



TVU networks

TVU Transceivers & Receivers User Guide

(For Version 6.0)

Document Revision 0.5

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Printed in U.S.A.
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Federal Communications Commission (FCC) Regulation of ENG Mobile Systems

The FCC provides specific policies and procedures related to radio frequency (RF) emissions in mobile and portable devices. The FCC outlines test requirements and specific test procedures based on the type of device. These test requirements and procedures can also cover Specific Absorption Rates (SAR) for RF.

The TVU Transmitter devices have always conformed to all applicable FCC regulations covering mobile systems for electronic newsgathering. All required tests for TVU Transmitter devices as outlined in the regulations were performed by a third party testing lab, which issued a certificate of compliance for TVU Transmitters. The certificate is applicable to both the FCC and CE. Additionally, the data modems used in TVU Transmitters are commercially available off-the-shelf brands and have been FCC and carrier certified.

Supporting documentation demonstrating TVU Transmitters' compliance with the applicable FCC regulations is available upon request. Please contact us at +1.650.969.6732 for assistance and questions regarding approved modem cards for use with TVU Transmitters.

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INTRODUCTION

TVU Receivers and Transceivers are powerful professional video hardware decoders that are designed for the centralized viewing, controlling and distributing of live video content. The model TR Receivers and model TX Transceivers can accept multiple video streams from any IP-based video source as well as any TVU Networks video transmitter. Designed to easily integrate with live video workflows, each model provides different features, functions and the option of upgradeability depending upon the specific needs of a video broadcaster.

ABOUT THIS GUIDE

This operational guide provides instruction for setting up the unit and a brief overview of the available components for this receiver: TVU TX3200 that's running TVUTransportR application version 6.0.

Before you begin setting up the TVU Receiver, we suggest that you identify the devices you intend to use with the unit including: cables, power sources, and unit accessories. Simply follow the steps contained in this guide to setup your new TVU.

TVU TRANSCEIVER AND RECEIVER COMPONENTS

TVU Transceivers and Receivers include these standard components:

- Server
- Power cable
- VGA adapter
- VOIP/IFB

Optional components for the TVU Receiver include:

- Keyboard and mouse
- Universal adapter

Note: If any component is missing, please contact TVU Networks Customer Support at support@tvunetworks.com or +1.650.440.4812.

TVU Transceiver TX3200 Features and Indicators

TVU Transceiver TX3200 Front Panel with Faceplate



Figure 1 TX3200 Front Panel

Label	TVU Transceiver Front Panel Faceplate
A	Power Button
B	USB Ports

Table 1

TVU Transceiver TX3200 Back Panel Connections (Standard SDI version)

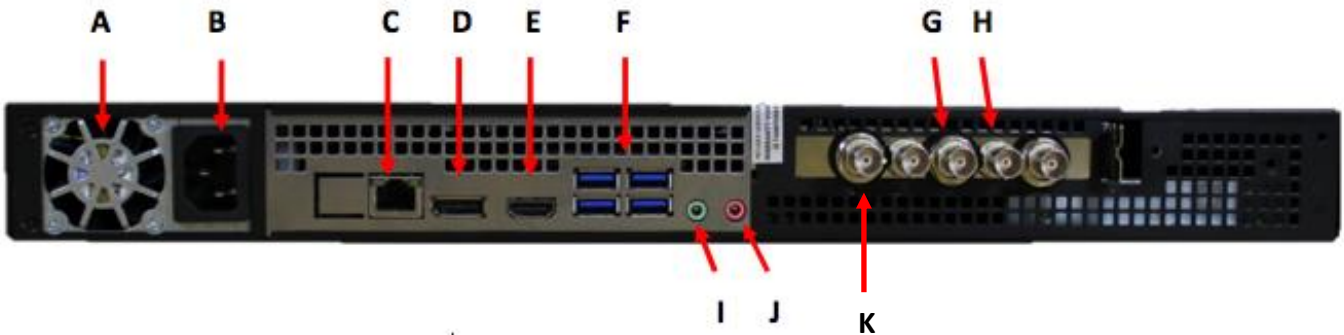


Figure 2 TX3200 Back Panel

Label	TVU Transceiver Back Panel Connections (SDI)
A	Vent; Do not block
B	AC Power
C	1 GigE Ethernet Port
D	Display Port: Connect the supplied Display Port to VGA adapter for primary display purposes (see image below)
E	HDMI Display Port
F	USB Ports
G	SDI Output
H	SDI Input
I	Audio Output
J	Not Used
K	Reference input: Allows for time sync with the television station's broadcasting system

Table 2

VGA Adapter

TVU provides a DP to VGA adapter for each TVU Receiver:



Figure 3 VGA Adapter

TVU Receiver: Network and Firewall Configuration

TVU Networks recommends assigning a static IP address to the TVU Receiver to ensure the network configuration remains stable. All the incoming ports referred to in this section are configurable. Please contact TVU Networks Customer Support if you wish to use a configuration other than the one specified in this documentation.

Please configure your firewall or router as follows:

1. Allow TCP outgoing from the TVU Receiver on port 3970.
2. Allow TCP/UDP outgoing from the TVU Receiver on port 123.
3. Permit all TCP/UDP incoming traffic for port 8088 to receiver.
4. Forward all traffic arriving on port 8088 of the external firewall interface to the IP address of the TVU Receiver.

This setup allows the TVU Transmitter and receiver to automatically link with each other and permit video transport.

Recommended firewall configuration for TeamViewer

TVU Networks uses TeamViewer software to enable remote support and troubleshooting. To enable this software, please ensure that either port 80 (TCP) or port 5938 (TCP) are open for outbound connections.

Recommended firewall configuration for remote control of TVU Receiver from tablet or smartphone

The TVU Transmitter hotspot feature allows remote configuration of the TVU Receiver settings from a smartphone. To enable this feature, permit all TCP/UDP incoming traffic for port 8288 to receiving terminal; forward all traffic arriving on port 8288 of the external firewall interface to the IP address of the TVU Receiver. This port is configurable.

Recommended firewall configuration for the FTP server

This feature allows files to be uploaded to the FTP server in the receiver. To enable this feature, permit all TCP/UDP incoming traffic for port 21 to the receiving terminal; forward all traffic arriving on port 21 of the external firewall interface to the IP address of the TVU Receiver. This port is configurable.

Recommended firewall configuration for remote configuration of a TVU Transmitter from the TVU Receiver

A TVU Transmitter and its modems can now be configured from a remote location. To enable this feature, permit all TCP/UDP incoming traffic for port 22 to the receiving terminal; forward all traffic arriving on port 22 of the external firewall interface to the IP address of the TVU Receiver. This port is configurable.

Recommended firewall configuration for the Return Video Feed

This is a feature that can only be used on a TX3200 or GX3200 series TVU Transceiver. It will allow camera operator in the field have the ability to watch a return video feed from the studio of their TVU transmission or from an SDI input at the transceiver. To enable this feature, ensure that you permit all TCP/UDP incoming traffic for port 8488. This port is configurable.

In order to view a TVU Transmitter feed remotely, ensure that port 10003 is open for all inbound traffic.

To view an SDI feed remotely, make sure that port 10004 is open for all inbound traffic.

Note: these are default ports, configurable if required.

For more details, please contact TVU support by phone at +1.650.440.4812, by email at support@tvunetworks.com, or by skype at skype.tvupack.

Bandwidth Recommendations

Allowances should be made for bandwidth of incoming TVU transmissions based upon the following criteria:

- Each TVU Receiver can utilize up to 20 Mbps of downstream bandwidth per live TVU Transmitter feed.
- A minimum of 2 Mbps upstream bandwidth per TVU Receiver is required for all features to function efficiently.

We recommend a stable, low latency connection with guaranteed bandwidth for best results.

OPERATING TVU TRANSCEIVERS & RECEIVERS

TVU Transceivers and TVU Receivers have two operating modes: Live and Record. You can pair multiple TVU transmitters to a transceiver or receiver, but can only receive video from one at a time. Depending on your specific license configuration, any number of TVU transmitters can be paired with your TVU Receiver.

For owners of the TVU HD version, please contact TVU Customer Support at +1.650.440.4812 for instructions on setting up the TVU Transmitter for HD mode.

Live Viewing Mode



Figure 4 Live Viewing Mode

Live Mode: Controls and Functions

Label	Live Mode: Controls and Functions Description
A	System Information: Displays receiver name, PID (unique identifier for TVU Receiver), Build Version, Build Date and Record Time Remaining (if the optional receiver record option is select).
B	Quality Histogram and Post-Live Quality Histogram: Shows the total transmission encoding bit-rate over a period of time as well as gives users access to a post-live quality histogram. <i>See Figure 5 and 9</i>
C	Status panel: Displays error rate, line quality, and battery status. <i>See Figure 5</i>
D	Transceiver Information: Displays the input type and format, the output type and format, IFB status and IFB signal. <i>See Figure 5</i>
E	Audio level light display: The four light displays provide visual monitoring of your audio levels. This displays dBFS audio input level at the receiver. <i>See Figure 5</i>

Label	Live Mode: Controls and Functions Description
F	Refresh button: Resets the video stream. <i>See Figure 5</i>
G	Stop buttons (x2): Clicking on either Stop button ends the live transmission
H	Edit Timer: Configure the countdown timer for the Eco-Preview mode. <i>See Figure 6</i>
I	Eco-Preview: Quickly start a preview in lower bitrate. <i>See Figure 6</i>
J	Mode selection button and mode indicator lights: Use this button to toggle through the receiver operational modes. <i>See Mode Selection (page 10) for more information</i>
K	Operational mode selection buttons: Use the operational mode buttons to choose an appropriate capture quality. Each mode has a default bit rate and delay. <i>See Figure 10</i>
L	Bitrate and delay controls: Sliding bars allow you to manually set the target bit rate and delay levels. <i>See Figure 10</i>
M	Datacard monitor panel: This monitor panel displays the current status of each data card. <i>See Figure 11</i>
N	Monitor Histogram: Displays throughput and IP address on each modem (mb/s). By right clicking on the histogram scale, you can configure the datacards of a particular transmitter. <i>See "Configuring Modem Cards from the Receiver Interface" on page 14.</i>
O	Connection mode and Connection strength indication: The connection mode is displayed when available in the dark gray box between the carrier name as well as the connection strength. <i>See Connection Mode and Connection Strength (page 12) for more information</i>
P	Reset: Provides a full power reset for a particular modem. Use this feature when the modem is no longer able to connect or is having problems. <i>See F on Figure 11</i>
Q	Scale: This drop down menu allows you to set the scale for the histogram graph. Once the scale has been changed, it will affect all of the histogram graphs displayed. Available selections are 1.2Mb/s, 2.4 Mb/s, 6Mb/s, and 12 Mb/s.
R	Thumbnail of current video feed from TVU Transmitter: The left-hand column of the TVU Transmitter monitor features an icon of the current feed. If a transmitter is live, a red box will appear around the thumbnail image.
S	GPS information: If a TVU Transmitter is used with modems that support GPS, a display of the transmitter's location can be retrieved. <i>See GPS Locator (page 12) for more information</i>
T	VOIP/IFB Indicator: The IFB indicator is displayed below the transmitter's thumbnail picture. <i>See Figure 14 and 15</i>
U	Dynamic Sorting: Sort all of the TVU Transmitters alphabetically or based on their live status. <i>See Figure 23</i>
V	Message: Two-way communication between receiver and the transmitter. Under each source there is a message button to communicate with the transmitter. If the MSG is green, it means it's clickable and you can communicate. If it is grey, it means it is offline.
W	Alert: Alert button to show alerts sent and received. On receiver page, alert only lasts a few seconds as a pop-up, but it is saved in the alert button inbox. You can also compose and choose multiple transmitters to send the alert to.

Table 3

Status Panel

Arranged vertically on the right hand side of the receiver panel are a number of indicators designed to help an operator make quality and troubleshooting decisions. Information such as error rate and line quality is displayed as well as a quality histogram

that depicts the total transmission encoding bit-rate over a period of time **(A)** (Figure 5). The histogram's scale can be change by selecting a different display option on the drop down menu **(B)**. The status of the transmitter's batteries **(C)** is also displayed.

Transceiver Information

Displays input type and input format of the transmitter, which are displayed as T Input and T Format respectively **(D)** (Figure 5). The output format of the transmitter is shown as R Format **(E)**. Lastly, the IFB status and the IFB Signal are displayed **(F)**. The IFB signal has a strength meter that depicts the input level of the IFB. To stop the live transmission, users can press the "Stop" button on the status panel **(H)**.

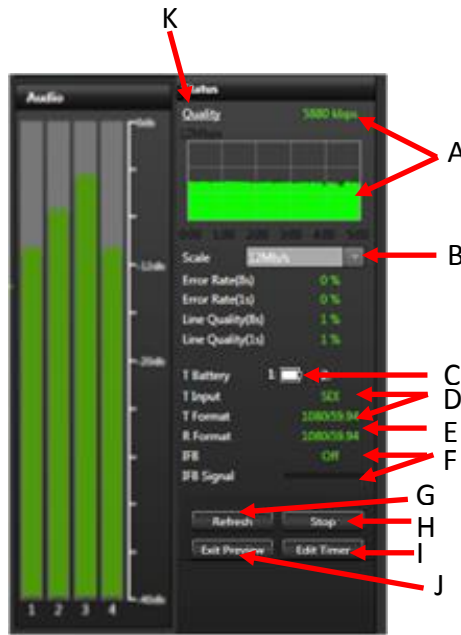


Figure 5 Status Panel

Refresh Button

If the video goes black or pixelates heavily and does not recover automatically within 15 seconds, click the Refresh button **(G)** to reset the video stream and reestablish the connection (Figure 5).

Economy Preview Mode

Quickly switch to the preview mode by clicking the "Eco-Preview" button (Figure 6). It will adjust the bitrate to 500 Kbps for preview without changing the delay so that reduce the usage of the throughput in the live video transmission.

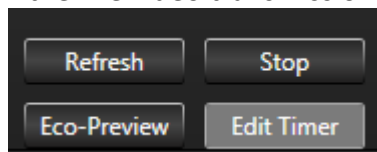


Figure 6 Eco-Preview Button

Before start the preview live transmission, you may need set the countdown timer (Figure 7) to exit the preview mode. To automatically exit the preview mode, select the "Timer" option (A), you can set the time between 1 to 1440 minutes. Also, you can manually exit the preview at any time (B).

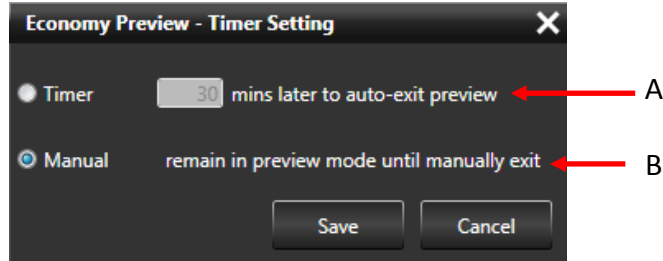


Figure 7 Timer Setting

In this mode, you will see the following warning message at the top of the video preview field or video output:

Economy Preview

If you select the timer function, a timer that resembles the following will display under the message:

Exit: 23:59:59

To exit the Economy Preview mode, you can click the "Exit Preview" button. Then, the bitrate will be adjusted to the default settings (such as 5120 Kbps).

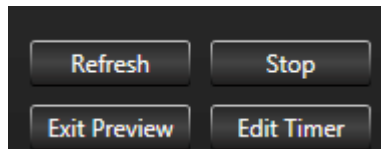


Figure 8 Exit Preview

Also, you can manually adjust any configuration in the "Setting" field, including bitrate, delay, or one of the preset modes, and then it will exit the Economy Preview mode.

Post-Live Histogram

The Quality button (B) allows users to access the post-live histogram (Figure 5). The post live histogram allows users to recall a histogram of the entire past transmission and display it as a Web-based graph to review the overall performance (A) of that transmission over a certain period of time (B) (Figure 9). When the Quality button is selected, users will be directed to a webpage where they can access the post-live histogram.

Users can look at a transmission that took place on a specific date as well as monitor the entirety of a live transmission (C) (Figure 9). The automatic refresh time can be set to a desired length (D) and users can search for a specific transmitter by typing in the PID number of the transmitter (E).



Figure 9

Mode Selection

The currently selected mode displays as a green-lighted tab. The modes that can be chosen are:

- **Live:** Live mode is the primary interface to be used during a live transmission. When this tab is selected, the status of each of the datacard network connections is displayed under the "Monitor" section of the interface and the Bitrate, Delay, and Operational Mode buttons are displayed.
- **Record:** Record mode displays the store and forward interface for the preview, download, and management of TVU One stored footage and files transferred via Auto Sync. Files transferred via FTP can also be accessed via this interface.

Operational Mode Selection

Depending on your news gathering environment, you can choose from the following preset bitrates and latencies (Figure 10):

- **Interview:** Bitrate 2048, delay 2 seconds.
- **Normal:** Bitrate 5120 delay 4 seconds.
- **Fast Moving:** Bitrate 5120, delay 8 seconds.
- **SD:** Bitrate 2048, delay 4 seconds.
- **Tapefeed:** Bitrate 10240, delay 10 seconds. This mode is optimized for content with multiple scene changes.
- **User 1 & User 2:** These are user-definable presets. To program these, users simply right click the preset they would like to define. Users can then name the preset (**C**), manually set latency (**D**), or check "Set Current", which will save the current latency setting to that particular preset (**E**). Press "Apply" to program once finished (**F**).

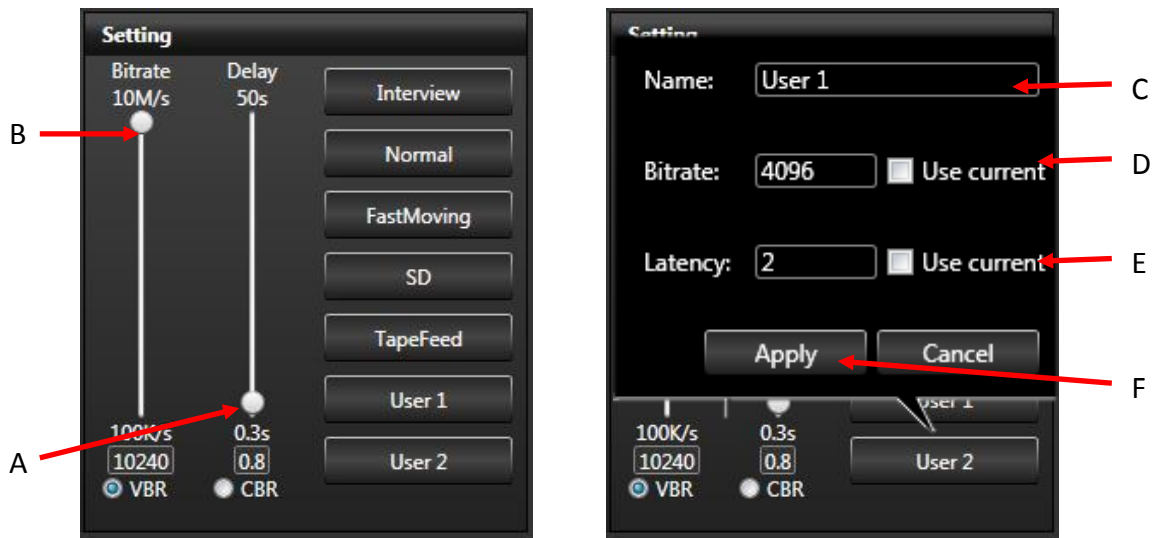


Figure 10

Bitrate and Delay Controls

The TVU Receiver has a Smart VBR scaling system. This means that the unit will automatically adjust the bitrate in order to output the best quality picture based on the desired latency. In order to effectively take advantage of the smart VBR scaling system, set your desired latency (A) and then set the maximum bitrate you would like to utilize (B) (Figure 10). When in "Live" mode, the error rate and picture quality will automatically be adjusted based on the desired latency and the available bandwidth in order to produce the highest quality picture.

Datacard Monitor Panel

The check boxes associated with each card's status bar enable or disable a particular datacard (A) (Figure 11). If unchecked, it will not be used to pass data. If checked on (default), it will be used. Individual read out panels show the carrier name (when available) of each active card (B). The slot number of each datacard is indicated in front of the carrier name (C). To retrieve the IP Address of a particular datacard, mouse over the name of that datacard. If no name is automatically provided and is displayed as <name>, you can input your own name. However, this will reset upon reboot. The color indicators displayed within the carrier name panel indicate the following status:

- **Red:** Not connected
- **Green:** Connected
- **Yellow:** Dialing/Connecting
- **Gray:** Disconnected or unplugged

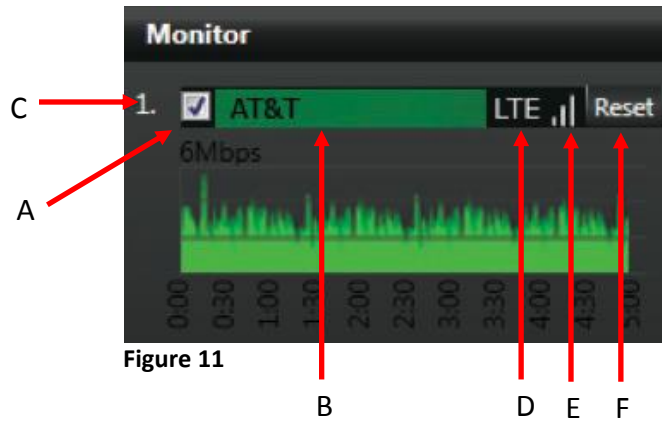


Figure 11

Connection Mode and Connection Strength Indicator

The connection mode (D) is next to the connection strength, which is indicated with three status bars (E)(Figure 11). If the bars are all gray, there is no connection. Three green bars indicate excellent connection strength.

GPS Locator and Tracking

When the transmitter is online, its name will be underlined underneath its thumbnail image. By clicking on the underlined name of the transmitter, the GPS data for that individual transmitter will appear. To locate all online transmitters at once, click "Locate All" at the top of the thumbnail column.



Figure 12

The location pin will show the name of the TVU Transmitter and the accuracy of the location. Additionally, a tracked of the path of the transmitter will be displayed to easily identify recorded content based on location. Simply mouse over a section of the tracked path and a thumbnail image of the recorded content at that location will appear. In

order to improve the location accuracy, make sure the TVU Transmitter is connected to a Wi-Fi card.

Note: If there is no real-time GPS data for a particular TVU Transmitter, cache GPS data will be used for that transmitter and the location pin will be yellow.

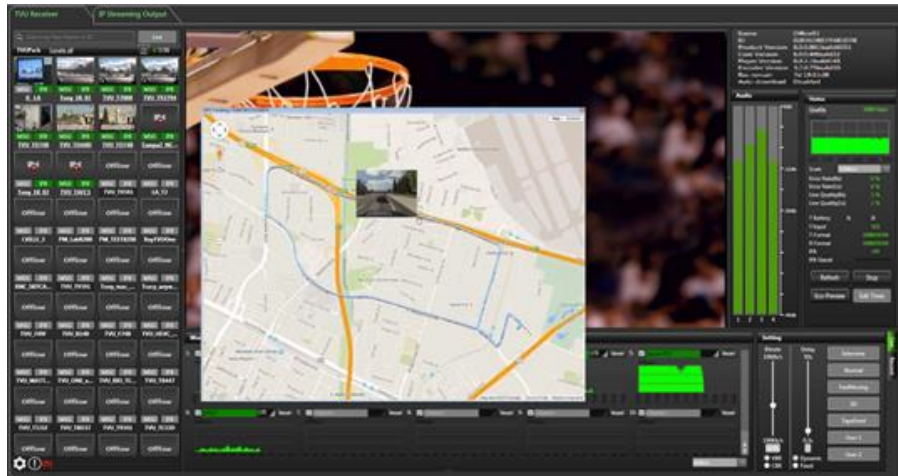


Figure 13

VOIP/IFB Indicator

The five-color indicators are as follows (Figure 14 and 15):

- **Red:** VOIP/IFB function is in use
- **Red-Gray:** Either the transmitter has gone offline and the VOIP/IFB will recover when it is back online or the transmitter goes live with a different receiver while you were speaking with the transmitter via the VOIP/IFB function
- **Green:** VOIP/IFB function is connected but not in use
- **Green-Gray:** Either when the transmitter is live with another receiver or when the transmitter is using the VOIP/IFB function to speak with another receiver
- **Gray:** VOIP/IFB function not available for this transmitter

If the version of TVU Transmitter is in Version 6.0 or above, it will support VOIP, and the VOIP indicator will appear as follows:

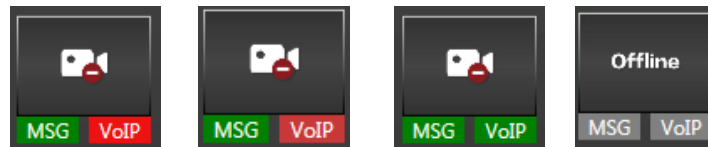


Figure 14

Additionally, you may see IFB indicator as one of the following screen shots if the version of the TVU transmitter is earlier than Version 6.0:



Figure 15

To use the VOIP/IFB function, click the VOIP/IFB indicator so that it turns red. The IFB on/off status is also indicated in the "Status" panel on the left side of the interface. Additionally, if a particular TVU Transmitter has a VOIP/IFB function, the IFB is automatically turned on when that transmitter goes live. Once the live transmission is stopped, the VOIP/IFB function will be turned off.

Dynamic Sorting

To sort all of the TVU Transmitters alphabetically (B) or dynamically based on their live status (C), simply click the sort button (A) above the thumbnail images of the transmitters on the left side of the receiver interface and choose the desired sorting method (Figure 16).

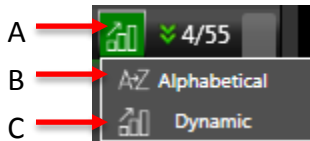


Figure 16

Configuring Modem Cards from the Receiver Interface

The modems can be configured on the TVU Receiver interface by taking the following steps:

- 1) Right click the histogram of the modem you would like to configure

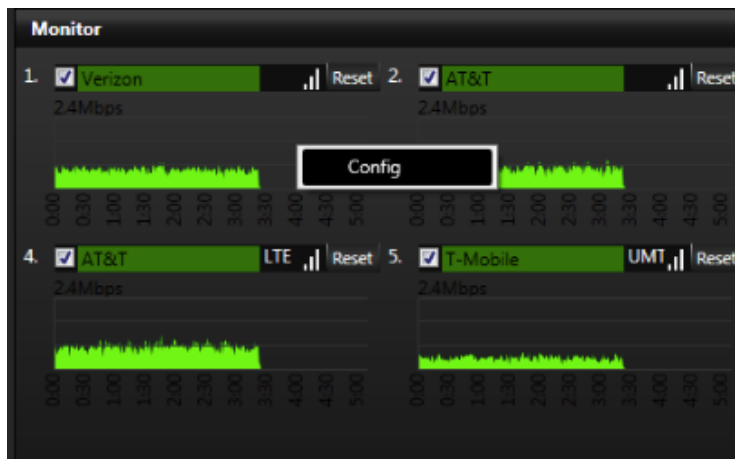


Figure 17

- 2) A pop-up window will appear with the dial number, APN, and other necessary information

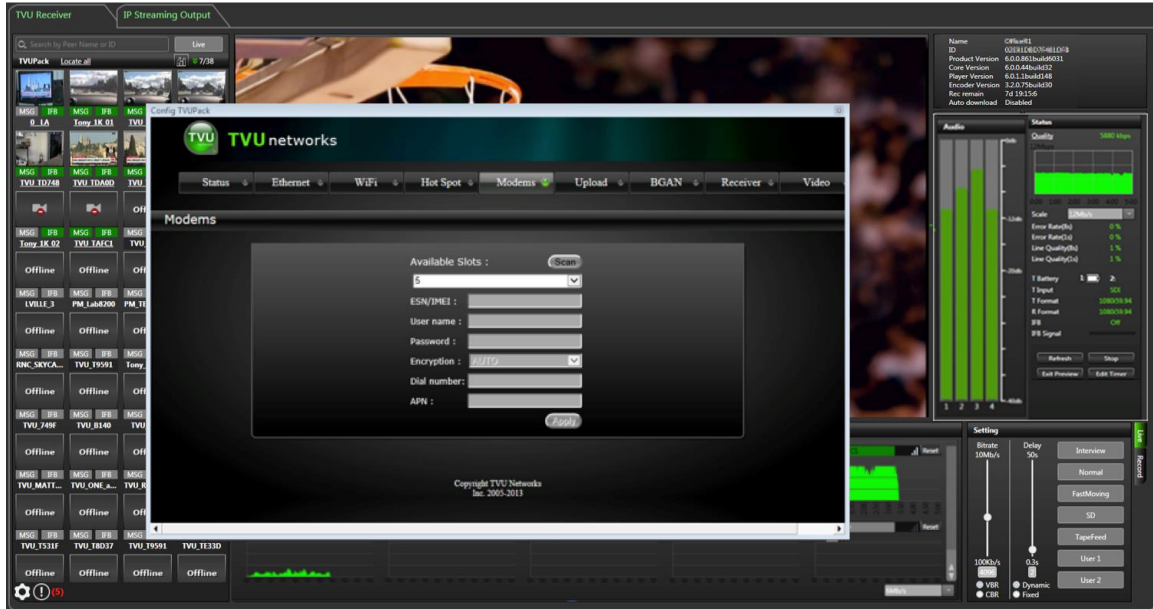


Figure 18

- 3) Hit "Apply" and the modem will be configured.

Audio Only Transmission

TVU Transceivers or receivers allow audio only transmission, and it's up to 4 channels. By default, the video field will show black screen during the transmission.

Manual Selection of Modem Carrier When Roaming

This function allows users to manually select which carrier a particular modem will roam on. When roaming, simply go to the web-based interface for monitoring and controlling the transmitter and select the "Modems" table. To access the web-based monitoring and control interface, right click the histogram of the modem you would like to configure (Figure 17). See *Configuring Modem Cards from the Receiver Interface* on pg. 14 for more information.

Simply select the desired carrier from the drop down menu of available carriers **(A)**. Then click "Scan Carrier" **(B)**(Figure 19). The roaming modem will automatically generate all of the necessary information for that carrier.

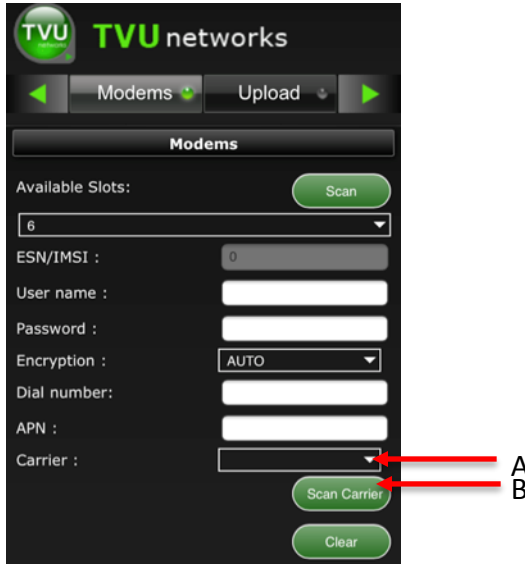


Figure 19

Adding an External IP Source

On the left side of the receiver interface, there is a section for external sources such as YouTube (A)(Figure 20). In order to add an external source to the receiver GUI, click the "+" on the section header (B).

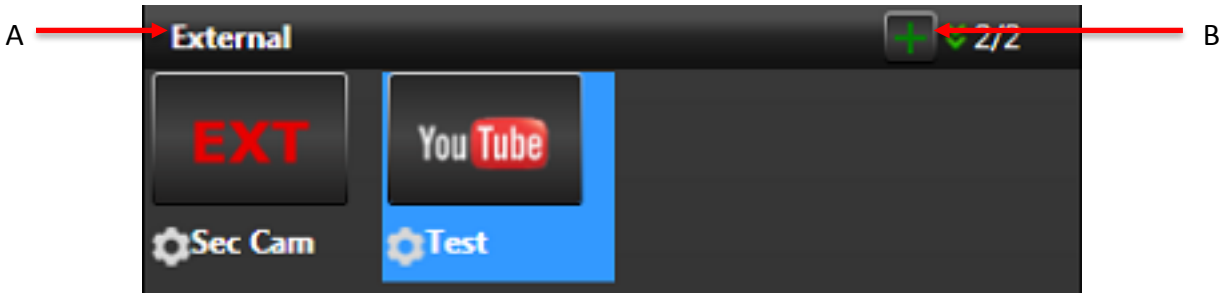


Figure 20

A pop-up screen will appear that will let you add an external source. Select the type of external source being added (A), insert the URL of the source and validate it (B), and name the source so that is easily recognized on the receiver GUI (C)(Figure 21). Finally, click "Add". A thumbnail icon of the added source will appear under the "External" section.

Add External Source

A → Type: YouTube

B → URL: Validate

C → Name:

Add Cancel

Figure 21

Note: The information of the external source can be edited by clicking on the round tool icon in the bottom left corner of the thumbnail image.

IP Streaming Output (Optional)

This optional feature allows users to take a live TVU transmission and easily output it to a third party decoder, file storage folder, or website such as YouTube. The live video transmission is encoded into an IP format and can be sent up to six different remote locations.

If this feature is enabled, users can utilize it by clicking on the "External Encoder" tab at the top of the TVU Transceiver interface **(A)**(Figure 22).

Note: A transmission must be live in order to use the IP Streaming Output feature to encode the video into an IP format and output it to a third party decoder, web streaming service or file folder.

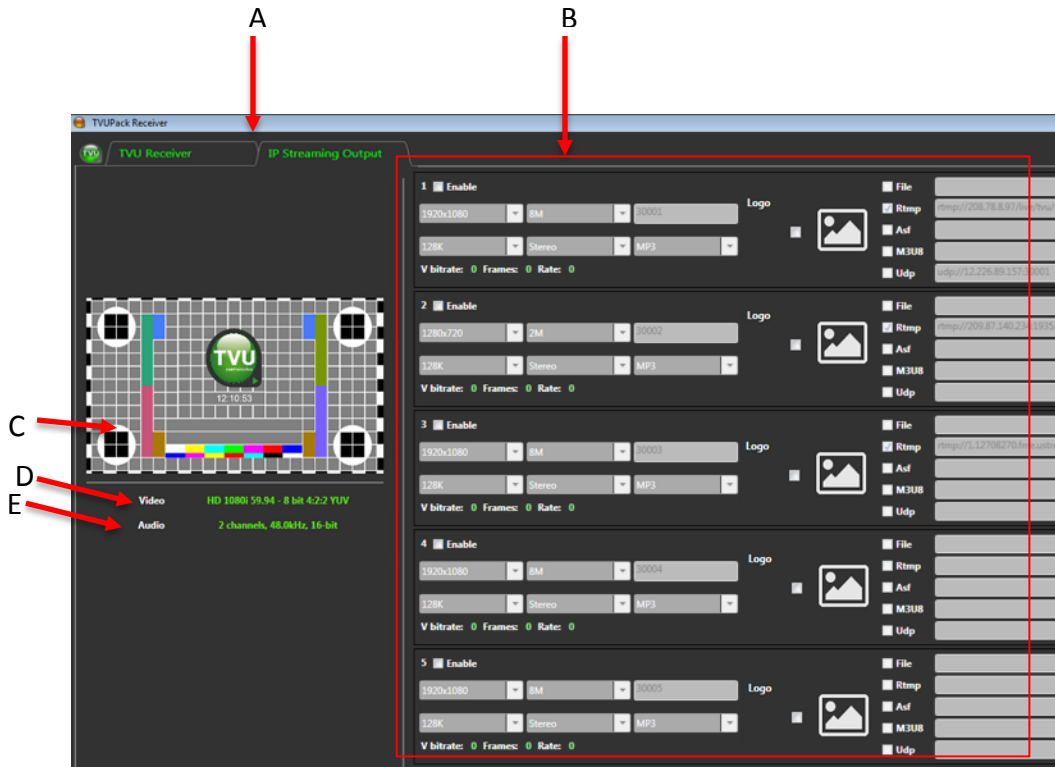


Figure 22

Label	IP Streaming Output Features and Functions
A	IP Streaming Output tab
B	Enables a single live transmission from the field to be encoded into an IP format and distributed to various locations. <i>See Figure 23 for more information</i>
C	Preview of live video source
D	Video source information
E	Audio source information

Table 4

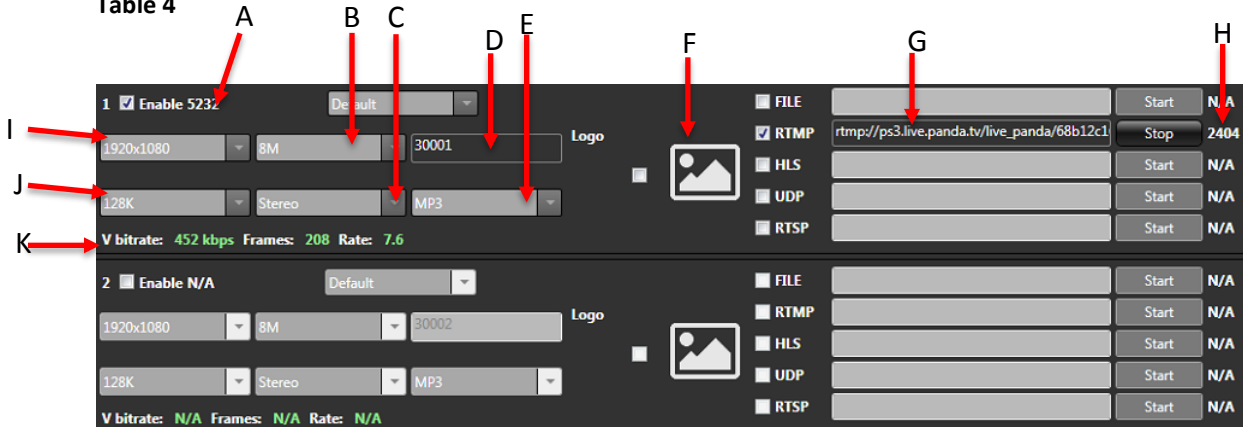


Figure 23

Label	IP Streaming Output Features and Functions
A	Enables the selected live transmission from the field to be encoded into an IP format and distributed to any remote location.
B	Encoding Bitrate Settings
C	Audio Channels

D	Port Number
E	Audio Format
F	Logo Option
G	Video Stream Format. <i>See below (p. 20) for Video Stream URL formats and examples.</i>
H	IP Output URL
I	Video Resolution
J	Audio Encoding Bitrate
K	Encoding Statistics including Variable Bitrate, Video Frames, and Frame Rate.

Table 5

Logo control in IP Streaming Output

TVU Transceivers or TVU Receivers (Version 6.0) supports to customize the logo in IP Streaming Output.

Select the checkbox at the left side of the logo to show the logo in the output video (Figure 24, A).

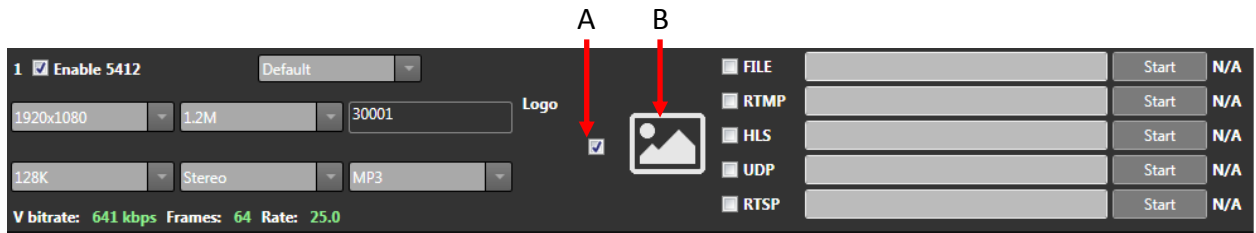


Figure 24

Click the Logo icon (B), and then the "Logo Config" window pops up as follows:

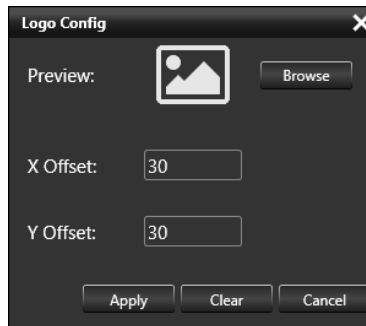


Figure 25

You can select a PNG file from the local disk by clicking the "Browse" button, and set the X and Y offsets.

Note: The size of the picture should be 640×480. And the logo cannot be previewed at the left panel in IP Streaming Output.

Video Stream URL Format and Examples

File

A local path.

Example: C:\test.ts

RTMP

If there's a stream key provided by CDN, add the key in the URL with a colon, as below.

*Example: rtmp://1.10378966.fme.ustream.tv/ustreamVideo/10378966:VHgEzINxjh07XT
TVt6iIXKQIY3aTMPEI*

M3U8

See the example below for proper URL for the M3U8 format. To play the M3U8 stream from your mobile device, open the URL with your mobile browser and type in:

<http://IP:Port/test.m3u8>. IP is the IP address of the receiver, and the port number by default is 8488. Port number is subject to configuration.

Example: C:\WWW\test.m3u8

UDP

"IP" and "port" belong to the receiving destination.

Example: udp://IP:Port

Record / Viewing Mode

Record mode allows you to preview, download, and delete stored footage.

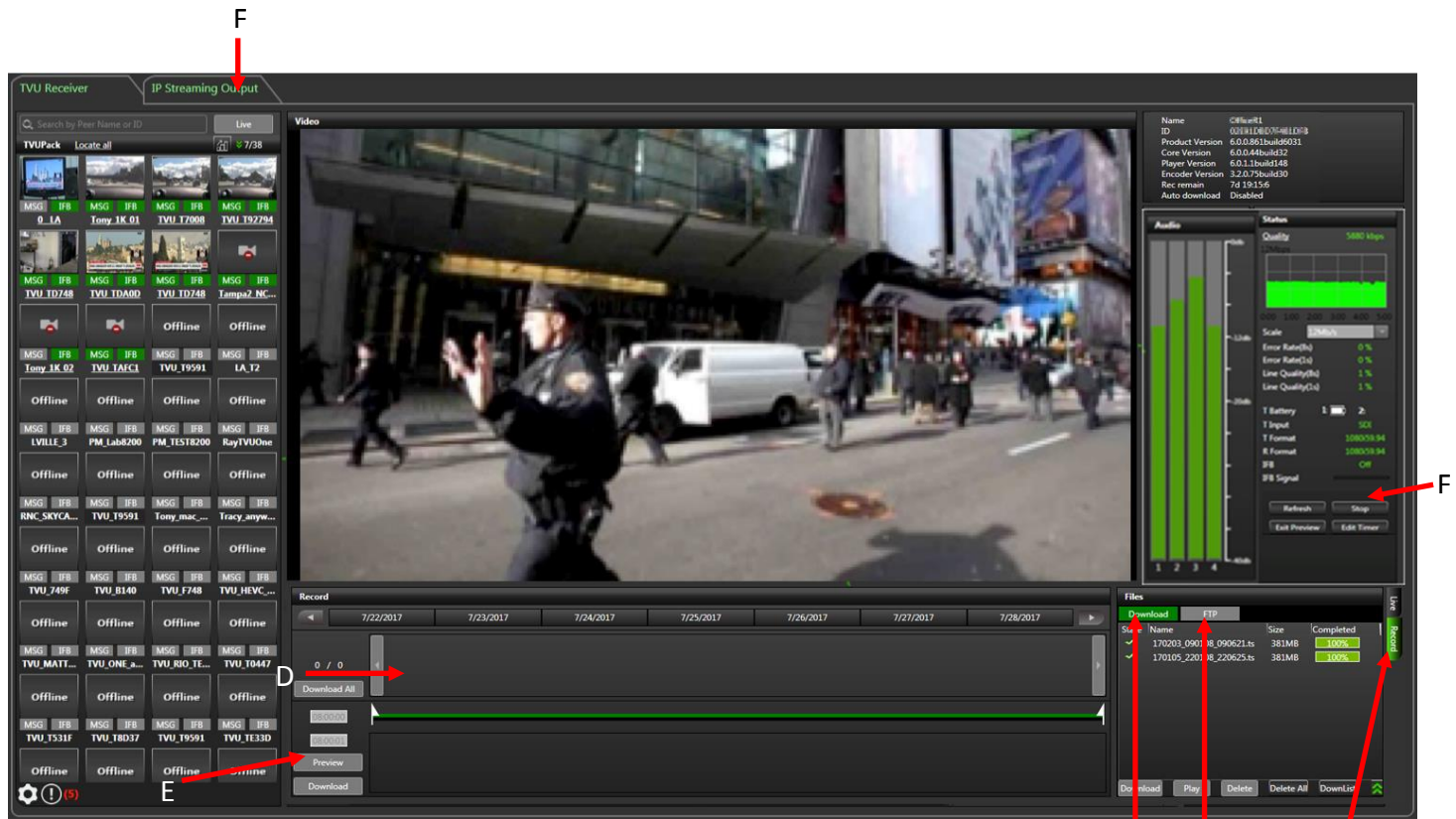


Figure 26 Record / Viewing Mode Screen

Record Mode: Controls and Functions

Please refer to **Live Mode: Controls and Functions** for a complete description and explanation.

Label	Record Mode: Controls and Functions Description
A	<p>Download tab - Files monitor panel: The Download tab shows the status, name, size, and completion percentage of all your downloaded files. Use the four buttons at the bottom of this panel to manage these files:</p> <ul style="list-style-type: none"> • Stop • Play • Delete • Download <p>For more information on downloading files, see <i>AutoSync File Transfer Using Wireless Hotspot</i> or <i>Automatic Ingestion of USB Memory Stick Content to TVU Transmitter</i> (pg. 26)</p>
B	<p>FTP tab: It is possible to upload video clips from an FTP to the TVU Receiver. The files uploaded to the FTP in the receiver will be displayed in this tab. Any type of file can be uploaded to the FTP server and most of the media files can be played back in the FTP tab and output to SDI. For further instructions, see <i>Uploading Media Content to the receiver Using the FTP</i> (pg. 30)</p>
C	<p>Operations mode tab: This tab displays the current operation mode</p>

Label	Record Mode: Controls and Functions Description
D	Records control panel: Each time a video source is switched on and off, the TVU Transmitter automatically creates a new recording on its internal SSD in a FIFO loop. This recording utilizes a completely different encoder than what is used for the Live transmission. This ensures that a high quality of version of any content (whether Live or not Live) is available. <i>See Records Control Panel below (p. 22) for more information</i>
E	Edit bar: Use the start and end time triangular cursors on the green edit bar to select the footage to download by time.
F	Stop buttons (x2): Clicking on either Stop button stops the preview of footage or the file download.

Table 6

Records Control Panel

The "Records" panel displays the number of recordings for each date on the scroll bar at the top. The green-circled numbers **(A)** that appear next to the dates show how many separate recordings have been captured on that day (Figure 27). Thumbnails of each recording **(B)** will display below the date bar. Each thumbnail also shows the start time for the clip. When you highlight a thumbnail, its start and end times appear in the left-hand column below the "Download All" button.

Use the green edit bar below the thumbnails to mark "in" and "out" **(C)** on the recordings for extraction. Additionally, to see a preview of the video clip at a specific time, mouse over the desired time to see an image of the video recorded at that time **(D)**.

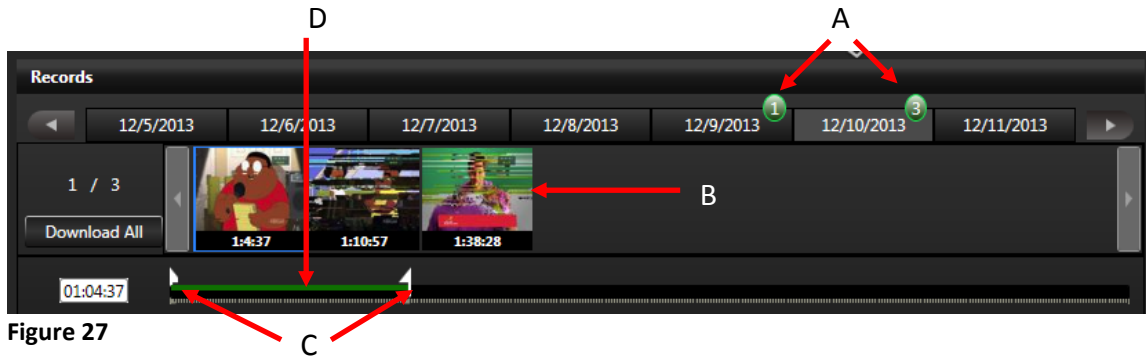


Figure 27

Viewing, Downloading, and Deleting Stored Data

The TVU Transmitter records all video it receives into a first in, first out (FIFO) drive. The last six hours of SD video or 1.5 hours of HD video are available for download from the TVU Transmitter. After the storage limit is exceeded, the transmitter records over the older video.

If the TVU Transmitter is currently in Live mode, begin by selecting **Stop** in the upper left corner. This will stop the live streaming video feed and change the status to Preview. The thumbnail of the current feed will display a stopped camera icon, also indicating no transmission. The system is now ready for managing the stored data. If you need to go back into Live mode, the stored data that is being exported or downloaded will be

paused. The process of exporting or downloading will resume once Live mode is disabled again.

Exporting an entire Video Clip

Take the steps outlined below to export an entire video clip:

1. Click on the arrow **(A)** to open the File Export and Rename drop-down menu (Figure 28 & 29).
2. Select the clip **(B)** to display in the task list **(C)** (Figure 28 and 30)
3. Click on the drop-down menu arrow and select the Export format **(D)** (Figure 30).
4. Rename the exported file in the Save As field **(E)**.
5. Click Export to start the file export process **(F)**.
6. Monitor the progress of the exported file **(G)**.



Figure 28 Record Mode Controls and Functions Screen

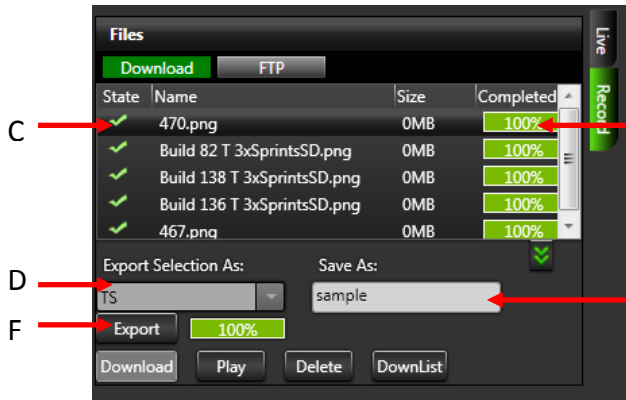


Figure 30 Record Mode Controls and Functions Screen

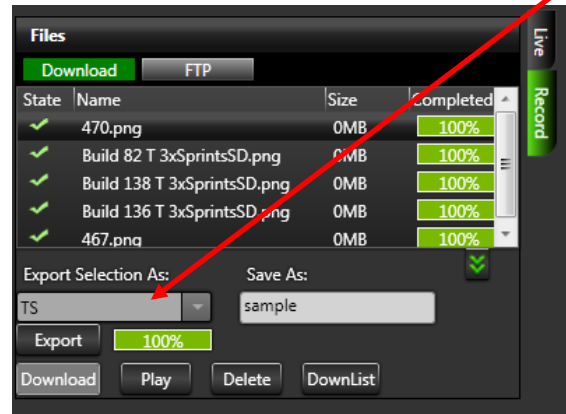


Figure 29

Take the following steps to select individual frames in a clip to export:

1. Navigate through stored data history by day or hour **(A)** (Figure 31).
2. Slide the start cursor **(B)** to the start of the time selected (Mark in).
3. Slide the end cursor **(C)** to the end of the time selected (Mark out).
4. Thumbnails of the in and out points will be generated by the system after a few moments.

5. Once the in and out points are selected, use the editing buttons (**D**) to download, play, delete, or stop the process.
6. Select the Export format (**E**) (Figure 32).
7. Re-name the exported file and click the Export button (**F**) to start exporting.
8. Select Export (**G**) to begin the process of preparing the video on the TVU Transmitter for transmission to the receiver.
9. When the file reaches 100%, (**H**) transfer to the receiver hard drive is complete and ready to be played out.
10. The file can be found under location C:\TVUTransporterR\download\0x_____ where the last section is the unique PID of the TVU Transmitter. On a receiver paired with multiple TVU Transmitters there may be up to 10 of these folders.

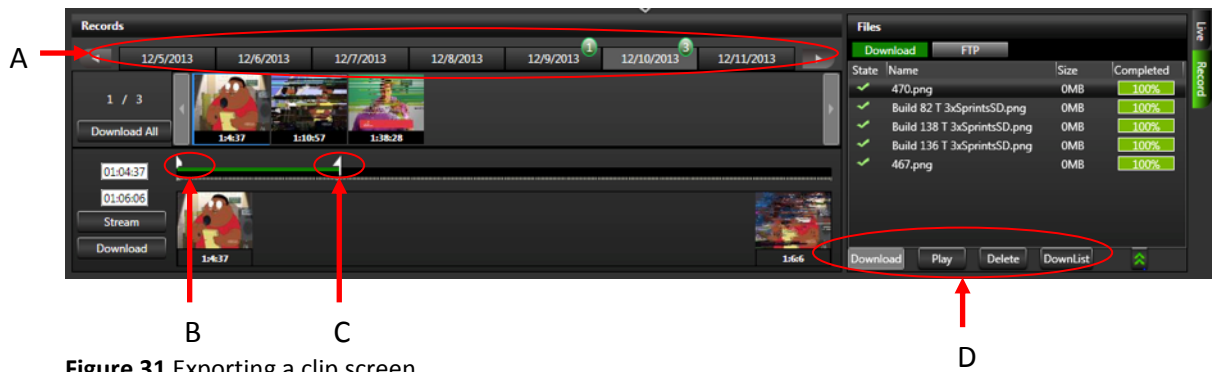


Figure 31 Exporting a clip screen

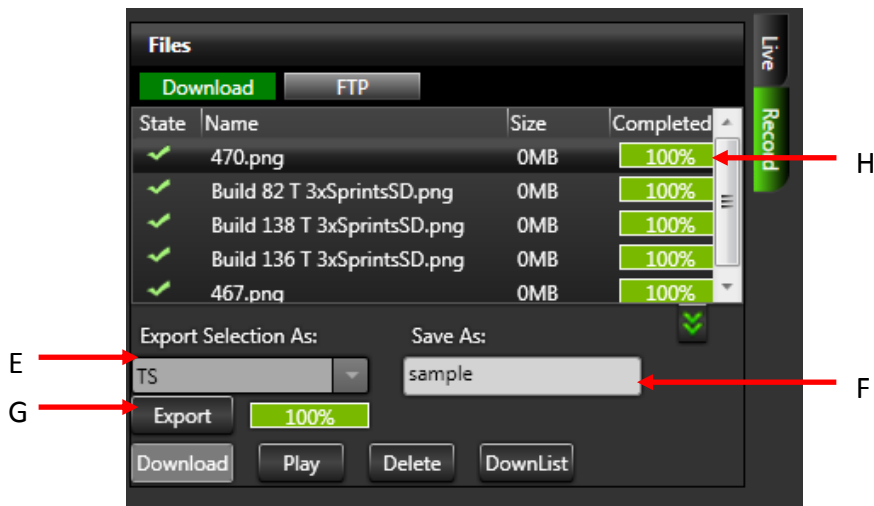
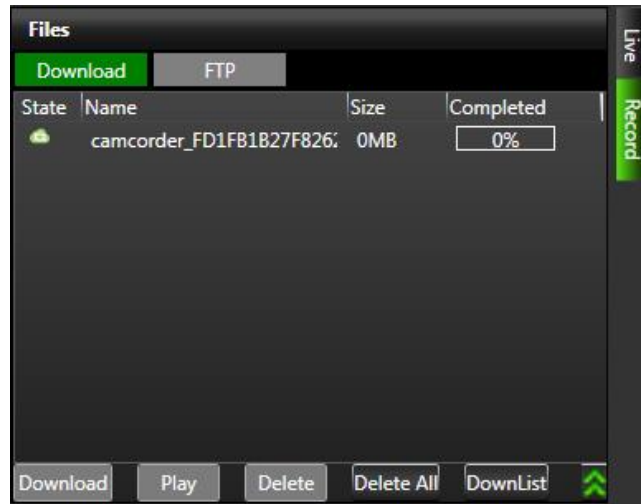


Figure 32 Exporting a clip screen

Progressive Download

TVU Transceivers or TVU Receivers (Version 6.0) can automatically trigger the



immediate download of a mirror image high-resolution clip from the TVU Transmitter's SSD to its local disk once pressing the camcorder's record button. Transceivers or receivers will show the download process under the **Record** tab (Figure 33).

Figure 33

When the download is in process, you can see a message at the upper left corner of the video preview area:

Proxy Preview - High Resolution File Download of Content in Progress

Note: To use the Progressive Download feature, ensure the **Progress Download Switch** is enabled in the TVU Transmitter's hotspot settings (Figure 34).

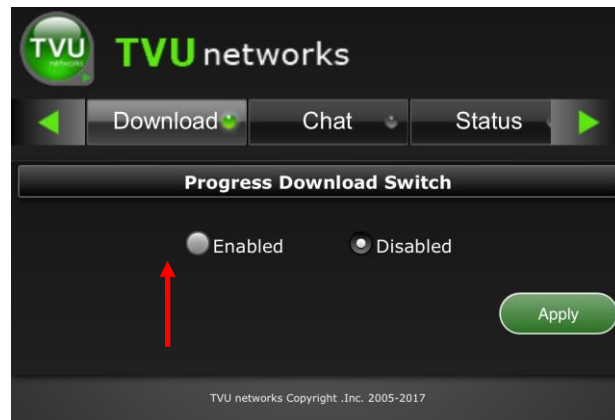


Figure 34

AutoSync File Transfer Using Wireless Hotspot

By using the TVU Transmitter wireless hotspot feature and your laptop, you can automatically send files to the TVU Receiver.

1. Make sure the hotspot card is in Slot 9.
2. Search for the hotspot on your laptop or smart phone. The SSID will be TVUPACK_XXXX where X is the last 4 digits of the transmitter's PID.
3. Connect to the SSID.
4. **The password is the last 8 digits of the PID of the TVU Transmitter** (Note: All characters are uppercase).
5. Once the connection is established, obtain the IP address in the Connection Details.
6. Open a web browser and enter the IP address.
7. You should see the following: (Figure 35)

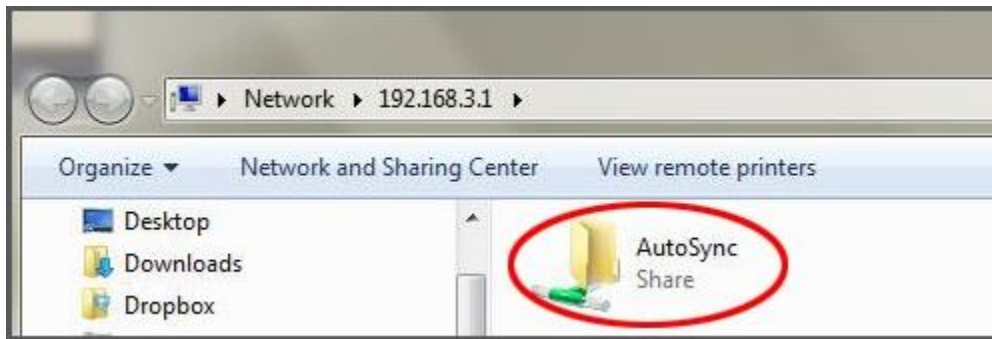


Figure 35 AutoSync screen

8. Drag and drop files to be transferred into the AutoSync folder (Figure 35).

Note: For assistance with other Operating Systems such as Mac OS, please contact TVU Customer Support at +1.650.440.4812.

Automatic Ingestion of USB Memory Stick Content to TVU Transmitter

You can wirelessly transmit digital content from the TVU Transmitter to the TVU Receiver. To do so, simply place the content on a USB memory stick and then connect the stick to the spare USB port on the TVU Transmitter unit. TVU Transmitter will auto-detect the memory stick and automatically transfer the contents to its internal SSD hard drive. The content will then be available for wireless transmission to the TVU Receiver. Please note that the supported disk format is FAT32 only.

Take the following steps to transfer content from a USB memory stick to TVU Transmitter:

1. Create a directory named "autosyncimport" in the memory stick.
2. Copy the content you want transferred into the "autosyncimport" directory.

3. Plug the memory stick into any to the spare USB port on the TVU Transmitter unit.
4. Monitor the status of the file upload on the TVU Transmitter's LCD screen. Do not unplug the USB memory stick during the file upload as this may cause the system to malfunction.

Local Download of Recorded Content to a USB Memory Stick

By connecting a USB memory stick (FAT32 only) to a TVU Transmitter while the video source is disconnected, the entire video content of the last session will be transferred to the memory stick in an NLE compatible format.

Additionally, on the web-based monitoring and controls interface, the Recording tab **(A)** will lists the recorded sessions on the TVU Transmitter SSD that are available for download (Figure 36). For more information on how to access the web-based monitoring and control interface, follow steps 1 and 2 on *Configuring Modem Cards from the receiver interface* on pg. 14 and choose the *Recording* tab **(A)** (Figure 36) at the top of the screen.

Users can download any of these sessions to the connected USB memory stick by selecting the desired recording(s) followed by pressing "Copy" **(B)**. Users will be warned if not enough space was available on the memory stick. Additionally, users can preview any recorded content by selecting a clip and pressing "Play" **(C)**.

Note: Playback is only available on iOS devices.



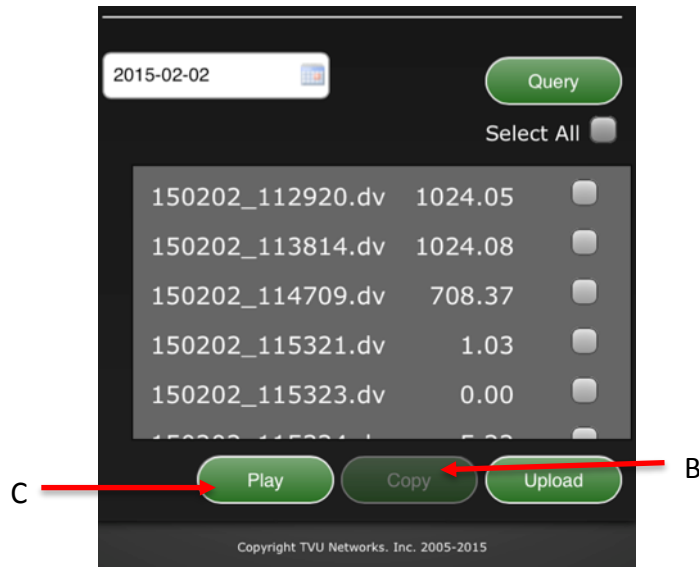


Figure 36

Once a file has been selected to download to the USB, a "Copying" message will appear in the interface while the file is copied and a "Complete" message would appear when finished.

Note: The TVU Transmitter cannot be "live" to use this function.

Deleting Uploaded Stored Content

Take the following steps to delete stored content:

1. On the TVU Receiver screen, select the Record tab **(A)** (Figure 37).
2. Select the file you would like to delete **(B)**.
3. Click the Delete button **(C)**.

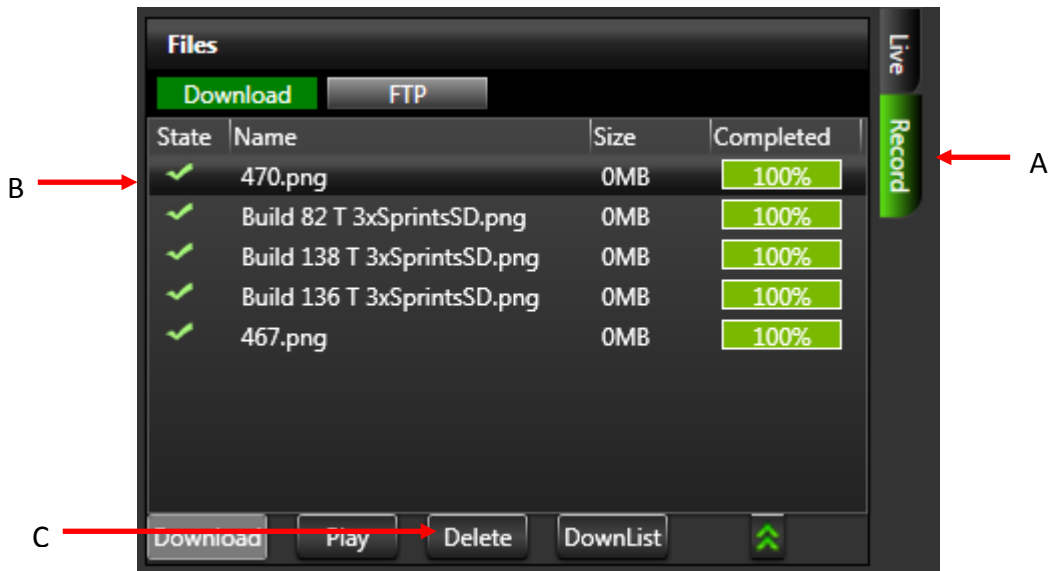


Figure 37 Delete stored content screen

Using the Alert feature

Alerts can be used as an urgent message-sending feature. To compose a message, select recipients and compose the message to be sent (Figure 38). To view sent alerts, click the sent button (Figure 39).

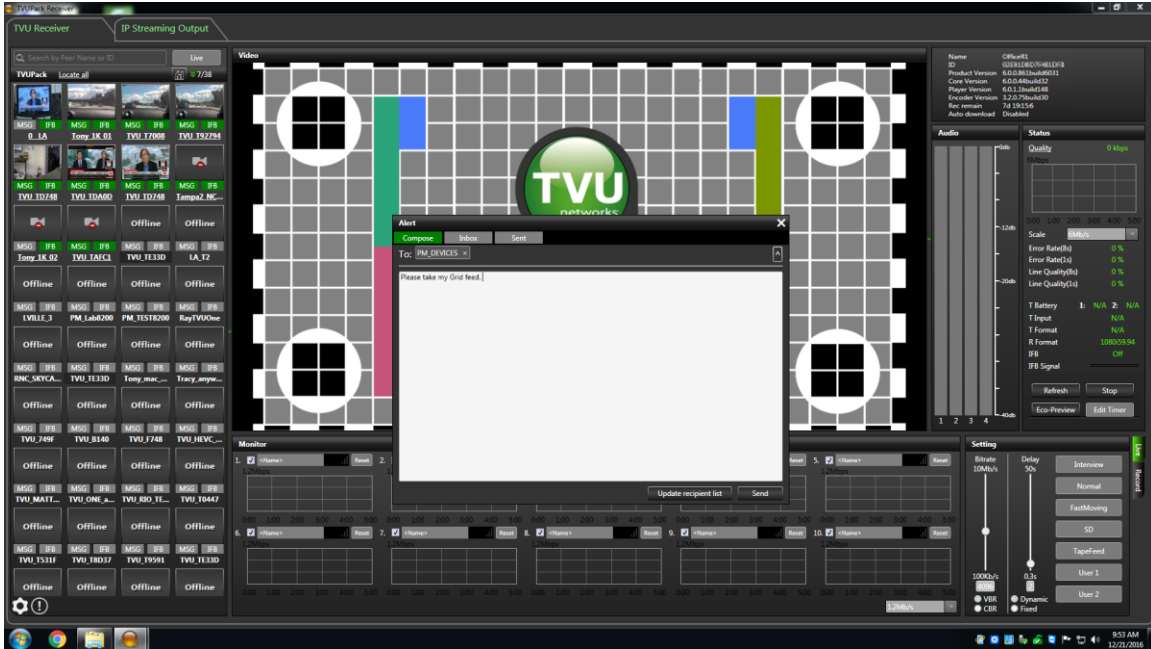


Figure 38 Alert composition screen

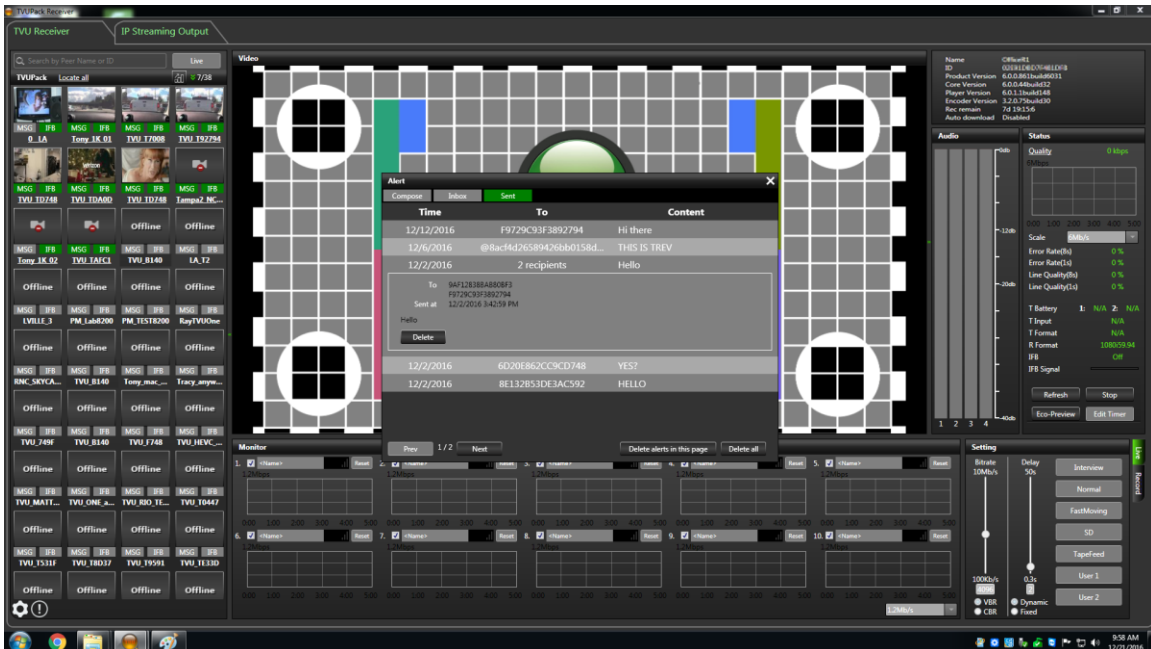


Figure 39 Alert sent screen

Uploading Media Content to the TVU Receiver Using the FTP

Take the following steps to upload media files from an FTP to the TVU Receiver:

1. Log in to your usual FTP client.
2. Retrieve the IP address of the TVU Receiver and plug it into the designated area on the FTP client.
3. Type in the username and password of the TVU Receiver on the FTP. The username is the last four digits of the PID of the receiver while the password is the last eight digits of the PID of the receiver.
4. Drop the files you would like to upload into the FTP and they will be transferred to an FTP folder on the Local (C:\) disk drive. These files will appear under the "Downloaded" tab on the TVU Receiver interface.

TVU Test Pattern

When a TVU Transmitter transmission stream is stopped by the user and goes offline, the preview screen on the receiver will display a TVU Test Pattern (Figure 40). When there is an unintentional interruption of the video stream, the preview screen on the TVU Receiver interface will go black for one minute and then switch over to the TVU Test Pattern.



Figure 40

Accessing the WebR

The TVU Receiver interface can be accessed from anywhere by using a standard webpage. In order to access the WebR, type in the follow URL: ***http://[The IP address of the receiver you would like to access]:8288/webr.***

You will be brought to a login page. To login, the username is "tvu" and the password is the last 8 digits of the PID of the receiver. Please note that all the characters are uppercase. This WebR has all the same features and functions as the receiver GUI.

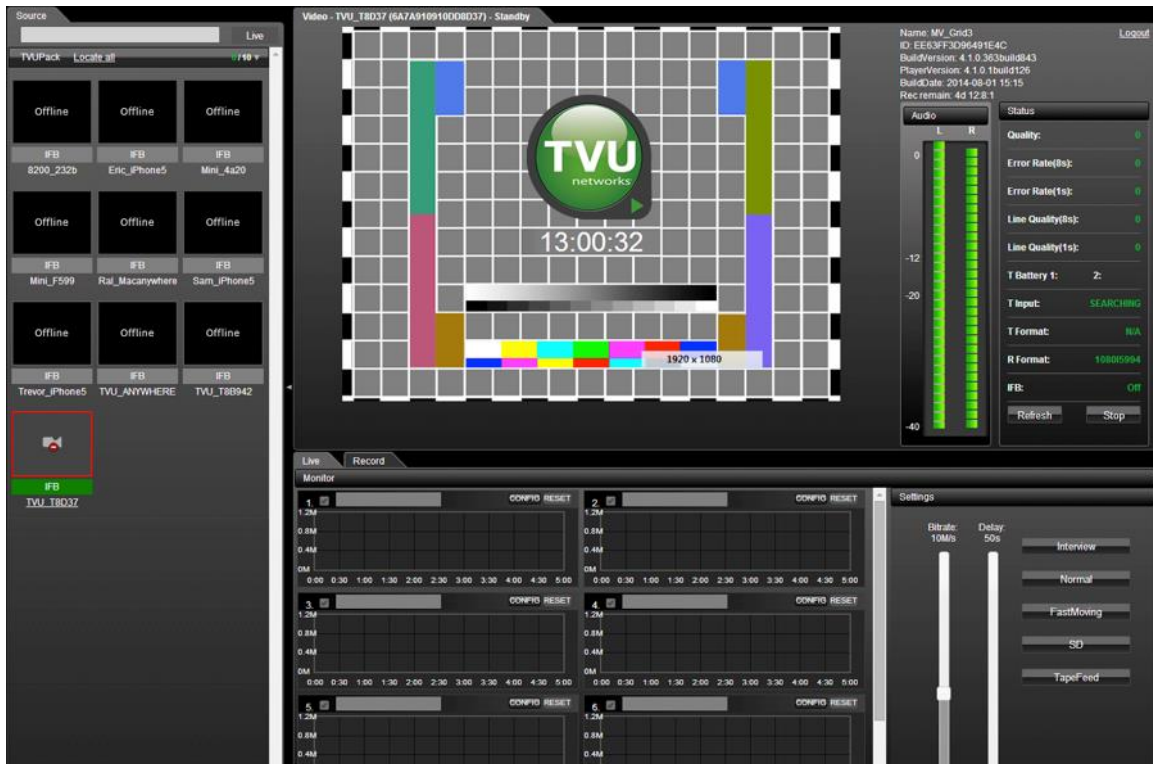


Figure 41 WebR interface

TVU Social

TVU Social allows broadcasters to post captured still images from a TVU Transmitter's live video stream directly to social media networks such as Twitter with just the push of a button. By using the new TVU Anywhere Pro app on an iOS device to connect with the TVU Transmitter via Wi-Fi, field crews are able to easily capture and send images directly to supported social media platforms of their choice.

The TVU Anywhere Pro app can be downloaded for free from the App store on your iPhone, iPad or iPad Mini. Once the app is downloaded and you have launched the app, simply tap on the Twitter icon **(A)** on the TVU Anywhere Pro interface (Figure 42).



Figure 42

You will be directed to a new page where you can easily capture and post images to Twitter (Figure 43). You will be asked if TVU Anywhere Pro can access your Twitter account. Select "Allow" in order to enable this feature.

Note: Your iOS device must be connected to the TVU Transmitter's Hotspot in order to capture of picture of the live transmission and post directly to Twitter. See steps 1-4 under *AutoSync File Transfer Using Wireless Hotspot* on pg. 26 for directions on how to connect your iOS device to the Hotspot.

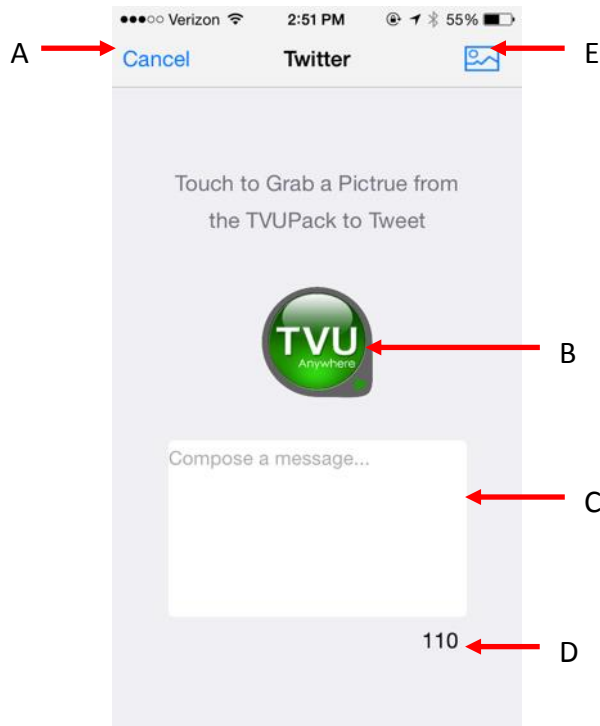


Figure 43

Label	TVU Transmitter Anywhere Pro - Twitter Support
A	Go back to the TVU Anywhere interface
B	Tap the TVU logo to grab a snapshot of a TVU Transmitter live video stream. You can also shake your phone, and a picture will automatically be captured and posted to your Twitter account. <i>(See note below)</i>
C	Compose a Tweet in the message box
D	Character count
E	Choose a photo from your camera roll to Tweet. Note: You need to allow TVU Anywhere Pro to access your camera roll by selecting "Allow" when prompted in order to post to twitter

Table 7

Note: If you have multiple Twitter accounts logged in on your smart device, it will automatically post the snapshot of the TVU Transmitter live video stream to the very first Twitter account that was added to your phone. When posting a picture from the camera roll, you will be prompted to choose a Twitter account.

TVU Social Media Manager Service (Optional)

TVU Networks also offers an additional service called the TVU Social Media Manager. This service allows broadcasters to have access to a cloud based web service that captures still JPEG images at regular intervals of the incoming live video streams from multiple TVU Transmitters in the field. This enables studio operators to select one or more JPEG images and post them directly to social media with the click of a button. These images are stored and can be used for future social media posts.

TVU Support will provide you with your TVU Social Media Manger account information, and you can log into the web service here: www.tvupack.com/social

Once logged in, you will see the TVU Social Media Manager interface and your paired TVU Transmitters (Figure 44). TVU Support will add your TVU Transmitters to your TVU Social Media Manager account. If you would like to add another TVU Transmitter to your account, please contact TVU Support.

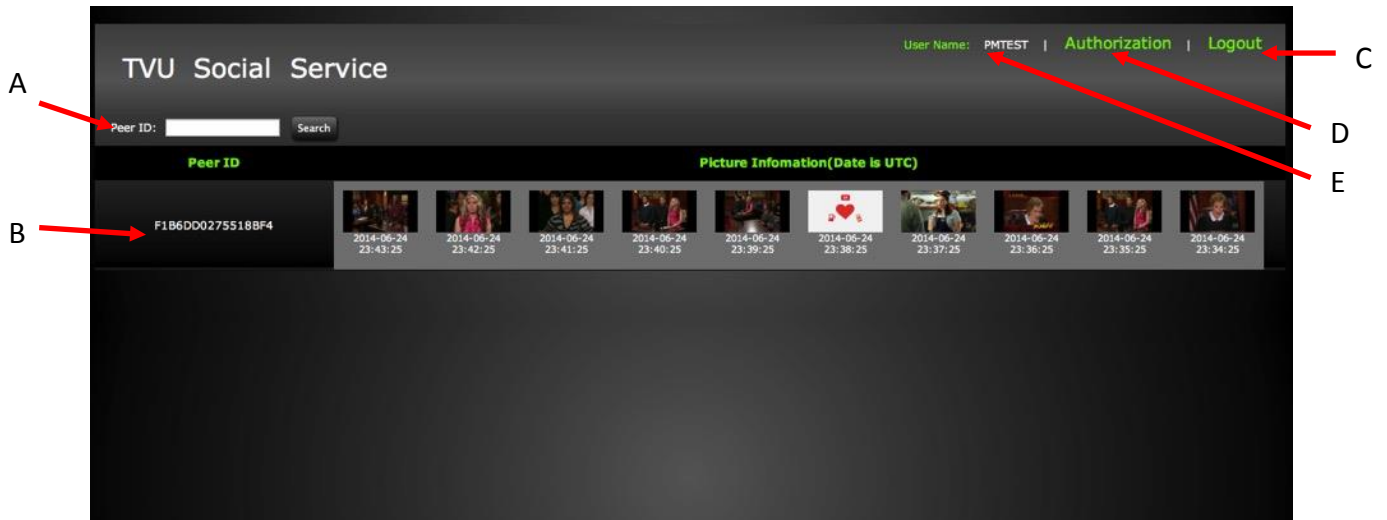


Figure 44

Label	TVU Social Media Manager - Twitter Support
A	Search for a specific TVU Transmitter by typing in the PeerID number
B	Each paired TVU Transmitter will be displayed with its PeerID number and then the stream of captured photos. The images are captured every one minute while the TVU Transmitter is connected to a camera source. It does not matter if the TVU Transmitter is "Live" or on "Standby"
C	Click to log out of the TVU Social Media Manager
D	Authorize your Twitter account so that you can post from the TVU Social Media Manager directly to your Twitter feed. Be sure to enable pop-up windows in order to authorize your account
E	The username is displayed

Table 8

To pair your Twitter account with the TVU Social Media Manager, click "Authorize". A pop-up window will appear that will allow you to authorize the TVU Social Media Manager to post to your Twitter feed (Figure 45). If you are not already logged into your account on your computer, you will be promoted to log into your account. If you are already logged into your account on your computer, simply hit "Authorize App".



Figure 45

To Tweet from the TVU Social Media Manager, simply click on the desired picture and you will be directed to a separate window in order to compose a Tweet (Figure 46).

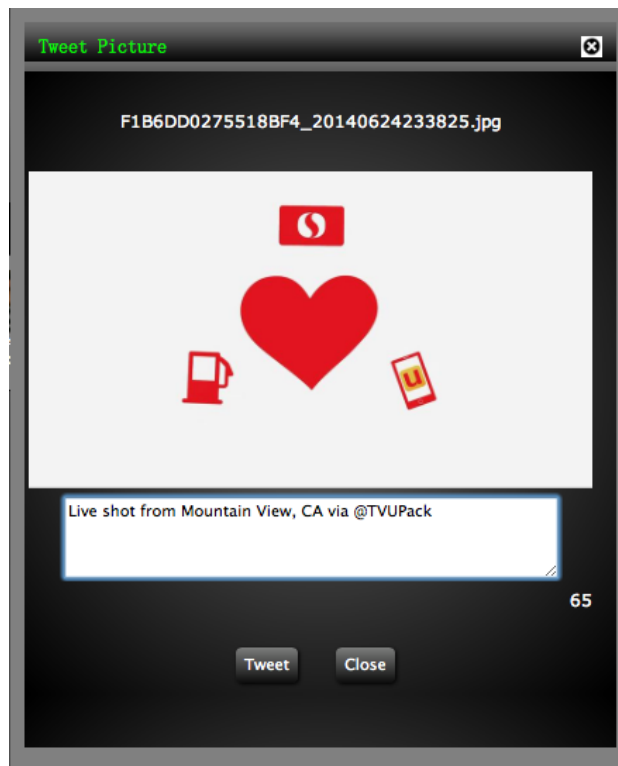


Figure 46

Compose a message in the box below the image. The character count is also displayed under the message box on the right. Once you are ready, click "Tweet" and your image and text will be posted to your Twitter feed.

Using the VOIP Feature (Optional)

TVU Transceivers or TVU Receivers support bi-directional IFB that's also called voice over IP (VoIP). This feature allows your news operations center to speak directly to a TVU Transmitter in the field without the need for telephone contact. On transceivers or receivers, you can see the VoIP indicator under the transmitter's thumbnail. To use this feature, connect a standard set of headphones to the 3.5mm audio jack on the TVU Transmitter and TVU Receiver. Setting up this option is as simple as "plug and play."

IS+ (Optional)

IS+ is an advanced version of TVU Networks' Inverse StatMux technology. With superior forward error correction technology, IS+ also has a higher throughput than the standard Inverse Statmux when under the same conditions. Additionally, with IS+, file transfers are between 2X and 4X faster than standard Inverse StatMux. This solution enables TVU Transmitter to deliver resilient, HD professional broadcast-quality picture in even the most challenging wireless environments.

Once IS+ has been installed on a TVU Transmitter, a "+" sign will appear next the version number on the TVU Transmitter user interface (Figure 47) and a "IS+" will appear to the right of the PID when mousing over the thumbnail of a particular transmitter on the receiver interface (Figure 48).



Figure 47



Figure 48

If you would like to enable IS+, please contact TVU Support:

Phone: +1.650.440.4812

Email: support@tvunetworks.com

Skype: skype.tvupack

TVU TRANSCEIVER TX3200 TECHNICAL SPECIFICATIONS

	TX3200 Specifications
Electrical	Line Voltage: 100-240V AC, 50/60 Hz 5A
Configuration	1RU standard rack mount
Audio/Video Output	BNC – SD/HD – SDI (1080-50i/ 59.94i, 720-50p/59.94p, NTSC/ PAL) w/embedded audio (Optional analog output)
Genlock	BNC – Tri-Level or BB
Display	DVI or HDMI
IFB Input (Optional)	External USB audio input with level control (mic/line), ¼" & XLR
Network I/O	1 independent 10/100/1000 BASE-T RJ45 Ethernet Interfaces, 2 x USB 2.0, 2 USB 3.0
Dimensions	1.7" x 17.2" x 9.8" 43mm x 437mm x 249mm (HxWxD)
Operating Environment	10-35° C (50-95° F), Humidity 20%

*Specifications are subject to change without notice and all features may not be available with encryption option enabled.

Table 9

CONTACTING TVU NETWORKS

At TVU networks, we value our customers and are committed to ensuring a high level of satisfaction. Should you ever need assistance with your TVU transmitter please contact us at one of our numbers below:

Technical Support:

Phone: +1.650.440.4812

Email: support@tvunetworks.com

Skype: [skype.tvupack](https://www.skype.com/join/tvupack)

Billing Questions:

Phone: +1.650.969.6732

Corporate Address:

857 Maude Avenue
Mountain View, CA 94043

APPENDIX A: TROUBLESHOOTING VIDEO QUALITY

Troubleshooting Video Quality Using the Status Indicators in Normal & Advanced Modes

The Status counters offer a visual indication of specific technical aspects of the current live session. By interpreting these numbers it is possible for an operator to troubleshoot and optimize the quality of a session.

Quality

This is the real time effective bitrate of the transmission. If the system is set to VBR (variable bit rate) mode, this number will fluctuate between the configured maximum bitrate and the lowest bitrate the data connections can currently sustain. The maximum target bitrate is set by either using a preset mode in normal operation, or by using the bitrate slider in advanced mode.

If the system is set to CBR (constant bitrate) this number will stay constant.

Error rate indicators

Error rate 8s. This indicates the percentage of uncorrected errors taken over an 8 second average. The aim is for this number to always be at zero during transmission.

Error rate 1s. This indicates the uncorrected error rate over the last second. The aim is for this number to always be at zero during transmission.

All uncorrected errors can contribute to undesirable video glitches. Any error rate greater than 0 indicates that the data connection is unable to operate cleanly in the current data environment. If attempting to operate in CBR (constant bitrate) mode try either lowering the required bitrate or switching to VBR to allow the system to adapt dynamically to conditions. If the system is already in VBR mode try increasing the delay to allow the error correction system more time to adapt to the network conditions.

Line quality indicators

Line quality shows the current error correction levels required for error free transmission at the configured settings.

Line Quality 8s: This is the level of error correction (as an average over the last 8 seconds) required to sustain clean transmission.

Line Quality 1s: This is the current level of error correction the system is using to sustain a clean transmission.

The TVU Transmitter uses multiple methods of error correction to ensure smooth clean video transmission in very challenging environments. Since the underlying network conditions are always a factor when working over multiple connections simultaneously, some error correction is always required. As a rule in difficult environments, the lower the latency, the more data is required for error correction to sustain a stable video

transmission. This error correction, while highly effective, utilizes some of the limited bandwidth that is available in most situations. It is desirable where possible to limit the error correction required as it allows the system bandwidth for extra video quality.

Operational Example 1: TVU Transmitter is being used in a poor data service environment.

In this scenario the receiver is set to Normal VBR mode, but the transmitter is inside a building with poor data service. The Quality indicator is seen to fluctuate between 2048 and 1000 as the signal strength and available data service varies. This indicates that the TVU Transmitter is using TVU's Inverse Statmux to measure the available bandwidth and maximize throughput on a continuous basis. If the video quality is fluctuating two approaches may be used at the receiver to improve the video output consistency and stability.

Suggestions

- Try increasing the delay in 1s increments to allow the TVU Transmitter extra time to compensate for the dips in available bandwidth.
- Try incrementally reducing the maximum bitrate so the fluctuations between high and low are less noticeable.

Operational Example 2: TVU Transmitter is being used in an environment with excellent data service.

In this scenario the receiver is set to Normal VBR mode and all data cards are performing well. The Quality indicator stays constant at 2048 and rarely fluctuates. Under these conditions it is possible that by switching to advanced mode and either increasing the bitrate (for improved video quality) or lowering the latency (for lower delay) may be practical. No action is required, but the system may be capable of enhanced performance if desired.

Suggestions

- Try increasing the bandwidth in 256k increments until the Quality indicator starts to become unstable and cannot sustain the new setting.
- Try decreasing the delay in 0.2 second increments until the Quality indicator becomes unstable and does not stay consistent at the maximum bitrate.

Operational Example 3: TVU Transmitter is being used in an environment with average data service.

In this scenario the TVU Transmitter is being used in an interview talkback situation. The desire is to minimize latency but the bandwidth available to the system is limited and the Quality indicator is fluctuating between 750 and 1800. Uncorrected errors are appearing in the video output.

Suggestions

- Try increasing the delay in 0.5 second increments until the uncorrected errors stop appearing.
- If delay is the most important factor, try decreasing the maximum bandwidth in 256k increments until the errors cease.

Operational Example 4:

In this scenario the receiver is set to Interview mode, but the TVU Transmitter is inside a building with poor data service. The line quality indicator increases up to approximately 50.00 but the Quality counter is down at 1000 and there are occasional errors. This indicates trouble on the underlying data networks.

Suggestion

- Try increasing the delay in increments of 0.5 seconds to allow the system time to compensate for poor conditions on the cellular network.

APPENDIX B: VISLINK HYBRID IP MICROWAVE INTEGRATION TECHNOLOGY

With an optional version of the TM8200 modem module, users can utilize Vislink's integrated microwave technology. The modem module includes up to 6 embedded modems and antennas. The Vislink microwave link provides a DHCP Ethernet connection (via USB adapter) to the TVU Transmitter and provides a UDP transmission path. By using Vislink's microwave technology along with other connections on the TVU transmitter simultaneously such as Ethernet, Wi-Fi and cellular modems, users can transmit an even more reliable live HD video with high-picture quality and minimal latency. The microwave IP path will come and go seamlessly without interrupting the transmission.

This unique modem module can easily be interchanged with the existing modem module by simply replacing the existing module with the new module that is integrated with Vislink technology. The microwave channel will connect seamlessly on the side of the TVU Transmitter. No configuration should be required, but some settings are available via the web-based monitoring and control interface. For more information on how to access the web-based monitoring and control interface, follow steps 1 and 2 on *Configuring Modem Cards from the Receiver Interface* on pg. 14. Additional settings and features will be available under the "Microwave" tab on the web-based monitoring and control interface.

Note: The Vislink Hybrid Modem Module requires a TM8200 with a 5-pin Modem Module interconnect. Please contact TVU Support for further details.

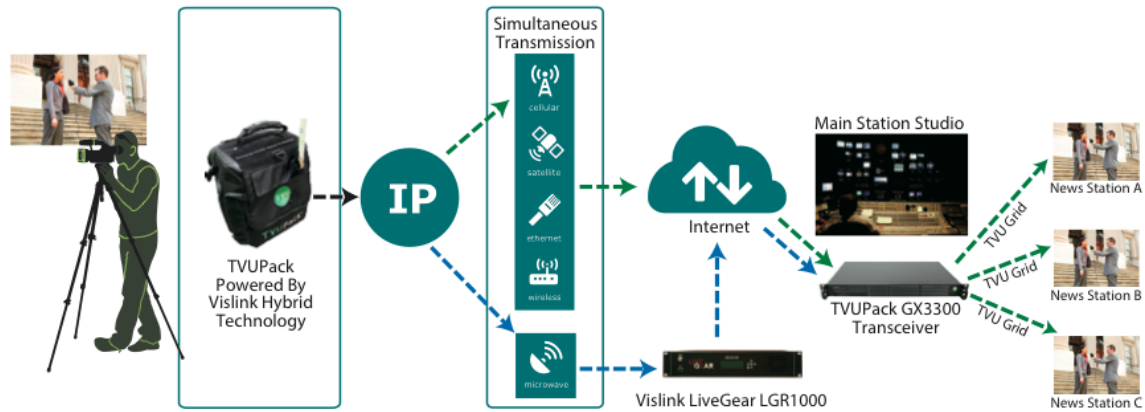


Figure 49

General Safety Information

The following safety requirements, as well as local site requirements and regulations, must be observed by personnel operating and maintaining the equipment covered by this manual to ensure awareness of potential hazards. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

About this Technical Note: This document is intended for use by qualified operators, installers, and service personnel. Users of this manual should already be familiar with basic concepts of radio, video, and audio. For information about terms in this manual, see *Glossary of Terms and Abbreviations* [Part No. 400576-1]. Pay special attention to Notes, Cautions, and Warnings.

⚠ WARNING: *RF power is present in the unit. Exposure to RF or microwave power can cause burns and may be harmful to health. Remove power from the unit before disconnecting any RF cables and before inspecting damaged cables and/or antennas. Avoid standing in front of high gain antennas (such as a dish antenna) and never look into the open end of a waveguide or cable where RF power may be present.*

✓ NOTE: *Hazardous RF radiation limits and recommended distances may vary by country. Ensure that all applicable state and federal regulations are observed when using this transmitter.*

The list below shows the Maximum Permissible Exposure [MPE] minimum safe distances from the antenna. [FCC OET Bulletin 65, August 1997]

Antenna Gain Safe Distance:

0 dBi	2 dBi	3 dBi	5 dBi	11 dBi
4 cm	6 cm	6 cm	8 cm	15 cm
1.57 in	2.36 in	2.36 in	3.15 in	5.9 in

Vislink RF Transport Overview

The TVU Transmitter encoder transmits an IP signal to a microwave receiver, which is collocated with the LGR1000 system to provide an intelligent IP backhaul to the TVU Receiver system.

The IP transport stream is demodulated (along with other IP connections such as from cell, Wi-Fi or Ethernet) to an SDI signal to be broadcast as a stable, live HD video broadcast regardless of network condition. This is accomplished with TVU's unique Inverse Statmux technique that measures available bandwidth and maximizes throughput on a continuous basis.

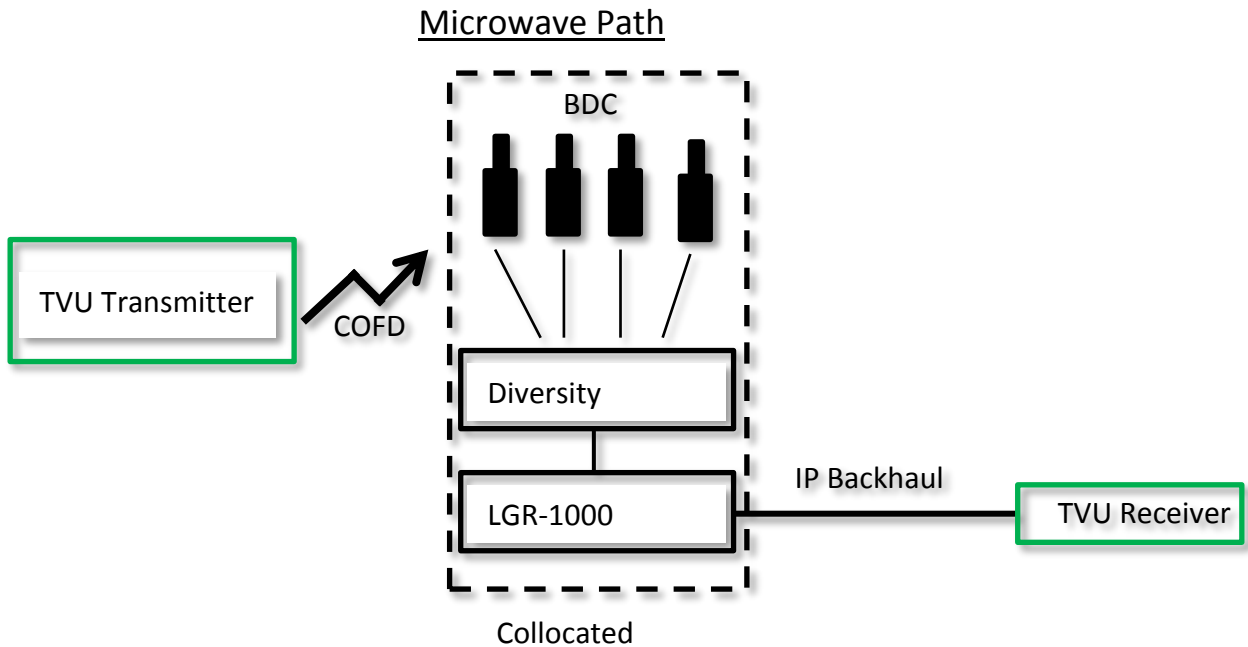


Figure 50

The Vislink Hybrid RF ASI over IP Modulator generates high power at 200 mW (milliwatts) and low power at 100 mW.

A link barrel booster may also be incorporated when required for enhanced capability. Refer to the TVU Transmitter image below.

LGR/TVU Transmitter System Set-Up

This section describes how to configure a LiveGear receiver to operate within a TVU Transmitter system. First, set the WAN IP address of the LGR and depending on your network setup, set port forwarding. After configuring the LGR, TVU Transmitter can be set to stream to the LGR.

It is recommended that users preconfigure the transmitter and receiver together in the studio to ensure that the initial settings are analogous. It is also suggested that you test the system with a live video feed prior to sending a TVU Transmitter team to a remote location.

LiveGear Receiver

- Connect AC Power Supply.
- Connect Signal Input from RF Receiver
- Connect Ethernet Cable [WAN port]
- Set the rear Power Supply switch to **On** position.

TVU Transmitter

- Install SIM cards.
- Connect video source.
- Connect power supply.

Configuration Steps to Stream Video

1. Connect a laptop to the 4 port switch on the rear panel and apply power to the LGR by setting the Power Supply rocker switch on the rear panel and by pressing the front panel **Power** push button. Check the LCD to ensure that the initialization process has completed.
2. Browse to the default IP address of the LGR on the LAN at <http://192.168.2.200>. Log in using the UID/PW: **admin/admin**.
3. Browse to Setup > Network Settings.
4. Set your IP address information in the WAN Configuration box and click **Save**.
5. Browse to Setup > LGR outputs:
 - a. Hit plus button on LGR outputs title bar
 - b. Name the TVU output
 - c. Select TVU as the input stream
 - d. Enter TVU Transceiver IP and Port 8088
Note: Port forwarding may be needed from LGR system to TVU Transceiver
 - e. Save settings.

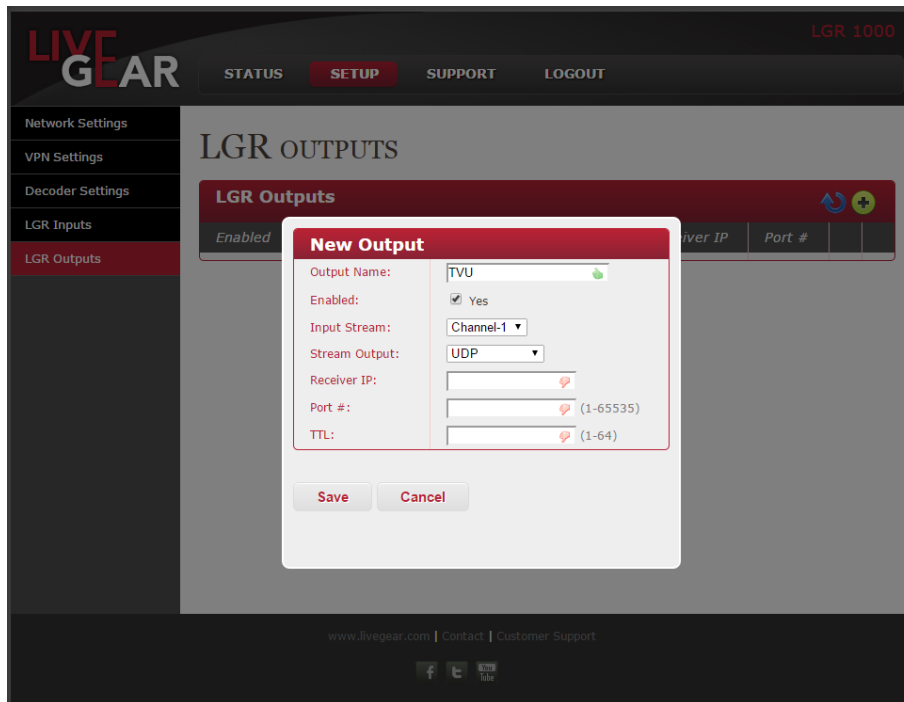


Figure 51

6. Apply power to TVU Transmitter and wait for the initialization process to complete. Ensure that you have installed fully charged batteries [or use DC input]. Batteries must be recharged using an external charger. Allow time for TVU Transmitter to boot up and optimize the cellular links for broadcast.
 - a) Ensure that you have a secure connection to your video source at the Video Input BNC connector on the left side of the TVU transmitter.
 - b) Set TVU Transmitter to begin live video streaming.
7. Check the RF connections on the receiver to ensure RF link. The RF link is always active due to TVU's Inverse Statmux video transport technique. Video will not be sent until the connection protocol is recognized by the TVU Transceiver.
8. Once you have configured the LGR to operate with the TVU Transmitter system, check the TVU Receiver Monitor display. The Vislink module will be shown as Interface 7, as shown in the example below.
9. If a good link is made in the system, Interface 7 will be lit green and show data transmission.

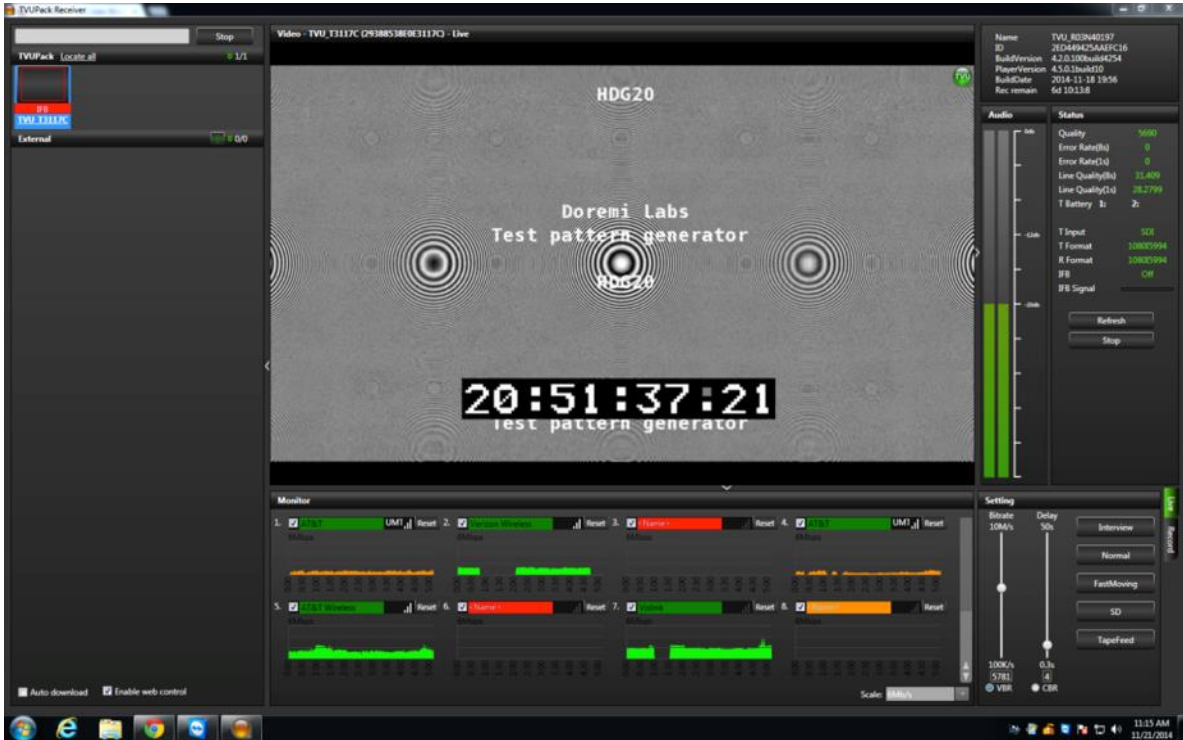


Figure 52

APPENDIX C: TVU RECEIVER TR3700

The TVU Transceiver is the companion decoder for all TVU transmitters and helps broadcasters monitor all aspects of a live transmission, including bit-rate and latency. The TR3700 model is slightly different from other TVU Transceivers because it allows for two TVU Transmitters to be live simultaneously on one transceiver with two independent SDI outputs and two separate TVU Receiver applications. Because of this function, the TR3700 requires some additional set-up.

Normally, users would only attach one SDI cable to the one SDI output on the transceiver unit (**A**) (Figure 53). However, this unit has a second SDI output (**B**) on the back connections panel as seen in Figure 53. In order to access the second SDI output, simply plug an additional SDI cable into that outer connection.



Figure 53

When TVU Support configures your TR3700, two receiver applications will be installed

on the desktop in order for the user to access the user interface for both outputs (Figure 54).

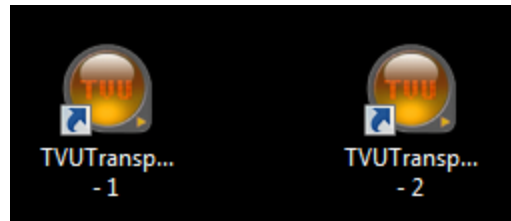


Figure 54

The TVU Receiver GUI 1 will display the output plugged into the middle connection on the transceiver **(A)**(Figure 53). The TVU Receiver GUI 2 will display the output plugged into the outer SDI output connection on the transceiver **(B)**(Figure 53). Both GUIs can be open at the same time in order to monitor and control the transmission of both TVU Transmitters simultaneously (Figure 55).



Figure 55

For additional assistance, please contact TVU Support:

Phone: +1.650.440.4812

Email: support@tvunetworks.com

Skype: skype.TVUPack

APPENDIX D: TVU RECEIVER TR3750

The TVU Transceiver is the companion decoder for all TVU Transmitters and helps broadcasters monitor all aspects of a live transmission, including bit-rate and latency. The TR3750 model is slightly different from other TVU Transceivers because it allows for two TVU Transmitters to be live simultaneously on one transceiver with two independent SDI outputs and two separate TVU Receiver applications.

Additionally, it has a redundant power supply. It has a redundant power supply. Thus, if the one power supply fails **(A)**(Figure 57), the other power supply **(B)** will keep running in order to keep the TVU tTransceiver powered up.

In order to use the dual power supplies properly, both AC power supplies must be plugged into both of the AC power adapters on the back panel of the TR3750 **(A)(B)**(Figure 57). When one power supply fails, the TVU Transceiver will make a continuous beeping sound to alert users of the failure.

Because of the dual outputs, the TR3750 requires some additional set-up. Normally, users would only attach one SDI cable to the one SDI output on the transceiver unit **(G)**(Figure 57). However, this unit has a second SDI output **(I)** on the back connections panel as seen in Figure 57. In order to access the second SDI output, simply plug an additional SDI cable into that outer connection.

TVU Transceiver TR3750 Front Panel



Figure 56

Label	TVU Transceiver TR3750 Front Panel Faceplate
A	Power Button

Table 10

TVU Transceiver TR3750 Back Panel

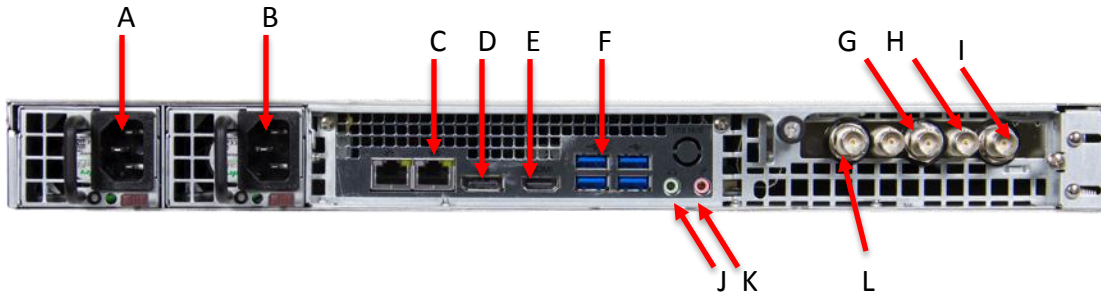


Figure 57

Label	TVU Transceiver TR3750 Back Panel Connections (SDI)
A	AC Power adapter
B	AC Power adapter
C	1 GigE Ethernet Port
D	Display Port: Connect the supplied Display Port to VGA adapter for primary display purposes.
E	HDMI Display Port
F	USB Ports
G	SDI Output
H	SDI Input
I	Secondary SDI Output
J	Audio Output
K	Not Used
L	Reference input: Allows for time sync with the television station’s broadcasting system

Table 11

When TVU Support configures your TR3750, two receiver applications will be installed on the desktop in order for the user to access the user interface for both outputs (Figure 58).

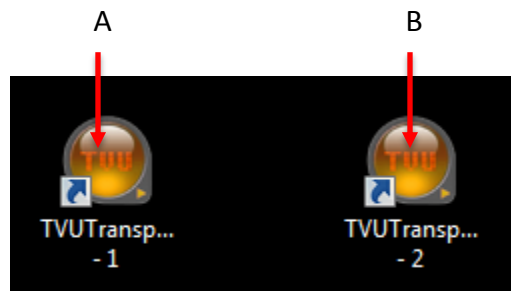


Figure 58

The TVU Receiver GUI 1 will display the output plugged into the middle connection on the transceiver (G)(Figure 57). The TVU Receiver GUI 2 will display the output plugged into the outer SDI output connection on the transceiver (I)(Figure 57). Both GUIs can be open at the same time in order to monitor and control the transmission of both TVU Transmitters simultaneously (Figure 59).



Figure 59

For additional assistance, please contact TVU Support:

Phone: +1.650.440.4812

Email: support@tvunetworks.com

Skype: skype.TVUPack

APPENDIX E: TVU TRANSCIVER TX3250

The TVU Transceiver is the companion decoder for all TVU transmitters and helps broadcasters monitor all aspects of a live transmission, including bit-rate and latency. The TX3250 model is slightly different from other TVU Transceivers because it has a redundant power supply. Thus, if the one power supply fails **(A)**(Figure 61), the other power supply **(B)** will keep running in order to keep the TVU Transceiver powered up.

In order to use the dual power supplies properly, both AC power supplies must be plugged into both of the AC power adapters on the back panel of the TX3250 **(A)(B)**(Figure 61). When one power supply fails, the TVU Transceiver will make a continuous beeping sound to alert users of the failure.

TVU Transceiver TX3250 Front Panel



Figure 60

Label	TVU Transceiver TX3250 Front Panel Faceplate
A	Power Button

Table 12

TVU Transceiver TX3250 Back Panel

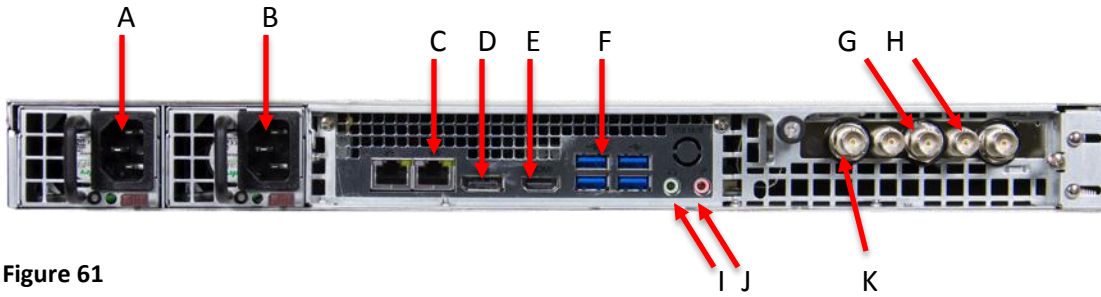


Figure 61

Label	TVU Transceiver TX3250 Back Panel Connections (SDI)
A	AC Power adapter
B	AC Power adapter
C	1 GigE Ethernet Port
D	Display Port: Connect the supplied Display Port to VGA adapter for primary display purposes.
E	HDMI Display Port
F	USB Ports
G	SDI Output
H	SDI Input
I	Audio Output
J	Not Used
K	Reference input: Allows for time sync with the television station's broadcasting system

Table 13