TABLE OF CONTENTS

1. Introduction ................................................................................ 3
   Support Resources ...................................................................... 3
   Disclaimer ................................................................................. 3
   Warning ..................................................................................... 3
   HEVC Products .......................................................................... 3
   HEVC Content .......................................................................... 3
   Physical Properties .................................................................... 4

2. Getting Started ........................................................................... 5
   Power Your Device ...................................................................... 5
   Connect to a Network .................................................................. 6
   Choose Your Application .......................................................... 7
   Choose a Stream Mode ............................................................... 9

3. Encoder Configuration ............................................................... 10
   Video/Audio Input ................................................................. 12
   Color Management ................................................................. 13
   Encoder .................................................................................... 14
   Network Interfaces .................................................................. 15
   Cloud Services ......................................................................... 17
   Video Stream Output ............................................................... 18
   Recording ................................................................................ 26
   IFB .......................................................................................... 27
   System .................................................................................... 28
   Licenses ................................................................................... 29

4. Decoder Configuration ............................................................... 30
   Video/Audio Output ................................................................. 31
   Color Management ................................................................. 31
   Network Interfaces .................................................................. 32
   Video Stream Source .............................................................. 34
   IFB .......................................................................................... 36
   System .................................................................................... 37
   Licenses ................................................................................... 38

5. Troubleshooting .......................................................................... 39

6. Technical Specifications ........................................................... 41

7. FCC Statement ........................................................................... 46
Thank you for purchasing Cube, the world’s first camera-top streaming HD video solution. Cube encoders stream HD video over any IP network. Wireless-enabled Cubes can connect directly to laptops, Cube decoders, mobile devices, or join an existing wireless network to stream over a LAN or WAN. USB-enabled Cubes are also capable of streaming using select 4G capable modems. Cube features native integration with some of the most popular video platforms for turn-key live Internet streaming and content distribution. Use this reference guide to help get the most out of your Cube.

Support Resources
In addition to this reference guide, there are a number of resources available for more information on Cube’s features and operation. For tips, information, and all the latest available firmware and software updates, visit Teradek’s support forum at https://support.teradek.com. If you are unable to find what you are looking for online, please contact Teradek’s support staff at support@teradek.com | Phone: (888) 941-2111 Ext. 2 (available M-F 5am-6pm PST).

Disclaimer
This manual is intended for user information only. Every effort has been made to ensure that the contents within are accurate at the time of printing, and that updates are made in a timely manner. Teradek cannot be held responsible for inaccuracies, typographical errors, or out-of-date information contained within this manual.

Warning
Teradek Cube products contain no user serviceable parts. Disassembly, modification, or removal of any of the device’s components may void your warranty. Please visit http://store.teradek.com/pages/warranty-information for up-to-date warranty terms and conditions.

HEVC Products
This product is sold with a limited license and is authorized to be used only in connection with HEVC content that meets each of the three following qualifications: (1) HEVC content only for personal use; (2) HEVC content that is not offered for sale; and (3) HEVC content that is created by the owner of the product. This product may not be used in connection with HEVC encoded content created by a third party, which the user has ordered or purchased from a third party, unless the user is separately granted rights to use the product with such content by a licensed seller of the content. Your use of this product in connection with HEVC encoded content is deemed acceptance of the limited authority to use as noted above.

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PHYSICAL PROPERTIES (CUBE ENCODER/DECODER)

A. RP-SMA connectors
B. USB port
C. Video input status
D. Codec status
E. Broadcast status
F. Fault/Error
G. SD card slot
H. Stream joystick
I. Menu joystick
J. SD/HD/3G−SDI input/output
K. HDMI input/output
L. 10/100/1000 Ethernet
M. Reset button
N. Power switch
O. Power input
P. 1/8” headphone output
Q. Mic/Line stereo input

START/STOP AND MENU JOYSTICKS

Use the Stream and Menu Joysticks (Fig. 2-1) to navigate the front panel interface.

Stream Joystick:
● (button press): Access quick menu actions, exit menu screens, start/stop recordings and broadcasts

Menu Joystick:
▲,▼,◄,►: Select menu items, change status screen on main display, select character.
● (button press): Confirm selection, open selected menu.
GETTING STARTED

There are three key steps to getting started with Cube:

1. Power your device.
2. Connect to a network.
3. Choose your application.

POWER YOUR DEVICE

1. To power Cube, connect the AC adapter using the 2-pin connector marked ‘6-28 VDC Input (Fig. 2-2), then turn the power switch to the On position. Cube begins to boot as soon as power is connected. NOTE: The codec LED blinks to indicate Cube is booting. This process takes approximately 1½ minutes.

2. Turn on your video source, then connect it to Cube using either an SDI or HDMI cable (Fig.2-3).

3. Attach the antenna (if applicable) via the threaded RP-SMA connector.

4. Attach any mounting accessories, such as the enclosed hot shoe mount, if desired.

5. Once Cube has booted, verify that the Video Input Status and Codec LEDs are illuminated, indicating a video source has been successfully detected (Fig. 2-4) and the codec is ready. If using a Cube decoder, the codec LED will remain off until it is configured (see page 10).

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CONNECT TO A NETWORK

Cube allows you to connect to a network using Wi-Fi, an Ethernet connection, or a USB modem. Use the front panel interface or the web user interface (web UI) to connect Cube to a network.

Connect via wireless (Wi-Fi)

1. Using the Menu joystick, navigate to the Network Setup menu, then select WiFi.

2. Press the Menu joystick to enter the WiFi mode menu, then select a mode:
   a. **Access Point (AP) Mode** - AP Mode is automatically enabled by default. Connect your computer to Cube’s AP network: Teranet-XXXXX (serial number of the device).
   b. **Infrastructure Mode** - Select Infrastructure Mode, then Scan for Networks. Select a Wi-Fi network (Fig. 2-5), then enter your credentials.

3. To obtain the IP address, select [Status], or press ▼ on the menu joystick from the main screen.

   Access the web UI
   The web UI can be accessed by using any available network interface. Simply open a web browser and enter the network’s IP address in the navigation bar (Fig. 2-6). If using a USB modem, connect your computer to Cube’s AP network first, then enter the IP address in the navigation bar.

Connect to an Ethernet network (Wired)

1. Plug an Ethernet cable into Cube’s Ethernet port (Fig. 2-7) and connect it to an Ethernet switch or router.

2. Once Cube is connected to the network, the front panel interface will indicate that it’s “Ready” (Fig. 2-8).

3. To obtain the IP address, press ▼ on the menu joystick, or navigate to the Wired menu, where it will be displayed.
Connect using a USB Modem:

1. Insert a compatible 3G/4G USB modem into the USB port (Fig. 2–9) and wait for the cellular reception icon (4 bars) to appear.

2. To confirm the modem is connected, navigate to the Network Setup menu and select USB Modem.

For additional configuration options, see page 16.

CHOOSE YOUR APPLICATION

Cube can be used for a variety of applications, such as live production and monitoring on Teradek’s iOS apps, streaming to the Internet, or transmitting to a decoder.

Connect and Broadcast using Live:Air Action

1. Connect your iPad to the same network as Cube.

2. Launch the Live:Air Action app.

3. Tap the Add New Source button on the Preview Editor’s bottom panel, then tap the Teradek Device button. Select a device (Fig. 2–11), then tap Done.

4. To configure a streaming destination, tap the button in the upper right-hand corner, enter the Broadcasting Destinations page, then navigate to Manage Destinations>Add a Destination (Fig. 2–12). Select a platform, then enter your credentials (if applicable).

5. To begin live streaming, tap the ‘Go Live!’ button in the upper right-hand corner.
Monitor using VUER

1. Set your stream mode to **Live:Air**.

2. Connect your iPad to the same network as Cube.

3. Launch the VUER app.

4. From the VUER app, tap the **CAMERA** button in the upper left-hand corner (Fig. 2-13), select your device(s), then tap **Done**.

Stream to an Internet Platform

1. From the **Video Stream Output** menu, select **Internet Streaming** as your stream mode (Fig. 2-14).

2. Select a streaming platform provider (Fig. 2-15) and enter your credentials, or follow the on-screen prompts to authorize Cube.

3. Select a channel or event to stream to.

4. After configuring your device, navigate back to the main display.

5. Press the Stream Joystick (see page 7) or tap the **Broadcast** button to go live.

**BROADCAST BUTTON:**
- **Cube is ready to broadcast**
- **Broadcast is in session**
- **Cube is not ready to broadcast**
Transmitting to a Decoder
If you purchased a Cube decoder along with the encoder, use the following steps to pair the two devices.

1. From the encoder’s front panel, navigate to the Streaming Setup menu, then select Primary Stream. If using the web UI, navigate to the Video Stream Output menu, then select Primary (see page 9).

2. From the decoder’s front panel, navigate to the Decoder Setup menu. If using the web UI, navigate to the Video Stream Source menu (Fig. 2-16).

3. Ensure that the both the Cube encoder and decoder are on the same network, and using the same stream mode and protocol.

CHOOSE A STREAMING MODE
Cube encodes and streams video using a variety of stream modes. Use the following steps to view, modify, or select a streaming mode to best suit your application.

1. Navigate to the Streaming Setup menu using the Menu joystick, then select Primary Stream. If using the web UI, navigate to the Video Stream Output menu, then select Primary (Fig. 2-10).

2. Select one of the following Stream Modes:
   - LIVE:AIR
   - TERADEK STREAM (TDS)
   - MPEG TRANSPORT STREAM (LICENSE REQUIRED)
   - INTERNET STREAMING
   - RTP
   - RTP/RTSP
   - HLS (HTTP LIVE)

See page 18 for Stream Mode descriptions and applications.
ENCODER CONFIGURATION

NAVIGATING THE SETTINGS MENU

The Settings menu allows you to customize and control Cube’s broadcast, audio/video, and network settings. Use the web UI or the front panel interface to access and modify the settings. **NOTE:** This section illustrates the settings as they are available on the web UI. These settings can also be configured from Cube’s front panel interface (see page 11).

<table>
<thead>
<tr>
<th>Video/Audio Input</th>
<th>Contains options for configuring your video/audio input, Test Pattern, and Deinterlacer preferences.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Management</td>
<td>Allows you to select 3D LUT and CDL files stored on your computer to apply to your video output.</td>
</tr>
<tr>
<td>Encoder</td>
<td>Adjust the codec, bitrate, resolution, frame rate, and other key features related to your Primary or Quickview stream. Options include:</td>
</tr>
<tr>
<td></td>
<td>- Codec</td>
</tr>
<tr>
<td></td>
<td>- Resolution</td>
</tr>
<tr>
<td></td>
<td>- Bitrate</td>
</tr>
<tr>
<td></td>
<td>- Audio Bitrate</td>
</tr>
<tr>
<td></td>
<td>- Key Frame Interval</td>
</tr>
<tr>
<td></td>
<td>- Frame Rate</td>
</tr>
<tr>
<td></td>
<td>- Advanced Options</td>
</tr>
<tr>
<td></td>
<td>- Max Frame Rate</td>
</tr>
<tr>
<td></td>
<td>- Overlay</td>
</tr>
<tr>
<td>Network Interfaces</td>
<td>Contains options for configuring Ethernet, Wi-Fi, and USB modem interfaces.</td>
</tr>
<tr>
<td>Cloud Services</td>
<td>Allows you to access and manage Core, Teradek’s cloud service management service.</td>
</tr>
<tr>
<td>Video Stream Output</td>
<td>Select and configure a streaming mode and broadcast destination. Options include:</td>
</tr>
<tr>
<td></td>
<td>- Live:Air</td>
</tr>
<tr>
<td></td>
<td>- MPEG-TS (license required)</td>
</tr>
<tr>
<td></td>
<td>- Teradek Streaming</td>
</tr>
<tr>
<td></td>
<td>- RTP/RTSP</td>
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<tr>
<td></td>
<td>- SRT</td>
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<tr>
<td></td>
<td>- RTMP</td>
</tr>
<tr>
<td></td>
<td>- Internet Streaming</td>
</tr>
<tr>
<td></td>
<td>- HTTP Live (HLS)</td>
</tr>
<tr>
<td>Recording</td>
<td>Enable or disable recording and select a media storage option.</td>
</tr>
<tr>
<td>IFB</td>
<td>Contains options for configuring two-way audio communication.</td>
</tr>
<tr>
<td>System</td>
<td>Perform factory reset, firmware upgrade, system diagnostics, and other essential functions.</td>
</tr>
<tr>
<td>License</td>
<td>Add, import, or export license files for additional functionality.</td>
</tr>
</tbody>
</table>

![Diagram of the Settings Menu](image-url)
FRONT PANEL INTERFACE SETTINGS

STREAMING SETUP: Configure a streaming mode option and/or broadcast destination for the Primary stream, or enable the Quickview stream. Primary stream options include:

- Live:Air
- Teradek Streaming
- SRT
- MPEG-TS (license required)
- RTP/RTSP
- Internet Streaming
- HTTP Live (HLS)

RECORDING SETUP: Enable or disable the recording feature, and select a recording trigger and media storage option.

VIDEO SETUP: Adjust the codec (700 series only), bitrate, resolution, frame rate, and other key features related to your stream. Options include:

- Input
- Resolution
- Frame Rate
- Max Frame Rate
- Deinterlacer
- Profile
- Bitrate
- Overlay
- Codec (Cube 700)
- MPEG-TS (license required)
- Internet Streaming
- Teradek Streaming
- RTP/RTSP
- HTTP Live (HLS)
- SRT
- RTMP

AUDIO SETUP: Allows you to configure an audio input source.

3D LUT SETUP: Enable or disable a look preset, or display a split screen view.

NETWORK SETUP: Contains options for configuring Ethernet, Wi-Fi, and USB modem interfaces.

CLOUD SERVICES: Allows you to enable Core, Teradek's cloud service management service.

SYSTEM: Perform factory reset, firmware upgrade, and modify your display settings.
The Video/Audio Input menu contains several input source configuration and video overlay options.

**Video Input Source** - Video Input Source lets you select the type of signal providing the video source.

**Deinterlacer** - The Deinterlacer converts interlaced video into progressive video before streaming, improving the appearance of video that has been scaled down from the original input resolution. In addition to supporting scaled down interlaced video, deinterlacing is also useful when streaming to the Internet or mobile devices instead of a decoder.

**1080p 50/60 Handling (600 series encoders only)** - Select whether to convert your video input to progressive video (Half Framerate) or interlaced video (Interlacer).

**Progressive (50/60) Output (700 series encoders only)** - With the Deinterlacer enabled, select whether your stream is transmitted in 1080p60 (Enabled), or 1080p30 (Disabled).

**SDI Ancillary Data (600 series encoders only)** - Extract Timecode or Closed Captions data from the SDI input and embed it into your stream.

**Audio Input Source** - Configure the audio input source. Selecting Embedded (HDMI) allows you to enable or disable L/R audio channels. Selecting Analog allows you to manually adjust the volume. Selecting Disabled produces a silent stream.

**Test Pattern** Broadcast a test image when no video is connected. Setting Force to Enabled allows the encoder to stream a test pattern (Fig. 3-1, 3-2) regardless of the video connection.
COLOR MANAGEMENT

The Color Management menu contains options for adding specific looks from your computer and saving them to Cube's interface. These looks can either be 3D LUT files, CDL preset files, or files composed of both formats. Use this menu or the front panel interface to apply presets to the video output. Up to 32 looks can be stored on the device.

Color Management options
Graded - Enable a look preset
Split - Display a split screen view of the original image and any selected preset
Original Signal - Transmit the input source’s original look without a look preset

Creating a Look

Look presets can be created from a 3D LUT and either an ASC CDL file or 1D LUT + Saturation files.

1. Select Add a new Look.

2. Enter a name for your look under the name field. If a name is not entered, the look will use the same name as the 3D LUT filename. Names can be up to 32 characters long.

3. Select whether you would like to load a CDL file (Fig. 3-3), or a 1D LUT file + Saturation file, then click Choose File to select the file(s) from your computer.

4. Select Choose File under the 3D LUT section and pick the 3D LUT file you wish to use.

Organizing look presets (Fig. 3-4)
Arrange look presets either by dragging the desired preset up and down on the list or clicking the † or ‡ icons.

Deleting looks
Look presets can be deleted by clicking the X button located in the look’s listing.
ENCODER

With Cube, you can control various characteristics of the network video stream, such as bitrate, frame rate, and resolution. Use this section to help you adjust the video stream to best suit your streaming environment. The Primary stream offers a complete set of options that are fully configurable; a subset of those options are available for the Quickview stream.

Encoder Options
Codec (700 series encoders only) - Select either HEVC or H.264 compression formats.
Bitrate and Audio Bitrate - Select your stream’s target bitrate. Lower bitrates require less bandwidth and may allow for a more stable stream while higher bitrates offer better video quality, but require more network bandwidth.
Resolution - Scale down the encoder’s input resolution or maintain the input’s native resolution.
Frame Rate - Set the encoder frame rate to full frame rate or a fraction of the input frame rate.
Max Frame Rate - Manually enter your stream’s target frame rate.
Key Frame Interval - Adjust the amount of time between full picture refreshes. By default, the encoder generates one key frame every two seconds.

Advanced Options
Caching* - This value can be left at its default (300 ms) in most cases. Decreasing the value reduces overall latency, but video quality and stability may deteriorate. Increase this value if your video stream stability is affected by a poor or challenging network environment.
Audio Sample Rate - Set the encoder audio sample rate.
Aspect Ratio* - Select the encoder aspect ratio -- Either Auto, 4:3, or 16:9.
Use Square Pixels* - This feature can be left enabled unless used with a decoder that requires non-square pixels. When enabled, the horizontal resolution is adjusted to set the picture aspect ratio (1:1 pixel aspect ratio). If disabled, the pixel aspect ratio varies to determine the picture aspect ratio.
Compression Profile - High profile encoding typically gives the best image quality at a given bitrate. Main and Baseline profiles utilize slightly different features, and may be more compatible with some decoders.
Frame Structure* - Select Macroblock-adaptive frame-field (MBAFF), frame, or field coding for interlaced video encoding.
SEI Timing* - Enable or disable SEI timing. This should be left enabled unless required for a particular stream application.

Overlay
Title - Overlay text or images onto your video stream, then adjust the appearance and location of text.
Image - Overlay imported images onto your video stream, then adjust the location of the image.

Rate Control
Mode - Select Auto, Manual, or Debug*. Additional options are present when set to Manual or Debug mode.
Static Scene Detection* - Prevents bitrate spikes during static-to-dynamic scene transitions when enabled. Improves video quality in mostly static scenes when disabled.
Complexity Detection* - Allows the encoder to adapt more quickly to very complex content and scene changes.
Zero Padding* - The stream is held at the configured bitrate. Extra data is added to the stream to “pad” the bitrate if it would otherwise drop below the configured value, preventing the bitrate from exceeding the configured value.

Encoder Settings Considerations
- Encoder settings will vary based on the bandwidth available and the platform used.
- Always select a video bitrate that is less than 70% of the total upload bandwidth available on the Internet connection (i.e. if 5 Mbps is available, set the video to 3.5 Mbps or lower).
- Some platforms (i.e. YouTube) will automatically generate lower quality streams from a high quality input (transcoding), so the highest possible quality can be used. If the streaming platform does not transcode the video, consider that your viewers must have the available download bandwidth to view the stream.

* 600 series encoders only
**NETWORK INTERFACES**

Cube allows you to connect and stream to the Internet by utilizing one of several network interfaces.

**Wired**

A wired Ethernet connection is typically the most reliable means for connecting to a network, as you don’t have to deal with the instability of a Wi-Fi or cellular connection. To configure the Ethernet interface, select **Wired** from the **Network Interfaces** page, then click **Modify** (Fig. 3-5).

**IP Address Modes**

- **Dynamic (DHCP)** - The connected router generates an IP address, allowing Cube to be automatically configured.
- **Static** - Manually configure the IP address settings if a DHCP server is not available, or if applications require a fixed address.

**Wireless (Wi-Fi)**

Although an Ethernet connection is the most reliable method of connecting to a network, a Wi-Fi connection may be more convenient, especially if an Ethernet connection is unavailable. There are two Wi-Fi modes available; **Access Point (AP) Mode** and **Client (Infrastructure) Mode** (Fig. 3-6).

**Wi-Fi Modes**

- **Access Point (AP) Mode** - Cube acts as its own dual band access point, allowing you to connect your device directly to Cube’s AP network.
- **Client (Infrastructure) Mode** - Cube and your device connect to the same local wireless network. Access Client Mode, then click **Browse** to scan for available networks (Fig. 3-7), or **Saved Networks** to connect to a previously saved network, then enter your credentials.
USB Modem
A USB modem allows you to broadcast wherever a cell connection is available. Cube automatically detects and supports many modems using the Auto setting. If you need to configure a modem, connect to Cube (see page 17) and insert the USB Modem into Cube (Fig. 3-8). From the Network Interfaces page, select USB Modem, then select a configuration mode.

Configuration Modes
- **Auto** (default): The modem is automatically detected and configured. Cube supports many modems worldwide using this setting.
- **Preset**: Contains configurations for modems that are supported but cannot be auto detected. User credentials are required if the modem account is password protected.
- **Custom**: Allows you to manually configure a modem if it's not automatically detected. Available configuration modes are GSM, CDMA, Composite, and Ethernet. Modes will vary based on the modem model and mobile network provider.

In addition to the above configuration modes, you can also select from several supported modem configurations (Fig. 3-9). Visit [http://support.teradek.com](http://support.teradek.com) for more information about specific modem models.
CLOUD SERVICES

Cube encoders and decoders can be remotely accessed, configured, and controlled using Teradek’s CORE Cloud management and routing service.

CORE

CORE Cloud Service
CORE is a professional cloud-based solution for managing, archiving, and routing Teradek encoders and decoders.

With CORE, you can:

- Bond multiple Internet connections, increasing your broadcast’s bandwidth and reliability
- Remotely control Teradek encoders, decoders and bonded systems from anywhere in the world
- Route live video feeds to multiple destinations and streaming platforms using a simple drag-and-drop web UI
- Easily connect encoders and decoders through firewalls
- Record streams from encoders and archive them to the “cloud” in real time

To get started, select CORE, then click **Apply** in the upper right-hand corner:

1. Sign up for CORE, then log in from the web UI (Fig. 3-10).

2. Select an account (company), then click “Not Configured...” to select a Sputnik server. If one isn’t available, open the CORE dashboard and navigate to **Inventory>Sputniks**, then select **Add Sputnik** to configure a Sputnik server.

3. After selecting a Sputnik (Fig. 3-11), click **Apply** in the upper right-hand corner. Return to the web UI and select **Refresh** to display the Sputnik server.

4. Once a connection is established, you can configure and control Cube from the CORE dashboard (Fig. 3-12).

Visit http://core.teradek.com to learn more and to create an account.

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VIDEO STREAM OUTPUT

Depending on the video’s destination, you can pick from a variety of different stream modes, each with its own set of configurable settings described here.

**LIVE:AIR**

Live:Air Action is a video production suite that can receive feeds from any Cube encoder for real-time video mixing, switching and even transitions. Once you’ve configured Cube to stream in Live:Air mode, you can manage it from the Live:Air Action (see page 7) or VUER apps (see page 8).

**TERADEK STREAMING (TDS)**

TDS is specifically optimized for local streaming with minimum latency between Teradek devices. Configure TDS by entering the IP address and destination port of a Teradek decoder.

**MPEG TRANSPORT STREAM (MPEG-TS)**

To stream over MPEG Transport Stream, you’ll first need to purchase the license from Teradek. In MPEG Transport Stream Mode, Cube sends video via a TCP or UDP protocol to a specified unicast or multicast address. TCP is recommended when streaming over the Internet, while UDP is recommended when streaming over a local network to avoid the additional network overhead of TCP. Select the protocol best suited for your application needs, and ensure the Cube encoder is configured to stream to the Cube decoder’s corresponding IP address and port.

**SRT**

SRT is used to transmit high quality, low-latency video over unreliable networks. SRT has two connection types: **Listener** or **Caller**. When the connection type is set to **Listener**, the encoder waits for the client to connect and pull the stream from it. When the connection type is set to **Caller**, the encoder pushes video to a single destination IP address on a specific port. For either mode, a port number is needed, and a passphrase (if encryption is enabled). For a direct connection (Caller mode), enter the correct destination IP address.

**CONFIGURABLE SETTINGS**

- Advanced Settings
  - Buffer
  - Max Clients

- Host
- Port
- Advanced Settings
  - Buffer
  - Packet Size
  - Protocol
  - DSCP

- Protocol (UDP/TCP/Multicast)
- Host
- Port
- MPEG-TS Server Mode
- Advanced Settings
  - Audio Codec
  - PSI Period
  - Packet Size
  - DSCP
  - PCR Period
- Constant Bitrate
- Adaptive Bitrate (TCP only)
- Transport Stream Info

- Connection Type
- Host (Caller)
- Port
- Encryption
- Latency
- Adaptive Bitrate
- OnCaptionInfo (700 series only)
**RTP/RTSP**
Cube is configured to stream via RTSP by default. RTSP is used for local streaming to computers and Cube decoders. When RTP/RTSP mode is enabled, the decoder communicates whether to use the TCP or UDP protocol for the stream. Ensure you have the correct port and stream name (*stream1* is the default). To view your stream on VLC, copy the link displayed under Video Stream Output panel in the Settings Menu (Fig. 3-14). To view an RTSP stream, launch VLC and navigate to **File>Open Network**. Paste the link in the URL field, then click **Open**.

**RTMP**
RTMP mode allows Cube to stream to other video platforms, CDNs, and streaming servers that are not one of the available Internet Streaming platforms (see below). RTMP is supported by most video streaming platforms, but you must first obtain a URL and stream key/name from the service you choose to stream to. Log into your account’s settings and retrieve the URL and stream key/name.

**HTTP LIVE (HLS)**
HTTP Live streaming (HLS) is supported natively by iOS-based devices and desktop computers (Mac OS X). Due to unreliable network conditions, local streaming to a browser or iOS device will have a higher degree of latency. For low latency streaming to iOS devices, use Live:Air mode with Teradek’s Live:Air Action, VUER, or TeraView apps.

**INTERNET STREAMING**
Cube features native integration with some of the most popular streaming platforms. Select a provider (platform), then enter your credentials and/or destination information.

<table>
<thead>
<tr>
<th>Integrated Platforms</th>
<th>Wowza (pg. 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestream (pg. 20)</td>
<td>Facebook (pg. 24)</td>
</tr>
<tr>
<td>Ustream (pg. 21)</td>
<td>Periscope (pg. 25)</td>
</tr>
<tr>
<td>YouTube Live (pg. 22)</td>
<td>Twitch (pg. 23)</td>
</tr>
</tbody>
</table>
Livestream:

1. Select Livestream and enter your credentials (Fig. 3-13).

2. Select the event you wish to stream to (Fig. 3-14), or create a new event at https://livestream.com.

3. After selecting an event, you will be redirected to the Video Stream Output page. Select Apply on the upper right corner.

4. Tap the Broadcast button to go live, then select whether or not to notify your followers (Fig. 3-15).

   **Notify Followers**
   If broadcasting from Cube’s web UI, you can notify your account’s followers by toggling the ‘Notify Followers’ switch to On before tapping the broadcast button.

5. When ending the broadcast, select whether to **Post**, **Save**, or **Delete** the video from the event (Fig. 3-16).

   **Post, Save, or Delete**
   During your broadcast, you can select whether to Post the recorded video immediately, Save it for posting later, or Delete it from the event.
Ustream:

1. Select **Ustream**, enter your credentials, then select **Apply** in the upper-right corner (Fig. 3-17).

2. Select an available channel to stream to from the Channels List (Fig. 3-18), or create a new channel at [https://www.ustream.tv](https://www.ustream.tv).

3. After selecting a channel, you will be redirected to the **Video Stream Output** page. Tap the **Broadcast** button to go live.

   **Auto Record and recorded files**
   Depending on your Ustream account level, broadcasts to your channel may be automatically recorded for viewing later. Enabling the ‘Auto-Record’ setting (Fig. 3-19) triggers these recordings. Access permissions for the recorded files can be configured on your Ustream account.
YouTube Live:

1. Select **YouTube Live**, then click **Authorize Your Device** (Fig. 3-20).

2. Copy the authentication code generated for your device, go to [http://www.google.com/device](http://www.google.com/device), then enter your credentials (Fig. 3-21). Enter the code, then allow Cube to access your account.

3. Select an event, create a new event, or select “Stream Now”.

Two types of Broadcast destinations
a. The ‘Stream Now’ destination is a continuously accessible public channel with a permanent URL. Streaming to the ‘Stream Now’ page is as simple as start and stop.

b. ‘Event’ destinations can be created, scheduled, started, and stopped. Every event comes with its own page URL, and once an event is finished it cannot be started again. After finishing an event, it is saved on its own page. Selecting an Event destination allows you to preview your broadcast.

4. After selecting a destination, begin your broadcast by selecting **Go Live**. If you selected an Event, you will have the option to **Preview** your broadcast (Fig. 3-22).

5. When ending the broadcast, select either **Stop** or **Complete Event** (Fig. 3-23).

Four key stages in the life cycle of a broadcast
To **start** Broadcast:
- **Preview** - Preview the video you intend to broadcast. Videos in preview state are visible on the event’s Live Control Room page.
- **Go Live** - Makes your event visible on its own channel page. An event can not return to preview once it has gone live.

To **stop** Broadcast:
- **Stopped** - Broadcasts can be stopped and restarted at any time while the event is in the preview or Live state.
- **Complete Event** - You will no longer be able to broadcast to the event, but it will be saved on the event page for viewing.
Twitch:

1. Select Twitch, enter your credentials (Fig. 3-24), then select Apply on the upper-right corner.

2. To begin live streaming, tap the Broadcast button.

Wowza:

1. Select Wowza.

   **Server Mode** (Fig. 3-25):
   a) Enter the host server URL and stream name provided by the streaming service.
   b) Enter your credentials, select Apply, then return to the Home screen.

   **Cloud Mode** (Fig. 3-26):
   a) Enter the connection code
   b) Enter your credentials, select Apply, then return to the Home screen.

2. Tap the Broadcast button to go live.
Facebook:

1. Select Facebook, then click Authorize Your Device (Fig. 3-27).

2. Copy the authentication code generated for your device, go to https://www.facebook.com/device, then enter your credentials (Fig. 3-28).

3. Enter the authentication code, then allow Cube to access your account.

4. Select whether to stream to your timeline or to a specific page, group, or event (Fig. 3-29), then click Apply on the upper left corner.

**Streaming Destinations**

- **Timeline** - Broadcast the video to your personal timeline or “wall.”
- **Page** - Broadcast the video to a page you manage.
- **Group** - Broadcast the video to a group you manage.
- **Event** - Broadcast the video to an event you created.

**Scheduled Broadcasts**

You can schedule a broadcast to post at a specific date and time. After creating a post on the page’s timeline, click the next to Publish, select Schedule, then enter the date and time you want your post to be broadcast.

**Privacy Settings**

- Your Timeline privacy setting will be used if a less restrictive privacy option is chosen. (e.g. your timeline is set to Friends, but you set Cube to ‘All.’ The post will be visible to friends).
- Posts to Facebook pages are always public.

4. Tap the Broadcast button to go live (Fig. 3-30).
Periscope:

1. Select Periscope, then click Authorize Your Device (Fig. 3-31).

2. Copy the authentication code generated for your device, go to https://www.periscope.tv/auth, then enter your credentials (Fig. 3-32).

3. Enter the authentication code, then allow Cube to access your account.

4. To post a link to your live stream on Twitter, enable the Tweet Broadcast feature.

5. Tap the Broadcast button to begin streaming (Fig. 3-33).

Persiscope and Twitter

Periscope works in conjunction with Twitter. In order to use Periscope, you must create an account with your Twitter credentials, or by using your mobile phone number.
Cube allows you to record your broadcasts directly to an attached USB, SD or micro SD card, or network file system (NFS). Each recording is saved with the same resolution and bit rate set on the device.

Enable/Disable Recording - Turns the recording feature on or off.
Media - Select a configured device location to store your recorded footage to.
Mount Network Share - Configure an NFS location to store your recorded footage to.
Format - Select a format for your recording.
Trigger - Select how recording is initiated:
  ● Manual - Recording function is controlled manually from either the web UI or the Stream joystick on the device
  ● Broadcast - Recording function is triggered when you start the broadcast.
  ● Camera (600 series encoders only) - Cube will start recording the stream when a supported camera starts recording.
Filename - Select how the recording is identified.

To begin recording:

1. Insert a compatible SD card (Fig. 3-34) or USB drive into Cube, and enable recording.
2. Select the media you will be recording to.
3. Select a Trigger, or click Start Recording below the Broadcast button.

To configure and record to an NFS:

1. Select Mount Network Share.
2. Enter the host address and port, then click Mount.

Recording Considerations
● For best results, use Class 6 or higher SD cards.
● Media should be formatted using FAT32.
● Maximum size for each file is 4GB
● New recordings are automatically started after the file size limit is reached.
**INTERRUPTIBLE FEEDBACK (IFB)**

Interruptible feedback (IFB) provides two-way audio communication between the encoder and the decoder, allowing the director or off-camera personnel to communicate with the camera operator.

**Point-to-Point IFB Configuration**

1. From both the encoder and decoder web UI, navigate to the **IFB** menu, then select **Enabled**.

2. Enter the encoder’s IP address in the decoder’s **Destination Host** field, and the decoder’s IP address in the encoder’s **Destination Host** field (Fig. 3-35).

3. Copy the encoder’s destination and receiving port values and enter them in the opposite fields in the decoder’s interface (Fig. 3-36).

4. Select UDP or TCP as the communication protocol (should be identical on both devices).

5. Select **Apply** on both devices.

**IFB Configuration via Sputnik**

1. From the encoder web UI, enter the **Cloud Services** menu, then select **Sputnik**.

2. Enter Sputnik’s IP address and create a session password. Select **Apply**.

3. From the decoder web UI, enter the **Cloud Services** menu, select **Sputnik**, then enter the same Sputnik IP address as the encoder.

4. Enter the **Stream Source** menu, then select **Sputnik** as the streaming mode (Fig. 3-37). Enter the encoder’s serial number and the session password created in the encoder web UI, then select **Apply**.

5. After enabling IFB on both the encoder and the decoder, the **IFB Buffer** knob will be displayed. If a poor connection causes audio quality issues, such as choppy audio or high latency, slide the knob to the right to increase the buffer (Fig. 3-38).
SYSTEM

Essential system functions, including factory reset and firmware upgrade, can be performed from the System menu in the web UI (System Setup from the front panel interface).

Factory Reset
Access the System menu and select Factory Reset (Fig. 3-39). Restore Cube to its original settings by selecting an option (All, Broadcast, or Network) to reset.

Firmware Upgrade
Upgrade Cube’s firmware to the latest version.

Perform a Firmware Upgrade from front panel
After turning on Cube, navigate to the System Setup menu to check for new firmware. If an update is available, simply follow the prompts to complete the firmware update.
Perform a Firmware Upgrade from web UI (Fig. 3-40)
a. Download the latest firmware version from teradek.com.
b. Select Firmware Upgrade.
c. Upload the file from your computer and select Upgrade.

Password
To add, change, or delete your password, select Password from the system menu on the web UI, then follow the prompts.

System Time
Select Manual mode to manually input the time and date, or select NTP to automatically synchronize the time and date.

Reboot
Restart your Cube device by selecting Reboot, or simply turn Cube off and on again.

User Settings
Import or export a saved user setting configuration.

System Diagnostics
Generate a diagnostic report specific to your device. Diagnostic reports can be used by Teradek’s support team to assist during troubleshooting.
LICENCES

Cube supports a variety of features that are activatable on a per-device basis. After purchasing a license, you will receive an email from Teradek containing the license key.

To add a License:

1. Copy the license key from the email, then paste it on to the License Text field (Fig. 3-41).

2. Click Add Licenses.

3. To activate the license, you will be prompted to reboot Cube. Navigate to the System menu and select Reboot.

Fig. 3-41
DECODER CONFIGURATION

NAVIGATING THE SETTINGS MENU

The Decoder Settings menu allows you to customize and control Cube’s audio/video output, and network settings. Use the web UI or the front panel interface to access the Decoder Settings menu. **NOTE:** This section illustrates the settings as they are available on the web UI. These settings can also be configured from Cube’s front panel interface (see below).

**VIDEO/AUDIO OUTPUT:** Contains options for configuring your video/audio output and Test Pattern preferences.

**COLOR MANAGEMENT:** Select 3D LUT and CDL files stored on your computer to apply to your video output.

**NETWORK INTERFACES:** Contains options for configuring Ethernet, Wi-Fi, and USB modem interfaces.

**CLOUD SERVICES:** Enable Core, Teradek’s cloud service management service.

**STREAM SOURCE:** Allows you to select and configure a streaming mode and its characteristics. Options include:
- Automatic*
- RTP/RTSP
- MPEG Transport Stream
- SRT
- Teradek Streaming
- RTP Push*
- Live:Air

**IFB:** Contains options for configuring two-way audio communication.

**SYSTEM:** Perform factory reset, firmware upgrade, system diagnostics, and other essential system functions.

**LICENSE:** Add, import, or export license files for additional functionality.

* 600 series encoders only

FRONT PANEL INTERFACE SETTINGS

<table>
<thead>
<tr>
<th><strong>DECODER SETUP</strong></th>
<th><strong>OUTPUT SETUP</strong></th>
<th><strong>3D LUT SETUP</strong></th>
<th><strong>CLOUD SETUP</strong></th>
<th><strong>NETWORK SETUP</strong></th>
<th><strong>SYSTEM SETUP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the video stream source and streaming mode option.</td>
<td>Allows you to configure the video and audio output.</td>
<td>Apply specific looks stored on Cube to apply to the video output.</td>
<td>Enable Core, Teradek’s cloud service management service.</td>
<td>Contains options for configuring Ethernet, Wi-Fi, and USB modem interfaces.</td>
<td>Perform factory reset, firmware upgrade, and configure your display and debug settings.</td>
</tr>
</tbody>
</table>
VIDEO/AUDIO OUTPUT

The Video/Audio Output menu contains several output source configuration and test pattern options.

**Output Resolution**
Use this option to configure the video output format. The output resolution can be set independently of the video stream resolution.

**Test Pattern**
The Test Pattern option allows you to output a test image when no video is connected. Setting Force to Enabled causes the decoder to output a test pattern (Fig. 4-1, Fig. 4-2), regardless of the video connection.

**Audio Output**
Configure the audio output. Audio can be enabled or disabled, and the output can be set to Mono or Stereo. When set to Mono, channel 1 (left) audio is output on channels 1 and 2 (left/right).

COLOR MANAGEMENT

The Color Management menu contains options for adding specific looks from your computer and saving them to Cube’s interface. These looks can either be 3D LUT files, CDL preset files, or files composed of both formats. Use this menu or the front panel interface to apply presets to the video output. Up to 32 looks can be stored on the device.

**Color Management options**
- **Graded** - Enable a look preset.
- **Split** - Display a split screen view of the original image and any selected preset.
- **Original Signal** - Transmit the input source’s original look without a look preset.

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COLOR MANAGEMENT (CONT.)

Creating a Look:
Look presets can be created from a 3D LUT and either an ASC CDL file or 1D LUT + Saturation files.

1. Select **Add a new Look**.

2. Enter a name for your look under the name field. If a name is not entered, the look will use the same name as the 3D LUT filename. Names can be up to 32 characters long.

3. Select whether you would like to load a CDL file (Fig. 4-3), or a 1D LUT file + Saturation file, then click **Choose File** to select the file(s) from your computer.

4. Select **Choose File** under the 3D LUT section and pick the 3D LUT file you wish to use.

Organizing look presets (Fig. 3-4)
Arrange look presets either by dragging the desired preset up and down on the list or clicking the ⬆️ or ⬇️ icons.

Deleting looks
Look presets can be deleted by clicking the ✗ button located in the look's listing.

NETWORK INTERFACES
Cube allows you to connect and stream to the Internet by utilizing one of several network interfaces.

Wired
A wired Ethernet connection is typically the most reliable means for connecting to a network, as you don't have to deal with the instability of a Wi-Fi or cellular connection. To configure the Ethernet interface, select Wired from the Network Interfaces page, then click Modify (Fig. 4-5).

IP Address Modes
- **Dynamic (DHCP)** - The connected router generates an IP address, allowing Cube to be automatically configured.
- **Static** - Manually configure the IP address settings if a DHCP server is not available, or if applications require fixed address.
**Wireless (Wi-Fi)**

Although an Ethernet connection is the most reliable method of connecting to a network, a Wi-Fi connection may be more convenient, especially if an Ethernet connection is unavailable. There are two Wi-Fi modes available (Fig. 4-6); **Access Point (AP) Mode** and **Client (Infrastructure) Mode**.

### Wi-Fi Modes

**Access Point (AP) Mode** - Cube acts as its own dual band access point, allowing you to connect your device directly to Cube’s AP network.

**Client (Infrastructure) Mode** - Cube and your device connect to the same local wireless network. Access Client Mode, then click **Browse** to scan for available networks (Fig. 4-7), or **Saved Networks** to connect to a previously saved network, then enter your credentials.

---

**USB Modem**

A USB modem allows you to broadcast wherever a cell connection is available. Cube automatically detects and supports many modems using the Auto setting. If you need to configure a modem, connect to Cube using AP mode (see page 17), and insert the USB Modem into Cube (Fig. 4-8). From the **Network Interfaces** page, select **USB Modem**, then select a configuration mode.

### Configuration Modes (Fig. 4-9)

**Auto** (default): The modem is automatically detected and configured.

**Custom**: Allows you to manually configure a modem if it’s not automatically detected. Available configuration modes are **GSM**, **CDMA**, **Composite**, and **Ethernet**. Modes will vary based on the modem model and mobile network provider.

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STREAM SOURCE
Select from a variety of different stream types to match your input source from the drop-down menu, or select an available stream to decode.

TERADEK STREAMING (TDS)
TDS is specifically optimized for local streaming with minimum latency between Teradek devices. Configure TDS by selecting a protocol (UDP or Multicast) and entering the destination port of the Teradek encoder. Enter the IP address if streaming in Multicast.

RTP/RTSP
When RTP/RTSP mode is enabled, the decoder communicates whether to use the TCP or UDP protocol for the stream. Ensure you have the correct port and stream name (stream1 is the default). To view your stream on VLC, copy the IP address from the Host field, launch VLC and open File>Open Network. Paste the IP address in the URL field, then click Open.

RTP PUSH
RTP Push streaming allows you to direct video to a server or client and generate an SDP file containing the stream description. SDP files can be stored on a streaming server, or opened by video players like VLC. The RTP Push license is provided by request, free of charge.

MPEG TRANSPORT STREAM (MPEG-TS)
To stream over MPEG Transport Stream, you’ll first need to purchase the license from Teradek. In MPEG Transport Stream Mode, Cube sends video via a TCP or UDP protocol to a specified unicast or multicast address. TCP is recommended when streaming over the Internet, while UDP is recommended when streaming over a local network to avoid the additional network overhead of TCP. Select the protocol best suited for your application needs, and ensure the Cube encoder is configured to stream to the Cube decoder’s corresponding IP address and port.
SRT
SRT is used to transmit high quality, low-latency video over unreliable networks. SRT has two connection types: **Caller** or **Listener**. Caller pulls the stream from the encoder, while Listener waits for the encoder to initiate the connection. For either mode, a port number and passphrase (if one is set) is needed.

LIVE:AIR
Live:Air Action is a video production suite that can receive feeds from any Cube encoder for real-time video mixing, switching and even transitions. Once you’ve configured Cube to stream in Live:Air mode, you can manage it from the Live:Air Action (see page 7) or VUER apps (see page 8).

AUTOMATIC
Automatic allows you to select a device to decode from.

<table>
<thead>
<tr>
<th>CONFIGURABLE SETTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection type</strong></td>
</tr>
<tr>
<td><strong>Port</strong></td>
</tr>
<tr>
<td><strong>Encryption</strong></td>
</tr>
<tr>
<td><strong>Latency</strong></td>
</tr>
<tr>
<td><strong>Advanced Settings</strong></td>
</tr>
<tr>
<td>- Caching</td>
</tr>
<tr>
<td>- Audio Sample Rate</td>
</tr>
</tbody>
</table>

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| **Connection type**    |
| **Port**               |
| **Encryption**         |
| **Latency**            |
| **Advanced Settings**  |
| - Caching              |
| - Audio Sample Rate    |

---

| **Choose a Stream**    |
| **Advanced Settings**  |
| - Caching              |
| - Audio Sample Rate    |
Interruptible feedback (IFB) provides two way audio communication between the encoder and the decoder, allowing the director or off-camera personnel to communicate with the camera operator.

**Point-to-Point IFB Configuration**

1. From both the encoder and decoder web UI, navigate to the IFB menu, then select **Enabled**.

2. Enter the encoder’s IP address in the decoder’s **Destination Host** field, and the decoder’s IP address in the encoder’s **Destination Host** field (Fig. 4-10).

3. Copy the encoder’s destination and receiving port values and enter them in the opposite fields in the decoder’s interface (Fig. 4-11).

4. Select UDP or TCP as the communication protocol (should be identical on both devices).

5. Select **Apply** on both devices.

**IFB Configuration via Sputnik**

1. From the encoder web UI, enter the Cloud Services menu, then select **Sputnik**.

2. Enter Sputnik’s IP address and create a session password. Select **Apply**.

3. From the decoder web UI, enter the Cloud Services menu, select **Sputnik**, then enter the same Sputnik IP address as the encoder.

4. Enter the **Stream Source** menu, then select **Sputnik** as the streaming mode (Fig. 4-12). Enter the encoder’s serial number and the session password created in the encoder web UI, then select **Apply**.

5. After enabling IFB on both the encoder and the decoder, the **IFB Buffer** knob will be displayed. If a poor connection causes audio quality issues, such as choppy audio or high latency, slide the knob to the right to increase the buffer (Fig. 4-13).
SYSTEM

Essential system functions, including factory reset and firmware upgrade, can be performed from the System menu in the web UI (System Setup from the front panel interface).

Factory Reset
Access the System menu and select Factory Reset (Fig. 4-14). Restore Cube to its original settings by selecting an option (All, Broadcast, or Network) to reset.

Firmware Upgrade
Upgrade Cube’s firmware to the latest version.

- Perform a Firmware Upgrade from front panel
  When you turn on Cube, the device will automatically check for new firmware. If an update is available, follow the prompts to complete the update.

- Perform a Firmware Upgrade from web UI (Fig. 4-15)
  a. Download the latest firmware version from teradek.com.
  b. Select Firmware Upgrade.
  c. Upload the file from your computer and select Upgrade.

Password
To add, change, or delete your password, select Password from the system menu on the web UI, then follow the prompts.

System Time
Select Manual mode to manually input the time and date, or select NTP to automatically synchronize the time and date.

Reboot
Restart your Cube device by selecting Reboot, or simply turn Cube off and on again.

User Settings
Import or export a saved user setting configuration.

System Diagnostics
Generate a diagnostic report specific to your device. Diagnostic reports can be used by Teradek's support team to assist during troubleshooting.
Cube supports a variety of features that are activatable on a per-device basis. After purchasing a license, you will receive an email from Teradek containing the license key.

To add a License:

1. Copy the license key from the email, then paste it on to the License Text field (Fig. 4-16).

2. Click Add Licenses.

3. To activate the license, you must reboot Cube. Navigate to the System menu and select Reboot.

Fig 4-16
TROUBLESHOOTING

POWER/CONNECTION ISSUES

Cube will not power on.
Power cable may not be connected properly, or the external battery may be discharged. Check the battery’s charge. If the battery is charged, remove the video cable and verify that the power cable or battery plates are connected and the cables are not damaged.

Video Input LED stays off, but a video cable is connected.
No video input is detected. Verify that your video source is connected to Cube. Check cables for damage. Check that the camera’s video output is enabled, and the output format is compatible with Cube.

AUDIO/VIDEO STREAMING

Cannot open or view my video stream.
Cube may not be encoding, or the stream URL may be incorrect. Verify that Cube is encoding (Codec Status LED is illuminated).

Video stream keeps breaking up/freezing.
Bitrate/resolution may be set too high for the network’s available bandwidth. From the Encoder menu, lower the bit rate and/or resolution to avoid lost/late video data. For 600 series Cubes, manually adjusting the Rate Control settings (see page 14) provides more control over the streaming bandwidth, and may improve performance in challenging or restricted network environments.

VLC video latency is more than a second.
By default, VLC’s buffer is set to 1.2 seconds. Decreasing the buffer size will reduce the latency.

Video to iPad is delayed by more than 10 seconds.
HTTP Live mode is enabled. For low latency streaming to iOS devices, download any of Teradek’s video streaming iOS apps (Live:Air Action, TeraView, or VUER), then switch to Quickview stream.

NETWORK/WEB UI

My video stream does not have audio.
Either audio is disabled, or Quickview stream is being used. Enable audio (embedded or analog) on the Video/Audio Input menu.

Cannot connect to Cube in Access Point (AP) mode.
The network settings may be incorrect.
(a) Verify you are connected to Cube's AP network (see page 8). Make sure Cube’s Wi-Fi indicator is displayed.
(b) Verify your computer is set to DHCP or has an IP address in the 172.16.x.x

Cannot connect to Cube in Infrastructure (Client) mode.
Cube may be disconnected from the network, or the network settings may be incorrect. From the front panel interface, navigate to Network Setup > WiFi, then select [Status] to view the WiFi status menu (see page 6). If you still cannot configure your WiFi connection, connect an Ethernet cable to Cube, access the web UI, and verify that infrastructure SSID, password, and security type are correct.
Cannot log in to web UI.
Below is the default login information for Cube’s web UI:
   Login: admin
   Password: admin
If the password has been changed, perform a full factory reset (see page 28).

INTERNET STREAMING

Cannot verify login.
You may have entered incorrect account information, or have no Internet connection. Verify your account credentials are correct. If they are correct, verify that your network has an Internet connection. Also, verify Cube’s Network Interfaces menu has valid gateway and name server values.

Cannot start broadcast.
Cube may not have an Internet connection, or the Cube encoder may not be started. Verify Cube has an Internet connection, and/or verify that the ENC LED is illuminated a solid green.

Broadcast has started, channel shows “LIVE,” but only a black screen is shown.
This indicates the bit rate may be set too high for the network’s available bandwidth. From the Encoder menu, lower the bit rate and/or resolution to avoid lost/late video data.
# TECHNICAL SPECIFICATIONS

## CUBE ENCODER

### 600 SERIES vs 700 SERIES

<table>
<thead>
<tr>
<th>Feature</th>
<th>600 SERIES</th>
<th>700 SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Inputs</td>
<td>HDMI 1.4a: Full Size SD/HD/3G-SDI (75 Ω BNC)</td>
<td>HDMI 1.4a: Full Size SD/HD/3G-SDI (75 Ω BNC)</td>
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<tr>
<td>Supported Resolution</td>
<td>1080p 23.98/24/25/29.97/30/50/59.94/60 1080i 50/59.94/60 1080PsF 23/24/25/29/30 720p 50/59.94/60 576i 480i 480p (for HDMI input only) 576p (for HDMI input only)</td>
<td>1080p 23.98/24/25/29.97/30/50/59.94/60 1080i 50/59.94/60 1080PsF 23/24/25/29/30 720p 50/59.94/60 576i 480i 480p (for HDMI input only) 576p (for HDMI input only)</td>
</tr>
<tr>
<td><strong>Video Processing</strong></td>
<td></td>
<td></td>
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<tr>
<td>Video Compression</td>
<td>H.264, baseline, main and high profile</td>
<td>H.265, H.264, baseline, main and high profile</td>
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<tr>
<td>Supported Video Bitrate</td>
<td>250 Kbps to 15 Mbps (Wired:15 Mbps, WiFi:10 Mbps)</td>
<td>250 Kbps to 30 Mbps</td>
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<tr>
<td>Test Pattern Generator Support</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Video Format Conversion Support</td>
<td>Built-in video scaler and deinterlacer</td>
<td>Built-in video scaler and deinterlacer</td>
</tr>
<tr>
<td>Color Correction</td>
<td>CDL/1024 1D LUT (supports 10-bit color), 33x33x33 3D LUT (supports 10-bit color)</td>
<td>CDL/1024 1D LUT (supports 10-bit color), 33x33x33 3D LUT (supports 10-bit color)</td>
</tr>
<tr>
<td><strong>Protocol Support</strong></td>
<td></td>
<td></td>
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<tr>
<td>Network Protocols</td>
<td>TCP/IP, UDP, HTTP, DHCP, NTP, SSL, IGMP</td>
<td>TCP/IP, UDP, HTTP, DHCP, NTP, SSL, IGMP</td>
</tr>
<tr>
<td>Supported Video Transport Protocols</td>
<td>RTMP, RTP, RTSP, RTSP over HTTP, MPEG-TS (MPEG-TS is an optional paid license)</td>
<td>RTMP, RTP, RTSP, RTSP over HTTP, MPEG-TS (MPEG-TS is an optional paid license)</td>
</tr>
<tr>
<td>Bonding</td>
<td>Ethernet, Wi-Fi, USB Modem, TeraLink, accepts Teradek Bond 4-port cellular bonding device</td>
<td>Ethernet, Wi-Fi, USB Modem, TeraLink, accepts Teradek Bond 4-port cellular bonding device</td>
</tr>
<tr>
<td>Remote</td>
<td>Teradek Core</td>
<td>Teradek Core</td>
</tr>
<tr>
<td>Platform Integration</td>
<td>UStream, YouTube Live, Facebook, Livestream, Twitch, Periscope</td>
<td>UStream, YouTube Live, Facebook, Livestream, Twitch, Periscope</td>
</tr>
<tr>
<td><strong>Audio</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Compression</td>
<td>AAC-LC, MPEG Layer 2</td>
<td>AAC-LC, MPEG Layer 2</td>
</tr>
<tr>
<td>Audio Input</td>
<td>Embedded audio input, analog line or mic in, adjustable gain</td>
<td>Embedded audio input, analog line or mic in, adjustable gain</td>
</tr>
<tr>
<td>Audio Output</td>
<td>Headphone output</td>
<td>Headphone output</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th><strong>600 SERIES</strong></th>
<th><strong>700 SERIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>4.75”W x 3”D x 1.1”H [120.7 x 76.2 x 27.9mm]</td>
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<tr>
<td>Weight</td>
<td>11.6oz (328.9g)</td>
</tr>
<tr>
<td></td>
<td>11.6oz (328.9g)</td>
</tr>
<tr>
<td>Construction</td>
<td>Milled Aluminum</td>
</tr>
<tr>
<td></td>
<td>Milled Aluminum</td>
</tr>
<tr>
<td><strong>INTERFACES</strong></td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td>OLED Display with joystick navigation buttons</td>
</tr>
<tr>
<td>Interfaces</td>
<td>OLED Display with joystick navigation buttons</td>
</tr>
<tr>
<td>Switches</td>
<td>On/Off and reset switch</td>
</tr>
<tr>
<td>Recording/Storage</td>
<td>SD Card: Full size</td>
</tr>
<tr>
<td>Desktop App</td>
<td>Feature-rich web UI for configuration and control</td>
</tr>
<tr>
<td></td>
<td>Feature-rich web UI for configuration and control</td>
</tr>
<tr>
<td>Mobile App</td>
<td>VUER, Live:Air Action</td>
</tr>
<tr>
<td></td>
<td>VUER, Live:Air Action</td>
</tr>
<tr>
<td>USB Interface</td>
<td>Powered USB 2.0 host port</td>
</tr>
<tr>
<td>Functionality</td>
<td>Powered USB 2.0 host port</td>
</tr>
<tr>
<td><strong>NETWORK</strong></td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td>10/100/1000 BASE-T Gigabit</td>
</tr>
<tr>
<td></td>
<td>10/100/1000 BASE-T Gigabit</td>
</tr>
<tr>
<td>Wireless</td>
<td><strong>Cube 655 only</strong> - 2.4/5GHz 802.11 ac/a/b/g/n MiMo</td>
</tr>
<tr>
<td></td>
<td><strong>Cube 755 only</strong> - 2.4/5GHz 802.11 ac/a/b/g/n MiMo</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3G/4G Modem support</td>
</tr>
<tr>
<td></td>
<td>USB 3G/4G Modem support</td>
</tr>
<tr>
<td>RF Channel</td>
<td><strong>Cube 655 only</strong> - Auto with 3 modes: (2.4 or 5 GHz), Auto (2.4 GHz only), Auto (5 Ghz only), Configurable to specific channels</td>
</tr>
<tr>
<td></td>
<td>Auto with 3 modes: (2.4 or 5 Ghz), Auto (2.4 GHz only), Auto (5 Ghz only), Configurable to specific channels</td>
</tr>
<tr>
<td>Encryption</td>
<td><strong>Cube 655 only</strong> - 802.1x, 802,11i, WPA2, WPA and WEP 64/128 TKIP, 128bit AES</td>
</tr>
<tr>
<td></td>
<td>802.1x, 802,11i, WPA2, WPA and WEP 64/128 TKIP, 128bit AES</td>
</tr>
<tr>
<td><strong>POWER</strong></td>
<td></td>
</tr>
<tr>
<td>Power Input</td>
<td>2 pin circular-locking connector</td>
</tr>
<tr>
<td></td>
<td>2 pin circular-locking connector</td>
</tr>
<tr>
<td>Nominal Power</td>
<td>7W (no WiFi)</td>
</tr>
<tr>
<td>Consumption</td>
<td>8W, 7W (no WiFi)</td>
</tr>
<tr>
<td>Auxiliary Power</td>
<td>6-28V DC</td>
</tr>
<tr>
<td>Input</td>
<td>6-28V DC</td>
</tr>
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</table>
## CUBE DECODER

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>VIDEO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Outputs</td>
<td>HDMI 1.4a: Full Size SD/HD/3G-SDI (75 Ω BNC)</td>
<td>HDMI 1.4a: Full Size SD/HD/3G-SDI (75 Ω BNC)</td>
</tr>
<tr>
<td>Supported Resolution</td>
<td>1080p 23.98/24/25/29.97/30/50/59.94/60 1080i 50/59.94/60 1080PsF 23/24/25/29/30 720p 50/59.94/60 576i 480i 480p (for HDMI output only) 576p (for HDMI output only)</td>
<td>1080p 23.98/24/25/29.97/30/50/59.94/60 1080i 50/59.94/60 1080PsF 23/24/25/29/30 720p 50/59.94/60 576i 480i 480p (for HDMI output only) 576p (for HDMI output only)</td>
</tr>
<tr>
<td><strong>VIDEO PROCESSING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Decompression</td>
<td>H.264, baseline, main and high profile</td>
<td>H.265, H.264, baseline, main and high profile</td>
</tr>
<tr>
<td>Supported Video Bitrate</td>
<td>250 Kbps to 15 Mbps (Wired:15 Mbps, WiFi:10 Mbps)</td>
<td>250 Kbps to 30 Mbps</td>
</tr>
<tr>
<td>Test Pattern Generator Support</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Video Format Conversion Support</td>
<td>Built-in video scaler and deinterlacer</td>
<td>Built-in video scaler and deinterlacer</td>
</tr>
<tr>
<td><strong>PROTOCOL SUPPORT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Protocols</td>
<td>TCP/IP, UDP, HTTP, DHCP, NTP, SSL, IGMP</td>
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</tr>
<tr>
<td>Supported Video Transport Protocols</td>
<td>RTMP, RTP, RTSP, RTSP over HTTP, MPEG-TS (MPEG-TS is an optional paid license)</td>
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<tr>
<td><strong>Local Device Configuration</strong></td>
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</tr>
<tr>
<td><strong>USB</strong></td>
<td>N/A</td>
<td>USB 3G/4G Modem support</td>
</tr>
<tr>
<td><strong>RF Channel</strong></td>
<td>Cube 675 only - Auto with 3 modes: (2.4 or 5 Ghz), Auto (2.4 GHz only), Auto (5 GHz only), Configurable to specific channels</td>
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<td><strong>Auxiliary Power Input</strong></td>
<td>6-28V DC</td>
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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

This device complies with Part 15 of the FCC rules and also with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

EC DECLARATION OF CONFORMITY

Teradek LLC hereby declares that the Slice encoder and decoder are in compliance with Directive 1999/5/EC. The full text of the EC Declaration of Conformity is available at the following Internet address: https://support.teradek.com/hc/en-us/articles/233429747-EC-Declaration-of-Conformity-for-CE-mark