VBrick 7000 Series Appliances

VBrick v3.1 H.264 Appliance Release Notes

Copyright

About VBrick Systems

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

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

Contents

H.264 Appliance v3.1 Release Notes

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This H.264 software release runs on VBrick H.264 network appliances only. Any information contained in this document is VBrick Systems customer confidential and should not be reproduced nor distributed to non-VBrick Systems customers without prior written permission. The *VBrick H.264 Appliance Admin Guide* provides a detailed description of all encoder configuration parameters. The complete appliance documentation set is available on the Product CD, from the Help (?) link in the VBAdmin management application, or at www.vbrick.com/documentation

What's New in v3.1

- Forward Error Correction (FEC) for transport streams
- Auto-FTP
- Smooth Streaming
- RTMP MBR support
- RTMP Wowza authentication
- Automatic Latency Control for transport streams
- SMPTE time code over SDI interfaces
- Announce Session Name Override

What's New in v3.0

The v3.0 release included the following enhancements to the H.264 hardware and software.

- Encoding at 1920x1080 resolution.
- Encoding at 60fps for resolutions of 1280x720 and lower.
- Multiple Bit Rate – a Video and Audio Input is copied and independently encoded. Up to three rates are supported. (Note that MBR is not supported on RTMP.)
- Archiving – The encoded stream can be stored on a internal hard drive or an external (USB) drive.
- RTMP (Flash) Publishing Client.
- KLV (LDS) over IP and SDI in addition to Serial and ESD.
- CoT over IP and Serial.
- Metadata for VEMS H.264 Presentations.
- Management via IPv6 in addition to IPv4.
- Video Color Space options (RGB, YCrCb).
- MISB 0604 video timestamp.

- Closed Captioning over SDI.
- User-defined login message.
- Transport Stream PID # can be configured.
- Security enhancements (shutdown Debug port).
- Maximum Video Bit Rates increased from 10Mb/sec to 20Mb/sec.
- Support for Inserted Closed Captioning for all video input formats.

Compatibility

The H.264 network appliance is compatible with the applications shown in Table 1.

Table 1. H.264 Appliance Compatibility †

Application	Vendor	Notes
VEMS 5.x/6.x	VBrick	Fully compatible.
StreamPlayer 5.2	VBrick	Fully compatible.
QuickTime 7.0	Apple	If not installed, download from Apple website. If you have streaming problems with QuickTime 7.6, go to QuickTime Preferences > Advanced > Video > DirectX and uncheck **Enable Direct3D video acceleration**.
VLC 1.0.1	VideoLAN	VLC is not fully tested or supported by VBrick.

† Use the software versions shown or higher.

HDCP Support

High Bandwidth Digital Content Protection (HDCP) is a form of encrypted, digital copyright protection developed and licensed by Intel that prevents copying of digital audio and video content moving over DVI or HDMI interfaces. *The VBrick H.264 encoder is designed to enforce digital copyright protection and will not encode HDCP-protected data.* This means if the video source from a DVD player, for example, is HDCP-protected, it will not be encoded by the H.264 appliance and you will typically get a `Video Input Problem` message on the Monitor > Video/Audio page. This is not an error; this is the expected behavior.

The High Definition (HD) inputs on the appliance include HDMI, SDI, and component. Of these, only HDMI supports HDCP, and the HDMI input port is typically used with a live video camera. In most cases video cameras with HDMI outputs will work with the appliance because they do not generally implement HDCP. Most DVD players on the other hand will not work because they do implement HDCP. To avoid HDCP conflicts with HD input, use a video camera for input to the HDMI port whenever possible; use the component port to connect a DVD player or similar device.

It is also possible that video input errors have nothing to do with HDCP. Although the H.264 appliance can only stream from one video source at a time, nothing prevents you from having multiple video inputs (for example composite, S-Video, HDMI, etc.) connected at the same time. In some cases conflicts may occur when multiple inputs from the same DVD player are connected to the appliance. If you get unexpected results—for example no video, or video but no audio—it is always a good idea to unplug all of the unused video inputs.

Software Upgrade

When you purchased your network video appliance 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 download it from our website (go to Support & Training > Resources > VBrick Downloads). **Use the following instructions only when upgrading the software.**

> **Note** There are important considerations you should be aware of *before* upgrading from a 2.x version of appliance software. See Upgrading from v2.x to v3.x below for details.

VBrick appliances are shipped with VBrick 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 appliance's flash memory (TCP/IP FTP transport services are used for this). Using VBDirectory is an easier method since it lets you choose the appliances by name instead of IP address. *When VBrick appliances are not accessible to VBDirectory, you must use the VBDownload application.* Also keep in mind the following important considerations:

- All saved configuration parameters are preserved when you upgrade your encoder and there is no need to reconfigure the unit after an upgrade. (See Upgrading from v2.x to v3.x below for exceptions to this general rule.) 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 up to five minutes and includes an automatic reboot of the unit. The appliance 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.

Upgrading from v3.0 to v3.1

There are no special instructions to follow when upgrading from v3.0 to v3.1. To perform this upgrade, follow the steps in Installing a Software Upgrade on page 5.

> **Note** Windows 7 only. Issues have been reported if UAC (User Access Control) is enabled while the application is being installed. If you experience problems with VBDownload, disable UAC prior to installation.

Upgrading from v2.x to v3.x

Be aware that when upgrading from a v2.x version of the software, some of your previous parameter values will be saved and carried forward; others (and some new parameters) will be set at the v3.x factory defaults. As shown in Figure 1 below, the **System Configuration** and **Video/Audio Configuration** values will be saved; the **Program Configuration** values will not be saved.

For best results VBrick strongly recommends that you upgrade to v3.x as explained below in Installing a Software Upgrade. You will then need to reconfigure the **Program Configuration** settings according to your own requirements. This includes the previous parameters and the new parameters—all of which will be set to the factory defaults. *Do not attempt to restore a configuration file saved from an earlier version.* Any attempt to restore an earlier version to an encoder that has been upgraded will fail.

Note A Video Template mismatch may appear after the code upgrade because of some parameter value changes. To correct this issue simply reapply the template.
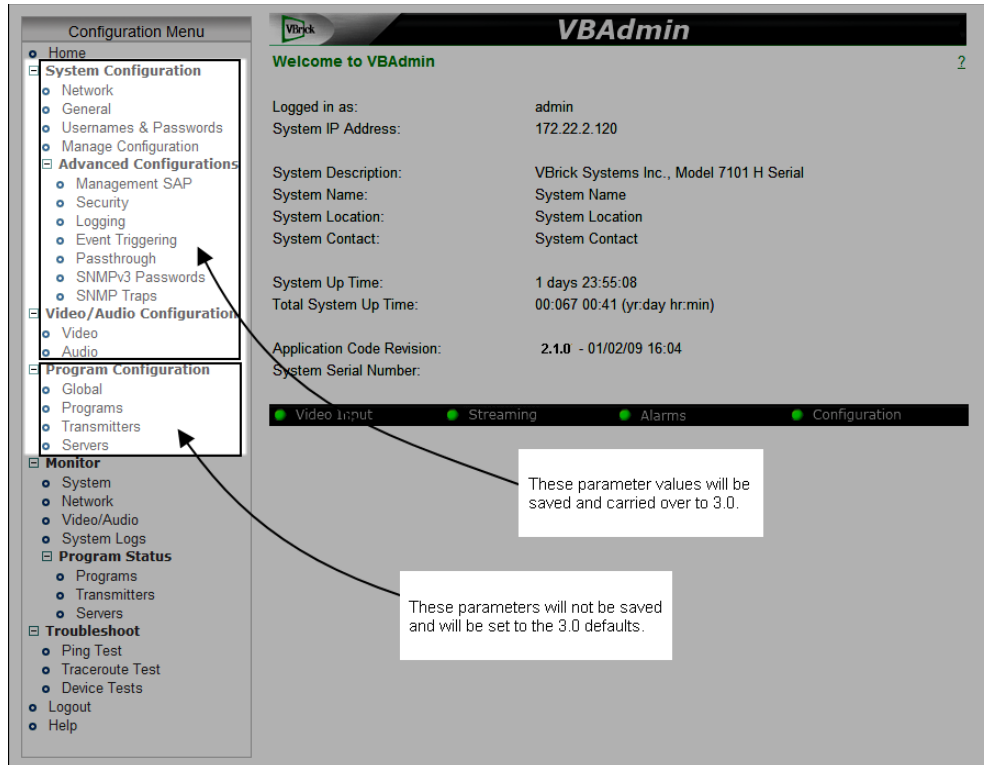
Figure 1. Upgrading from 2.x to 3.x

Avoiding Overload Conditions

The VBrick v3x H.264 encoder has numerous configuration options and can be configured to encode more video and/or process more streams than it can reasonably be expected to handle. This can result in two types of overload conditions.

- *The main (Host) processor is overloaded.* This is indicated by the **Operational Mode** reporting an "overload" on the Monitor > System page. If this happens reduce some or all of the following: Target Bit Rate, number of streams, transmitters, clients, and archivers.

- *The encoding DSPs are overloaded.* This will result in **Frames Dropped By Congestion** (on Monitor > Video/Audio page) counter increasing. If this happens reduce the video **Resolution** and/or **Target Frame Rate**. Note that the **CPU Utilization** for all processors is shown on the Monitor > System page; each value represents a different processor (Host, DSP1, DSP2, DSP3) and none should be at 100%.

Guidelines for Playing 720p and 1080p Streams

In order to play 720p or 1080p streams on a PC you need an adequately powered hardware platform and an efficient player. Although VBrick can make no specific guarantees as to the performance of a particular hardware configuration, the guidelines in Table 2 are strongly recommended.

Table 2. Guidelines for Playing 720p and 1080p Streams

Minimum Processor	Intel Core2 (Dual- or Quad-core) processor with 2.0 GHz minimum clock speed. †
Recommended Processor	Intel i3, i5 or i7 family (Dual- or Quad-core) processor with 2.0 GHz minimum clock speed. †
Graphics Card	Nvidia/ATI graphics card. Newer model with discrete (not integrated) design.
Operating System	64 bit operating system recommended.

† or AMD equivalent.

Installing a Software Upgrade

▼ To upgrade a VBrick:

1. Double-click on the release executable (`SetupVB7000_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\VB7000\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 appliances 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 appliances's username and password (default = `admin`/`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 appliance 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**.

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

VBDirectory

As a convenience, the H.264 Appliance Product CD includes the VBDirectory management application. VBDirectory was developed for use with DHCP and provides quick access to all VBrick appliances on your network. You can install VBDirectory from the H.264 Appliance Product CD.
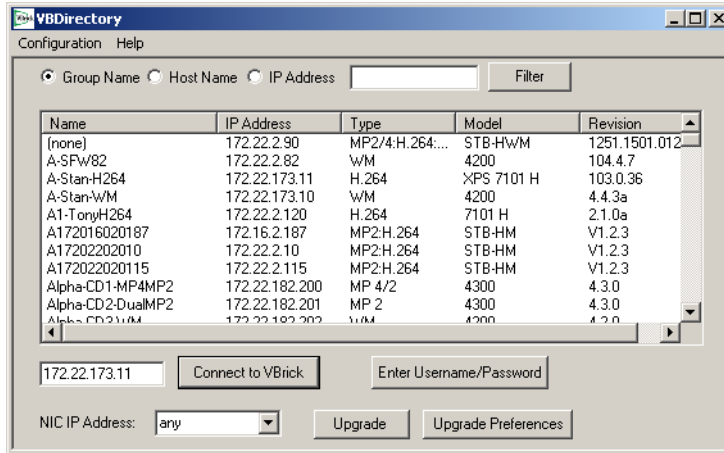
Caveats

This section addresses known issues in this release, most of which have an easy workaround. For more information about any item, or help with an issue not listed here, contact your reseller or VBrick Support Services. The following "caveats" are divided as follows:

Encoder Issues – address issues directly related to the VBrick H.264 encoder.

Player Issues – address issues related to StreamPlayer, QuickTime and VLC.

Browser Issues – address issues related to Internet Explorer, Firefox, etc.

Encoder Issues

- The **Announce Session Name Override** field (on Program Configuration > Transmitters page) is only visible in "edit" mode. To see this field, click **Show advanced settings** and **Edit** button. (3365)

- You cannot restore a System Configuration using an .xml file if the audio **Gain/ Attenuation** setting (on the Video/Audio Configuration > Audio page) is a negative number. To work around this issue, change the **Gain/Attenuation** setting to 0, save and restore the System Configuration, then change back to a negative number if desired. (3366)

- VBrick H.264 encoders are fully compatible with VEMS v5.3 or higher. *VBrick H.264 encoders are not compatible with VEMS 5.2 when using specific "Advanced Settings" for scheduling a live broadcast.* In VEMS v5.2, when using the "Advanced settings > Schedule Start Options," the scheduled live broadcast from an H.264 encoder will fail with an error at runtime if the Destination = Server or if the Destination = Multicast and you change the **Closed Captioning** default or the **Video** or **Audio** rate defaults. Please contact Support Services for more information.

- For optimum performance when using an AmiNET130 Transport Stream, Max Packet Size (on Program Configuration > Programs page) should not exceed 1480. Packet Size = 1316 is optimal.
- When streaming to Quicktime players, a Max Packet Size less than 1000 may cause audio dropouts. (1010)
- Security and Surveillance template: closed captions will not work if the Target Frame Rate is set below 2 frames/sec. (2860)
- Because of a bug in the Darwin server, the first AutoUnicast may fail (with no video) when pushing a stream to a Darwin server via UDP (Auto Unicast via TCP is not affected). The connection to the Darwin server will appear successful and the failure will become apparent only when an end user connects to the Darwin and receives only audio. To workaround this issue, create a second Transmitter with a different publishing point (Auto Unicast Dest Pub Point Name) on the server. (2898)
- 1920x1080 encoding at bit rates higher than 15Mbit using Constant Transport Stream Mode may have quality issues when played on a VBrick H.264 Decoder. For best results use Variable Transport Stream Mode when streaming 1920x1080 at rates higher than 15Mbit to a VBrick H.264 Decoder. (3091)
- When refreshing the Storage Information on the Monitor > System page, the USB drive **Format Status** is not always updated correctly—even after a manual "refresh." (2660)
- If you have any IP address configured in the system with an address outside your local subnet, and did not configure a gateway (on the System Configuration > Network page), then that IP will default to the loopback address (127.0.0.1) after a save and reboot. To work around this issue always configure a gateway. (2777)
- When using 1080i or 1080p input (HDMI or Component) and streaming at 1280x720 60 or 30 fps, several distorted lines may be displayed at top of the video. To work around this issue use the **Blackout Bottom** feature on the Video/Audio Configuration > Video page. (3165)
- If using RTMP or AutoUnicast TCP transmitters, leave **Max Packet Size** at the default value (1452) or the transmitter session will experience problems. (3173)

Player Issues

The following caveats refer to issues with VBrick StreamPlayer, Apple QuickTime, or VideoLan VLC Media Player.

StreamPlayer

- When using the **Overlay CC on Video** StreamPlayer preference at less than three frames per second, the closed captions will be out of sync with the video. To work around this issue, uncheck the overlay option in StreamPlayer. (2013)
- Audio-only H.264 streams are not supported by VEMS and may result in unpredictable behavior. For example they will not play in StreamPlayer, they cannot be added to a Wowza server, etc. (9075)

QuickTime

- To play H.264 streams on Windows PCs, you must have Apple QuickTime 7.0 or higher installed.
- To use QuickTime Player for playing live RTP streams, go to Edit > Preferences > go to QuickTime Preferences > Advanced > Video > DirectX and uncheck **Enable Direct3D video acceleration**.

- QuickTime may go slightly out of sync after 24 hours or more of continuous operation. If this happens, restart the QuickTime player. (1509)
- QuickTime does not fully decode SBR audio streams. This is a QuickTime bug.
- Be aware that QuickTime performance is highly dependent on the power of the graphics card installed on your computer. (3104)
- Due to known performance limitations, do not use the QuickTime PC player for live 1080p30 streams.
- QuickTime does not fully support closed captions. (2029)
- When streaming to QuickTime players, a **Max Packet Size** less than 1000 may cause audio dropouts. (1010)

VLC

- Served MPEG2TS transport streams will play properly in VLC until closed captions are enabled. When enabled, the video breaks up. (3355)
- VLC does not work with a Target Frame Rate (on Video page) less than 2 frames/sec. To work around this issue increase the Target Frame Rate. (1529)
- VLC player will report any 24Khz Sample Frequency as SBR and display the frequency as 48Khz. (1241)
- VLC player will not play audio for streams configured with "Dual" Audio Source. (2917)
- RTP Metering distorts video on VLC player. (2057)

Browser Issues

Firefox

After changing the Secure VBAdmin Server Port using Firefox from the default (443) the browser will be unable to connect to VBAdmin via HTTPS. To work around this issue:

1. Open Firefox, type `about:config` in the address bar, and ignore any warning.
2. Right-click in any blank area of the page and select New > String.
3. Enter string name `network.security.ports.banned.override`, string value `1-65535`, and click OK. (2738)