T-RAX

User Guide

TERADEK

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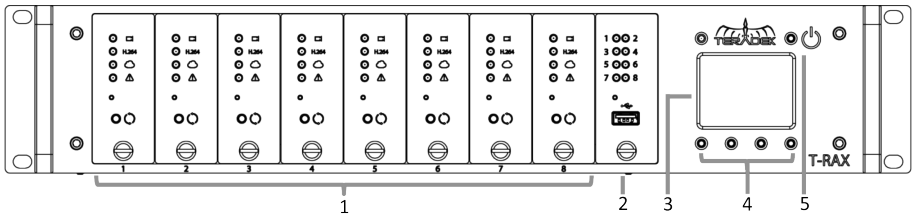
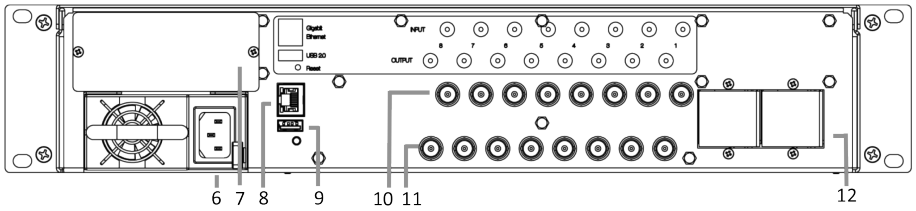
CONNECT AND POWER

FRONT



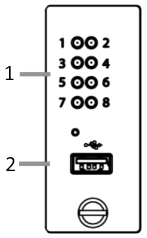
1. **Encoder/Decoder card slots 1-8**
2. **Controller card**
3. **Display**
4. **Display operation buttons**
5. **Power on/off button**

REAR

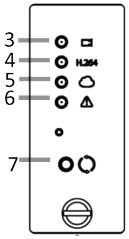


6. **110-240V A/C input**
7. **Power supply #2 (optional)**
8. **10/100/1000 Ethernet (RJ45)**
9. **USB 2.0 port**
10. **SD/HD-SDI inputs**
11. **SD/HD-SDI outputs**
12. **Expansion plates**

LED OPERATION



1. **Card Status LEDs**
2. **USB 2.0 port**



3. **Video Status**
4. **Codec status**
5. **Broadcast Status**
6. **Warning**
7. **Reset button**

BASIC CONFIGURATION

FIRST TIME USE

Installing T-RAX

1. Connect 100-240v A/C power to the power input (6) on T-RAX via the included IEC cable. Connect a second cable if your device includes a redundant power supply (7).
2. Connect an Ethernet cable between the 10/100/1000 Ethernet port (x) and a network switch.
3. Connect SD/HD-SDI video sources to any input BNCs corresponding to installed encoder cards.
4. Connect SD/HD-SDI outputs via BNC cable to your monitor/switcher/router.

Connect to T-RAX

T-RAX can be configured using its built-in web interface. This is accessible over your network, or via the built-in Wi-Fi.

Ethernet defaults

IP mode: DHCP, T-RAX will request an IP address from your network. View the IP address by pressing the < and > button on T-RAX until the *Network* screen is displayed.
Bonjour: Bonjour is enabled by default, and can be used to find T-RAX without using the IP address. If your web browser supports Bonjour, T-RAX will appear as a Webpage with the default friendly name *T-RAX xxxxx* Administrative Console where *xxxxx* is the last 5 digits of the controller card's serial number.

Wi-Fi defaults

ESSID	Teranet-0
Security Mode	WPA2 Personal
Password	terawifi
IP Address	172.16.116.1
Subnet Mask	255.255.255.0

Login information

Once you've connected a computer or tablet to the same network as T-RAX, view the admin panel by opening a web browser and either selecting the Bonjour friendly name or navigating to the IP address.

Username	admin
Password	admin

The T-RAX admin page contains status information and configuration options for the T-RAX system and all of the connected cards.

Stream information

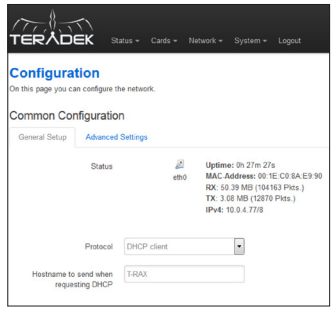
T-RAX encoder cards are configured to stream via RTSP by default. When an active video signal is connected, you can preview the stream using a computer or mobile device.
Note: video streaming is only supported over the Ethernet interface.

Stream to a Computer:
Use an RTSP player (such as VLC) to open the following URL.
rtsp://ip.address:port/stream1

ip.address: T-RAX's Ethernet IP address.
port: 255x, where x corresponds to the T-RAX card slot.

Configuration

T-RAX has a number of options available to help it fit into your existing IT and video workflow requirements. This section discusses some of the most commonly adjusted parameters, separated into Network, Streaming, and Encoder sections.



Network

From the web UI, configure the T-RAX Ethernet interface and other network options by opening Network > Configuration, and the Wireless interface by opening Network > WiFi.

The network configuration page also shows statistics about the Ethernet interface, including up time, the MAC address, IP address, and the amount of data sent and received. The following configuration options are available.

- **Protocol** – Select between *DHCP client and Static address*. When set to DHCP, T-RAX will request an IP address and all other network configuration from the network's DHCP server. When set to Static address, you will need to manually configure the IP address, subnet mask, gateway, and DNS server to connect to the network.
- **Hostname to send when requesting DHCP** – Enter an alphanumeric host name, this is used by T-RAX to identify itself when requesting a DHCP lease. This does not need to match the System hostname, which is configured on the System > Configuration page. This value can be left blank.

Streaming

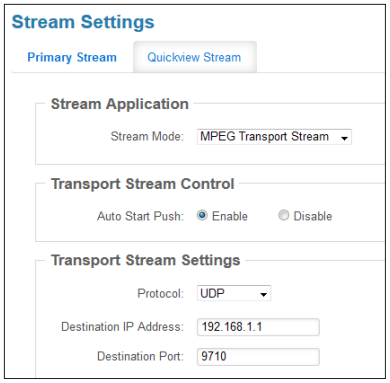
T-RAX encoder cards are capable of encoding video and streaming it using a variety of different protocols. Choose the Stream Mode best suited for your application. Find information on two common stream modes below. View the current streaming configuration by navigating to Cards > Configuration, and click the Edit button next to a listed card to modify the configuration. All Streaming options are located under the card's *Stream* tab.

RTP/RTSP

T-RAX encoder cards are configured to stream via RTSP by default. RTSP is used for local streaming to computers and Teradek decoders. The URL for a standard RTSP stream is rtsp://*ip.address:port*/stream1, where *ip.address* is T-RAX's Ethernet IP address. *Port* is 255x, where *x* corresponds to the T-RAX card slot.

Transport Stream

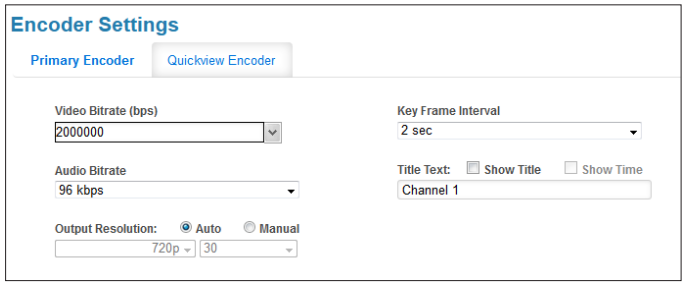
In transport stream mode, the encoder card sends video via UDP or TCP to a specified unicast or multicast address. The MPEG transport stream protocol is used in many broadcast applications and is also supported by many IPTV set top boxes. To enable transport stream, select 'MPEG Transport Stream' as the *Stream Mode*, choose your streaming protocol (see below), enter your destination IP address and port, and click 'Apply.'



- **Protocol:** TCP is recommended when streaming over the internet or a WAN. For streaming over a local network, UDP can be used to avoid the additional network overhead of TCP. On a local network, use 'UDP (Unicast)' if streaming to a single decoder, or 'UDP (Multicast)' when streaming to multiple decoders over a multicast-capable network.
- **Auto Start Push:** If enabled, the encoder will push video to its destination as soon as the codec starts. Video can be paused and resumed using controls on the Stream page.

Encoder

In addition to configuring your stream type, T-RAX allows you to control various characteristics of the network video stream. These include bitrate, frame rate, video scaling, and more. All of these settings can be found under 'Video Setup' -> 'Encoder Settings.' Use this page to adjust the video stream to best suit your streaming environment.



Video Bitrate: Allows you to select different bitrates or manually enter your stream's target bitrate (in bits per second). Lower bitrates require less bandwidth and may allow for a more stable stream. Higher bitrates offer better video quality, but require more network bandwidth. See below for recommended video bitrates based on the resolution.

RESOLUTION	RECOMMENDED MINIMUM BITRATE
1920x1080	4.5 mbps
1280x720	1.5 mbps
960x540	1 mbps
SD (480i/p, 576i/p)	768 kbps
480x270	450 kbps
360x240	300 kbps

Audio Bitrate: Similar to above video bitrate setting. Use this to adjust the audio bitrate, if enabled.
Output Resolution: Adjust T-RAX encoder's streaming resolution. If your network conditions have bandwidth restrictions or if you are streaming to mobile devices or the Internet, you can scale the encoder's video to a smaller size to maintain video quality. You can also adjust the video stream's frame rate here.
Key Frame Interval: Adjusts amount of time between full picture refreshes. Increasing this value allows for better video quality at a given bitrate. Decreasing the value may lower the overall image quality, but will allow for quicker recovery of the stream if data is lost during transmission. By default, the encoder generates one key frame every two seconds.
Title Text: Enter your desired title text here. Check 'Show Title' to display the title text on your video stream. If the title text is enabled, you can also display the encoder's system time by checking 'Show Time Code.' The title text is also used as your channel name, and the default name is 'Channel 1.'

Support Resources
In addition to this Reference Guide, there are a number of resources available for more information on T-RAX's features and operation.

For online information, visit **www.teradek.com**.
If you are unable to find what you need online, please contact Teradek's support staff:
E-mail: **support@teradek.com** | Phone: (888) 941-2111 ext. 2 (available M-F 7AM-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
T-RAX contains sensitive electronic components that can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the device is not damaged. Damage due to inappropriate handling is not covered by the warranty. For complete warranty information, please see the warranty card that arrived with the device, or visit **www.teradek.com/pages/warranty-information.**