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VGADVI Broadcaster™ User Guide

Epiphan Technical Documentation

June 2013

epiphan SYSTEMS INC.

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- The behavior of your VGADVI Broadcaster LED indicators.
- Technical description of the signal source including resolution, refresh rate, synchronization, type of hardware.
- Complete description of the problem you are experiencing.

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1 Table of Contents

2 Overview

2.1 Introduction

Epiphan's VGADVI Broadcaster™ is a compact, portable solution combining both Ethernet-based audio-video broadcast streaming and recording functionalities. The VGADVI Broadcaster is ideal for educational and training institutions, creating sales and marketing videos and technical support, how to demonstrations that require the ability to stream/record/synchronize a computer display along with live video. It transfers up to 30 frames per second of visual and audio information with resolution up to 1920x1200.

Input sources can be:

- a DVI/VGA/HDMI display or camera source,
- an analog camera (S-Video or composite) source, and
- an analog audio source.

This flexibility of input sources gives the VGADVI Broadcaster the capability of synchronizing a high quality audio stream with a corresponding video stream. Streams can be encoded with Motion JPEG, MPEG4 or H.264 video compression.

When video from the two input sources is being used for either broadcasting or broadcasting and recording simultaneously the following format choices are available:

1. **Independent Channel Stream**, streams the video from the two input sources using two separate URLs. Recordings consist of a single multi-track file with two video tracks and one audio track. In this mode you cannot publish both streams through CDN or set up two multicast RTP streams.
2. **Single Channel Stream**, combines the input from the two video input sources using one URL and various picture in picture layouts. Recordings consist of one video track and one audio track.

The VGADVI Broadcaster is connected to a network with an Ethernet connection. Depending on settings, the VGADVI Broadcaster can be automatically assigned an appropriate IP address and connected to a network in the case where the network uses DHCP addressing. Once connected to the network, it can be configured and operated through an easy-to-use web interface.

Each channel which is being streamed is automatically assigned a unique URL. Viewers are simply provided with the required URL in order for them to watch the

desired broadcast stream. Additionally, the VGADVI Broadcaster allows content producers to also record the broadcast to .AVI, .MOV, or MPEG-TS formatted files.

When configured for dual streaming, the VGADVI Broadcaster is being used for the simultaneous broadcasting from both a DVI/VGA/HDMI input source and either a composite or S-Video analog input source if this is not the case of publishing stream or multicast RTP stream. In addition to a single URL showing both streams, viewers may obtain two different URLs one for each of the input sources making up the broadcast. However, when the VGADVI Broadcaster is also recording a broadcast consisting of video input from its two video sources, it always records both video input sources into a single multi-track AVI, MOV or MPEG-TS file. Whether this multi-track file consists of one or two video tracks depends upon whether the recording is being done using the Single Channel Stream configuration or the Independent Channel Stream configuration.

When recording broadcasts, recorded video files are stored in internal solid-state memory. Recorded video files can be archived to a network storage device such as a FTP server or copied to an inserted USB drive. When using FTP to transfer recorded files, the internal memory is used to provide buffering such that in the event the network is experiencing slow transfer rates, no captured data will be lost.

3 Physical Attributes

3.1 System Hardware Features

The VGADVI Broadcaster device is a 202mmx105mmx35mm (7.95”x4.13”x1.38”) unit.

Figure 1 Front View of the VGADVI Broadcaster

Below is a table summarizing the connectors and indicators found on the front panel of the VGADVI Broadcaster.

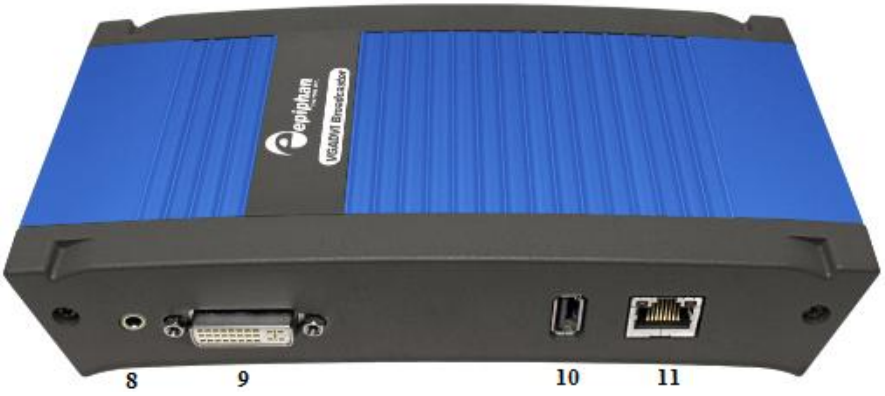
Table 1 ***Summary of the Front Panel's connectors and Indicators***

Number	Name	Description
1	Factory Reset Button	Resets the VGADVI Broadcaster back to its factory configuration defaults. In order to avoid accidentally resetting the device, a special sequence is required: • disconnect power to the device, • press and hold the Reset button as you reconnect the power. • the blue LED lights up. • keep pressing the Reset button until the blue LED turns off and the green LED lights up. • release the Reset button. Refer to the **Restoring the VGADVI Broadcaster Default Factory Configuration** section.
2	Record Stop/Start Toggle	**Record on/off:** toggles the recording on/off status.
3	Power and Capture LEDS	**Red LED:** During operation the red LED blinks each time the VGADVI Broadcaster captures an image. The red LED can be used as an indicator that the VGADVI

		Broadcaster is capturing images. When the input signal(s) stop(s) sending images, the red LED stops blinking. **Green and blue LEDs**: When the VGADVI Broadcaster device first starts up, the blue LED lights up. A few seconds later the green LED lights up. After about another 20 seconds the blue LED turns off, leaving the green LED on indicating that the VGADVI Broadcaster has started up and can start capturing images. During operation the blue LED blinks during video signal test operation and when the system tunes video parameters (e.g. VGA parameters). **Blue LED:** The blue LED blinks to indicate that the VGADVI Broadcaster is recording received images. If the files are not being recorded, the blue LED remains off. Note: Sometimes it may take more than 20 minutes to power up the device. During this time the blue LED is on and the green LED is blinking. It means that the Check disk function started automatically when the device powered up.
4	USB port	This expansion port allows the connecting of any of the following to the VGADVI Broadcaster: an external HDD, a USB flash drive, a remote mouse control for the starting/stopping of a recording, or an RS-232 serial port for remote controls. It is important to note that due to resource constraints, simultaneous usage of multiple USB devices can seriously affect the performance of the VGADVI Broadcaster.
5	S-Video input	Use this port to connect an S-Video source. To connect a composite video source, use a Composite to S-Video adapter which is included in the standard VGADVI Broadcaster package.
6	DVI In	Connects a DVI source to the VGADVI Broadcaster using the included DVI cable. To connect a VGA source, use the included VGA to DVI adapter. To connect an HDMI source (non-copy protected content) use the included HDMI to DVI adapter.
7	Audio In	Connects a microphone or audio source. The input can be mic or line.

The back panel is illustrated below.

Figure 2 Rear View of the VGADVI Broadcaster



Below is a chart detailing the connectors found on the rear panel.

Table 2 ***Summary of Connectors on the Rear Panel***

Number	Connector	Description
8	Audio Out	Connects audio equipment, such as headphones or speakers, to confirm whether the audio stream is currently being captured by the VGADVI Broadcaster.
9	DVI Out	Used to verify and confirm that the connected video source from DVI In port is being received. A DVI monitor or projector can be used with this port using the included DVI to DVI cable. Alternatively, if the device to be used to confirm the receiving DVI input signal is a VGA monitor, use the included DVI to VGA cable. This output can also act as a converter. For example if a VGA signal is on the input, the output can be provided as DVI or VGA. Note: To confirm that the connected video source from S-Video port is being received, please refer to the **Troubleshooting** chapter.
10	USB port	This is an additional USB expansion port as described above.

11	RJ45 Ethernet	Primary 10/100 Base-T RJ-45 Ethernet network port to connect the VGADVI Broadcaster to an Ethernet network. The VGADVI Broadcaster's Ethernet port is auto-sensing. Power over Ethernet is used to power the VGADVI Broadcaster. If the intended network connection does not provide power over Ethernet, use the Power over Ethernet Injector and this port in order to power the device.

3.2 Cables, Connectors and Adapters

The VGADVI Broadcaster can be connected to a number of different types of equipment using a variety of cables, and adapters. This section describes a subset of connectors, cables and adapters that are known to be compatible with the VGADVI Broadcaster.

3.2.1 3.5 mm Mini-jack

A 3.5mm mini jack connector is used to carry audio signals. It can be connected to VGADVI Broadcaster to either its Audio In port or its Audio Out port.

Figure 3 3.5mm Mini-jack

3.2.2 VGA to DVI Cable

Connects a VGA source to either of the VGADVI Broadcaster's DVI ports. This cable is included with the VGADVI Broadcaster.

Figure 4 VGA to DVI cable

3.2.3 DVI to DVI Cable

Connects a DVI source to either of the VGADVI Broadcaster's DVI ports. This cable is included with the VGADVI Broadcaster.

Figure 5 DVI to DVI cable

3.2.4 S-Video Cable

Connects an S-Video output analog source to the VGADVI Broadcaster's S-Video port.

Figure 6 S-Video cable

3.2.5 Composite to S-Video Cable

Connects a composite output analog video source to the VGADVI Broadcaster's S-Video port. This cable is included with the VGADVI Broadcaster.

Figure 7 Composite to S-Video cable

3.2.6 HDMI to DVI Adapter

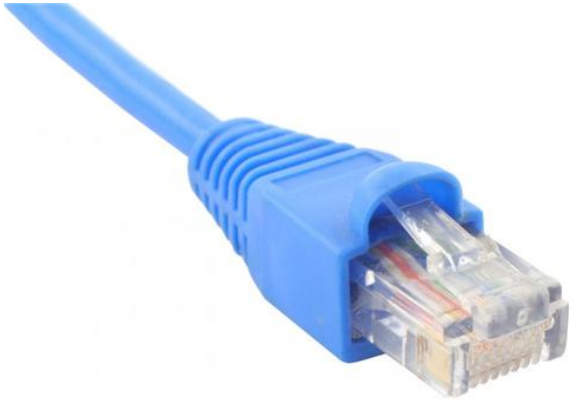
Connects an HDMI source to either of the VGADVI Broadcaster's DVI ports. This adapter is included with the VGADVI Broadcaster.

Figure 8 HDMI to DVI adapter

3.2.7 RJ-45 Male

Connects the VGADVI Broadcaster to an Ethernet network.

Figure 9 RJ-45 Male cable



3.2.8 Power over Ethernet (PoE) Injector

The VGADVI Broadcaster incorporates a Power over Ethernet (PoE) technology. PoE delivers both data and electrical power to an Ethernet enabled device using a single Ethernet cable. This eliminates the need for the VGADVI Broadcaster to be situated close to a power outlet. This allows more freedom in its placement.

PoE injectors supply or inject direct current (DC) power through network cables to power network devices.

4 Getting Started

4.1 Supplying Power to the VGADVI Broadcaster

To provide power to the VGADVI Broadcaster, plug the provided PoE adapter into a 10/100Base-T Ethernet network using an Ethernet cable. This network must be running the TCP/IP protocol.

If your network does not provide Power over Ethernet, connect the VGADVI Broadcaster to an AC power outlet with the PoE adapter/injector connected to an Ethernet cable and plugged into the VGADVI Broadcaster's RJ45 Ethernet port.

Regardless of the power source once connected, the VGADVI Broadcaster now powers up. Its power and activity LEDs will now light up following their start up sequence.

4.2 Confirm Input Signals are Received

Confirming that the input signals are being received by the VGADVI Broadcaster can be done once the VGADVI Broadcaster has been powered on and the input sources have been started.

First, check that the VGADVI Broadcaster's red LED is blinking. A blinking LED indicates that the VGADVI Broadcaster is capturing images. If the red LED does not start flashing, check the input sources to ensure that they are transmitting a signal. Additionally, check that all cables from the input sources to the VGADVI Broadcaster are connected correctly.

Depending on the input source, the VGADVI Broadcaster's output signal ports can be used to confirm that data from specific input sources are being captured

4.2.1 Checking the Signal from a DVI/VGA or HDMI Input source

The VGADVI Broadcaster has a DVI output port that is used to confirm that the signal from any of the above sources is being captured. In order to perform this verification ensure that there is an input source streaming to the VGADVI Broadcaster using its DVI input port. If yes, then connect a monitor to the VGADVI Broadcaster using the DVI output port and the appropriate DVI cable. The monitor will then display any data being captured by the VGADVI Broadcaster via its DVI input port.

4.2.2 Checking the Signal from an S-Video or Composite Source

The VGADVI Broadcaster does not come equipped with a mechanism to confirm the quality of the video input being received via its S-Video input video source. However, you can trouble shoot by this source by connecting an S-Video or composite receiver such as a TV or monitor to confirm that a high quality signal is being generated by the video source prior to connecting the S-Video or composite source to the VGADVI Broadcaster.

4.2.3 Checking the Analog Audio Signal

As with any input source plugged into the VGADVI Broadcaster's DVI input port, any audio input being sent to the VGADVI Broadcaster via its Analog Audio input port

can be verified. To listen to the audio being captured by the VGADVI Broadcaster, plug in a stereo speaker or headsets into the Analog Audio out port.

4.3 Network Connections

Please to refer to the Networking chapter for the instructions on direct System's connection to the Ethernet, discovering the System on the network, IP address settings and other details.

4.4 Logging into the Web Admin Interface

The Web admin Interface is accessible by logging into it using one of the following methods.

4.4.1 Access through Service Discovery

The **multicast Domain Name System** (mDNS) is a zero configuration host name resolution service. It allows a user to do without an IP address when performing access to the device. Bonjour software installed on a Windows or Mac machine supports mDNS.

To access the device through service discovery, the following conditions should be met depending on your OS:

Microsoft Windows – you must install Bonjour Print Services as explained below.

To install Bonjour Print Services on a Windows machine:

1. Use the following URL - http://support.apple.com/kb/DL999
2. Click Download.
3. Follow the system prompts to download the application on your computer.

MacOS X – Bonjour software which is used for service discovery comes built-in with Mac OS. Therefore VGADVI Broadcaster device can be accessed without any additional installations.

Linux – the Avahi implementation used for service discovery is shipped with most Linux distributions. Therefore most probably your device will be accessed without

any additional installations. However you are recommended to address your administrator for the details first.

The simplest way to access Web Admin interface of your VGADVI Broadcaster in the local network is to type the following string in the address bar of your web browser:

<serial>.local

where <serial> is the serial number of your VGADVI Broadcaster.

For example: **http://92033.local**

4.4.2 Epiphan's Network Discovery Utility.

The Epiphan Network Discovery Utility can be installed and executed from a workstation running Windows XP, Vista or Windows 7. Follow the following steps to access the Web admin Interface through this utility:

1. Start the Epiphan Network Discovery Utility tool.
2. Click **Search** to find all of the Epiphan devices on the network and select the desired VGADVI Broadcaster.
3. Click **Web config.**
4. A web browser starts and you are prompted for the VGADVI Broadcaster's administrator user name and password.
5. Enter the following information:
   User Name: **admin**
   Password: *configured password*<return>, there is no default password so unless a password has been configured, just hit <return>

The Web admin interface opens.

Alternatively the Network Discovery Utility can be used to retrieve the VGADVI Broadcaster's IP address and access to the Web admin Interface will be done using a browser.

4.4.3 Logging into the Web Admin Interface Using a Web Browser and the IP Address of the VGADVI Broadcaster

The web browser can be running on Windows, Mac OS X, Linux or any other operating system.

1. Start a web browser on any workstation connected to the same network as the VGADVI Broadcaster.
2. Browse to the VGADVI Broadcaster.
   http://<ip address of the VGADVI Broadcaster>/admin
   The IP address of the VGADVI Broadcaster can be obtained using any of the following methods:
   a. The Epiphan Network Utility
   b. The EpiphanTouch app
   c. From the network administrator
   d. Using the Factory Default static IP address. Only if the steps in section, Connecting Directly to the VGADVI Broadcaster, are followed
3. Log in as the VGADVI Broadcaster's administrator user
   User Name: **admin**
   Password: *configured password*<return>, there is no factory default password so unless a password has been configured, just hit <return>

The Web admin Interface opens.

4.5 Users Logging

The VGADVI Broadcaster comes with three pre-configured users which can log in the control interface. The first is the administrator user, the user name is **admin.** The second is the operator user, the user name is **operator**. The third is the viewer user, the user name is **viewer**. Each can be assigned a password but their user names cannot be altered. It is not possible to create new user names.

Important: When you install firmware for the first time after purchasing the device, no default passwords are set.

4.5.1 The Administrator User

The administrator user is granted rights to log into the VGADVI Broadcaster and perform any of the following functions:

1. Perform configuration changes to the VGADVI Broadcaster.
2. Manage the current broadcast. This can include the starting or stopping of the recording of the broadcast.
3. Manage previously recorded broadcasts. Including the archiving of recordings.

4. System monitoring. This would involve retrieving any system statuses and retrieving the solid state memory status.
5. **Upgrading the System Firmware** from Epiphan Support. New firmware is released to fix known problems or to add new features.
6. Perform network diagnostics.

As a default factory setting, the administrator user does not come with a password but it is recommended that a password is configured as early as possible for security reasons.

4.5.2 The Operator User

The operator user is granted rights to log in to manage broadcast recordings, configure audio and frame grabber settings, access the recorded files and perform network diagnostics.

As a default, the operator user does not come with a factory configured password. Configuring an operator password is optional.

4.5.3 The Viewer User

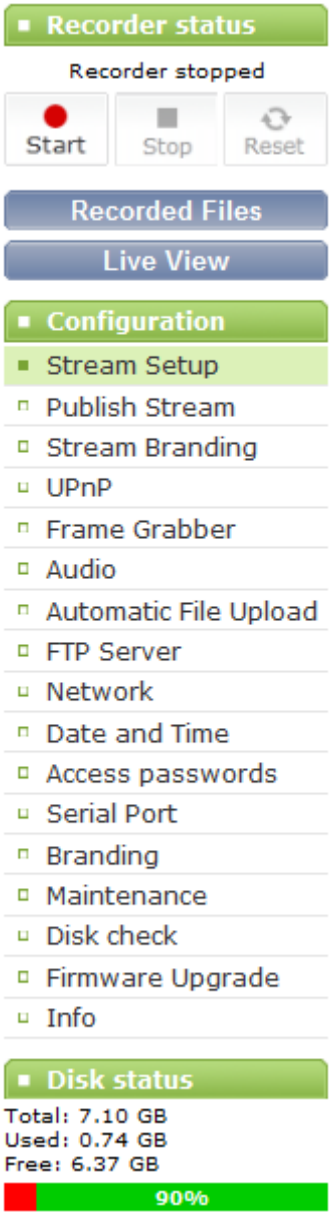
The viewer user is granted rights to log in to view broadcasts and does not have any administrative ability.

As a default, the viewer user does not come with a factory configured password. Configuring a viewer password is optional.

4.6 Web Admin Interface

In this section you can see a diagram showing the Web admin Interface's main menu. It is located on the left side of the screen.

Figure 10 Web Admin Interface's Main Menu



The following table briefly describes each of the options on the Web admin Interface's main menu.

Table 3 ***Web admin Interface's Main Menu Options***

Stream Setup	Change the stream settings.
Publish Stream	Sends the stream to a remote streaming server such as a Content Distribution Network service provider (CDN) or Epiphan.tv portal
Stream Branding	Customize the recording and broadcast: specify the information that is displayed to a viewer and select the logo and "No signal" image.
UPnP	Access recorded files and streams on the local network using a media player via the UPnP protocols.
Frame Grabber	Make frame grabber image adjustments.
Audio	Change and adjust the audio input and headphone output.
Automatic File Upload	Set up automatic files uploading from the VGADVI Broadcaster device to a network storage device.
FTP Server	Configure FTP access settings to connect to the VGADVI Broadcaster internal solid state memory using an FTP client and the administrator, operator or viewer account.
Network	Change the VGADVI Broadcaster network configuration.
Date and Time	Change VGADVI Broadcaster date and time settings.
Access passwords	Change the admin, viewer and operator account password.
Serial Port	Integrate the VGADVI Broadcaster with other equipment featuring an RS-232 port and control your device over the RS-232 connection.
Branding	Customize design of the browser where the broadcast is viewed.
Maintenance	Reboot or shut down the VGADVI Broadcaster device. Restore factory configuration.
Disk Check	Set a Maintenance Schedule for checking the VGADVI Broadcaster solid-state memory for errors.
Firmware Upgrade	Upgrade the VGADVI Broadcaster firmware.
Info	Display information about the VGADVI Broadcaster Firmware and hardware, broadcasting and recording status, available streams, input video signal.
Disk Status	View the total solid state memory in GB, the used and available hard solid state memory in GB, and also the amount used as a percentage of the total solid state memory.

5 Signal Flow Diagrams

A series of diagrams below depicts how signal capture, encoding, streaming and recording is performed.

Figure 11 Data Capture Flow in case of Single Stream Mode

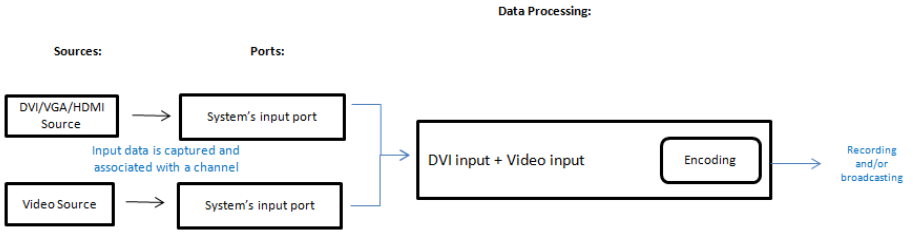


Figure 12 Data Capture Flow in case of Independent Stream Mode

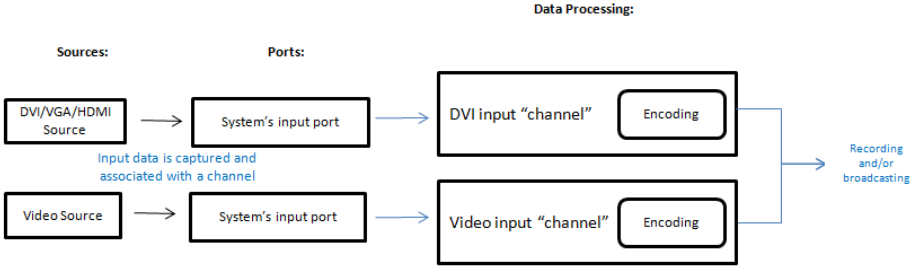
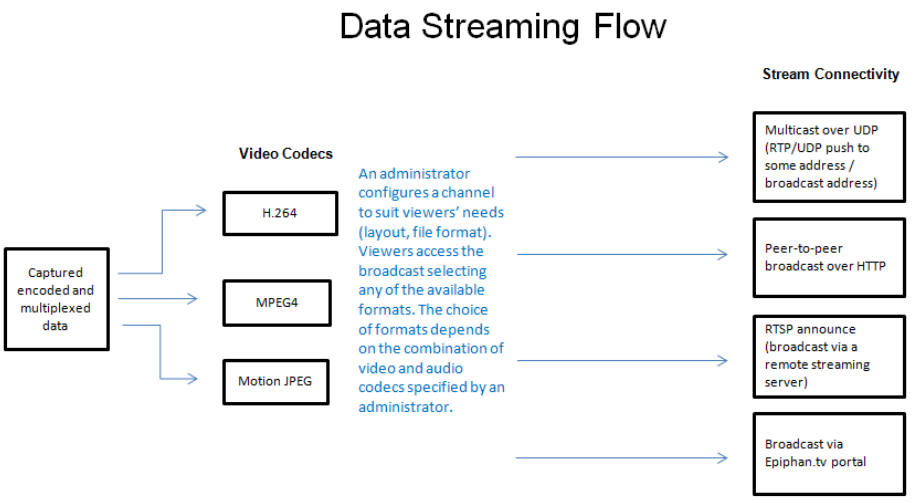


Figure 13 Data Streaming Flow



6 Video Formats and Standards

The VGADVI Broadcaster supports broadcasting of various standards and formats. The choice of video format will depend on the broadcast content and performance requirements. For example, Motion JPEG does not support audio from an external source. It also depends on how the intended viewers are planning to receive and play the broadcast. Keep in mind that browser viewer capabilities and compatibilities are subject to change.

With the VGADVI Broadcaster, video codec for streaming is selected by an administrator. After this action the system creates a list of available streaming formats for this codec. Users can view the broadcast in any available format depending on their preference. Moreover, multiple users can view the same broadcast in different formats. The list of formats available for the selected combination of video and audio codecs displays on the Info page of the Web admin interface.

The VGADVI Broadcaster can stream video using Flash (H.264), ASF (MPEG4 or H.264 codecs), Motion JPEG, RTSP (MPEG4 or H.264 codecs) or MPEG-TS (H.264). A quick definition of these video streaming methods and the type of application that a viewer would use to watch that particular video stream is now provided.

The **Adobe Flash Video stream type** is proprietary but is supported on most web browsers and on many media players including the VLC Media Player. This stream type supports the H.264 standard. This video supports analog audio from an external source.

The **Advanced System Format (ASF) stream type** also called Advanced Streaming format, can be viewed with the Windows Media Player or the VLC Media Player. Additional codecs may need to be installed to view ASF files. This stream type supports H.264 and MPEG4 standards. This video supports analog audio from an external source.

The **Motion JPEG stream type** records each frame in the video in JPEG format and can be viewed using most web browsers. This video format does not support analog audio from an external source.

The **RTSP type** supports many media players including QuickTime and MPlayer. This file type supports H.264 and MPEG4 standards. This video supports analog audio from an external source.

The **MPEG Transport Stream** (MPEG-TS) type supports many software and hardware media players. This stream type conforms to H.264 standards.

Note: Media Player, browser, viewer capabilities and compatibilities are subject to change.

7 Signal Capture

7.1 Connecting Input Sources

It is recommended that prior to powering up the VGADVI Broadcaster, the input sources are connected first. This input source can be a DVI, VGA or HDMI source. Any one of these sources would be connected to the VGADVI Broadcaster using its DVI input port. Alternatively or additionally, it can be an S-Video or composite video

source using the VGADVI Broadcaster's S-Video port. Audio input will be connected to the VGADVI Broadcaster's Audio in port.

7.1.1 Connecting DVI, VGA or HDMI Input Sources

All DVI, VGA or HDMI input sources are connected to the VGADVI Broadcaster using the DVI input port. How this connection is made and using which cable is dependent on the input source.

DVI input sources are connected using the DVI to DVI cable, Figure 5 DVI to DVI cable.
VGA input sources are connected using the VGA to DVI cable, Figure 4 VGA to DVI cable.
HDMI input sources are connected using the HDMI to DVI cable, Figure 8 HDMI to DVI adapter. These sources should only be non-copy protected content.

Note that an HDMI signal containing audio will not be captured.

7.1.2 Connecting Analog Video Input Sources

When using an S-Video input source with the VGADVI Broadcaster, the connection between this input source and the VGADVI Broadcaster is done using the S-Video Cable, Figure 6 S-Video cable and the VGADVI Broadcaster's S-Video input port.

For all composite video input sources, the connection is made using the Composite to S-Video cable, Figure 7 Composite to S-Video cable.

7.1.3 Connecting Audio Input Sources

All audio sources are connected to the VGADVI Broadcaster using the audio input port.

7.2 Frame Grabber Adjustments

A frame grabber is an electronic device that captures individual still frames from an analog video signal or a digital video stream and transmits them in a digital form. An Epiphan frame grabber is a subsystem component in the VGADVI Broadcaster and can be configured separately. From the Web admin interface, select **Frame Grabber** from the main menu to configure Frame Grabber adjustments.

The VGADVI Broadcaster automatically adjusts image capture settings every time it starts up. The automatic image adjustment is repeated every 60 seconds during operation. The interval between automatic adjustments can be changed to have

them occur more or less often. The capture settings attempt to produce the best quality captured image for the equipment being used.

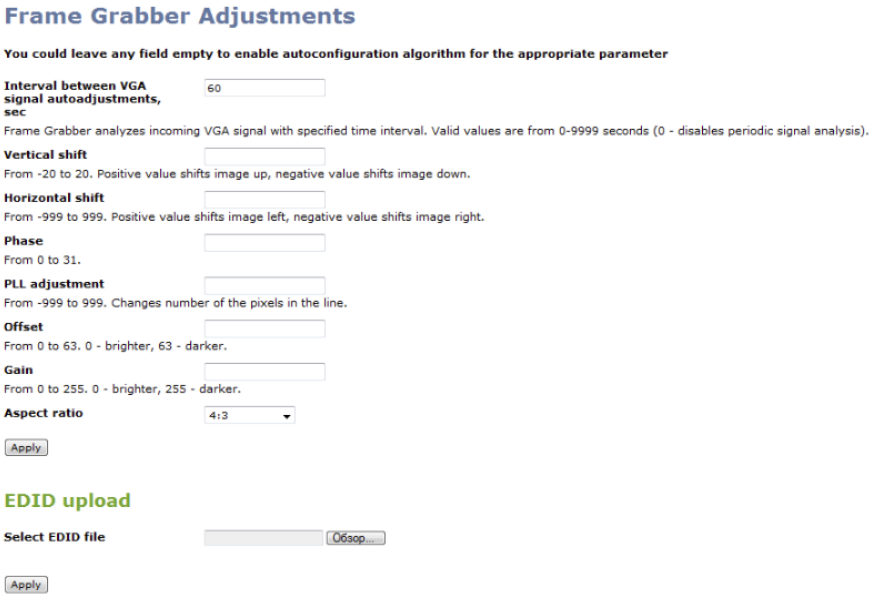
Normally, making manual image adjustments should not be necessary. This means that there are no default Frame Grabber adjustment settings. However, special requirements may exist that produce image quality problems that can only be fixed by making image adjustments.

The Frame Grabber adjustments page within the Web admin interface contains most of the information needed to make image adjustments. This includes a brief description of the effect created as a result of each adjustment and the adjustment range.

To make an adjustment, add a value to one or more fields and select **Apply**.

To clear any adjustments, delete the value from one or more fields and select **Apply**.

Figure 14 Frame Grabber Adjustments



The table below discusses all options found on the Frame Grabber Adjustment page.

Table 4 ***Frame Grabber Adjustment Options***

Use signal from	Specify the the native colour space of the signal source, either RGB or YUV. The following values are available: - VGA/DVI signal (RGB) – default setting - Component signal (YCrCb)
Interval between VGA signal autoadjustments, sec	Change the interval between automatic adjustments if you want them to occur more or less often. To suspend automatic adjustments, enter 0.
Vertical shift	Configure the vertical shift to offset the captured image's position. For example, a captured image that is shifted slightly downward or vertically can be corrected with minor adjustments to the vertical shift settings. Increasing or decreasing the value entered in the Vertical Shift field shifts the image up or down.
Horizontal shift	Configure the horizontal shift to offset the captured image's position. For example, a captured image that is shifted slightly to the right or horizontally can be corrected with minor adjustments to the horizontal shift settings. Increasing or decreasing the value entered in the Horizontal Shift field shifts the image to the right or left.
Phase	This setting adjusts the vertical synchronization properties of the image. You may need to change it when there is a repetitive distortion or blurriness on the horizontal axis of the image. Adjust the setting in small steps until a sharper image is displayed.
PLL adjustment	This setting is used to squeeze or stretch the image horizontally.
Offset	Use the offset and gain controls together to optimize image quality. Increasing the offset reduces background noise but also reduces the overall signal. Balance offset and gain values to achieve the best quality image. Adjust these settings by the smallest values possible to achieve the best results. Compensate for a large change to

	one by making a large change to the other, but setting both offset and gain to high values can result in poorer video quality.
Gain	Use the offset and gain controls together to optimize image quality. Increasing the gain amplifies weak signals but also increases noise. Balance offset and gain values to achieve the best quality image. Adjust these settings by the smallest values possible to achieve the best results. Compensate for a large change to one by making a large change to the other, but setting both offset and gain to high values can result in poorer video quality.
Aspect ratio	Sets the aspect ratio of the captured image. The default aspect ratio is 4:3. The aspect ratio can be set to wide mode in order that the VGADVI Broadcaster can accurately capture wide aspect ratio modes. It's not always possible for the Epiphan device driver to distinguish between analogue (or VGA) video modes when they have the same number of rows, for example, 1024x768 and 1280x768. In these situations change the aspect ratio to Wide Mode.
Select EDID file	Browse to the Extended display identification data (EDID) file to be uploaded. EDID is the information about display's supported resolutions, timings, formats, chromacity, and other media parameters. This information can be used by a signal source for adaptation to the characteristics of a device accepting the signal. Use this URL to upload EDID files: http://www.epiphan.com/downloads/edid/

8 Channel Setup

This chapter explains how to select video codec, configure channels and audio.

8.1 Select Video Codec

Before starting the video recording or broadcasting process, you have to specify the video codec for encoding. It can be selected on the Stream Setup section of the channel's page.

To select the video codec:

1. Select the required channel.
2. Click the Stream Setup option.
3. Click an arrow in the **Codec** field.
4. Select the required codec from the drop-down list. The following values are available for selection:
   - H.264
   - MPEG4
   - Motion JPEG

After you have specified required video and audio codecs (as described in this section and in the **Select Audio Format** section), click the Info menu option of the Web Admin interface to see available broadcasting formats for your settings and obtain the IP addresses for the broadcast.

Figure 15 Stream Settings

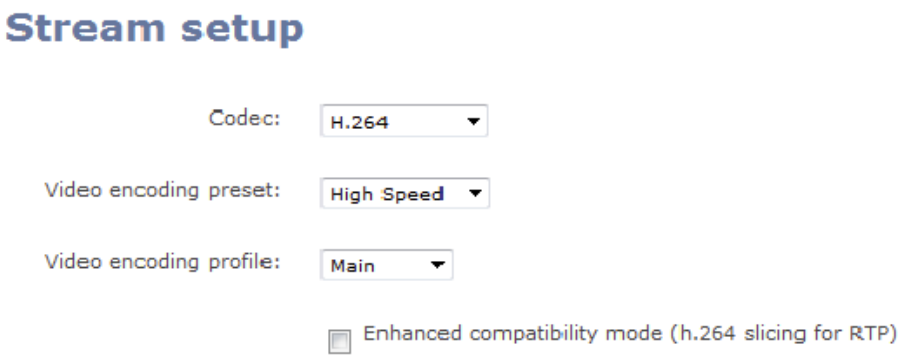


Table 5 Stream Setup Settings

Video encoding preset	Defines how a video stream should be encoded: - at a high quality - at a high speed - according to the default system settings.
Video encoding profile	Select one of the following encoding profiles that target specific classes of applications: 1. **Baseline**: for applications requiring additional data loss robustness, e.g. videoconferencing 2. **Main**: for standard-definition broadcasts 3. **High**: for broadcast and disc storage

	applications This parameter can be set for the H.264 codec only.
Enhanced compatibility mode (h.264 slicing for RTP)	This parameter provides operating stability if the transmitted video/audio stream is not quite supported by the viewer's equipment. When this parameter is activated, each picture is subdivided into one or more slices. The slice is given increased importance in H.264 as the basic spatial segment that is independent from its neighbours. Thus, errors or missing data from one slice cannot propagate to any other slice within the picture.

VGADVI Broadcaster can capture analog and digital signals. When you log in to the control interface, under the Stream Setup section you can configure both VGADVI Broadcaster channels– DVI channel and Video channel. The following sections explain how to configure both channels.

8.2 DVI Channel Setup

The following settings can be made for the DVI channel:

Figure 16 DVI Channel Settings

Below is a table showing the DVI source settings that are configurable.

Table 6 ***DVI Channel settings***

Show time label	If the video needs to be time labeled or timestamped, this parameter allows how the date and time will be displayed. Click on **Show substitutions** and use the **Format substitutions** commands to select the desired date and time format. The commands are described in table 7 below. If time labeling is not required, leave this field blank.
Frame size	Select a frame size from the drop down list to limit the width and height of the video image. If the video source is sending resolutions larger than the resolution limit configured, the video image will be scaled to the resolution limit. Limiting the frame resolution can help to reduce bandwidth usage. Note that the final frame size can be larger in case the Picture in Picture layouts are used. For the Side-by-Side and Video-outside-DVI/VGA modes the largest height from both resolutions is used. The resulting width is equal to the total width amount for both resolutions.
Key frame interval	Controls the number of frames. Key frames define the starting and ending points of any smooth transition.
Limit frame rate	Enter a value in terms frames per second. This field is used to set a frame rate that is lower than the maximum frame rate at which the VGADVI Broadcaster can capture images. Reducing the frame rate reduces the number of images being captured by the device. Decreasing the frame rate can help to reduce bandwidth usage.
Bitrate	Enter a DVI signal bitrate. A lower bitrate produces lower quality videos and smaller file sizes. A higher bitrate produces better quality videos and larger file sizes. Please refer to the following diagrams: Figure 73 Correlation Between FPS and Bitrate Values at Resolution 1280x720 Figure 74 Correlation Between FPS and Bitrate Values at Resolution 1920x1080 Figure 75 Correlation Between FPS and Bitrate Values at Resolution 640x480
Quality parameter (for	This parameter is similar to Bitrate. Use bigger values to

MJPEG only)	improve the quality of the broadcast.

Table 7 Format Substitutions Commands

Command	Value	Example (27/09/2012 10:50:45.378)
date	%F	2012-09-27
year	%G	2012
month (as **01**)	%m	09
month (as **Jan**)	%b	Sep
month (as **January**)	%B	September
day of month	%d	27
weekday (as **Thu**)	%a	Thu
weekday (as **Thursday**)	%A	Thursday
time	%T	10:50:45
hour	%k	10
minute	%M	50
second	%S	45
ms	%#m	378

8.3 Video Channel Setup

The following settings can be made for the video channel on the Stream Setup page from the Web admin interface's main page.

Figure 17 Video Channel Settings

The table below outlines the video channel video configurable options.

Table 8 ***Video Channel Settings***

Enable video channel	Select this checkbox to enable the recording of the video signal from the analog video source.
Picture-in-picture layout	Use these radio buttons to specify how the DVI/VGA and S-Video/composite video sources are streamed when both are being used. These settings are explained in the Picture In Picture Layouts section.
Background color	Specify the background colour for the blank part of the screen in the **Video outside DVI/VGA** mode.

Video signal type	Select the video signal type coming from the S-Video source: - S-Video - Composite
Frame size	Select a Frame size from the drop-down list to limit the width and height of the video image. If the analog video source is sending resolutions larger than the resolution limit they will be scaled to the resolution limit. Limiting the frame resolution can help to reduce bandwidth usage.
Show time label	If the analog video needs to be time labeled, use this parameter to specify how the date and time will be displayed. Use the **Format substitutions** commands to select the necessary date and time format. The commands are described in table 7. Note: This option is available in the Independent Streams mode only.
Key frame interval	Controls the number of seconds between key frames. Note: This option is available in the Independent Streams mode only.
Limit frame rate	Enter a value in terms of frames per second. This field is used to set a frame rate that is lower than the maximum frame rate at which the VGADVI Broadcaster can capture images. Reducing the frame rate reduces the number of images being captured by the device. Decreasing the frame rate can help to reduce bandwidth usage. Note: This option is available in the Independent Streams mode only.
Bitrate	Enter the signal bitrate. A lower bitrate produces lower quality videos and smaller file sizes. A higher bitrate produces better quality videos and larger file sizes. Note: This option is available in the Independent Streams mode only. Please refer to the following diagrams:

	Figure 73 Correlation Between FPS and Bitrate Values at Resolution 1280x720 Figure 74 Correlation Between FPS and Bitrate Values at Resolution 1920x1080 Figure 75 Correlation Between FPS and Bitrate Values at Resolution 640x480

8.4 Picture In Picture Layouts

If you are capturing video from two video sources, you can create a layout for the recording/broadcast, i.e. specify how two videos are positioned on a screen relative to each other.
Please keep in mind that the final frame size can be larger (particularly for the Video outside DVI/VGA layouts). Bitrate, limit frame rate and key frame interval values are taken from the DVI channel settings.

To create a layout for the videos from two sources:

1. Connect two video sources to the device
2. Select **Stream Setup** section in the Web admin interface.
3. Select the **Enable video channel** check box.
4. Select the Picture-in-picture layout radio button, either **Video inside DVI/VGA** or **Video outside DVI/VGA,** with the required position of the inset window.
   - **Video inside DVI/VGA** – the DVI/VGA stream is displayed on the full screen at the same time as the analogue stream is displayed in the left or right inset window. The streams are superimposed.
   - **Video outside DVI/VGA** - the DVI/VGA stream is displayed in the bigger screen at the same time as the analogue stream is displayed in the smaller screen. The streams are not superimposed.

8.4.1 Select Background Color

If you selected the Picture-in-picture layout and the **Video outside DVI/VGA** mode, it is possible to specify the background color for the blank part of the screen.

Use the **Background color** drop-down list in the Stream Setup section of the Web admin interface to select the background color. On the figure below red arrows indicate the screen's part for which you can specify the color.

Figure 18 Setting Background Color

8.5 Common settings

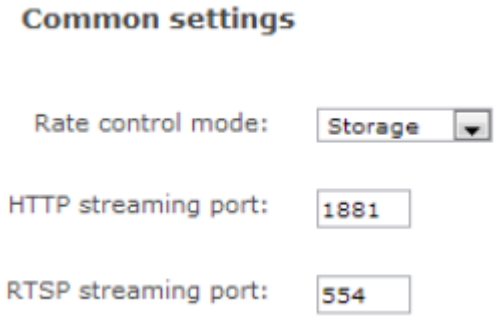
The following common parameters can be additionally specified:

Table 9 Common settings

Rate control mode	Used for H.264 and MPEG4 codecs. It specifies the bitrate encoding for the signal. Select one of the following: - **Low Delay** Means Constant Bitrate Encoding (CBR) will be used. CBR is useful for streaming multimedia content on limited capacity channels since it is the maximum bit rate that matters, not the average. Therefore, CBR would be used to take advantage of all of the channel capacity. - **Storage** Means Variable Bitrate Encoding (VBR) will be used. This produces a better quality-to-space ratio compared to a CBR file of the same data. VBR files vary the amount of output data per time segment and the FPS value may be lower.
HTTP streaming port	The number of the port being used to stream the HTTP broadcast. This value would be used along with the URL to access the broadcast. In the case when independent

	streaming is being used and there are two streams, this value remains the same for both of the URLs being used. The port number cannot be lower than 500. In case of RTSP streaming this value is not considered.
RTSP streaming port	The number of the port being used to stream the RTSP broadcast. This value would be used along with the URL to access the broadcast. In the case when independent streaming is being used and there are two streams, this value remains the same for both of the URLs being used. The port number cannot be lower than 500.

Figure 19 Common Settings



The **Page refresh time** parameter in the MJPEG webpage section is available if the Motion JPEG codec is selected.

Page refresh time	Specify how often the browser updates the visual information coming from the VGADVI Broadcaster. In other words, how often the page is refreshed

8.6 Select Audio Format

The Audio settings pane in the control interface can be accessed by clicking the Stream Setup option from the menu. Select the **Enable audio** checkbox and specify the audio signal parameters.

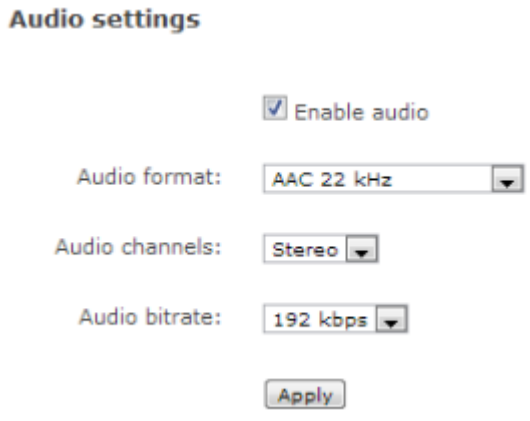
Table 10 ***Audio settings***

Enable audio	Select this checkbox to enable audio for the broadcast.

Audio format	You can select the following audio formats:
	• MP3 – a common audio format for consumer audio storage
	• Raw PCM (Pulse Code Modulation) – a standard form for digital audio in computers as well as other uses such as digital telephone systems
	• G.711 – an ITU-T standard for audio companding. It is a very commonly used waveform codec.
	  ○ μ-law is used primarily in North America
	  ○ A-law is in use in most other countries outside North America
	• AAC - a standardized, lossy compression and encoding scheme for digital audio. AAC generally achieves better sound quality than MP3 at similar bit rates.

Audio channels	Select either mono (1 channel) or stereo (2 channels) sound.
Audio bitrate	Select the audio bitrate value for the broadcast.

Figure 20 Audio Settings



9 Streaming

There are several decisions that need to be made when planning the creation of a broadcast, besides its exact content of the broadcast. Will the broadcast include an

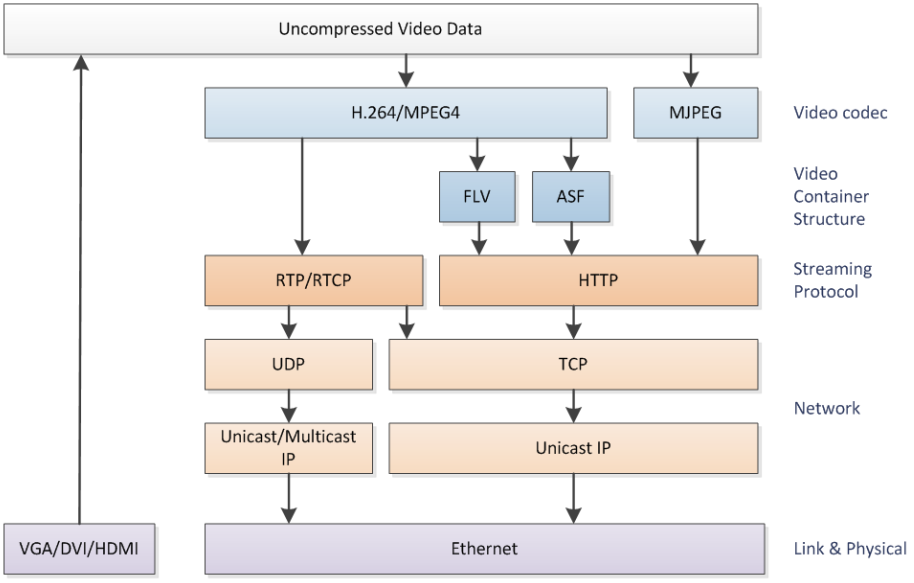
audio component coming from an analog audio source? What video format to use, what video standard to use, how to stream the broadcast are all questions that have to be answered when creating a broadcast. Most of the answers depend on the intended audience of the broadcast, how are the viewers going to view the broadcast, and how many simultaneous viewers are expected to view the broadcast? Where are the viewers located in relation to the where the broadcast is being streamed? What are the performance expectations? These are the types of questions that will determine the overall design of the broadcast.

This chapter outlines how a suitable design of a broadcast can be architected based on these types of questions and their resulting answers and how the System can be used in this design.

The VGADVI Broadcaster supports streaming of various standards and formats. The choice of video format will depend on the broadcast content and performance requirements. For example, Motion JPEG does not support audio from an external source. It also depends on how the intended viewers are planning to receive and play the broadcast. Keep in mind that browser viewer capabilities and compatibilities are subject to change.

With the VGADVI Broadcaster, video codec for streaming is selected by an administrator. After this action the system creates a list of available streaming formats for this codec. The figure below is representation of the protocol stack diagram showing how the video data is processed.

Figure 21 Protocol Stack Diagram



How the broadcast will be delivered to its viewers depends on the number of intended viewers and where the viewers are in relation to where the broadcast is originating. Are they on the same LAN or will they be accessing the broadcast from an external network? The answers to the above questions will help decide the delivery method of the broadcast.

The VGADVI Broadcaster can support streaming over HTTP, RTSP, peer-to-peer RTP connection, multicast RTP, MPEG-TS, and a Content Distribution Network (CDN) broadcast network. Each broadcast delivery method will be now discussed in more detail.

9.1 HTTP or RTSP Streaming

For HTTP or RTSP streaming the only information required to view the broadcast is the URL of the broadcast. The VGADVI Broadcaster is ready to go straight out of the box, without any additional settings. If your broadcast needs to be accessed by many clients, use a Content Distribution Network as explained in the **Using a Content Distribution Network** section.

9.2 Using a Content Distribution Network

A content delivery network (CDN) is a system of computers or servers that ingest an incoming stream source and rapidly provides this content to numerous users by duplicating the content on multiple servers and directing the content to users.

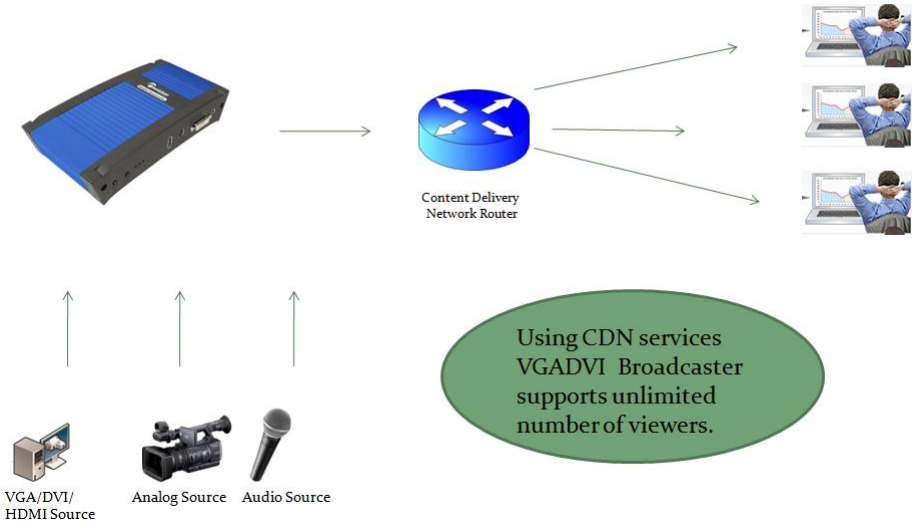
CDN distributes a heavy load of traffic to multiple locations in order to avoid congestion on a network that could impact a user's Internet experience. A CDN is highly scalable and can make financial sense to website owners as you will not need to pay for additional server hardware or routing should your website traffic start to increase or even decrease. The use of CDN technology has obvious advantages to those users whose broadcasts have large audiences from locations all over the world. If dozens or hundreds of viewers happen to select the same Web page or content simultaneously, the CDN sends the content to each of them without delay or time-out.

To stream to multiple users, the System can be configured as a client to CDN. Please click http://epiphan.tv/cdn-partners.php to view the list of CDN providers preferred by Epiphan. By connecting to a CDN server, the broadcast from the System can be streamed to multiple viewers. By using a CDN, the maximum number of concurrent clients is increased, while at the same time reducing the load on the uplink internet connection.

CDN streaming is a very effective approach when you are broadcasting streams from the Epiphan solutions and want to add scalability to your broadcast. The System features the Publish Stream functionality that enables you to stream the broadcast either via Epiphan's portal or CDN providers to multiple viewers. You must use the H.264 codec for CDN streaming.

Using CDN it is possible to set a user name and a password for the broadcast. Each viewer will have to request it from you before viewing the broadcast. This function allows you to manage access to your content ensuring visibility only to the appropriate and authorized viewers.

Figure 22 Using a CDN Service Increases Scalability of Concurrent Viewers



The Publish Stream functionality allows for directing captured video and audio to servers or clients using one of the available stream modes. The following options are available:

- **Disabled**. If this option is enabled, you cannot send multicast RTP stream, perform CDN broadcasting or stream video to Epiphan's portal.
- **to xxxxx.epiphan.tv**. This option allows for streaming video to the Epiphan's portal.
- **using RTSP announce**. This option allows for connecting to CDN server.
- **using RTP/UDP push**. This option allows for IP multicast broadcasting.
- **using MPEG-TS UDP push**. This option allows for IP multicast broadcasting of files in the MPEG-TS format in case when the UDP transportation protocol is used.
- **using MPEG-TS RTP/UDP push**. This option allows for IP multicast broadcasting of files in the MPEG-TS format in case when the RTP/UDP transportation protocol is used.

All options and settings to be performed are discussed further.

In the **Independent Channel Stream** mode it is not possible to publish both input sources using any of the Publish Stream options. Whether you need to send multicast RTP stream or publish video through CDN, it can be done only for the DVI input source.

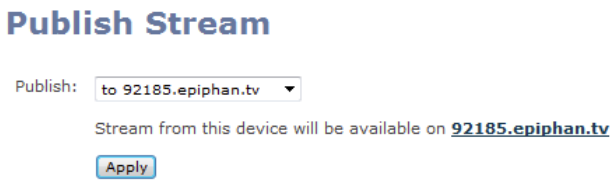
The Publish Stream functionality is available only for the H.264 video codec.

9.2.1 Using Epiphan.tv Portal for Streaming

To set up and perform streaming via Epiphan.tv portal:

1. Click the Publish Stream option in the main menu of the control interface.
2. Select **to xxxxx.epiphan.tv** from the **Publish** drop-down list where xxxxx is the unique serial number of the VGADVI Broadcaster.
3. Select **Enable publishing** and click Apply. The system informs you that stream will be available on the Epiphan's portal and provides a link.

Figure 23 URL to Epiphan Server



4. Click this link and access the portal where the stream is being broadcast in a new window.
5. In case you have selected a codec other than H.264 for streaming (MPEG4 or Motion JPEG), the system will give you a warning (see Figure 24 System Message in Case of Excessive Bitrate Speed). Click on **fix by setting H.264 codec**. The codec will be set to H.264 automatically.
6. In case the bitrate of your broadcast exceeds 500 kbit/s, the system will give you a warning (see Figure 24 System Message in Case of Excessive Bitrate Speed). Click on **fix by reducing bitrate to 500 kbit/s**. The bitrate will be set to 500 kbit/s automatically.
   Note: Epiphan.tv is a demonstration service to help customers experiment with publishing streams to content distribution networks. Therefore certain bandwidth and performance limits are applied. To upgrade to a full service please select one of Epiphan's CDN partners.

Figure 24 System Message in Case of Excessive Bitrate Speed

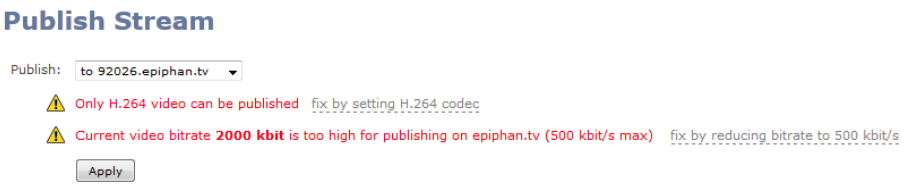


Figure 25 System Message after Setting H.264 codec and Reducing Bitrate

Now connection through the media tunnel is established. The VGADVI Broadcaster starts streaming to the Epiphan's portal – **epiphan.tv**.

It is required to set up audio format as **MP3** when streaming through the epiphan.tv. This setting is performed in the control interface's Stream Setup section (see **Select Audio Format**).

There are several buttons available at the bottom of the epiphan.tv portal page (see Figure 26 Epiphan's Portal):

Switch to	Click this button to select a plugin which will be used for viewing the stream. Refer to Figure 27 Plugins Available for Selection on the Portal. The following plugins are available: - Flash RTMP - Flash HTTP - QuickTime - VLC Player
Embed	Displays a code that allows you to embed video stream into your web page. Refer to Figure 28 Code for Stream Embedding.
Direct URL	Displays a list of URLs for different types of broadcasting. Refer to Figure 29 Listing of Direct URLs.

7. Click **Switch to** button and select a plugin for viewing the stream.
8. If you need to embed the stream into your web page, click **Embed** to obtain the code.
9. Click **Direct URL** to obtain the list of URLs for different types of broadcasting.

Figure 26 Epiphan's Portal

Figure 27 Plugins Available for Selection on the Portal

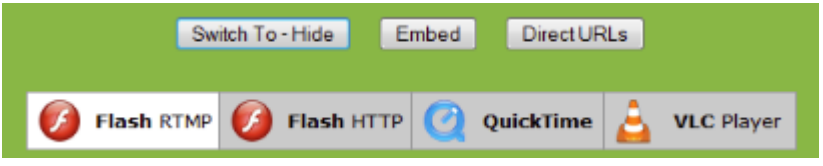


Figure 28 Code for Stream Embedding

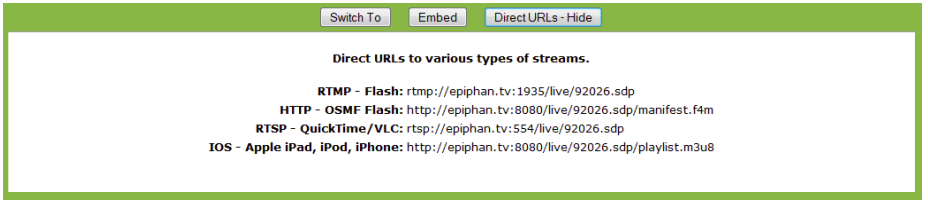
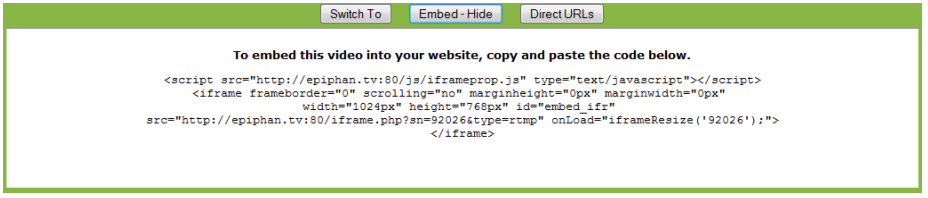


Figure 29 Listing of Direct URLs



Alternatively you can configure VGADVI Broadcaster to stream their content through epiphan.tv directly on the portal.

To view the stream directly on the portal:

1. Type http://epiphan.tv in the address bar of your browser.
2. Enter serial number of VGADVI Broadcaster. It is displayed in the Info section of the Web admin interface.
3. Click the **Go!** button.

9.2.2 Using Epiphan's Partners as CDN Providers for Streaming

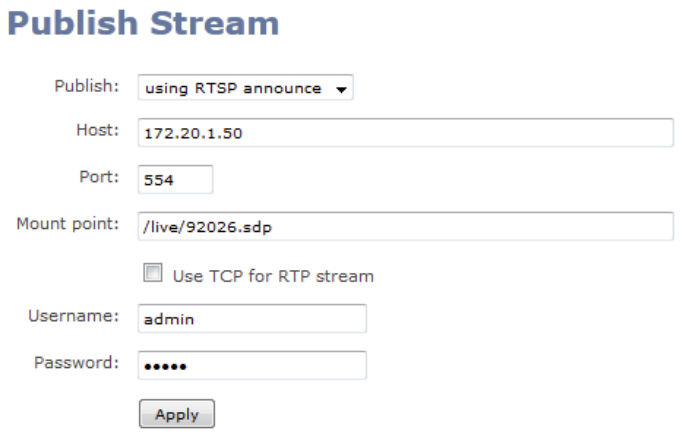
Use this option if you need to perform streaming on a remote streaming server other than **epiphan.tv**. Please contact CDN support to request the list of supported audio codecs and perform the required setting in the control interface's Stream Setup section (see **Select Audio Format**).

To use this option:

1. Select **RTSP Announce** from the drop-down list.

2. Enter the host/server name. For example, **172.20.1.50**.
3. Enter the number of port which is used for streaming to server. Usually for RTSP streaming it is port 554.
4. In the **Mount point** field enter the full path to locate an SDP file on server. This path is provided by the CDN provider.
5. The RTSP protocol uses UDP or TCP as transport layers. If your CDN service requires TCP as a transport layer, select the **Use TCP for RTP stream** check box.
6. If necessary, enter the user and password information.
7. Click **Apply**.

Figure 30 RTSP Announce Functionality



9.2.3 Setting up Multicast from Publish Stream

A multicast RTP stream provides a one-to-many broadcasting framework. In a multicast RTP configuration, the VGADVI Broadcaster sends a packet only once to a router that supports multicasting. This router then distributes the packets to all intended viewer nodes using a multicast protocol.

A multicast address is associated with a group of interested receivers. In IPv4, addresses 224.0.0.0 through 239.255.255.255 (the former Class D addresses) are designated as multicast addresses.

Sending multicast streams requires equipment that supports multi-casting, configuring your network and enabling specific multicasting features on the VGADVI Broadcaster. Multicast architectures are used predominantly within a high bandwidth corporate LAN and not on Internet based architectures. Multicast RTP streaming is not usually propagated outside the LAN though it may be propagated through VPNs connecting several LANs. Multicast transmission is available during RTP streaming.

In the **Independent Channel Stream** mode it is not possible to set up multicast for streaming video from both sources. You are able to operate only the stream coming from the DVI input. The system provides a URL only for this stream even if the sources are connected to both DVI and S-Video inputs.

RTP/UDP Push streaming allows you to direct video to a server or client and generates an SDP file containing the stream description. SDP files can be stored on a streaming server, or opened by video players.

To use this option:

1. Select Publish Stream from the main menu.
2. Select **using RTP/UDP Push** from the drop-down list.
3. Enter a destination multicast IP address. At this target point the broadcast will be viewed.
4. Specify the numbers of the video and audio ports where the broadcast will be received.
5. Click **Apply**.
6. An SDP file is now generated. It is available in the **Info** section of the Web Admin interface. You can either save an SDP file on your local machine or provide the link to SDP file to your audience.

Figure 31 RTP/UDP Push Functionality

9.2.3.1 RTP/UDP Push streaming for the MPEG-TS file format

The Web interface allows you to set up the MPEG-TS stream using **MPEG-TS for RTP/UDP Push and MPEG-TS for UDP Push** options. These options are used, for example, when you need to add a VGADVI Broadcaster's stream to an IP TV or set-top box' playlist.

To use the RTP/UDP Push streaming, you must configure the following streaming settings in the Web Admin interface:

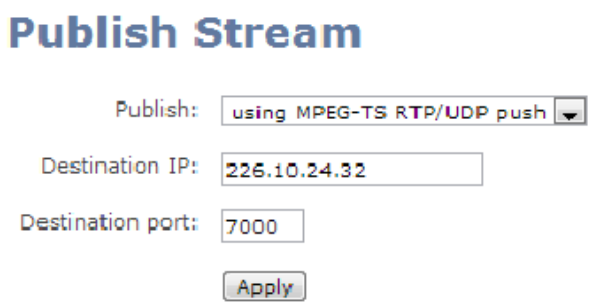
Video codec	H.264
Audio codec	MP3 or AAC

Using the first of these options it is possible to configure RTP/UDP transporting for the MPEG-TS stream.

To use this option:

1. Select Publish Stream from the main menu.
2. Select **using MPEG-TS for RTP/UDP Push** from the drop-down list.
3. Enter a destination multicast IP address. At this target point the broadcast will be viewed.
4. Specify the number of the destination port where the broadcast will be received.
5. Click **Apply**.

Figure 32 MPEG-TS UDP Push Functionality



To view the stream you need a link: rtp://@ip:port (for example, rtp://@226.63.45.23:6000).
To get the link for the stream, select the Info section of the Web admin interface and view the Stream Info pane.

9.2.3.2 UDP Push streaming for the MPEG-TS file format

To configure UDP transporting for the MPEG-TS stream, select **using MPEG-TS for UDP Push** from the drop-down list.

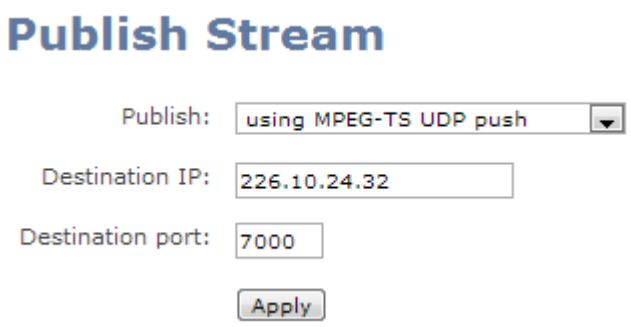
To use the UDP Push streaming, you must configure the following streaming settings in the Web Admin interface:

Video codec	H.264
Audio codec	MP3 or AAC

To use this option:

1. Select Publish Stream from the main menu.
2. Select **using MPEG-TS for UDP Push** from the drop-down list.
3. Enter a destination multicast IP address. At this target point the broadcast will be viewed.
4. Specify the number of the destination port where the broadcast will be received.
5. Click **Apply**.

Figure 33 MPEG-TS RTP/UDP Push Functionality



To view the stream you need a link: udp://@ip:port (for example, rtp://@226.63.45.23:6000).
To get the link for the stream, select the Info section of the Web admin interface and view the Stream Info pane.

9.3 UPnP

The VGADVI Broadcaster supports a set of networking protocols named **Universal Plug and Play** (**UPnP**). It allows you to discover a presence of the functioning VGADVI Broadcaster on the network using a device such as media player connected to a TV set. Once the VGADVI Broadcaster is connected to a network, it automatically establishes working configuration with the media player and can share the data stream.
To use the UPnP functionality, you must configure the following file and streaming settings in the Web Admin interface:

Video codec	H.264
Audio codec	MP3 or AAC. Alternatively you may configure UPnP without selecting any audio codec.
File type	MPEG-TS – to obtain access to the files recorded earlier.

This functionality is enabled in the **UPnP** section of the Web Admin interface. The media player identifies the VGADVI Broadcaster as a media server. In the explanations below the UPnP settings are illustrated by the example of the media player Asus O!Play.

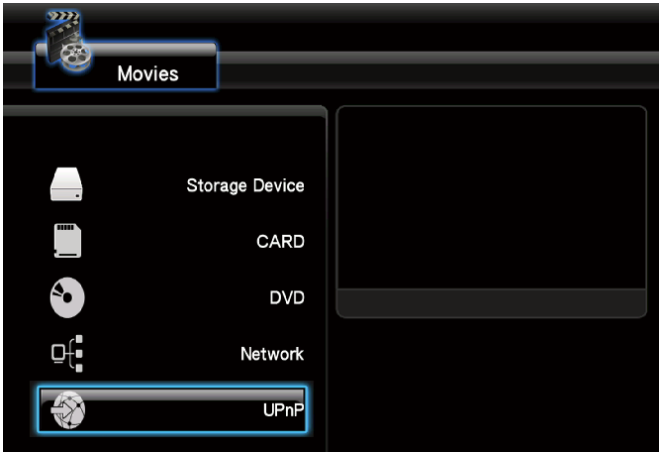
To establish UPnP connection:

1. Set up the VGADVI Broadcaster and start streaming/recording.

Make sure the viewer password is not set up.

2. If necessary, in the **UPnP** section use the **Server** field to name the media server (VGADVI Broadcaster).
   You can use the following characters: A-Z, a-z, 0-9, _, :, @, ^, #, -. {}, [], ().
3. In the **UPnP** section select the **Share live video through UPnP** checkbox if you want to share live video streaming only.
4. Select the **Share recorded files through UPnP** checkbox if you want to share recorded files only.
   If none of these check boxes is selected, the media server will not be displayed on the local network.
5. Connect your media player to your TV set.
6. Power on the media player and select the UPnP option in the player's interface.

Figure 34 UPnP Option in the Media Player's Interface



7. Select the media server.
   The media player displays either Live Streams or Recorded Files folder depending on settings (see steps 3 and 4). In case both check boxes were selected, both folders will be visible.

Figure 35 Live Streams and Recorded Files Folders

8. Select the folder and the required stream or recorded file. All files are sorted by date (Last 24 hours, last month, last week, older).

Figure 36 Sorted Files in the Folders

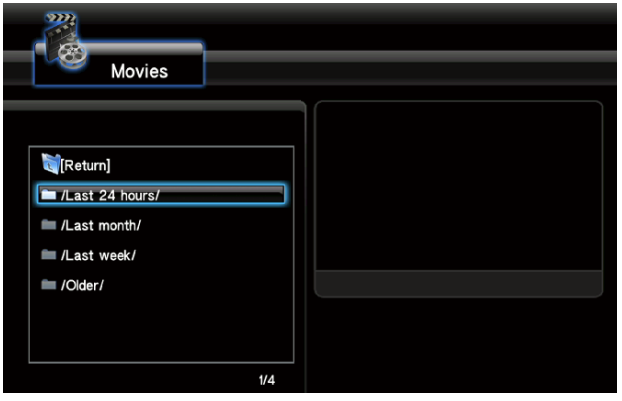
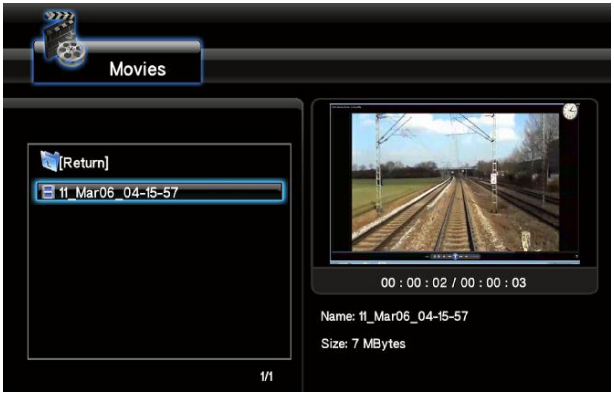


Figure 37 Selecting Live Stream



9.4 Viewing Streaming Video

The VGADVI Broadcaster may capture audio and video at resolutions up to 1920 x 1200. The resolution of the broadcast may exceed this value, for example, in case of analog video broadcasting.

Viewers can access the broadcasted video streams with a web browser that supports Motion JPEG, MPEG4 or Flash Video/H.264 compression or with a media player that is compatible with the stream format being transmitted. The available video stream formats is determined by selected video codec. Audio is available for all formats except from Motion JPEG.

9.4.1 Retrieving the Stream's URL for Broadcasting

In order for viewers to log in and view a stream, the administrator must release the URL(s) of the stream. The administrator is able to provide separate URLs for the stream coming in from the VGADVI Broadcaster's video input ports and audio input ports. Alternatively, one URL can be provided that includes all the streams from all input sources. The administrator can retrieve the appropriate stream URL or URLs as explained below.

9.4.2 Using the Web Admin Interface's Info Page

The following indicates where each URL for the broadcast can be found on that page:

Live broadcast is the URL for the simultaneous broadcast from both video sources and the one audio port. If the **Single Channel Stream** mode is enabled (see **User**

Viewing Experience: Single Channel Stream vs. Independent Streams), this URL is used to view video from both DVI and S-Video inputs. The Live View button (see the section **Using the Web Admin Interface's Live View Feature**) performs the same action.

URLs for the broadcast coming from the DVI port are named as shown below:

http:// (or rtsp://)***.***.***.***:***/stream.***

URLs for the broadcast coming from the S-Video port are named as shown below:

http:// (or rtsp://)***.***.***.***:***/stream_video.***

URL for the broadcast coming from the DVI port (in case you accessed the device through serial discovery as explained in Access through Service Discovery):

http:// (or rtsp://)<s/n>.local:***/stream_video.*** where s/n is the serial number of the device

URL for the broadcast coming from the S-Video port (in case you accessed the device through serial discovery as explained in Access through Service Discovery):

http:// (or rtsp://)<s/n>.local:***/stream.*** where s/n is the serial number of the device

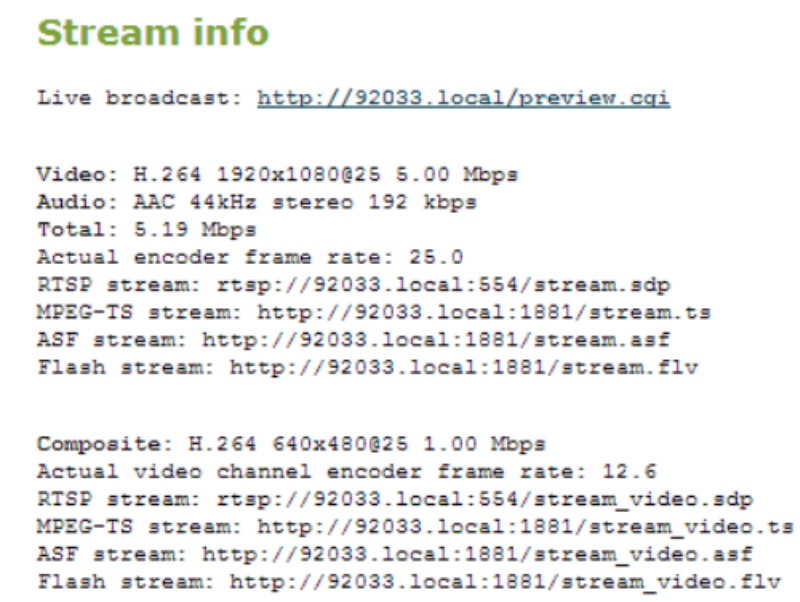
If you selected the **Motion JPEG** codec (see the Select Video Codec section), the following information is displayed:

Snapshot http://***:*/image.jpg

The incoming analog signal's type, S-Video or composite, is determined automatically and displayed. This URL is displayed only if the **Independent streams** mode is enabled**.**

See an example below.

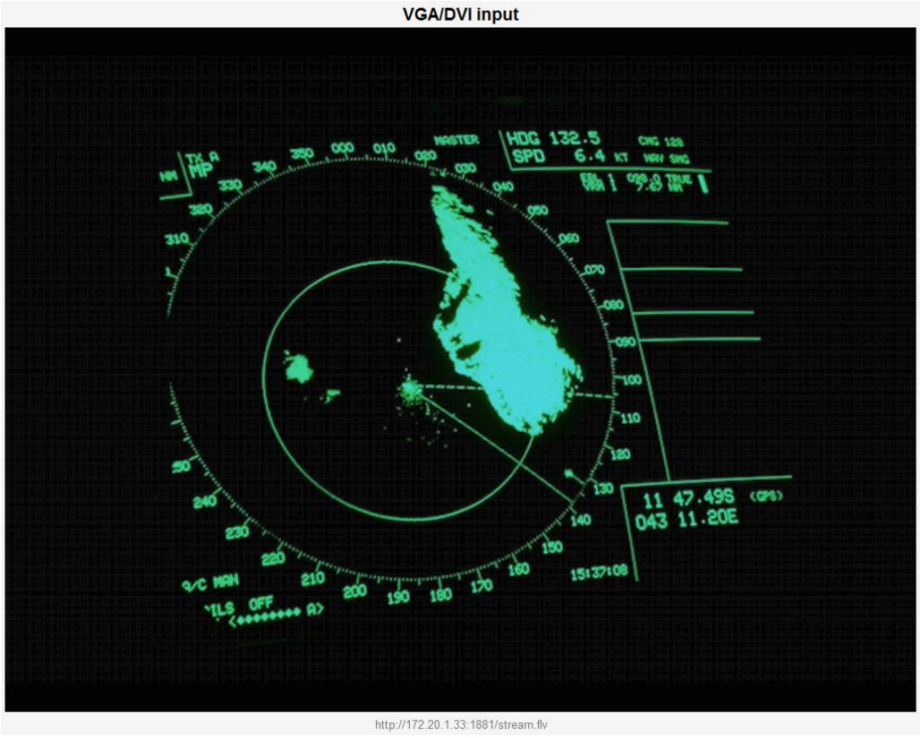
Figure 38 URLs of the Broadcast Displayed in the Stream Info Section



9.4.3 Using the Web Admin Interface's Live View Feature

The second method for retrieving the desired broadcast URLs is to use the Web Admin interface's Live View Feature. This feature not only shows the current broadcast to the administrator but also provides the broadcast URLs. By clicking on the **Live View** button from the main menu, a preview of the current broadcast's videos appear in the web browser. Under each of the broadcast screens the system displays the URL of that broadcast. For an example refer to the following figure:

Figure 39 A Broadcast with its URL Displayed Under the Broadcast Image



9.5 Viewing a Broadcast with a Browser

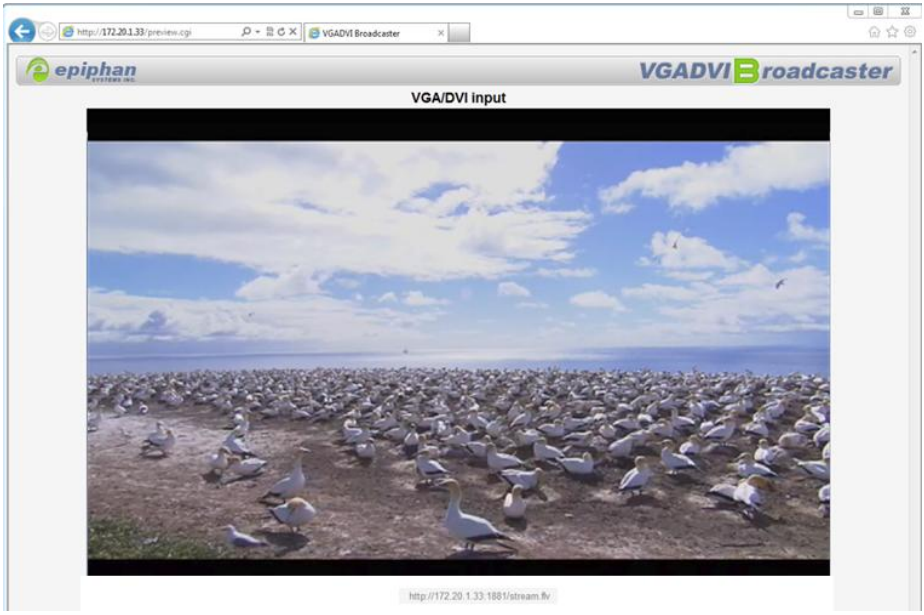
If the administrator has configured a viewer password, participants must obtain the password in order to log in. The administrator will also provide the IP Address or the URL to be used by the viewer's browser.

To log in to view the broadcast using a browser:

1. Start any web browser.
2. Browse to the IP address of the VGADVI Broadcaster's broadcast stream. For example, if the IP address of the VGADVI Broadcaster's broadcast is **172.20.1.33**, then browse to: http:// **172.20.1.33**
3. Enter the following:
   User Name: **viewer**
   Password: (enter the viewer password).
4. Press Enter.

5. The broadcast begins to play within the viewer's browser.

Figure 40 Viewing a Broadcast Using a Web Browser



9.6 Viewing a Broadcast with a Media Player

If the administrator has configured a Viewer password, participants must obtain the password in order to log in. The administrator will also provide the IP Address or the URL to use within the media player.

To log in to view a stream using a media player:

1. Launch the media player.
2. Use the Menu bar to open the URL dialog box and enter the URL address of the stream.
3. When prompted, enter the following:
    a. User name: **viewer**
    b. Password: enter the viewer password.
    c. Press Enter.
4. The stream begins to play within the viewer's player.

9.7 Compatibility Information

This section provides information on compatibility of video streaming formats and player which is necessary for streaming video.

The VGADVI Broadcaster can stream video using Flash (H.264), ASF (MPEG4 or H.264 codecs), Motion JPEG or RTSP (MPEG4 or H.264 codecs). A quick definition of these video streaming methods and the type of application that a viewer would use to watch that particular video stream is now provided.

The **Adobe Flash Video file type** is proprietary but is supported on most web browsers and on many media players including the VLC Media Player. This file type supports the H.264 standard. This video supports analog audio from an external source.

The **Advanced System Format (ASF) file type** also called Advanced Streaming format, can be viewed with the Windows Media Player or the VLC Media Player. Additional codecs may need to be installed to view ASF files. This file type supports H.264 and MPEG4 standards. This video supports analog audio from an external source.

The **Motion JPEG file type** records each frame in the video in JPEG format and can be viewed using most web browsers. This video format does not support analog audio from an external source.

The **RTSP type** supports many media players including QuickTime and MPlayer. This file type supports H.264 and MPEG4 standards. This video supports analog audio from an external source.

MPEG-TS is a standard format for transmission and storage of audio, video, and Program and System Information Protocol (PSIP) data. It is used in broadcast systems such as DVB, ATSC and IPTV. It supports such media players as MPlayer, VLC Media Player, KMPlayer,

The following table displays the compatibility between the video/audio codecs and the file formats during data streaming.

Video codec selected	Audio codec selected	RTSP	FLV	ASF	MPEG-TS	MJPEG
H.264	No audio codec	+	+	+	+	-
H.264	LPCM	+	+	+	-	-
H.264	G.711	+	-	+	-	-
H.264	MP3	+	+	+	+	-
H.264	AAC	+	+	+	+	-
MPEG-4	No audio codec	+	-	+	-	-
MPEG-4	LPCM	+	-	+	-	-
MPEG-4	G.711	+	-	+	-	-
MPEG-4	MP3	+	-	+	-	-
MPEG-4	AAC	+	-	+	-	-
MJPEG	No audio codec	-	-	-	-	+

The following table displays the compatibility between the video/audio codecs and the file formats during data recording.

Video	Audio	AVI	MOV	MPEG-TS
H.264	No audio codec	+	+	+
H.264	LPCM	+	+	-
H.264	G.711	+	+	-
H.264	MP3	+	+	+
H.264	AAC	+	+	+
MPEG-4	No audio codec	+	+	-
MPEG-4	LPCM	+	+	-
MPEG-4	G.711	+	+	-
MPEG-4	MP3	+	+	-
MPEG-4	AAC	+	+	-
MJPEG	No audio codec	-	-	-

10 Recording

The VGADVI Broadcaster captures video and audio data which can be encapsulated in a file or files and recorded.

The Web admin interface provides the administrator and operator users with the ability to start, stop and configure the recording. Additionally, recorded video files might need to be downloaded or copied to another device for archiving purposes; also they might need to be deleted in order to manage disk space on the VGADVI Broadcaster. For organizing, recorded video files may need to be renamed. All of these management tasks are available via the VGADVI Broadcaster's Web admin Interface.

10.1 User Viewing Experience: Single Channel Stream vs. Independent Streams

Streaming and recording of all synchronized input sources can be performed in either of the following modes:

Single Channel Stream

Both video sources are combined into one and streamed to a common URL. Both video tracks and the audio track are combined and recorded to one video track and one audio track. The viewer is enabled to watch two different video sources at the same time and specify whether both streams are superimposed or not.

To enable Single Channel Stream Mode:

1. Select the Stream Setup menu option.
2. Select the **Enable video channel** check box.
3. Select either Video inside DVI/VGA or Video outside DVI/VGA radio buttons (**Picture-in-picture layout** field) in the Video channel pane.

Independent Channel Stream

In this mode each video source is streamed to a distinct URL. Both video tracks and the audio track are recorded to a multi-track file. Independent streams can be viewed in the separate windows of a browser or a media player. In this mode you should select the H.264 codec with Video encoding profile set as Main or High.

In this mode you are unable to publish both streams using the Publish Stream function. Also note that in this mode only a URL for the broadcast coming from the DVI input can be used for publish streaming.

To decide which mode to select you need to know how you will use the VGADVI Broadcaster. For example, the **Single Channel Stream** mode is ideal to deliver presentation material while the narrator is giving his comments. It is an effective way to create movies in sign language. As for the **Independent Channel Stream** mode, it is appropriate when a viewer does not need to watch both video streams simultaneously.

If you are streaming both video sources and an audio source using this mode, note that audio will be available with a DVI/VGA stream only.

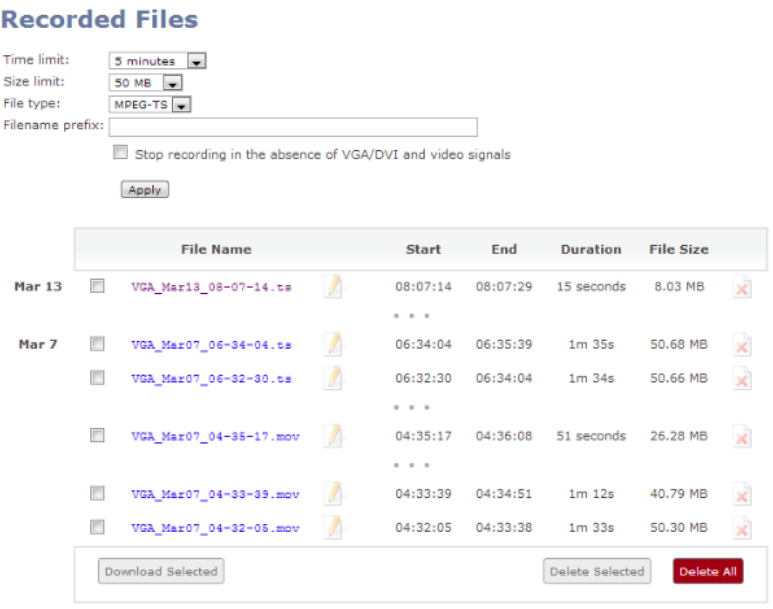
To enable Independent Channel Stream Mode:

1. Select the Stream Setup menu option.
2. Select the **Enable video channel** check box.
3. Select the **Independent streams** radio button (**Picture-in-picture layout** field).

10.2 Selecting Recording File Format

The format of the record is specified using the **Recorded Files** button of the Web admin interface.

Figure 41 Select Recording Format



1. Use the **File Type** drop-down list to select the recording format. The following file formats are available:
   - **MOV**
   - **AVI**
   - **MPEG-TS**

2. Click **Apply**.

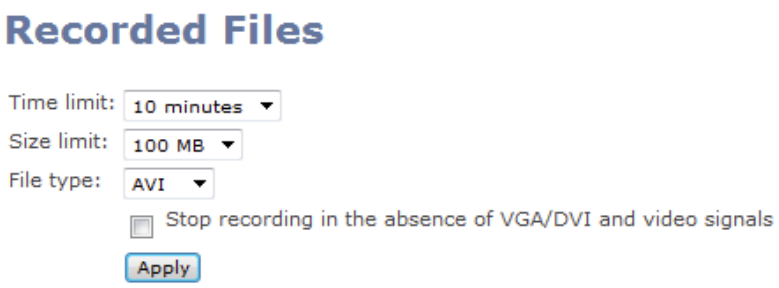
10.3 Changing Time and Size Limits

The VGADVI Broadcaster can record the channel to one or more files according to time and file size limit parameters. It will automatically create and start recording to a new file whenever either limit is reached.

To specify the time and file size limit parameters:

1. Click the **change** command.
2. Select the parameters values from the drop-down list (see Figure 42 Changing Time Limit and Size Limit).

Figure 42 Changing Time Limit and Size Limit



3. Click **Apply**.

Table 11 Time and file size limit parameters

Time limit	Specify the maximum amount of time to record to a file. When either the time limit or the size limit is exceeded, the system starts recording data to a new file.
Size limit	Specify the maximum size of the recorded file. When either the time limit or the size limit is exceeded, the system starts recording data to a new file.

10.4 Selecting File Prefix

You can specify a prefix to the recorded file names. All recorded files will start with this prefix. If you have not specified any prefix, the system will use a prefix VGA by default.

To select a prefix:

1. Click the **Recorded Files** button of the Web admin interface.
2. Specify the prefix in the **Filename prefix** field.
   You can use the following characters: A-Z, a-z, 0-9, _, , #, -, [], ().
3. Click **Apply**.

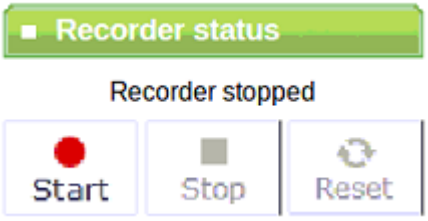
The next file you will record after clicking Apply will have the new prefix you specified.

10.5 Starting and Stopping Recording

The recorder status is shown in the Web Admin interface. It is located on the left hand side of the screen above the Web Admin interface's main menu. The ability to manage a recording with the Web Admin interface is done using these buttons.

Note that the format of the recorded file is specified clicking the **Recorded Files** button and selecting the required **File Type** value.

Figure 43 Recorder Status



To start a recording, click the **Start** button in the Recorder status section of the main menu.

To stop a recording, click the **Stop** button in the Recorder status section of the main menu.

To close the file being recorded and start recording to a new file, click the **Reset** button. Or, alternatively click **Stop** and click the **Start** button again.

It is possible to specify whether the recording is stopped in case there is no signal. To enable this parameter, click the **Recorded Files** button of the Web admin interface and select the **Stop recording in the absence of VGA/DVI and video signals** check box.

Note that in case both signals are streamed via DVI and video ports, recording will be stopped only if streaming through both ports is interrupted. If either video signal is continued, recording will be continued too.

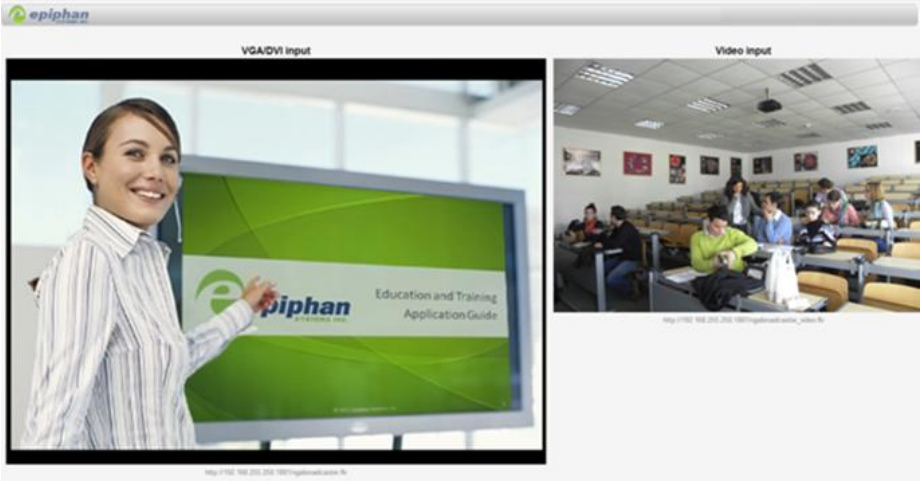
10.6 Viewing the Current Recording

Viewing the broadcast as it is being recorded is performed by doing the following:

Select **Live View** from the Web Admin Interface's main menu. A preview of the broadcast that is currently being recorded appears in the web browser. The preview is exactly the same as what is being recorded.

If the broadcast is coming from two sources through the DVI and S-Video connectors, both will be seen. Under the broadcast screen the system displays the broadcasts' URLs.

Figure 44 Broadcasts Coming from Two Input Sources (Independent Streams Mode)



10.7 Recording a Stream on iPad, iPhone and iTouch

You can record a stream on iDevices using EpiphanTouch™. This discovery and remote control application is available as a free download from iTunes and the App store. It allows you to log into the device as the administrator user. Refer to Epiphan's EpiphanTouch App for iPad, iPhone, iTouch section for details.

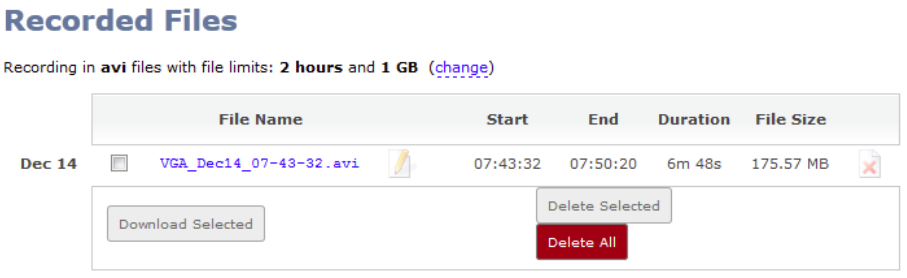
10.8 Recorded Files

The Recorded Files section lists all of the video files recorded by the VGADVI Broadcaster and that are saved on it. It is accessed by clicking the **Recorded Files** button from the Web admin interface's main menu.

If the signals are captured from two input sources, both streams are overlaid during recording. Therefore both input sources will be recorded to one file.

For each file, the list includes the name of the file, start and end times, duration, and size in MB. Each recording file listing also includes icons that can be used to download, delete, or rename the file.

Figure 45 Recorded Files



10.8.1 Downloading Recordings

Download recordings to either save or view them. Also you can download a single file or multiple files as a single .zip file.

1. Click **Recorded Files**.
2. Click the file you want to download. To download multiple files, select the checkboxes beside all of them and then select the **Download Selected** button at the bottom of the file list.
3. Follow the instructions to download the file or files.

If you select the **Download Selected** button, all of the files that you have selected are downloaded in a single zip file. You must unzip this file to view the individual video files.

If you have downloaded multiple files, select **Continue** to return to the previous page.

10.8.2 Deleting Files

The administrator and operator users can delete files from the VGADVI Broadcaster to free up space on the solid state memory. Files can be selected one at a time, or multiple files can be selected to be deleted. Alternatively there is a **Delete All** button

that allows deleting all files that have been previously downloaded. This can be a time-consuming operation.

1. Click **Recorded Files**.
2. To delete individual recordings, select the **Delete File** icon  beside the file you want to delete. To delete multiple files, select the checkbox beside the files you want to delete and then select **Delete Selected**.
3. Follow the instructions to delete the file or files. The files are deleted from the solid state memory.

10.8.3 Renaming Files

The administrator and operator users can rename one file at a time. Again, this function is done by going to the **Recorded Files** section from the Web admin interface main menu.

To rename a file:

1. Click **Recorded Files**.
2. Select the rename file icon  .
3. Enter the new name for the file.
4. Select **Submit**.

10.8.4 Viewing Completed Recording Files

As broadcasts are being recorded into the file, they can be viewed using the Live View button in the Web Admin interface. Closed recordings can be viewed using a compatible media player.

The instructions below explain how to view a closed recording file using the default media player installed on a computer. These instructions will only work when using the default player. To view a closed recording file using another player the closed file will need to be downloaded or copied to a location that is accessible by the player. The recorded file will then be opened from within the player itself.

1. Once the recording is completed, log into the Web Admin interface.
2. Click **Recorded Files** in the main menu and click the file that is to be viewed.
3. The system will suggest you to open the file with the computer's configured default player. For example, for systems running Windows, the default player is the Windows Media Player.
4. The player opens the window with the recording. If you have recorded streams from the two sources in the Independent Stream mode (see **User Viewing Experience: Single Channel Stream vs. Independent Streams mode**), the player will display them in separate windows. If you have recorded streams from the two sources in the **Single Channel Stream** mode, the player will display both streams in one common window.

10.8.5 Viewing Recorded Snapshots

When you take a snapshot using a URL displayed in the Info section (see Using the Web Admin Interface's Info Page), this recorded snapshot is added to the list of the recordings in the Recorded Files section.

10.9 File Transfer of Recorded Files

The VGADVI Broadcaster provides several options to automatically copy recordings to a network storage location, or a USB flash drive. This is a great feature for professional AV service providers that want to provide a copy of the presentation to the speaker before they leave the presentation venue.

10.9.1 Copying Recorded Files to a USB Flash Drive

The VGADVI Broadcaster is equipped with USB ports that can be used to copy recorded data from the VGADVI Broadcaster to an external USB flash drive formatted with one partition in one of the following file systems: FAT32, ext3, ext2, ISO 9660, HFS. This is a great feature for professional AV service providers that want to provide a copy of the presentation to the speaker before they leave the presentation venue.

Figure 46 A USB Flash Drive Connected to a USB port Receives Recorded Data

A flash drive can be connected to the VGADVI Broadcaster any time. Stick a flash drive into a USB port on the device and press lightly. The stick fits into the port only one way. After inserting, the VGADVI Broadcaster will recognize the stick, however, this occurs without any user notification whatsoever.

Figure 47 Insert a USB Flash Disk

The VGADVI Broadcaster copies to the inserted USB flash drive, only files recorded before inserting the flash drive, starting from the oldest record to the newest. The

flash drive's LED (if any) will be blinking indicating data transfer. The VGADVI Broadcaster can copy maximum 100 recorded files to the flash drive. If you are making new recordings during copying data to the flash drive, these new recordings will not be copied.

Due to speed limitations flash drives are not capable of recording data on the fly. This means that while the previously recorded data captured by the VGADVI Broadcaster on its internal solid state memory will be copied to the flash drive, the currently opened recording file cannot be copied until the file is closed. Once closed, it is then available for copying.

Once the data has been copied, safely remove the flash drive. To check its free storage, files that have been copies and their size, insert the drive into a computer and see its properties.

10.10 Automatic File Upload

The automatic file upload feature will automatically copy recorded video files from the VGADVI Broadcaster to another device on your network. This feature's page is reached from the Web admin interface's main menu by clicking on **Automatic File Upload**.

By uploading recorded broadcast files to another network device, these broadcasts become available to be viewed from other device besides the VGADVI Broadcaster. This feature also provides a method of automatically archiving recorded broadcast files after they are closed.

Note that the files that are currently being copied to another device on your network, have an extension **.part**. The image below is a screenshot from the user's PC. There is a folder where the files are being copied from the VGADVI Broadcaster. Copying is enabled. One file with the extension **.part** is now being copied from VGADVI Broadcaster.

Figure 48 This File is Being Copied Now

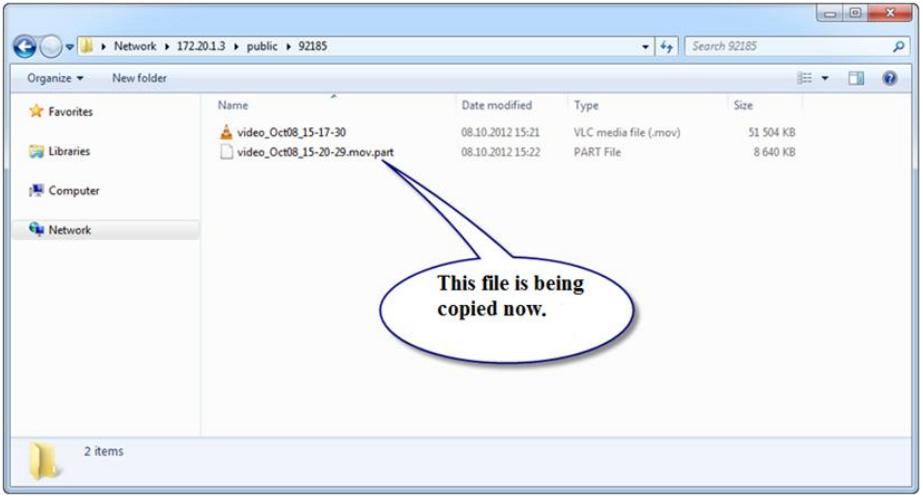
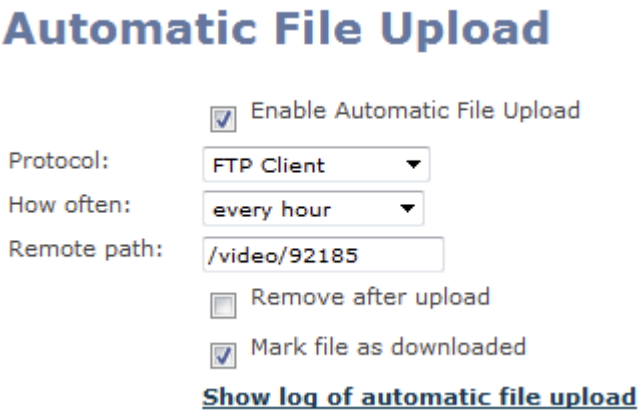


Table 12 ***Automatic File Upload Configurable Options***

Enable Automatic File Upload	Check this box to enable this feature, uncheck this box to disable this feature.
Protocol	Select the upload client.
How often	Select how often video files are to be uploaded. By selecting **On file rotation**, the VGADVI Broadcaster uploads each video file after it stops recording the current video file and starts recording the next one. You can also configure the VGADVI Broadcaster to upload all video files every 1, 6, 12, or 24 hours.
Remote path	The path on the upload server to upload the video files to. This path must match an actual path on the server. If a path is not entered, the files are uploaded to the root location.
Remove after upload	If you select this checkbox, the video files will be deleted on VGADVI Broadcaster after uploading. In case the check box is not selected, the

	system check if there is enough place for a new file based on the size limit value (please refer to **Changing Time and Size**). If there is not enough place, the system deletes the oldest files.
Mark file as downloaded	Select the checkbox to keep the files on VGADVI Broadcaster after uploading copies to the server. The filenames before uploading are displayed in blue. The filenames after uploading are displayed in purple.
Show log of automatic file upload	Use this command to display the log of file uploads

Figure 49 Configuring the Automatic File Upload Feature



10.10.1 Configuring Automatic File uploads

Recorded files can be uploaded to a CIFS server (a Windows share), an RSync server, or an FTP server.

1. Select **Enable Automatic File Upload**.
2. Set **Protocol** to *FTP Client*, *RSync Client*, or *CIFS client* depending on what upload server is being used.
3. If the **How often** option is set to *On file rotation,* the VGADVI Broadcaster will upload each video file after it stops recording to it. Alternatively, the

VGADVI Broadcaster can be set to upload all video files every 1, 6, 12, or 24 hours.

4. Set **Remote Path** to the path on the upload server to upload the video files to. This path must match an actual path on the server. If a path is not provided, the files are uploaded to the root location.
5. Select the **Remove after upload** checkbox to delete all video files on the VGADVI Broadcaster after uploading them.
6. Select **Mark file as downloaded** to keep the files on the VGADVI Broadcaster device after uploading copies to the server. The filenames before uploading are displayed in blue. The filenames after uploading are displayed in purple.
   Note: In case you select both checkboxes (**Remove after upload** and **Mark file as downloaded)** the files uploaded to server will be removed from the device.

7. Configure the appropriate client for the designated upload server:

   - If the upload server is a CIFS server (for example, a Windows shared folder), select and configure the CIFS Client. See **Configuring a CIFS Client**.
   - If the upload server is an RSync server, select and configure the RSync client. See **Configuring an RSync Client**.
   - If the upload server is an FTP server, select and configure the FTP Client. See **Configuring an FTP Client**.

8. Click **Apply**.

The first copy is made after the time period set in **how often** expires. For example, if the VGADVI Broadcaster is set to upload files every hour, the first set of files is uploaded after one hour. If five video files are saved in the first hour, those five video files are uploaded. One hour later, all of the video files saved since the start of that hour are uploaded.

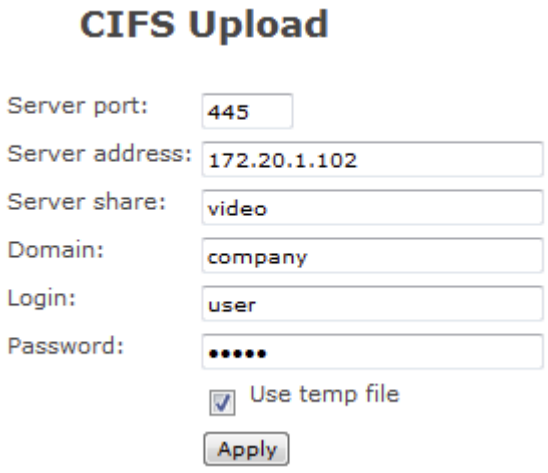
Video files saved before you selected **Apply** are not uploaded. For files saved before Automatic File upload is configured, a manual upload process will have to be done.

10.10.2 Configuring a CIFS Client

Use the CIFS client configuration to have the VGADVI Broadcaster device behave as a CIFS client connecting to a CIFS server (such as a Windows shared folder) when uploading broadcast files. Different networks may have different CIFS server

configurations. If required, contact your network administrator for assistance with getting the VGADVI Broadcaster to connect to the server. Depending on your CIFS server configuration you may not have to enter information in every field shown in the following diagram.

Figure 50 Configuring a CIFS Client



To configure the CIFS client:

1. Select *CIFS Client* in the **Protocol** field.
2. Enter the **Server port** if the CIFS server uses a non-standard port. If your CIFS server uses standard ports you should not have to add any information to this field. If your server uses non-standard ports or looks for a non-standard port first, enter the port number in this field.
3. Enter the **Server address**. This can be the numeric IP address or fully qualified domain name of the CIFS server.
4. Enter **Server share**. This is the CIFS share name or the name of the Windows shared folder on the CIFS server.
5. If required, enter the name of the CIFS **Domain**. The Domain can be a Windows Domain or Work Group name.
6. Enter the **Login** and **Password** required to authenticate with the CIFS server to connect to the server share.
7. Select the **Use temp file** check box to upload a temporary file. This prevents you from using a file which is not fully uploaded yet. After the file is uploaded, it is renamed to its original name.

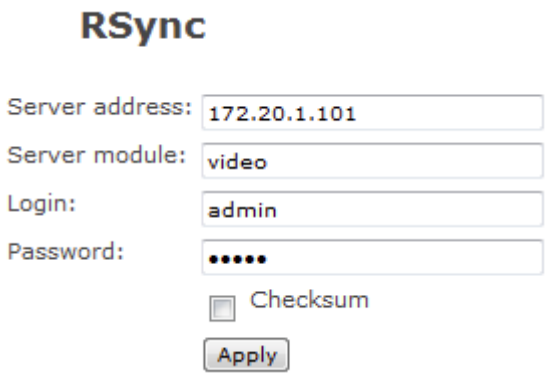
8. Select **Apply**.

The VGADVI Broadcaster will then attempt to connect to the CIFS server. To view messages about whether the VGADVI Broadcaster is able to connect to the CIFS server and the status of the connection, click **Show log of automatic file upload (**Figure 49 Configuring the Automatic File Upload Feature**)**.

10.10.3 Configuring an RSync Client

Use the RSync client configuration to have the VGADVI Broadcaster act as an RSync client connecting to an RSync server. Different networks may have different Rsync server configurations. If required, contact your network administrator for assistance with getting the VGADVI Broadcaster to connect to the server.

Figure 51 Configuring an RSync Client



To configure the RSync client:

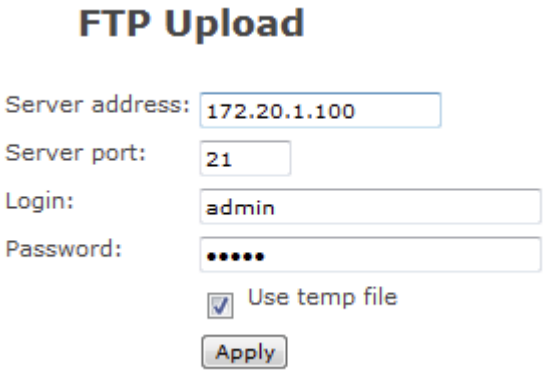
1. Select *RSync Client* in the **Protocol** field.
2. Enter the **Server address**.
3. Enter **Server module** which is a directory on the RSync server.
4. Enter the **Login** and **Password** required to authenticate with the RSync server to connect to the server share.
5. Select the **Checksum** checkbox to enable computing checksums algorithm applied during file synchronization between sender and recipient servers.
6. Select **Apply**.

The VGADVI Broadcaster will then attempt to connect to the RSync server. To view messages about whether the VGADVI Broadcaster is able to connect to the RSync server and the status of the connection, click **Show log of automatic file upload (**Figure 49 Configuring the Automatic File Upload Feature**)**.

10.10.4 Configuring an FTP Client

Use the FTP client configuration to have the VGADVI Broadcaster act as an FTP client to an FTP server to upload broadcast files. Different networks may have different FTP server configurations. If required, contact your network administrator for assistance with getting the VGADVI Broadcaster to connect to the server.

Figure 52 Configure an FTP Client



To configure the FTP client:

1. Select *FTP Client* in the **Protocol** field.
2. Enter the **Server port** if the FTP server uses a non-standard port. The standard FTP port is TCP 21.
3. Enter the **Server IP address**.
4. Enter the **Login** and **Password** required to authenticate with the FTP server to connect to the server.
5. Select the **Use temp file** check box to upload a temporary file. This prevents you from using a file which is not fully uploaded yet. After the file is uploaded, it is renamed to its original name.
6. Select **Apply**.

The VGADVI Broadcaster will then attempt to connect to the FTP server. To view messages about whether the VGADVI Broadcaster is able to connect to the FTP server and the status of the connection, click **Show log of automatic file upload (**Figure 49 Configuring the Automatic File Upload Feature**)**.

10.10.5 Testing the Automatic File Upload

Test the automatic file upload to ensure all settings are correct.

To test automatic file upload:

1. Confirm that the upload server is operating.
2. Start recording the stream.
3. Log into the Web admin interface.
4. Select **Automatic File Upload**, from the main menu.
5. Set the **How Often** setting to *On file rotation*.
6. Click the **Reset** button in the main menu. The file currently being recorded will be closed and saved.
7. The recording will then be uploaded to the configured remote path using the configured client.
8. Check the server to confirm that the most recently saved video file has been uploaded to it and it is in the proper path location on that server.

If the file is not uploaded, click **Show log of automatic file upload** to view the log. Verify that the client configuration and Automatic File Upload configuration settings are correct. Check the remote device's root path, if the remote path is incorrectly configured, the broadcast file will be uploaded to that location.

Check the **Recorded Files** page from the Web admin interface:

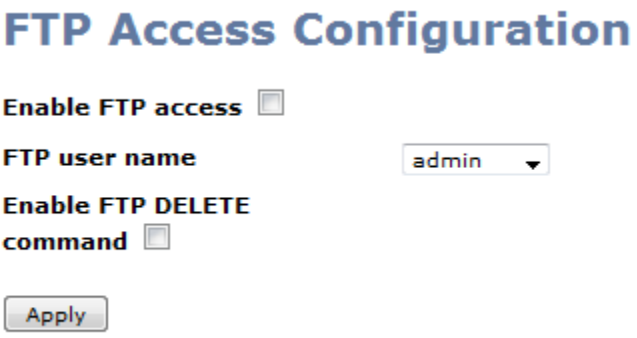
If the **Remove after upload** checkbox is selected, the uploaded file should have been deleted from the **Recorded Files** section.

10.11 FTP Server

An FTP server can be configured on the VGADVI Broadcaster to enable a FTP client to connect to the VGADVI Broadcaster's internal solid state memory. An FTP client can be used to manually download video files from the VGADVI Broadcaster. FTP access can also be given permission to delete video files remotely from the VGADVI Broadcaster.

The FTP access options are accessible from the Web admin interface's main menu, **FTP Server**.

Figure 53 FTP Server Options



Enable FTP Access	Enables FTP access to the VGADVI Broadcaster.
FTP user name	Select one of the following users as the FTP client: • admin • operator • viewer
Enable FTP DELETE command	Select this option to grant the FTP client the ability to delete videos from the VGADVI Broadcaster internal memory.

11 Networking

11.1 Connecting Directly to the System

This section discusses how to directly connect to the VGADVI Broadcaster using the factory default network settings. This method must be used if the network where the VGADVI Broadcaster resides does not have a DHCP server, you have lost the correct network settings or it is desired to simply connect a capture workstation and the VGADVI Broadcaster without a router, by simply using a direct connect Ethernet cable.

The next section discusses tools that can be used to discover the VGADVI Broadcaster that has been plugged into the local network and been assigned an

appropriate IP address for the given network by a DHCP server. This network discovery also applies if the device was assigned a static IP.

Either method, connecting directly or connecting using network discovery, is required to access the VGADVI Broadcaster to allow for further configuring of the device.

11.1.1 Rescue Settings

The VGADVI Broadcaster comes with the following static address settings:

IP: 192.168.255.250 (this special IP address is permanent to improve safety).

Netmask: 255.255.255.252

User Name: admin (no password)

For more information on the admin user, see the section **Configuring Administrator Access** .

11.1.2 Connecting Directly to the VGADVI Broadcaster

Using the default network settings, perform the following steps:

1. Record the network settings of the workstation being used to connect to the VGADVI Broadcaster so that they can be restored later if needed.
2. Temporarily change the network configuration on the workstation to the following:
    a. Static IP assignment
    b. IP address: 192.168.255.249
    c. Subnet mask: 255.255.255.252
3. Establish an Ethernet connection between the VGADVI Broadcaster and the workstation by one of the following methods:
    a. Connect the VGADVI Broadcaster's Ethernet port to the same Ethernet network as the workstation
    b. Connect the VGADVI Broadcaster's Ethernet port to an Ethernet network switch and connect the workstation's Ethernet to that same switch.
    c. Connect the VGADVI Broadcaster's Ethernet port directly to the workstation's Ethernet port using either a regular or a crossover Ethernet cable.
4. Start a web browser on the workstation and browse to: http://192.168.255.250/admin/
5. Log in as the administrator user:
   User Name: **admin**

Password:**<return>**

6. The VGADVI Broadcaster's Web admin interface opens. See the chapter, **Web Admin Interface**, for more details on using the Web admin Interface to configure the VGADVI Broadcaster.
7. Restore the previously save network configurations on the workstation.

11.2 Network Discovery of the VGADVI Broadcaster

Instead of connecting directly as described in the previous section, to the VGADVI Broadcaster, the VGADVI Broadcaster can be discovered on the network and its IP address can be obtained.

You can easily access the VGADVI Broadcaster in the network using service discovery tools. Please refer to **Access through Service Discovery** section.

When the VGADVI Broadcaster device is configured for DHCP and has been plugged into a network with a DHCP server, the DHCP server automatically assigns an IP address to the VGADVI Broadcaster relevant to the network. Determining the IP address assigned to the VGADVI Broadcaster is required to access the VGADVI Broadcaster to allow for further configuring of the device.

There are tools that will return the VGADVI Broadcaster's IP address. Epiphan provides two such tools and they are described in the following section.

Alternatively, contact the relevant network administrator to retrieve the VGADVI Broadcaster's IP address.

Regardless of the method used to obtain the VGADVI Broadcaster's IP address, its assigned IP address is required to allow for any further configuring.

11.2.1 Epiphan's Network Discovery Utility

Epiphan's Network Discovery Utility runs on a Windows based PC. It finds the VGADVI Broadcaster device on the network and displays its assigned IP address. The Network Discovery Utility can also be used to connect to the VGADVI Broadcaster Web admin interface tool.

11.2.1.1 To install Epiphan's Network Discovery Utility Tool

1. Find the latest Network Discovery Utility on the website's download page (http://www.epiphan.com/downloads/).
2. Select **Download Network Discovery Utility**. Ensure to note the download destination folder.
3. Run NetworkDiscovery.exe from the above noted download destination folder.
4. Select Search to find the Epiphan devices connected to the network.

The Network Discovery Utility can only find the Epiphan devices on the same network as the Windows PC that is running this utility.

11.2.2 Epiphan's EpiphanTouch App for iPad, iPhone, iTouch

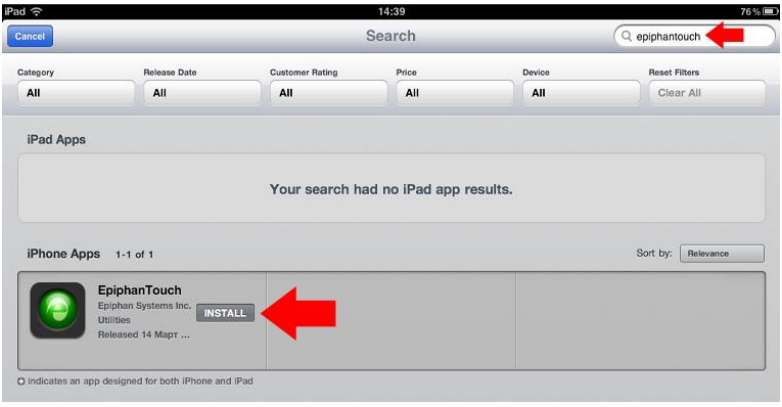
EpiphanTouch™ is a discovery and remote control application available as a free download from iTunes and the App store.

EpiphanTouch finds, provides the IP address, and can be used as a remote control to start and stop broadcastings and recordings on the VGADVI Broadcaster. It will list all Epiphan devices including the VGADVI Broadcaster operating on the same network as the iPhone, iTouch, or iPad that is running the EpiphanTouch application.

11.2.2.1 To install and use EpiphanTouch from iTunes:

1. Either follow the URL to go directly to the EpiphanTouch page in the App store:http://itunes.apple.com/pk/app/epiphantouch/id424405619?mt=8# or search for the EpiphanTouch application in the App Store using the **Search** field.

Figure 54 Search for EpiphanTouch in the App Store



2. Install the EpiphanTouch App on your iDevice.
3. The EpiphanTouch will discover all Epiphan devices. The IP addresses of all devices will be displayed. Record the IP address corresponding to the VGADVI Broadcaster you want to configure. If there is more than one Epiphan device on the network, you can identify your VGADVI Broadcaster by the serial number displayed.
4. To use EpiphanTouch's remote control feature, select the desired VGADVI Broadcaster and log into the device as the administrator user. See section The Administrator User for more details about logging into the VGADVI Broadcaster.

Figure 55 Log into the VGADVI Broadcaster as the Administrator

5. Start or stop video capturing and recording.

11.3 Setting IP Address

Changing the network configuration involves setting how the VGADVI Broadcaster receives an IP address. IP Addresses can be assigned statically or dynamically with the use of a DHCP server. For network configuration changes to take effect, the VGADVI Broadcaster device must be rebooted after making the changes, refer to the section **Rebooting or Restarting VGADVI Broadcaster**.

If the IP address is changed, the VGADVI Broadcaster must be removed from the Network Discovery Utility and then re-discovered by selecting **Search**.

Additionally, the VGADVI Broadcaster's MAC address is displayed on the Network Configuration page. Providing the MAC address to your network administrator may be helpful for managing your network.

11.3.1 Set the VGADVI Broadcaster to use a static IP address

1. Log into the Web admin interface.

2. Select **Network** from the main menu.
3. Select **Use static address**.

   Enter an IP Address, Network Mask, Default Gateway, and DNS Server that are valid for your network. Ensure that this gateway setting is the gateway of your local LAN, i.e. the local router. Contact your network administrator if you are not sure what information to use. The IP address, Network Mask, Default Gateway, and DNS Server assigned must be compatible with your network.
4. Select **Apply** to save these changes.
5. Select **Maintenance**.
6. Select **Reboot Now**.
7. It takes a few minutes for the VGADVI Broadcaster device to reboot.
8. After a few minutes log into the Web admin interface. Logging into the Web admin interface can be done by:
   a. Using a browser and browsing to the new IP address assigned to the VGADVI Broadcaster.
   b. Using the Network Discovery Utility, see section **Logging into the Web Admin Interface** for more details.
9. Re-log into the Web admin interface using the administrator username and password.

11.3.2 Set the VGADVI Broadcaster to use a DHCP server

By default, the VGADVI Broadcaster is configured to connect to a network using a DHCP server, the DHCP server will automatically configure the network settings and assign a relevant IP address to the VGADVI Broadcaster. This section describes how to re-enable DHCP settings if they have been disabled.

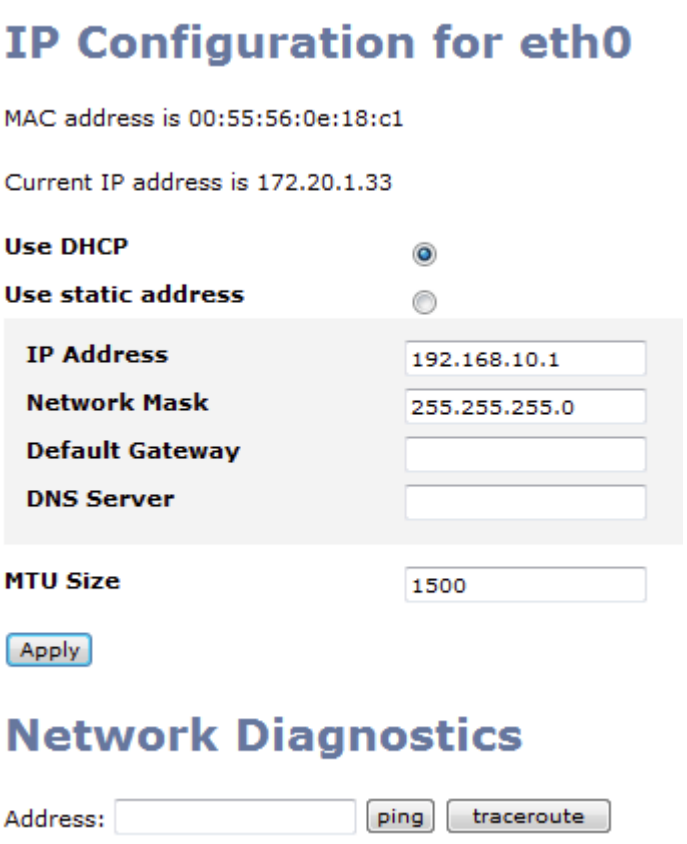
1. Log into the Web admin interface.
2. Select **Network** from the main menu.
3. Select **Use DHCP**.
4. If required, in the **MTU Size** field specify the largest packet size permitted for Internet transmission. If this value is too large for the connection, it

may result in packet loss or dropping Internet connection.

5. The other fields can be left as is.
6. Select **Apply** to save these changes.
7. Select **Maintenance**.
8. Select **Reboot Now**. It takes a few minutes for the VGADVI Broadcaster device to reboot.
9. After a few minutes log into the Web admin interface. Logging into the Web admin interface can be done by:
    a. See the section **Network Discovery of the VGADVI Broadcaster** on how to obtain the IP address for VGADVI Broadcaster
    b. Using a browser and browsing to the new IP address assigned to the VGADVI Broadcaster.
    c. Using the Network Discovery Utility, see section **Logging into the Web Admin Interface** for more details.
10. Re-log into the Web admin interface using the administrator username and password.

The following diagram shows the network page from the Web admin interface and enabling DHCP.

Figure 56 Enabling DHCP



11.3.3 Performing Network Diagnostics

A tool in the Network section of the web interface combines the functionality of the **traceroute** and **ping** programs in a single network diagnostic tool.

Traceroute is a computer network diagnostic tool for displaying the route or path and measuring transit delays of packets across an Internet Protocol (IP) network.

Ping is a computer network administration utility used to test the reachability of a host on an IP network and to measure the round-trip time for messages sent from the originating host to a destination computer.

This tool investigates the network connection between the host that the VGADVI Broadcaster runs on and a user-specified destination host. After entering the URL or

IP address, click either **ping** or **traceroute**. If ping is clicked, the tool determines the reachability of the user-specified host. If **traceroute** is clicked, the route and measures transit delays of packets is displayed. As it does this, the tool displays statistics about each machine.

Figure 57 Statistics displayed by the diagnostics tool after using the Ping utility

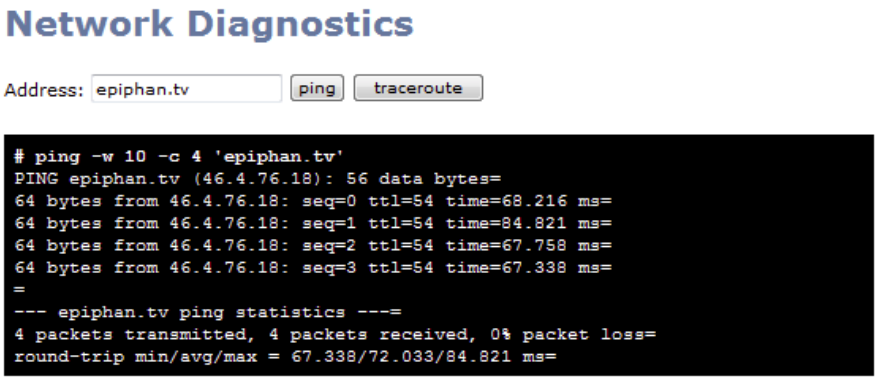
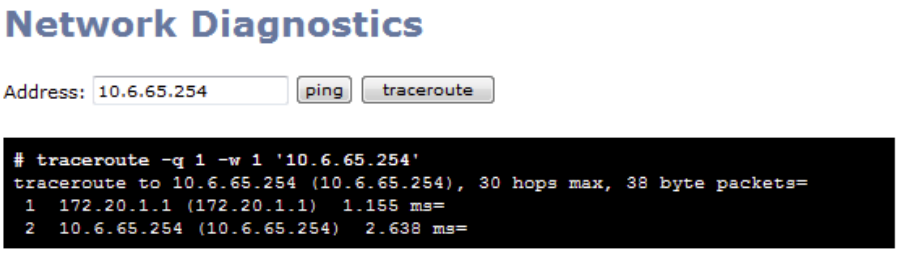


Figure 58 Statistics displayed by the diagnostics tool after using the Traceroute utility



12 System Administration

12.1 Setting the Date and Time

The date and time can be set manually or Time synchronization can be enabled on the VGADVI Broadcaster. Configuring how the date and time is managed on the VGADVI Broadcaster is done by selecting **Date and Time** from the Web admin interface's main menu.

Clicking **Enable Time Synchronization** on the Date and Time page, results in the date and time being received from a public network time protocol (NTP) server. This is done by having the VGADVI Broadcaster connect to the server over the Internet. NTP uses UDP and port 123. The default NTP server is time.nrc.ca. This should be changed to a NTP server that is recommended for your location. This information should be available from your network administrator.

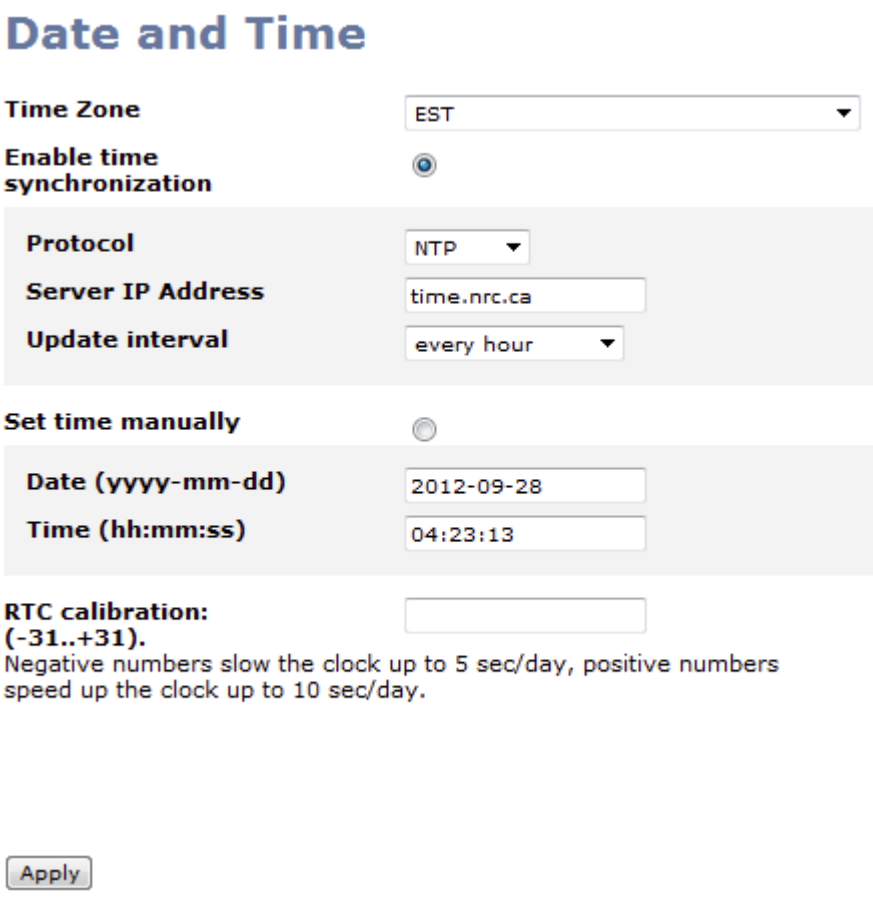
For more information about NTP, including a list of recommended NTP servers, refer to the following webpage: The NTP Public Services Project.

To get the correct time from the NTP server, ensure that the correct Time Zone for the location of the VGADVI Broadcaster is selected.

If the VGADVI Broadcaster device cannot connect to the Internet and there is an RDATE server on the network, you can set time synchronization to use RDATE (as defined by RFC 868). Contact your network administrator for the address of the RDATE server and enter the RDATE server IP address into the Server IP Address field.

In both cases, how often the date and time is updated can be configured. The Time Update interval can be every 1, 6, 12, or 24 hours.

Figure 59 Setting the Date and Time



The following table summarizes the configurable options for setting the date and time.

Table 13 ***Date and Time Configurable Options***

Time Zone	Select the appropriate time zone
Enable time synchronization	This parameter enables time synchronization with a NTP or RDATE server
Protocol	Select the time protocol
Server IP Address	Enter the IP address of the NTP or RDATE server

Update interval	Specify the frequency of time synchronization
Set time manually	This parameter enables manual time setting
Date (yyyy-mm-dd)	Specify the date
Time (hh:mm:ss)	Specify the time
RTC calibration: (-31..+31).	This field allows RTC calibration, the slowing or speeding the clock up to 10 sec/day. Negative numbers slow the clock down up to 5 seconds a day and positive numbers speed up the clock up to 5 seconds a day.

12.2 Configuring Administrator Access

Initial factory settings provide no password for the administrator user. For security reasons, a password to control access to the administration functions should be added.

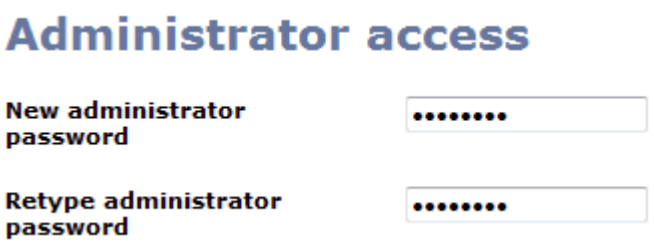
The administrator user's password can be added or changed at any time in the **Access Passwords** section of the Web Admin interface.

If you lose or forget the admin password you can reset the device to its factory default setting. See **Restoring the VGADVI Broadcaster Default Factory Configuration** in order to reset the device to factory defaults.

12.2.1 To add or change the Administrator password

1. Log into the Web admin interface.
2. Select **Access Passwords**.
3. Enter the new password in the **New administrator password** field. The password is case sensitive and can include up to 255 ASCII characters.
4. Repeat the password using the **Retype administrator password** field.
5. Select **Apply**. The Web admin interface will log off the current administrator user.
6. When prompted, re-log into the Web admin interface with the admin user name and the new password.

Figure 60 Adding or Changing the Administrator's Password



12.2.2 Deleting the Administrator password

The administrator password can be deleted if it is not required. However, by removing the administrator password, it makes it easier for unauthorized users to change the VGADVI Broadcaster's configuration.

1. Log into the Web admin interface
2. Select **Access Passwords.**
3. Select **Apply** leaving the administrator password fields blank.
4. When prompted, re-log in leaving the password field blank.

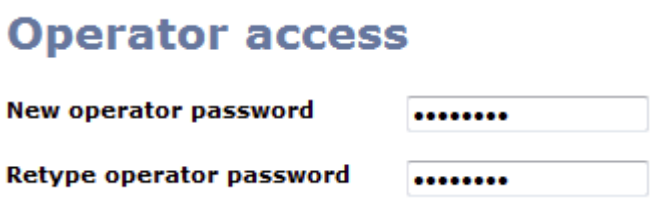
12.3 Configuring Operator Access

An operator's role allows you to grant particular rights to some users. They are able to have access to the recorded files and can adjust frame grabber and audio settings. It is highly recommended to set a password for the operator's role.

12.3.1 To add or change the Operator password

1. Log into the Web admin interface.
2. Select **Access passwords**.
3. Enter the password in the **New operator password** field
4. Repeat the new password in the **Retype operator password** field. The password is case sensitive and can include up to 255 ASCII characters.
5. Select **Apply**.
6. Distribute or communicate the operator access password to authorized operators of the broadcast.

Figure 61 Changing the Operator password



12.3.2 Delete the Operator Password

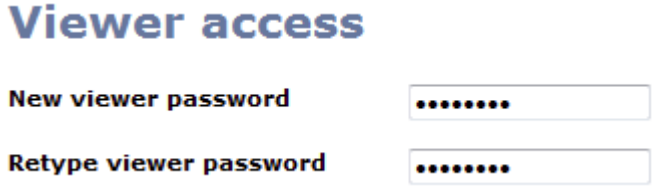
The operator password can be deleted if operators are not required to enter a password to access the broadcast.

1. Log into the Web admin interface.
2. Select **Access Passwords**. The password fields should be blank.
3. Select **Apply** without adding characters to the password fields. The password is deleted.

12.4 Configuring Viewer Access

Controlling viewer access to a broadcast can be done in two different ways. The first is to assign a password to the VGADVI Broadcaster's viewer password and the second is to enable IP Address based authentication. By default the viewer user does not have a password to control access and no IP Address based authentication is enabled. Viewers have access only to Live View functionality in browser or direct streams in player.

Figure 62 Changing the Viewer Password



12.4.1 To add or change the viewer password

Used to add or change the password associated with the viewer user. The viewer access password is the same for all viewers until it is changed. Any viewer that knows the password will continue to have access until the password is changed. It is good practice to change the password each time there is a change in the users that should be authorized to access the broadcast. Please contact your network security administrator with respect to password management required for your applications.

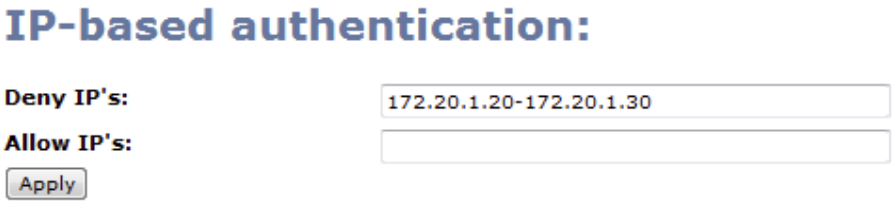
Once a viewer password is configured, participants must obtain the current viewer password in order to log in. The user name is always the same: **viewer.** It cannot be changed. If the viewer password is changed during a broadcast, the broadcast is interrupted and all viewers will be required to re-log in using the new viewer password in order to continue receiving the broadcast. Depending on how the viewer is receiving the broadcast, this will involve clicking the refresh button in the viewer's browser or clicking on the play button in the viewer's media player.

1. Log into the Web admin interface.
2. Select **Viewer Access**.
3. Enter and repeat the new password. The password is case sensitive and can include up to 255 ASCII characters.
4. Select **Apply**.
5. Distribute or communicate the viewer access password to authorized viewers of the broadcast.

12.4.2 Configuring IP-based Authentication for Viewers

This function allows the option of providing access to the broadcast to a large number of users without having each individual user log in with the viewer username and password. This is done by configuring individual IP addresses or a range of IP addresses that are either granted access or denied access to the broadcast. Once set up, users can access the broadcast just by clicking on a supplied link. The administrator for the broadcast would continue to access the Web admin interface using the administrator user credentials to access all features.

Figure 63 IP-based Authentication



If any addresses are specified in the **Allow IP's** field, access to the broadcast will be allowed only for these addresses.

If any addresses are specified in the **Deny IP's** field, access to the broadcast will be forbidden for these addresses and allowed for all other addresses.

The list of allowed IP addresses must be specified in the **Allow IP's** field. All addresses not specified in this field will be considered as denied.

The list of denied IP addresses has a higher priority over the list of allowed IP addresses in case of their intersection. An example of how this is implemented would be the following:

1. In the **Allow IP's** field enter **172.20.1.22, 172.20.1.33**.
2. In the **Deny IP's** field enter **172.20.1.20-172.20.1.30**.

Access to the broadcast will be forbidden for the entire subset of addresses - **172.20.1.20-30**.

The set of users must have a fixed IP address or a range of IP addresses through which they connect to the internet. Individual computers may have dynamic server-assigned addresses but as long as they use a gateway with a static address to access the internet, this feature can be configured

IP authentication is primarily about convenience, rather than extra security. The level of security is comparable with that of a password-based authentication. Bear in mind that anyone who has access to a computer within the specified range will be able to access the broadcast without having to provide log in credentials. Also it is probably not possible to restrict access to a single computer since in most networks a number of computers share a single gateway to the internet.

The table below shows the fields used in configuring IP-based authentication for viewers.

Deny IP's	Enter individual IP addresses separated by a comma or a range of IP addresses that are denied access to the broadcast. To specify a range of addresses, use a hyphen (-). Example 1: **172.20.1.20, 172.20.1.32** Example 2: **172.20.1.1-100**

Allow IP's	Enter individual IP addresses separated by a comma or a subset of IP addresses that are granted access to the broadcast. To specify a range of addresses, use a hyphen (-).

12.4.3 Delete the Viewer Password

The viewer password can be deleted if viewers are not required to enter a password to access the broadcast. If you want to use the UPnP functionality, do not enter any viewer password.

1. Log into the Web admin interface.
2. Select **Viewer Access**. The password fields should be blank.
3. Select **Apply** without adding characters to the password fields. The password is deleted.

12.5 Upgrading the System Firmware

Epiphan releases new firmware version to fix known problems or to add new features. When available, new firmware version can be obtained from Epiphan Support.

Updating firmware can take several minutes. Once a firmware upgrade is started, the VGADVI Broadcaster cannot broadcast or record streams until the firmware upgrade is complete.

When you upgrade the existing firmware, the administrator's password and the operator's password as well as all other settings are preserved.

12.5.1 Installing new firmware

Do not interrupt or power down the VGADVI Broadcaster device during the firmware update.

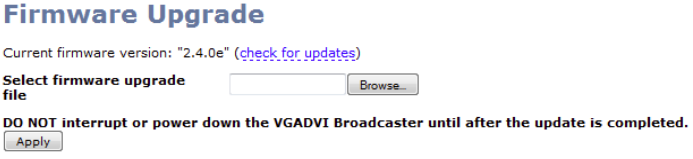
1. Log into the Web admin interface.
2. Select **Firmware Upgrade** from the main menu.
3. Click the **Check for updates** command. The system will indicate whether any updates are available. If updates are available, select **Browse** and then select the downloaded firmware file.
4. Select **Apply**. The firmware file is uploaded to the VGADVI Broadcaster. It then

unpacks the firmware file, verifies the contents and then upgrades the firmware.

5. To complete the firmware upgrade you must reboot the VGADVI Broadcaster. Refer to the section, **Rebooting or Restarting VGADVI Broadcaster**.
6. Log into the Web admin interface and confirm that the VGADVI Broadcaster is now running the new firmware version by selecting **Info** from the main menu and by viewing the firmware version.

Should the firmware update fail, restore to the default factory configuration. Refer to the section **Restoring the VGADVI Broadcaster Default Factory Configuration**.

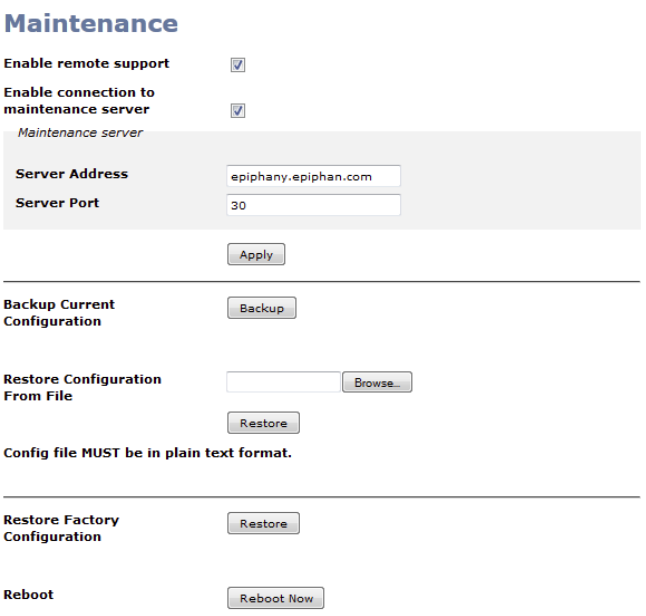
Figure 64 Firmware Upgrade



12.6 Maintenance Controls

From the Web admin interface's main menu, select **Maintenance** to perform operations such as restoring the factory configuration, and rebooting the VGADVI Broadcaster.

Figure 65 Maintenance Options



12.6.1 Restoring the VGADVI Broadcaster Default Factory Configuration

Select **Restore** beside Restore Factory Configuration to reset the stream and frame grabber settings back to the default factory configuration. The default factory configuration is the configuration that the VGADVI Broadcaster had when it was received from Epiphan. It can be useful to return the VGADVI Broadcaster to this configuration if a number of configuration changes have been made that need to be reversed.

Note that restoring default factory configuration also restores default network configuration (DHCP settings are enabled by default).

Pressing the Reset button on the VGADVI Broadcaster will also perform a reset to the default factory configuration. See the section, **System Hardware Features** , for information on the location of the reset button and the proper steps that need to be followed to perform a hardware based factory reset.

12.6.2 Rebooting or Restarting VGADVI Broadcaster

Many VGADVI Broadcaster configuration changes require you to reboot the VGADVI Broadcaster in order to have these changes come into effect, the following outlines the steps to reboot the VGADVI Broadcaster.

1. Log into the Web admin interface.
2. Select **Maintenance**.
3. Beside **Reboot** select **Reboot now**.

The reboot process is not lengthy and once completed, the VGADVI Broadcaster will resume normal operation.

12.6.3 Backing up Current Configuration

Use this functionality to ensure that you have a backup version of your current configuration on your local machine. It is helpful, for example, when you need to set up multiple devices using the same parameters. Note that you should not store any passwords in the configuration file since it has plain text format and all passwords will be visible.

1. Log into the Web admin interface.
2. Select **Maintenance**.
3. Beside **Backup current configuration** select **Backup**.

12.6.4 Restoring Configuration from File

1. Select **Maintenance**.
2. Click **Browse** near **Restore configuration from file** and select the configuration file.
3. Click **Restore**.

12.6.5 Shutting down the VGADVI Broadcaster

To shut down VGADVI Broadcaster you need to disconnect power. It is not possible to shut down the device from the Web Interface.

12.7 VGADVI Broadcaster System Information

To display the following system information, select **Info** from the Web admin interface's main menu:

1. The current firmware version, revision and date.
2. The services status.

3. The information about the broadcast characteristics, encoder's frame rate and the IP addresses of the broadcast in all possible formats. Please refer to **Using the Web Admin Interface's Info Page**.
   Note: If you refer the device by its serial number as described in the Access through Service Discovery section, the IP address is not displayed.
4. Active connections.
5. Resolution of the connected video source and other VGA mode information.
6. The hardware platform information.

This page is also displayed when you first log into the Web admin interface.

Figure 66 VGADVI Broadcaster Information

Firmware

```
Version:  2.4.0b
Revision: 18562_1268
Date:     2012-09-27
```

Services status

```
Encoder: up 38 seconds
Broadcaster: up 41 seconds
Recorder: disabled
```

Stream info

```
Live broadcast: http://172.20.1.33/preview.cgi

Video: H.264 1024x768@30 500 kbps
Audio: AAC 22kHz stereo 128 kbps
Total: 628 kbps
Actual encoder frame rate: 30.0
RTSP stream: rtsp://172.20.1.33:554/stream.sdp
ASF stream: http://172.20.1.33:1881/stream.asf
Flash stream: http://172.20.1.33:1881/stream.flv
RTP multicast stream: http://172.20.1.33:1881/cds.sdp

Svideo: H.264 720x576@20 1.00 Mbps
Actual video channel encoder frame rate: 20.0
RTSP stream: rtsp://172.20.1.33:554/stream_video.sdp
ASF stream: http://172.20.1.33:1881/stream_video.asf
Flash stream: http://172.20.1.33:1881/stream_video.flv
```

Connections

Stream name	Client IP	Bitrate	Bytes transmitted
cds.sdp	226.0.1.15	744	2045 KBytes

VGA mode

```
Videomode: 1280 x 1024 @ 60400 mHz

32 03 1B 06 00 51
00 05 00 04 F0 EB 00 00 02 00 00 00
3A 01 4B 03 2A 04 B3 00 2A 00 80 02 00 04 00 00 00 00 00 00 00 00
```

Hardware

```
gioconda
```

13 Serial Port Configuring

The VGADVI Broadcaster can be integrated with control equipment that uses an RS-232 interface. This RS-232 interface is used to trigger the device to perform various actions by sending a command over the RS-232 connection, refer to the RS-232 Commands chapter for more information about these commands.

To connect your control equipment to the VGADVI Broadcaster, use a standard RS-232 null-modem cable. Then an RS-232 serial adapter is connected to the RS-232 null-modem cable before inserting it into one of the two USB ports on the VGADVI Broadcaster.

The standard VGADVI Broadcaster package does not include an RS-232 serial adapter but one can be purchased from Epiphan as an optional accessory.

Flow control is the only configurable item for this feature. This is done by navigating to the Serial Port section of the Web admin interface.

Table 14 ***Configuring the Serial Port Feature***

Flow control	Flow control means the ability to slow down the flow of bytes in a wire. For serial ports this means the ability to stop and then restart the flow without any loss of bytes. Specify by what means this control will be performed: • **Hardware** • **Software** • **None**

Figure 67 Configuring the Serial Port Feature

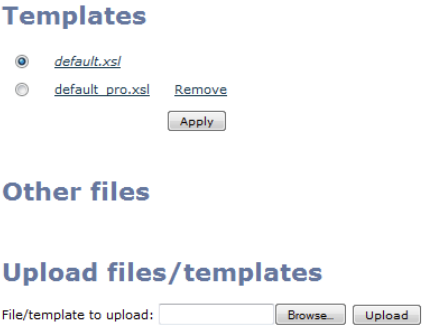
14 Customizing Presentation and Web Content

This feature allows the customizing of the viewer's Web browser's display of the broadcast. For example, the event's name, company logos and other pertinent data can be displayed to the viewer. Note that this feature affects only viewers who are connecting to the broadcast via Live View (please refer to **Using the Web Admin Interface's Live View Feature**).

To use this option, select **Branding** from the Web admin interface's main menu.

To customize the design you need to create an .xsl file using XML document formatting. The creation of this file is beyond the scope of this document.

Figure 68 Customizing Web Content



The table below outlines how to select and upload the necessary files to customize the viewing browser.

Table 15 Web Content Configurable Options

Templates	Available template files are displayed. To select a template, click a radio button near its name. Then click **Apply**.
Other files	Files that were uploaded and used during template creation are displayed.
Upload files/templates	Browse to the template or file you need to upload and click Upload.

15 Stream Branding

In the Stream Branding section of the Web Admin interface you can customize the broadcast and specify the information that is displayed to a viewer without creating an .xsl file.

The upper pane of this section allows you to specify content metadata. Media player pulls this information and displays it to a viewer. Metadata provides the following important information about the broadcast:

- **Title**
- **Author**
- **Copyright**
- **Comments**

In the middle pane (**Logo**) you can specify a logo that will be displayed over the broadcast. Previously you must upload the logo file using the Branding section. No transparent images are allowed.

To create a logo:

1. Select the **Branding** section of the Web Admin interface.
2. Upload the required files with logos using the **File/template to upload** field.
3. Select the **Stream Branding** section of the Web Admin interface.
4. Use the **Image** drop-down list to select the file with logo.
5. The logo can be positioned using the left top, right top, left bottom, right bottom values. Use the **Position** field to select the required value.
6. Specify the **left/right** and the **top/bottom** margins for the logo. The margins are calculated using the selected position as the starting point.

If you have specified the logo position details incorrectly (for example, only a part of the logo will be viewed according to the settings), the full image will be displayed anyway.

In the lower pane (**“No signal” image**) you can specify an image that displays when there is no signal detected. As in case with the logo file, you must previously upload the No signal file in the **Stream Branding** section.

Figure 69 Stream Branding

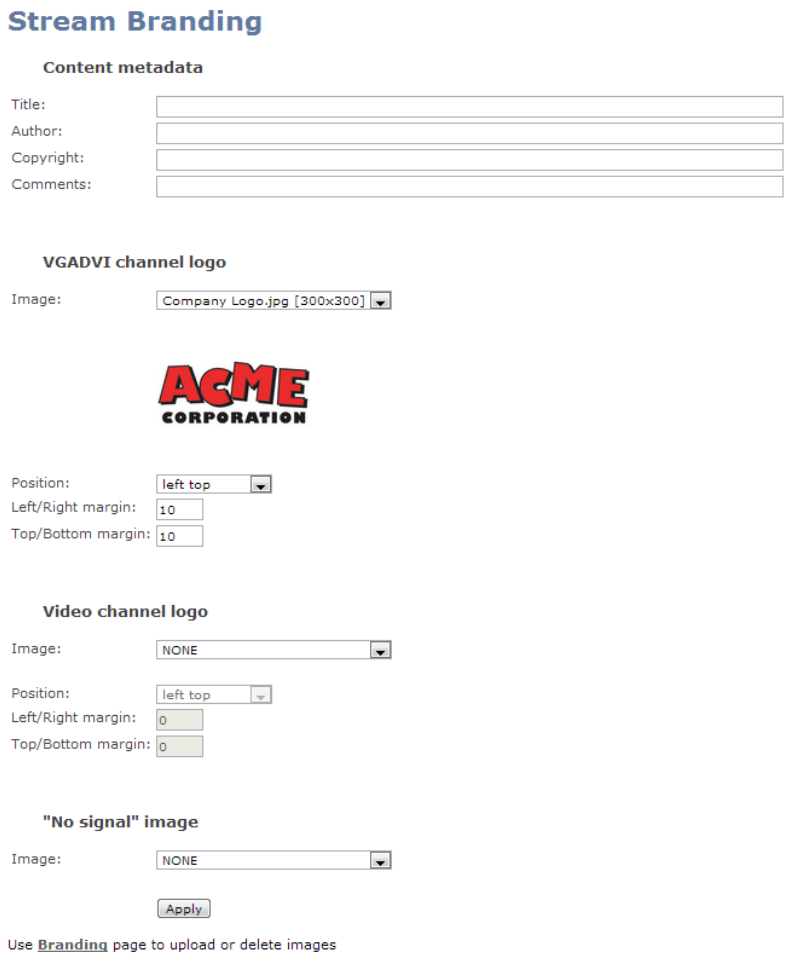


Figure 70 Video Stream with a Configured Logo

16 Configuring Remote Support

The VGADVI Broadcaster uses remote support settings to communicate with the Epiphan maintenance server. When enabled, communicating with the maintenance server allows Epiphan to review the device configuration, firmware version, and other basic operating parameters. If you contact Epiphan Support for help with the VGADVI Broadcaster, the support team can use this maintenance information to help remotely troubleshoot the problem.

The VGADVI Broadcaster device does not send private information to the Epiphan maintenance server, just basic operation and configuration information. The amount of traffic sent to the Epiphan maintenance server is small and should not affect the network or Internet throughput.

By default, communication with the Epiphan maintenance server uses TCP port 30.

The default address of the Epiphan maintenance server is **epiphany.epiphan.com**.

The VGADVI Broadcaster must be able to find a DNS server to resolve the default address and then must be able to connect to this address on the Internet using TCP port 30. If the VGADVI Broadcaster's network settings are set to use DHCP, it gets

the address of the DNS server from the DHCP server. If network settings are set to use a static IP address, the IP address of the DNS server must be entered. This IP address can be retrieved from your network administrator.

If you have a firewall or some other device protecting the network from the Internet and you would like to enable remote support, the configuration of this device may have to be changed for the VGADVI Broadcaster to connect to the Epiphan maintenance server. Contact your network administrator for assistance.

Remote support is enabled by default. Use the **Maintenance** section in the Web admin interface to access the remote support settings and refer to the following diagram and table for more details on how to configure this feature.

Figure 71 Remote Support Configuration

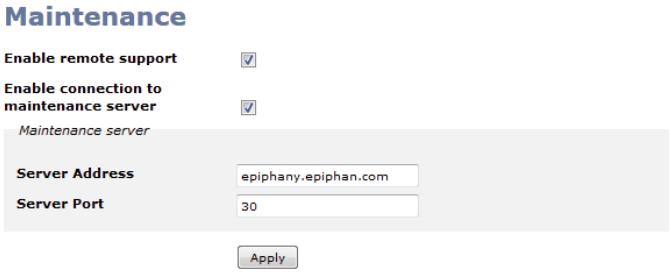


Table 16 ***Remote Configuration Options***

Enable Remote Support	Allow Epiphan Support to log into the VGADVI Broadcaster with special access privileges to troubleshoot problems.
Enable connection to maintenance server	The VGADVI Broadcaster establishes an outgoing TCP connection to the Epiphan maintenance server using TCP port 30. Using this connection, the device sends information to the Epiphan maintenance server and Epiphan Support can use this connection to remotely log into the device.
Server Address	The address of the Epiphan maintenance server. This address is usually **epiphany.epiphan.com**. Only change this address if required, and only if recommended by Epiphan Support. For example, this might be changed to a numeric IP address if the VGADVI Broadcaster cannot connect to a DNS server.
Server Port	The Epiphan maintenance server's port number.

You can enable and disable remote support and the connection to the maintenance server independently.
The following table describes the results of different configurations:

Table 17 ***Different Results by enabling/disabling Remote Support and Connection to the Maintenance Server***

Enable Remote Support	Enable Connection to Maintenance Server	Result
Yes	Yes	The VGADVI Broadcaster connects to the Epiphan maintenance server. If required, Epiphan Support can remotely connect to the device with special access privileges.
No	Yes	The VGADVI Broadcaster connects to the Epiphan maintenance server. Epiphan Support can remotely connect to the Web admin interface with the same access privileges as an administrator.
Yes	No	The VGADVI Broadcaster does not connect to the Epiphan maintenance server. If required, Epiphan Support can remotely connect to the device with special access privileges. Contact Epiphan Support for assistance.

Please contact your network security administrator to review your security settings for the VGADVI Broadcaster.

17 Disk Check

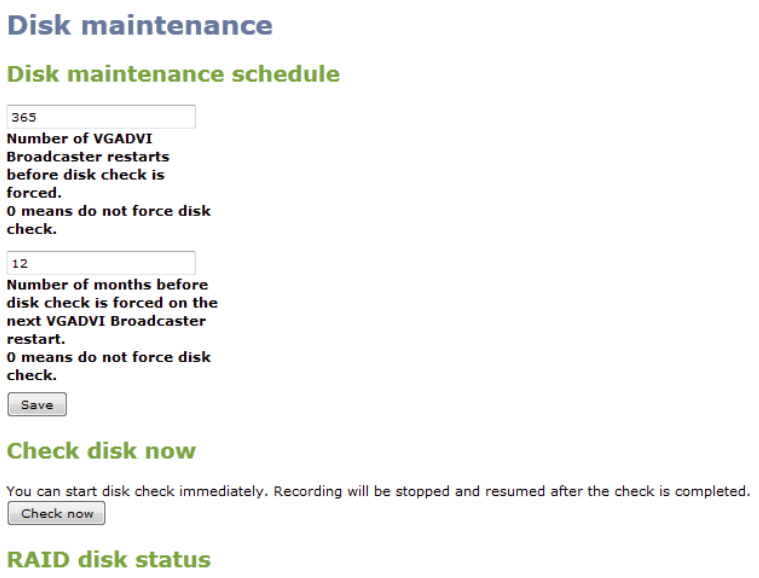
A disk maintenance schedule can be set up for checking the VGADVI Broadcaster's hard disk for errors. The hard disk maintenance schedule includes running a disk check after either a configured number of device restarts or after a configured number of months of operation. This is configured on the Disk Check page which is opened by selecting **Disk Check** from the Web admin interface's main menu.

This page allows the number of the Recorder restarts before a disk check is to be performed and the number of months to lapse prior to a disk check to be configured. The system will trigger a disk check based on these values and based on whichever event occurs first. The actual disk check process will be run the next time the VGADVI Broadcaster restarts. The disk check occurs during system startup and can cause a lengthy delay in starting up the device.

Alternatively on the same page, select **Check disk now** to immediately perform the disk check. Clicking this button causes the device to stop recording and to check the disk immediately. The disk check process can take a few minutes. The VGADVI

Broadcaster automatically resumes recording after the disk check is complete. Results of the disk check are not displayed unless errors that cannot be corrected are found.

Figure 72 Configuring the Disk Maintenance Schedule



18 Disk Status Information

In the **Disk status** section of the Web admin interface's main menu, the total amount of space available on the VGADVI Broadcaster's solid state memory in GB is listed. Additionally, the used and available space in GB, and the amount used as a percentage of the total amount of space on the disk is displayed for quick reference.

If the VGADVI Broadcaster is running low on disk space the administrator can delete files. The administrator can also configure automatic file uploads to keep the VGADVI Broadcaster from running out of disk space. The VGADVI Broadcaster stops recording if there is less disk space available than the amount required saving a broadcast file.

19 Configuring using a Third-Party Application

The VGADVI Broadcaster can be configured and managed with the third-party applications or with a script that sends commands to the VGADVI Broadcaster as URLs. Please contact Epiphan for the most recent updates to the API.

This chapter describes:

- Serial port configuration;
- RS-232 commands;
- Syntax for HTTP API Commands;
- Keys for HTTP API Commands;
- and finally provides some examples.

19.1 Serial Port Configuration

The VGADVI Broadcaster's serial port configuration has the following settings:

Parameter	Value
Speed	19200 bps
Data bits	8
Parity	None
Stop bits	1
Flow control	Hardware

19.2 RS-232 Commands

The VGADVI Broadcaster implements an RS-232 interface allowing for the easy integration with existing control room and board room equipment.

Table 18 ***Serial Interface commands and Status Report commands and description***

STOP	Stop recording
START	Start recording
SNAPSHOT	Take snapshot (must be MJPEG)
GET.<key>	Get value of a broadcasting parameter <key>. Please refer to section Broadcasting Setup Keys for

	details. The command varies depending on the stream as shown below. To get value for a VGA/DVI channel, use the following command: **GET.<key>** E.g., GET.framesize To get value for a video channel, use the following command: **GET.video_<key>** E.g., GET.video_framesize
SET.<key>=<value>	Set value of a broadcasting parameter. Parameter values containing spaces must be enclosed in quotation marks (either single or double). New values might not take effect immediately and will be lost after the reboot unless SAVECFG command is issued later. The command varies depending on the input stream as shown below. To get value for a VGA/DVI channel, use the following command: **SET.<key>=<value>** To get value for a video channel, use the following command: **SET.video_<key>=<value>**
SAVECFG	Save parameters values modified by SET command.
STATUS	Report status of recording service. Note that the device reports the status information only at the moment when the status is updated. Status values are: "Running", "Stopped", "Uninitialized".
FREESPACE	Report free space on the data partition, in bytes.
RECTIME	Report elapsed time for the current recording file.

If any of the START commands are given while a recording is already in progress, the current recording will be stopped and a recording with the new settings will be started. The VGADVI Broadcaster reports its status back using the following messages:

Status Line Value

RECTL STATUS {UP <time>|DOWN
<time>|UNKNOWN}

Status of the recording

RECTL MICVOLUME <0-100> Level of line-in amplification (percents)
RECTL PCMVOLUME <0-100> Level of line-out amplification (percents)

Each status line is terminated with an LF (ASCII code 10) character.

19.3 Retrieving a List of HTTP API Commands

You can easily retrieve the list of HTTP API commands available for the VGADVI Broadcaster. You only need to type in the following URL in the address bar of your browser:

http://device_ip/admin/http_api.cgi

where **device_ip** is an IP address of the VGADVI Broadcaster. This IP address can be obtained from the Network section of the Web admin interface. Refer to Setting IP Address section.

19.4 Syntax for HTTP API Commands

Use the following syntax to get configuration settings:

```
http://<address>/admin/get_params.cgi?key
```

Use the following syntax to set or change the configuration:

```
http://<address>/admin/set_params.cgi?key=value
```

In this example **<address>** is the IP address or name you use to connect to the System admin interface.

E.g., if you log into the VGADVI Broadcaster's Web admin interface using http://192.30.23.45/admin, then <address> would be 192.30.23.45.

Key is the name of the object of the VGADVI Broadcaster to be viewed or changed. See the next section for more information on the valid values for **key**.

V**alue** is the value to be set. Some values include spaces, for example, the frame size can be 1024 x 768. Use %20 for spaces, for example: framesize=1024%20x%201068

You can include multiple <key>or <key>=<value>statements in one URL. Separate the statements with &.
For example:
• To get the product name and firmware version:
http://<address>/admin/get_params.cgi?product_name&firmware_version
• To set the stream type to ASF and bit rate to 256000:
http://<address>/admin/set_params.cgi?streamtype=2&vbitrate=256K

For third party applications like wget, you should always include the admin username and password to change the VGADVI Broadcaster configuration. The syntax for using wget to enter URLs is:

```
wget --http-user=admin --http-passwd="<passwd>" http://<address>/admin/get_params.cgi?<key>[&<key>]..."
wget --http-user=admin --http-passwd="<passwd>" http://<address>/admin/set_params.cgi?<key>=<value>[&<key>=<value>]...
```

19.5 Keys for HTTP API Commands

This section lists and describes all of the keys that can be used in HTTP API commands to view or change the VGADVI Broadcaster configuration. These keys are broken into the following types:

- Device Info Keys
- Broadcasting Setup Keys
- ASF Encoder Keys
- RTP Unicast Keys

19.6 Device Info Keys

These keys are used for getting information about the device.

Table 19 Device Information Keys

Key	Description
vendor	Name of a vendor. The value is always "Epiphan Systems

	Inc.”
product name	Name of a product.
firmware_version	Firmware version.
mac_address	MAC address.

19.7 Broadcasting Setup Keys

These keys are used for getting or setting the broadcasting setup.

Table 20 Broadcasting Setup Keys

Key	Description
framesize	Get or change the frame size in pixels, for example 1024 x 768. Use %20 for spaces.
htmlrefresh	Get or change the Flash/MJPEG webpage page refresh time in seconds. The range is 0 to inf (infinite). 0 means that page will not refresh.
streamport	Get or change the stream port number. The range is 1000 to 65535. You cannot use port 5557 because this port is used for network discovery.
streamtype	Get or change the stream type: • 0 - Flash • 1 - Flash+H.264 • 2 - ASF • 3 - ASF+H.264 • 4 - MJPEG • 5 – RTSP
vbitrate	Get or change the video bit rate in kbit/s, for example vbitrate=65536. You can use short forms such as vbitrate=64K and vbitrate=1M.
bcast_disabled	Possible values are 'on' or empty. Broadcasting will be disabled if the value is 'on'.
audio	Possible values are 'on' or empty. Enables broadcasting of audio signal.
usenosignal	Possible values are 'on' or empty. Displays “No signal” image if the signal is off.

vbufmode	Use this key to define compression level of the broadcast. E.g., in the Strong mode the broadcast parameter strictly correspond to the specified bitrate. Select the level: • Relaxed • Balanced • Strong
fastvideo	Enables fast video. Possible values are 'on' or empty
timelabel	Enables time labeling functionality. Possible values: • 'none' • 'date' • 'hms' • 'date_hms' • 'hms_ms' • 'date_hms_ms'
vgopsize	Minimum interval between key frames.
fpslimit	Video frame rate limit.

19.8 ASF Encoder Keys

These keys are used for getting or setting ASF encoder settings. You can change ASF encoder settings when stream type is set to ASF stream.

Table 21 ASF Encoder Keys

Key	Description
title	Add a title for the video being broadcast. Use %20 for spaces.
author	Add the name of the author of the video being broadcast. Use %20 for spaces.
copyright	Add copyright information for the video being broadcast. Use %20 for spaces.
comment	Add a title for the video being broadcast. Use %20 for spaces.

19.9 RTP Unicast Keys

These keys are used for getting or setting RTP unicast settings. You can change these settings when stream type is set to RTP.

Table 22 RTP Unicast Keys

Key	Description
unicast_enabled	Enable RTP unicast. Possible values are 'on' or empty.
unicast_address	Get or change the unicast address.
unicast_aport	Get or change the unicast a port.
unicast_vport	Get or change the unicast v port.

19.10 Recorder Keys

These keys are used to enable or disable the recording of a broadcast.

Table 23 Recorder Keys

Key	Description
rec_enabled	Enables recording functionality. Possible values are 'on' or empty.

19.11 Examples

For a VGADVI Broadcaster device with an IP address of 192.30.23.45, and admin password of pass123, one can use wget to do the following:

- Enter the following command to view the broadcasting stream type and frame size:

  wget --http-user=admin --http-passwd=pass123 "http://192.30.23.45/admin/get_params.cgi?streamtype&framesize"

- Enter the following command to set the broadcasting stream type to ASF, add the title “VGADVI Broadcaster Stream”, and enable recording audio.

  wget --http-user=admin --http-passwd=pass123 "http://192.30.23.45/admin/set_params.cgi?streamtype=2 &title= VGADVI Broadcaster %20Stream&audio=on"

20 Sample Configurations

This chapter describes video and audio parameters recommended for performing slides and video recording from PC, Mac and iPad.

PC with video

Codec	H.264 codec
Video encoding preset	High Speed
Video encoding profile	Main
Enhanced compatibility mode (h.264 slicing for RTP)	OFF
Key frame interval	2 sec
Limit frame rate	30
Bitrate	2000 kbits for ~ HD; 4000 kbits for ~ Full HD
Rate control mode	Low delay
Audio format	PCM 44 kHz
Audio channels	Stereo

Mac with video

Codec	(H.264 codec
Video encoding preset	High Speed
Video encoding profile	Main
Enhanced compatibility mode (h.264 slicing for RTP)	ON
Key frame interval	2 sec
Limit frame rate	30
Bitrate	2000 kbits for ~ HD; 4000 kbits for ~ Full HD
Rate control mode	Low delay
Audio format	PCM 44 kHz
Audio channels	Stereo

PC with slides

Codec	H.264 codec
Video encoding preset	High Quality
Video encoding profile	High
Enhanced compatibility mode (h.264	OFF

slicing for RTP)	
Key frame interval	2 sec
Limit frame rate	15
Bitrate	1000 kbits for ~ HD; 2000 kbits for ~ Full HD
Rate control mode	Storage
Audio format	PCM 44 kHz
Audio sample rate (Hz)	Stereo

Mac with slides

Codec	H.264
Video encoding preset	High Quality
Video encoding profile	High
Enhanced compatibility mode (h.264 slicing for RTP)	ON
Key frame interval	2 sec
Limit frame rate	15
Bitrate	1000 kbits for ~ HD; 2000 kbits for ~ Full HD
Rate control mode	Storage
Audio format	PCM 44 kHz
Audio sample rate (Hz)	Stereo

iPad with slides

Codec	Motion JPEG
Video encoding preset	High Quality
Limit frame rate	15
Quality parameter	80 — for MJPEG only

iPad with video

Codec	Motion JPEG
Video encoding preset	High Speed
Limit frame rate	30
Quality parameter	40 — for MJPEG only

The diagrams below illustrate how the FPS and bitrate parameters correlate at different resolutions during the broadcast. These diagrams may be useful if you need to select optimal FPS and bitrate values and avoid possible broadcast issues.

Figure 73 Correlation Between FPS and Bitrate Values at Resolution 1280x720

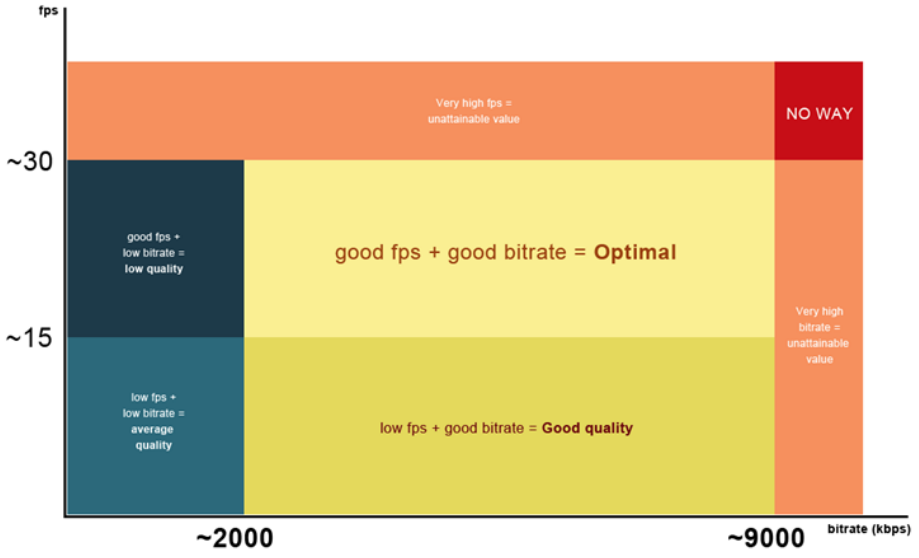


Figure 74 Correlation Between FPS and Bitrate Values at Resolution 1920x1080

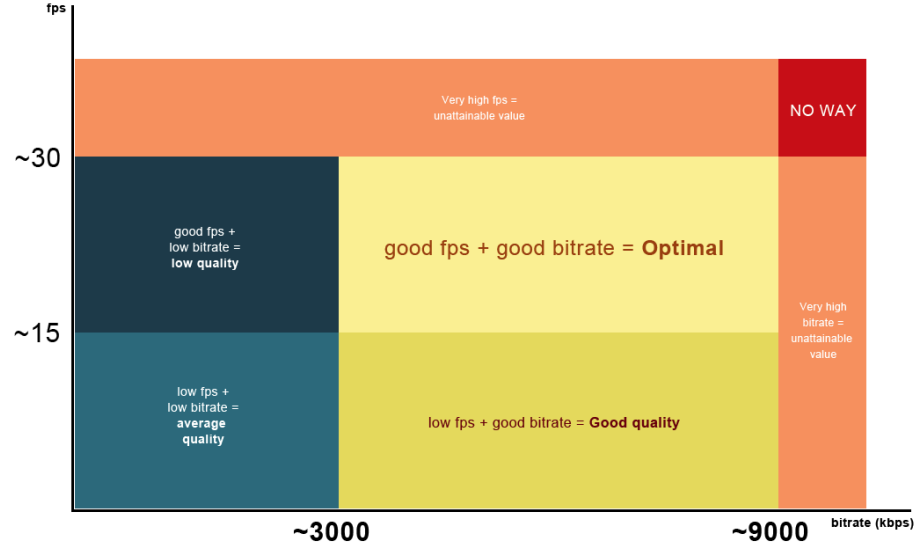
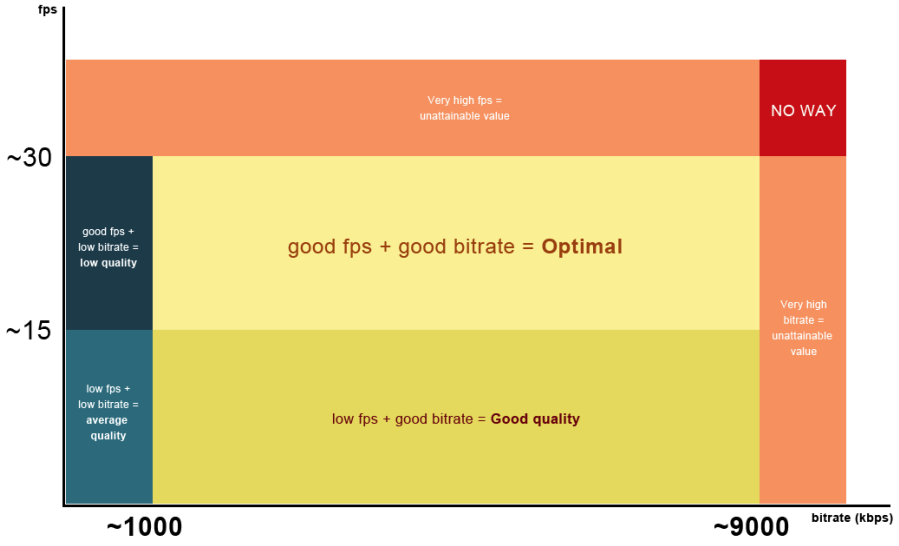


Figure 75 Correlation Between FPS and Bitrate Values at Resolution 640x480



21 Troubleshooting

In this chapter you will find some solutions to some of the more common situations and issues you may come across.

Observation	Corrective action
I have connected a video source to the VGADVI Broadcaster's DVI In or S-Video ports but I am not sure whether the connected source is being received from the incoming ports	For the DVI In port: 1. Connect a DVI or VGA monitor to a VGADVI Broadcaster's DVI Out port (use DVI-VGA adapter if necessary) and view the stream on the monitor. For the S-Video port: 1. Unplug a cable from a DVI In port (if any). 2. Ensure that the video stream is enabled on the Stream Setup page in Web Admin Interface. 3. Look at the red LED. If it is blinking, the signal is being received from the S-Video port.
No sound is coming from an audio source	Verify the **Input Source** parameter value in the **Audio** menu item of the web interface. It should correspond to the selected source type (**Line** or **Microphone**).
Too much noise on audio	Verify the **Input Amplifier Volume** parameter value in the **Audio** menu item of the web interface. It is recommended to select **40%** in this field.
Insufficient image quality	To provide better productivity and higher image quality: 1. Make sure that the source resolution matches the resolution of the recorded image. Ensure that the **Frame size** parameter value in the **Stream Setup** menu item of the web interface equals the frame size of the source image. Example: If the source video resolution is 720p, set the **Frame size** to 1280x720

	2. Increase the **Bitrate** value and/or decrease the **Limit frame rate** value in the **Stream Setup** menu item.
Low fps	Increase the **Limit frame rate** value and/or decrease the **Bitrate** value in the **Stream Setup** menu item. Refer to Streaming for details. Alternatively, enter low negative value (-5) in the Frame Grabber's Vertical Shift field.
I cannot play the broadcast in my media player/browser	First, check the LEDs activity on the VGADVI Broadcaster. Normally during the broadcast the green LED lights up while the Red LED is blinking. If the broadcast is being recorded, the blue LED is blinking too. Further, verify whether the **Stream Type** parameter in the **Stream Setup** corresponds to the media player being used. Refer to Video Formats and Standards for details. If the issue is not solved, disable all firewalls (Windows). If the suggested steps do not solve your issue, please contact Epiphan Support.
The broadcast interrupts or the image breaks up	Verify the Stream Setup settings as described above in "Insufficient image quality". If the issue is not solved, verify your network connections as well as network filters, routers and applications settings. Packet loss may result in broadcast failure.
Record issues	If the record does not start up, view the Disk Status Information and check whether there is enough disk space for a new file of desired size. If the issue is not solved, perform a Disk Check and start the record again.
Firmware upgrade	If you are unable to upgrade firmware manually, i.e. upload firmware to the device from your working station, reboot the device and retry.

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March 11, 2013

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In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way.
The crossed-out wheeled bin symbol invites you to use those systems. If you need more information about collection, reuse and recycling systems, please contact your local or regional waste administration. You can also contact us for more information on the environmental performance of our products.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

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24 Configuration Worksheet

Use this worksheet to keep necessary information about the VGADVI Broadcaster installation, settings etc.

Parameter (IP address, DNS server, SSID…)	Value

Notes: