# VGA Broadcaster Lite™ User Guide

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## Product Feedback

We regularly contact our customers to ensure product performance and reliability. We strive to continually enhance our products to accommodate your needs. We welcome your feedback and suggestions for product improvements. You can email your comments to info@epiphan.com.

## Specifications

You can go to the Broadcasting page of the Epiphan website to get information about the VGA Broadcaster Lite.

## Warranty

All Epiphan Systems products are provided with a 100% return to depot warranty for one year from the date of purchase.

## Technical Support

Epiphan is staffed by a professional support team. If, after checking the FAQs for your product on the Epiphan website and re-installing the Epiphan driver software (where applicable), you continue to have outstanding issues, email a problem report to support@epiphan.com. To help us solve the problem efficiently, include the following info:

- Your VGA Broadcaster Lite serial number.
- The behavior of your VGA Broadcaster Lite 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

# 1. Introduction

The Epiphan VGA Broadcaster Lite™ device can broadcast the output from multiple types of video sources to viewers on an Ethernet network.  Video sources supported are:

- VGA,

- DVI, mini DVI, micro DVI

- HDMI[1]

- Other compatible sources with appropriate adapters and/or converters

VGA Broadcaster Lite is a portable, stand-alone device that requires no additional software or hardware to capture video signals.  The VGA Broadcaster Lite device can also broadcast audio signal sources.

*Figure 1. Typical VGA Broadcaster Lite Applications*
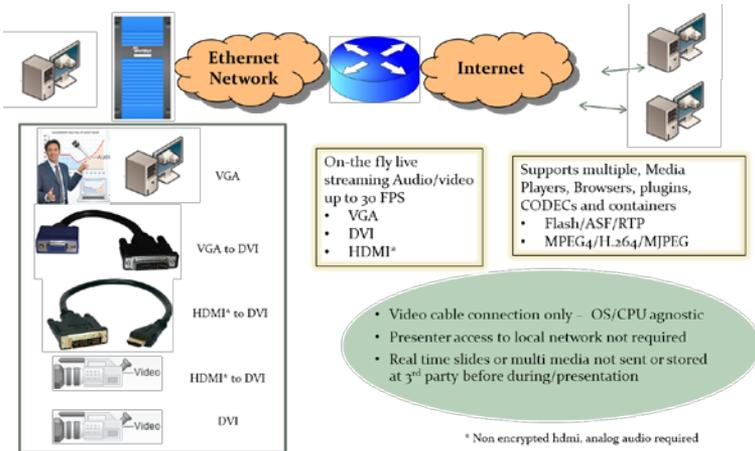


The VGA Broadcaster Lite is an Ethernet network device that can be automatically configured onto networks that support DHCP addressing or manually configured to use static IP addressing.  For more advanced users, the VGA Broadcaster Lite device can also be administered using a directly connected workstation using an Ethernet port, in advance of connecting to the Ethernet network.

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[1] Supports Non encrypted HDMI with analog audio source

Once connected to an Ethernet network, VGA Broadcaster Lite can be configured and operated through an easy to use web-based administration interface.

The VGA Broadcaster Lite device can be configured to broadcast the video source (DVI/VGA/HDMI (unencrypted HDMI)) and audio output over of the following Ethernet connections:

- a wired Ethernet cable connected to the network, or
- a wireless Ethernet connection using a USB wireless network adapter available separately  as VGA2WiFi™. Please refer to the **VGA2WiFi User Guide** to know more about this optional functionality.



Broadcaster Lite Wireless Scenarios Applications
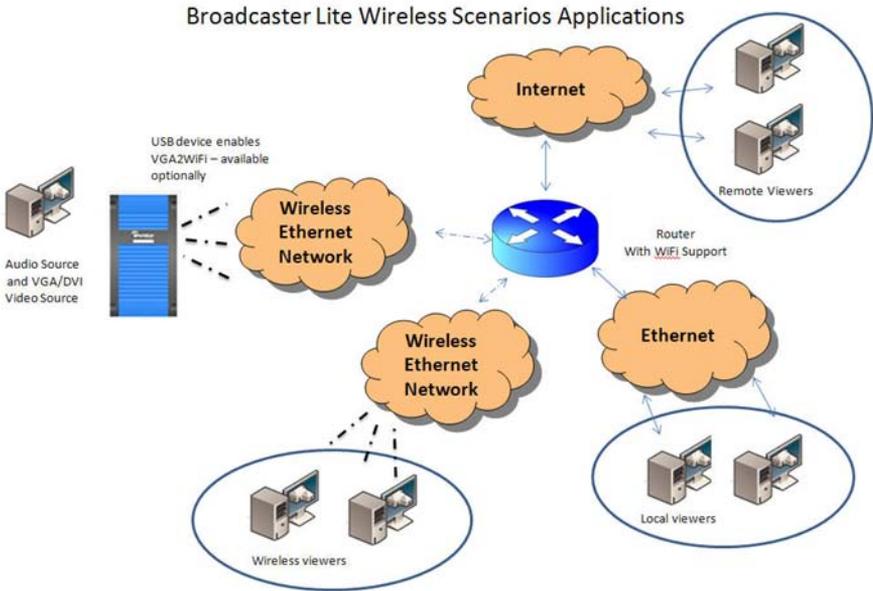
Broadcaster Lite Wireless Scenarios Applications
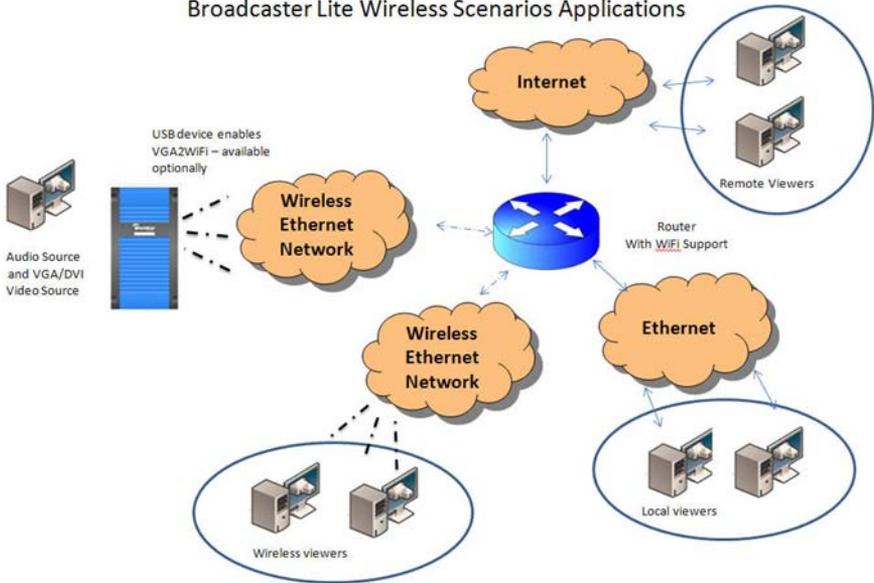
Administrators and viewers access the broadcast video stream with a media player such as QuickTime, VLC or Windows Media Player, or with a web browser that supports the formats supported by VGA Broadcaster Lite (e.g. motion JPEG, MPEG4 or Flash Video/H.264 compression).

In order to view the broadcast, viewers need the IP address, or DNS name or URL of the VGA Broadcaster Lite and the optional viewer password.  If the viewer password is configured, the password should be distributed or otherwise communicated to authorized viewers of the broadcast.  URLs or DNS address names are supported once DNS is correctly configured for your network by your Ethernet network administrator.

The VGA Broadcaster Lite supports multiple streaming types and configurations.  VGA Broadcaster Lite supports stream over HTTP, RSTP, unicast RTP, multicast RTP and content distribution network (CDN) broadcast network streaming architectures. Which architecture you choose to build will depend on your application, the number of clients, and the network capabilities at your disposal.  Please refer to Different Stream Distribution Architecture Methods section for additional information.

- **Streaming over HTTP**. The VGA Broadcaster Lite transfers data to the viewer via HTTP protocol. You can play such stream directly in the browser using appropriate plug-ins. Streaming over HTTP sends duplicates of all data to each connected client. Due to this duplication, the number of supported clients is typically limited to three viewers. If you would like to support more than three, Epiphan provides larger systems that can scale to more users, or you can consider using RTSP, Multicast or CDN network architectures for your applications.

- **RTSP streaming.** RTSP is similar to Streaming over HTTP (see above). However, the viewer can choose between TCP (which is very similar to HTTP) and UDP protocols using its software. UDP protocol can reduce the latency (the delay between the moment an image appears on the VGA/DVI input and the moment remote clients see it) in streaming. However, UDP requires better router/firewall cooperation at the location where VGA Broadcaster Lite is installed.

- **RTP streaming**. RTP streaming is performed using the UDP protocol. However, unlike previous streaming methods, it does not require a request from the viewer to start sending data. The multimedia stream is *always* sent to the specified destination IP address. If the destination IP address is a workstation's address, then only specified workstation receives the stream and this is **Unicast RTP**. If the specified address is a multicast/broadcast address, an unlimited number of workstations on a LAN can access and view the stream as a **Multicast RTP** stream. The advantage is that only one copy of the data is sent from VGA Broadcaster Lite. Generally, due to the nature of the Internet, a Multicast RTP stream is not usually propagated outside the LAN (though it may be propagated trough VPNs connecting several LANs).

- **Content Delivery Networks.** VGA Broadcaster Lite can be set up to send a stream (using any method mentioned above except **Multicast RTP**) to a special destination type of client, called Content Delivery Network (CDN). CDN is a network service that redistributes the stream for multiple viewers. An architecture that serves viewers through the CDN significantly increases the maximum number of concurrent clients, while reducing the load on the

uplink internet connection.  This architecture would typically be used between a Broadcaster Lite inside the LAN and multiple clients outside of the LAN.
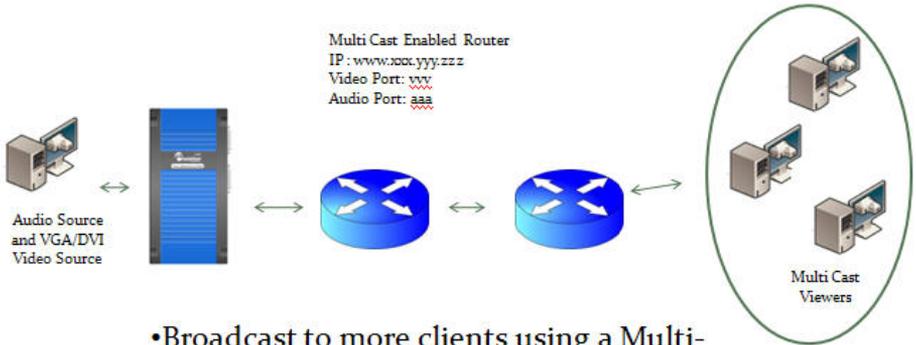
Multi Cast Enabled Router
IP : www.xxx.yyy.zzz
Video Port: vvv
Audio Port: aaa

Audio Source
and VGA/DVI
Video Source

Multi Cast
Viewers

•Broadcast to more clients using a Multi-cast router
    •Configure IP and port numbers to stream broadcast through a multi-cast service

Audio Source and
VGA/DVI Video Source

Content Delivery
Network Router

Using CDN services
Broadcaster Lite can
support unlimited
number of viewers.
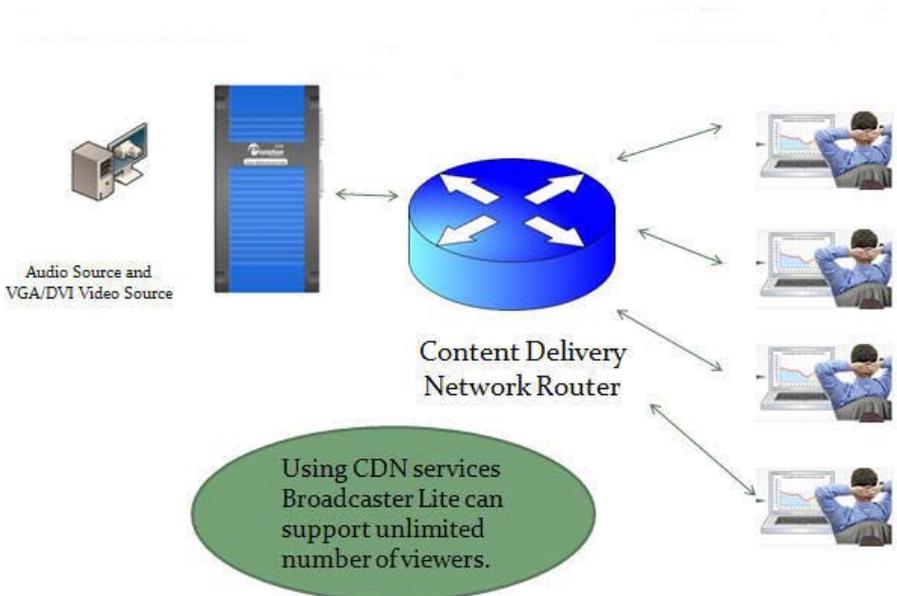
Administrators who log in using the administrator password can also access the Web admin interface to change advanced configuration features, or operate and maintain

the VGA Broadcaster Lite device for their specific environment or applications.

For more advanced administration or automation, the VGA Broadcaster Lite can also be integrated into a custom management system or web infrastructure. This topic is discussed further in this document, or you can contact Epiphan for custom integration details.

The VGA Broadcaster Lite is part of Epiphan's complete line of video signal capture, broadcasting and recording products. For more information about all of Epiphan's broadcasting products, please see the Broadcasting Products Overview or Recording Products Overview on the Epiphan website.

## *Connecting VGA Broadcaster Lite Device to a Video Source*

Epiphan's VGA Broadcaster Lite is a compact, portable solution combining both Ethernet-based broadcasting and wireless broadcasting functionalities (optional). It transfers up to 30 frames per second of visual and audio information. Using Motion JPEG, MPEG4 and H.264 video compression, the VGA Broadcaster Lite lets you broadcast to remote client displays, one of the following supported video sources:

- VGA,

- DVI, mini DVI, micro DVI, HDMI[2]

- Other compatible sources with appropriate adapters and/or converters

Simply connect the input source of DVI or VGA signal (for VGA – connect with a VGA to DVI cable provided).  Once VGA Broadcaster Lite is correctly configured and connected to a local Ethernet network, you're ready to start sharing the broadcast with participants on the local Ethernet network and/or the Internet.

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[2]HDMI: Supports non encrypted HDMI with analog audio  transmitted through 3.5mm audio input

*Figure 2. Wired Ethernet Network diagrams*
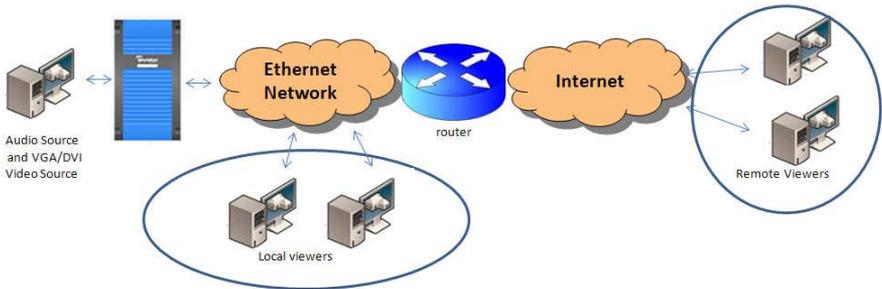


*Figure 3. Wireless Ethernet Network diagram*
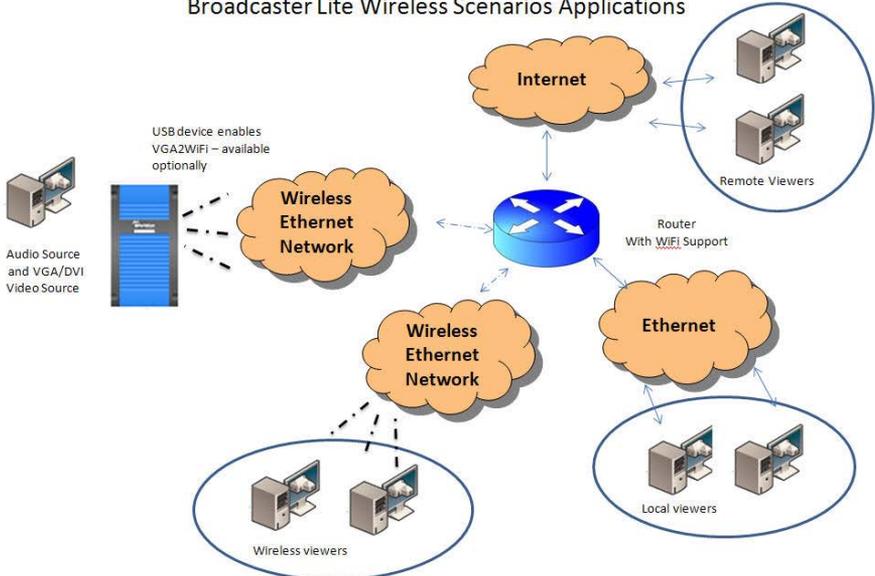


*Figure 4. DVI and Audio ports on the VGA Broadcaster Lite's front panel*

## *Browser/Media Player/Format Compatibility Tables*

The VGA Broadcaster Lite may broadcast audio and video at resolutions of up to 1920 x 1080 without any loss in quality or sharpness. Viewers can access the broadcasted video stream 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 format being transmitted.  The video stream format is selected by the VGA Broadcaster Lite administrator. Audio is available for all formats except from Motion JPEG.

For your convenience, below is a list of browsers, operating systems and video format support, which is believed to be accurate at time of writing. For additional media browser platform support, compatibilities and capabilities, please visit our website and/or the relevant browser or plug in documentation.

Table 1. Browsers and Video Formats

| Browser | Motion JPEG | ASF | RTSP | Flash Video (H.264) |
|---------|-------------|-----|------|---------------------|
| Internet Explorer 8 | | O | O | O |
| Mozilla | O | O | O | O |
| Safari | O | O | O | O |
| Chrome | O | O | O | O |

In order to play ASF, RTSP, and Flash Video formats in browsers you should install the appropriate plug-ins.

> # Browser/viewer capabilities and compatibilities are subject to change.

For your convenience, below is a list of media players, operating systems and video format support, which is believed to be accurate at time of writing.  For additional media player support, compatibilities and capabilities, please visit our website and/or the media player documentation.

Table 2. Media Players and Streams

| Media Player | Motion JPEG | ASF | RTSP | Flash Video (H.264) |
|---|---|---|---|---|
| Windows Media Player (v.12) | | ○ | ○ | ○ |
| MPlayer (Windows, Mac OS, Linux) | ○ | ○ | ○ | ○ |
| QuickTime (Mac OS) | ○ | ○ | ○ | ○ |
| VLC (Windows, Mac OS, Linux) | ○ | ○ | ○ | ○ |

> # Media Player capabilities and compatibilities are subject to change.

# 2. Installation

This chapter describes the basics of how to connect a VGA Broadcaster Lite device to a VGA, DVI or HDMI (unencrypted) source and to an Ethernet network.

The VGA Broadcaster Lite device uses Ethernet network connection to present visual information to viewers. Participants can connect to the URL or IP address of the VGA Broadcaster Lite to view the broadcast.

## *VGA Broadcaster Lite Hardware Features*

The VGA Broadcaster Lite device is a 202mm x105mm x35mm (7.95"x4.13"x.1.38") unit. The front panel includes power and capture activity LEDs, Reset button, DVI In and Out, audio In and Out ports. The back panel includes 10/100/1000 Ethernet port, 2 USB ports, and a power connector.

*Figure 5. VGA Broadcaster Lite Video, Audio connectors and LEDs (rear view)*

**Figure 6. VGA Broadcaster Lite Video, Audio connectors and LEDs (front view)**



**Figure 7. VGA to DVI Cable (included)**

**Figure 8. HDMI to DVI cable**



Table 3: Connector, Interface and LED Descriptions

| Number | Interface | Description |
|--------|-----------|-------------|
| 1 | RJ45 Gigabit Ethernet | Primary 10/100/1000 Base-T RJ-45 auto-sensing Ethernet network port to connect the VGA Broadcaster Lite device to an Ethernet network. The VGA Broadcaster Lite device Ethernet port is auto-sensing. |
| 2,3 | USB | USB 2.0 port (also supports USB 1.1). |
| 4 | Power | Connect the AC adapter to the VGA Broadcaster Lite power connector and to a power outlet |
| 5 | LEDs | **Red LED:** during operation the red LED blinks each time the VGA Broadcaster Lite captures an image. You can use the red LED as an indicator that the VGA Broadcaster Lite is capturing images.<br>**Green and blue LEDs:** when the VGA Broadcaster Lite 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 VGA Broadcaster Lite 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) |
|---|---|---|
| 6 | Reset Button | Reset the device to factory default settings. To use this button, 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. The VGA Broadcaster Lite device starts normally but with all settings returned to factory defaults. |
| 7 | DVI In | Connect a DVI source to the VGA Broadcaster Lite device using a DVI cable. You can also connect a VGA source using a VGA to DVI adapter (included). To identify this cable please see Figure 7 (VGA to DVI Cable (included)). If you want to connect an HDMI (unencrypted) source, use an HDMI to DVI cable (not included). To identify this cable please see Figure 8 (HDMI to DVI cable). When VGA Broadcaster Lite acts as a converter, use this port for the signal input. |
| 8 | DVI Out | This port allows you to check the presence of the signal. As VGA Broadcaster Lite features an active splitter for the incoming video source, you can check the presence of the signal and view it in a high quality.  Connect a DVI monitor or projector using a DVI cable or a VGA monitor using DVI to VGA cable (included). When VGA Broadcaster Lite acts as a converter, use this port for the signal output. |
| 9 | Audio IN | Connect a microphone if you need to broadcast audio stream. |
| 10 | Audio OUT | Connect audio equipment (e.g. headphones or speakers) to control whether audio stream is currently being captured by |

| | | VGA Broadcaster Lite. In case the device accurately captures audio, it will be transmitted via this port. |
|---|---|---|

# VGA Broadcaster Lite Software Features

Use the following software features to install and configure the VGA Broadcaster Lite device.

| Default IP address and network mask | **IP:** 192.168.255.250<br><br>**Netmask:** 255.255.255.252<br><br>**User Name:** admin (no password) |
|---|---|
| IP address from a DHCP server | The VGA Broadcaster Lite device can get an IP address on the network from a DHCP server if the network has one. If the network does not have a DHCP server, see the "*If the Network Does Not Have a DHCP Server*" section. |
| Web admin interface | Use the VGA Broadcaster Lite Web admin interface for changing the VGA Broadcaster Lite IP address, making Frame Grabber Adjustments, and installing new firmware. You can log into the Web admin interface by selecting **Web config** from the Network Discovery Utility or by opening a web browser and browsing to:<br>`http://< VGA Broadcaster Lite_IP_Address>/admin/`<br>**User Name:** admin (no password)<br>The Web admin interface is described in Chapter 3 of this User Guide. |

|  |  |
|---|---|
|  |  |

# Connect and Power on a VGA Broadcaster Lite Device

To connect a VGA Broadcaster Lite device you need:

- A DVI or VGA video source. If connecting a VGA source, you will need to connect a VGA to DVI cable (provided).

- An Ethernet connection between the VGA Broadcaster Lite device and a network.

Figure 9. Connecting the VGA Broadcaster Lite device to a network
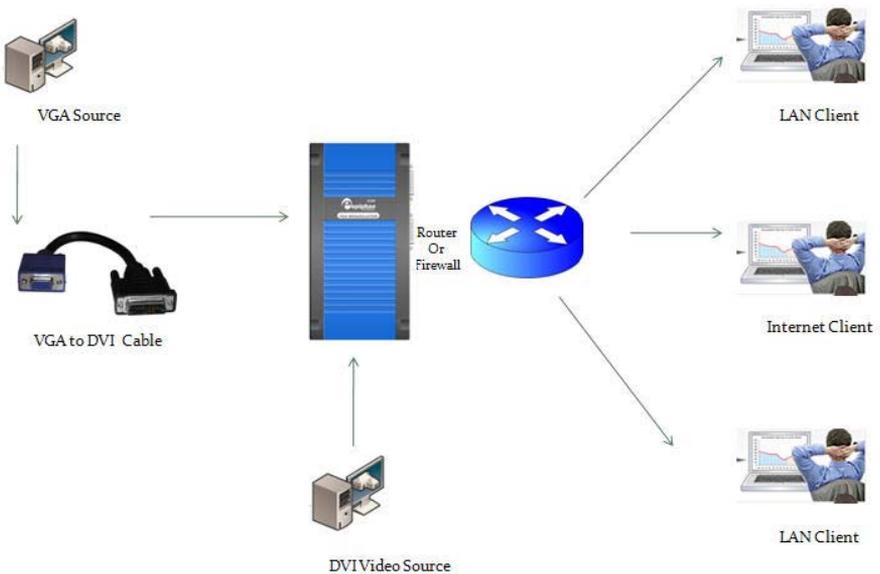


# To connect and turn on the VGA Broadcaster Lite device

1. Use a DVI cable to connect the DVI source to the VGA Broadcaster Lite DVI IN port on the front panel of the device. If connecting a VGA source, you will

also need a VGA to DVI cable to connect the VGA source and the DVI IN
port.

2.   The VGA Broadcaster Lite features an active VGA/DVI splitter, i.e. it reclaims
the lost signal strength resulting from the split. You may connect a monitor or
projector to DVI OUT to check for the presence of a signal.  The active
splitter also acts as a converter. It can convert DVI (Analog) to VGA (Analog)
signal and vice versa. DVI (Analog) or VGA (Analog) signals can be
converted to DVI (Digital). Use DVI IN and DVI OUT ports to connect input
and output sources.

3.   Use an RJ-45 Ethernet cable to connect the VGA Broadcaster Lite Ethernet
port to the 10/100/1000 Base-T Ethernet network. For best performance,
connect the VGA Broadcaster Lite device to a 1000 Base-T Ethernet link to
your network. The network must be running the TCP/IP protocol.

4.   Connect the power cable to the VGA Broadcaster Lite device.

5.   Press the **Power** button on the VGA Broadcaster Lite front panel to turn on
the device. The VGA Broadcaster Lite device powers on and the power and
image capture activity LEDs light up as the device starts up.

6.   Start up the DVI/VGA source.

To confirm that the VGA Broadcaster Lite is receiving images from the DVI/VGA
source:

- Check to see if the VGA Broadcaster Lite's red LED is blinking indicating that
VGA Broadcaster Lite is capturing images.

- Connect a monitor to the DVI Out port of the Broadcaster – you should see
the stream that is being captured on the monitor.

- Log into the Web admin interface and select **Info** to find the **Direct stream
URL**.

- Insert the URL displayed in the **Direct stream URL** field in your media player
or browser to confirm that a captured image appears.

- Type in the URL for VGA Broadcaster Lite broadcast as displayed into the
**Direct stream URL** field in your media player or your internet browser to
confirm that a captured image appears. You will need to ensure your media
player or browser supports the video format being displayed.

If the red LED does not start flashing, check the source to make sure it is transmitting an image. Also check the cable(s) between the VGA Broadcaster Lite device and the source to make sure it is connected correctly.

# Network Discovery Utility to Find IP Address of VGA Broadcaster

You can use the Epiphan Network Discovery Utility on a Windows PC to find the VGA Broadcaster Lite device and its IP address on the network. You can also use the Network Discovery Utility to connect to the VGA Broadcaster Lite Web admin interface.

The VGA Broadcaster Lite device must be assigned an IP address on the network to be able to transmit visual information, and so that participants can view that information. It can get an IP address from a DHCP server if there is one on the network. If the network does not have a DHCP server, see the see the "*If the Network Does Not Have a DHCP Server*" section. This section assumes that the network has a DHCP server and that the DHCP server gives the VGA Broadcaster Lite device an IP address on the network.

## To install the Network Discovery Utility

1.  Find the latest Network Discovery Utility on a VGA Broadcaster Lite download page:

http://www.epiphan.com/products/broadcasting/VGA Broadcaster Lite/documentation/

Alternatively, you can visit http://www.epiphan.com/products/broadcasting/VGA Broadcaster Lite/ and navigate to find the documentation section.

2.  Select **Download Network Discovery Utility**.

    Make sure you note the download destination folder.
3.  Run NetworkDiscovery.exe from the destination folder above.
4.  Select Search to find the Epiphan devices connected to the network.

**Note:** The Network Discovery Utility can only find the Epiphan devices on the same network as the Windows PC.

If the VGA Broadcaster Lite device is operating, has received an IP address from a DHCP server, and is connected to the network, the Network Discovery Utility should find it and it should appear on the Network Discovery Utility display.

# 3. Web admin interface

This chapter describes configuring the Web admin interface options.

## *Logging into the Web admin interface*

Use the Web admin interface to configure the VGA Broadcaster Lite device. You can log into the Web admin interface by:

- Selecting Web Config from the Epiphan Network Discovery Utility (Windows XP, and Vista only).
- Browsing to the VGA Broadcaster Lite admin interface using any web browser. The web browser can be running on Windows, Mac OS X, Linux, or any other operating system.

To log into the Web admin interface you need the VGA Broadcaster Lite IP address. You can obtain the IP address by using the Network Discovery Utility (see *"Network Discovery Utility to Find IP Address of VGA Broadcaster Lite"*) or by contacting your network administrator in order to determine the address assigned to your VGA Broadcaster Lite by your network and/or DHCP server.

Note: You can also log into the Web admin interface by browsing to the default VGA Broadcaster Lite IP address, which is http://192.168.255.250 ( assuming DHCP is off or the network has not assigned a new IP). To log into the VGA Broadcaster Lite using this IP address, you should record the network settings for the workstation so that you can restore them later, then set the workstation you are using to use the static IP address 192.168.255.249 and netmask 255.255.255.252.  Once your network settings are configured, open a Web browser and browse to:

```
http://192.168.255.250/admin
```

Disconnect any other Epiphan devices from the network before attempting to connect to the VGA Broadcaster Lite device.   Restore the original network settings for your workstation.

## To log into the Web admin interface from the Network Discovery Utility

1. Start the Epiphan Network Discovery Utility and select Search to find the Epiphan devices on the network.
2. Select the VGA Broadcaster Lite device and select Web config. You can log into any device with a status of Device OK. A web browser starts and you are prompted for a user name and password.
3. Enter the following (assuming the admin password has not yet been configured):

   ```
   User Name: admin
   Password: (no password required)
   ```
4. To add a Web admin interface password, see "Adding or Changing the Web admin interface Password".
5. Press **Enter**. The Web admin interface opens.

## To log into the Web admin interface using a web browser

Note: 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 VGA Broadcaster Lite device.
2. Browse to:

   ```
   http://<VGA Broadcaster_Lite_IP_address>/admin
   ```

   For example, if the VGA Broadcaster Lite IP address is 192.30.23.45 browse to:

   > http://192.30.23.45/admin

   Remember to include "/admin" at the end of the address or you will access the broadcast rather than the Web admin interface.
3. Enter the following:

   ```
   User Name: admin
   Password: (no password required, if it is the initial
   factory default setting)
   ```

To add a Web admin interface password, see *"Adding or Changing the Web admin interface Password"*.

4.    Press **Enter**. The Web admin interface opens.

*Figure 10.        VGA Broadcaster Lite Web admin interface*
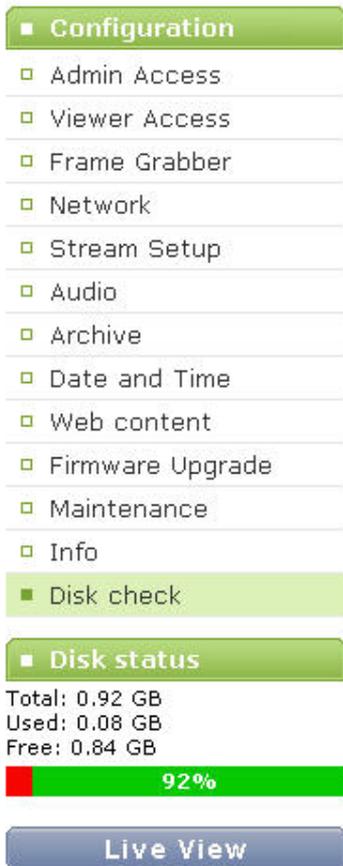
Use the Web admin interface configuration options to administer and operate the VGA Broadcaster Lite device. Once you have successfully configured your device, you can select **Live View** to view the broadcast.

| | |
|---|---|
| Admin Access | Change the admin account password. See *Adding or Changing the Web admin interface Password*. |
| Viewer Access | Change the viewer account password. See *Adding or Changing the Viewer Password*. |
| Frame Grabber | Make Frame Grabber image adjustments. See *Configuring Frame Grabber Adjustments*. |
| Network | Change the VGA Broadcaster Lite network configuration. See *Changing the Network Configuration*. |
| Stream Setup | Change the stream type, frame size, frame rate, bitrate, stream port, refresh rate and ASF stream information. See *Changing Broadcasting Setup* . |
| Audio | Change and adjust the audio input and headphone output. See *Configuring Audio.* |
| Archive | Record the broadcast on the internal memory card. See *Recording the Broadcast*. |
| Date and Time | Change VGA Broadcaster Lite date and time settings. See *Setting the Date and Time*. |
| Web Content | Customize design of the browser where the broadcast is viewed. See *Customizing Web Content*. |
| Firmware Upgrade | Upgrade the VGA Broadcaster Lite firmware. See *Upgrading the VGA Broadcaster Lite Firmware*. |
| Maintenance | Enable and configure remote support. See *Configuring Remote Support*.<br>Reboot or shutdown the VGA Broadcaster Lite device.<br>Restore factory configuration. See *Using Maintenance Controls*.<br>Display information about the VGA Broadcaster Lite Firmware, CPU, Frame Grabber and VGA Mode. See *Displaying VGA Broadcaster Lite Information*. |

| Info | Display information about the VGA Broadcaster Lite Firmware, CPU, Frame Grabber and VGA Mode. See *Displaying VGA Broadcaster Lite Information*. |
|------|------|
| Disk Check | Set a Maintenance Schedule for checking the VGA Broadcaster Lite solid-state memory for errors. |
| Disk Status | View the total hard disk space in GB, the used and available hard disk space in GB, and also the amount used as a percentage of the total space. |
| Live View | View the broadcast |

## If the Network Does Not Have a DHCP Server

If the network does not have a DHCP server, you need to log into the Web admin interface to change the VGA Broadcaster Lite IP address. To do this, you need to temporarily change the network configuration of the workstation.

You must also establish an Ethernet connection between the VGA Broadcaster Lite device and your workstation. You can do this using one of the following methods:

- Connect the VGA Broadcaster Lite Ethernet port to the same Ethernet network as the workstation.
- Connect the VGA Broadcaster Lite Ethernet port to an Ethernet network switch and connect the workstation's Ethernet port to the same switch.
- Connect the VGA Broadcaster Lite Ethernet port directly to the workstation's Ethernet port. (You can use a regular or crossover Ethernet cable for this connection.)

## To log into the Web admin interface

1. Record the network settings for the workstation so that you can restore them later.
2. Change the IP address of the workstation to static IP assignment with the following Address: 192.168.255.249 Subnet Mask: 255.255.255.252

3. Follow the instructions for your operating system. If the operating system supports adding more than one IP address, then you can add this IP address as a second IP address instead of changing the current address.

4. Start a web browser on the workstation and browse to:
   http://192.168.255.250/admin/

5. Enter the following:

        User Name: admin
        Password: (no password required)

6. Press **Enter**. The Web admin interface opens. To change the VGA Broadcaster Lite IP address, see *"Changing the Network Configuration"*.

7. Don't forget to restore the previous network system on your workstation once you have completed your administration of VGA Broadcaster Lite.


# *Adding or Changing the Web admin Interface Password*

Initial factory settings are such that no password is set in the Web admin interface. For security reasons, you should add a password to control access to the administration interface functions. You can add a password or change the password at any time.

Note: If you lose or forget the admin password you should contact your reseller or Epiphan Technical Support for help to reset the device to factory defaults.

## To add a password to the Web admin interface

1. Log into the Web admin interface.

2. Select **Admin Access**.

3. Enter and repeat the new password. The password is case sensitive and can include up to 255 ASCII characters.

4. Select **Apply**. The password changes and after a pause you are prompted to log into the Web admin interface.

---

5. Log into the Web admin interface with the admin user name and the new password.

*Figure 11.*        *Change Administrator's Password*

**Administrator Access**

New administrator password                ••••••••

Retype new administrator password                ••••••••

Apply

## To delete the Web admin interface password

You can delete the Web admin interface password if you don't want to require administrators to enter a password to log into the Web admin interface. Note: Removing the Web admin interface password makes it easier for unauthorized users to change the VGA Broadcaster Lite configuration.

1. Log into the Web admin interface.
2. Select Admin Access. The password fields should be blank.
3. Select Apply without adding characters to the password fields. The password is deleted and after a pause you can log into the Web admin interface with the user name **admin** and no password.

# *Adding or Changing the Viewer Password*

Add a password to control viewer access to the broadcast. You can add a viewer password or change the viewer password at any time.

Note: If you lose or forget the viewer password you replace it with a new password at any time.

### To add or change the viewer password

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**. The password changes and you must log into the Web admin interface.

5. Log into the Web admin interface with the admin user name and password.

6. Distribute or communicate the viewer access password to authorized viewers of the broadcast.

Notes:

- 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.

*Figure 12.*          *Change Viewer's Password*



## To delete a viewer password

You can delete the viewer password if you do not want to require viewers to enter a password to access the broadcast.

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.

## Testing How Participants Log In With a Viewer Password

After you add a Viewer password, participants must obtain the current viewer user name and password in order to log in. User name is always the same: **viewer.** It cannot be changed.

### To log in to view the broadcast

Start any web browser.

Using a browser or media player, open the **Open URL** dialog box and enter the IP, DNS or URL address of the VGA Broadcaster Lite device. For example, if the IP address of the device is 192.168.23.45 then browse to: http://192.168.23.45

Enter the following:

> User Name: viewer

> Password: (enter the viewer password)

Press **Enter**. If the VGA Broadcaster Lite device is capturing images and is broadcasting images over the network, the viewer can see the visual information as it is transmitted.

If the administrator changes user password during the broadcast, the broadcast will be interrupted.  Users that are already logged in will need to click their Refresh button in the browser or click the Play button in media player. After successfully entering a new password the broadcast will resume.

# *Configuring 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 used as a component in the VGA Broadcaster Lite device

and can to be configured separately.

On the Web admin interface, select Frame Grabber to configure Frame Grabber adjustments. The VGA Broadcaster Lite device automatically adjusts image capture settings every time it starts up. The automatic image adjustment is repeated every 60 seconds during operation. You can change the interval between automatic adjustments if you want them to occur more or less often. The capture settings attempt to produce the best quality captured image for the equipment used in your applications.

Normally you would not have to make manual image adjustments. However, you may have special requirements or for other reasons have image quality problems that may only be fixed by making image adjustments.

The Web admin interface contains most of the information that you need to make image adjustments including a brief description of the effect 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. To have changes take effect, you must reboot the VGA Broadcaster Lite device (see *"Rebooting or Restarting VGA Broadcaster Lite"*). You can make more than one change before selecting Apply and rebooting.

**Figure 13.          VGA Broadcaster Lite Frame Grabber Adjustments**

## Frame Grabber Adjustments

You could leave any field empty to enable autoconfiguration algorithm for the appropriate parameter

**Interval between VGA signal autoadjustments, sec**  `60`

Frame Grabber analyzes incoming VGA signal with specified time interval. Valid values are from 0-9999 seconds

**Vertical shift**

From -20 to 20. Positive value shifts image up, negative value shifts image down.

**Horizontal shift**

From -999 to 999. Positive value shifts image left, negative value shifts image right.

**Phase**

From 0 to 31.

**PLL adjustment**

From -999 to 999. Changes number of the pixels in the line.

**Offset**

From 0 to 63. 0 - brighter, 63 - darker.

**Gain**

From 0 to 255. 0 - brighter, 255 - darker.

**Aspect ratio**  `4:3`

**Noise filter**  `Automatic`

**HSync threshold**

From 0 to 255. Adjusts horizontal sync detection.

**VSync threshold**

From 0 to 255. Adjusts vertical sync detection.

`Apply`

## EDID upload

**Select EDID file**  `Browse...`

`Apply`

Note: Because Frame Grabber adjustments are made automatically there are no default Frame Grabber adjustment settings.

| 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 vertical shift to offset the captured image position. For example, a captured image shifted slightly downward (vertically) can be corrected with minor adjustments to the vertical shift settings.<br><br>Increasing or decreasing the value entered in the Vertical Shift field shifts the image up or down. |
| Horizontal shift | Configure horizontal shift to offset the captured image position. For example, a captured image shifted slightly to the right (horizontally) can be corrected with minor adjustments to the horizontal shift settings.<br><br>Increasing or decreasing the value entered in the Horizontal Shift field shifts the image to the right or left. |
| Phase | Configure phase (also called sampling phase) to adjust the horizontal resolution of the image. Improperly adjusted phase will result in a fuzzy image. You can adjust the sampling phase in small steps until a sharper image is displayed. |
| PLL adjustment | Configure PLL to adjust the vertical synchronization properties of the image. The PLL adjustment may need to be changed when there is a repetitive distortion or blurriness on the horizontal axis of the image. You can adjust the PLL setting in small steps until a sharper image is displayed. |
| Offset | Use the offset and gain controls together to optimize image quality. Increasing offset reduces background noise but also reduces the overall signal.<br>Balance offset and gain to achieve the best quality image. You should adjust these settings by the smallest values possible to |

|  | achieve the best results. You can 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 gain amplifies weak signals but also increases noise. Balance offset and gain to achieve the best quality image. You should adjust these settings by the smallest values possible to achieve the best results. You can 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 | Set the aspect ratio of the captured image. The default aspect ratio is 4:3. You can change the aspect ratio to wide mode so that the VGA Broadcaster Lite device can accurately capture wide aspect ratio modes.<br><br>It's not always possible for the Epiphan device driver to distinguish between video modes when they have the same number of rows, for example, 1024x768 and 1280x768. You can change the aspect ratio to Wide Mode if you want the driver to choose wide video mode in these situations. |
| Noise filter | This settings allows you to adjust noise filter performance |
| HSync threshold | Adjusts horizontal sync detection. |
| VSync threshold | Adjusts vertical sync detection. |
| Select EDID file | Browse to the Extended display identification data (EDID) file to upload it. It describes the capabilities of the digital display to a video source. |

## *Changing the Network Configuration*

You may want to change the VGA Broadcaster Lite network configuration:

- If the network does not have a DHCP server.
- If the network does have a DHCP server but you want the VGA Broadcaster Lite device to have a static IP address.
- If the VGA Broadcaster Lite device is using the DHCP server-assigned IP address, but you want to change the IP address. If for some reason the DHCP server goes down you can log into the VGA Broadcaster Lite Web admin interface and change the IP address.
- If you have previously configured the VGA Broadcaster Lite device to use a static IP address and want to change some network settings or revert back to using DHCP.

For network changes to take effect you must reboot the VGA Broadcaster Lite device after making the changes. See *"Rebooting or Restarting VGA Broadcaster Lite"*.

Note: If you change the IP address you will need to remove the VGA Broadcaster Lite device from the Network Discovery Utility and then select Search to find it again.

Note: You can also see the VGA Broadcaster Lite MAC address on the Network Configuration page.   Providing the MAC address to your network administrator may be helpful for managing your network.

## To set the VGA Broadcaster Lite to use a static IP address

1. Log into the Web admin interface.

2. Select **Network**.

3. Select **Use static address**.

4. Enter an IP Address, Network Mask, Default Gateway, and DNS Server that are valid for your network. Note: Clarify that this gateway setting is the gateway of your local LAN (i.e. 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 that you assign must be compatible with your network.

**Figure 14.** **Change the VGA Broadcaster Lite IP address**



For example:

```
IP:          192.168.1.20

Mask:        255.255.255.0

Gateway:      192.168.1.2

DNS server:  192.168.1.99
```

5.   Select **Apply** to save these changes.

6.   Select **Maintenance**.

7.   Select **Reboot Now**.

8.   It takes a few minutes for the VGA Broadcaster Lite device to reboot.

9.   After a few minutes log into the Web admin interface by browsing to its new IP address. For the example above, browse to: http://192.168.1.20/admin/

10.  Enter the Web admin interface user name and password to login.


## To reset network settings to use DHCP

By default, if you connect the VGA Broadcaster Lite device to a network with a DHCP

server, the DHCP server will automatically configure the network settings. If required you can disable DHCP settings and use a static IP address. This procedure describes how to re-enable DHCP settings that have been disabled.

1.  Log into the Web admin interface.

2.  Select **Network**.

3.  Select **Use DHCP**.

4.  Select **Apply** to save these changes.

5.  Select **Maintenance**.

6.  Select **Reboot Now**. It takes a few minutes for the VGA Broadcaster Lite device to reboot.

7.  After a few minutes log into the Web admin interface by browsing to its new IP address. For example, browse to: http://192.168.23.107/admin/

8.  Enter the Web admin interface user name and password to login.

# *Configuring Remote Support*

The VGA Broadcaster Lite device 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 the VGA Broadcaster Lite device is having problems and you contact Epiphan Support, the support team can use this maintenance information to help remotely troubleshoot the problems.

Note: The VGA Broadcaster Lite 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 VGA Broadcaster Lite device 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 VGA Broadcaster Lite 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, you must enter the IP address of the DNS server. You can get this IP address 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 VGA Broadcaster Lite device to connect to the Epiphan maintenance server. Contact your network administrator for assistance.

Use the Maintenance section in the Web admin interface to access the Remote support settings:

**Figure 15.      Remote Support Configuration**

# Maintenance

**Enable remote support**    ☑

**Enable connection to
maintenance server**    ☑

*Maintenance server*

**Server Address**    epiphany.epiphan.c

**Server Port**    30

Apply

You can change the following remote support settings. Remote support is enabled by default.

| Enable Remote Support | Allow Epiphan Support to log into the VGA Broadcaster Lite device with special access privileges to troubleshoot problems. |
|---|---|
| Enable connection to maintenance server | The VGA Broadcaster Lite device 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. However, you can change this address if required, (but usually only as recommended by Epiphan Support). For example, you may have to change this address to a numeric IP address if your VGA Broadcaster Lite device cannot connect to a DNS server. |

You can enable and disable remote support and the connection to the maintenance server independently.

The following table describes the results of different configurations:

| Enable Remote Support | Enable Connection to Maintenance Server | Result |
|---|---|---|
| Yes | Yes | The VGA Broadcaster Lite device connects to the Epiphan maintenance server. If required, Epiphan Support can remotely connect to the device with special access privileges. |
| No | Yes | The VGA Broadcaster Lite device 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 VGA Broadcaster Lite device does not connect to the Epiphan maintenance server. If required, Epiphan Support can remotely connect to the device with special access privileges. If you provide remote access to your network in some other way (for example, using port forwarding). Contact Epiphan Support for assistance. |

Please contact your network security administrator to review your security settings for VGA Broadcaster Lite.

## *Changing Broadcasting Setup*

VGA Broadcaster Lite supports broadcasting of various standards and formats. Your choice will depend on the application and performance requirements. Browser/viewer capabilities and compatibilities are subject to change. The video stream format is

selected by an administrator and users view the broadcast in this format. It is possible to use multiple VGA Broadcaster Lite devices with different settings for different browsers/media player capabilities.

You can set the VGA Broadcaster Lite device to stream video using Flash (H.264), ASF (MPEG4 or H.264 codecs), Motion JPEG or RTSP (MPEG4 or H.264 codecs).

- 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 H.264 standard.

- 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. You may need to install a codec to view ASF files. This file type supports H.264 and MPEG4 standards.

- The **Motion JPEG file type** records each frame in the video in JPEG format and can be viewed using most web browsers.

- The **RTSP type** supports many media players including QuickTime and MPlayer. This file type supports H.264 and MPEG4 standards.

| | |
|---|---|
| Media Player, Browser, Viewer capabilities and compatibilities are subject to change. | |

| | |
|---|---|
| Show time label | Define how whether video should be time labeled and how (only date, only time, date and time, time and ms, date, time and ms. |
| Stream type | You can select Flash (H.264), ASF (MPEG4 or H.264 codecs), Motion JPEG or RTSP (MPEG4 or H.264 codecs). |

| | Flash video (H.264) and Motion JPEG can be viewed on many operating systems and web browsers. ASF can be viewed with the Windows Media Player on Windows systems, and the VLC Media Player on Windows and other operating systems. RTSP supports many media players including QuickTime and MPlayer.<br><br>For streaming over HTTP you can select any stream type except for RTSP.<br><br>For RTP streaming use the Specific Stream Settings section described below. |
|---|---|
| Video encoding preset | Define whether video stream should be encoded at a high quality, high speed or according to the default system settings |
| Video encoding profile | You can select encoding profiles targeting specific classes of applications:<br><br>1. Baseline: for applications requiring additional data loss robustness, e.g. videoconferencing<br>2. Main: for standard-definition broadcasts<br>3. High: for broadcast and disc storage applications |
| Frame size | You can 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 they will be scaled to the resolution limit. Limiting the file resolution can help to reduce bandwidth usage. |
| Key frame interval | Controls the number of seconds between key frames. Key frame defines the starting and ending points of any smooth transition. |
| Limit frame rate | Enter a value (frames per second) in the Limit frame rate field to set a frame rate that is lower than the maximum frame rate at which the VGA Broadcaster Lite device can capture images. You can reduce the frame rate to reduce |

| | |
|---|---|
| | the number of images captured by the device. You may want to reduce the frame rate to reduce network usage. |
| Bitrate | You can enter a Video bitrate. A lower bitrate produces lower quality videos and smaller file sizes. A higher bitrate produces better quality videos and larger file sizes. |
| Rate control mode | Select a setting from the drop down list to set how important it is for the VGA Broadcaster Lite device to maintain the Bitrate setting. You can select Relaxed to allow the bitrate to increase temporarily to maintain image quality. Select Balanced to balance the bitrate restriction and the image quality. Select Strong to maintain the bitrate restriction and temporarily reduce the image quality. |
| Stream port | You can enter a port number for the internal streaming server. The default streaming port is 1881. You might want to change the stream port if port 1881 is used by other services on your network or if you do not want to add a port forwarding configuration for a port other than port 1881 to your router or firewall. You can change the stream port to any port between 1000 and 65535 except 5557 or any port used by another Internet service. For example, you can't change the stream port to 80 because 80 is the port used by HTTP. If you change the stream port, you must configure port forwarding on your router or firewall for the changed port. See *Enabling Access to the Broadcast from the Internet.* |
| Enable audio | Select this checkbox to enable audio settings for the broadcast. |
| Audio format | You can select ether MP3 or Raw PCM (Pulse Code Modulation) formats. |
| Audio sample rate (Hz) | Number of samples per second that are used to digitalize a particular sound |
| Audio channels | You can select either mono (1 channel) or stereo (2 |

| | |
|---|---|
| | channels) sound |
| Audio bitrate | Select audio bitrate value for the broadcast |

# *Specific Stream Settings*

Parameters that are available in this section are displayed depending on the selected video stream and, in some cases, codec.

Particularly you need to configure these settings in order to send a unicast or multicast stream to the IP address of the server on specific ports. Sending a stream to Content Delivery Network (CDN) also requires configuring these parameters. Once the video and audio encoding parameters above are configured, the parameters specific to the selected video stream type should be setup if necessary.

| | |
|---|---|
| Page refresh time (available if Motion JPEG stream type is selected) | Specify how often the browser updates the visual information coming from the Broadcaster, i.e. how often the page is refreshed. |
| Quality parameter (available if Motion JPEG stream type is selected) | This parameter is similar to bitrate. Use bigger values to provide better quality of the broadcast. |
| Title (available if ASF or Flash video stream type is selected) | Specify the stream's title to be displayed on the media player interface. |
| Author (available if ASF or Flash video stream type is selected) | Specify the author's name to be displayed on the media player interface. |
| Copyright (available if ASF or Flash video stream type is selected) | Specify the copyright details to be displayed on the media player interface. |
| Comments (available if ASF or Flash video stream type is selected) | Specify comments if necessary to be displayed on the media player interface. |
| Enable RTP/UDP stream (available if RTSP video stream type is selected) | Select this checkbox to enable RTP/UDP settings. |
| Enhanced compatibility mode (available if RTSP (MPEG-4 codec) video stream | This parameter provides operating stability, if transmitted video/audio stream |

| | |
|---|---|
| type is selected) | is not quite supported by the viewer's equipment (only for H.264). |
| Destination IP (available if RTSP video stream type is selected) | The IP address that receives the stream. |
| Audio port (available if RTSP video stream type is selected) | Configure video port for the stream |
| Video port (available if RTSP video stream type is selected) | Configure audio port for the stream |

# *Different Stream Distribution Architecture Methods*

Broadcaster Lite can support stream over HTTP, RSTP, unicast RTP, multicast RTP and content distribution network (CDN) broadcast network streaming architectures.

A **unicast** stream is used for a one-to-one node connection. In this scenario, a logical connection is established with a single client node. It does not require a request from the viewer to start sending data. Only one copy of the data is sent. The multimedia stream is always sent to the specified IP address. Unicast transmission is available during RTP streaming.
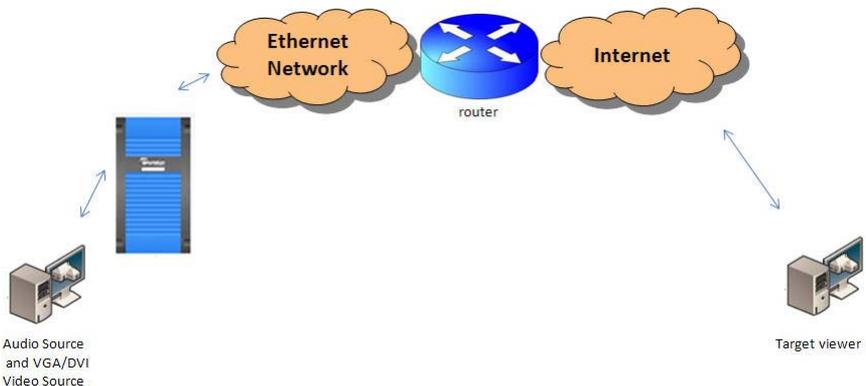
To configure unicast transmission:

1. Select the Enable RTP/UDP stream checkbox.
2. Use the Destination IP field to enter the IP address of the target host.
3. Fill in other fields as required.

A **multicast** stream provides one-to-many communication over an IP infrastructure in a network. In a Multicast configuration the Broadcaster Lite sends a packet only once to a router that supports multicasting, and this router distributes the packets to client nodes using a multi-cast protocol.  Sending multicast stream requires equipment that supports multi-casting, configuring your network and special Broadcaster settings. Multicast architectures are used predominantly within a high bandwidth corporate LAN and not on Internet based architectures. Multicast RTP stream is not usually propagated outside the LAN (though it may be propagated through VPNs connecting several LANs). Multicast transmission is available during RTP streaming.
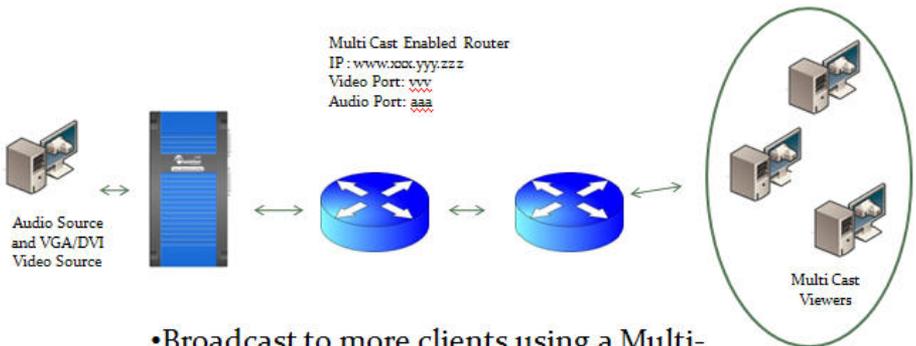


•Broadcast to more clients using a Multi-cast router
•Configure IP and port numbers to stream broadcast through a multi-cast service

To configure multicast connection:

1. Select the Enable RTP/UDP stream checkbox.
2. Use the Destination IP field to enter the IP multicast group address.

3. Fill in other fields as required.

**Content Delivery Networks**. During streaming over HTTP or RTSP streaming all data is duplicated to each connected client. Therefore, only up to 3 clients can access the broadcast. All they need to know is a URL of the broadcast. For this purpose you can use VGA Broadcaster out of the box, without any additional settings. If you would like to send a stream to multiple users, it is necessary to configure VGA Broadcaster Lite to the special type of client, called Content Distribution Network (CDN). It is recommended to use CDN provider StreamZilla (www.streamzillacdn.com). CDN then redistributes the stream for multiple viewers. Serving viewer trough the CDN significantly increases the maximum number of concurrent clients, while reducing the load on the uplink internet connection. Effectively, this type of data transmission is very similar to unicast - you should specify IP address of CDN provider as a stream receiver.



Audio Source and VGA/DVI Video Source

Router Or Firewall

Without connection to CDN services Broadcaster Lite supports up to three viewers.

Content Delivery
Network Router

Using CDN services
Broadcaster Lite can
support unlimited
number of viewers.

Audio Source and
VGA/DVI Video Source
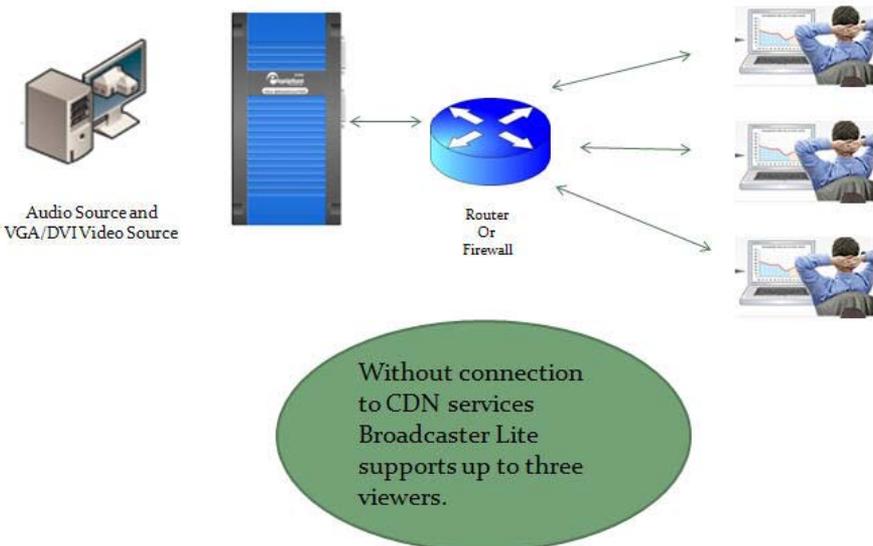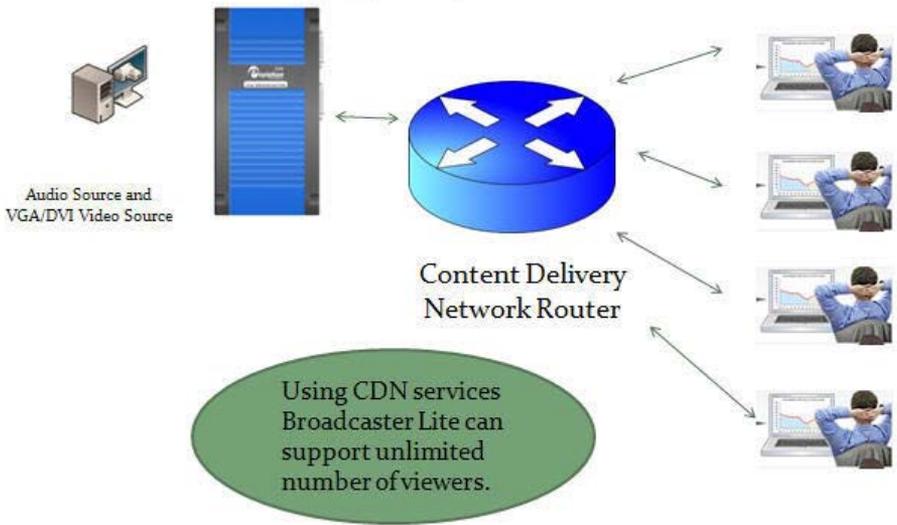
To configure connection to a CDN provider:

1. Select the Enable RTP/UDP stream checkbox.

2. Use the Destination IP field to enter the IP address provided by CDN provider.

3. Fill in other fields as required.

## To set the Video Stream type

1. Log into the Web admin interface.

2. Select Flash (H.264), ASF (MPEG4 or H.264 codecs), Motion JPEG or RTSP (MPEG4 or H.264 codecs).

3. If you have set **Stream type** to Flash Video (H.264) or Motion JPEG, you can enter a value for Page refresh time.

4. If you have set **Stream type** to Flash Video (H.264), RTSP or ASF stream,

you can Enable audio.

5.  If you have set **Stream type** to ASF, you can enter information in the Title, Author, Copyright and Comments fields under ASF stream info.

Note: VGA Broadcaster Lite can broadcast only one format at a time. For broadcasting multiple formats you need to install one VGA Broadcaster Lite for each format you want to support.

## *Configuring Audio*

Configure audio settings to control audio inputs. All available formats support audio except Motion JPEG.

*Figure 16.* *VGA Broadcaster Lite audio configuration*

**Audio Configuration**

**Input Amplifier Volume** 100%
**Microphone 20dB boost** ☐

**Input Source** Mic
**Headphones Amplifier Volume** 50%

Apply

| | |
|---|---|
| Input Amplifier Volume | Reduce the input volume if the line in signal volume is too high for the VGA Broadcaster Lite line in amplifier. The default input amplifier volume setting is 100%. If the input volume is too high, change the setting to between 5% and 90% to reduce the input volume. |
| Microphone | Increase the VGA Broadcaster Lite microphone's power. Select this |

| 20dB boost | option to increase the recording volume if the volume is very low. Disable microphone boost if loud sounds cause problems such as distortion or clipping while recording. |
|---|---|
| Input Source | Select the audio input source. For microphone input select **Mic** and connect a microphone to the device's microphone port. For line in input select **Line** and connect a line in audio input to the Line in port on the back of the device. |

## *Recording the Broadcast*

You can record the broadcast using the internal solid state memory. The system will perform recording depending on the limit parameters, whichever is earlier.



| Recorder enabled | Select this checkbox to start recording. |
|---|---|
| Time limit | Specify the record duration. |
| Size limit | Specify the size of the recorded file. When either of the limits (time or size) is exceeded, the system starts recording data in another file. |

The archive lists all video files recorded by VGA Broadcaster Lite and saved on the device. For each file, the list includes the name of the file, its status, start and end

times, duration, and size in MB. Each video file entry on the list also includes icons that you can use to download, delete or rename the file.

# Setting the Date and Time

You can set date and time manually or you can enable Time synchronization. Enable Time Synchronization to update the date and time by using a time server. You can select NTP, to get date and time updates from a public network time protocol (NTP) server by connecting to the server over the Internet. NTP uses UDP port 123. The default NTP server is time.nrc.ca. You should change this to an NTP server recommended for your location (available from your network administrator).

*Figure 17.        Date and Time Configuration*

## Date and Time

| Time Zone | Select the appropriate time zone |
|---|---|
| Enable time synchronization | This parameter enables time synchronization with the defined server |

| Protocol | Select the time protocol |
|---|---|
| Server IP Address | Enter the IP address of the time server |
| Update interval | Specify 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 – slowing or speeding the clock up to 10 sec/day. |

For complete information about NTP including a list of recommended NTP servers, see The NTP Public Services Project. To make sure you get the correct time from an NTP server you should select the correct Time Zone for the location of your VGA Broadcaster Lite device.

If the VGA Broadcaster Lite device cannot connect to the Internet and if there is an RDATE server on the network, you can set time synchronization to use RDATE (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, you can control how often the date and time are updated. The Time Update interval can be every 1, 6, 12, or 24 hours.

## *Customizing Presentation and Web Content*

This option allows you to customize design of the Web browser where the broadcast is viewed. For example, you can add the event's name, company logos etc.

To customize the design you need to create an .xsl file using XML document formatting.

| 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. |

*Figure 18.* *Web Presentation and Content options*



## Upgrading the VGA Broadcaster Lite Firmware

You can obtain new firmware versions from Epiphan Support. New firmware is released to fix known problems or to add new features.

Figure 19. *VGA Broadcaster Lite firmware upgrade*

## Firmware Upgrade

Current firmware version: 3.7.7

**Select firmware upgrade file** [                    ] ( Browse... )

**DO NOT interrupt or power down the VGA Broadcaster Std until after the update is completed.**

( Apply )

## To install new firmware

Installing new firmware can take several minutes. Once you start a firmware upgrade, the VGA Broadcaster Lite device cannot display captured images until the firmware upgrade is complete.

> Note: Do not interrupt or power down the VGA Broadcaster Lite device during the firmware update.

1. Get the new firmware file from Epiphan Support.
2. Place a copy of the firmware file on the workstation you use to connect to the Web admin interface.
3. Log into the Web admin interface.
4. Select **Firmware Upgrade**.
5. Select **Browse** and then select the firmware file.
6. Select **Apply**. The firmware uploads to the VGA Broadcaster Lite device. The device unpacks the firmware update file, verifies the contents and then upgrades the firmware.
7. To complete the firmware upgrade you must reboot the VGA Broadcaster Lite device. See *"Rebooting or Restarting VGA Broadcaster Lite"*.
8. Log into the Web admin interface and confirm that the VGA Broadcaster Lite device is running the new firmware version by selecting Info and viewing the firmware version.

Note: In case firmware update fails you can restore the factory configuration as it is

explained in the following section ("Using Maintenance Controls").

## Using Maintenance Controls

On the Web admin interface, select **Maintenance** to perform operations such as restoring the factory configuration, and rebooting or shutting down the device.

Figure 20.      Maintenance Options

**Maintenance**

| Restore Factory Configuration | ( Restore ) |
| Reboot | ( Reboot Now ) |
| Shutdown | ( Shutdown Now ) |

## Restoring the VGA Broadcaster Lite Default Factory Configuration

Select **Restore** beside Restore Factory Configuration to reset the Broadcasting and Frame Grabber settings. The factory default configuration is the configuration that the VGA Broadcaster Lite device had when you received it from Epiphan. It can be useful to return the VGA Broadcaster Lite device to this configuration if you have made a number of configuration changes that you want to reverse.

Restoring the factory configuration can also help with troubleshooting. If after making a number of configuration changes you notice problems and you are not sure which change is causing the problems, you can restore the Factory Configuration and start over.

Note: You can also press the reset button on the VGA Broadcaster Lite device to return the device to its original Factory defaults including resetting the passwords and IP Address. See *"VGA Broadcaster Lite Hardware Features"* for information on the location of the reset button.

# Rebooting or Restarting VGA Broadcaster Lite

Many VGA Broadcaster Lite configuration changes require you to reboot the VGA Broadcaster Lite device. For an example, see *"Changing the Network Configuration"*.

### To reboot or restart the VGA Broadcaster Lite

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

The VGA Broadcaster Lite device takes a short time to reboot and resume operation.

### Shutting Down the VGA Broadcaster Lite Device

Shut down VGA Broadcaster Lite to take the device off the network without disconnecting the power.

To shut down the VGA Broadcaster Lite device,

1.    Log into the Web admin interface,
2.   Select Maintenance, and
3.   Beside Shut down select Shut down now.

The VGA Broadcaster Lite device shuts down. Now you cannot log into the Web admin interface or view captured images. At the same time the Network Discovery Utility will not find the VGA Broadcaster Lite device on the network. To restart the VGA Broadcaster Lite device you must disconnect and reconnect the power.

# Displaying VGA Broadcaster Lite Information

Select **Info** on the Web admin interface to display the following VGA Broadcaster Lite system information:

- The current firmware version including the version number and details of the firmware build.
- The VGA Broadcaster Lite system CPU details.
- The Frame Grabber installed in the VGA Broadcaster Lite device.
- The Frame Grabber VGA mode information.

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

*Figure 21.       VGA Broadcaster Lite system information*

## VGA Broadcaster Davinci info

### Firmware

```
FIRMWARE_VERSION=2.1.20
FIRMWARE_BUILD_HOST="tochilka 2.6.31-17-server"
FIRMWARE_BUILD_DATE="2010-11-11"
FIRMWARE_PLATFORM=VGA2CPU_DM365
FIRMWARE_ARCH=arm
```

### Services status

```
Encoder: up 5066 seconds
Broadcaster: up 5068 seconds
```

### Stream info

```
Actual encoder frame rate: 22.8
Live broadcast: http://172.30.209.114/preview.cgi
Direct stream URL: http://172.30.209.114:1881/vgabroadcaster.flv
```

### Connections

| Stream name | Client IP | Bitrate | Bytes transmitted |
|---|---|---|---|
| vgabroadcaster.flv | 172.30.209.161 | 1744 | 1068671 KBytes |

### VGA mode

```
2C 03 18 0A 00 50
00 04 00 03 15 25 01 00
02 10 80 F9 DF 8E 1F 1B 00 00 00 00 00 00 00 00 00 00 00 00 00
```

# Disk Check

You can setup disk maintenance schedule for checking the Broadcaster hard disk for errors. The hard disk maintenance schedule includes running a disk check after a configured number of device restarts and after a configured number of months of operation. At any time you can also select **Check disk now** to check the hard disk.

Enter the number of the Broadcaster restarts and the number of months. The system will perform disk check depending on these parameters, whichever is earlier.

The actual disk check will be run the next time the Broadcaster restarts. The disk check occurs during system startup and can cause a lengthy delay in starting up the device.

Selecting **Check disk now** causes the device to stop recording and to check the disk immediately. The disk check can take a few minutes. The device automatically resumes recording after the disk check is complete. Results of the disk check are not displayed unless an error is found that cannot be corrected.

## Disk maintenance

### Disk maintenance schedule

Number of VGA Broadcaster Davinci restarts before disk check is forced.
0 means do not force disk check.
`365`

Number of months before disk check is forced on the next VGA Broadcaster Davinci restart.
0 means do not force disk check.
`12`

[ Save ]

### Check disk now

You can start disk check immediately. Recording will be stopped and resumed after the check is completed.

[ Check now ]

# Disk Status

In **Disk status** section (under **Disk check**), you can view the total amount of space available on the Broadcaster solid state memory in GB, the used and available space in GB, and also the amount used as a percentage of the total amount of space on the disk.

# 4. Viewing the Broadcast

Before viewing the broadcast make sure your network settings are properly configured.

## *How to View Broadcast on Media Players*

1. Launch a media player.

2. Use the Menu bar to open the **Open URL** dialog box and enter the IP, DNS or URL address of the VGA Broadcaster Lite device. For example, if the IP address of the device is 192.168.23.45 then browse to: http://192.168.23.45

3. Enter the following:

   > User Name: viewer

   > Password: (enter the viewer password)

4. Press **Enter**.

## *How Participants Log In With a Viewer Password*

If the administrator has configured a Viewer password, participants must obtain the current viewer user name and password in order to log in. User name is always the same: **viewer.** It cannot be changed.

## *To log in to view the broadcast*

Start any web browser.

Browse to the IP, DNS or URL address of the VGA Broadcaster Lite device. For example, if the IP address of the device is 192.168.23.45 then browse to: http://192.168.23.45

Enter the following:

> User Name: viewer

Password: (enter the viewer password)

Press **Enter**. If the VGA Broadcaster Lite device is capturing images and is broadcasting images over the network, the viewer can see the visual information as it is transmitted.

If the administrator changes user password during the broadcast, the broadcast will be interrupted.  Users that are already logged in will need to click their Refresh button in the browser or click the Play button in media player. After successfully entering a new password the broadcast will resume.

*Figure 22.        A Browser with URL in an Address Bar*
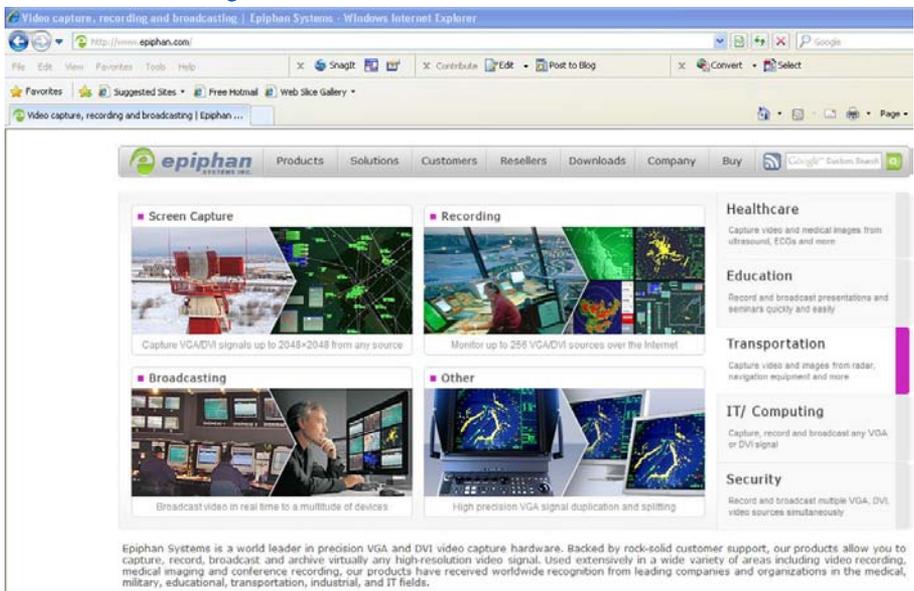


# Remote Viewing: Enabling Access from the Internet

This section is mostly intended for network administrators on the viewer's side.

In case FLV/ASF/Motion JPEG or RTSP streams are broadcasted, different procedures are recommended.

- In case FLV/ASF/Motion JPEG streams are broadcasted:

To allow viewers access from the Internet, your network administrator must configure your Internet router or firewall to allow connections from the Internet to the VGA Broadcaster Lite IP address and the ports associated with its services.

A common way to do this is to configure port forwarding on the router or firewall. When users attempt to connect to the designated public IP address, the connection is forwarded through the router or firewall to the destination VGA Broadcaster Lite device.

First, ensure that port 80 and port 1881 are setup on your firewall as outgoing ports and no other applications are conflict with use of these ports.

You should configure port forwarding on the router or firewall for the two ports before users will be able to access the broadcast from outside your firewall.

- Port 80 is used for HTTP by both admin and viewers.
- Port 1881 is used for accessing the broadcast streams.

If you need to view the broadcast from outside the network, note that the URL /IP displayed in the Info section of the Web interface can be used for local broadcast only. The correct address would contain the IP address and the port of the machine you have configured to face remote viewers on the Internet.

For example, you could configure port forwarding on the router or firewall so that when a user on the Internet connects to the Internet IP address of the router or firewall on port 80 the connection is forwarded to the VGA Broadcaster Lite device. If the Internet IP address of the router or firewall is 192.168.20.37, users on the Internet would connect to the following URL:

<http://192.168.20.37:80>

The router or firewall would forward this connection to the VGA Broadcaster Lite web interface. This port forwarding configuration allows HTTP connections using port 80 from the Internet to be forwarded to the VGA Broadcaster Lite device using port 80.

- In case FLV/ASF/Motion JPEG or RTSP streams are broadcasted:

  Make sure that port 80 and RTSP port (usually 554) are setup as outgoing ports. When a RTSP connection is established, VGA Broadcaster Lite sends packets to the router's UDP ports. Enable forwarding for these ports to the viewers.

  Important: It is recommended that your network administrator properly configures port forwarding, and other security settings before viewer accesses the broadcast from the Internet.   You may also ask that the network administrator configure DNS and URL mapping or aliases so that viewers can access a more user friendly URL.

**Figure 23.        Broadcaster Lite Remote Viewing**
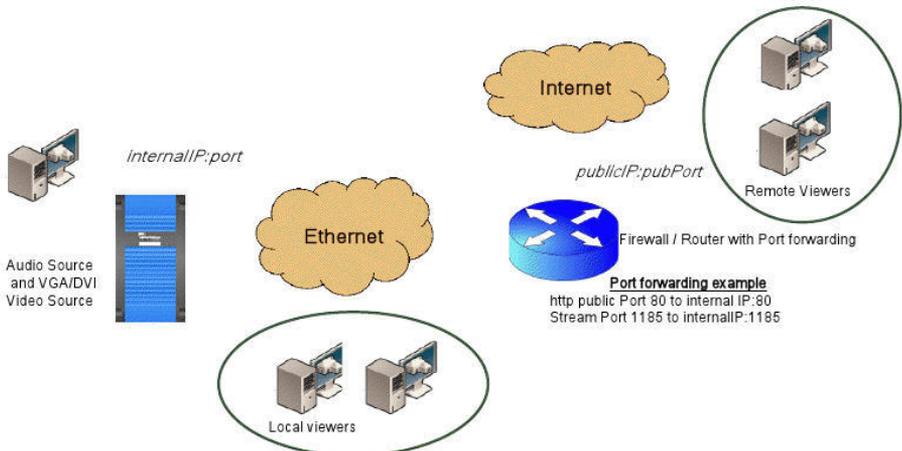


- Internal Broadcast URL : http://<internalP>/
- External Broadcast URL : http://<publicIP:pubPort>/

# 5. Changing the Configuration from a Third-Party Application

You can integrate a VGA Broadcaster Lite device with a third-party application, a tool such as Wget, or a script that sends commands to the VGA Broadcaster Lite device as URLs. You can send commands to get (and view) configuration settings and to change configuration settings.

Note: Contact Epiphan for the most recent updates to the API.

This chapter describes:

- Syntax
- Keys
- Examples

## *Syntax*

Use the following syntax to get configuration settings:

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

Use the following syntax to set or change the configuration:

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

- <address> is the IP address or name you use to connect to the VGA Broadcaster Liteadmin interface.

  For example, if you log into the VGA Broadcaster Lite device using http://192.30.23.45/admin then <address> would be 192.30.23.45.

- <key> is the name of the part of the VGA Broadcaster Liteconfiguration to view or change. See "Keys" for more information.
- <value>is the value to change the configuration setting to. 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 vertical and horizontal shift Frame Grabber adjustment settings:

http://<address>/admin/get_params.cgi?vshift&hshift

• To set the vertical shift to 5 and the horizontal shift to 10:

http://<address>/admin/set_params.cgi?vshift=5&hshift=10

## Including the Admin Username and Password

You must always include the admin username and password to change the VGA Broadcaster Lite configuration from a third-party application. 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>]...
```

# *Keys*

This section lists and describes all of the keys that you can use to view or change the VGA Broadcaster Lite configuration. You can use the following types of keys:

•       Frame Grabber Adjustment Keys
•       Broadcasting Setup Keys
•       ASF Encoder Keys
•       Flash Encoder Keys

## Frame Grabber Adjustment Keys

Table 3 lists the keys available for getting or changing Frame Grabber adjustments. See "Configuring Frame Grabber Adjustments" for more information about each key.

Table3: Frame Grabber adjustment keys

| Key | Description |
|---|---|
| gain | Get or change the gain. The range is 0 to 255. |
| hshift | Get or change the horizontal shift. The range is -999 to +999. |
| offset | Get or change the offset. The range is 0 to 63. |
| phase | Get or change the phase. The range is 0 to 31. |
| pll | Get or change the PLL adjustment in pixels. The range is -999 to +999. |
| tune_interval | Get or change the adjustments interval in seconds. The range is 0 to 9999. |
| vshift | Get or change the vertical shift. The range is -20 to +20. |

## Broadcasting Setup Keys

Table 4 lists the keys available for getting or changing the broadcasting setup. See "Changing Broadcasting Setup" for more information about each key.

Table 4: Broadcasting setup keys

| Key | Description |
|-----|-------------|
| framesize | Get or change the frame size in pixels, for example 1024 x 768. Use %20 for spaces. The supported resolutions are 640 x 480, 720 x 400, 720 x 480, 720 x 576, 768 x 576, 1024 x 768, 1152 x 864, 1280 x 720, 1280 x 768, 1280 x 960, 1280 x 1024, 1360 x 768, 1360 x 1024, 1600 x 1200, and 1920x 1200 |
| 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:<br><br>• 0 is flash<br>• 1 is ASF video<br>• 2 is Motion JPEG |
| 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. The range is 300 to 2000. |

## ASF Encoder Keys

Table 5 lists the keys available for getting or changing ASF encoder settings. You can change ASF encoder settings when stream type is set to ASF stream. See *"Changing Broadcasting Setup"* for more information about setting the stream type to ASF.

Table 5: ASF encoder setting 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. |
| mpg_gop_size | Get or change the maximum number of frames that make one group of pictures (GOP) for the ASF encoder. The GOP is the number of frames between key frames. The default GOP size is 30, which means 30 frames between each key frame. The range is 1 to any number.<br><br>Normally you would not have to change the GOP size; however, you can increase the GOP size to reduce the number of key frames. Reducing the number of key frames reduces the amount of bandwidth used by the broadcast. However, a new viewer can only join the stream at a key frame, so if there is a long pause between key frames there will be a long pause for viewers joining the stream. |
| mpg_qmax | Get or change the maximum video quantizer scale (Qmax) value for the ASF encoder. The lower the Qmax the higher the video quality and the higher the amount of bandwidth required to view the video. The range is 1 to 31. The default value of |

| | |
|---|---|
| | Qmax is 31. You can reduce Qmax to increase the video quality. |
| mpg_qmin | Get or change the minimum video quantizer scale (Qmin) value for the ASF encoder. The lower the Qmin the higher the video quality and the higher the amount of bandwidth required to view the video. The range is 1 to 31. The default value of Qmin is 1. If you need to reduce the bandwidth requirements of the video, increase the Qmin. Usually you would only increase qmin if setting Qmax to 31 does not achieve the required bandwidth reduction. |

Note: Qmax and Qmin define the frame quantizer range. Q is the dynamically changing coefficient of image quality degradation, performed by the encoder to maintain selected bitrate. Since Qmax and Qmin define a range, Qmax must always be greater than Qmin.

## Flash Encoder Keys

Table 6 lists the keys available for getting or changing flash encoder settings. You can change flash encoder settings when stream type is set to Flash video. See *"Changing Broadcasting Setup"* for more information about setting the stream type to Flash video.

Table 6: Flash encoder setting keys

| Key | Description |
|-----|-------------|
| h263_gop_size | Get or change the maximum number of frames that make one group of pictures (GOP) for the flash encoder. The GOP is the number of frames between key frames. The default GOP size is 30, which means 30 frames between each key frame. The range is 1 to any number.<br><br>Normally you would not have to change the GOP size; however, you can increase the GOP size to reduce the number of key frames. Reducing the number of key frames reduces the amount of bandwidth used by the broadcast. However, a new viewer can only join the stream at a key frame, so if there is a long pause between key frames there will be a long pause for viewers joining the stream. |
| h263_qmax | Get or change the maximum video quantizer scale (Qmax) value for the flash encoder. The lower the Qmax the higher the video quality and the higher the amount of bandwidth required to view the video. The range is 1 to 31. The default value of Qmax is 31. You can reduce Qmax to increase the video quality. |
| h263_qmin | Get or change the minimum video quantizer scale (Qmin) value for the flash encoder. The lower the Qmin the higher the video quality and the higher the amount of bandwidth required to view the video. The range is 1 to 31. The default value of Qmin is 1. If you need to reduce the bandwidth requirements of the video, increase the Qmin. Usually you would only increase qmin if setting Qmax to 31 does not achieve the required bandwidth reduction. |

Note: Qmax and Qmin define the frame quantizer range. Q is the dynamically changing coefficient of image quality degradation, performed by the encoder to maintain selected bitrate. Since Qmax and Qmin define a range, Qmax must always be greater than Qmin.

## *Examples*

For a VGA Broadcaster Lite device with IP address 192.30.23.45, and admin password of pass123, you 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 "VGA Broadcaster Lite Stream", set the ASF qmax to 5:

```
wget --http-user=admin --http-passwd=pass123
"http://192.30.23.45/admin/set_params.cgi?streamtype=0
&title="VGA Broadcaster Lite%20Stream&mpg_qmax=5"
```

# 6. Connecting Broadcaster Lite to a Wireless LAN

An optional USB 802.11 b/g Wireless adaptor allows for establishing wireless Ethernet connection between Broadcaster Lite and the Ethernet LAN.  The adaptor should be within a range of approximately 100 meters (110 yards).

Once configured correctly, VGA Broadcaster Lite can transfer VGA/DVI output using the 802.11 b/g wireless standard instead of the Ethernet port and cable.

To enable wireless connectivity, plug the USB wireless Ethernet adapter into the USB port of the VGA Broadcaster Lite, turn on the VGA Broadcaster Lite and configure the wireless network settings. See the *VGA2WiFi User Guide* for details.

# 7. Cables, Connectors and Adapters

VGA Broadcaster Lite can connect to a number of different interfaces cables, and adapters. This chapter describes a subset of connectors, cables and adapters that can be used with the VGA Broadcaster Lite device.

## *3.5 mm Mini-jack*

A 3.5mm mini jack connector is used to carry audio signals. It can be connected to VGA Broadcaster Lite via Audio IN and OUT ports.

## *DVI*

A DVI cable can be connected to VGA Broadcaster Lite via DVI IN and OUT ports.

## *VGA*

A VGA Cable can be connected to VGA Broadcaster Lite via DVI IN and OUT ports
with the help of the DVI to VGA adapter (shown below).



## *DVI to VGA cable.*

Connects VGA sources to a VGA Broadcaster Lite's DVI port.

## *RJ-45 Male*

Ethernet RJ-45 connector:  Used to connect VGA Broadcaster Lite to the Ethernet network.



## *USB Connector*

Used by a wireless network adapter to connect to WiFi. The VGA Broadcaster Lite device can connect over wireless Ethernet to broadcast the video/audio sources (unencrypted) through the wireless network adapter (not included). Please refer to the *VGA2WiFi User Guide* to know more about this optional functionality.

## *HDMI to DVI Cable*

Used to connect VGA Broadcaster Lite to unencrypted HDMI sources.

# 8. Sample Applications

The following section describes a number of applications and scenarios for using VGA Broadcaster Lite. For example, VGA Broadcaster Lite can be used as part of video surveillance equipment. It is connected to a camera with a VGA or DVI output and transfers the captured signal over LAN/Internet. The captured output can be viewed remotely on a monitor.

Another possible application: corporate communication. High-quality live video and audio is being used to broadcast live announcement, events, engage, educate and communicate with employees, customers and investors in a timely way.

## *Customer Support Application*

During a customer support call, the customer service representative can direct a single customer or multiple distributed customer individuals to a URL in order to observe a demonstration of a product in action. The customer support representative's computer display output is broadcast to the customer in real-time. The output of the demonstration can also be recorded with an Epiphan recording product (see www.epiphan.com) or shared with other customers or service representatives for training and quality purposes.
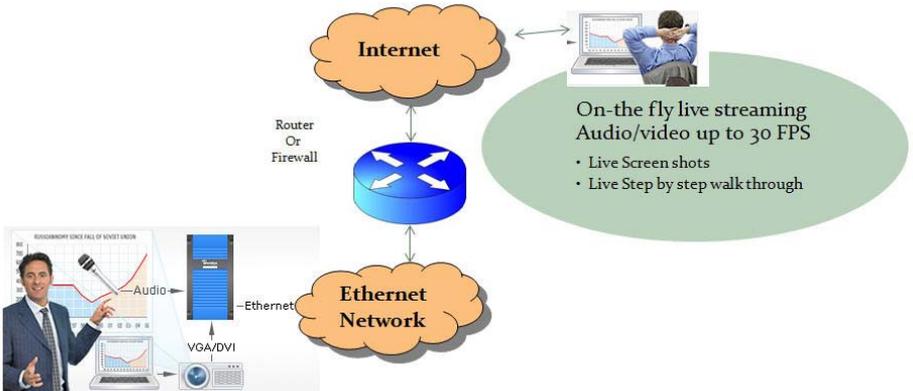
# Virtual Expert Inbound Video Support Application:

For OEM equipment vendors such as medical image devices, enabling customers to share images with their colleagues can be a key differentiating feature of their products and services.

In this sample application VGA Broadcaster Lite is used to provide live video to a telemedicine expert in order to deliver better healthcare services at a distance. It is connected to medical equipment and transmits  medical data/information to a remote expert through the Ethernet connection.

This application enables immediate consultations with the medical device's product specialist, or another specially skilled remote medical professional without the need to be present with the equipment or patients
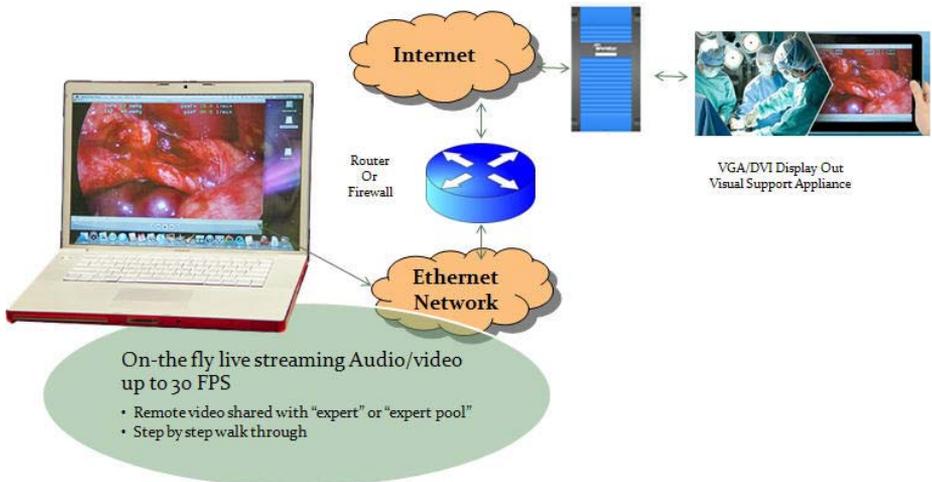


# Assisting Mobility, Visual or Hearing Impaired Attendees

VGA Broadcaster Lite allows conference organizers to provide facilities for hearing/visual/mobility impaired.  This device allows either broadcast event via Internet for those who are not able to attend or helps visual and hearing impaired attendees display and/or amplify the conference content on their local computers.
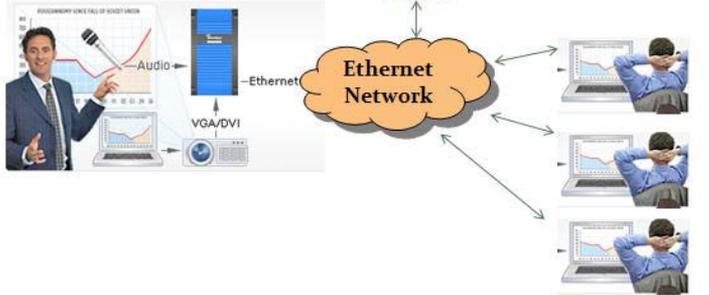
## *Providing Simultaneous Translation Channels*

VGA Broadcaster Lite enables multi-language webcasts for the local and remote viewers. In this application two VGA Broadcaster devices are daisy chained as shown in the diagram below. The audio on the first device is connected to the presenter audio source, while the audio of the second VGA Broadcaster Lite stream is provided by a simultaneous translator. Viewers are then provided with the URL for the presentation in the language of their choice.
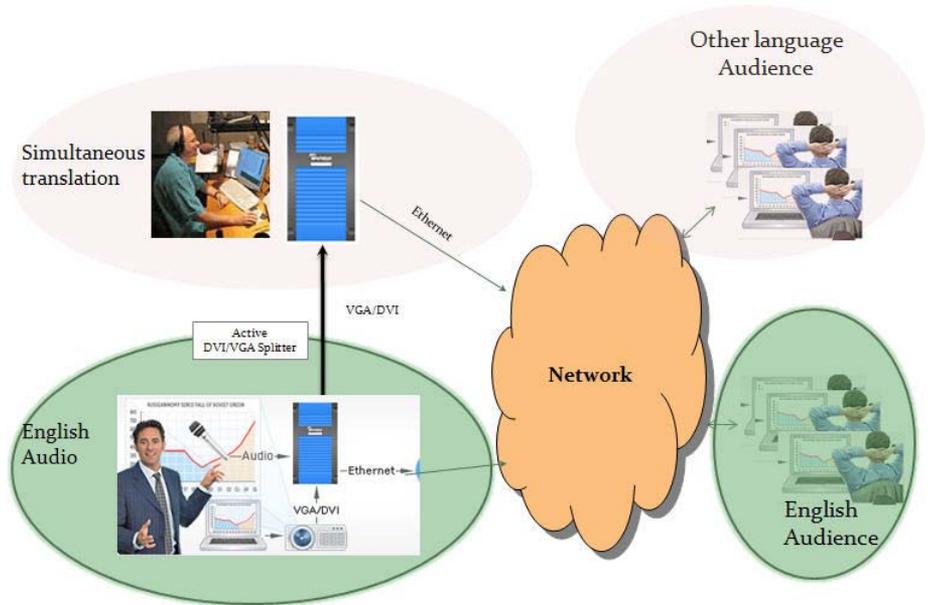
## *Education Electronic White Board*

In this application the teacher in a classroom using an electronic white board can also broadcast the white board content to local and remote students.  The school can also use other Epiphan products to record the session for later play back.
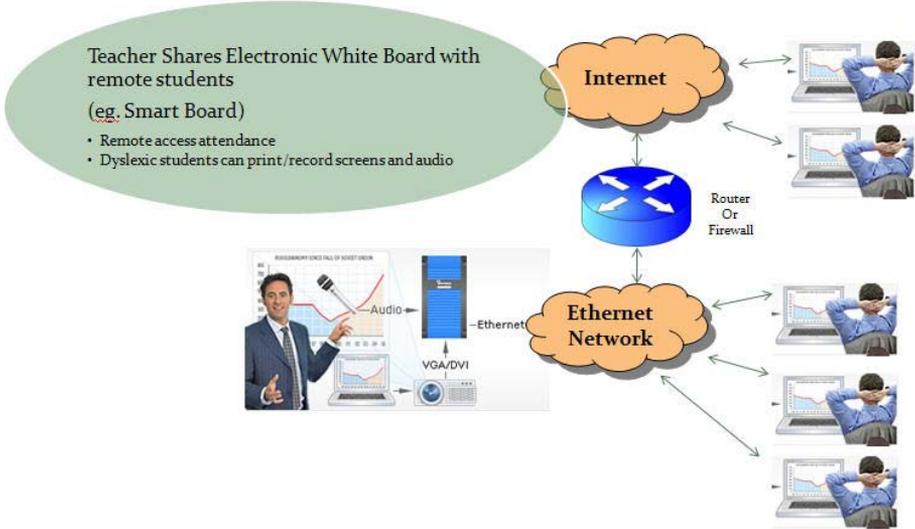
# Audio/Video Conference - Document Sharing "Camera"

Broadcaster Lite can be used to share documents, and other video source in real-time during a video conference.  This application ideal for online collaboration or for situations when

- you want real-time multi-media
- you do not want to send material in advance or via third party hosted services or email.
- The real time broadcast also enables you to make changes locally to your presentation or document and share them in real-time with the remote participants.

# 9. List of Figures

## Environmental Information

The equipment that you bought has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

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.

## FCC & CE Compliance Statement

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.

Marking by the symbol $C\,\epsilon$ indicates compliance of this device with EMC directive of the European Community and meets or exceeds the following technical standard.

EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.

## Other Jurisdictional Issues

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# 10.    Configuration Worksheet

Use this worksheet to keep necessary information about VGA Broadcaster Lite installation, settings etc.

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