Streambox

SBT3/5-9860 Avenir Mini 5 Encoder/Decoder

SETUP AND OPERATION GUIDE

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Section I: Introduction and Hardware

1 Introduction

The Streambox Avenir Mini Series are mobile video encoders targeted for broadcast-level video/audio quality and challenging connectivity environments. The Mini 5 can be configured with up to 5 internal modems for a specified carrier region.

1.1 Avenir Mini Series HD/SD Portable Encoder

The Avenir Mini is a lightweight, small-form-factor encoder that is capable of delivering high quality real-time HD/SD video and near real-time HD/SD file-based video. Avenir Mini can deliver video over any IP network including Ethernet, Wi-Fi, and most Wireless Wide-Area Network technology - bonding up to five internal 3G/4G modems as well as up to 2 external USB modems. Avenir Mini contains many advanced features for ease of use and operation, including automated 3G/4G multiplexing and automatic bandwidth negotiation. Additional benefits for video quality and operation include automated HD/SD video selection, easy-to-navigate touch-screen interface, and a family of optimized smart-presets for delivering the highest quality video for best results. It includes a Wi-Fi user interface that can be used to access Avenir Mini's controls remotely using a Wi-Fi-enabled smartphone or other portable device. Additionally, technicians can connect to Avenir Mini over the internet to aid users in the field.

Avenir Mini has two built-in paths to transmit HD/SD video from the field. The direct connection allows Avenir Mini to send live video to a Streambox Decoder or Media Player, and transmit file-based video to a Streambox Enterprise Server residing in the broadcast studio or datacenter. As an alternative, Avenir Mini can utilize the Streambox Cloud cloud-based service to send both live and file-based video for real-time routing, archiving, and video sharing.

The Avenir Mini system can be fully integrated with other Streambox products such as the Streambox Cloud Service and the Streambox Store and Forward Server for centralized file-based acquisition and management. Avenir Mini works with Streambox Cloud Service for live streaming to the web, mobile devices, and desktops; it also handles uploading and managing HD/SD video files. The Avenir Mini is designed to shorten and streamline workflows for both live and file-based acquisition by offering field-editing features including play/pause, trim to selection, file deletion, and file uploading.

1.2 Streambox® ACT-L3 and ACT-L5 Codecs

The ACT-L3 codec is an advanced video compression technology optimized for interlaced and progressive video and display systems. ACT-L3 provides higher HD/SD video quality at much lower data rates than MPEG and H.264 compression. The ACT-L3 codec is adaptable to user selectable data rate requirements with constant bitrate and variable bitrate modes.

The ACT-L5 codec adds greater color depth and chroma subsampling to the ACT-L3 codec, allowing 10- and 12-bit color, 4:4:4 chroma subsampling, as well as the ability to stream with a variety of common color gamuts.

The robust family of ACT-L3 and L5 video transport solutions features innovative error correction and bandwidth shaping technologies that manage, control, and mitigate packet loss and correct irregularities common to video delivery over IP-based networks.

1.3 Avenir Management Workflows

Field Managed Workflow

In this workflow the Encoder settings and streaming options are set primarily by the field operator with quality feedback and queues given from the Station. Each field operator should be trained on the full functionality of the Avenir for quality optimization and troubleshooting.

Station Managed Workflow

In this workflow the Encoder settings and streaming options are set primarily by the Operator in the Station using remote control. The Field Operators need only to power on the Avenir and establish and verify network connectivity for remote control access. Each Station Operator should be trained on the full functionality of the Avenir for quality optimization and troubleshooting.

This workflow allows field operators to focus more on camera setup and placement while Avenir control and optimization is handled by the station operators remotely.

1.4 Solution Features

- Automated HD/SD live streaming.
- Near real-time high-quality HD/SD store and forward video.
- Enhanced Low-Delay Multi-Path (LDMP) Transport gives consistent lower latency over multiple network connections.

- Integrated embedded hardware 3G/4G modems (4 modems in Avenir Mini 1 and Mini 2; 5 modems in Avenir Mini 5 and 4).
- Network connections including Ethernet and Wi-Fi and WWAN 3G/4G modems.
- HD/SD Video automation from selection, capture to delivery over bonded 3G/4G networks with Automated Bandwidth Negotiation (ABN).
- Smart presets for high quality, low-latency optimized video end-to-end delivery.
- SD-SDI, HD-SDI and HDMI inputs.
- Controls are accessible via touch screen LCD, or via local Wi-Fi using iPod Touch, iPhone, and iPad.
- Up to 90 minutes of operation from IDX or Anton-Bauer battery.
- Advanced HD/SD Encoder.
- IFB Audio reception.
- Works directly with all Streambox Decoders, Streambox Media Player, Store and Forward Server, Streambox Cloud Service and Enterprise Server.
- Imports ACT-L3 files from other Streambox Encoders for transmission with the built-in Store and Forward Client.
- Works with Streambox Cloud Service for many-to-many video sharing, routing, and file archiving.
- Remote Configuration allows distant technicians to optimize and support Avenir Mini over the Internet.

Figure 1 Avenir Mini 5 (front-side view)	
	Figure 3 Avenir Mini 5 (bottom view)

Figure 2 Avenir Mini 5 (top view)

2 Unpacking

When removing the unit from the packaging, take note of how the unit is packaged. All packaging should be kept, in case there is a need to ship the product to another location or to ship the unit to Streambox for repairs. Streambox does not warranty products that are shipped without original packaging materials.

2.1 Package Contents

- Streambox SBT3-9860 Avenir Mini 5 Unit
- AC Adapter (100-240V, 3 pins)

Optional Accessories

- 3G/4G Antenna (Optional)
- Shoulder Bag (Optional)

2.2 Storage and Transport

Store the Avenir Mini in a cool, dry place.

You may choose to store Avenir Mini in a foam-filled hard-exterior case, in which it may be easily transported in a shock-absorbing environment. Be sure to store other objects in the case in such a way that they cannot damage the screen of Avenir Mini, or penetrate the ports or vents.

When not in use, cover the unit with a dry cloth or towel taken extra care to protect the connection ports and air vent from dust.

2.3 Keeping Clean

To clean the display, power down the Avenir Mini completely, and use an ammonia-free glass-cleaner and a gentle lint-free cloth. Spray the cleaner on the cloth and use the cloth to gently wipe the glass surface of the display. Allow to dry and repeat as necessary.

The metal exterior of Avenir Mini can be cleaned with any mild household cleaner, taking care not to let any liquids get inside the chassis. Apply the cleaning agent to a cloth rather than directly onto the chassis. It is not necessary to polish the Avenir Mini.

3 Network Connections

Network connections allow the system to send an ACT-L3 transport stream from the encoder to the decoder. All Streambox® units come standard with RJ-45 Ethernet connections for TCP/IP networks.

Ethernet can be connected using standard Ethernet cable, CAT-5, 5e, or 6. Connect the Ethernet jack to your network device using a category 5/6 Ethernet cable.

The Avenir Mini is also equipped with 802.11b/g/draft-N Wireless Ethernet (Wi-Fi) adapter which will allow connections to most public Wi-Fi networks as well as private networks equipped with Wi-Fi access points.

Finally, the WWAN (Wireless Wide Area Network) adapter aggregation feature of the SBT3-9860 permits excellent connections to 3G and 4G (LTE) cellular data networks, which connect to the public Internet while within range of these networks. While coverage in urban areas is nearly ubiquitous (barring interference or blocked signals), coverage also common in rural areas, especially along highways, at major intersections, town centers, and other places where people assemble. External WWAN adapters are not included.

3.2 Inserting SIM cards

GSM (3G) and LTE (4G) modems use Subscriber Identity Module (SIM) cards to store user account and mobile carrier information required by the modem to connect to the carrier. These cards are provided by a mobile carrier.

Avenir Mini 5 has up to 5 modems labelled 1-2-3-4-5, which were selected at the time of purchase to correspond to the user's region and country. Not every SIM will work with every modem, so Streambox will assist the user in getting the appropriate SIM/carrier to the appropriate modem.

To insert SIM cards, find the small removable cover attached to one of the long edges on the opposite side from the LCD display. The cover is attached with 3 small screws.

The SIMs should be gently inserted with the electronic contacts on the bottom, and the angled notch to the left. Then gently push the SIM card into the unit and it should click into place. If the SIM card does not fit inside the cover, it may have been inserted incorrectly or it was not clicked into the SIM holder.

3.3 Utility Connections

Utility connections are used for administering the Streambox unit using the more convenient peripherals of a mouse and keyboard connected via USB, and a VGA monitor for clear viewing on a larger screen than the Avenir Mini's display.

- USB connections are provided to allow connection WWAN adapters for use with Avenir Mini's multiplexing feature. Two USB sockets on the top of Avenir Mini are recessed in a small compartment and are intended for this purpose. Four additional USB sockets are on the left side, intended for additional WWAN adapters, as well as USB peripherals, such as a computer keyboard and mouse for use with the graphical user interface. These connections can also be used to transfer files or a firmware update using a USB memory stick if necessary.

3.4 Encoder Connections

The SBT3-9860 Avenir Mini is designed to accept high-quality digital video using common digital connections such as SDI and HDMI.

Video Input

This portable unit uses a BNC connector for a positive fit and reliable connection. To connect the video BNC connector, push the connector into the port and turn the connector clockwise until it is locked into place.

To connect the HDMI, orient the tapered side of the plug to correspond with the tapered side of the socket, and insert the plug gently but firmly for a smooth fit.

- **SDI** input accepts HD-SDI or SD-SDI signal using SMPTE 292/296 standard. This connection also accepts up to six channels of embedded SDI audio in 24-bit SMPTE-259 standard format in HD-SDI and up to six channels of SDI audio in SD-SDI.

- **HDMI** input accepts HDMI Type A connector for DVI-standard (CEA-861) video and Stereo PCM or IEC 61937-compliant compressed audio.

NOTE: If both types of connectors are connected, Avenir Mini will recognize the SDI source. **It is strongly recommended that only one source be connected at a time.**

Audio Input

The SBT3-9860 requires that audio signals be embedded within the video signals using the HDMI or SDI connections.

3.4 Output Connections

Audio Output

The one Audio-only connection uses a 3.5mm stereo Mini-plug for use with the IFB Client. This port outputs analog audio for amplified speakers or unamplified headphones from the IFB client.

3.5 Power Connections

The main power connector is a standard four pin XLR power connection with a retainer bracket to prevent accidental removal. Use the provided cable for this connection and secure the retaining bracket. Avenir Mini is shipped with an AC adapter with in-line transformer, as well as an automobile accessory power adapter.

Battery

The SBT3-9860 can be powered by industry-standard batteries such as IDX and Anton Bauer. These batteries are Lithium-ion rechargeable batteries, rated at greater than 14V, and come in a variety of sizes. The battery mates with the power supply using the standard V-Mount, optional Gold Mount, or an Adapter that converts one to the other. See Appendix C for a list of approved batteries and adapters.

Additionally, a "T-adaptor" is available to connect 2 batteries at once, allowing for the user to "hot-swap" a battery without interrupting a stream or recording.

Battery Life

With normal use, each fully charged battery should last for about one to two hours before requiring recharging. Note that using the Preview feature on the video screen will increase power draw.

Switching between AC Adapter and Battery

To switch from the AC adapter power to battery power, mount the battery to the Avenir Mini and then disconnect or unplug the AC adapter. The switch from the AC Adapter to the Battery power is seamless and automatic; no lapse in power will occur.

Likewise to switch from the battery to AC adapter, connect the AC adapter to Avenir Mini and plug it into an AC electrical socket. Once this is done, Avenir Mini immediately begins to run on current from the AC adapter and you may disconnect the battery without interrupting power.

NOTE: Connecting the AC adapter to Avenir Mini *will not charge the battery.*

4 Turning the Unit On and Off

The SBT3-9860 power switch is a rocker switch on the side panel near the USB and Ethernet connections.

4.1 Power On

Press the upraised half of the power switch and release. The switch will spring back into its original position.

4.2 Power On Sequence

As the unit starts it will go through three phases of startup.

1. **Power On Self Test (POST):** During the first phase of the power-up, the power indicator light should illuminate, all fans should start, and the front display should show the BIOS loading and testing memory.
2. **Operating System Loading**: During the second phase of power up, the unit will load its operating system.
3. **Software Startup:** During the third phase of power up, the unit will load the Streambox software. After displaying a white splash-screen with the Streambox name and logo, the front panel display will load the Home Screen.

NOTE: If using an AREM, please wait until Avenir Mini is fully powered and booted before connecting the AREM; this allows the modems to draw the power they need without competing with the draw required by Avenir Mini for power-up.

4.3 Power Off

Press the power switch as if to turn on the unit. The Avenir Mini will start a software shutdown process which will turn the unit off within ten seconds.

If you need to power down Avenir Mini immediately, press and hold the power switch for 6 seconds; at that time, the unit will shut down instantly. It is recommended that you always attempt a software shutdown described above before resorting to this "hard shutdown."

4.4 Airflow

When powered on, the unit draws cold air from the top end (among the connections) and blows heated air out of the bottom fan port. The unit should be seated or carried so that airflow is not obstructed and air can freely flow through the unit's top and bottom.

The internal fan will activate only when the unit's passive airflow is not adequate to cool the components. It can also change speed. The fan has been selected for relatively quiet operation.

5 Encoder Web Administration

In addition to the standard console interface, the Streambox Encoder may also be equipped with a web management feature. This allows the Encoder to be easily controlled using a web browser on any computer with network access to the unit. The web interface uses advanced html which allows dynamic updates of the web interface so that information is updated without having to refresh the page. The web interface can be accessed by typing the IP address of the Streambox ACT-L3 Encoder into a web browser and selecting "go".

5.1 Login Page

When first connecting to the web interface of the Streambox ACT-L3/L5 Encoder or Decoder you are prompted for the user name and password to access the interface. This username and password is specific to the web interface and is not shared by the console or RDP interfaces. The login and password are case-sensitive. The default credentials are:

Login: administrator
Password: demo

Figure 1 Encoder Web UI Login Page

5.2 Title Bar

The title bar contains the Streambox logo, product information, and important information about the Streambox stream.

5.3 Info Page

The Info page is the main interface for Streambox Chroma Encoder and allows an instant view of the current video and network settings.
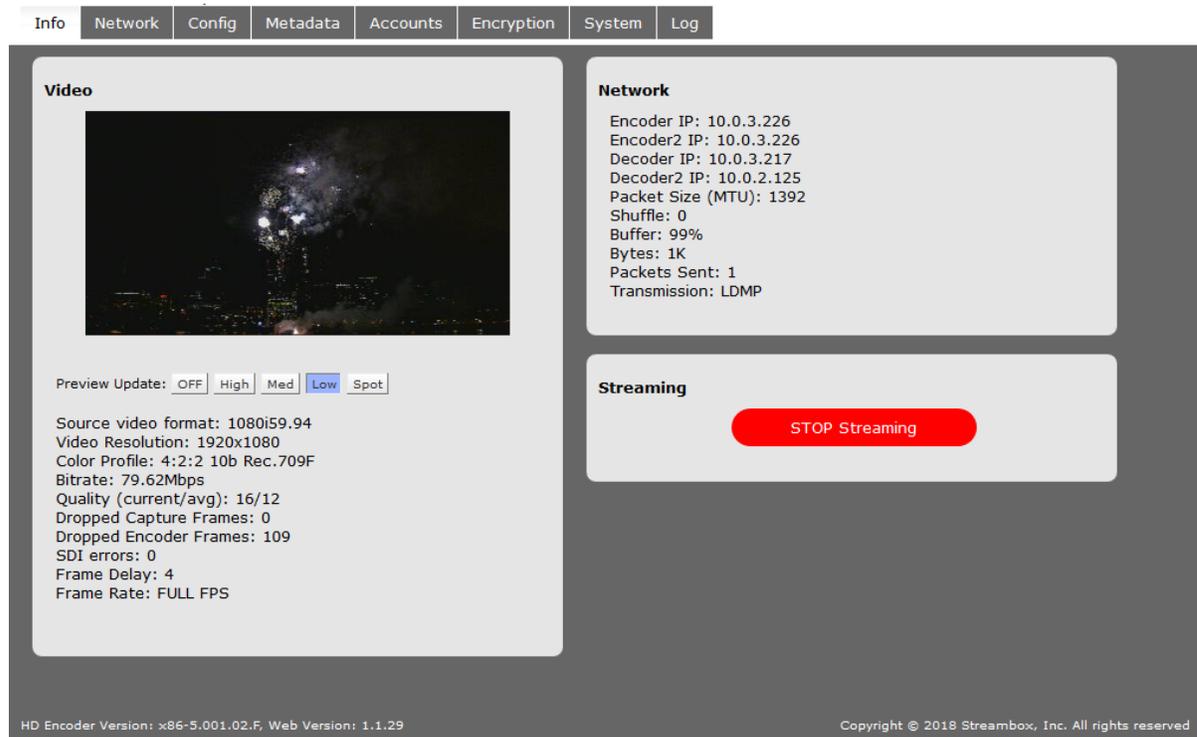
Figure 2: Encoder Web UI Info Page

Video

The video section shows a scaled down preview of the video input to assist in verifying the video input signal.

Preview Update: With these buttons, you can select the frequency with which the picture will be updated. *Spot* will load a single frame, while *Low*, *Med,* and *High* will load frames at different speeds; it will not be a realtime picture, however, and if bandwidth limitations affect the preview, it will load fewer frames. Furthermore, this compressed image will not have the full quality of the stream being sent.

Source Video Format: displays the resolution, progressive/interlaced, and the framerate of the source video, as detected by the Encoder.

Video Resolution: the video stream's intended resolution, which may be a fraction of the source resolution.

Color Profile: the color capture profile

Bitrate: the total overall transfer rate of the ACT-L3/L5 stream, including all video, audio, FEC, and ancillary data

Quality: the current and average compression quality metric for the encoded frames; 0 is highest quality (no compression) and 300 is the lowest quality (highest compression)

Dropped Capture Frames: amount of video frames dropped by the capture process; typically due to a problem with video input (cumulative)

Dropped Encoder Frames: amount of video frames dropped by the Encoder software engine; typically due to the "prefer quality over framerate" setting or a problem with the Encoder settings (cumulative)

> **NOTE:** Even in a perfect stream, it's normal for this to drop several dozen or hundred packets at the start of an LDMP stream.

Frame Delay: The number of frames buffered in the capture process

Frame Rate: The frame rate setting of the encoded stream

Network

Encoder IP: IP address that the Encoder is using to send data from (source address)

Decoder IP: IP address that the Encoder is using to send data to (destination address)

Packet Size (MTU): IP Packet size (default = 1392)

Shuffle: Forward Error Correction Shuffle setting

Buffer: the amount of network buffer available; this will vary based on the complexity of the video and limitations in the network connection; a negative value indicates a failed network connection

Bytes: size of the buffer in bytes

Packets Sent: number of total packets sent since last restart

Transmission: Indicates LDMP or UDP network mode.

Streaming

This region includes a start/stop button for the stream.

5.4 Network Page

The network page allows access to the network settings such as bitrate, latency, and Decoder IP.

Figure 3 Encoder Web UI Network Page

For basic functionality of the system upon initial set up, two settings need to be set: the Decoder IP address and target bitrate.

Bitrate and Buffer Settings

Target Bitrate: sets the total transfer rate that will not be exceeded when streaming
VBR Buffer: Variable bitrate buffer in seconds; amount of time in seconds that the Encoder has to process the video before it is to be transported to the Decoder; values 0.1s to 5s; A lower setting decreases latency while a higher setting often improves video quality
Packet Stuffing: fills the outgoing stream with blank data as needed to maintain an output bitrate at the Target Bitrate. This setting is useful for checking that the full amount of data can get through if needed.

Target Decoder

Destination IP: target IP address for the Decoder to which the video stream will be sent. Unicast and multicast addresses are supported. 224.1.1.1 is an example of a Multicast IP address
Destination Port: IP port number for outbound ACT-L3/L5 UDP stream (default: 1770)
IP Packet Size: the size of the IP packet (default: 1392)

Forward Error Correction

FEC recovers lost packets due to varying network conditions. This setting refers to the number of redundant packets sent to compensate for variable network conditions.

FEC: FEC is denoted as "R-S x% (D/F)" in the Encoder interface, where D stands for number of data packets, F stands for number of FEC packets, and x% is the percentage of the data stream that will be consumed by Burst FEC.
Shuffle: Rearranges the FEC packet sequence for 'burst' error protection. The following formula is used to calculate the recommended setting for the Decoder when shuffle is enabled: buffer/jitter size in packets = FEC packets X shuffle size

5.6 Config Page

This section will cover each of quality settings for Streambox Encoder stream.
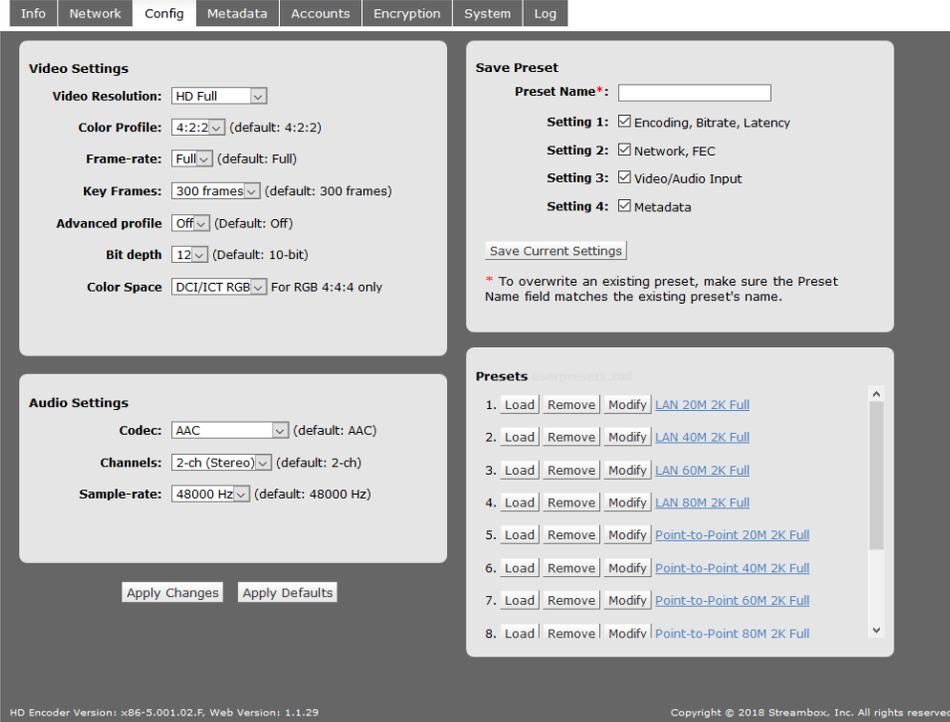
Figure 3 Encoder Web UI Config Page

Video Settings

Video Resolution: Sets the capture resolution of the encoded video.

Color Profile: The video color profile specifies the detail level at which the Streambox Encoder captures color data.

Frame-rate: The frame rate at which the ACT-L3 or ACT-L5 encodes video may be adjusted below full frame rate.

Key Frames: The key frame frequency value determines the **maximum** amount of frames to be encoded before key frame creation is forced. (Default: 1080i – 300, 720p – 240). Lower values require higher bandwidth as it will force keyframes to send more frequently.

Advanced Profile (AP): This feature allows improved quality for low delay application. Instead of sending single big I-Frame, the encoder spreads keyframe in a left-to-right pattern, producing slightly lower delay and more graceful image recovery. This is more useful in general for lower bitrates, below 12 Mbps.

Bit Depth: The number of bits used for color in the pixels. Possible values are 8, 10, and 12. (12-bit is ACT-L5 only). For similar quality, a 10-bit setting requires an additional 25% bitrate over 8-bit, and 12-bit requires 50% more than 8-bit.

Color Space: Select the color gamut for the stream.

Audio Settings

The Audio Settings allows changes to be made to the stream's audio parameters. Do not make changes to this menu during live broadcast as it will interrupt the audio feed.

Codec: Selects the audio codec to use for audio transport. 5 options are available.

Channels: Selects the number of audio channels to encode

Sample-rate: Selects the audio capture sample rate

To save your settings, press '**Apply Changes**' to save your settings. If you want to go back to original settings, press '**Apply Defaults**'.

Save Preset

Presets allow the user to recall frequently used ACT-L3 or ACT-L5 configuration settings quickly and easily. Presets can be helpful for engineers in configuring a unit before use requiring less training for non-technical users.

When the desired settings for Video, Network, and other stream qualities are set. Start by entering a name for the preset. Presets can include all or some of the 4 settings listed below; select the desired settings using their corresponding checkboxes. Click "Save Preset."

Presets can be loaded in the section below.

5.7 Metadata

The Metadata tab is where the user can enter metadata related to their stream. This metadata is viewable via a Streambox Media Player, the web interface of a Streambox Decoder, or the command line interface or a Streambox Decoder.
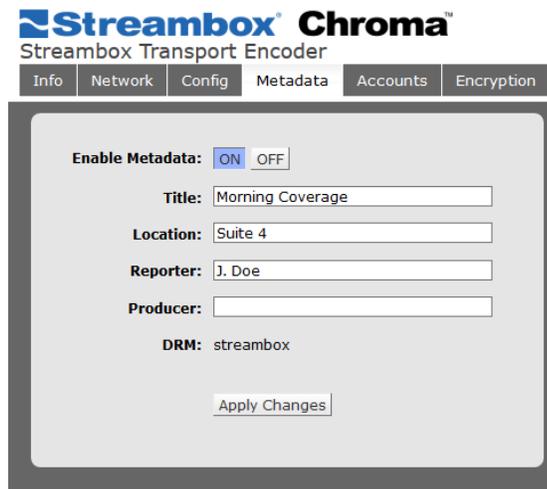
Figure 4 Encoder Web UI Metadata Page

Streambox recommends enabling Metadata even if blank or not in use.

When streaming to Streambox Cloud, it's recommended that the Reporter field be filled in.

Note that DRM is the same as "Group" as seen in other Streambox products. This field is necessary for use with Streambox servers, such as Streambox Cloud. It is changed in the System tab.

5.8 Accounts Page

This page shows user accounts for Web UI users.

Figure 5 Encoder Web UI Account Page

Use the **Add User** button to add additional users. There are 3 types of users:

- Administrator: All-access
- Operator: Can access all features and make changes, but cannot create or delete users.
- Guest: Can view all status and settings but cannot make changes.

Login Page

Select the "Enable login data autocompleting" box for the Login form to auto-complete usernames based on the initial entry by the user.

5.9 Encryption Page
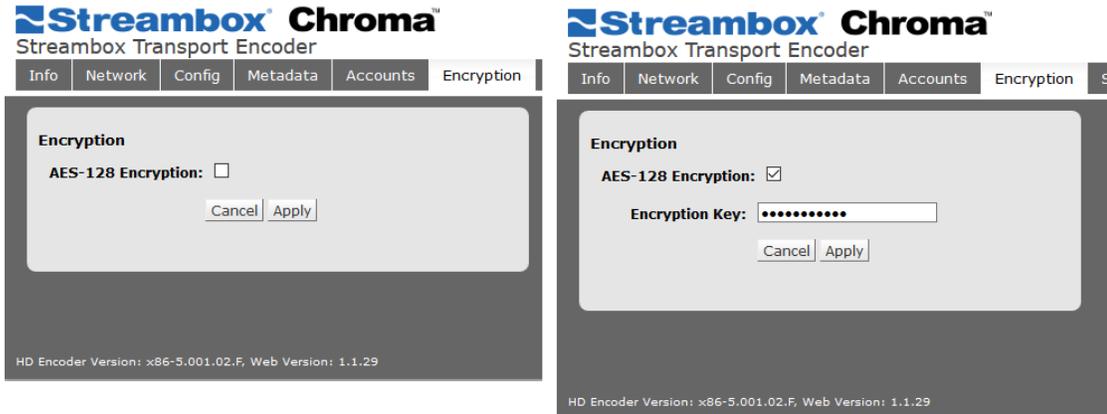
Figure 9 Encryption Page (disabled/enabled)

Streambox Chroma offers the optional feature Stream Encryption, using 128, 192, or 256-bit AES encryption. This page allows you to start the Activation process (if you've paid for an activation key) and, following activation, enable or disable encryption.

Check the box to enable encryption, and a field will appear in which to enter your Crypto-Key. This key is not given by Streambox, but rather is the shared-secret phrase that sender and receiver must use. Use letters and numbers.

5.10 System Page

The system page allows system functions to be performed on the unit and it displays the serial number, version and firmware.   Here you can also switch between ACT-L3 and ACT-L5 codecs.
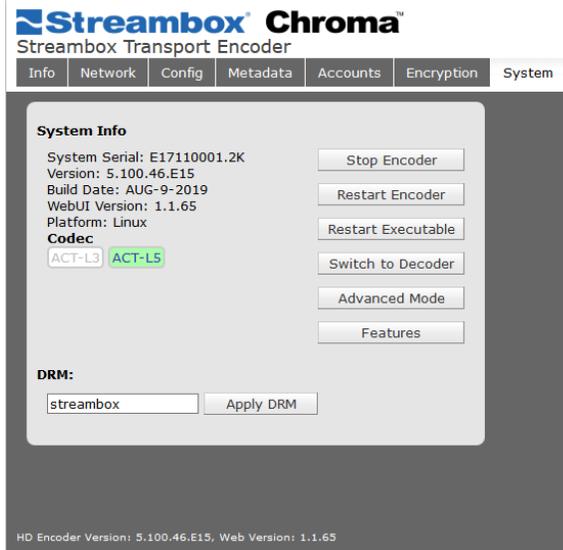
Figure 10 System Page

Codec: The current codec is highlighted green, and indicated by the Version number, which will begin with a 3 for ACT-L3, and version 5 for ACT-L5. Encoder and Decoder must match codecs for a successful stream. A Decoder version starting with X is made to receive both ACT-L3 and L5.

Stop Encoder: Stop the video stream or video recording

Restart Encoder: restarts the Encoder software application; it takes only a fraction of a second but will interrupt a stream.

Switch to Decoder: Stop the Encoder software and switch modes to Decoder mode.

Advanced Mode: Open the Legacy web UI which has additional settings and diagnostics

Features: Open the Features page to view current activations or add additional features.

DRM: Also called Group or Network 1, this metadata field is necessary for streaming to Streambox Cloud or Streambox Enterprise Server. When using the Sessions feature of Streambox Cloud, you enter the Session code, starting with $, here. Click the "Apply DRM" button to save changes.

5.11 Log Page

The log page is where the user can preview and download the Decoder application log. This tool is used to assist in troubleshooting possible issues.

Figure 11 System Page

OFF and **ON:** Disable or Enable the log feed preview. Logging continues whether or not this is enabled.

REFRESH: Update the current display manually with the most recent lines of the log
SCROLL TO END: Jump to the end of the log stored in the browser buffer
AUTO UPDATE: Enable the Web UI to automatically refresh your view of the log

The following should only be done if requested by Streambox Support:
DOWNLOAD LOG FILE: Download the most recent logfile
DOWNLOAD LOG SNIP: Download a previous, snipped-and-compressed log file.

6 Decoder Web Administration

The Streambox Decoder may also be equipped with a web management feature. This allows easy control from any computer with network access to the unit. The web interface allows dynamic updates of the web interface so that information is updated without having to refresh the page. The web interface can be accessed by connecting to the IP address of the Streambox ACT-L3/L5 Decoder using a web browser.

6.1 Login Page

When first connecting to the web interface of the Streambox ACT-L3/L5 Encoder or Decoder you are prompted for the user name and password to access the interface. This username and password is specific to the web interface and is not shared by the console. The login and password are case-sensitive. The default credentials are:

Login: administrator
Password: demo

Figure 62 Decoder Web UI Login Page

6.2 Title Bar

The title bar contains the Streambox logo, product information, and important information about the Streambox stream.

Figure 73 Decoder Web UI Title/Status Bar

6.3 Info Page

Figure 8 Decoder Web UI Info Page

Statistics

The statistics section shows information about the incoming ACT-L3/L5 stream. If there is no incoming ACT-L3/L5 stream, the statistics will show zero or N/A.

Bitrate: the current data rate of the incoming ACT-L3/L5 stream as viewed by the Decoder. This value may be slightly different from the bitrate that is set on the ACT-L3/L5 Encoder that is sending the stream.

Buffer: the current size of the Decoder's receive buffer. This value will vary based on the bitrate, VBR buffer size, and jitter used.

Lost Frames: the total number of frames that have been lost due to packet loss.

Recovered Packets: the number of packets that have been recovered using forward error correction.

Metadata

Metadata can be used to further identify an incoming stream. Metadata is entered on the ACT-L3/L5 Encoder software under the Metadata menu and is transferred to the Decoder inside the ACT-L3/L5 Stream.

Title (formerly Slug): a name given to the video segment
Location: the location from where the live video feed is sent

Connectivity: the type of connection used to transport the ACT-L3/L5 Stream

Reporter: the name of the user operating the Streambox ACT-L3/L5 Encoder

Producer: the name of the producer

GPS Latitude: the latitude of the Streambox ACT-L3/L5 Encoder (supported by some mobile Streamboxes)

GPS Longitude: the longitude of the Streambox ACT-L3/L5 Encoder (supported by some mobile Streamboxes)

Decoder Info

The Decoder info section displays specific information about the Decoder software and the decoded ACT-L3/L5 stream overall.

Video: the captured resolution of the ACT-L3/L5 stream currently being received by the Decoder.

Decoder IP: the current local IP address of the Decoder

Frame Rate: the current video standard of the Decoder video output. This video standard will change to NTSC (59.97) or PAL (50), or 720p (23.98) based on the format of the ACT-L3/L5 stream it receives.

Color Profile: the color profile that the ACT-L3/L5 Encoder is set to capture

FEC: the forward error correction used on the incoming ACT-L3/L5 stream

Shuffle: the forward error correction shuffle setting on the incoming ACT-L3/L5 stream

Latency: the current latency of the incoming ACT-L3/L5 stream

Audio: the audio codec and channel setting of the incoming ACT-L3/L5 stream

Jitter: the jitter setting set on the Decoder

Jitter2: the secondary jitter setting on the Decoder

Port: The UDP port number on which the ACT-L3/L5 stream is received

Field Order: Applying to interlaced video, this field indicates the first field that's being processed: UP for Upper First (odd-numbered lines), for example.

Codec: The Codec if the incoming video, ACT-L3 or ACT-L5

Dolby Vision: Indicates whether Dolby Vision audio metadata is being received in the stream.

Preview

The preview window displays a low-framerate representation of the incoming video stream. With these buttons, you can select the frequency with which the picture will be updated. *Spot* will load a single frame, while *Low*, *Med,* and *High* will load frames at different speeds; it will not be a realtime picture, however, and if bandwidth limitations affect the preview, it will load fewer frames. Furthermore, this compressed image will not have the full quality of the stream being sent.

Annotation

The Annotation feature allows users to draw on the current image in order to indicate areas and directions to other viewers of the Annotations who are also viewing the Decoder Preview. Click Annotate to pop up the Annotation window. In the example below, a tablet user was able to draw and write on a frame of the video.

Figure 15 Decoder Annotations Window

The Annotation window allows the user to change the view between SD or HD (which are the available quality settings for the picture, even if the video has higher resolution), and set the expected framerate. Like the regular preview, the Decoder will do its best to meet that demand. The user can also save the image or set the drawings to appear on the Decoder's video stream output.

Clear: Clears all annotation

SD / HD: Sets the resolution of the video image in the Annotation screen.

FPS: Sets the intended Frames Per Second rate of the video.

Save: Save the image to Chroma

List: See a list of saved images, and download to the local machine using this button.

Burn-In: When enabled, the annotation drawings will be visible on the decoder's SDI/HDMI video output in addition to being seen in the browser.

Interface Data

The Interface Data section shows statistics about the individual network adapters used by the Encoder including its IP address.

6.4 Network Page

The network page allows access to the network settings on the Streambox ACT-L3/L5 Decoder. Network settings affect how the Decoder handles the network data stream.
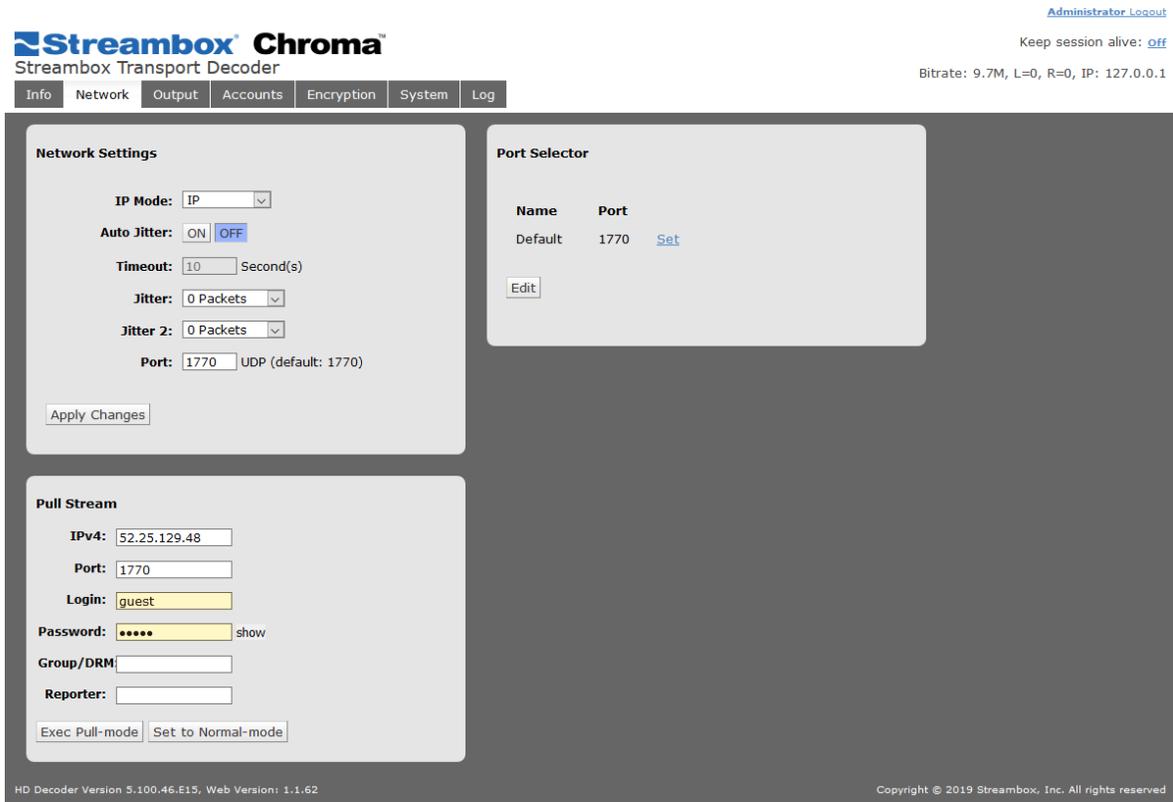
Figure 96 Decoder Web UI Network Page

Network Settings

IP Mode: selects the IP mode in which the Decoder interface is set to listen. Options are "IP" and "IP Multicast".

IP mode sets the Decoder to receive a Unicast ACT-L3/L5 stream. (default)
IP Multicast mode sets the Decoder to receive a multicast ACT-L3/L5 stream. (rare)

Auto Jitter: When enabled, Auto-Jitter will spend a period of time defined by the Timeout (in seconds), increasing the Jitter settings as needed by the connection. Text including the metadata is displayed on the screen to deter this video being used for broadcast, as the stream quality is still being adjusted during this time.
NOTE: Auto-Jitter feature should only be used for non-LDMP wireless streams.
Jitter: sets the number of packets to use in the primary jitter buffer. The primary jitter buffer on the receiver (Decoder) is used to compensate for packets received out-of-order due to network congestion

Jitter 2: sets the number of packets to use in the secondary jitter buffer. The secondary jitter buffer is used to buffer packets that arrive out of time, or bursting packets.

Port: sets the IP port that the Decoder will listen for the incoming ACT-L3/L5 stream

Pull Stream

This section allows users of Streambox Cloud and Streambox Enterprise Server to pull streams from those servers by matching the metadata of the stream being sent to the Server. This requires credentials for the server and knowledge of the metadata, or else a Session ID.

IPv4: Set the IP (version 4) address of the Server from which the stream is to be pulled.

Port: Network port, usually 1770, to which the stream will connect.

Login & **Password:** Credentials to log in to the Server.

Group/DRM: The Group (also called DRM) found in the metadata of the stream being pulled from the Server.

Reporter: Should match the Reporter or Contributor metadata of the stream.

Once data has been entered, use a button to start pulling the stream:

Exec Pull-Mode sets the unit into pull mode and it will request a stream from the server. When Pull Mode is enabled, it's indicated in the status bar, upper right.

Set to Normal Mode: returns the unit to its normal Listen mode, where it awaits an incoming stream.

6.5 Output Page

Figure 107 Decoder Web UI Output Page

General Settings

Audio Channels: Sets the number of audio channels to output.

- 6 Channels mode should be used for 1, 2, 4, or 6 audio channels.
- 8 Channels mode should be used for 8 audio channels

Standby Video: sets the Decoder to display the standby video image ("colorbars image") when the Decoder receives no incoming data. The default value is "ON" If this setting is off, the screen will show a freeze-frame of the last video frame processed.

Standby Delay: This is the amount of time in seconds that the Decoder will display a freeze-frame of the last video frame processed before switching to the Standby Video image, if enabled. This delay allows time for the Encoder to resume the stream without interrupting the video with the standby image.

Latency Control: sets the Decoder to control decoding latency. The default, and recommended, value is "ON"

Show Audio: sets the Decoder to overlay audio meters on the output video signal. The default value is "OFF".

Show Timer: sets the Decoder to overlay decode timing and display data on the output video signal. The default value is "OFF".

Video Settings

SDI Output: selects the output configuration; depending on hardware, Chroma supports 3G, 6G, and 12G SDI Connections. Depending on the video resolution, up to a single 12G connection, 2x 6G connections, or 4x 3G connections may be utilized to channel the output to the output monitor.

SDI Bit Depth: Sets the Bit Depth (8-bit, 10-bit, or 12-bit) of the color of the output.

Force RGB Output: Enable this to force the output to RGB even if the incoming stream was sent with a different color gamut.

Output HDR meta data over HDMI: Enables the HDR Metadata over HDMI

Genlock Settings

Genlock: Enable two modes of genlock, Reference or Input 1, or disable genlock with the Free Run setting.

Dolby Settings

DolbyVision Output: Enables DolbyVision metadata in Tunneling or CMU modes.

6.6 Accounts Page

This page shows user accounts for Web UI users.
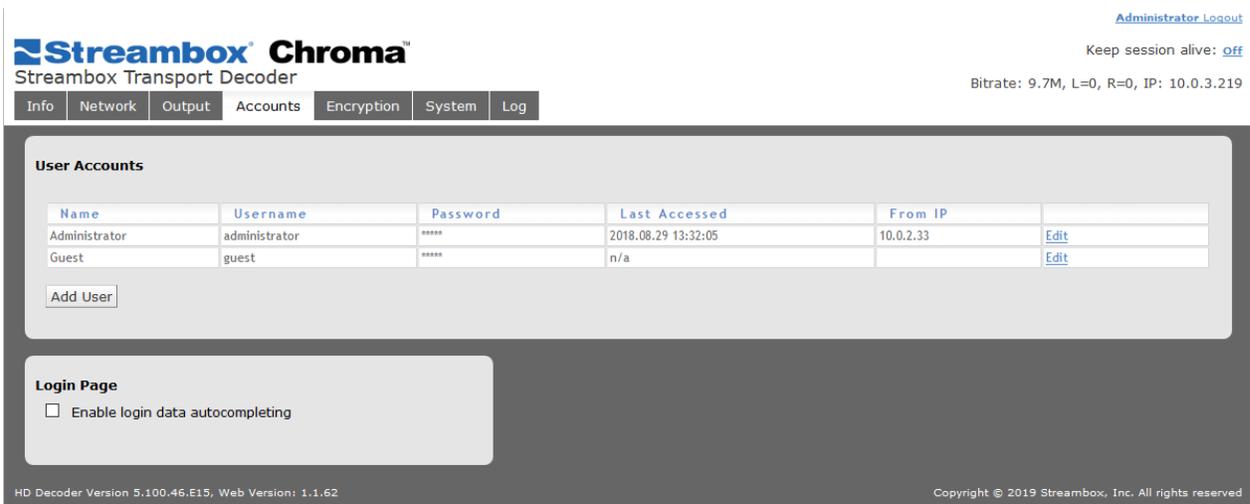
Figure 11 Decoder Web UI Accounts Page

Use the **Add User** button to add additional users. There are 3 types of users:
- Administrator: All-access
- Operator: Can access all features and make changes, but cannot create or delete users.
- Guest: Can view all status and settings but cannot make changes.

Login Page

Select the "Enable login data autocompleting" box for the Login form to auto-complete usernames based on the initial entry by the user.

6.7 Encryption Page

The port settings page allows the default receive port that the Decoder listens on to be changed. The Decoder is set to listen for its ACT-L3/L5 network stream on UDP port 1770. However if the Encoder and network is set up for transport on another UDP port, the Decoder must be set to listen for the stream on that port. To change the port, click edit and enter an alternate port number. Click set to enable the changes.
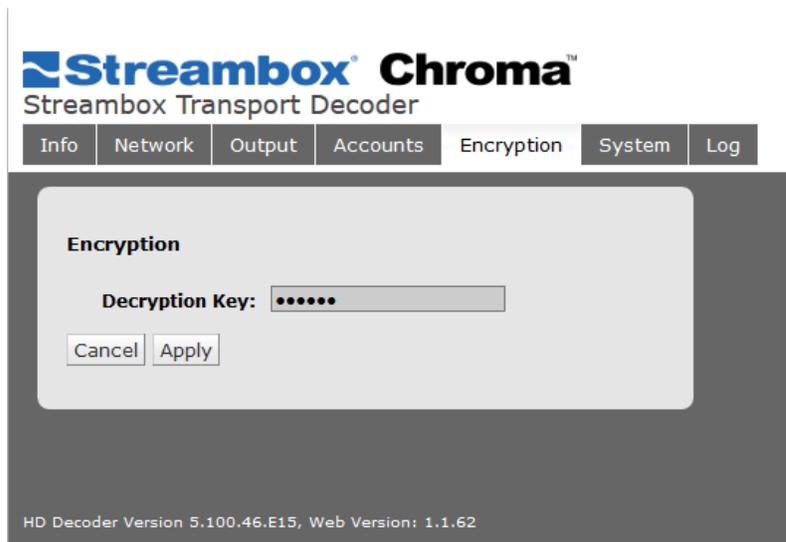
Figure 19 Web UI Encryption Page

Streambox Chroma offers the optional feature Stream Encryption, using 128, 192, or 256-bit AES encryption.

This page allows you to start the Activation process (if you've paid for an activation key) and, following activation, enter a Decryption Key. This key is not given by Streambox, but rather is the shared-secret phrase that sender and receiver must use. Use letters and numbers.

If Decryption is successful, the status line in the upper right will indicate that success with **ENCRYPTED**:
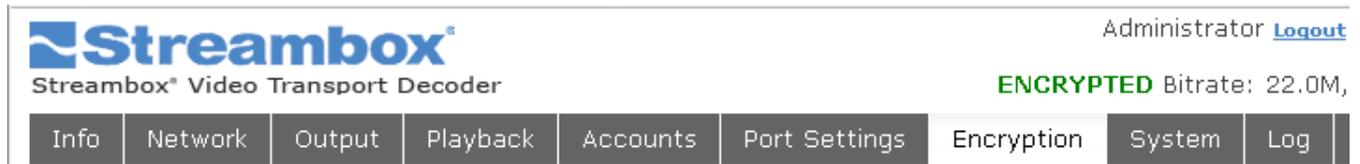
Figure 20 Decoder Web UI Encryption Success

If the stream is Encrypted, but the Decryption Key entered by the decoder user is not a match, the status line will report **Bad Decryption Key**:
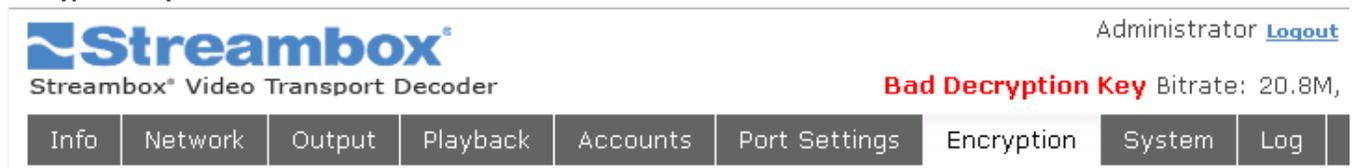
Figure 21 Decoder Web UI Encryption Failure

NOTE: If the Encoder stream is not encrypted, there is no need to clear out the Decryption Key.

6.8 System Page

The system page allows system functions to be performed on the unit and it displays the serial number, version and firmware.   Here you can also switch between ACT-L3 and ACT-L5 codecs.
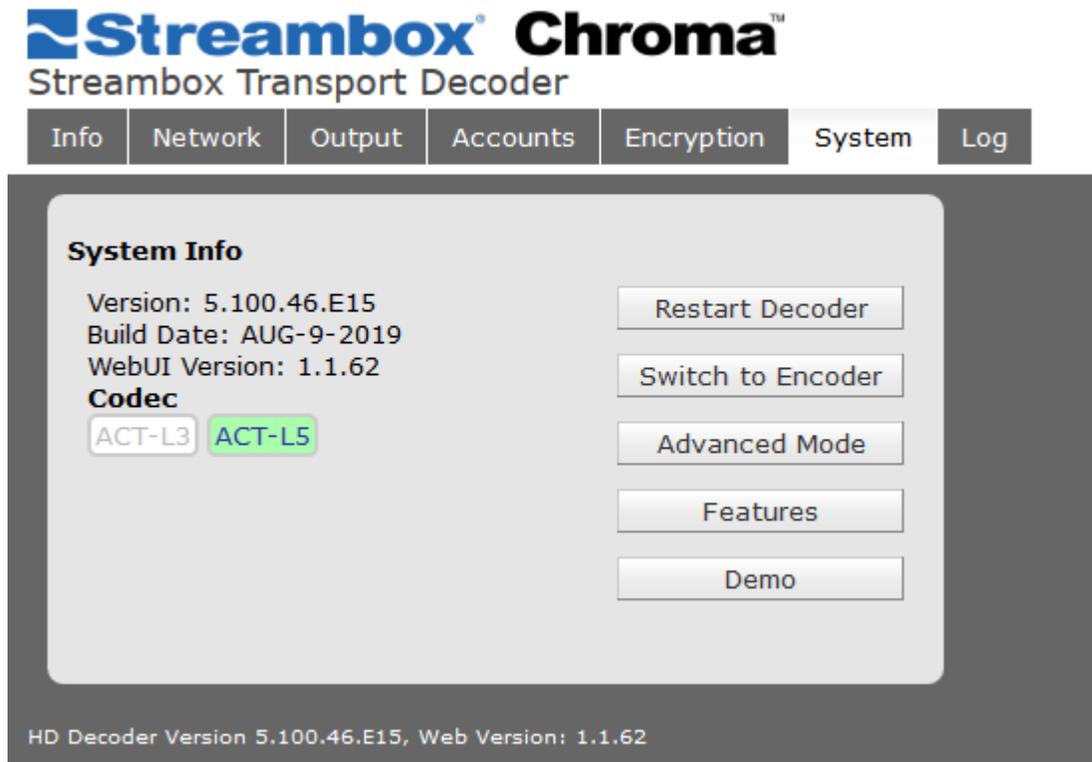
Figure 22 Decoder Web UI System Page

Codec: The current codec is highlighted green, and also indicated by the Version number, which will begin with a 3 for ACT-L3, and version 5 for ACT-L5. Encoder and decoder must match codecs in order for a successful stream.

Restart Decoder: restarts the Decoder software application; it takes only a fraction of a second but will interrupt a stream.
Switch to Encoder: Stop the Decoder software and switch modes to Encoder mode.
Advanced Mode: Open the Legacy web UI which has additional settings and diagnostics
Features: Open the Features page to view current activations or add additional features.
Demo: [Not yet implemented.]

6.9 Log

The log page is where the user can preview and download the Decoder application log. This tool is used to assist in troubleshooting possible issues.

Figure 23 Decoder Log Page

OFF and **ON:** Disable or Enable the log feed preview. Logging continues whether or not this is enabled.

REFRESH: Update the current display manually with the most recent lines of the log

SCROLL TO END: Jump to the end of the log stored in the browser buffer

AUTO UPDATE: Enable the Web UI to automatically refresh your view of the log

The following should only be done if requested by Streambox Support:

DOWNLOAD LOG FILE: Download the most recent logfile

DOWNLOAD LOG SNIP: Download a previous, snipped-and-compressed log file.

7 Using the LCD Touch-Screen

Avenir Mini 5 features a compact touch-screen LCD display which allows the user to start live streams using the Smart Presets and a Custom Preset, view statistics about connectivity, change network for streaming, and view other information without requiring the full remote-control interface.

To press a button on the touch screen, gently press your finger or a soft, blunt stylus onto the screen on the region directly over the button.

Located on the side of Avenir Mini, the display initially features the Smart Presets of Avenir.
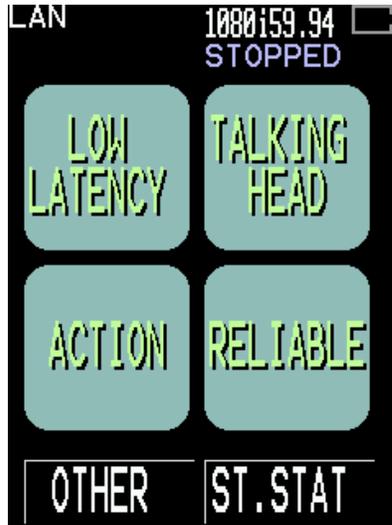
Home Screen featuring Smart Presets

NOTE: Always use a gentle pressure on the surface; increased pressure does not emphasize your intention or increase the priority of your command. If Avenir Mini does not appear to be responding, wait a moment and try your button-press again.

Additionally shown are the **OTHER** button, which links to an menu of settings and other operations, and **ST.STAT**, the Stream Status button.

At the top of this screen, the indicator in the upper left will show the current network setting used for streaming. Other network connections may exist, but the video stream *will only travel over the selected network.*

7.1 Other Operations

Other Operations Menu

The Other Operations Menu includes multiple links to information displays to assist the user in streaming using the Avenir Mini.

At the top, a **Restart Encoder** button will interrupt a stream and reset the Avenir Mini's encoder software to the state it was in before a stream was begun.

The **Params** button leads to an additional informational menu of unit parameters. See below for details on the parameters menu and contents.

The **Preview** button displays a view of the video source. This is useful for confirming that the source is working and framed correctly.

Click the **Color Mode** button to toggle the color in the preview video.

The **Params** button leads to the Parameters submenu with two buttons. The **SYS Info** button displays information about the Avenir Mini unit itself: Serial number, firmware versions, and disk space are found here. The **ENCParams** button shows settings currently in the Encoder software, such as video resolution for the output, network mode, maximum bitrate (during a stream), and audio codec setting.

The **WWAN** button displays the current status of the 4 embedded Wireless Wide-Area Network modems in the Avenir Mini.

The **Stream** button displays current stream status. This is the same screen show when the **ST Stat** button on the homepage is pressed. On this screen, each network adapter in use for the streaming will be listed along with its current bandwidth and status.

The **Net Mode** button displays the 4 possible modes of network connectivity: **LAN** (wired Ethernet), **WIFI** (Wi-Fi Wireless Ethernet), **WWAN** (embedded and connected 3G/4G wireless modems), or **ALL** (any combination of existing connections).

The **LMSensor** button displays temperature information measured inside the Avenir Mini.

7.2 During Live Streams

The LCD panel reports live-stream statistics as well as the initial ABN process in a compact version of the remote-control Avenir interface.
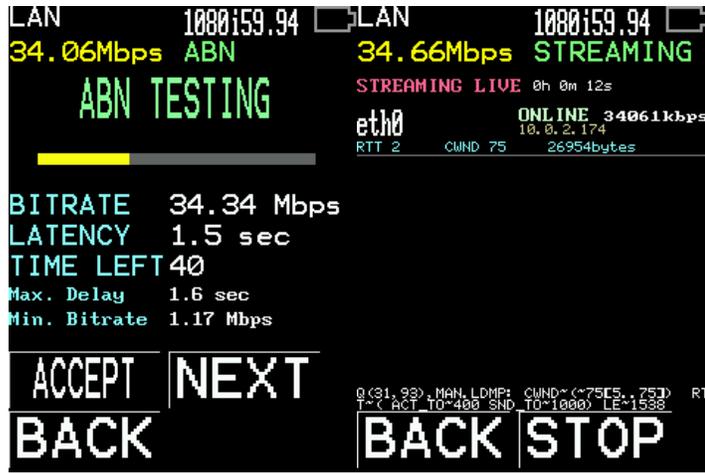
Auto-Bandwidth Negotiation (ABN) and Streaming Status

Once a stream is begun, the LCD panel will automatically display the ABN process followed by the Stream Status display. In this display, each network adapter and its contributions to the transmission of the stream are shown. Some adapters may say they are "OFFLINE." This does not necessarily mean that they are not connected to the network, but that the connection to the Decoder through that adapter has a higher latency than is allowed by the current settings.

8 Using the Small LCD Menu

In addition to the touch-screen on the side, there is a small LCD display on top of Avenir Mini 5, with plenty of useful information that can be read at a glance.

4 LED indicators help indicate the status of the video source, network connectivity, streaming, and can also indicate if the system is experiencing a problem.
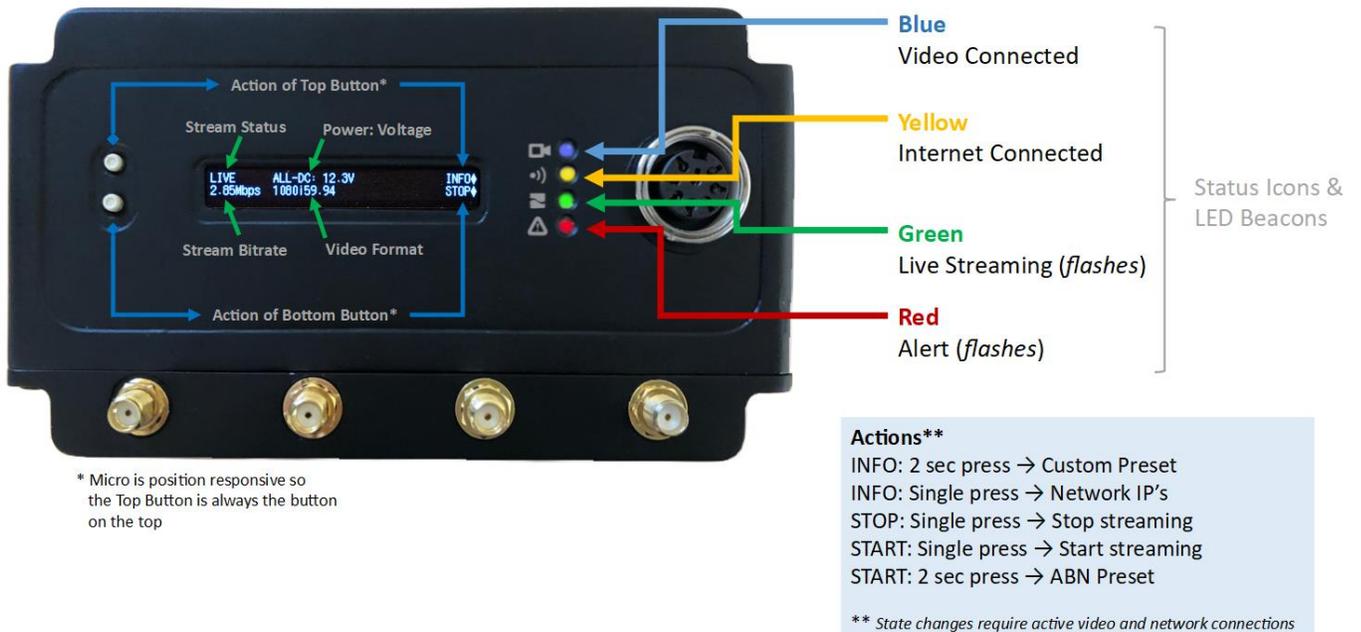
8.1 Home Page – Ready to Stream Video

Notice that the green LED beacon is off since the unit is on standby and not streaming. Also notice that the Network Contribution and Bitrate Meters are off since there is no active stream.

9 Action Items & Navigation

9.1 Right-Side-Up View

Action items are designated by a diamond (◆). There can be 1 or 2 action items on a page; each corresponds to its respective top or bottom button. On the Home page, MENU is the only action item and is here associated with the bottom button.

9.2 Upside-Down View

If you rotate the device upside-down, the screen will rotate its orientation to remain upward and the buttons will flip so that the bottom button remains on bottom relative to the screen orientation. Right-side-up or upside-down, the MENU item on the Home page is always activated by pressing the on bottom button.

9.3 Two Action Items

In the example below, there are 2 Action Items, HOME (associated with the top button) and NEXT (associated with the bottom button). In most cases the top button executes an action and the bottom button navigates within a screen. So in this example, the top button executes the command to open the HOME page and the bottom button navigates along the bottom row of tabs (notice that LAN is highlighted).

10 Main Menu

The Main Menu page is displayed when you press the MENU button (top) on the Home page. On the Main Menu page there are two Action Items; ENTER and NEXT. NEXT cycles through the seven menu items, and ENTER executes the highlighted item; [Start] in this case.
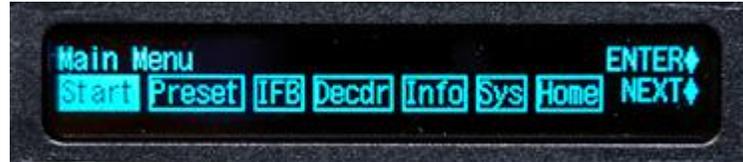
10.1 Main Menu Items

- **Start/STOP** — Start or Stop, respectively, the video stream and return to Home page
- **Preset** — Open the Presets selection page
- **IFB** — Open the IFB page
- **Decdr** — Open the Decoder page
- **Info** — Open the Info page
- **Sys** — Open the System page
- **Home** — Open the Home page

Start/Stop Video Stream

The **Start** and **STOP** action items start and stop the video stream, respectively. If video is streaming, Stop will be the item. If in standby, Start will be the item.

Presets Selector

Presets are predefined video streaming profiles. The Avenir Mini 5 comes with a number of presets; some optimized for LAN & WiFi connections, some optimized for 3G/4G/LTE connections, some optimized for satellite connections, etc. You can create your own Presets via the advanced web interface (discussed in a separate document).
To move up the list of Presets, you select the [+] item, and to move down the list you select the [-] item. Remember, pressing ENTER executes your selection. Once you see the desired Preset displayed in the top row (*Talk* in this example), you NEXT over to the [Apply] item to apply the Preset or you can NEXT over to the [Stream] item to apply your selection and start streaming with that Preset (see image below).

Smart Presets

There are 3 Smart Presets that are included in the Preset list. They employ ABN (see next section) to determine the optimal bandwidth settings based on your Internet connection.

1. **Talk** — Talking Head is optimized for in-person interviews with little action

2. **Action** — Action is optimized for action or high-motion shots
3. **Reliable** – Reliable is optimized for highest quality at the expense of a longer latency

Automatic Bandwidth Negotiation (ABN)

Automatic Bandwidth Negotiation or ABN is an automated process to determine the best bandwidth. ABN is activated when using Smart Presets (see previous section). Once ABN is activated, you can press ACCEPT (lower button) when an acceptable bandwidth has been reached or you may allow ABN the full time to determine the best bandwidth available. In this example (see figure below), the bitrate is 5.43 Mbps with a 1.2 second latency and there are 13 seconds remaining in the ABN process for determining the optimal settings.

IFB Manager

Streambox Avenir Mini 5 encoders support IFB audio. IFB is an abbreviation for Interruptible foldback or feedback. This is used by news agencies to communicate to field reporters during live interviews. IFB requires a Streambox IFB server and access to the web interface to set parameters (covered in a separate document).
From the IFB page you can change the audio volume up or down (**[VOL+]** or **[VOL-]**), or change the channel up or down (**[CH+]** or **[CH-]**), and/or **[START]** an IFB connection. If the 'Offline' status is displayed on the top line, then there is no IFB connection and the [START] action item is displayed (see upper image below). If an IFB connection is already started, as indicated by a 'Receiving data…' status on the top line, [STOP] will be displayed to terminate the IFB channel connection (see image below).

10.2 Decoder selector

The Avenir Mini 5 is by default setup to stream directly to the Streambox Cloud servers that are stationed throughout the world (e.g., LiveUS (US West), LiveUSEst (US East), LiveAU (Australia), LiveDE (Germany), LiveEU (Europe), LiveJP (Japan), LiveSG (Singapore), LiveIN (India), and others. You can also set the encoder to stream directly to a Streambox decoder (software, rackmount, NODE) or Streambox Enterprise Server via the web interface (discussed in a separate document). Use the up [+] or down [-] action items to select the desired decoder (closest to your location). Then NEXT to the [Set] action item to set the decoder. Remember, use the ENTER, top, button to execute the selected item.

10.3 Info Page

The **Info** page provides system information. NEXT to the desired item and the respective status is displayed on the top line (in the example below, [**LAN**] is selected and the LAN IP address is displayed, indicating a LAN IP connection). At any time, you can return to the Home page by pressing the HOME (top) button.

4. **LAN** — LAN IP address

5. **WiFi** — WiFi IP address (in this case, since the device was not connected to WiFi, no IP is displayed.

6. **Temperature** — This is CPU temperature in degrees centigrade. Temperature is provided for diagnostic information. As a general rule, CPU temperature should stay below 100°C.

7. **Power** — Power provides info about the connected power supply. In this case, the attached power is 12.0 VDC. The functional power range is 7 to 17VDC.

8. **Date** — System date and time are displayed (for product support purposes).

9. **S/N** — Serial number is displayed. Also, LCD version is displayed (for product support purposes only)

10.4 System Menu

The System menu is similar to the Info menu but with items less often accessed by the user.

System Menu Items

- **Main Menu** — Return to Main menu
- **Net** —Network Mode selector
- **Encoder** — Restart encoder page
- **LCD** — Screen settings page
- **BATT** — Battery type selector
- **OTHR** — Reset LAN for Auto IP assignment (DHCP), Enable OTG Net

Network Mode Selector

Network mode selector sets which network connection the Avenir Mini 5 uses; by default, **ALL** is selected so the Avenir Mini 5 will bond all available networks together to improve bandwidth. You can also select LAN (for LAN only – as in this example), WiFi (for WiFi only), and WWAN (for mobile modems only). Use the [**Mod+**] and [**Mod-**] to change mode and then [**SET**] to make it so.

Encoder

From time to time it may be necessary to restart the encoder. Press the bottom, RESTART, button to initiate a restart and the top, HOME, button to return to the Home page. Often, powering the unit off and then on again is a more practical approach.

Screen Settings

The LCD (or OLED) page allows you to adjust contrast (**[Cnt+]** and **[Cnt-]**), invert the display from white-on-black to black-on-white (**[Inverse]**), or lock auto screen rotation (**[Rotation]**).

Battery Type Selector

It is necessary to know what type of batteries are being used for the power meter on the Home page to properly report the state of the battery condition. You can simply move up **[+]** the list or down **[-]** the list until you find the battery type that best matches the ones in use.

System Access (Other)

This is provided for product support access to system files via OTG Net. Also, LAN->DHCP may be used if the unit is locked out of a local area network due to IP conflicts.

11 Advanced Menu

SBT3-9860's Advanced Menu will guide you to your required workflow or settings with just a few taps on the screen. The menu hierarchy is intended for simplicity, and the current location in the menu system is always identified on the screen.

The top center of each screen gives the descriptive name of the screen.

In the upper right corner of this and many other screens, there is a Preview button. This button is visible at all times, no matter what menu is displayed. Click this button to preview the video as it appears from the source. Select Preview again to disable the preview and return to the menu from which you came.

Below the Preview button, some text appears, describing the format of the video source detected by Avenir Mini. HD Inputs indicate the provided frame rate as well. If no source is provided, the phrase "NO VIDEO INPUT" will appear.

In the upper left corner, the current selection for the type of Network connection is displayed. Sometimes, one or more red or green bars will be displayed, corresponding to disconnected or connected network adapters. Additionally, a stream bitrate value may appear next to the network connection type will appear.

11.1 Home Menu
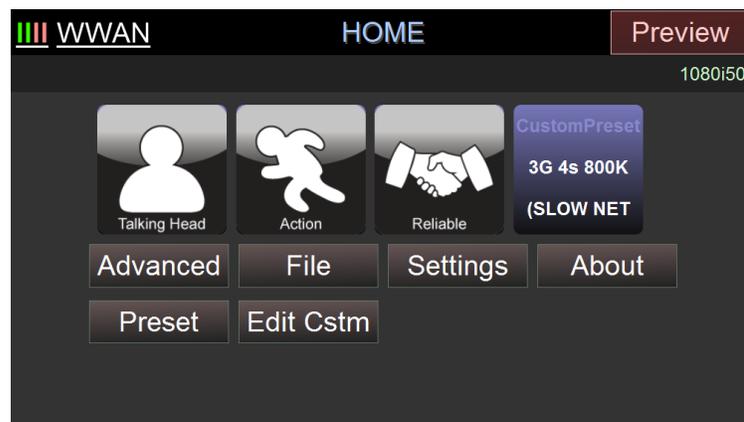
This is the Avenir Remote Home Screen.

You can return to the Home screen from any other screen, tap the Home Icon in the upper left corner.

The Avenir Mini Home screen defaults to LIVE streaming mode with 4 selectable use profiles called Smart Presets. (See section 8: *Live Streaming* for a description of Smart Presets.)

The user may also choose to enter Advanced mode, File mode, Settings, or About page from the home screen.

- **Advanced:** This the legacy mode, used for custom live streams and testing, where quality can be evaluated and optimized, or for creating custom Live Stream presets; this mode allows manual selection of all encoder settings including bitrate, resolution, audio codec, and FEC.
- **File:** This button will let you record video and assist you in transmitting the file over your network connection, either now or at a future time when network connectivity has improved.
- **Settings:** This button takes you to the global settings for the SBT3-9860, such as network and decoder settings, server connections, input settings, and restarting the software or operating system.
- **About:** This button provides version information for the software and operating system, which may be requested by Streambox or other support personnel.
- **Preset:** Directly access a pre-made preset. Avenir Mini comes with a basic set of presets but the user can make more to fit the local network conditions and Avenir usage. See Section 8.3.
- **Edit Cstm:** This button opens the manual settings so the user can create a Custom Preset to appear on the Home screen, or select an existing preset to appear there.

12 Advanced Menu

The SBT3-9860 is purpose-built for high-quality live video streaming from anywhere network connectivity is available, while being carried and operated by a small crew or a single person. To begin a live stream, connect a video source and press a Smart Preset button.

12.1 Smart Presets

The Smart Presets contain settings appropriate for four different scenarios for using Avenir Mini:

Talking Head: Use for low motion content such as live fixed location reporting with tripod; reduced latency, higher quality.

Action: Use for high motion video such as sports; higher frame rate, lower resolution, and reduced latency.

Reliable: Use under adverse networking conditions; includes a slightly lower data rate and higher delay due to increased and error correction.

Automatic Bandwidth Negotiation (ABN)

Automatic Bandwidth Negotiation examines your network connection and sends out some short signals to determine how much fast bandwidth is available.
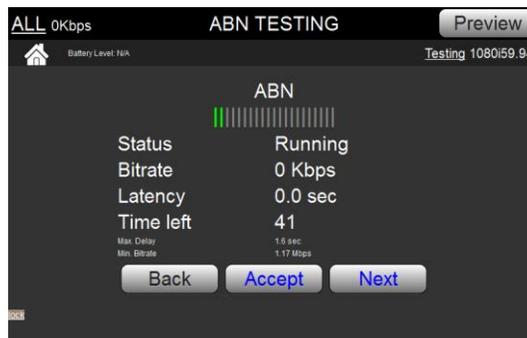
After you press a Smart Preset button, the Automatic Bandwidth Negotiation sends signals to the Streambox Decoder, and receives signals in return, measuring the speed and return time of the data exchanged in order to find out much bandwidth the Avenir Mini can deliver while still giving low-latency performance. ABN cycles through numerous possible settings for the LDMP Transport to find a setting that exceeds a Minimum threshold for bitrate, and falls below a maximum threshold for latency.

ABN typically cycles through about 5 possible levels of settings.

NOTE: It is recommended that the user **does not press the Accept button** unless Avenir Mini is being used under known, static network conditions.

The ABN period is 45 seconds by default, but that may be changed in the ABN settings. Streambox does not recommend that you change the ABN period unless you are absolutely confident that you can manually select the best settings using the Next and Accept buttons.

12.2 Live Stream Status Display
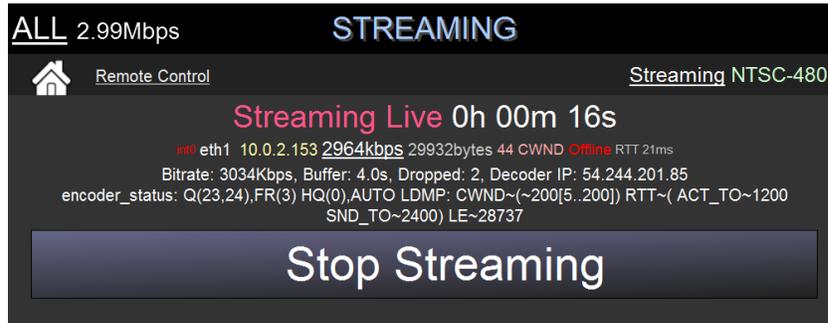
Whether automatically set, pre-set, or manually set, the network and video signal settings are displayed on the screen for your reference.

Each network adapter in use will have a status line displayed on the Streaming screen. First in the line is the network adapter identifier, according to the Linux system of identifying network adaptors; eth for Ethernet (LAN), WLAN for Wi-Fi, and PPP for a USB WWAN adapter. Following that is the encoder IP address, the bitrate currently being transmitted, and the number of bytes sent so far. Next is the CWND, the current Congestion Window for this adapter, the status of the adapter (Online when the adapter is in use, Offline if the adapter is not responding or the latency is too high) and finally RTT, the measured round-trip time or latency of the connection.

After the individual network adapter lines, the overall status of the stream is displayed. The first item is the transmission bitrate setting in kilobits per second (kbps). Bitrate is the main factor for quality of the transmission, higher being better. Following that is the Encoder Buffer, which elsewhere may be referred to as Encoder Latency or VBR, and it is measured in seconds (s). This represents the built-in delay added by the encoder software to improve the compression of the ACT-L3 video before sending the video frames.

"Dropped" indicates *dropped encoder frames*; it should remain zero or fixed after stream startup in most cases. If this number starts climbing, then the video-encoding software could be malfunctioning. If the Prefer Quality Over Framerate feature is being used, this may be increasing due to low-quality frames being dropped.

NOTE: Sometimes a few frames are dropped at the start of a video capture, but as long as the number is not increasing, there is nothing to be concerned about.

Following dropped frames is the Decoder IP, which is the address at which the Streambox Decoder or Streambox Media Player is receiving your live stream.
The second status line contains some technical diagnostic information, including a summary of encoder switch settings, a summary of LDMP settings, and ending with a measurement of latency from encoder to decoder, measured in milliseconds.

In the center of the screen you have a timer measuring the duration of your live stream, and a large button to stop the stream.

In the upper left corner of the screen, next to the Network adapter, is the instantaneous bitrate of the live stream. This number should be near the intended bitrate, but it may fluctuate.

12.3 Advanced Configuration

The **Advanced** button will take you to a settings page that allows for detailed customization of your settings for this screen. Unless you are experienced with stream optimization, or you are instructed to do so by someone with experience, you should avoid these settings. It is very easy to turn a good stream into a bad one by mis-adjusting these settings.

If you choose incorrectly, click the Home Icon home in the upper right corner, and you will return to the top of the menu.

Advanced Settings

On the Advanced Settings screen, you can adjust any setting to optimize the live video streams sent from the Avenir Mini. This screen is most useful for creating custom presets, but an experienced user can use it to fine-tune the stream to adjust for local network conditions and audio/video quality at the receiving end.

Bitrate

The specified value is the total bitrate for audio, video and FEC, as well as any IP overhead.

VBR

Encoder processing buffer, in seconds. This setting allows the Encoder to distribute bits within a specified buffer to improve video quality. A lower setting decreases latency while a higher setting improves video quality.

AP (Advanced Profile)

Enables Streambox key-frameless codec, ACT-L3 Advanced Profile Codec, which requires special decoder software. Unless you are certain you are using the Advanced Profile Decoder software on your decoder, do not enable this setting.

FEC (Forward Error Correction)

FEC works to reduce & recover lost packets due to varying network conditions. This setting refers to the number of redundant packets sent to compensate for variable network conditions. FEC can decrease the bitrate of the audio/video signal in order to maintain the maximum bandwidth. For example; a 5 Mbps stream with 20% FEC will allocate 80% (or 4Mbps) to the audio/video stream and 20% for FEC packets.

FEC Reed-Solomon is a FEC specifically for burst error protection involving multiple packet loss. For example, a setting of 'R-S 64/10' can recover from up to 10 random or sequential packets lost in a group of 74 (64+10) packets. Burst FEC is denoted as "R-S x% (D/F)" in the Encoder interface, where D stands for number of data packets, F stands for number of FEC packets, and x% is the percentage of the data stream that will be consumed by Burst FEC.

NOTE: FEC will add latency to the transport. This additional latency is dependent on the amount of packets included in FEC and the amount of video data in each packet. For example, every 2 FEC packets at 256 Kbps, will add about 1 frame of latency. In this case FEC Reed Solomon - 32/2 adds 34 (32+2) packets or about 16 frames delay.

Resolution

Different video resolution options are available to achieve the best video quality based on the content type, amount of motion, and the available network bandwidth. The captured and encoded horizontal resolution is scaled based on the incoming video format. Avenir Mini will automatically offer SD options when an SD video source is connected, and HD options when an HD video source is connected.

Resolution in Standard Definition

The Standard Definition capture resolution at which the ACT-L3 Transport encodes video may be adjusted below full D1. It may be necessary to lower the capture resolution during low bandwidth transport to produce acceptable video quality. Video bitrates below 1.5 Mbps may need less than full D1 capture resolution to create acceptable video quality.

● **Full D1**	720 x 480/576 resolution
● **3/4 D1**	528 x 480/576 resolution
● **2/3 D1**	480 x 480/576 resolution
● **1/2 D1**	352 x 480/576 resolution
● **CIF**	352 x 240/288 resolution
● **QVGA**	320 x 240/288 resolution
● **SD Single Field**	720 x 240/288 resolution

Resolution in High Definition

The High Definition capture resolution at which the ACT-L3 Transport encodes video may be adjusted below full HDTV resolution. It may be necessary to lower the capture resolution during low bandwidth transport to produce acceptable video quality. Video bitrates below 8 Mbps may need less than full HD capture resolution to create acceptable video quality.

When source is 1080i:

- **Full HDTV**   1920 x 1080 resolution
- **3/4 HDTV**   1440 x 1080 resolution
- **2/3 HDTV**   1280 x 1080 resolution
- **1/2 HDTV**   960 x 1080 resolution
- **HD Single Field**   1920 x 540 resolution (progressive)

When source is 720p:

- **Full HDTV**   1280 x 720 resolution
- **3/4 HDTV**   960 x 720 resolution
- **2/3 HDTV**   800 x 720 resolution
- **1/2 HDTV**   640 x 720 resolution

Frame Rate

The frame rate at which ACT-L3 Transport encodes video may be adjusted below full frame rate. It may be necessary to lower the frame rate during low bandwidth transport or when a higher quality still image is required. Video below 1.0 Mbps may need less than full frame rate to create acceptable video quality. The values reflect a fraction of the current frame rate. For example, at NTSC 29.97 frames per second, 1/2 Frame-rate yields a frame rate of 15 frames per second.

- **Full Frame-rate**   30 NTSC / 25 PAL frames per second
- **3/4 Frame-rate**   22.5 / 18.75 frames per second
- **1/2 Frame-rate**   15 / 12.5 frames per second
- **1/3 Frame-rate**   10 / 8.3 frames per second
- **1/4 Frame-rate**   7.5 / 6.25 frames per second
- **1/5 Frame-rate**   6 / 5 frames per second
- **1/10 Frame-rate**   3 / 2.5 frames per second

Keyframe

Key frames are video frames encoded without reference to any images in another frame. ACT-L3 Transport will automatically create key frames when needed. The keyframe value determines the **maximum** amount of frames to be encoded before key frame creation is forced. The default maximum keyframe value is 300 frames. This setting should not be modified during normal optimization. (When AP is enabled, this setting is disabled.)

Deinterlace

Select if the video should be deinterlaced prior to encoding. If this setting improves your video output, it's possible the field order settings on the decoder need to be changed. Generally speaking one should not need Deinterlace turned on.

Audio Codec

Audio is captured in the encoder and then converted to digital format, compressed, and sent using ACT-L3 Transport. Various audio codecs may be used depending on the desired audio quality and application. Audio bandwidth is subtracted from the overall ACT-L3 Transport stream resulting in a minor trade-off between audio and video quality in some cases.

● **AAC Audio Codec:** The AAC audio codec is the highest quality audio available with the ACT-L3 Transport. The maximum audio bitrate is 64 Kbps per channel. AAC is the only option which allows for 6 (5.1) channel audio.

● **GSM Audio Codec:** The GSM audio codec delivers medium quality audio for lower bandwidth usage. Using GSM audio will allow for lower latency over the ACT-L3 Transport. This codec only supports mono audio (single channel).

● **AAC Low Bitrate Audio Codec:** The AAC low bitrate audio codec delivers lower quality audio for lower bandwidth usage. This codec only supports mono audio (single channel).

● **GSM Low Bitrate Audio Codec:** The GSM low bitrate audio codec delivers lower quality audio for lower bandwidth usage. This codec only supports mono audio (single channel).

● **CELP Low Bitrate Audio Codec:** The CELP low bitrate audio codec delivers lower quality audio for the lowest bandwidth usage.

Channels

The number of audio channels captured and sent using ACT-L3 Transport may be set on the encoder. Each audio channel uses bandwidth, and thus there is a minor trade-off between the number of audio channels and video quality. When in single channel mode, the first channel, or left channel is transported only.

Sample

Audio Sample Rate, in kilohertz (kHz).

ODCT

Overlapped DCT Filter. Enable this at very low bitrates, such as below 200kbps.

Pref. Quality

Prefer Quality over Framerate. This setting, when enabled, will score every encoded frame of video for quality, on a scale of 0 to 300, 0 is the highest quality score; 300 is the lowest. The score is compared to the quality thresholds (Pref.Q.I and Pref.Q.P) and, if the score is worse, the frame will not be transmitted.
NOTE: The Prefer Quality Over Framerate feature will **deliberately drop frames** if the quality settings are set too high for the available network bandwidth. This feature should primarily be used for bitrates below 1Mbps.

Pref.Q.I.

Sets the quality threshold for i-frames (inter frames, better known as key frames). Recommend setting: 40.

Pref.Q.P

Sets the quality threshold for p-frames (predicted frames), the frames that go between the i-frames.

Press "Start Streaming" to commence the Live Stream.

12.4 Presets

Selecting the Presets button for live-streaming will display a list of stored presets, or prepared groups of quality settings. Here you may edit or delete presets. Select a preset and five buttons will appear. Press Edit to rename or to examine the contents of a preset, Up or Down to change the order in which the preset is displayed. Delete will remove the preset; there is a confirmation prompt before deletion. The CustomP button will set the selected Preset into the Custom Preset button on the Home screen.
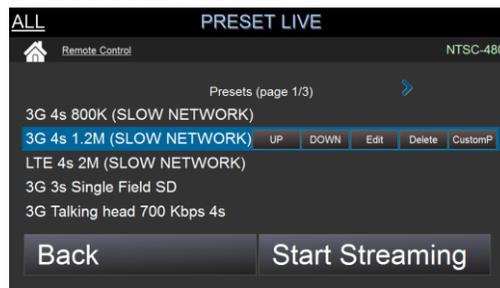
Editing a preset is the same as creating a manually-set stream through the Advanced button, described above, but the preset has a field for a Preset Name, and a link to adjusting LDMP settings to be stored with the preset.

Click the "edit" link in the bottom center to create custom LDMP settings.

13 File Recording and Sending

If streaming live is not an option or not desired, you can record your video as a file and upload for play out later on. By recording your file, you can increase the recording quality settings, including bitrate. High bitrate recordings can generate very large files, a fact to keep in mind when considering how and when you'll be transferring the file for later playback.
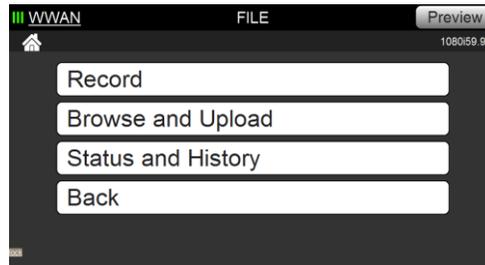
13.1 Record a New File

File recording is just as simple as Live Streaming, and it begins with presets. In this case, quality settings will be higher in general, and error correction is not an issue because files can be transferred at any speed with the built-in error correction of any file-transfer system.

Presets
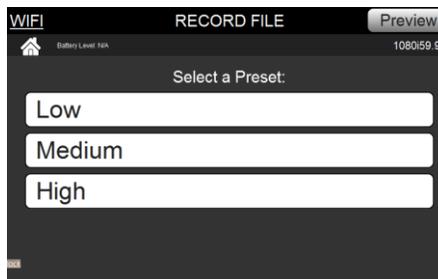
Pressing the Record button will take you directly to the presets screen. Selecting a high bitrate will make for large file size, but the will be proportionally increased. These Presets cannot be changed by the user.

Start Recording

59
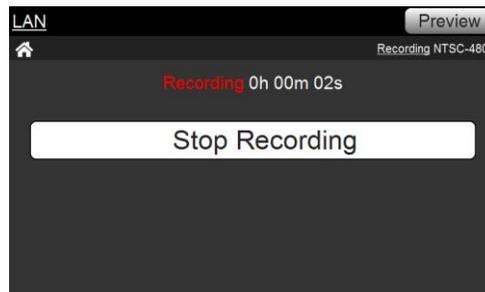
This next screen will make it clear that recording is underway and lets you know what preset you are using/at what bitrate you are recording, along with the elapsed time.

Stop Recording

The recording saves automatically as you record. Press the Stop Recording button to end the recording and save the video file. The file will be named automatically as well, based on the date, video settings, and timestamp. However, you will be able to rename the files by using the built-in file browser.

13.2 Browse and Upload Files

The Avenir Mini has a built-in file-browser which will let you delete or rename files, and edit the metadata contents of the each stored file. Additionally, this is where you navigate to upload files to the Store and Forward Server or other destination set up in the Avenir Mini Settings. Use the left and right arrows to display additional files, and tap on the file name to select the file.
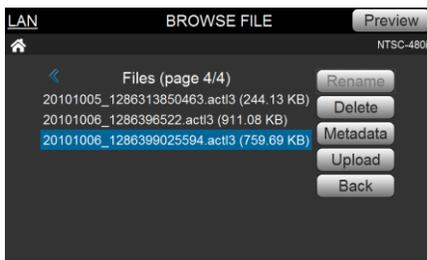
- Rename: Select a file and press Rename to change the filename.
  NOTE: do not change the .actl3 suffix, as this is necessary for other machines to recognize the file-type.
- Delete: Select a file and press Delete to erase the file permanently.
- Metadata: Select a file and press Metadata to change the Metadata fields associated with this file.
- Upload: Select a file and press upload to use the current network connection to send the file to a destination determined by the "SFS Settings menu," either a Store and Forward Server or Streambox Cloud Server.
  NOTE: If uploading to Streambox Cloud, it is important that the Metadata fields are all filled in, and that the Group field matches the "DRM" code of your organization.
- Exit: Return to the main File Menu.

13.3 Status and History

The Upload screen displays the progress of the current uploads, and allows you to quit or resume the upload, if the upload is interrupted. You can also view previous upload attempts and whether or not they were successful by tapping the History heading. While viewing the upload history, select "Clear History" to clear out all entries in the list. Return to the Active Transfers view by tapping "Active Transfers."

Press "Back" to return to the File menu.

14 Basic Settings
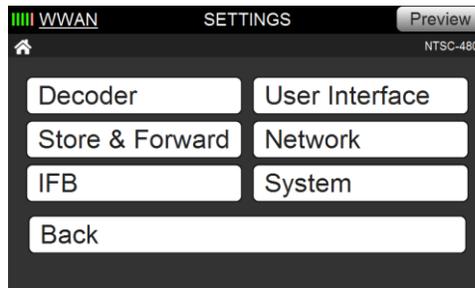
From the Home Menu, select Settings to configure Avenir Mini for use in the field. This section will include settings for Avenir Mini to send streams and files back to the production facility, server connections, configuring inputs and outputs, network setup, and some basic system functions.

14.1 Decoder Settings
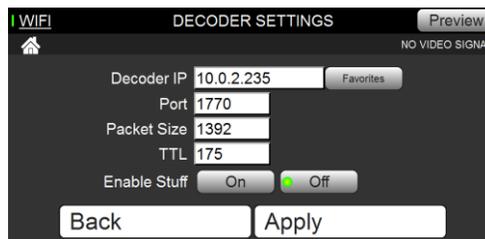
On the Decoder Settings screen, enter the IP address and port number (default is UDP 1770) for a target decoder which will be available to receive your live streams. **Unless instructed to by a Streambox Support Technician or a Network Engineer, do not alter the Packet Size or TTL settings.** If you are on a low-bandwidth wireless link, we recommend that you keep the "Enable Stuff" feature On. This feature is called stuffing, and will ensure that the Avenir Mini encoder is sending at its full bitrate even if the video currently streaming does not require it. This will help ensure that the video optimization process is based on full-bitrate transmission.

This menu can now store a list of your frequently used decoders, which can include, for example, Streambox Cloud, Streambox Enterprise Server, or a workstation with a Streambox Media Player. Press the "Favorites" button to get a list of Decoders stored on Avenir Mini.

Select a Decoder with the Select button. Edit its settings with the Edit button, and remote it from the list with the Delete button.

To add a decoder to your list, Press the "Add New" button.
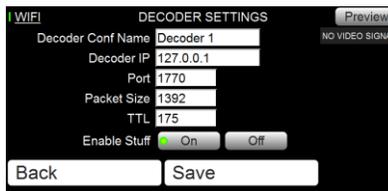
Fill in the fields as if configuring your Decoder on the main Settings page. Press the Save button to return to the list of Decoders.

Press Back to return to the Settings menu without saving changes. Press Apply to save changes and return to the Settings menu.

14.2 Store & Forward Settings
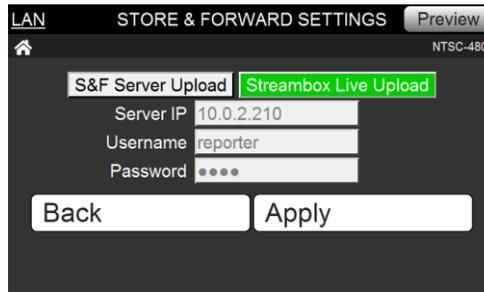
On the Store & Forward Settings screen, set the IP address and reporter credentials (username and password), for transferring file uploads to the Store and Forward Server or Streambox Enterprise Server or, alternatively, the Streambox Cloud Server. Press the "Live Mode" button to upload to the Streambox Cloud Server.

Streambox Decoders with the Store & Forward upgrade can be upgraded with "Store and Forward Receiver" software which will configure a Decoder to receive files directly from Avenir Mini, instead of sending to a server. To send files to a Decoder with Store and Forward Receiver, put the Decoder's IP address in the "Server IP" field and leave the Username and Password fields blank.

Press Back to return to the Settings menu without saving changes. Press Apply to save changes and return to the Settings menu.

14.3 IFB Settings
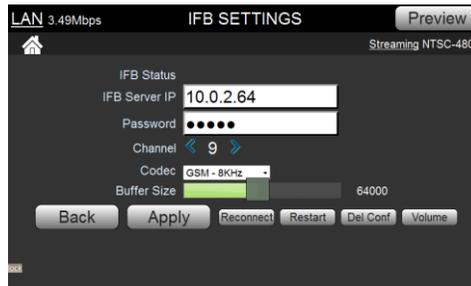
On the IFB Settings screen, set the IP address, password, and channel number or name for the IFB (Interruptible Foldback) Server, in order to receive IFB audio instructions and messages from the receiving location.

Setting the Codec from the available choices will alter the bitrate, and hence audio quality of the audio stream coming from the server. Here the Buffer size can also be adjusted: when set too low, audio will stutter, but increased buffer increases the delay in the audio.

Press Back to return to the Settings menu without saving changes. Press Apply to save changes and return to the Settings menu.

Additional buttons on the Settings menu allow you to attempt to reconnect to the IFB server, restart the IFB Client (within Avenir Mini—this should be used only as a diagnostic step in case of a problem), delete the IFB configuration entirely, and to go to a screen where the receiving volume can be adjusted.

13.4 User Interface Settings
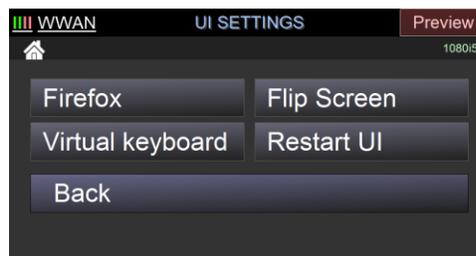
These settings are not applicable in the Avenir Mini.

14.5 Network Settings
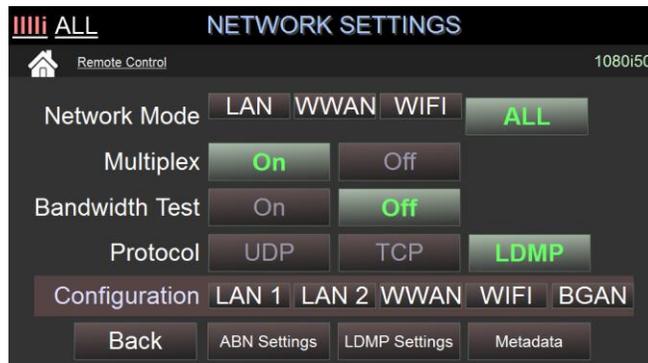
On the Network Settings screen, you can configure which network adapter(s) through which you're connecting. The Network mode will always appear in the upper left corner of the screen, and you can tap that word to get to this menu at any time.
- Select LAN (Local Area Network) for when connected via Ethernet cable to a network.
- Select WWAN (Wireless Wide Area Network) when using 3G/4G USB adapters. When you select WWAN, a "Modem Status" button appears. Select this button to view the status and connectivity of connected WWAN adapters.
- Select Wi-Fi (Wireless Area Network, 802.11b/g) when connected to a public or open private wireless network. Remember when using Wi-Fi that the network is controlled by someone else, and that streaming video or large video transfers may not be tolerated.
- Select All to engage multiplexing of multiple connections (LDMP Only)

Multiplex: Select ON to allow a live video stream to be split among more than one WWAN adapter.

Bandwidth Test: Select ON to permit the adjustment of how much bitrate goes through each available WWAN adapter.

Protocol: This setting default to LDMP, the new two-way communication protocol for Streambox Avenir Mini and its Streambox Decoder. However, this will not work in some circumstances, or older versions of Streambox Decoder. If Avenir Mini is unable to communicate with the decoder using LDMP, you can switch to the UDP or TCP. If Avenir Mini is connecting to older versions of Decoder, switch to UDP. (LDMP requires Decoder version 3.128 at least; TCP requires Decoder version 3.125.)

Configuration: See Section 11 for information on configuring the network adapters.

ABN Settings

The ABN button will take you to a screen in which you can manually start and stop a Bandwidth Test, one which normally occurs as part of the Automatic Bandwidth Negotiation.

ABN_TIME (intger) Set ABN duration. Input -- to set default.	45
ABN_AVG (intger) Set ABN averaging interval -- to set default (5 seconds)	19
Max Delay for low latency (intger: ms)	2000
Min bitrate for low latency (intger: kbps)	1500
Max Delay for talking head/action (intger: ms)	2400
Min bitrate for talking head/action (intger: kbps)	500
Max bitrate for ABN/streaming (intger: kbps 500-12000)	3000
EnableSmartStuffing (intger) Set stuffing algorithm for VBR below 0.5s, ON/1- default	--
RTTx for Low Delay	-1
Jitter2 for Low Delay	-1
RTTx for Talking Head/Action	-1
Jitter2 for Talking Head/Action	-1
Back	Apply

Use the ABN_Time field to adjust the length of the ABN test. It is recommended to run for at least 45 seconds. ABN_Avg is a field that adjusts how sensitive ABN is to changes in bandwidth; it uses this number of seconds to average the measured bandwidth over that time.

The next four fields, "Max Delay for _____" (measured in milliseconds) and "Min Bitrate for _____" (measured in kilobits per second) are the two threshold settings for the respective Smart Presets to which they apply; the first two fields apply to Low Latency only, while the third and fourth field apply to both Talking Head and Action Smart Presets.

When that Smart Preset is selected, ABN uses these measurements as required thresholds for the network connection to meet. The ABN system cycles through groups of LDMP settings, it will use the first one that meets both criteria for streaming.

The field "Max Bitrate for ABN/Streaming" is the maximum bitrate at which Avenir Mini will attempt to stream. This applies to manually-set streams using the Advanced menu as well as Smart Presets.

Enable Smart Stuffing is a feature that regulates the amount of Packet Stuffing added to the stream when the VBR Buffer is set below 0.5 seconds.

The last four fields apply once again to the Smart Presets. These can be specific LDMP settings for the Low Latency and Talking Head/Action Smart Presets. RTTx changes the RTT Multiplier Setting, and Jitter2 changes the Jitter2 buffer setting. The default setting of **-1** means that no changes are made from the existing LDMP defaults.

Press Apply to save changes, or Back to leave this screen without saving changes.

LDMP Settings

The LDMP Settings button opens the settings screen for LDMP's settings. Use this screen to enable manual LDMP settings (applies to the Advanced mode only—Smart Presets always use automation for LDMP), adjust the Congestion Window (CWND Minimum and maximum), Acknowledgement Timeout, and Send Timeout settings. See section entitled "Advanced LDMP Settings" for information about these settings.

Press Apply to save changes, or Back to leave this screen without saving changes.

Metadata

Metadata allows ACT-L3 live-streams and recorded files to be identified with custom location and usage information. Fill in these fields by tapping on each and using the software keyboard to enter or edit the content. This information is visible to producers and others on the receiving end, so you can inform them as to what you're sending.

When using Avenir Mini in concert with the Streambox Cloud Service, it is required to use these metadata fields. The DRM field must match the "drm" name for your organization (sometimes called "group"). Streambox Cloud will ignore streams with blank metadata, and streams with "public" in the DRM field will be public to all Streambox Cloud users.

Press Save to save changes, or Back to leave this screen without saving changes.

14.6 Advanced LDMP

Overview

LDMP is a streaming video networking transport technology developed by Streambox. LDMP stands for "Low-Delay Multi-path", and is designed to guarantee fixed latency over multiple network paths as well as aggregate all available bandwidth for the use of streaming video. LDMP will give more reliable transmissions, and allow combine throughput of multiple network types. LDMP is also a "semi-reliable" transport, which means that users will not need to use as much FEC.

Requirements
● Decoder version 3.139 or later: To update your Decoder software please contact support@streambox.com and arrange for your Decoder to be updated or to get the correct software.

Decoder version 3.139 is backwards compatible so if you encounter issues with LDMP you can simply switch the Encoder back to UDP mode.
- UDP Port 1770 open 2-way bi-directionally on firewall: LDMP uses efficient, low-overhead two-way communication over the WAN you use for sending your streams, be it the internet or private network. Units at both ends will receive and send UDP packets through port 1770. Any firewalls between Encoder and Decoder must be configured to allow this two-way traffic and forward the incoming traffic to the Streambox.

Advanced LDMP: Settings

There are three new variables which affect the performance and functionality of LDMP mode, they can be modified by going to "Network -> LDMP".
- CWND sets the maximum congestion window for all interfaces combined.
- CWND_MIN sets the Minimum congestion window for each individual interface.
- CWND_MAX sets the maximum congestion window for each individual interface.
- ACK_TO is the number of milliseconds the encoder will wait for confirmation that a packet arrived before it tries to resend. This setting affects allowed latency of the stream because interfaces (USB modems for example) that are too slow and don't meet this requirement will not be used. This is how LDMP is able to guarantee latency. If your total bandwidth seems very low, and cards are not being used then try raising this number.
- SND_TO is the number of milliseconds the encoder allows any interface to exceed the ACK_TO number before it stops using it.
- RTT Multiplier tells the decoder how much predictive jitter buffer to create for out of order packets. Increasing this value will increase reliability and latency when multiple interfaces are used.
- JITTER2 tells the decoder how much predictive Jitter2 buffer to create for bursting or delayed packets. Setting this value higher will increase reliability and latency when network bandwidth fluctuates.

Advanced LDMP: Best Practices

FEC should not be used with LDMP. The nature of LDMP's interaction between the Decoder and Encoder negates the need for FEC's redundancy, because the Encoder is better informed as to what the Decoder is failing to receive.

For the best results with rackmount units use the following settings for your respective network.

Fast Broadband Public Internet connection single interface	*Slow Broadband Public Internet connection single interface*
- CWND: 150 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:200 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 10	- CWND: 150 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:300 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 10
Broadband Public Internet connection multiple interface	*LAN connection single interface*
- CWND: 150 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:300 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 30	- CWND: 150 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:150 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 10
BGAN or Thuraya Broadband Satellite	*WWAN with Slow or Unreliable Networks*
- CWND: 75 - CWND_MIN: 75 - CWND_MAX: 75 - ACK_TO:1200 - SND_TO:2000 - RTT Multiplier: 0 - JITTER2: 0	- CWND: 170 - CWND_MIN: 25 - CWND_MAX: 25 - ACK_TO:1200 - SND_TO:2000 - RTT Multiplier: 4 - JITTER2: 400
WWAN with LTE Networks	*WWAN with 3G Networks*
- CWND: 150 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:250 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 40	- CWND: 75 - CWND_MIN: 5 - CWND_MAX: 75 - ACK_TO:300 - SND_TO:2000 - RTT Multiplier: 1 - JITTER2: 40

14.7 System Settings

Restart Encoder/Restart Avenir Mini

The System Screen can be used to restart the Encoder Software with the "Restart Encoder" button, or restart the entire Operating System by pressing the "Restart Avenir Mini" button.

Restore Defaults

The Restore Defaults button will restore all settings to their initial state. This will delete decoder and server settings, video input settings, etc. Be careful when using this button!

Remote Configuration

Remote configuration is a very simple way for you to connect your Avenir Mini to the network—no matter which network type is available—and connect to a Streambox Technician who can examine the menus and settings, and often replicate your issue right there in your own machine. Streambox technicians also have access to hidden settings that can aid your streams and Aircard usage as well. Remote Configuration is automatically enabled

To begin a Remote configuration session with a technician, studio engineer, or Streambox Support, begin by connecting Avenir Mini to a network. Next, call the tech, engineer, or calling Streambox Support. When the technician is ready to work with your Avenir Mini, be ready to tell them the Avenir Mini's Serial number.

Technicians and Engineers should see "Section 14: Remote Configuration Over the Internet" to see how to remotely connect to Avenir Mini.
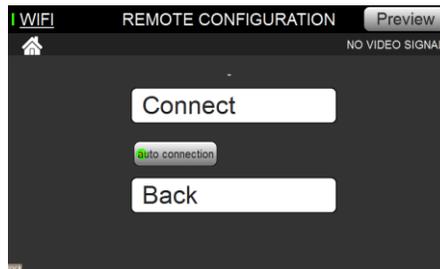
The Avenir Mini will connect to a Streambox server using SSH, a secure communications link, using a high-numbered port to ensure the connection doesn't interfere with other network traffic. The Streambox technician will verify your connection, and then connect via the Streambox server to your Avenir Mini.

You may not see the screen or menus change, because the technician will see his own set of menus and settings.

Remote configuration works over LAN and Wi-Fi and even works over 3G/4G connections.

NOTE: When using Remote Configuration and streaming through the same connection, make sure to limit your streaming bitrate so the Remote Connection has sufficient bandwidth to continue operating.

File Sharing

The File Sharing button can stop and start the File Import feature. Please see "Section 15: File Import" for an explanation and instructions for that feature.

Update Software

Avenir Mini can update its software over the internet. You must have a network connection capable of accessing the web, but any connection will do. From time to time, you may receive an email from Streambox asking you to apply a new update.

Press the Update Software button on the System Settings screen. You'll first be shown a warning overlay, reminding you to stop any stream and make sure the Streambox is connected to a reliable, preferable wired, internet connection. Press "Update" to continue to the update screen:

On this screen you can see various software releases for Avenir Mini. Some of them are explicitly labeled BETA, which means that they are unsupported experimental software being tested by willing customers. Speak with a Streambox support representative to find out whether one of the Beta software releases has a new function that you'd like to help test.

Find the software version you'd like to change to, and select "Upgrade" or "Downgrade" as the case may be. One does not need to upgrade to each incremental version—there is no harm in skipping a version and upgrading directly to the newest software.

Depending on your network connection's available bandwidth, the upgrade can take several minutes to download and then several more minutes to install the updates. If the update process is interrupted, just try again. Updates are free for the foreseeable future.

Following an upgrade or downgrade, the Avenir Mini will require a restart in order to apply the changes. You can perform a soft restart in the system menu or you can manually reboot the entire unit.

APN Name

This button allows one to change the name of the Wi-Fi access point, known as the SSID, of Avenir Mini.
Normally, Avenir Mini's SSID is the same as its serial number.
Do not make this SSID the same as your regular Wi-Fi network. This network is one created by Avenir Mini alone.
Do not attempt to use Avenir Mini as an ordinary Wi-Fi access-point.

Restart UI

This button will restart and refresh Avenir Mini's User Interface.
Use this when asked to by a Support Technician.

15 Network Configuration

For each Streambox unit to function properly over an IP connection it will need an IP Address, Subnet Mask, and Gateway. The TCP/IP settings should be provided by the network administrator or Internet Service Provider.

From the Home Menu; select Settings, then select Network. Select the type of network you're connecting to. When using WWAN or public Wi-Fi, an IP address will be assigned automatically through DHCP (in which a server on the network provides an address), and manual configuration is unnecessary. However, LAN connections and sometimes private Wi-Fi connections will require manual setup.

As of version Avenir Mini 1.8.0, an "ALL" button has been added to permit the use of multiple types of connections at once; selecting the All button will permit you to access the configuration menus for LAN1, LAN2, Wi-Fi and WWAN all together. Disconnect any connections that are not to be used for streaming.

15.1 LAN Configuration

Select LAN from the list of network types. Avenir Mini has two LAN adapters, so select from LAN1 and LAN2 to choose which adapter you'll be configuring.
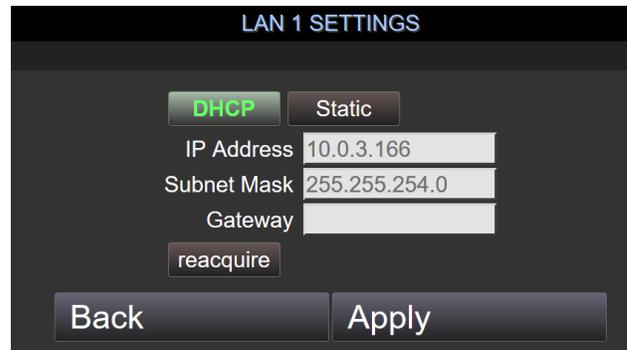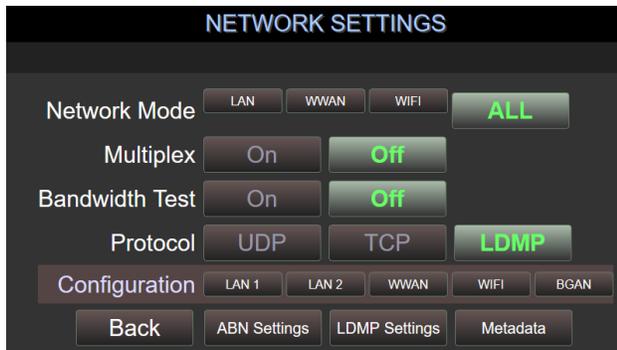
Use the available fields to adjust IP address, Subnet Mask, and Default Gateway, as well as to switch from DHCP to Static IP.

15.2 Wi-Fi Configuration

Select WI-FI from the list of network types. Then select "Wi-Fi" to connect to a network.

Select WPA (1 or 2 Personal are supported, but not WPA 2 Business), WEP, or None for the level of encryption required by the available network. If you know the SSID (Network name, a.k.a. Access Point name) for the Wi-Fi network you'd like to connect to, you may enter it on the "AP Name" line, which is not

case-sensitive. Then enter the caps-sensitive password in the Password field. Press Connect to join the network. If required, the IP Address, Subnet Mask, and Default Gateway can be entered manually. At any time, press Disconnect to abort the connection or to leave the network.

If you don't know what networks are available, Press the "Scan" button to detect nearby networks. A screen overlay will appear and, after a moment, begin to list available networks and a number of bars indicating signal strength (more is better). Select a network from the list by tapping on the name. Enter Encryption Level, password if necessary, and press Connect.

Note that not all Access Points will transmit their Name/SSID, as a security measure. If your network is not listed, try manually entering the AP Name. Consult a system administrator if you do not know what that should be.

WWAN: See Section 12 for information on WWAN settings

BGAN: Used for configuring the Hughes BGAN Terminal for the satellite internet connection.
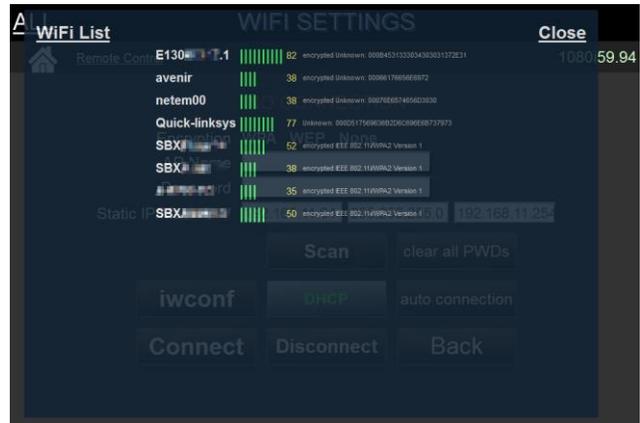
15.3 WWAN (Wireless Wide Area Networking)

WWAN refers to the regional data networks established by mobile telephone carriers.

Emphasizing maximum area of coverage over quality, the WWAN network extends in some form over nearly all of the United States and North America, and the areas of high population on every continent.

In every case, the WWAN network (or networks) is supported by a cellular infrastructure, wherein the coverage area is divided into circular regions, cells, and at the center of that cell is the transmitter/receiver. As with cellular telephone calls, WWAN connections are handed off to different fixed antennas as the user moves from cell to cell. Cells in densely populated areas are equipped to handle more calls and data connections than cells in sparsely populated areas.

At the edge of the coverage, in remote areas, the network might only cover a highway or a small population center. Mountains and large bodies of water are often obstacles in receiving a signal to connect to WWAN networks. In regions supported by multiple carriers, there will be areas that are covered by one carrier that isn't covered by some others.

WWAN and Cellular/Mobile telephone carriers use numerous radio technologies to carry the WWAN network and mobile phone communications. Devices capable of connecting to some of these technologies are not able to connect to all of them. The technologies primarily differ in the specific radio frequencies they use, and how the device will obtain access to the network.

CDMA ([Code Division Multiple Access](#)) and GSM (Global System for Mobile Communications) are the two most common standards for mobile telephone communications; a device capable of using one standard will be incompatible with the other. Each mobile carrier will establish a network using one or the other standard, and sell only devices compatible with that standard. In the United States, for example, AT&T and T-Mobile use the GSM standard, while Verizon Wireless and Sprint use CDMA. In most of Europe, GSM is the only standard. CDMA networks cover Japan, excluding GSM entirely. If you are uncertain whether your device is GSM or CDMA, note that all GSM devices carry a SIM card to uniquely identify the unit. CDMA devices do not carry SIM cards.

Within each of those standards, there are radio technologies that are constantly being improved for speed, security, enhanced connectivity, and so on. These technologies include PCS, PDC, IS-95, iDEN (2G), GPRS, EDGE (2.5G), UMTS, HSDPA (3G), WiMAX, LTE, HSDPA+ (4G) and many others. The "G" ratings by which they are grouped signify the generation of technology to which they are attributed, though numerous enhancements to each technology mean that the enhanced versions can span the generations. (The first generation, 1G, was basic analog cellular telephony.) Though some of these technologies are outdated, the older generations still exist at the fringes of the network, as it takes time and money to convert an antenna tower from 2.5G to 3G to 4G. As a result, many mobile communications devices will support several generations at once.

In practice, devices that connect to these WWAN networks fall into two categories: stand-alone, and computer modem. Stand-alone devices include mobile phones and smartphones, and wireless "hotspots" that permit Wi-Fi connections and connect them to the internet via 3G or 4G. The Computer modems are generally connected to a computer via USB and require the computer to run specific software in order to "dial" the modem and connect to the WWAN network. The Avenir Mini uses the modems, but contains its own software for connecting the modem to the internet.

Connecting Avenir Mini to WWAN

The Avenir Mini contains 4 embedded modems, selected at the time of manufacture, for connecting to 3G or 4G WWAN data networks. A plate on the Avenir Mini chassis conceals the ports for adding SIM cards to the modems. CDMA modems are also supported and do not require SIMs.

Additionally, 2 USB (2.0) ports on the side of Avenir permit the user to attach additional USB WWAN adapters for additional network connectivity.

NOTE: USB modems must be initialized before use with Avenir, and occasionally updated over time, using a Windows or OSX computer. Streambox recommends that USB modems be checked on a regular computer every few months.

Some USB WWAN adapters require that they be connected at a right-angle to their general oblong shape—in those cases, use a short USB extension cable (often provided with the WWAN adapter, or available from the WWAN carrier, or wherever cables are sold) to connect the adapter to the Avenir Mini, again using the recessed compartment. If that is not available, you may still connect the WWAN adapter directly to the side-panel.

Once connected, the Avenir Mini should automatically detect the WWAN adapters – it may take several minutes. When some or all WWAN adapters are connected and you wish to connect the Encoder to the WWAN networks, go to the Network Settings screen (Home -> Settings -> Network) and select WWAN from the Network mode

choices. You will see the "WWAN/Modem Settings" button become available. Select that to view information about individual WWAN adapters.

Once connected, WWAN adapters will assign themselves an IP address, issued by the carrier. For that reason, there are no manual IP settings for WWAN connections.

WWAN Settings (Modem Connection Manager, MCM)

Before using a new USB WWAN modem with Avenir Mini, the modem has to be activated and initialized first on an ordinary USB-equipped computer (Mac OSX or Windows) using the modem carrier's software, which is provided with the modem or can be downloaded from the carrier's website.

WWAN modem operation is similar to the operation of a dial-up modem. Modem Connection Manager (MCM) needs to establish a dial-up connection first and then it tries to establish a data connection.

The first time Avenir Mini uses a particular model of WWAN modem, the modem must be configured in Manual mode to connect to the carrier's network. Following that, the modem may be used in automatic mode. The current mode is indicated in parenthesis to the right of the Modem Settings heading.
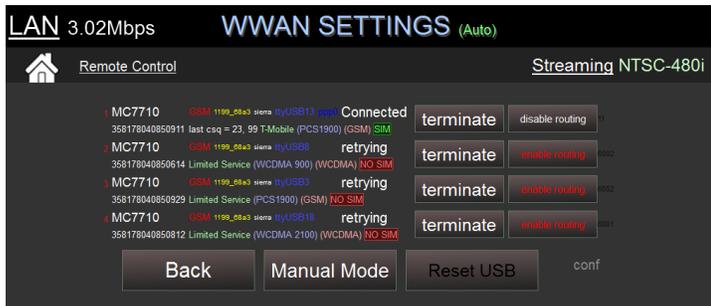
Automatic (Auto) mode

This is the default mode, for use with modems already configured by the user or by Streambox. When in Automatic mode, a modem is plugged in to Avenir Mini, and the MCM automat*i*cally attempts to connect to the Internet. After connecting successfully, the MCM will enable the routing of data from the encoder to stream to the Internet.

When in Automatic mode, two buttons appear next to each modem's entry: Terminate, which will sever the connection to the Internet, and Enable Routing, which forces the MCM to route data from the encoder to the connection.

NOTE: Normally it is unnecessary to press either of these buttons.

Manual mode

Switch to Manual mode whenever using a modem for the first time in Avenir Mini and the modem is not recognized.

You can configure a modem by clicking the "Config" button. If the modem is connected, click the "Terminate" button to disconnect so the Config screen can be accessed. After the modem is configured and saved, users can connect to the Internet manually by clicking "Reconnect" button.

In the Config screen, enter appropriate settings information (usually the APN is all that is required, but sometimes the username, password, SIM PIN, and/or telephone number) in the modem configuration screen, and click "Save" button.

While the modem is disconnected, some information can be accessed on the modem by clicking the modem model name (e.g. MC7710); if that modem is underlined, the link is available. A display of the modem's band settings, SIM detection, and more is shown. Additionally, if the modem is a Sierra modem on GSM networks, the word GSM, appearing in red, can be clicked while the modem is disconnected, and the Sierra Settings screen is displayed:
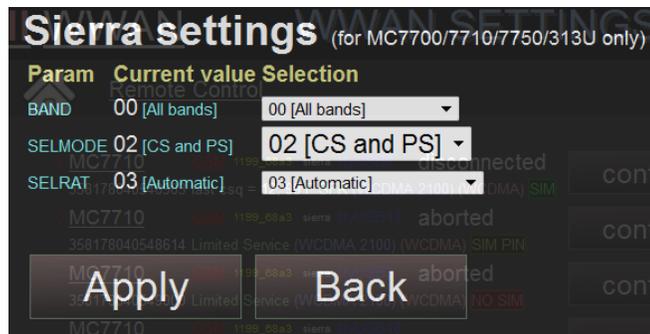
On this screen, the Band selection, the Service Domain selection (SELMODE), and the Radio Access Technology setting (SELRAT). These settings are usually changed by Streambox Engineers at the time of initial setup for the SIM.

NOTE: If all modems are already configured and are able to use Automatic mode, do not use the Manual mode to change connection settings.

Polling Mode

This is a modem-diagnostic mode that will not connect the modems to the network, but will interrogate the modems' connections and attempt to measure them.

Modem Configuration Settings

Modem Information

On the left side of this screen is a display of this modem information, which includes its model and maker, serial number, and a list of serial ports called TTYs. If possible, this will note which USB port, "Slot" in which it is plugged.

SIM PIN

This is the Personal Identification Number inside the SIM card. It's a security passcode unique to each modem. Only GSM modems require it.

APN (Access Point Name)

This is the network component belonging to the carrier that resides on the internet and connects to the modems. Often the carrier's configuration software has already set the appropriate APN in the modem (or stored on the SIM card), so users don't have to specify it. If it is not the case, users can specify the APN of the carrier.

CDMA modems don't require an APN.

Phone number

1. CDMA modems:
   "#777" is the default phone number. You can leave the phone number blank and MCM will automatically use this number.

2. GSM modems:
   "*99#" is the default phone number. You can leave the phone number blank and MCM will automatically use this number. If the modem has multiple configuration profiles, each of which has an APN setting, the phone number is used to specify the profile. For example, the phone number for profile 2 is "*99***2#" while the phone number for profile 3 is "*99***3#" and so on.

User ID and Password

This is used for establishing a PPP (Point-to-Point Protocol) connection. Most carriers use common user ID and password for all users/modems. Some operators like T-Mobile don't need them.

Metric

This field is an experimental field used to prioritize any connection for purposes of the Remote Config connection. This has no effect on the Streaming processes. Metric defaults at 300 for WWAN modems, 200 for Wi-Fi, and 100 for LAN. (The Wi-Fi and LAN settings are hidden.) The lower the Metric number, the higher the priority.

Carrier Type

The communications technology used by the modem's carrier: either GSM or CDMA. Most of the time, auto detection will detect the carrier type. If not, ask your carrier which one to select.

Apply to

Use this menu to specify to which USB port (referred here as "USB Slots") on Avenir Mini the configuration is applied. The choices here are "This S/N" (This Slot Number), the current slot in which the modem is plugged. "Any," which refers to any of the 8 slots, "SP Slot 1" (Special Slot #1), which is the leftmost top USB port as face the screen while orienting the battery shoe downwards. "SP Slot 2" (Special Slot #2), which is the USB port adjacent to Special Slot #1.

AT Commands

Use these fields to specify AT (a.k.a. Hayes) modem commands to initialize the modem. One typical case is "ATZ", which means "modem reset." Commands must have the AT ("Attention") prefix before the command. Lists of AT or Hayes commands can be found on the Internet.

Serial Port

Most modems have multiple ports and sometimes the MCM cannot find which one is the correct modem port. In that case, users must specify the correct port manually. In the "Modem Information" in the left side of the screen, the line labeled "TTYs" shows the detected ports of the modem.

15.4 BGAN (Satellite)

BGAN connections have higher latency range from should be 256Kbps or higher. The Streambox Avenir has some configuration options that allow it to connect directly to the BGAN terminal. To connect and use BGAN on the Avenir use the follow steps.

1. Set the Avenir to the ALL Network mode.
2. Connect the Avenir to the HNS9201 terminal with an Ethernet cable. Be sure the terminal is powered on, then power on or restart the Avenir unit
3. From the Avenir full user interface select Settings > System > HNS9201
4. Select Term IP and verify that the IP is the correct IP for the HNS9201 terminal (192.168.128.100)
5. Select Open Term, the unit should display the terminal information and prompt for registration.
6. Select the desired connection and the terminal will start the connection. If registration or connection fails then you may need to use a laptop to connect to the terminal and establish a connection using BGAN Launchpad.
7. After the connection is created you need to use a custom preset to stream live with BGAN optimal settings. While video source is connected select Presets > BGAN-Streaming 256K or an appropriate preset for your connection and choose "CustomP". This will set the custom preset button on your home

screen to the selected preset for easy access. For streaming live video with BGAN, minimum 256K Streaming class connection is recommended.

16 About Menu

The About screen displays the version and build information about the software and web server running on the Avenir Mini unit, as well as numbers that are unique to this Avenir Mini, such as its MAC address (network hardware address) and its Streambox Serial Number (S/N). This information may be requested by a Streambox support technician.

This screen also displays the current IP address of the machine if connected to a network. (The IP Address displayed is that of the LAN1 port before the LAN2 port, or the IP of the first WWAN adapter plugged in, or else the Wi-Fi adapter's IP address.)

Finally, this screen displays the amount of available file-storage space on the solid-state drive used for storage. If this amount gets below 1 GB (Gigabyte), it is time to delete some files to recover space.

The Package Info button will display another screen with additional version information. A Streambox Technician may ask the user to obtain information from this screen during troubleshooting or an upgrade.

1080i50

avenir-logrotate-conf	0.2	**restorekit**	0.0.2
logrotate config files for encoder and mcm		restore the default setting files (Avenir).	
avenir-updater	0.1.5	**serial-touchscreen**	1.0.0
Avenir Remote Software Update Daemon		touchscreen serial configuration for Xorg	
avenirifd	1.8.0.15b	**sfc-for-avenir**	2.0.30a
Network Interface configuration Daemon for Avenir		SFC Client for Avenir	
config4root	1.0.11	**sierra-driver**	1.7.40
root account configuration for starting		Sierra wireless modem driver for 2.6.34	
gpiomonitoranddriver	1.28	**streambox-encoder-for-avenir**	3.160.01
GPIO Monitor & driver for Winbond W83267DHG		Streambox Encoder for Avenir	
madwifi-config	1.0.3	**streambox-ifbclient**	3.14
configuration for WiFi Master mode of ath_pci dev		Streambox IFB Client	
modemconnectionmanager	1.0.45l	**wireless-drivers**	2.6.34sb2.4.1
modem connection manager.		updated wireless drivers for kernel 2.6.34sb2	
rclocal4avenir	1.0.2	**www-for-avenir**	1.8.5p
/etc/rc.local file for Avenir		Web files (HTML, PHP, CSS) for Avenir	

Back

reload

17 File Import

File Import is a feature in which you can now set Avenir Mini on a network, enable this feature, and then you can move files (such as recorded ACT-L3 files) to and from the Avenir Mini. Perhaps you want to send in a file you created outside Avenir Mini, using our Store and Forward client, or extract a file from Avenir Mini so you can put it into a laptop editor. Either way, File Import will let you move files as easily as using a shared network drive.

Note that this File Import system will work with Streambox and non-Streambox systems (that support CIFS/SMB for file transfer) alike. If sending files to a Streambox system, it is better to use Avenir Mini's Store and Forward Client, but this system will let you share files from or to a non-Streambox Windows or OSX system with ease.

17.1 Enabling File Import

Begin by putting Avenir Mini on a network over which it will be sharing files. Connect Avenir Mini to an private LAN if available, or create a small LAN by connecting an Ethernet cable from Avenir Mini to the workstation or notebook computer with which it will share files. Alternately, you can connect to Avenir Mini's own Wi-Fi network.

Activate this feature by starting at the Home screen and selecting Settings -> System -> Others -> CIFS/SMB and press Start. The word "ON" will appear when this feature is started.

17.2 Connecting to Avenir Mini

Any OSX, Windows, or Linux computer can connect to Avenir Mini as if Avenir Mini is a Windows (CIFS) network drive. The connecting computer does not have to be a Streambox or running Streambox software to connect. Use that computer to connect to Avenir Mini as a guest and Avenir Mini will share a network-shared folder called "actl3". Opening this folder will reveal the RAW ACT-L3 video files recorded by Avenir Mini, often with an xml-file of the same name, which contains the metadata.

The connecting PC has read/write permission to this folder: its user can take files off, or put files on Avenir Mini in this fashion. Once on Avenir Mini, any files can be sent to the Store & Forward Server using the built-in Store & Forward client.

Connecting over LAN

To connect to Avenir Mini over LAN using a Mac, Open Finder, open the "Go" menu and select "connect to server..." (or just Command-K) and, using the address for Avenir Mini's LAN connection (as seen in its Network settings), enter the server address as
smb://IP Address
Example: smb://10.3.10.50

If prompted for a login, select guest access or use guest as the username, no password.

From a Windows PC, use Start -> Run and enter
\\IP address
Example: \\10.3.10.50

If prompted for a login, select guest access or use guest as the username, no password.

Connecting with Wi-Fi

To connect to Avenir Mini over Wi-Fi, one uses the same Wi-Fi connection used by the remote-control via iPad/iPod/iPhone (see Section 16). Connect to an Access Point with the Avenir Mini's serial number as the network name. The password is "1111111111" (that's ten ones). This gives access to Avenir Mini's private Wi-Fi network, but doesn't grant access to the files.

NOTE: You must use Avenir Mini's Private network for this function; to attempt this using a Public Wi-Fi connection will could expose your files to tampering or deletion.

To access Avenir Mini's file-store, connect to Avenir Mini's Wi-Fi address on its own network: 10.111.111.1
To connect to Avenir Mini over Wi-Fi using a Mac, Open Finder, open the "Go" menu and select "connect to server..." (or just Command-K) and enter the server address as
smb://10.111.111.1

If prompted for a login, select guest access or use guest as the username, no password.

From a Windows PC, use Start -> Run and enter
\\10.111.111.1

If prompted for a login, select guest access or use guest as the username, no password.

File Import and WWAN

As with using a public Wi-Fi, using WWAN with File Import would amount to sharing your files over the public Internet. Additionally, WWAN modems are not all alike and some may not handle the sharing correctly. For these reasons, Streambox strongly recommends you *never* use File Import while connected to WWAN.

Appendix A: Avenir Mini 5 Specifications

Video Formats	HD: 1080/23.98PsF, 1080p/23.98, 1080p/24, 1080p/25, 1080i/59.94, 1080i/50, 720p/59.94, 720p/50; SD: (NTSC): 525i/59.94, (PAL): 576i/50
Video Encoding	HD: 1920, 1440, 1280, 960x1080, 1280, 960, 800, 640x720, 1920x540; SD: 720, 528, 480, 352x480, 320x240, 720, 528, 480, 352x576, 320x288, 720x240, 720x288
Audio Formats	AAC, CELP, GSM 1/2/4/8 channels
Compression	Streambox ACT-L3 Advanced Profile, ACT-L5 Advanced Profile
Network Interfaces	Up to 5x embedded 3G/4G/LTE modems and 5x external USB modems, 1x Gigabit Ethernet, 2x Wi-Fi (802.11 a/b/g/n)
Antennas/RF	High gain antenna array for 3G/4G/LTE, Dual-Wi-Fi Antenna
Video In	HD-SDI and HDMI-full size
Audio In	Embedded SDI Audio, HDMI audio
Video Post-Filtering	Interlaced/progressive post filtering, including de-blocking, de-mosquito, and anti-aliasing
Metadata	End-user selectable: Title, Reporter, Location, Group
IFB Audio Support	3.5mm stereo
Color Profile	4:2:0, 4:2:2
Forward Error Correction	Reed-Solomon, Parity, Shuffle; adjustable from 0 to 50%
Store & Forward	Supports S&F Server, Live Server, Enterprise Server or Decoder SFR
User Interface	Touch screen 2.4" LCD or remote via Web, iPhone, iPad or Android
Storage	64 GB SSD
Operation	Automatic and Advanced; One Click Automation Modes: Low Delay, Talking Head and Reliable
Latency	User selectable, sub second, 2 seconds, up to 14 seconds
Network Protocol	LDMP 2.0, UDP, TCP
Dimensions	5.5"W x 7.9"D x 2.3"H (14cm W x 20cm D x 6cm H)
Weight	3.6lbs (1.6kg)
Battery Life	1-2 hrs (depending on battery type)
Power	AC 100-240V 50/60Hz, DC 11-17V, Max. 65W
Accessories	AC Adapter
Options	Streambox Signal Extender (SSE) 1.6, SSE 4 USB, SSE 10 USB, SSE2.0

Appendix B: Functional Test

It is recommended to perform a functional test or your Streambox system to both verify functionality and to familiarize yourself with the configuration and usage. The systems should be set up back-to-back in a controlled environment with inputs and outputs connected similar to how they would be set up in the production environment.

Ethernet Bench Test

To bench test an Ethernet system you will need an Ethernet (CAT5) crossover cable. This is different from a T1/E1 crossover cable. A standard category 5/6 (CAT5) crossover cable with RJ45 connectors can be used. Alternatively, an Ethernet hub or switch may be used for bench testing.

Connect the Streambox Units

Make all required video, audio, and network connections for testing at this time. After the Streambox units are installed and connected, power them on and verify operation.

Enter IP Address Information

After the units have powered on, enter a private static IP address for each system to test with. You may use the following IP address information in most cases.

Encoder	**Decoder**
IP Address: 10.0.2.130	IP Address: 10.0.2.131
Subnet Mask: 255.255.255.0	Subnet Mask: 255.255.255.0
Gateway: Not required for this test	Gateway: Not required for this test

Set Test Parameters

After network connectivity has been established the ACT-L3 Transport must be configured.

1. Start by entering the target decoder IP address (10.0.2.131 in this example) on the encoder and setting a target bitrate.
2. On the decoder, verify that a data stream is being received by examining the front panel display.
3. Next, verify the video and audio output from the decoder's baseband outputs.

Test the System

Experiment with different settings to familiarize yourself with the ACT-L3 Transport.

Cloud Test

Streaming to Streambox Cloud is an excellent way to test the setup of your stream. Create a Cloud trial account at: http://live.streambox.com/ls/reg.html

Your Streambox Cloud account will have a Group (also called DRM) code which must be set in the Encoder's Metadata **DRM** field. Use the Metadata Menu (of the Windows application) to enter your Group/DRM text into the first of the Network Groups fields or the DRM field or the Metadata Tab (of the Web Interface).

Stream to the Cloud by entering the IP Address, from the chart below, of the nearest Streambox Cloud Server, in the Network settings (Target Decoder IP) of the Encoder.

Cloud Server Name	IP Address	Session ID starts with…	Region
LiveUS.streambox.com	52.25.129.48	$A	Western USA (Oregon)
LiveUSEast.streambox.com	54.83.19.155	$B	Eastern USA (Virginia)
LivePost.streambox.com	52.8.239.106	$P	SW USA (California)
LiveAU.streambox.com	52.62.2.246	$C	Asia Pacific (Sydney)
LiveDE.streambox.com	54.93.179.19	$E	Europe (Frankfurt)
LiveEU.streambox.com	54.247.100.52	$F	Europe (Ireland)
LiveIN.streambox.com	52.66.83.26	$G	Central Asia (India)
LiveJP.streambox.com	52.69.71.156	$H	Asia Pacific (Tokyo)
LiveSA.streambox.com	54.233.86.10	$I	South America (Sao Paulo)
LiveSG.streambox.com	52.76.243.157	$J	Asia Pacific (Singapore)

https://streambox.force.com/support/s/article/streambox-cloud-server-ip-addresses

Appendix C: Recommended Batteries

Streambox uses and recommends IDX Batteries and chargers with the V-Mount connector, for Avenir Mini. Recommended batteries include E-10, E10S, E-HL9, and E-HL9S. Additionally, a pair of model E-7 batteries joined in Tandem will be adequate.

NOTE: Neither the IDX VL-2PLUS Charger nor a single IDX E-7 battery can supply Avenir Mini with adequate power for full HD encoding.

Streambox can also be used with Anton-Bauer batteries either by the Gold Mount connector (optional) or by using an adapter (Anton-Bauer model QR-A200) to convert the IDX V-Mount to the Anton-Bauer Gold Mount.

The Anton-Bauer batteries that are approved for use with Avenir Mini are DIONIC 160, DIONIC HC, DIONIC HCX, HYTRON 100, HYTRON 140, and the DIONIC 90.

NOTE: The DIONIC 90 cannot continuously supply enough power for full HD encoding.

Appendix D: Troubleshooting/FAQ

WWAN Modems/SIMs are not connecting:

1. Go to Network Settings: *Home -> Settings -> Network*
2. Select WWAN, and select WWAN Configuration.
3. For the modems that are not connecting, select Reset. When the modem is reset, it will disappear, and then re-appear with the Config button. Click Config.
4. Enter the APN, Username, Password, SIM PIN, and so on. (Many of these fields are supposed to be blank.) This information can be obtained from the SIM carrier.

"NO VIDEO SOURCE" appears in the upper right of the screen:

1. Reboot Avenir.
2. Check that the camera is connected, powered, and set to output a compatible video format. (See manual for formats.)
3. Check and replace cable.

Video Stream not received:

This usually indicates the Decoder is unreachable. Start a stream with a Smart Preset; if Bitrate shows 0, Latency shows 0.0 for the duration of the test, the Decoder cannot be reached.

4. Check Decoder Settings and confirm the correct Decoder selection, IP address and port number.
5. If available, try streaming to another Decoder
6. Check internet connectivity from Avenir by attempting to connect through the Remote Config Server (see Section 2.1 *Online Remote Configuration*)

Operating in very poor 3G connectivity areas:

Home -> Advanced
Set the following values.
Bitrate: 2Mbps
VBR: 5sec
FEC: 5%~10% (or more if needed)
Resolution: SD Single Field

Or select an appropriate preset from *Home -> Preset*

BGAN	3G
BGAN 220k	3G Low Delay 3s 700K
BGAN-Streaming 256K	3G Reliable 1.5mbps
X-BGAN340K	3G Driving 1.1m 7s

	3G Talking Head 1.2Mbps 4s
LAN LAN 3Mbps reliable 7s LAN – 6Mbps	3G/4G Bonded – 1Mbps Bonded – 2Mbps Driving 2.5m 4s Talking head 3Mbps 2.5s Reliable 3mbps

Stream bandwidth drops by 30% or more:

1. *Home -> Advanced*
2. Set the Bitrate at around 50% of dropped bitrate

Example: If with 3Mbps ABN selected and 30% drop (around 2Mbps) will freeze the video. Go to *Home -> Advanced*, and set the bitrate to 1.5MBps (50% of 3Mbps)

Recommended ABN Setting:

Home -> Settings -> Network -> ABN Settings
Max bitrate for ABN/streaming: (sets a ceiling for stream bitrate)

- 3G areas - 2000 kbps
- 4G/3G - 3000 kbps
- Wi-Fi - 3000
- LAN - 8000 kbps

Appendix E: Contact Information

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Technical Support

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