

# Harness the Potential of Live Remote Production

Low-latency, multi-camera synchronized remote production solutions optimized for commodity internet applications.

## TVU RPS Link Encoder

- △ Suitable for remote production applications using wireless or wired commodity internet.
- △ Aggregates multiple cellular, satellite and ethernet connections for greater bandwidth and redundancy.
- △ Fully synchronized transmission of up to six SDI sources + two return feeds.
- △ Glass-to-glass latency as low as 500ms.
- △ VLAN tunnel provides peripheral connectivity between the studio and the field.

## TVU RPS

- △ For fixed remote production applications using wired, private or commodity, internet connections.
- △ Fully synchronized transmission of up to six SDI sources + two return feeds.
- △ Transcontinental latency - as low as 0.5 seconds.
- △ VLAN tunnel provides peripheral connectivity between the studio and the field.
- △ Aggregates multiple wired links for greater bandwidth and redundancy.
- △ Outputs independent SRT or permits TVU ISSP monitoring of IP streams.

## TVU Timelock

- △ For untethered remote production applications using cellular connectivity.
- △ Synchronize multiple TVU One transmitters and receivers together.
- △ Camera operators are free to roam the production space with no attached cables.
- △ Control multiple devices with fixed, low latency from a single Command Center GUI.

## TVU Quadlock

- △ For fixed remote production applications using aggregated cellular uplink.
- △ Mux and transmit up to four synchronized 1080p SDI inputs using a single TVU One 4K transmitter.
- △ Portable, battery powered footprint for ultra-remote productions.
- △ Control, monitor and manage from a standard TVU Transceiver or the Command Center GUI.

# TVU RPS Link Encoder

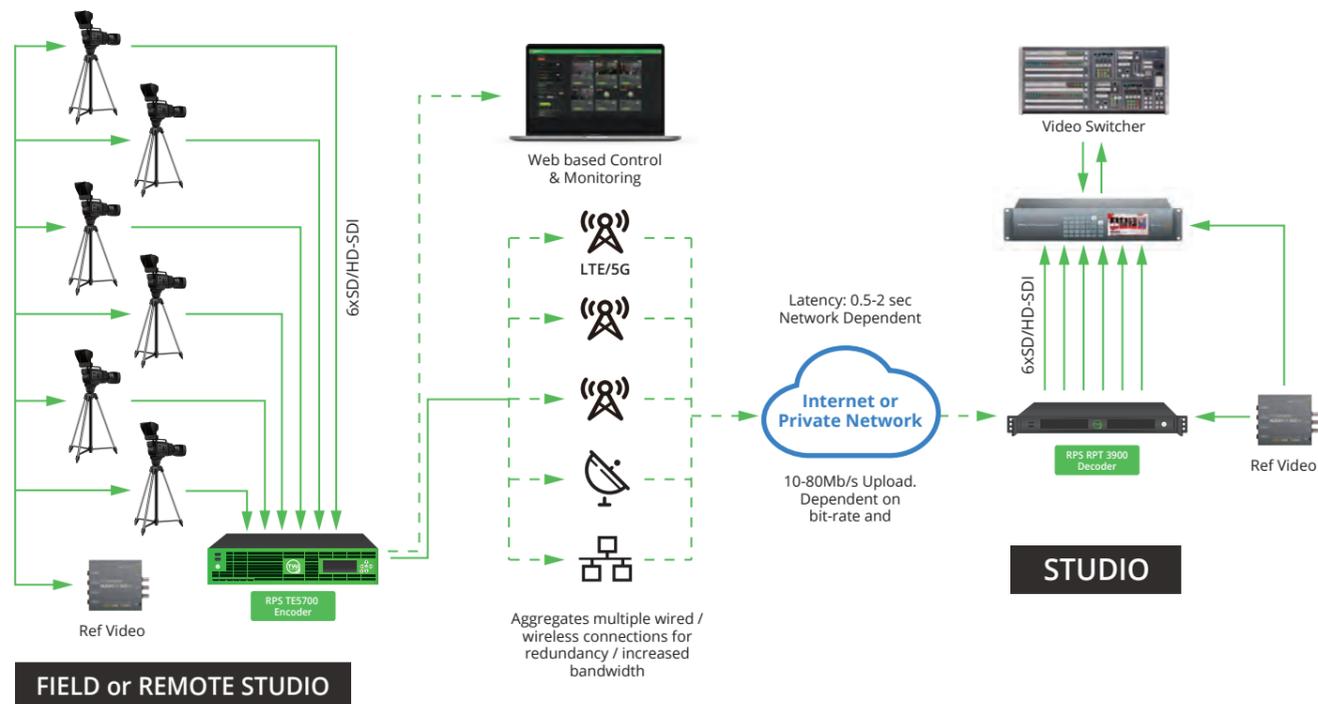
The TVU RPS Link Encoder provides multi-camera, synchronized remote production capability using IS+ and aggregating up to 12 connections. This includes embedded 5G/LTE modems, WIFI, Ethernet or satellite.



## Key Features

- △ IP based peripherals including talkback system, tally lights, and remote cameras have full connectivity via VLAN tunnel
- △ Latency over commodity internet as low as 500ms
- △ Compatible with the existing TVU RPS hardware decoder
- △ Lego like interconnection with TVU's complete Cloud Production ecosystem
- △ Low latency source preview (200-300ms) for remote camera operation
- △ H264 or HEVC encoding up to 15Mb/s per channel (VBR and CBR)
- △ RPS can be controlled and monitored using its built-in web interface or via TVU Command Center

## Workflow diagram for TVU RPS Link Encoder



## Technical Specifications\*

Model	TE5700
Form Factor	2RU Rack-Mount Chassis
OS	Linux
Encoder	6 channel version: 6 primary (H264 or HEVC), 4:2:0 CBR/VBR, Return video feeds with 16 channel embedded audio support per channel and preview. 4 channel version: 4 primary (H264 or HEVC), 4:2:0 CBR/VBR, Return video feeds with 16 channel embedded audio support per channel and preview.
Video Resolutions	SD/HD - SDI (1080-50i/59.94i, 1080p50/59.94 support*, 720-50p/59.94p, NTSC/PAL) * can only support 4-channels live with no preview on the 6 channel version
Video Inputs	6-ch version SD/HD-SDI 1.0/2.3 DIN connectors: Ports 1-6 utilized for primary transmission and Ports 7-8 used for return video 4-ch version SD/HD-SDI BNC connectors: Ports 1-4 utilized for primary transmission and Ports 3-4 used for return video( if applicable)
Genlock Input (Decoder)	Ref: 1.0/2.3 DIN, BB or Tri level (BNC adapter included)
Transmission Protocol	Inverse Statmux +
Network Interface	2x GigE Ethernet
Display	HDMI and VGA
Embedded Modems	Up to 6 5G/LTE/4G/3G modems with external SMA antenna ports. System ships standard with high-gain external antennas
USB Ports	3 x USB 3.0; 4 x USB 2.0
WiFi/Hotspot	2 x Built in 2.4/5GHz Wifi connections for WAN connectivity and internal HotSpot use. Ships standard with external antennas
Ethernet	2 x GigE Ethernet
Power Source	100-240V ~/3.5A 47Hz-63Hz
Dimensions	2U, 16.9"x3.5"x15.3"
Weight	8.6kg
Operating Temperatures	0°C to 35°C
Power Supply	Dual

# TVU RPS

## Frame accurate multi-camera REMI at-home production over IP

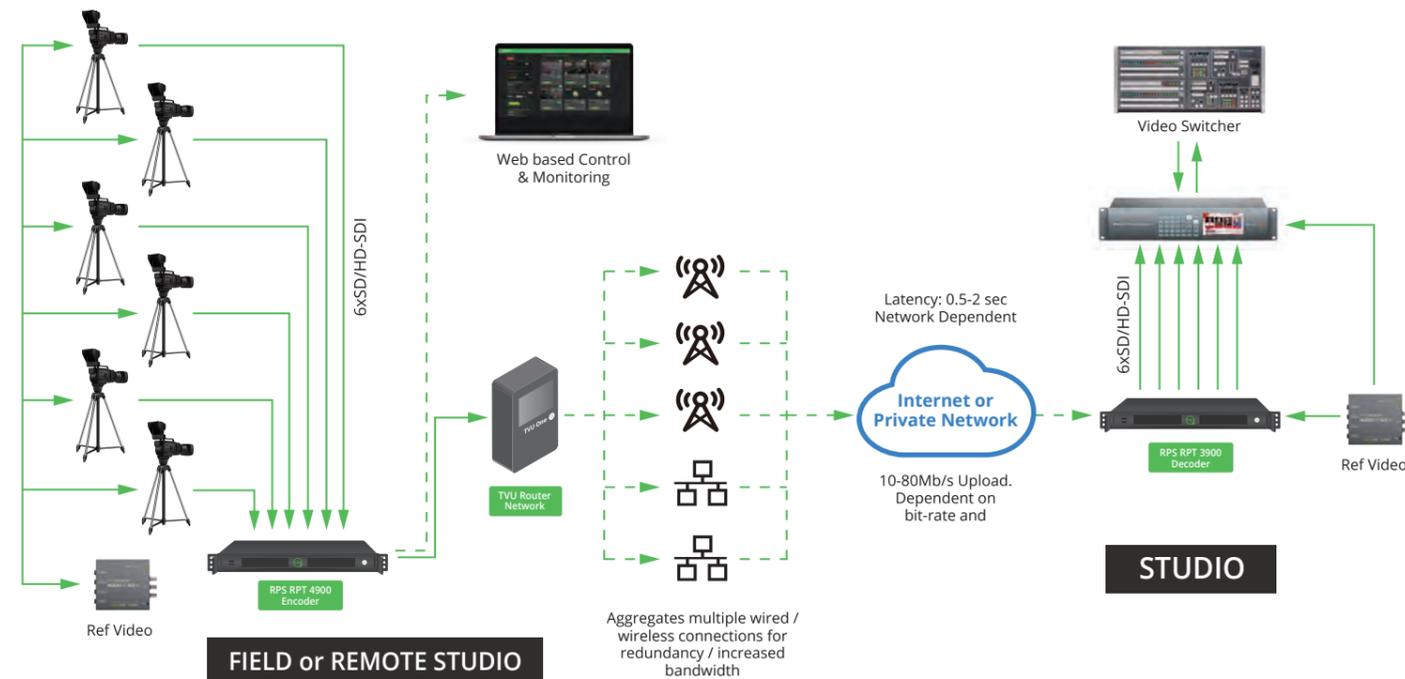
With a 1RU encoder at the venue and a separate decoder at the remote studio, RPS transmits up to six fully frame synchronized HD sources from a remote location to your studio, allowing you to use your existing production equipment to produce a remote live event. TVU RPS also supports up to two HD return video feeds, 16 audio channels per input, delivers sub-second latency down to 0.5 seconds and features H264 or HEVC CBR or VBR encoding for efficient data use over commodity internet.



### Workflow

- △ TVU RPS can transit from one encoder to a single decoder or two decoders simultaneously (for redundancy and different workflows) or from the encoder to TVU Producer for purely cloud based production.
- △ User-friendly web-based interface grants control over all aspects of transmission, including encode bit-rate and latency settings, and provides a low-latency preview of all six channels.
- △ Ultra-low latency preview in 4-ch. mode allows effective control of remote cameras.
- △ Provides up to two low-latency return video feeds from the studio back out to the encoder in the field.
- △ VLAN tunnel allows you to extend IP studio peripherals such as camera tally, intercom, CCU or other setups out to the field.
- △ TVU RPS encoders can be installed in the field behind networks firewalls and only require outbound internet connectivity with no special port forwarding required even for return video feeds.
- △ TVU RPS sessions can be controlled completely in the cloud using TVU Command Center, using the locally host web interface on the encoder or using a mouse/keyboard and local HDMI monitor.
- △ It is possible to aggregate up to two separate links on the encoder and decoder, for increased bandwidth and/or redundancy.
- △ TVU RPS can deliver fiber-like reliability by aggregating multiple independent commodity Internet connections. All connections are used simultaneously, load balanced and provides automated rollover redundancy.
- △ TVU RPS outputs independent SRT or permits TVU ISSP monitoring of IP streams of each channel at the decoder, enabling the distribution of ISO feeds for monitoring or distribution without needing to re-encode the SDI outputs.

### Workflow diagram for TVU RPS



### Technical Specifications\*

Model	VS3500
Form Factor	1RU Rack-Mount Chassis
OS	Linux
Encoder	6 Channel Version: 6 primary (H264 or HEVC), 4:2:0 CBR/VBR, 2 x Return Video Feeds with 16 channel embedded audio support per channel and preview 4 Channel Version: 6 primary (H264 or HEVC), 4:2:0 CBR/VBR, 2 x Return Video Feeds with 16 channel embedded audio support per channel and preview
Video Resolutions	SD/HD - SDI (1080-50i/59.94i, 1080p50/59.94 support*, 720-50p/59.94p, NTSC/PAL) * can only support 4-channels live with no preview on the 6 channel version
Video Inputs	6-ch version SD/HD-SDI 1.0/2.3 DIN connectors: Ports 1-6 utilized for primary transmission and Ports 7-8 used for return video 4-ch version SD/HD-SDI BNC connectors: Ports 1-4 utilized for primary transmission and Ports 3-4 used for return video( if applicable)
Genlock Input (Decoder)	Ref: 1.0/2.3 DIN, BB or Tri level (BNC adapter included)
Transmission Protocol	Inverse Statmux +
Network Interface	2 independent 10/100/1000 BASE-T RJ45 Ethernet ports (one for VLAN and one for WAN), 2 x USB 2.0, 2USB 3.0
Display	HDMI and VGA
USB Ports	2x USB 3.0; 2x USB 2.0
Ethernet	2x 1 GigE Ethernet ports (WAN+VLAN)
Power Source	100-240V ~/3.5A 47Hz-63Hz
Dimensions	16.92in (430mm)L x 10.39in (264mm)W x 1.77in (45mm)H
Weight	9.56lbs (4.34 kg)
Operating Temperatures	32F - 89.6F; 0C - 32C
Power Supply	Single or optional Dual

### Key Features

- △ Supports up to six fully synchronized transmission.
- △ Dependable, fixed low-la- tency transmission over standard commodity wired Internet connections.
- △ Multiple encode behaviors to suit virtually any CBR, VBR and VBR with Channel Priority modes.
- △ Connect production peripherals such as IP talkback, CCU, remote camera control, tally and more from the studio to the field using the VLAN tunnel.
- △ Supports up to two high quality return feeds.
- △ Ultra Low latency web preview allows for effective control of remote cameras.

### Use Cases

- 🏃 **Sports** - TVU RPS helps cover multi camera sporting events economically. It also helps in covering multiple events with the same production crew back to back. Just send cameras and camera operators into the field and contribute synchronized camera feeds via IP over the conventional internet back to their in-house control room for switching, and the addition of graphics, effects, text and other production elements. Entire production crew is no longer needed on site.
- 📰 **News** - When important stories happen away from the studio, TVU RPS plays an important role in making it possible to deliver that same professional, high-quality broadcast to its audience. Be it covering an event/ morning shows from multiple cameras or management and control from a remote studio RPS can help.
- 🎙️ **Media Production** - Conducting a talk show at the same time as an award show has never been that easy and cost effective. RPS helped to reliably transport video from one location to another, yielding professional-level results while still making economic sense.

# TVU Timelock

## Wireless 4K/HDR At-Home remote production over aggregated cellular

TVU Timelock allows completely wireless, untethered remote production. Multiple camera-persons using standard TVU One / TVU One 4K devices transmitting via aggregated cellular can freely roam while covering an event. All TVU One devices and their corresponding receivers are synchronized together allowing production to take place at a remote location.

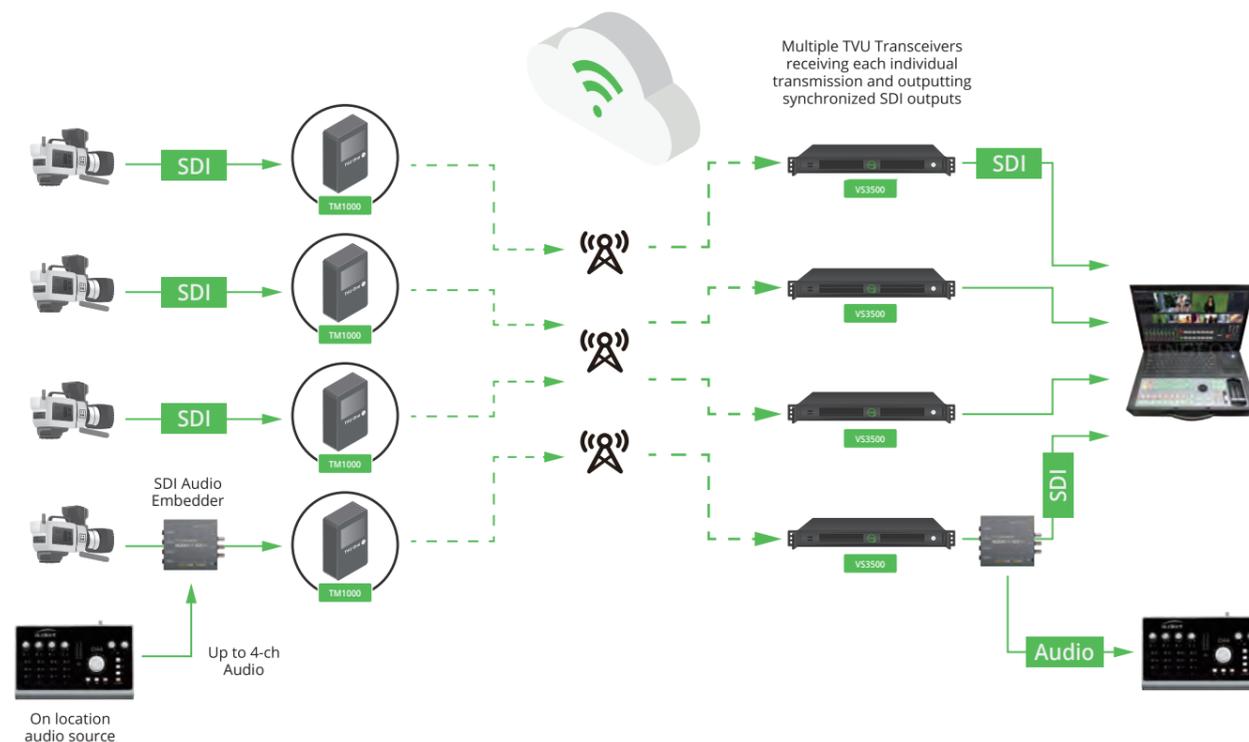
### Key Features

- △ Synchronize up to 6 standard TVU One transmitters and 6 TVU receiver channels with a single set latency.
- △ SDI outputs from TVU Receivers used in a TimeLock session are synchronized.
- △ Battery power and no tethered cables allows camera people to freely roam.
- △ Monitor and control a TimeLock session from a single TVU Command Center interface.

### Use Cases

- 🏃 Sports** - In sports, things can take a turn in a split second. With TVU Timelock, since the camera is not tethered to a cable, it allows the camera operator to freely move around and capture the exact frame that matters.
- 🎪 Events** - From concerts to parades to fashion shows, many events are best captured at multiple angles to give viewers the full experience. TVU Timelock makes it possible for camera crews to move throughout the venue to capture the intensity and excitement of the event, so people watching on their screens can feel like they are a part of it.
- 📺 Live, Multi-camera Television** - Easily setup and transmit a live, multi-camera television program from virtually anywhere or even on the move (e.g. morning show, red-carpet coverage, on location etc. ) without a complex setup or fixed bandwidth requirements.

### Workflow diagram



# TVU QuadLock

TVU QuadLock is the solution for fixed remote production using aggregated cellular uplink. Using an external mux adapter, it is possible to input up to four 1080P SDI signals and transmit together via IS+ and Smart VBR encoding using a single TVU One 4K to a TVU 4K transceiver where all four sources are demuxed and output fully frame synchronized, allowing production in a remote studio.

### Key Features

- △ Inexpensive alternative for remote production.
- △ Battery power and cellular connectivity allows multi-cam live productions from virtually anywhere.
- △ Synchronized multi 1080P SDI camera feeds.
- △ Ultra lightweight and portable.
- △ Allows any TVU One 4K to be used for At-home/REMI production.

### Workflow diagram

## TVU One 4K - 4 x 3G-SDI Transmission



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\*Specifications are subject to change.