TVU Networks®

TVU One™
Transmitter

TVU One transmitter

Software User Guide

Legal notices

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Specifications in this publication are subject to change. Contact TVU Networks Corporation for specifications that are critical to your application. Go to www.tvunetworks.com for the latest product information.

Related literature and media

The following list contains related literature and media:

Product data sheets

- TVU One Data Sheet

Hardware Set up and Operating manuals

- TVU One Transmitter Hardware User Guide
(part number: TVUOne UG EN Rev A 04-2019)

Software Set up and User manuals

- TVU One Transmitter Software User Guide
(This manual, part number: TVU One Software User Guide
Document part number: TVUOne SW User Guide Rev A EN
04-2019)

Media

Not applicable

FCC/CE Compliance

Federal Communications Commission (FCC) Regulation of Electronic News Gathering (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.

TVU transmitter devices have always conformed to all applicable FCC regulations covering mobile systems for electronic news gathering. 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.

Contact us

Supporting documentation demonstrating TVU transmitters' compliance with the applicable FCC regulations is available upon request. Contact TVU Networks at +1.650.440.4812 for assistance and questions regarding approved modem cards for use with TVU transmitters.

Contents

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1 Introduction, software setup and configuration

This User Guide provides a product overview, software setup and configuration information for the TVU One transmitter.

Product overview

TVU One delivers high-definition picture quality with 0.5 second latency at 3 Mbps within an ultra compact and rugged hardware design. It uses HEVC or H.265 compression standard to deliver greater efficiency in data use as well as increased transmission stability. With TVU One, broadcasters of live video can fully leverage the versatility of a small, lightweight, IP-based high-definition video field transmitter without sacrificing performance, features or picture quality.

Contents and features

TVU One has a robust set of features and functions designed to fit the needs of any live broadcaster. The TVU One runs on the TVU platform and includes the following features:

- **Simple Worry-Free Operation** – TVU pioneered one button operation in portable live video streaming transmitters, and TVU One carries on that tradition. TVU One requires no in-field configuration, and boots up in less than 20 seconds with just the push of a button.

- **Small Form Factor, Big Features** – Despite its small size, TVU One is feature-rich with no compromises to performance or capabilities. To see a full list of hardware and software specifications for TVU One, refer to "Product Specifications".

- **Inverse StatMux Plus** – TVU One features proprietary video transmission technology called Inverse StatMux Plus (IS+). With IS+, unsurpassed HD picture quality is dependably delivered at sub-second latency over cellular 3G/4G/LTE modems even when transmitting in a moving vehicle traveling at over 60 mph/100 kph.

- **Powerful Real-Time Store and Forward** – TVU One can simultaneously live stream and record. TVU One can record up to 7 hours of full HD footage, depending upon the selected configuration. Additionally, TVU has HD file transfer functionality that ensures the delivery of a HD quality error-free video clip to the studio in real-time without needing to

wait until the clip is fully recorded on the transmitter.

- **Fully Compatible with TVU Grid** – TVU's IP based video switching, routing and distribution solution allows a broadcaster to share a TVU One live video transmission with any other TVU Grid enabled station, operations center or physical location. TVU Grid features very low latency when switching, routing or distributing live video.

TVU Grid Web interface

The TVU One integrates with the TVU Command Center Web interface which provides a cloud-based centralized management and control solution of all TVU devices and services. For detailed information about TVU Command Center, refer to the "TVU Command Center Set up and User Guide ".
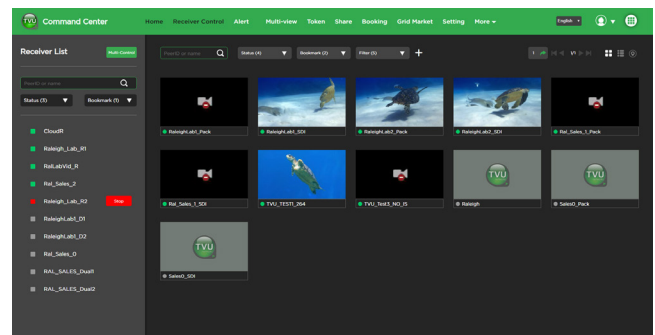
TVU Command Center Web interface

About this guide

This software user guide provides detailed information about the following topics:

- Important safety guidelines
- Advanced configuration settings
- Monitoring, and controlling the TVU One transmitter
- Advanced transmitter operations
- File-based workflows
- Legacy command-line configuration
- Connectivity through captive portals

Before you begin

Before you begin setting up the TVU One transmitter, it is recommended that you identify the devices you intend to use with the unit including: cameras, cables, power sources, modems and unit accessories.

Be sure to read and follow the Safety notices contained in this guide before you setup your new TVU One. Refer to the TVU One Hardware User Guide for Setting up and operating the TVU One transmitter hardware:

Document part number: *TVU One UG RevA EN 04-2019*

Safety notices and statements in this document

The safety notices and statements that may appear in this document are as follows:

Note: These notices provide important tips, guidance, or advice.

IMPORTANT: These notices provide information or advice that might help you avoid inconvenient or problem situations.

ATTENTION: These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

CAUTION: These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

TVU One unit and battery safety and airline travel guidelines

CAUTION:

The following CAUTION statements indicate situations that can be a potentially hazardous procedure step or situation:

> **To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel**

1. To reduce the risk of fire or electric shock and interference, use the recommended accessories only.

2. This apparatus can be operated at a voltage in the range of 12 - 19 V DC.

3. Only use a TVU networks supplied AC adapter with this unit.

   Important information regarding the supplied AC adapter:

   - The supplied AC adapter is designed to be used with an input voltage in the range of 100-240 V AC.

   - Voltages other than 120 V are not intended for U.S.A. and Canada.

   - Operation at a voltage other than 120 V AC may require the use of a different AC plug. Please contact either a local or foreign TVU Networks authorized service center for assistance in selecting an alternate AC plug.

4. A coin type battery is installed inside of the unit. Do not store the unit in temperatures over 60 °C (140 °F).

5. Danger of explosion or fire if battery is mistreated.

6. Do not leave the battery in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

7. Do not disassemble the battery or dispose of it in fire.

8. Do not store the battery in temperatures over 60°C (140°F).

9. Replace battery only with same or specified type.

10. To completely disconnect this equipment from the AC mains, disconnect the mains plug from the AC receptacle.

11. To maintain adequate ventilation, do not install or place this unit in a confined space. To prevent risk of electrical shock or fire due to overheating, ensure that nothing obstructs ventilation.

IMPORTANT:

The following safety notices and instructions provide information or advice that might help you avoid inconvenient or problem situations:

1. Unplug this apparatus during lightning storms or when unused for long periods of time.

2. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

AC adapter

The rating plate is on the underside of the AC Adapter. Disconnect the AC mains plug from the AC mains socket when not in use.

Use only TVU Networks supplied or authorized batteries and chargers

This device is designed to be used only with TVU Networks supplied batteries. Use only TVU Networks supplied devices and chargers to charge the supplied batteries. To see a list of qualified external batteries to use with this device, please contact TVU Networks. Use of non-qualified batteries with this system may cause damage to the unit or possibly fire.

FAA regulations

FAA Regulations require rechargeable and non-rechargeable lithium batteries, cell phone batteries, laptop batteries, external batteries, portable rechargers, spare (uninstalled) lithium ion and lithium metal batteries must be carried in carry-on baggage only.

When a carry-on bag is checked at the gate or at plane side, all spare lithium batteries must be removed from the bag and kept with the passenger in the aircraft cabin. The battery terminals must be protected from short circuit.

This includes spare lithium metal and spare rechargeable lithium ion batteries for personal electronics such as cameras, cell phones, laptop computers, tablets, watches, calculators, etc. This also includes external battery chargers (portable rechargers) containing a lithium ion battery. For lithium batteries that are installed in a device (laptop, cell phone, camera, etc.), see the entry for "portable electronic devices, containing batteries" in this chart.

Size limits

Lithium metal (non-rechargeable) batteries are limited to 2 grams of lithium per battery. Lithium ion (rechargeable) batteries are limited to a rating of 100 watt hours (wh) per battery. These limits allow for nearly all types of lithium batteries used by the average person in their electronic devices. With airline approval, passengers may also carry up to two spare larger lithium ion batteries (101-160 watt hours). This size covers the larger after-market extended-life laptop computer batteries and some larger batteries used in professional audio/visual equipment.

Quantity limits

None for most batteries – but batteries must be for use by the passenger. Batteries carried for further sale or distribution (vendor samples, etc.) are prohibited. There is a limit of two spare batteries per person for the larger lithium ion batteries described above (101-160 watt hours per battery).

Batteries must be protected from damage. Battery terminals (usually the ends) must be protected from short circuit (i.e., the terminals must not meet other metal). Methods include: leaving the batteries in their retail packaging, covering battery terminals with tape, using a battery case, using a battery sleeve in a camera bag, or putting them snugly in a plastic bag or protective pouch.

See the regulation: 49 CFR 175.10(a)(18)

Tip: Newer lithium ion batteries have the watt hour (wh) rating marked on them. To calculate watt hours, multiply the battery voltage by the amp hours (ah). To learn more about lithium batteries, their restrictions, and how to tell what size they are, go to http://SafeTravel.dot.gov.

Refer to the link below for International Air Transport Association (IATA) regulations and information regarding airline travel with lithium batteries:

http://www.iata.org/whatwedo/cargo/dgr/Documents/LithiumBattery_PassengerFlyer.jpg

Additional airline travel information

When traveling, the TVU One transmitter's onboard battery should be removed from the unit to prevent accidental power on. The onboard battery terminals should be protected to prevent accidental short circuit. Protect the onboard battery terminals by placing them in a plastic bag or covering the battery terminals with electrical tape.

TVU onboard batteries should always be transported as carry-on baggage. It should never be transported in the cargo hold.

2 Advanced configuration

This section provides instructions for advanced configuration settings for hotspot, WiFi, modem, microwave, router, and BGAN configuration for the TVU One transmitter.

TVU One status monitoring and control using a Web browser, iPhone, or smart mobile device

The TVU Transmitter operational status can be monitored and various parts of the transmission can be controlled from a Web browser. This interface can be accessed using a standard web browser connected to the TVU One hotspot USB port on the side transmitter panel.

Connecting the TVU One to the internal hotspot

Complete the following steps to configure the TVU One to the internal hotspot using your iPhone or smart mobile device:

Configuring the TVU One transmitter for hotspot (optional)

1. Search for the hotspot on your iPhone/smart device. Then, when prompted, enter the case-sensitive SSID:
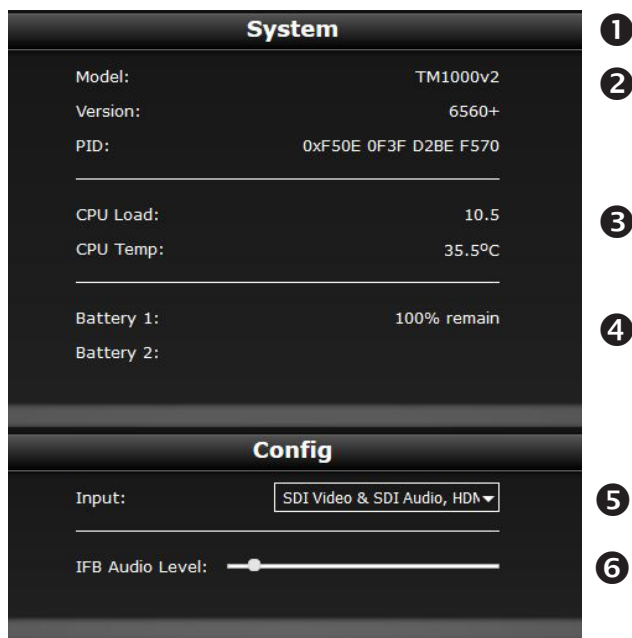
   `TVUPACK_XXXX`

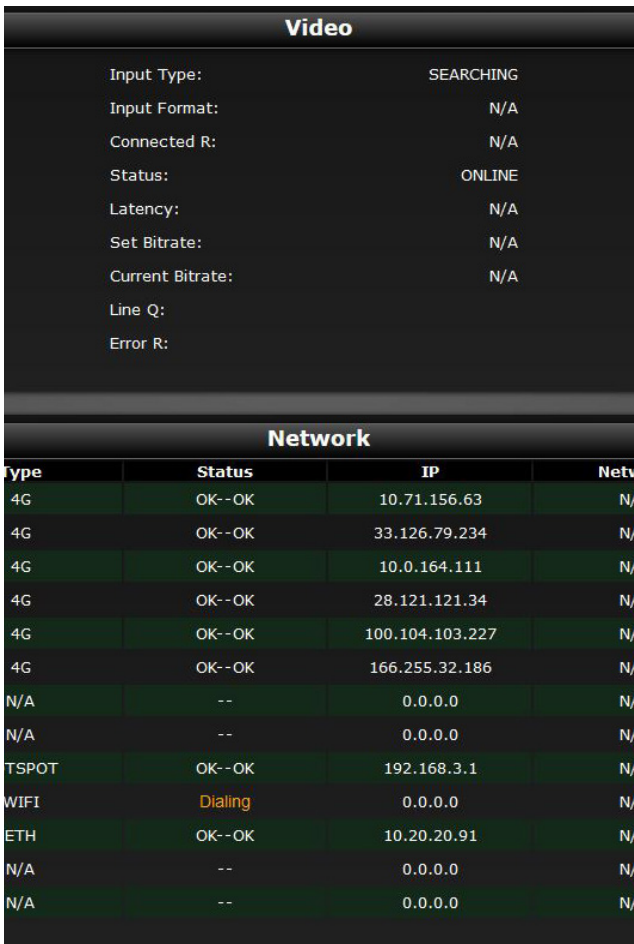   (Where *X* is the last 4 digits of the transmitter's PID)

   The default password is the **last 8 digits** of the TVU One PID

> **All password characters are uppercase. The password can be changed in the Web UI if desired.**

2. Connect to the SSID using your iPhone/smart device. Refer to the following examples of how the status screens display on a smart device Web browser.

3. Once the connection is established, you can open a web browser and enter **http://192.168.3.1** in the address line to see the pack status.

4. Click the **Status** tab to view the system information.
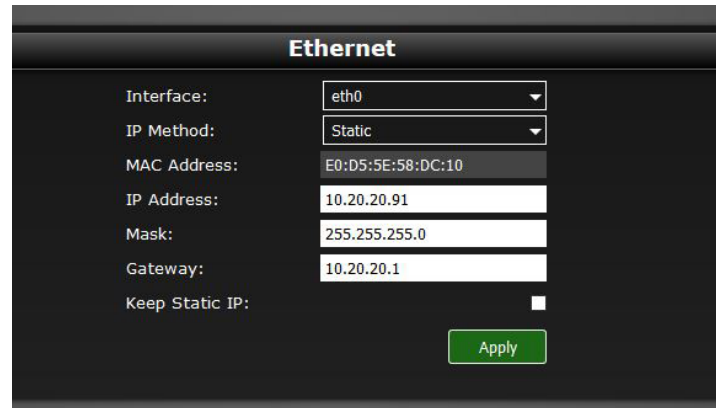

TVU One status screen

TVU One status; video and network screen

TVU One transmitter functions and status screen descriptions are as follows:

❶ **Drop-down menu** - Use the drop-down menu to select, monitor, and control all aspects of a transmission including data cards, Ethernet, WiFi, BGAN, Receiver, and return video feed.

❷ **TVU Pack information** - Provides information about a specific TVUPack which includes model number, version number, and PID.

❸ **CPU** - Displays the current CPU capacity and temperature.

❹ **Battery** - Main battery status.

❺ **Input** - Displays the input source.

❻ **IFB** - Allows the user to change the audio level of the IFB function.

❼ **Video** - Displays video transmission information and status.

❽ **Network** - Modem card information including type, connectivity, and IP address all organized by slot number.

Ethernet configuration

Complete the following steps in this procedure to set up and configure Ethernet using the TVU One set up and configuration window.

TVU One Ethernet set up and configuration window

1. Click the drop-down menu and select **Ethernet**.

2. Click the IP Method drop-down menu and select a **Static IP** or **DHCP IP** method.

3. If your IP method is static, you can enter a static IP address in the IP Address field.

4. If your IP method is static, you must enter the Subnet Mask in the Mask field.

> **The DHCP IP address is automatically generated and cannot be manually entered.**

5. If your IP method is static, you must enter the Gateway in the Gateway field.

> **IMPORTANT: Be advised that when "Static" is selected from the "IP Method" drop down menu, you must click the Keep Static check box to keep the desired static IP address from being lost after a reboot.**

6. Press the **Apply** button to save your changes.

WiFi configuration and settings

The WiFi menu provides configuration information and access to change the WiFi settings. The transmitter can optionally support multiple WiFi connections by purchasing optional hardware. For more information, contact TVU Networks support.

When multiple WiFi adapters are connected, you can scan available slots for WiFi adapters and configure the WiFi login information using the TVU One WiFi setup and configuration window.
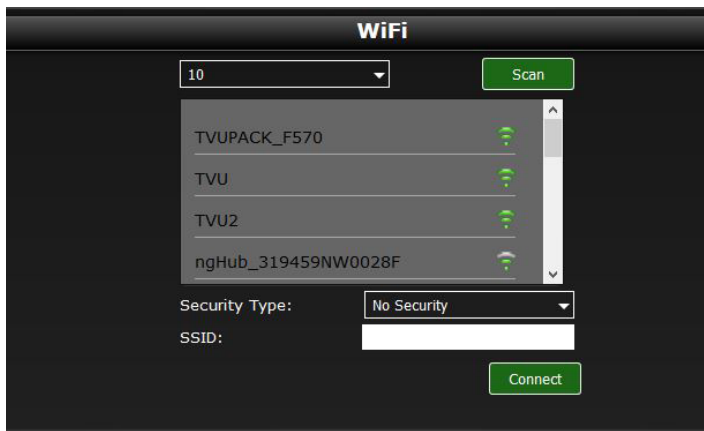
TVU One WiFi setup and configuration window

Configuring WiFi

Complete the steps in the following procedure to configure your WiFi settings:

1. Click the drop-down menu and select **WiFi**.

2. Press the **Scan** button to display any available networks. Available networks display in the center panel. Choose the desired network from the center panel.

3. Click the Security Type drop-down menu to review the security type of the connection. This setting supports WPA-DSK and WEP.

4. In the SSID field, verify your wireless network name.

5. Click **Connect** to save your changes.

TVU One hotspot settings

The hotspot menu provides status information on clients connected by way of the hotspot.

TVU One hotspot set up and configuration window

Configuring hotspot

Complete the following steps in the following procedure to view and change hotspot status:

6. Click the drop-down menu and select **Hotspot**.

> The Connected Client list window displays a list of devices that are connected by way of hotspots.

7. To update the **Password**, edit the password field provided.

> The new password must be 8 characters and does not take affect until the system is restarted.

8. The hotspot feature will enable a connected device to access the internet using one of the connected networks.

9. To manually select the route taken (for example, a Hotel WiFi network), choose the path from the Route drop-down menu. For more information, refer to the Appendix topic "Using hotspot with a captive portal".

10. In the Band drop-down menu, choose **2.4 GHz** or **5 GHz**.

11. Click **Apply** to save your changes.

Modem configuration

The Modem screen provides modem configuration information. Many cellular data cards are automatically detected by the TVU transmitter and will self-configure. If this is the case, no further action will be required. If a data card needs to be configured, you can use the Modem menu to configure specific data cards.
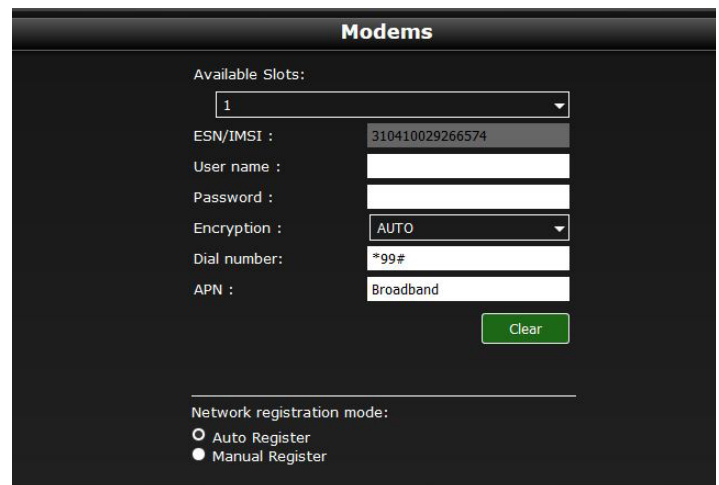
TVU One Modem set up and configuration window

Configuring data cards

Complete the steps in the following procedure to configure specific data cards:

1. Click the drop-down menu and select **Modems**.

2. Click the **Available Slots drop-down list** to display a list of slots that are available for configuration.

3. Go to the **User Name field** and enter the carrier user name information from the network carrier.

4. Go to the **Password field** and enter the carrier password information from the network carrier.

5. Click the Encryption drop-down menu and select the appropriate **encryption standard**.

6. Go to the **Dial number field** and enter the carrier dial information from the network carrier.

7. Go to the **APN field** and enter APN information from the network carrier.

8. Under the **Network registration mode**, to select the Manual register radio button when roaming.

9. Click the **Scan Carrier button** to scan for available carrier networks.

10. Click **Apply** to save any changes.

BGAN Configuration

The BGAN window provides BGAN configuration and transmission information. Settings are as follows:
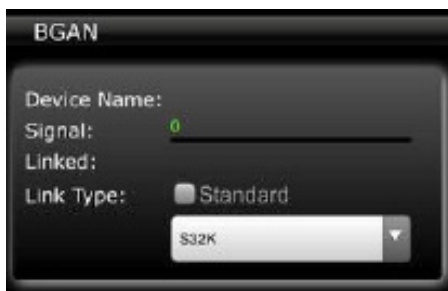
Device Name - Displays the device name.

Signal - Displays the signal strength.

Linked - Indicates if the BGAN is connected.

Link Type - Indicates the BGAN link type.

Drop-down menu - Use this drop-down menu to select a streaming class.


TVU One BGAN status and configuration window

The TVUPack can support BGAN Hughes 9201 for automatic data connections.

Configuring BGAN

Complete the following steps to set up the BGAN Hughes 9201 auto connection:

1. Click the drop-down menu and select **BGAN**.

2. To set up the BGAN device to Auto Register Network mode by LaunchPad, enable automatic registration, Select **Terminal** > **Auto Start mode**. The Configure Auto-Start screen displays.
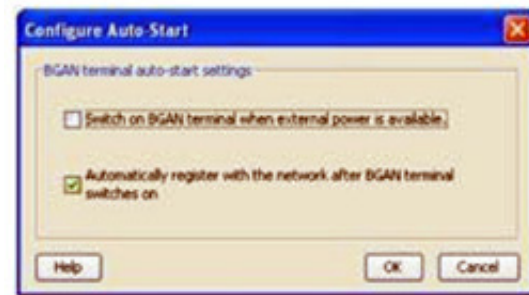
3. Check **Automatically register with the network after BGAN terminal switches on** and then click **OK**. Then, power Off the BGAN device.

4. Connect the **Ethernet cable** from the BGAN to the TM8200.

5. Point to a satellite using the Pack configuration Web UI from an iPhone or IE, for Hughes 9201. Then, locate the signal strength indicators on the panel.

> You may need to manually adjust the equipment location and orientation in order to confirm that the signal strength is greater than 60%.

6. Set the **link mode**. The TVUPack automatically sets up X-stream as the default mode.

Setting the link mode

> If the interface connected with the BGAN device displays consistently yellow and does not change to green after setting up the "Link Type", check whether the BGAN equipment when connected to a PC, can work normally with LaunchPad's X-stream mode.

7. Check on the TVUPack's screen to make sure that the BGAN is connected.

8. **Power Off** the BGAN device to close the connections.

If the BGAN is the only device connected with the receiver, then the receiver will automatically change the bit rate to 80% of the XStream with four seconds of delay at the CBR mode.

Single BGAN mode

If there is no BGAN connected, the menu will display "No Device Detected"
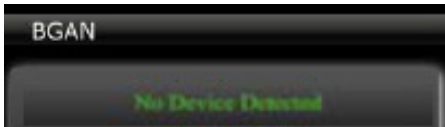
BGAN menu - No Device Detected

Router configuration settings

The TVU router has two pass-through data modes, Standard and TVU Router mode. In standard mode, the transmitter can be used as an internet hotspot making use of one of the data connections.

In advanced TVU Router mode, the transmitter can utilize and make available the full aggregate bandwidth of the system for pass-through traffic. The bandwidth can often exceed 200 Mbps.

TVU Router is an advanced licensed feature that must be activated before it becomes available.

Standard mode configuration

Complete the following steps to configure the pass-through in Standard mode. Standard mode is used for hotspot pass through providing a single default connection:

1. Click the drop-down menu and select **Router.**

2. Click the **Standard** radio button.

3. Click the **Apply** button.
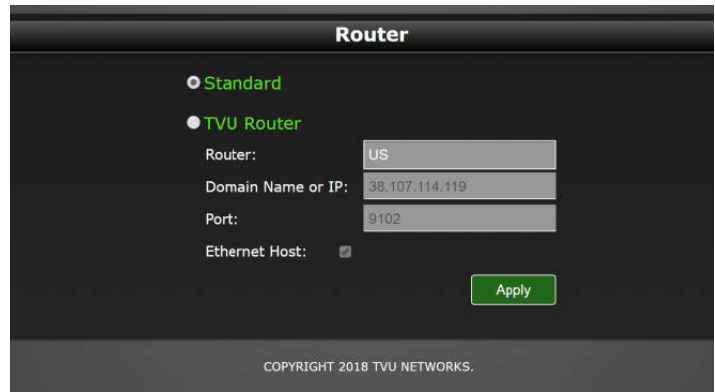
Standard mode selection

TVU Router mode configuration

Complete the following steps to configure TVU Router mode.

1. Click the drop-down menu and select **Router.**

2. Click the **TVU Router** radio button.

3. Click to open the Router drop-down menu and select your **region**.

4. Click the **Ethernet Host** check box to enable services for up to 10 attached devices.

5. Click the **Apply** button.

6. Refer to the *TVU Router User Guide* for more information.
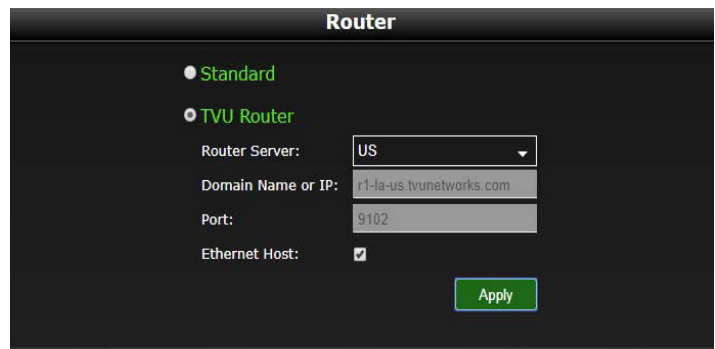
Router mode selection

Advanced encoder configuration

Using the Encoder function

Complete the steps in the following procedure to choose the video encoding type for the transmitter:

1. Click the drop-down menu and select **Encoder Type**.

Selections and their criteria are as follows:

- The default is **TVU264**.

- If the optional HEVC license is purchased, then both **HEVC**

Interview and **HEVC Fast Motion** mode will be available as selections.

- **HEVC Interview** is optimized for shots containing limited motion, such as stand ups or fixed shot interviews.

- **HEVC Fast Motion** is used to optimize compression for video containing significant motion elements, such as sports video containing high motion or fast pans and zooms.
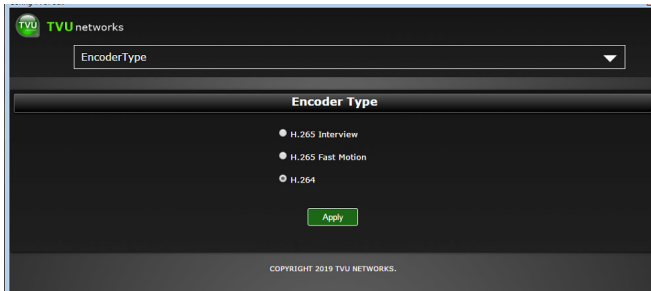
Encoder status screen

2. Click the radio button to select the encoder type that suits your application based on the above criteria. Then, click the **Apply** button to save your selection.

3 Advanced operations

This section provides information and instructions for advanced transmitter operations.

Receiver status and control

Advanced control of the receiver' Live session can be configured through the use of the Config page available by way of the TVU One hotspot feature.

Use the Config window to control bit rate and delay by entering your data in the respective fields and clicking the **Apply** button to save your settings. This status window also allows you to choose the operational mode provided in the drop-down menu at the bottom of the screen: Interview, Normal, Fast Moving, SD, Tape Feed, and User Definable.

Controlling the live transmission

Complete the steps in the following procedure to select an alternate receiver, view its status, and set up and control a "Live" transmission:

1. Click the drop-down menu and select **Receiver**.


TVU One receiver status window

2. The R: drop-down menu displays the receiver name. To view and select a different receiver, click the **R: drop-down menu** to scroll and select a receiver from the list.

3. Click the **Solo check box** if you want a particular TVUPack to only display 'Online" on the receiver you selected from the R: drop-down menu.

4. In the bitrate (kbps) field, enter the desired **transmission bit rate** and **delay(s)**.

5. Click the **Apply** button to save your changes.

6. To Start or Stop the live transmission, click the **Live** button.

> **Below the Live and Apply buttons you can view the Receiver status. Receiver status displays the current TVUPack Receiver ID, TVUPack Transmitter ID, Line Quality, Error Rate, and Auto Set information.**

7. Click the **Mode: drop-down menu** to select an alternate Mode for optimized preset bit-rate and latency based on broadcast setting(s).

Return Video Feedback feature
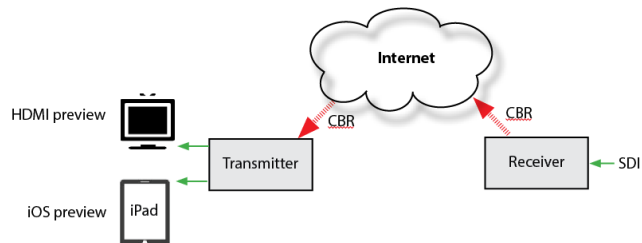
Return Video Feedback diagram

The return video feedback feature allows the operator in the field to have the ability to watch a return video feed from the studio of their transmission or from an SDI input on the transceiver. The return video feed can be sent from the receiver to the transmitter when in Live, Online, or in Standby modes.

You can view the return video feed using the TVU transmitter hotspot for any WiFi enabled iOS device with a standard Safari web browser, or HDMI display

Using the return video feedback feature

The TVU Return video feature is available in two output formats. Software preview for display on an external iOS device and HDMI which will display the return video directly on a locally connect HDMI monitor.

> Activation of the HDMI return video feature replaces the standard video preview output feature, and must be configured by TVU Support. Hardware HDMI preview offers lower latency than the software preview method.

Complete the steps in the following procedure to use the HDMI return video feedback feature:

1. Plug the HDMI connector into the TVU One side panel HDMI output port.

2. Power On the TVU One unit.

3. Refer to "Configuring the TVU One transmitter for hotspot (optional)" for instructions about how to connect to a hotspot.

4. Click the drop-down menu in the **HDMI Video** tab to select a source device for your video return.

TVU One Video Feedback status window

> You must select the receiver that is currently streaming your TVU-Pack from the drop-down menu in order to see the feed. You cannot view other Pack feeds.

5. Click the **Pack** button to monitor a return feed of your TVU-Pack transmission. Then, click **Start** to monitor the feed or click **Stop** to stop monitoring the feed or:

6. Click the **SDI** button to monitor a return feed of the SDI input at the transceiver. Then, click **Start** to monitor the feed or click **Stop** to stop monitoring the feed.

> Return video stream resolution is configured at the source. Contact TVU Networks Support for further information as needed.

IP Source

Selecting a camera or outside IP source

Complete the steps in the following procedure to select an outside IP source or camera source from the selection window with which to go live:

1. Click the drop-down menu and select **IP Source**.
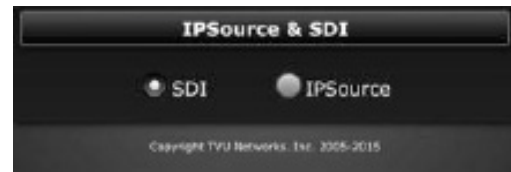
TVU One IP Source window

TVU One IP Source selections

2. Click the **SDI** radio button to display the camera source that is connected to the TVUPack.

3. Click the **IP Source** radio button to add an IP source with which to go live.

4. Click the **Home** button to send all IP sources in one matrix picture to the TVU receiver.

5. Enter the valid **IP address** in the field under an available source selection with which you want to go live. Then, click the **Apply** button to save your source selection.

4 File-based workflows

This section provides information and instructions for file-based workflows. Topics in this section include dual-encoder operations, Autosync, using the recording function, file upload feature, and Download feature.
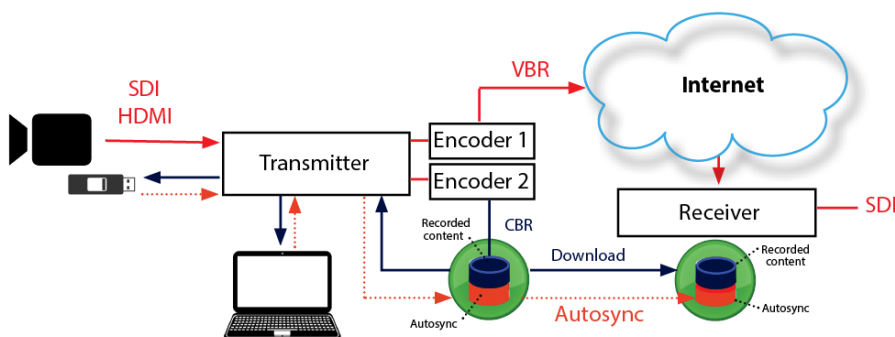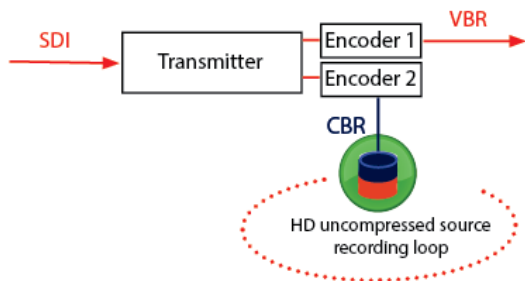

Dual-encoder feature

The optional TVU dual-encoder feature records a pristine, high resolution copy of all detected video directly to the local SSD storage. Thus ensuring that no video is ever lost even if the original transmission encountered difficulties.

The TVU One transmitter is always recording at a high bit-rate using a second encoder. The second encoder Is always on when the unit is powered and does not require any manual configuration or power.

- A remote operator can then use the receiver download feature to view and extract recorded content from the TVU Transmitter remotely.

- In addition, the local TVU operator can access the recorded content for editing purposes.

Dual encoder diagram

Autosync feature

Autosync is a high-speed file transfer feature that automatically pushes the files from the transmitter to the receiver using IS+.

There are two Autosync methods you can use to automatically send files to the TVU receiver:

- You can perform Autosync by inserting a USB stick into the transmitter.

- You can use the TVU transmitter wireless hotspot feature to transfer files directly to the TVU transmitter for upload.

Using the Autosync feature with a hotspot (PC)

Complete the following steps to perform an Autosync file transfer using a wireless hotspot:

1. 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 TVU transmitter PID)

2. Connect to the SSID

3. The password is the last 8 digits of the PID of the backpack (Note: All characters are uppercase)

4. Once the connection is established, obtain the IP address in the Connection Details

5. Open file explorer, select "network" and enter the IP address. *For example:* \\192.168.3.1

6. The Autosync folder displays (as shown in the following graphic). Drag-and-drop the files to be transferred into the Autosync folder.
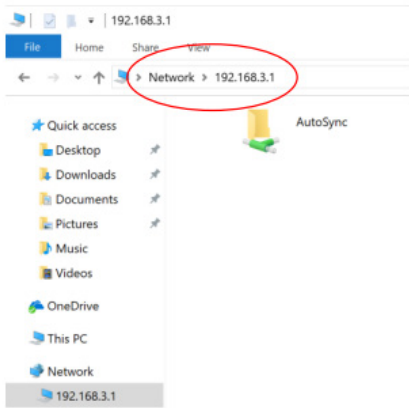
Network IP connection and Autosync folder

Using the Autosync feature with a hotspot (Mac)

Complete the following steps to perform an Autosync file transfer using a wireless hotspot:

1. 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 TVU transmitter PID)

2. Connect to the SSID

3. The password is the last 8 digits of the PID of the backpack (Note: All characters are uppercase)

4. Go to Finder and select **Connect to Server** under the "Go" tab.
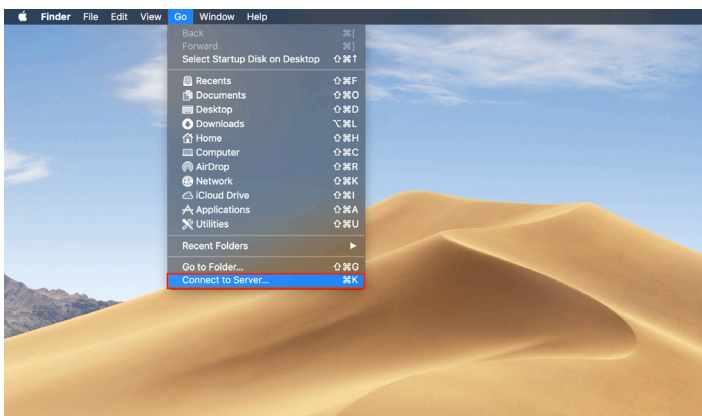
Connect to the server

5. Enter "192.168.3.1" in the "Server Address" field and click **connect.**
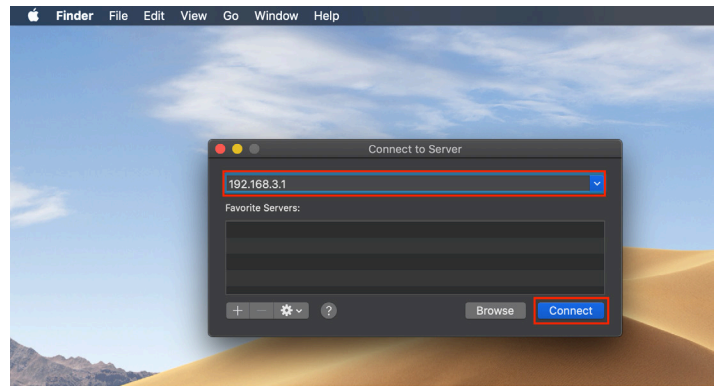
Enter the server address

6. A "Connect As" pop-up menu displays. Select **Guest** and then **Connect**.
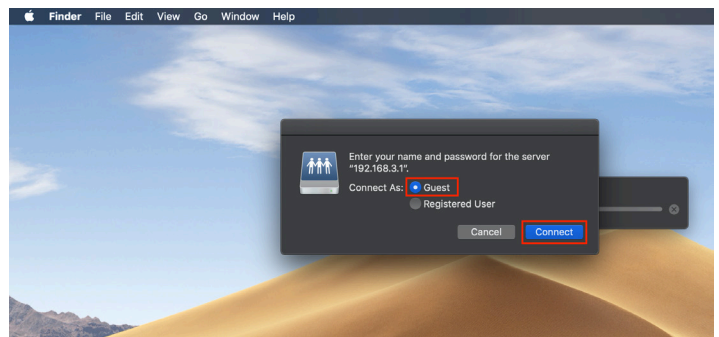
Autosync shared drive icon

7. Move files that you wish to be sent using TVU Autosync to the "Autosync" shared drive icon on your desktop.

Using the Autosync feature with a USB stick

The Autosync feature also allows you to transmit wireless digital content from the TVU transmitter to the TVU receiver using a USB memory stick.

The 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.

> **Attention: The supported disk format is FAT 32 only.**

To perform an Autosync using a USB memory stick to a TVU One transmitter complete the following steps:

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 spare USB port on the transmitter.

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.

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

Accessing stored content

Local Download of Recorded Content to a USB Memory Stick

By connecting a USB memory stick (FAT 32 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 screen (explained in this section and *"Working with recorded content")* will list the recorded sessions on the TVU transmitter SSD that are available for download and explain how to use the following three functions that are available in the Recording screen:

- Copy and play

- Upload

- Mark in and Mark out

Copy and Play functions

The Copy function allows the user to extract recorded clips listed in the recording screen from the transmitter to a local USB drive. To use the Copy function, completing the following steps:

1. Click the drop-down menu and select **Recording**.

2. Select the check box next to the desired recording(s).

3. Click the **Copy** button. Users will be warned if not enough space was available on the memory stick.

4. To preview any recorded content, select a clip and click the **Play** button.
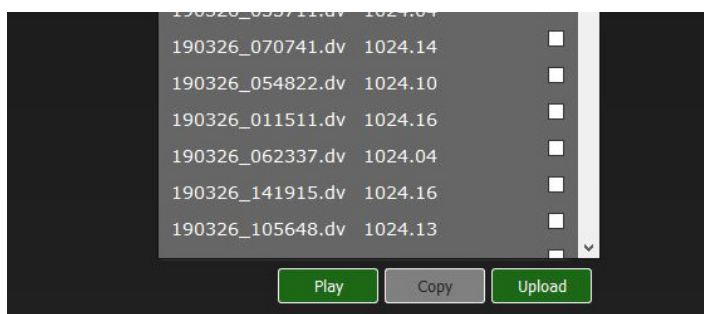
TVUPack recording screen

Note: Playback is only available on iOS devices

Once a file has been selected to download to the USB, a "Copying" message will display while the file is copied and a "Complete" message displays when the process is complete.

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

Upload function

The Upload function in the Recording screen will use the Autosync feature to push recorded clips from the transmitter to a remote receiver.

Working with recorded content

Mark In and Mark Out functions

The Mark In and Mark Out functions in the Recording screen are used to explicitly select a portion of a live ingest for extract or upload.

Complete the steps in the following procedure use the Mark In and Mark Out functionality in the Recording screen to isolate and copy a live video clip to a USB thumb drive, or upload directly to a receiver using the Recording status window:

The TVU device is always recording when it is powered on and a valid video source is connected.

1. Click the drop-down menu and select **Recording**.
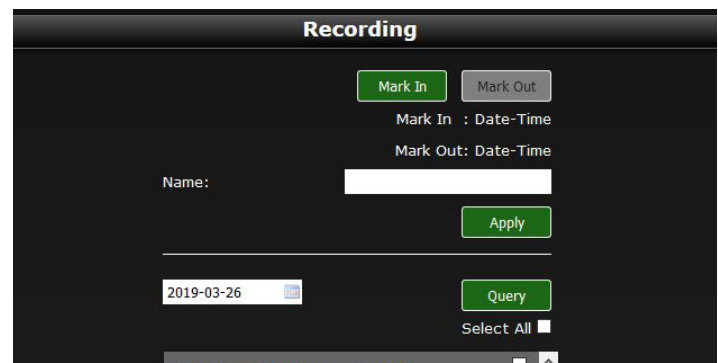
TVUPack recording status window

2. Click the **Mark IN** button to mark the IN point of a segment in the recorded video on the TVUPack.

3. Click the **Mark OUT** button to mark the OUT point of a segment in the recorded video on the TVUPack.

After the IN and OUT points are identified, it is possible to play the clip, copy the clip locally to an inserted USB thumb drive, or upload it directly to the selected receiver.

4. In the **Name field**, enter a specific name for the recorded segment.

5. Click the **Apply** button to add the recording to the recorded segment list located at the bottom of the Recording status window.

6. To search for and display a recorded video segment by date, click the **calendar icon** in the Query search field and **select the date of a recording** and then, click the Query button to display the recording in the list. Click the **Select All** check box to display only recordings completed on a selected date.

7. To select and play a preview of a specific video recording in the list, click the **check box** next to the recording and click the **Play** button.

8. To copy a clip from the list to a TVUPack, insert the thumb drive into the TVUPack USB port, click the recorded file **check box** in the list. Click the **Copy** button.

9. To transfer the copied recorded file from the TVUPack to the default receiver (designated in the receiver window), click the **Upload** button.

Upload feature

The TVU One Upload window gives you the ability to upload files using the Autosync feature to a particular receiver.

TVU One Upload window

Using the Upload window

Complete the steps in the following procedure to select a specific receiver to upload files from:

1. Click the drop-down menu and select **Upload**.

2. For each file uploaded, select the **specific receiver** to which you would like the files to be uploaded from the drop-down menu located under to the file name.

3. Once the receiver is selected, click the **Select Default R: check box** to make your selection the default receiver. This will enable all future files are uploaded to the default receiver.

4. Click **Apply** to save your changes.

> For instructions on uploading files from a TVU Transmitter to the TVU Receiver, see Autosync File Transfer Using Wireless hotspot, or Automatic Ingest of USB Memory Stick Content to TVUPack for more information.

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

Download feature

The download (pull) RX feature allows the operator to see and extract recorded Pack video remotely.

The download local Pack (T) feature allows local access to recorded content for editing purposes.

Refer to the Receiver Operating Manual for detailed information about the Download feature and its functionality.

Progressive download feature

The Progressive download feature allows for real-time simultaneous download streaming from a file-based clip. This feature allows the operator to begin playback of the media before the download is complete.

> When delivering using the progressive download feature, you can encode at higher variable bit rates than with streaming.

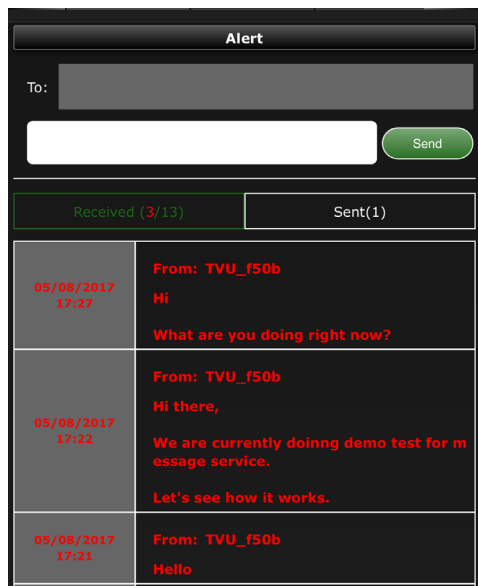To use the Progressive download feature complete the following steps:

1. To start the progressive download feature click the Download tab.

2. Click the **Enabled** radio button. Then click **Apply**.
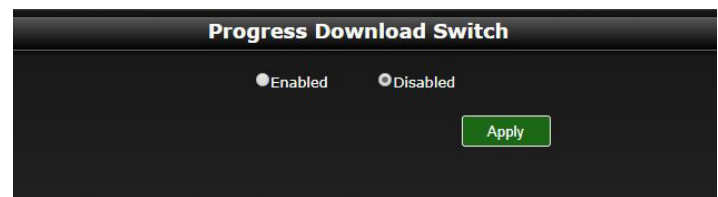
TVUPack recording status window

Alert feature

The Alert feature allows users to send messages between transmitters and receivers.

TVU Alert window

Complete the following steps to send a message to another transmitter or receiver:

1. Click the drop-down menu and select **Alert**.

2. In the "To" field, enter the recipients TVU receiver or transmitter **PID**.

3. Enter your message content in the field to the left of the Send button. Then click the **Send** button to send your message.

> **The Received field lists the number of messages that were received by the TVU One transmitter.**
>
> **The Sent field lists the messages that were sent from the TVU One transmitter.**
>
> **Just below the Sent field, is a list of detailed messages from the latest to the oldest.**

Audio channels

The Audio channels window allows you to switch audio channels between , 4, and 8 channels.

> **Note: TVU One transmitter that's running Version 6.0 allows audio only transmission through the BNC connector, and it's up to 4 channels. By default, the screen will show black screen during the transmission.**

The TVU One transmitter that is running version 6.5 and higher allows 2, 4, and 8 channel switching.
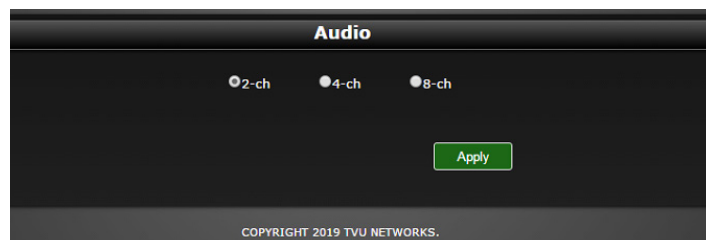
TVU One Audio window

Complete the following steps to update the audio switching setting:

1. Click the drop-down menu and select **Audio**.

2. Select the audio channel you desire and click the **Apply** button.

Upgrade firmware

Users can upgrade the embedded radios to the latest firmware using the Firmware upgrade window.

TVU One Firmware Upgrade window

Complete the following steps to update the audio switching setting:

1. Click the drop-down menu and select **Firmware Upgrade**.

2. Follow the online instructions. If your firmware does not need to be upgraded, a confirmation message stating so displays.

5   Product specifications

This section provides product specifications for the TVU One model TM1000 v1and TM1000 v2 transmitters.

Product specifications

Specification	TVU One transmitter
Video Input formats	HD/SD-SDI (BNC) input -1080i 59.94/50, 720p-59.94/50 480i-59.94, 576-50.
Audio input	Supports up to 8 channels of embedded audio.
Audio/Video encoding and compression	TVU264 or enhanced H265/HEVC (The TVU One TM1000 v1 model does not support HEVC)
Transmission	Inverse StatMux Plus (IS+)
Dual encoders	Simultaneously live stream a transmission over IP while also encoding a completely separate recording to the internal SSD that can be retrieved for future use.
Return video feed	TVU One feed or SDI input at TX; Requires hotspot
Start-up time	Less than 40 seconds
Supported data connections	Simultaneously aggregates up to 12 data connections including WiFi and Ethernet. System supports cellular 3G/4G/LTE modems, 2.4 GHz WiFi, 5 GHz WiFi, WiMax, Ethernet, Microwave and KaBand, KuBand, BGAN Satellite connections.
Glass-to-glass latency	0.5 seconds
Video recording	Up to 7-hours of live recording
External interface connectors	SDI, HDMI, USB, Ethernet, IFB
Power source	A single removable, rechargeable internal battery
Internal battery run time	120 minutes
DC input	Right angle Mini Jack DC input that connects to external battery or supplied AC adapter. External power adapter: 11-18V DC.
Transmitter controls	- One button start - On-unit monitoring and management - Remote monitoring and management using mobile smart device or laptop
TVU social support	Supports live streaming to Facebook Live. Also capable of capturing and posting still images of TVU One's live stream to social media platforms
Encoder hardware dimensions	7.48 in. x 4.72 in. x 2.76 in. (19 x 12 x 7 cm)
Weight	2.2 lbs (1 kg)
Carrying case	Belt-mount or shoulder bag carrying case options with hot swappable battery mount
Operating temperature	32°F to 104°F (0°C to 40°C)
TVU Software version	TVU6 v6.5

A Appendix

This section provides related support documentation for TVUPack legacy command-line configuration.

TVUPack legacy command-line configuration

As a back up configuration method, you can configure the TVUPack using the legacy command-line interface. To configure your TVUPack using the command-line interface complete the following steps:

Connect a keyboard to a USB port on the TVU One transmitter.

1. At the command line, type the command `TVU` and press **Enter**.

Command list

2. Page through the settings and complete the configuration.

Wireless configuration example

Basic configuration display

TVU One Command-line configurations

The Command-line interface can be used to perform the following TVU One transmitter configurations:

- Configuring SIM cards
- Setting the IP address
- Configuring WiFi
- Configuring a hotspot

> Note: Commands are case sensitive

Configuring SIM cards

> Make sure that your data cards are securely connected before attempting to configure them.

To configure a SIM card, complete the following steps:

1. Connect a keyboard to a USB port on the TVU One transmitter.

2. At the command line, type the command `TVU` and press **Enter**.

3. At the command line, type `CARD` and press **Enter**.

4. Make your selection and press **Enter**.

5. At the "Input slot ID to configure" prompt, type the slot number to configure and press **Enter**.

6. Select your menu number choice and press **Enter**.

> Note: If your input displays on the screen with red underlined text, the information entered is not correct and must be re-entered correctly.

Incorrect data example

7. The words in RED are the variables that have just been configured. If these are not correct, reconfigure this data card by choosing item **5**. Also, some service providers do not have User name, password or APN. If this is the case, continue to press **Enter** until the "Select your choice" prompt and menu display.

Correct data example

8. To configure your next data card, select menu item **3** and press **Enter**.

9. When you are finished, select menu item **4** to Exit and press **Enter**.

   After exiting the interface, the status screen should show the cards dialing and connecting successfully. Your TVU transmitter is now ready to broadcast live. If the cards do not come online or if you are having difficulty with configuring the data cards, please contact TVU Networks Customer Support for further assistance.

Setting the IP address

To set the IP address, complete the following steps:

1. Connect a keyboard to a USB port on the TVU One transmitter.

2. At the command line, type the command `TVU` and press **Enter**.

3. At the command line, type `SETIP` and press **Enter**.

4. During the configuration script Pressing Enter will accept the existing value or default. Press **Enter** to accept NIC name eth0.

   The next screen shows the status of your connection. If the

configuration was completed correctly, your entered information should appear under the New Config portion of the screen. Your Ethernet connection is ready to use.

Configuring WiFi

To configure WiFI, complete the following steps:

1. Connect a keyboard to a USB port on the TVU One transmitter.

2. Make sure the wireless USB card is present on USB slot 10, which is on the side of transmitter.

3. At the command line, type the command `TVU` and press **Enter**.

4. At the command line, type `WIRELESS` and press **Enter**.

5. At the command line, type the command `S` and press **Enter**. The device scans for available wireless networks in range.

6. At the command line, type the command `C` and press **Enter** to connect to an available network. An input screen will appear and prompt you to enter the ESSID, encryption key type, password, and setting for DHCP or static IP address.

7. D. Enter the information requested on each line and press Enter.

8. To complete the set-up process and establish your wireless connection, you must exit completely from this screen . At the command prompt, type `EX` for "exit" and press **Enter**. When you see the TVU status screen, your wireless connection set up is complete and the status screen should show an IP address in green for the connection called "WIRELESS".

B Appendix

This section provides instructions to set up a captive portal connection.
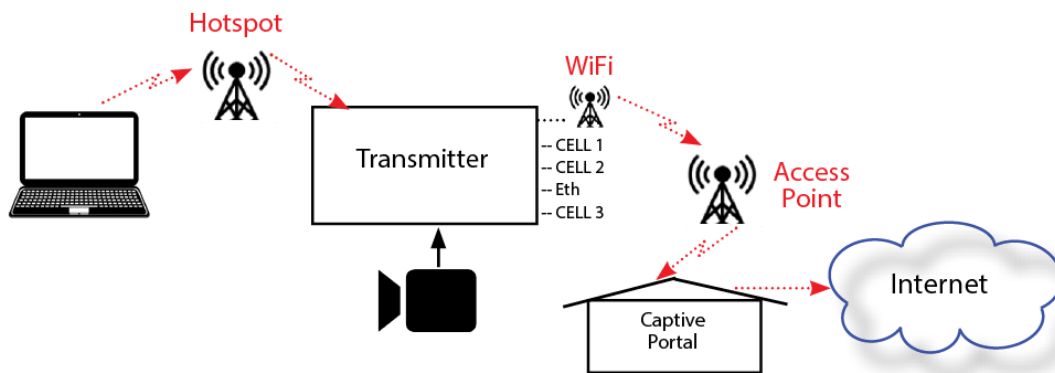
Connectivity through captive portals

While it's convenient to be able to stream at any given moment, sometimes the only WiFi connection you can find in a public place is being blocked by a "captive portal", where one of those pop-up screens that force you to click a box or type in your e-mail before gaining access to its WiFi such as a Hotel. Because encoders require a "direct" connection to the router or access point, they don't come equipped with captive portal bypassing functions. So what can you do to work around this limitation to stream?

To bypass the pop-up "Guest access" screen, you would first need a device to authorize the Web page that pops up. This can be done on your laptop or desktop if applicable. Once the authorization is sent and access to WiFi (or wired Internet) is granted, you'll have a couple options to use that connection.

To set up your captive portal connection complete the following steps:

1. Connect your device to the TVUPack hotspot. Search for the hotspot on your iPhone/smart device. Then, when prompted, enter the case-sensitive SSID:

    `TVUPACK_XXXX`

    (Where *X* is the last 4 digits of the TVUPack PID)

    The default password is the **last 8 digits** of the TVUPack PID

    All password characters are uppercase.

2. Connect to the TVUPack WiFi. Click **Router** and open the WiFi drop-down menu and select **hotspot**.

3. Open your browser. When prompted, enter the requested captive portal access information to authenticate your connection.

Contact information