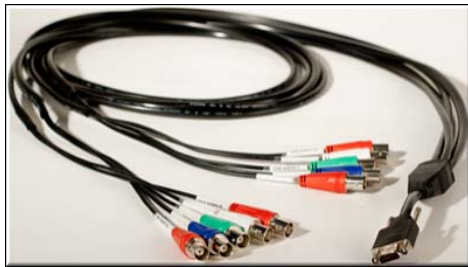
2. Connect the Channel 1 component video cables. Using the labeled component connectors on the other end of the cable, connect the three "channel 1" component video cables (YPbPr) to the three source video connectors on your video camera or DVD player.

> **Note:** There are two channels on each breakout cable for a maximum of four video channels. For quick start purposes, you only need to connect one set of three component connectors.

3. Connect the audio. Connect the "channel 1" (left and right) audio cables on the breakout cable to the source audio connectors.

> **Note:** The previous steps explain how to setup a 9000 Series encoder or a blade using "component" connections. If you will be using the Vbrick-provided HDMI (or SDI) cable, you will need to change the **How is Video Connected** parameter in the VBAdmin management application (**Encoder Configuration** > Video) *after* connecting to the network.

Step 2: Connect to the IP Network

Step 3: Power-on the Encoder

Step 4: Find or Set an IP Address

Step 5: Verify Streaming Video and Audio

Step 2: Connect to the IP Network

Use the provided Ethernet cable to connect the encoder to your IP network.

1. Plug one end of the Ethernet cable into the Ethernet port (to the left of the COM ports) on the encoder.
2. Plug the other end of the Ethernet cable into a network port or switch.

Step 3: Power-on the Encoder

Attach the provided power cable to the encoder or rack mount shelf (which has two cables) and to an appropriate AC power source(s) as explained below. When powered-on, the encoder will automatically run a power-on self-test sequence.

1. For standalone encoders, insert the power connector that comes with the encoder into the 24 VDC power receptacle in the lower left corner of the back panel.
2. For a rack mount shelf, insert the two power connectors into the dual power supplies on the back panel.
3. Connect the other power connector end(s) to a conventional 110/220 VAC power source.
4. *Wait until the encoder or blade completes the boot sequence before continuing.* This may take 1–3 minutes and the unit will self-test while displaying status messages on the optional LCD display on the front panel.
5. The encoder will then search for a DHCP server and display the IP address on the LCD panel (if present). If this process completes successfully, note the IP address and skip to step five. See: Step 5: Verify Streaming Video and Audio.
6. If you do *not* have an LCD display, and/or your network is *not* DHCP-enabled, you will need to connect an ASCII terminal to the serial port to find or set the IP address. This is explained in step four. See: Step 4: Find or Set an IP Address.

Step 4: Find or Set an IP Address

All encoders are configured by default with DHCP enabled. This means that when you power on the encoder, if a DHCP server is present on your network, the encoder will automatically obtain its IP Address and Subnet mask from the DHCP server. If the encoder cannot find a DHCP server, you will need to set a static IP address manually using the serial (COM) port. Similarly, if your network requires a Gateway IP Address, and this is not provided by the DHCP server, you will also need to enter this address manually.

▼ To Find or set an IP address manually using the serial port:

1. Connect an ASCII terminal from the RJ-45 serial port (COM1) on the encoder to the COM port of the computer or terminal device (usually COM1), using the provided serial cable.

2. From the Windows Start menu, go to: Start > All Programs > Accessories > Communications > HyperTerminal and press Enter to display the login prompt. Configure the Port Settings for 9600 baud, 8 Data bits, no Parity, 1 Stop bit (8N1).

3. Login to the encoder using "admin" (case-sensitive) for both User Name and Password.

4. When the Command Line Interface is displayed, type **nt** to display the Ethernet Network Options. This will let you set IP Address, Subnet Mask, and other options.

5. When finished, type **apply** and press **Enter** to save your changes.

Step 1: Connect Audio and Video Connectors

Step 2: Connect to the IP Network

Step 3: Power-on the Encoder

Step 5: Verify Streaming Video and Audio

Install Blade Encoders

Step 5: Verify Streaming Video and Audio

The last step is to verify the encoder is running properly and streaming audio and video. Assuming you connected a video source in step one, you can use the VBAdmin management application or a Vbrick StreamPlayer to verify that video is streaming from the encoder.

▼ To Verify Operation with VBAdmin (Windows or Macintosh)

You can verify operation on Windows or Macintosh desktops by playing the stream directly from the encoder using the VBAdmin management application. This method requires the Apple QuickTime plugin.

1. Open a browser and launch VBAdmin with the encoder IP Address (step 3 or step 4) in the following format:

    `http://<encoder_ip_address>`

    Then login with **admin** as both the username and password credentials.

    > **Note:** These steps assume that the video source you connected in step 1 is streaming at 1080i/60. If not streaming at 1080i/60, go to the **Encoder Configuration** > Video page in VBAdmin and set **Video Format** to match your actual video source.

2. Navigate to **Encoder Configuration** > Servers > **Edit** button. Then click **"Click Here to Play Stream."** This will launch the stream using the QuickTime plugin. QuickTime 7.0 or higher is required. If QuickTime is not installed, you will be prompted to download it from Apple.

    > **Note:** If you have streaming problems with Quicktime 7.0, go to Edit > Preferences > QuickTime Preferences > Advanced > Video > DirectX and uncheck "Enable Direct3D video acceleration."

▼ To Verify Operation with StreamPlayer (Windows only):

You can verify operation on Windows desktops by playing the stream directly from the encoder with StreamPlayer 5.3. Vbrick's StreamPlayer application lets you receive and play streaming video originating from the encoder on a PC. You can download and install StreamPlayer 5.3 from the Vbrick Support Services Downloads Website. Once StreamPlayer is installed:

1. Launch the StreamPlayer application. Go to Start > All Programs > Vbrick > StreamPlayer.

2. In the IP Address field (near bottom of player) type the following text and press Enter:

    `vbrtsp://<encoder_ip_address>/vbstream1s1`

    (type **vbstream1s2...1s3...1s4** to test other channels)

3. This will launch the stream in your configured media player. If you hear audio and see video, you are successfully streaming from the Vbrick encoder to your local PC.

Step 1: Connect Audio and Video Connectors

Step 2: Connect to the IP Network

Step 3: Power-on the Encoder

Step 4: Find or Set an IP Address

Install Blade Encoders

Install Blade Encoders

The Vbrick 9000 Encoder Rack Mount Shelf is a customized enclosure for Vbrick 9000 blades that lets you mix and match 7000 encoder blades and 9000 encoder blades on the same shelf. It provides common redundant power sources and common cooling, and supports up to 11 H.264 blade encoders. In general, the blades are fully-functional encoders housed within a shelf rather than as standalone encoders. Each blade is configured independently of the others and has its own network connection and IP address. If you purchased blades with your order they will be packaged separately and not installed in the shelf prior to shipment. Like the encoder, each blade is configured by default for DHCP. Each blade is connected and configured in the same manner as a standalone encoder. If you have a rack mount shelf, the first thing you will need to do is install the blades.

▼ To install the blades:

1. Find the anti-static wrist strap that was shipped with your order and attach the banana pin to the receptacle in the upper right corner of the shelf.
2. Unpack and inspect each blade. Remove and save as many blank filler panels as necessary.
3. Install blades from left to right beginning in Slot 1. Be sure each blade is properly seated in its guides before connecting to the backplane. (The Slot 1 blade will report backplane data to VBAdmin if service is ever required.)
4. Each encoder slot has top and bottom card guides. *Work carefully and be sure the encoder card is properly seated in the guides before connecting to the backplane.*
5. When properly seated, hand-tighten top and bottom spring-loaded screws.
6. Repeat for each blade and then proceed to standard quick start steps, beginning with step one (See: Step 1: Connect Audio and Video Connectors).

> **Note:** Before installing blades, you may want to install ground screws (not included) in the unpainted area on each side of enclosure. Use #10-32 machine screws to attach earth ground. When rack-mounting, you can also adjust the mounting ears on each side of the unit if necessary.
> See: Rack Mount Shelf and Blade Setup

This completes the initial installation and verification. If you can stream and hear video and audio you are ready to configure your encoder for the real-world streaming video requirements at your site.

The next step is to review the Vbrick Encoder v4.8 Admin Guide. This document explains all of the possible video and audio configuration options you are likely to use.

Step 1: Connect Audio and Video Connectors

Step 2: Connect to the IP Network

Step 3: Power-on the Encoder

Step 4: Find or Set an IP Address

Step 5: Verify Streaming Video and Audio

Front Panel LCD Display Messages

The encoder (and blade) has a read-only 2 line x 20 character LCD screen for informational messages about the encoder and its configuration. When first powered on, it runs through a power on self-test sequence during which a series of messages are displayed. During normal operation (when the self tests are complete) the encoder will cycle through a series of messages as outlined in Table 1 below. As noted, the display is read-only and cannot be used to set configuration parameters. The first two messages are user-configurable and can be modified on the **System Configuration** > General page in VBAdmin. The backlight color of the LCD display will alert you to configuration errors or warnings.

```
Vbrick Systems
Release: x.x.x
```
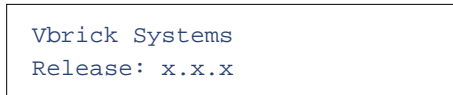
Figure 1. Front Panel LCD (with Default Data)

Table 1 shows the sequence of messages displayed on the LCD panel. Note that on encoder-only models, you will see messages relevant to the encoder. On decoder-only models you will see those relevant to the decoder. On combination models you will see messages for the encoder followed by messages for the decoder. The LCD display scrolls at the rate of one new message every three seconds.

> **Tip:** The first two messages in the front panel display are user-configurable and can be modified (or hidden) on the System Configuration > General page in VBAdmin. See the Front Panel Settings topic for details.

Table 1. LCD Message Sequence

Sequence	Message	Description

1	`Vbrick Systems`
	`Release x.x.x`
	`IP xxx.xxx.xxx.xxx`
	`Host Name/MAC Address`
		Basic information (including user description, IP address, host name/MAC address) is enabled by default and always present unless disabled in VBAdmin.

2	`Edit Mode`	An Edit message is displayed when an Edit session is in progress.
3	`Limited Run Mode` `Video Input Problems`	Warning messages are displayed if present.

4	`Program x (1-4)`
	`    Multicast`
	`    Unicast`
	`    Served`
		Encoder messages are displayed if an encoder is present. They show program information for each configured transmitter and server.

5	`RX x Connected`
	`Program Name`
	`Output Format/Frame Rate`
		Decoder messages are displayed if a decoder is present. They show receiver connected, program name, and output format/frame rate.

6	`POST Errors`	Error messages, if present, are shown last.

Table 2. Backlight Color Definitions

State	Backlight
Normal	Light Blue

State	Backlight
Error	Red
Warning	Yellow

Chapter 3

Rack Mount Shelf and Blade Setup

Rack Mount Shelf Overview

The Vbrick 9000 Encoder Rack Mount Shelf is a customized enclosure for Vbrick blades. It lets you mix and match 7000 encoder blades and 9000 encoder blades on the same shelf. It provides a common redundant power source/common cooling and supports 11 Vbrick 9000 encoder blade encoders in a standard 19 inch rack.

It has hot-swappable, redundant AC input power supplies and LED and audible failure alarms. It also has a common, hot swappable cooling unit and a replaceable air filter. The chassis for a rack mount shelf has a removable cable management panel (not shown) and card rails that make it easy to insert or remove individual blade encoders.

Figure 1. Vbrick 9000 Encoder Rack Mount Shelf

Vbrick 9000 Blades

In general, the Vbrick 9000 Blades are fully-functional encoders and decoders housed within a rack mount shelf rather than as standalone encoders. Each blade is configured independently of the others and has its own network connection and IP address.

The blades can have Standard Definition connectors or Standard and High Definition connectors (depicted in the image below). In most respects, the blade models operate in the same manner as the 1RU Industrial models without a front panel but there are some important exceptions:

- The blade has a scrolling 8x1 character mini LCD on the face plate.
- The blade displays their shelf slot position (1–11) in the VBAdmin management program.
- The blade in Slot 1 will read and display shelf manufacturing data from an EEprom on the backplane.

Figure 1. Vbrick 9000 Blade

Table 1. Rack Mount Shelf Specifications

Specification	Description
Dimensions	• 8U height • 19 in. EIA rack mount
Fan Tray Unit	• Slides out for easy replacement • Hot swappable • Visual LED failure indicator
Air Flow	• Intake – front bottom • Output – rear top
Encoder Blades	1–11 Vbrick 9000 encoder blades.
Power Supplies	• Redundant AC Input • Hot-swappable • Visual LED failure indicator and audible alarm
Cable Panel	Removable cable management panel allows for easy routing and management of cables (video, audio, Ethernet, etc.).
Environmental	• Standard operating temperature: 5° to 40° C • Storage temperature: -45° to 85° C • FCC Part 15 Class A, CE, UL • EIA Compliant • RoHS Compliant

Blade LCD Display

Each blade has an 8x1 character, mini LCD on the faceplate panel that displays eight characters at a time and scrolls through informational messages. During boot and POST processing, the LCD will display appropriate messages. Once the encoder is running normally, the encoder will cycle through the IP address and various other messages for five seconds each.

Table 1. Mini LCD Color and Messages

Color	Message	Description
Green	`Release x.x.x.x` `IP:xxx.xx.xxx.x`	Blade is good.
Yellow	`Warning`	Blade in warning mode. This can include a DHCP failure, a video input problem, a temperature problem, or an encoder in limited run mode.
Red	`Failure`	Blade in failure mode. This can include a POST failure, a hardware failure, or a hardware mismatch.

Vbrick 9000 Blade Installation

Unpack and Inspect

Before proceeding, open the box and inspect the components. Each shipment comes with the components shown in the table below. If anything is missing or damaged, contact Vbrick or your reseller at once. Otherwise, install the shelf in a standard 19 in. EIA rack mount chassis.

> **Tip:** Since the encoder blades are removed from the front, Vbrick rack mount units can be mounted back-to-back (on the same shelf) without consuming additional vertical rack space. This effectively doubles the density in installations where rack space is an issue.

Vbrick 9000 Encoder Blade †	Number
9000 encoder blades	1–11 per shelf
Quick Start Guide	1 per order
Anti-static wrist strap	1 per order
Serial cable and adapter	1 per order
Ethernet cable	1 per blade
HDMI cable and adapters	1 per channel
A/V breakout cables	1 per slot

† The 9000 rack mount shelf must be purchased separately. It includes a cable management panel and 2 AC power supply cords.

Install the Blades

Note that if you purchased blades with your order they will be packaged separately and not installed in the rack mount shelf prior to shipment. Each blade is configured by default for DHCP.

Keep in mind:

• Blade encoders are set up and connected in the same manner as a standalone encoder (See: Quick Start Installation Steps).

- The only difference is that, if necessary, you must use the serial port to set a static IP address since there is no front panel. (See: Step 4: Find or Set an IP Address for details.)

Use the provided anti-static wrist strap by attaching the banana pin to receptacle in upper right corner of the shelf. Ten blank filler panels are included. If you remove a blade, be sure to install a filler panel to maintain proper air flow.

Before installing blades, be sure to read the Blade Safety Precautions.

Install Blade Encoders

Software Configuration

All blades are independently configurable using the IP address and the VBAdmin management program. In all respects, blade software configuration is identical to encoder software configuration. See the Vbrick Encoder v4.8 Admin Guide for details about all configurable parameters.

To identify the blade by slot number, launch VBAdmin, go to the Monitor > System page, and note the **Slot ID** (see below). The blades are numbered 1–11 from left to right. If service is ever required, scroll down to the **Add-on Boards** table (Slot 1 only) for manufacturing data associated with the backplane.

Monitor --> System

System Information

System Model	MP 1.1 Quad MisMatch
Hardware Revision	261 - 0
Boot Revision	2.00 - 03/14/12 12:36
Application Code Revision	1.0.0 - 03/15/12 16:31
Current Operational Mode	Run
Temperature	34°C
Fan Status	On
Slot ID	7
Overloaded Count	0
CPU Utilization (%)	12, 0, 7, 100, 18
System Up Time	06:47:06
Total System Up Time	00:009 09:43 (yr:day hr:min)
System Date & Time	3/28/2012 15:20

Manufacturing Information

User Information Version	User Info 1.0
Part Numbers	
Enclosure	9304-0000-0000
Slot 1	9310-4312-0000
Slot 2	9310-4312-0000
Aux	9300-0000-0000
Combined	9314-1212-0000
System Serial Number	91031200015
Customer Class	
Manufacturing Date	20120307

Shelf Maintenance

Power Supplies

The Rack Mount Shelf has dual, hot-swappable AC input power supplies (seen in the image below) with LEDs that will indicate a failure. As explained below in Table 2, each individual power supply has an LED that will illuminate red if there is a failure. There is also a master LED that shows the combined state of both power supplies. Any power supply failure will be accompanied by an audible alarm which can be silenced by pressing the button.

If a power supply fails, contact Vbrick for a replacement as soon as possible. Do not attempt to repair a power supply as this will invalidate the warranty. *Although the shelf will operate with a failed power supply, a redundant power supply will ensure there is no downtime.* Each supply can handle a full load of 500W if the other supply has failed or been turned off. There will be no loss of service time if only one supply fails. If both are active, they will load share (50/50) to support the rack.

Table 1. AC Input Voltage and Frequency (iStarUSA Model IS-500R8P)

Parameter	Minimum	Nominal	Maximum	Max. Current
Voltage (115V)	90 VAC	100–120 VAC	132 VAC	8A
Voltage (230V)	180 VAC	200–24 VAC	264 VAC	4A
Frequency	47 Hz	50/60 Hz	63 Hz	

Table 2. Power Supply LEDs and Controls

Item	Color	Description
Individual Power Supply LED	Green	Power supply is good.
	Red	The power supply has been turned off or has failed.
Master Power Supply LED †	Green	Both power supplies are operating normally.
	Red	One or both of the power supplies has been turned off or has failed.
Alarm Button ††	Press to silence alarm.	

†   Located above both power supplies on the right.

††   Located above both power supplies on the left.

If a power supply fails, the LED will turn red and an alarm will sound. Push the alarm reset button (the small black bubble button to the left of the left power cord receptacle) to silence the alarm.

▼   To remove/replace the power supply:

1. Turn off power to the power supply with switch at bottom and unplug power cord.
2. Pull unit out with handle while pressing the red release lever.
3. When replacing a power supply, push in firmly to seat firmly in backplane.

Figure 1. Dual Power Supplies

Fan Tray

The shelf has a common fan tray with four fans and a replaceable air filter. There are no user-serviceable components in the fan tray. If an individual fan fails, you must replace the entire unit or you will invalidate the shelf warranty. Contact Vbrick for a replacement fan tray as soon as possible. The **Status** LED will turn red if any of the fans has failed. *To avoid damaging the blades, do not run the shelf if more than one fan has failed.* When you pull out the fan tray, you can see the fans slowly spinning down. Any fan <u>not</u> spinning down has likely failed.

Table 1. Fan Tray LEDs

Color	Description
Green	Fan tray is good.
Red	The fan tray has failed and should be replaced as soon as possible. *Do not run the shelf if more than one fan has failed or the tray been removed.*

▼   To remove/replace the fan tray:

1.   Loosen the screws on each side of unit.

2.   Press the **REQ** (Request) button. This will power down the fan tray. The status LED will go from green to red and the **OK** LED will illuminate blue.

3.   Remove the tray and determine how many fans have failed (see above). Do not run the shelf if more than one fan has failed.

4.   Contact Vbrick for a replacement fan tray as soon as possible.

5.   When powering down the fan tray to install a replacement, work quickly to avoid overheating the blades.

Figure 1. Fan Tray Controls and Indicators

Air Filter

The air intake unit at the bottom of the enclosure has a replaceable filter element. Inspect and replace the filter element every 90 days—more often in challenging environments. For best results, use replacement filters from Vbrick. You need not power off the shelf to replace the filter element.

▼   To remove/replace the filter element:

1.   Loosen the screws on each side and remove the entire unit.

2.   Replace the filter with a Vbrick-supplied replacement element.

Blade Safety Precautions

Use common sense when installing the blade server. Do not expose the unit to direct sunlight, high humidity or wet conditions. Do not block the air vents or impede the airflow in any way. Before you rack mount the blade server, please take a moment to read the following important safety precautions.

Restricted Location. Because of hazardous energy circuits on the backplane that are exposed when the fan tray or the blades are removed, this equipment must be installed in a restricted location with limited access for authorized users who are familiar with the electrical hazards and required safety precautions. It should not be used in a home, school, or other area accessible to the public. To be installed only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-26, 110-27 or the National Electric Code ANSI/NFPA70, or per the applicable code in the country of installation.

Operating Temperature. If installed in a closed or multi-unit rack, the operating ambient temperature may be greater than the room ambient. Install the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow. Do not restrict air flow in any way. Rack mount the equipment so that the amount of air flow required for safe operation is not compromised.

Mechanical Loading. Avoid uneven mechanical loading. When rack-mounting the equipment, be sure that the devices are evenly balanced.

Circuit Overloading. Do not overload the supply circuits. Be aware of the effect that overloading the circuits can have on overcurrent protection and supply wiring. Refer to the equipment nameplate ratings for details.

Reliable Earthing. The rack-mounted equipment must be reliably earthed. This particularly applies to power strips and other indirect connections to the branch circuit.

Replaceable Battery. Do not attempt to replace the battery since it may explode if replaced incorrectly. Return to Vbrick Support Services for replacement with the same or equivalent type of battery. Vbrick will dispose of used batteries in accordance with manufacturer recommendations.

Management Tools

Overview

The VBAdmin configuration tool is an intuitive GUI-based management tool and Vbrick recommends using VBAdmin as the primary means of managing Vbrick encoders. The table below details the tools available that may be used to manage an encoder.

Management Tool	Description
VBAdmin	The VBAdmin management interface allows quick and secure control through the encoder's IP interface. See Using VBAdmin topics.
VBDirectory	The Vbrick Support Downloads site contains VBDirectory, an application that facilitates finding, accessing, and upgrading all encoders on a network.
Command Line Interface	The Command Line Interface provides management through the encoder's COM port. See the Connect through the COM Port with HyperTerminal or Connect with Telnet or SSH topics.
SNMP	SNMP commands through encoder's IP interface, including SNMP Traps.
Web Services	You can set any configuration parameter in the MIB using an industry-standard Web Service.
Auto Configuration	See **System Configuration** > Manage Configuration in the Vbrick Encoder v4.8 Admin Guide.

> **Note:** There is only one active editing session allowed at any time in a single encoder. In VBAdmin 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 best results, click **Finish Edit** before you exit the VBAdmin page. Note that Telnet, CLI and SNMP automatically log you out when you exit the program.

VBAdmin

The encoder has an embedded Web server that lets you manage the configuration from an external browser. This allows network managers to remotely configure and monitor the encoders from virtually anywhere in the world. VBAdmin is compatible with Internet Explorer and Firefox (other browsers may not give acceptable results). For best results, Vbrick Systems recommends Internet Explorer or Firefox.

Connect to VBAdmin by pointing to the IP Address (e.g. **http://172.17.5.5**) of the encoder and logging in. VBAdmin is one of several ways to manage an encoder. There are other methods

but VBAdmin's graphical user interface is the easiest to use. VBAdmin is described in detail in VBAdmin topics.

VBDirectory

A management application called VBDirectory provides quick reference and access to all Vbrick encoders on a network. VBDirectory v4.4 or higher is compatible with encoders. VBDirectory is automatically installed with a software upgrade and is also available on the Vbrick Support Downloads site.

The *VBDirectory User Guide* is also included on the Vbrick Documentation site.
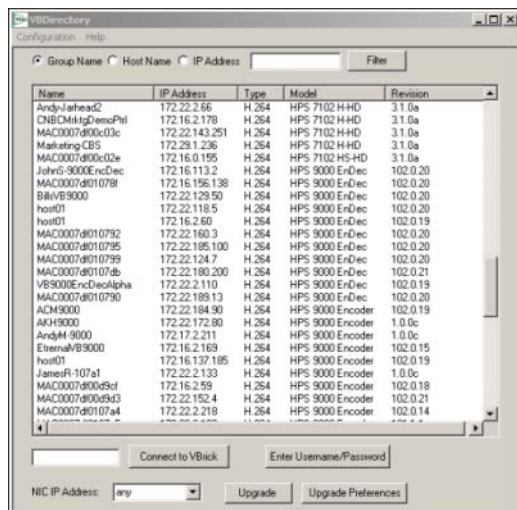
Command Line Interface

Vbrick encoders can be configured using a standard ASCII terminal or terminal emulator program connected to the serial port (**COM 1**) on the rear of the encoder. The MIB-based CLI can be used to access *all* Vbrick parameters. (Keep in mind that all parameters that are available in the MIB-based CLI are also available in the Web-based VBAdmin application. Always use VBAdmin unless you have a compelling reason to use the command line.)

```
!#
!#########
!##############
!#####          ############
!####                       ############
!##                              ####
!##    \\       __              ###
!##     \\    \//  ||   /-- **     ||
!##      \\   //\\  ||  //--       ||
!##       \\_//  \\ || //          ||
!##        \//    \\||//           ||
!##                 ||             ###
!##                               ####
!####                       ############
!#####          ############
!##############
!#########
!#

JBrick#
 BE                    - Begin edit session
 EE                    - End edit session
 ERRORS                - Show configuration errors
 GVAR                  - Get parameter
 NT                    - Ethernet Network Configuration
 QUIT                  - Logoff the CLI session
 RESET                 - System reset
 SAVE                  - Save configuration
 SD                    - Set defaults
 SFD                   - Set factory defaults
 SVAR                  - Set parameter
 WAIT                  - Delay for specified time
JBrick#
```

You can use HyperTerminal or the industry-standard Telnet to manage the Command Line Interface (CLI). 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). The Telnet and HyperTerminal applications are both referred to as CLI or Command Line Interface. For more information see Command Line Interface topics.

SNMP

The Vbrick encoder can also be configured and managed through its MIB which is available on the Vbrick Support Downloads site. Various SNMP (Simple Network Management Protocol) management tools are available to issue SNMP based commands to the encoder. 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 encoder. Note that the SNMP community strings are the usernames. The image below shows a typical, freeware MIB browser.

Web Services

For customers who want to build custom applications, the Vbrick 9000 Encoder SDK provides a standards-based SOAP architecture to programmatically interface to the encoder. It includes detailed documentation that explains how to configure and control encoders via command line scripts. The SDK is sold separately and is not bundled with other Vbrick products. Contact a Vbrick sales representative or your certified Vbrick reseller to purchase the SDK.

Auto Configuration

Auto Configuration lets you perform a configuration via a URL script file. It is typically used for remote configuration and troubleshooting or to configure Vbrick encoders that are behind a firewall. To configure a parameter on an encoder (or more likely a set of parameters) you simply point the URL to a server with an .xml configuration file. This is useful, for example, to change a transmitter destination address, set the audio and video rates, and so forth when the encoders are behind a firewall and cannot be accessed remotely.

See System Configuration > Manage Configuration in the <u>Vbrick Encoder v4.8 Admin Guide</u> for complete details.

Auto Configuration	
URL	
Poll Rate (minutes)	0
Auto Config Status	Script Never Run
Script Control	Run Script

Software Upgrade

> **Note**: When you purchased your encoder from Vbrick, it was shipped with the latest software already installed and no additional software installation is necessary. If you ever need to reinstall the software, you can get it from the Downloads page on the Vbrick Website.
>
> *Use the software upgrade instructions in the following topics only when upgrading the software.*

Vbrick encoders are shipped with PC applications that allow for easy upgrade. Once the release is installed, the upgrade tools become available in the Vbrick program group, located under Start > All Programs > Vbrick. 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 encoder's flash memory (TCP/IP FTP transport services are used for this). Using VBDirectory is an easier method since it lets you choose the encoders by name instead of IP address. When Vbrick encoders are not accessible to VBDirectory, the VBDownload application must be used. Also keep in mind the following considerations:

- All saved configuration parameters are saved when you upgrade your encoder and there is no need to reconfigure the unit after an upgrade. The upgrade process requires a unit reset, so be sure to save your configuration prior to the upgrade.
- Part of the install process occurs during the first reboot after the upgrade. Do not power off the unit during this time. The process may take 5 minutes and include an automatic reboot of the unit. The encoder is ready for operation when you are able to login via VBAdmin or CLI.
- Vbrick strongly recommends against loading a earlier version of code. As a general rule, never downgrade a unit to a code version older than what was originally installed at the factory. If you do load an earlier version of code, reset all parameters to the factory defaults and remove the external USB drive (if present) before the downgrade.
- 3.x or higher builds cannot be loaded on units that are running 1.0.x software. The workaround is to download 2.0.x first and allow it to come up then download 3.x.x. VBdownload will warn if this download is attempted. If you load 3.x over 1.0.x, the encoder will become inoperable and will have to be returned to Vbrick.

Install a Software Upgrade

▼ To upgrade an encoder:

1. Double-click on the release executable (**SetupVB9000_x_x_x.exe**) to install the release on your PC. It is recommended that you accept the default destination folder which is:

   `Program Files\Vbrick\VB9000\download\ReleaseVx_x_x.`

2. The setup programs for VBDownload and VBDirectory will automatically run after the files have been extracted. Click **Next**, follow the instructions, and use the default folders if possible.

3. When the **Maintenance Complete** page is displayed, click **Finish**.

4. Go to **Start > All Programs > Vbrick > VBDirectory** to start the management utility. The VBDirectory program will show all Vbrick encoders available for upgrade.
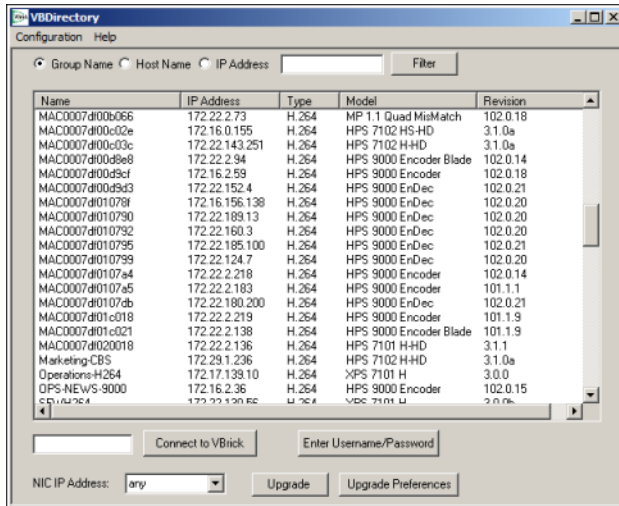
5. Select the device to be updated by highlighting the name and then click the **Upgrade** button. (If the user name and password are not set, a dialog box will appear and you will need to configure the encoders's username and password (default for both = **admin**).

6. In the VBDownload window, if you installed the release to the default directory, that directory will be auto-selected in the **Revision Folder**. If not, **Browse** to the directory that contains the unzipped files from the release package.

7. Select a **Revision** and click **OK** to start the download. Since the default mode of VBDownload is **Intelligent Download** the utility will query the Vbrick to determine which release components need to be downloaded. When prompted, press **OK** to allow VBDownload to upgrade the suggested components. This may take several minutes.

8. When the download completes, reboot the encoder using the **Reset Unit** radio button and follow the prompts.

9. Note that part of the upgrade takes place during the first boot after the download and may take up to 5 minutes. The upgrade is complete when you can login via VBAdmin or CLI, or when its name is refreshed in VBDirectory.

10. When done close the window or click **Exit**.

> **Tip:** To verify the download has successfully installed, check the **Application Code Revision** field on the VBAdmin "Welcome" page.

Configure VBDownload Folders

The VBDownload application is used to upgrade Vbrick encoders. When you click on the setup executable, the application files are automatically installed in **Program Files\Vbrick\Vbrick 9000**.

If you have a mixture of 6000, 7000, and 9000 devices present, the application will default to the **Vbrick 9000** folder. Experienced Vbrick users can modify this default behavior by creating a new shortcut for VBDownload that uses **VB6000** as the default folder.

▼   To configure the VB6000 folder as the default folder:

1.   Go to Start > All Programs > Vbrick.

2.   Highlight **VBDownload** then right-click and select **Create Shortcut**. Then highlight the new shortcut and select **Rename**.

3.   Enter a meaningful name, highlight it, then right-click and select **Properties**.

4.   In the **Target** field, append the following text, beginning with a space, to the existing path. (Note that question marks are required for any spaces in the path.)

    `-i "" -f C:\Program?Files\Vbrick\VB6000\Download\ReleaseVx_x_x`

5.   Replace **ReleaseVx_x_x** with the actual version number of the setup file and click **OK** when done.

VBAdmin
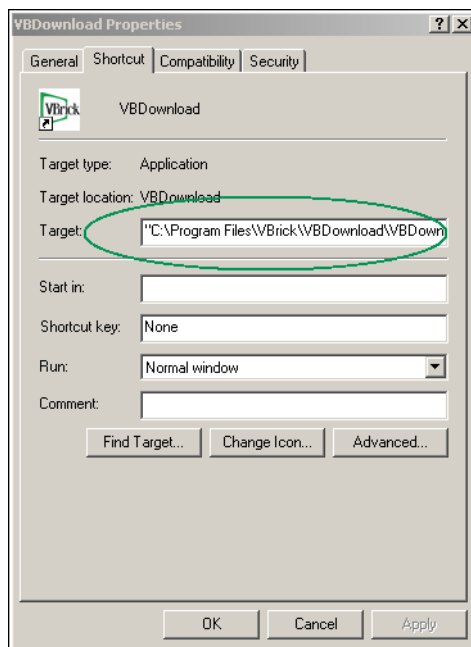
Using VBAdmin

The Vbrick encoder has an integrated management interface (VBAdmin) that lets you manage configuration from an external browser. This allows network managers to remotely configure and monitor the encoders from virtually anywhere. You can launch VBAdmin in Internet Explorer or Firefox (other browsers are not supported by Vbrick). Connect to VBAdmin by pointing to the IP Address (for example: **http://192.168.5.5**) of the Vbrick encoder and logging in. (Note that passwords passed between client and server are encrypted.) VBAdmin is one of several ways you can manage the Vbrick encoder (for example you can also use Telnet or the Command Line Interface) but VBAdmin is the easiest to use.

To login to an encoder with Microsoft Internet Explorer, 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 VBAdmin window automatically close when accessing a different Vbrick encoder, go to Tools > Internet Options > Advanced and *uncheck* the **Reuse windows for launching shortcuts**.

For details on using VBAdmin, see: Vbrick Encoder v4.8 Admin Guide

Command Line Interface

Although VBAdmin is the preferred management interface you can also access the encoder's configuration using the Command Line Interface (CLI). Some users prefer to use the command line.

Connection Modes

This topic explains how to access encoder parameters using the COM serial port or over an IP network. You can use HyperTerminal or ProComm with the serial port for example, or Telnet or PuTTY over an IP network.

To send input commands to an encoder, you can use ProComm, Telnet, scripts, cut-and-paste, or any program that supplies text-based input via the get and set commands.

Connect through the COM Port with HyperTerminal

▼   To access the encoder using HyperTerminal:

1. Connect the included cable (which provides a standard 9-pin serial connection) from the serial port on your computer to the encoder's **COM** RJ-45 connector.
2. Navigate to **Start > Programs > Accessories > Communication > HyperTerminal**.
3. Connect through your computer's COM Port (usually COM1) with the following settings.

Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

4. When you connect to a terminal, a prompt for login (username) and password will be displayed. Login and password are case sensitive (**admin**). Once logged in, the main menu will appear by typing a question mark (**?**) at the **vbrick>** prompt.

Connect with Telnet or SSH

Vbrick encoders can be managed remotely via industry-standard Telnet or an SSH client such as PuTTy. With Telnet, the same commands that are displayed on a local terminal are

instantly available over an IP network. Vbrick uses the standard Telnet port. See the CLI Shortcut Commands topic for a list of the commands that are available.

> **Note:** Telnet (as well as FTP, VBAdmin, SNMP, and front panel data) can be disabled on the encoder for security purposes. If you cannot login to the encoder via Telnet, check that the **External Telnet Server** is enabled. Open VBAdmin and go to **System Configuration > Advanced Configurations > Security**.

▼   To login using Telnet:

1. Navigate to **Start > Run** and type **telnet** to open a Telnet window.
2. Type **open <ip_address>** using the IP address of the Vbrick encoder. This will launch the Command Line Interface.
3. Enter the Login name and Password. Default is **admin** for both.
4. At the Vbrick prompt, type **?** to display the top-level commands.

Use the Management Information Base (MIB)

All encoder parameters are accessible through an industry-standard SNMP Management Information Base (MIB). The CLI is a syntactically simple interface which is suitable for scripting. The syntax for each parameter is documented in the SNMP MIB for the encoder.

▼   To find and set encoder parameters with the CLI:

1. Find the parameter you want to set or change. See Find Encoder Parameters.
2. Set the parameter using valid values obtained from the MIB. See Set Encoder Parameters.
3. Apply the changed value(s) using the **ApplySet** command for that group as specified in the MIB. See Apply Changes to Parameter Configuration Updates.
4. Optional. Save the configuration file. See Save Changes to Parameter Configuration Updates.

The **Get** and **Set** commands are shown in the following table. All CLI commands are shown in the Command Line Interface topics. You will need to login to the encoder and begin an Edit session before you can make any changes.

Once the parameters have been set to the correct values, you must do an **ApplySet**. If the response to any **ApplySet** does not match the value of the set, an error message is displayed. Use care when typing commands. *All commands and parameter names are case sensitive. All parameter names must be prefixed by "vbrick".*

Command	Response
GVAR vbrickMIBNAME	$!MIBNAME=value or $!ERROR=errorstring
SVAR vbrickMIBNAME=value	$!MIBNAME=value or $!ERROR=errorstring

Note: The serial port is also used by the Vbrick encoder to emit system messages. In order to allow the script writer to distinguish between direct responses to commands and other output, all CLI response messages have **$!** as leading characters. *Any responses that do not begin with these characters can be safely ignored.*

It is important to note that some commands also cause a reboot of the Vbrick. In order to notify the command initiator when this happens, the string **$!Rebooting** is emitted from the encoder. In this case the commanding entity must be prepared to wait before continuing the editing session. In practice, it is unlikely that any automated program will be tasked with initiating any tasks that will cause a spontaneous reboot.

Find Encoder Parameters

The best way to find a parameter name is by viewing the Configuration Log. Once you find the parameter name, you can check the MIB using a MIB browser to verify the definition and usage.

▼ To locate a parameter name using the Configuration Log:

1. Use VBAdmin to set or change a parameter and click **Apply**.
2. Navigate to Monitor > System Logs > Configuration Log and examine the log. You will see a configuration log message reporting the exact name of the parameter you just changed.
3. Verify the definition and usage of the parameter by examining the MIB file with either a standard MIB browser or a text editor.
4. You can use this parameter name in a script. Make sure you prefix the parameter name with **vbrick**, for example:

    vbrickProgramTransmitterName

The following example shows how the **Transmitter Name** in VBAdmin is associated with **vbrickProgramTransmitterName** in the MIB.

First find the **Transmitter Name** parameter name using the Configuration Log. Then open the appropriate MIB file (see MIB Files) in a MIB browser. The valid value for this variable is **DisplayString**. If the syntax calls for an integer, use a numeric value; if the syntax calls for a string, use an alpha value.

▼ To find the encoder parameter name and syntax:

1. Find and change the parameter in VBAdmin. Navigate to Encoder Configuration > Transmitters > Transmitter Name.

2. Navigate to Monitor > System Logs > Configuration Log and find the name of the parameter you just changed.

3. Open the appropriate MIB file in a MIB browser and view the syntax. Once you know the syntax, you can use the correct variable name and value on the Command Line.

MIB Files

The MIB files provide read-only access to all configurable encoder parameters and are organized as shown in the table below. To access any MIB variable, open the appropriate file in a MIB browser. The easiest way to visualize Vbrick's control structure is to understand the relationship between the VBAdmin and the MIB.

To get started, open a MIB file in a text editor or a MIB browser. For the most part, parameters are grouped according to where they appear on the VBAdmin pages. Once you find the parameter, other related parameters are usually contained in the same group. Each of the top-level groups comprises a page in VBAdmin. Note that valid values for the selected parameter are shown next to the **Syntax** column in the lower left area of the window in the MIB browser example above.

MIB	Description
vbrick_reg.mib	This file is used as a reference by the MIB browser.
vbrickEncoder.mib	Contains encoder parameters including video, audio, configuration, and status parameters.
vbrickProgram.mib	Contains transmitter, server, and SAP parameters.
vbrickSystem.mib	Contains IP address, network traps, auto-config, front panel configuration, etc.
vbrickDecoder.mib	Contains decoder parameters including receiver IP address, jitter queue settings, etc.

Set Encoder Parameters

Log In

The first step is to connect to the encoder using whatever method is appropriate at your site (e.g. Telnet, HyperTerminal, etc.). When logging in, you are prompted for a login name and password. These credentials give you access to the encoder and are typically provided by an administrator. When the **vbrick>** prompt is displayed, you are successfully logged in.

Regardless of whether you access the CLI through HyperTerminal (shipped with Windows) or Telnet, the command structure is the same. The CLI interface is launched as soon as you enter a valid Login name and Password. The table below describes the "shortcut" commands that are available using the **?** command. You can use these shortcuts at any time during an editing session.

CLI Shortcut Commands

The CLI shortcut commands are described below.

Login: <username>
Password: <password>
Vbrick#

Command	Description
BE	Begin edit session
DEBUG	Generate a debug file if requested by Vbrick Support Services.
EE	End edit session

Command	Description
ERRORS	Show configuration errors
GVAR	Get parameter
NT	Ethernet Network Configuration
QUIT	Logoff the CLI session
REBOOT	System reboot
SAVE	Save configuration
SD	Set defaults
SFD	Set factory defaults
SVAR	Set parameter
WAIT	Delay for specified time

Begin or End an Edit Session

To begin a CLI edit session, first login and then enter the first two commands shown below *using the same username you used to login to the encoder*. You only need to do this at the start of an Edit session or if someone has ended your Edit session. Also, you only need to begin an Edit session to *set* variable and table parameters—not to *get* parameters. You can *get* parameters without starting an Edit session. When your Edit session is done, and after you have applied or saved your changes, do an End Edit. You can also use the Begin Edit (**BE**) and End Edit (**EE**) shortcut commands shown in the CLI shortcut commands table. See: CLI Shortcut Commands).

▼ To begin an edit session:

```
Vbrick# SVAR vbrickEditName=
Vbrick# SVAR vbrickEditName=<admin>
```

▼ To end an edit session:

```
Vbrick# SVAR vbrickEditName=
```

Get or Set a Variable

Use the following format to get or set a variable. This command shows how to read the encoder's MAC address but is only an example. Use the actual parameter name and value as shown in the Find Encoder Parameters topic. *All parameter names must be prefixed by "vbrick"*.

```
Vbrick# gvar vbrickManufacturingInfoMacAddress
```

Valid system commands display a response in the following format:

```
$!vbrickManufacturingInfoMacAddress=00:07:df:01:07:8e
```

Invalid system commands display an error response in the following format:

```
$!ERROR=SNMP GET failure
```

> **Note:** Double quotes (" ") *may* be used for any strings but they *must* be used if the string contains spaces.
>
> For example, you can use the following syntax to create a blank space in the **ManagementSAPGroupName:**
> ```
> svar "vbrickManagementSapGroupName=Madrid Vbrick"
> ```

Get or Set a Table Variable

Table variables can be single-indexed where there is only one instance of a variable (for example an IP address) or double-indexed where there are multiple instances (for example TransmitterName).

As shown below, when viewing the Configuration Log, single-indexed table variables will be appended with **".n"**.

Double-indexed table variables will be appended with "**.n.m**"

Single Index Example

This example shows how to read and change the **Brightness** parameter on Channel 1.

```
Vbrick# gvar vbrickEncoderVideoCommonBrightness.1
$!vbrickEncoderVideoCommonBrightness.1=50
Vbrick# svar vbrickEncoderVideoCommonBrightness.1=75

$!vbrickEncoderVideoCommonBrightness=75
```

Double Index Example

This example shows how to read and change the Rate 1 **Resolution** parameter on Channel 1.

```
Vbrick# gvar vbrickEncoderVideoH264Resolution.1.1
$!vbrickEncoderVideoH264Resolution.1.1=15
Vbrick# svar vbrickEncoderVideoH264Resolution.1.1=2

$!vbrickEncoderVideoH264Resolution=2
```

Apply Changes to Parameter Configuration Updates

The **ApplySet** command is used to apply changes to configuration updates. There is one **ApplySet** command per program group in the MIB and the syntax varies slightly according to the group.

Use this command, for example **vbrickProgramTransmitterApplySet**, to actually apply the change(s) you made with a **SVAR** or a **STAB**. An **ApplySet** is always written in the following format with the trailing **=2**.

```
Vbrick# svar vbrickEncoderVideoCommonApplySet.1=2
```

It is important to note that some ApplySets can cause the encoder to send unsolicited messages. For example, the encoder may reboot with the following message:
```
$!Rebooting …
```

Save Changes to Parameter Configuration Updates

Once you are done, you must save to persistent storage if you want your edits saved in the configuration file. Unless you save the configuration, any changes you have made will be lost if the encoder reboots.

A save is always written in the following format with the trailing **=2**. Note that some changes to the configuration will reboot the encoder in which case you must wait for it to reset. Note that you can also use the **SAVE** command as a shortcut.

```
Vbrick> svar vbrickSysSaveConfiguration=2
```

Error Handling in the CLI

Programming errors, for example syntax errors, illegal values, and so forth display informational messages in the CLI; for example **$!ERROR=Value out of range**. Other system or network issues, for example a dropped connection or a failed save (see below) are shown in the System Log (VBAdmin > Monitor > System Logs > Configuration Log).

You can also see all configuration errors using the **ERRORS** command. Potential errors may be detected in advance by getting the value of various status parameters in the encoder. For example, if you are writing a script, you might want to check **Transmitter State** or **FTP Status** before you set parameters for a related task.

Reset the Encoder in the CLI

Use the following command (or the **RESET** shortcut) to reset the encoder. A reset is simply a reboot. It does not change or reset any configured parameters.

```
vbrick> svar vbrickSysReset=2
```

CLI Examples

The following examples show two common configuration tasks. Remember that you only need to begin an Edit session at the start of an Edit session or if someone has ended your Edit session. You only need to end an Edit session when you are done, and after you have applied or saved your changes. Also remember that an **ApplySet** command is always required and comments are not allowed on the same line as a command.

CLI Example 1

This example shows how to read and set the **Target Bit Rate** for the first video rate on Channel 2. User input commands are shown in bold text.

Vbrick# gvar vbrickEncoderVideoH264TargetBitRate.2.1

```
$!vbrickEncoderVideoH264TargetBitRate.2.1=750000
```

Then it sets and applies the **Target Bit Rate** to 800K.

Vbrick# svar vbrickEncoderVideoH264TargetBitRate.2.1=800000

```
$!vbrickEncoderVideoH264TargetBitRate=800000
```

Vbrick# svar vbrickEncoderVideoCommonApplySet.1=2

```
$!vbrickEncoderVideoCommonApplySet=2
```

CLI Example 2

This example shows how to set the unicast **Destination IP Address** and enable the transmitter for Program1 and Transmitter1.

```
Vbrick# svar vbrickProgramTransmitterInetAddrType.1=1
```

```
Vbrick# svar vbrickProgramTransmitterInetAddr.1=172.22.118.105
```

```
Vbrick# svar vbrickProgramTransmitterEnable.1=2
Vbrick# svar vbrickProgramTransmitterApplySet.1=2
```

CLI Scripting Syntax

- Script commands must start in column 1.
- **svar** (set variable) must precede the variable name.
- Wait time is defined milliseconds. A value of 1000 = 1 second.
- Most variable changes require an **ApplySet**.
- There is no clear command.
- There is no chaining of scripts.
- Comments are not allowed on the same line as a command.
- Comments start with **//** in column 1.
- Blank lines are not allowed.
- 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.

Web Services

Web Services Interface

The Vbrick encoder provide a standards-based SOAP architecture to programmatically interface to the encoder. The Web Service interface allows the user application to **Get/Set** MIB parameters in the encoder. The methods supported by the service are listed below.

Method	Description
getNewSessionId (device)	Used to get a new session id from the encoder. It allows the Web service to maintain session with the encoder.
test (echoString)	Used as a test Web service method to test if the interface to the encoder is working. It returns the input string as an echo.
login (sessionId, loginName, hashedPassword)	Used as method to allows the user to login into the box as a particular user with appropriate privileges. Returns **OK** if successful, **ERROR** otherwise.
beginEdit (sessionId, editName)	Used as a method to begin the edit session to become editor of parameters. Returns **editName** if successful, **ERROR** otherwise.
endEdit (sessionId)	Used as a method to end the editor session. Returns **OK** if successful, **ERROR** otherwise.
endOtherEdit (sessionId)	Used as a method to forcefully end another editor session. Returns **OK** if successful, **ERROR** otherwise.
logout (sessionId)	Used to logout of a Web session. Returns **OK** if successful, **ERROR** otherwise.
getParameterValue (sessionId, parnName, parmIndex)	Used as a parameter to get a parameter value. Returns parameter value as a string if successful, **ERROR** otherwise
setParameterValue (sessionId, parmName, parmIndex, parmValue)	Used as a method to set a parameter value. Returns **OK** if successful, **ERROR** otherwise.
setMultipleParameterValue (sessionId, parmName, parmValue, count)	Used as a method to set multiple parameter values, where **parmName** is a string array of names, **parmValue** is a string array of values to the corresponding array of names, and count is the number of items in the array. Returns **OK** if successful, **ERROR** otherwise.

The WSDL file for the Web service methods can be obtained by calling the following URL where **<encoder_ip_address>** is the IP address of the encoder or a host name that can be resolved to an IP by the local DNS server.

http://<encoder_ip_address>/VbrickWebSrvc/VbrickWebSrvc.wsdl

All methods return **ERROR** as the response if the request cannot be fulfilled. **OK** is returned for methods that complete successfully. **GetNewSessionId** returns a new SessionId if it

succeeds; **test** returns the input string as an echo. In order to set parameters, the user must be authenticated and must also be an active editor (by calling **beginEdit**). A typical sequence of calls to the methods is shown below.

> **Note:** There are multiple ways to locate and verify Vbrick parameters. See Set Encoder Parameters for more information.

▼ To Get a parameter value:

1. Get a new SessionId by calling **getNewSessionId**.
2. Login into the encoder by calling the **login** method and supplying the login name and hashed password value. The algorithm to hash the password is provided as "C" code and also as a VBCrypt package for the Microsoft .NET and C# environments.
3. Get the parameter value by calling the **getParameterValue** method supplying the MIB name and parameter Index (if any). Note: Some parameters may require the user to be the active editor. More parameters can be retrieved by calling the method several times.
4. Logout of the session by calling the **logout** method.

▼ To Set a parameter value:

1. Get a new SessionId by calling **getNewSessionId**.
2. Login into the encoder by calling the **login** method and supplying the login name and hashed password value. The algorithm to hash the password is provided as "C" code and also as a VBCrypt package for the Microsoft .NET and C# environments.
3. Call the **beginEdit** method to become the active editor in the box.
4. Set the parameter value by calling the **setParameterValue** method supplying the MIB name, parameter Index (if any), and parameter value. More parameters can be set by calling the method several times, or by calling the **setMultipleParameterValue** method.
5. End the edit by calling **endEdit**
6. Logout of the session by calling the **logout** method.

> **Note:** If you successfully login to the encoder, you must logout when your session completes or subsequent users will be unable to access the encoder. You should end edit and logout if login or begin edit were successful regardless of the success or failure of your Get or Set call.

Streaming Video Basics

Video Basics

It is important that the source of the video being encoded and streamed is 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, 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 HDMI via mini-DIN connectors. BNC-to-RCA adapters are readily available if RCA-type cables are used.

Getting the Best Video

Video quality is a subjective concept that depends on a variety of factors. Vbrick's philosophy is to make our network encoders as flexible as possible so they can be used effectively in different applications on a wide variety of networks. This means you can configure an encoder for maximum performance but you can also configure it in such a way that it will only work well in a very limited environment. Video quality is also relative. What is acceptable quality for a surveillance application on a low-bandwidth network is most likely unacceptable for a corporate presentation or a two-way video conference on a high-speed LAN. Much depends on your network, the bandwidth you have available, and the audience you are trying to reach.

For best results, start with the default values and then adjust the bit rate, frame rate, resolution, and other parameters with care. Experiment with different settings to see the trade-offs in quality and performance. You can track your changes by periodically saving the configuration file using the **Read** and **Restore** options on the Manage Configuration page in VBAdmin. If the audio and video quality is still less than you would expect, re-apply your saved configuration and try again. Keep in mind that the Vbrick is stable, reliable and flexible. In most cases a small amount of experimentation will help you find the configuration settings that will deliver the best audio and video your network can support. For more information, or help configuring your encoder, contact Vbrick <u>Support Services</u>.

Network Considerations

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. (Vbrick encoders enforce this rule.)
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 ranges on a given network.

Vbrick Accessories

Vbrick encoders have various optional hardware accessories. These work directly with Vbrick encoders 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. You can use COM1 or COM2 for passthrough. When COM1 Passthrough is enabled, the management port and CLI are not available. The serial ports operate at the configured baud rate (e.g. 110 to 115.2K bps). See the *Encoder Admin Guide* for passthrough 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.
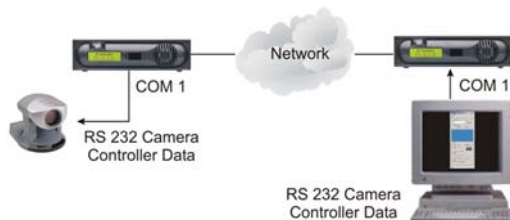
How Passthrough Works

Vbrick encoders 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." COM is assigned port 4439. 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 encoders.

You must select configuration settings to enable Serial Port Passthrough. First it is necessary to decide if the encoder 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** encoders. 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 encoder will use the destination information when trying to establish a connection. The destination can be configured as follows:

Dedicated	Means that the initiator will attempt to make a Passthrough connection to the configured Dedicated Destination and Port. The Dedicated Destination can either be configured using IP Address or Host Name. If set to Host Name, the Resolved Destination IP Address is derived from the Host Name parameter. If set to IP Address, the Resolved Destination IP Address is derived from the IP Address parameter.

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 encoder 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 encoder is configured as an **Initiator** and the **Responder** encoder has Passthrough disabled or is not on the network it will continue to try to establish a connection.A Vbrick encoder 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.

Serial Port Passthrough Using Telnet

As mentioned in the previous section, either serial port can be accessed over Ethernet via a Telnet client. A Vbrick encoder configured as a Passthrough Responder will accept a connection request to TCP port 4439 (COM). The request can come from a Telnet client or other PC application. Any data sent by the PC to TCP port 4439 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.

Full duplex RS-232 Port for:
- Camera Control
- Alarm Monitoring
- Data Collection
- Remote Control

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.

Vbrick iPhone App

App Overview

> **Note**: The Vbrick iPhone app is used to monitor the status of 7000/9000 encoders only. It provides limited support 9000 decoders.

Vbrick provides an iPhone app which you can use to monitor the status of 7000/9000 encoders. This app lets you perform basic configuration tasks by running predefined scripts. *You cannot modify configuration parameters except by running a script.* You can create and FTP script files that perform common tasks like changing the bit rate or starting a transmitter.

These scripts are associated with the four function keys (F1–F4) on the iPhone interface. F1 runs script 1, F2 runs script 2, etc. You cannot change the script file names (e.g. **event1Script.txt**) nor can you add more scripts. After you create the scripts, you will need to FTP them to the **scripts** folder on the encoder.

If you need help creating scripts, see the <u>Command Line Interface</u> topics. This topic explains how to find and set encoder parameters. These are the actual MIB object names you will need to identify in your scripts.
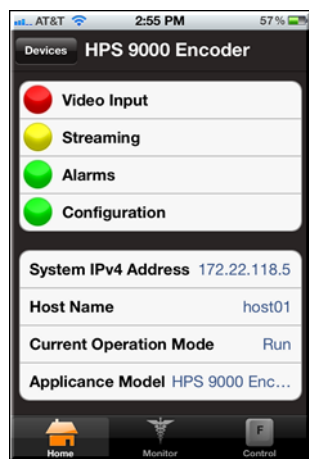

**Figure 1.** iPhone App Home Page

Get the iPhone App

The Vbrick iPhone app is available from the Apple App Store. To get the app simply click on the App Store icon on your iPhone home page and search for "Vbrick" apps. There is no charge for the Vbrick iPhone app.

Monitor an Encoder with the iPhone App

Be aware that to use the iPhone app, your iPhone must be on the same wireless network as the 7000/9000 encoder.

▼   To launch the Vbrick iPhone app:

1. Tap on the Vbrick icon to launch the app. The page will show any 7000/9000 Series devices that have manually added or discovered.

2. Click on the 🟧 icon to manually add devices. You will be prompted for Name, IP Address, and login credentials. When done select a **Default Device** (if desired).

3. Tap on any available device to see the home page for the device.
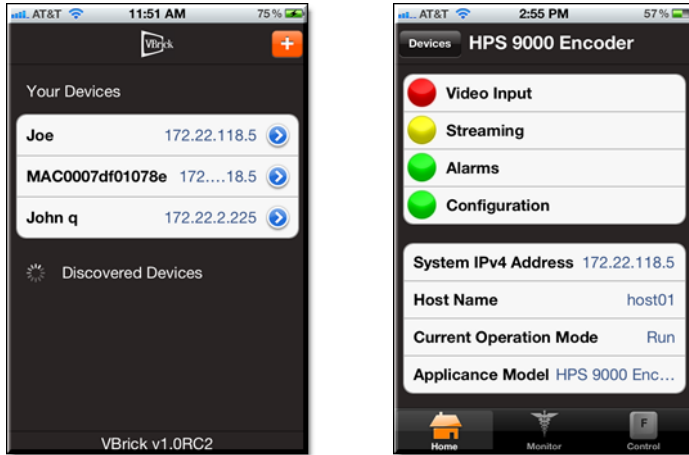
4. Click on the **Monitor** button to display a list of Channels and then select any available Channel. This will display (below right) the relevant status values for the selected Channel. These values are read-only and cannot be changed.
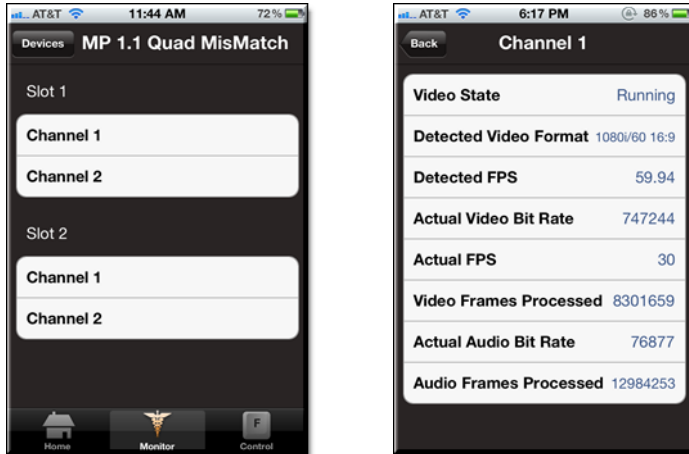
Run a Script

The iPhone app supports four predefined scripts that you can use to modify encoder configuration parameters. (This is the only way you can modify parameters using the iPhone app.) After you create and FTP these scripts (to the **scripts** folder on the encoder), you can use them to modify configuration parameters on the encoder. You run the script by tapping the **Control** icon. **F1** is associated with script1, **F2** with script 2, etc. You can also change the label names (below the buttons) as desired (see below Change the Function Key Labels). If the script runs successfully you will see a confirmation message.

Create a Script File

Script files are simply .txt files with a list of one or more commands. For a detailed description of how to create scripts that will change encoder parameters, see the CLI Examples topic.

As noted, you can create and FTP script files that will perform common configuration tasks. For example the following script sets the **Target Bit Rate** for the first video rate on Channel 2 to 800K.

```
Vbrick# svar vbrickEncoderVideoH264TargetBitRate.2.1=800000
Vbrick# svar vbrickEncoderVideoCommonApplySet.1=2
```

Script files have explicit, predefined names that cannot be changed. There are also specific syntax rules that must be observed (See: CLI Scripting Syntax). In particular make sure that every configuration element in the script is followed by an appropriate `applyset` command. The script file names include:

```
event1Script.txt
event2Script.txt
event3Script.txt
event4Script.txt
```

FTP a Script File

After creating a script, it must be FTPed to the encoder before you can use it. You can use an FTP program or you can use the FTP functionality in VBAdmin:

▼   To FTP scripts using VBAdmin:

1. Open VBAdmin and go to System Configuration > Advanced Configurations > Event Triggering.
2. Click on **Edit** and again on **FTP Scripts**.
3. When the FTP directory page is displayed, click **Page**, and then click **Open FTP Site in Windows Explorer**.
4. When the Windows Explorer page is displayed, drag the new script file(s) into the window.

Change the Function Key Labels

You can use CLI (or a script) to modify Function key labels (F1–F4). Each of the following commands is associated with a specific function key. Replace the bolded text below with a meaningful label that describes the script. Do not exceed 20 characters including spaces.

```
svar "vbrickFrontPanelUserFunctionDescription.1=F1 label"

svar "vbrickFrontPanelUserFunctionDescription.2=F2 label"

svar "vbrickFrontPanelUserFunctionDescription.3=F3 label"

svar "vbrickFrontPanelUserFunctionDescription.4=F4 label"

svar vbrickFrontPanelApplySet=2
```

Vbrick 9000 Series Reference

Device Interfaces

Video-In

Table 1. Support Video Inputs

Interface	Description
Component	The component connectors (**YPbPr**) on the A/V cable support high definition video and audio.
Composite	The yellow jack with an RCA connector is used for composite video input.
HDMI	The **HDMI** (High-Definition Multimedia Interface) connector supports both digital audio and video.
SDI	The Serial Digital Interface supports both SD-SDI typically used for broadcast-grade video (meets SMPTE 259M) or HD/3G-SDI which processes 1080p at bit rates of 2.97 Gbits/sec (meets SMPTE 424M) and digital audio.
VGA	The Video Graphics Array connectors support most of the common analog output videos from a PC or laptop.

Audio-In

Each channel on the encoder can accept digital audio via the HDMI port (**Digital L+R 1/2**) or analog audio using the A/V breakout cable (**Unbalanced**). The HDMI port (High Definition Multimedia Interface) carries high-quality multichannel audio. It moves the audio across the TMDS lanes using a packet structure. The audio can be sampled at rates of 32, 44.1, or 48 KHz.

Table 1. Supported Digital Audio Formats

Format	Description
HDMI	HDMI 1.1 compatible audio interface (basic audio).
SDI	User selected digital audio stereo channel 1, 2, 3, or 4.

COM 1/COM 2

RS-232/422/485 COM Port Pinouts

The encoder has two COM ports. COM 1 is generally used for management (9600 8N1) although it can also be used for passthrough; COM 2 is used for passthrough. When COM1 Passthrough is enabled, the management port and CLI are not available. The COM Passthrough Port is used to pass control information between Vbrick encoders over the network. The **COM** port presents a standard DTE interface on an RJ-45 connector. The serial

port operates at a default rate of 9.6 Kbps, Async, 8-Bit, No Parity, Controls = None. The pins on the passthrough port can be set for RS-232 *or* RS-422-485 (see below) using the **COM Interface Type** parameter on the Passthrough page in VBAdmin.

> **Note:** See System Configuration > Passthrough in the Vbrick Encoder v4.8 Admin Guide for detailed information about Passthrough configuration.

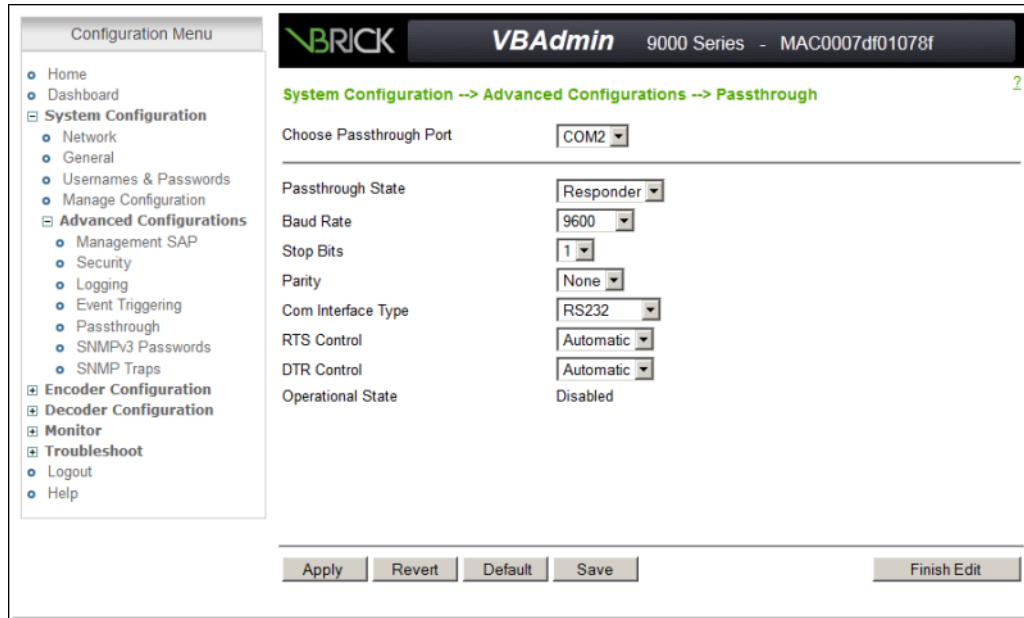**Table 1.** RS-232 Pinouts

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
7	DSR Data Set Ready	Input
8	CTS Clear to Send	Input

Table 2. RS-232-422/485 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(+)

Ethernet

The Ethernet port is used to connect the encoder to your network. It uses a standard 10/100/1000 cable.

Power

The power entry interface supplies 24VDC to the encoder from an external 110/220 VAC power source.

External Event Triggering

The 9000 Series event triggering feature lets you use an external switch to control the function of the encoder. 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 encoder 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 Pin 7. See System Configuration > Advanced Configurations > Event Triggering in the Vbrick Encoder v4.8 Admin Guide for configuration details and RS-232/422/485 COM Port Pinouts for pinout details.

> **Note:** You cannot execute a script using an event trigger if VBAdmin is currently running in **Edit** mode. If you run a script directly from VBAdmin, it automatically exits **Edit** mode and terminates the active editing session.

The 9000 Series encoder has two COM ports and supports a total of four external events. Note that Pin8 is used for UART control and cannot be used as a trigger.

Table 1. Input Event and Associated Scripts

Input Event	Runs This Script
COM1 pin7 High to Low	`event1Script.txt`
COM1 pin7 Low to High	`event2Script.txt`
COM2 pin7 High to Low	`event3Script.txt`
COM2 pin7 Low to High	`event4Script.txt`

A total of four trigger voltage outputs are available for generating trigger inputs. The outputs can be forced high or low (the voltage depends on whether you select RS232 or RS422/485) and are configured on the Passthrough page. (Note that passthrough is only supported on COM 2 so COM 1 outputs cannot be forced). The outputs are:
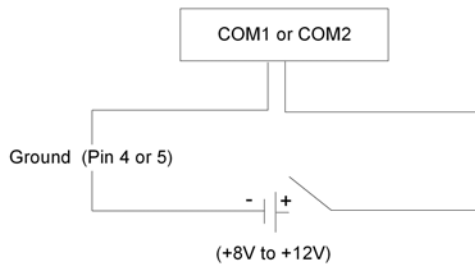
COM1 pin1 RTS

COM1 pin2 DTR

COM2 pin1 RTS

COM2 pin2 DTR

Example 1

This example uses an external power source. Connect an external power supply (+8V to +12V) and a switch directly to the ground pin and an event pin of the COM 2 port on the encoder.

Example 2

This example uses the Vbrick COM port output. Connect the COM output pin (COM2 pin1 RTS or COM2 pin2 DTR) through a switch to a COM event pin. For this method to work, you must force the desired output pin (RTS or DTR) to **On** using VBAdmin:

▼ To force the desired output pin to On:

1. Go to the System Configuration > Advanced Configurations > Passthrough page in VBAdmin.
2. Change **Passthrough State** to **Responder** and click Apply.
3. Change **RTS/DTR Control** to **Force On** and click Apply.
4. Change **Passthrough State** to **Disabled** and click Apply.
5. Click **Save Config** when done.