VPX Series

VPX-TC1-PRO• VPX-TC1-LT • VPX-TC1-WP2-PRO

4K60 4:4:4 1GbE Visually Lossless
Low Latency AV over IP

VPX-TC1-PRO

VPX-TC1-LT

VPX-TC1-WP2

iPBT™

SAFETY INSTRUCTIONS

Please review the following safety precautions. If this is the first time using this model, then read this manual before installing or using the product. If the product is not functioning properly, please contact your local dealer or Aurora for further instructions.

The lightning symbol in the triangle is used to alert you to the presence of dangerous voltage inside the product that may be sufficient to constitute a risk of electric shock to anyone opening the case. It is also used to indicate improper installation or handling of the product that could damage the electrical system in the product or in other equipment attached to the product.

The exclamation point in the triangle is used to alert you to important operating and maintenance instructions. Failure to follow these instructions could result in injury to you or damage to the product.

Be careful with electricity:

- **Power Outlet:** To prevent electric shock, be sure the electrical plug used on the product power cord matches the electrical outlet used to supply power to the Aurora product. Use the power adapter and power connection cables designed for this unit.
- **Power Cord:** Be sure the power cord is routed so that it will not be stepped on or pinched by heavy items.
- **Lightning:** For protection from lightning or when the product is left unattended for an extended period, disconnect it from the power source.

Also follow these precautions:

- **Ventilation:** Do not block ventilation slots, if applicable, on the product, or place any heavy object on top of it. Blocking airflow could cause damage. Arrange components so that air can flow freely. Ensure that there is adequate ventilation if the product is placed in a stand or cabinet. Put the product in a properly ventilated area, away from direct sunlight or any source of heat.
- **Overheating:** Avoid stacking the Aurora product on top of a hot component, such as a power amplifier.
- **Risk of Fire:** Do not place unit on top of any easily combustible material, such as carpet or fabric.
- **Proper Connections:** Be sure all cables and equipment are connected to the unit as described in this manual.
- **Object Entry:** To avoid electric shock, never stick anything in the slots on the case, or remove the cover.
- **Water Exposure:** To reduce the risk of fire or electric shock, do not expose to rain or moisture.
- **Cleaning:** Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- **ESD:** Handle this unit with proper ESD care. Failure to do so can result in failure.

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two (2) conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

Trademarks

All trademarks in this document are the properties of their respective owners.

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PACKAGE CONTENTS

Please make sure the following items are included within your package.

Box Versions

VPX-TC1-PRO

- 1 QTY VPX-TC1-Pro 4K60 4:4:4 1G RJ-45/SFP Copper/Fiber Transceiver Unit
- 2 QTY Mounting Ears and screws.

VPX-TC1-LT

- 1 QTY VPX-TC1-LT 4K30 4:4:4 1G RJ-45/SFP Copper/Fiber Transceiver Unit
- 2 QTY Mounting Ears and screws.

Wall Plate 2 Gang Versions

VPX-TC1-WP2-PRO

- 1 QTY VPX-TC1-WP2-PRO (-W for White or -B for Black) 1G RJ-45 Copper Transmitter Unit with 1 HDMI & USB-C Inputs, HDMI Output & USB 2.0 Type A

Power supplies are sold separately.

****Note: Go to www.auroramm.com for the latest manual and firmware.***

License Options

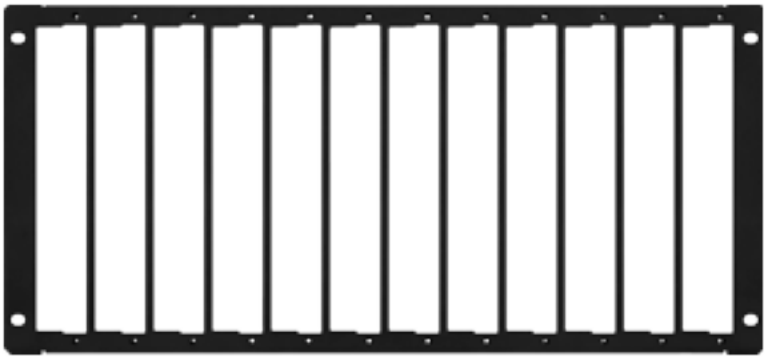
Dante/AES67

- LCN-DTE-2 2x2 Channel Dante/AES67 License
- LCN-DTE-8 8x8 Channel Dante/AES67 License

OPTIONAL ACCESSORIES

- **RK2-1-K**
  (1RU Rack Mount Holds 2 Units)
  Includes 4 rails and 1 blank

- **RK2-5-K**
  (5RU Rack Mount Holds 12 Units)
  Includes 24 rails and 4 blanks



- **RK2-BP-K**
  (Blank Plate for Rack Mounts)
  RK2-RL-K
  (For VPX-TC1 Use in Rack Mounts)

- **IRC-11 IR Remote Control**
  (IR Remote for Changing Channels and EPG Guide)

- **IPA-SFP-RJ45-1**
  (1G RJ-45 LAN SFP Module)

- **IPA-SFP-1GMM-1**
  (1G Multi-Mode Fiber SFP Module)

- **IPA-SFP-1G20**
  (1G Single-Mode Duplex Fiber SFP Module)

- **PS0081-1**
  (48V 24-Watt PoE Injector)
  Available in –US, -AU, -EU, and –UK worldwide models

PS0094-3
(48V 25-Watt Wall Supply)
Comes with US, AU, EU, and UK interchangeable blades

- **IR Receiver CA0026-1**

- **IR Emitter CA0061-1**

- **RS-232 Adaptor CA0052-F2T3R**
  (3.5mm TRS to FEMALE DB89 2-TX 3-RX)
  RS-232 Adaptor CA0052-F3T2R
  (3.5mm TRS to FEMALE DB89 3-TX 2-RX)
  RS-232 Adaptor CA0052-M2T3R
  (3.5mm TRS to MALE DB9 2-TX 3-RX)
  RS-232 Adaptor CA0052-M3T2R
  (3.5mm TRS to MALE DB9 3-TX 2-RX)

- **LVR-2G Gang Electrical Ring**

INTRODUCTION

About

The VPX-TC1 Series provides one of the most advanced 1G IP Streaming solutions on the market utilizing Aurora's new Mimix™ CODEC technology. Mimix™ compression allows for near perfect reproduction of video and graphic images at resolutions up to 4K60 4:4:4 over 1G networks. It has zero frame (1.78ms) of latency and seamless switching for fast lag-free content. Power consumption is important as the VPX-TC1 uses as little as 8 watts. It does this with no fan (box versions) and a small form factor, saving a lot of money on utility bills as it uses 1/3 the power of comparable systems.

Audio, video, data, and control can be sent securely to one or many units using an off-the-shelf Managed 1G Ethernet and/or Fiber switch. When the VPX-TC1 is set up to be a transmitter, the HDMI or USB-C (VPX-TC1-WP2-Pro only) inputs become a source switch and the HDMI output becomes a potential loop out. When set up as a receiver, a user can select the local HDMI inputs or an IP source. Seamless switching of the sources further enhances the presentation. Regardless of how the VPX-TC1 is set up, the audio can be de-embedded at any location, and/or be sent to or received from a Dante® enabled device. The USB extension is also flexible, working as a KVM and/or a high-speed data transfer for memory sticks & another port just for cameras. To keep the system friendly, an OSD and integrated web server are available for easy navigation and setup of features.

Digital signage, education, corporate, and residential are just a few markets which benefit from the flexibility and low cost of the VPX-TC1.

Documentation

Aurora provides many documents to support the VPX Series and accessories. Below is a list of the available documents that can be found on the download tab of the VPX products or the customer portal.

- VPX Series Control API (Available only on Customer Portal)
- VPX Series Control API Quick Start Guide (Available only on Customer Portal)

Features

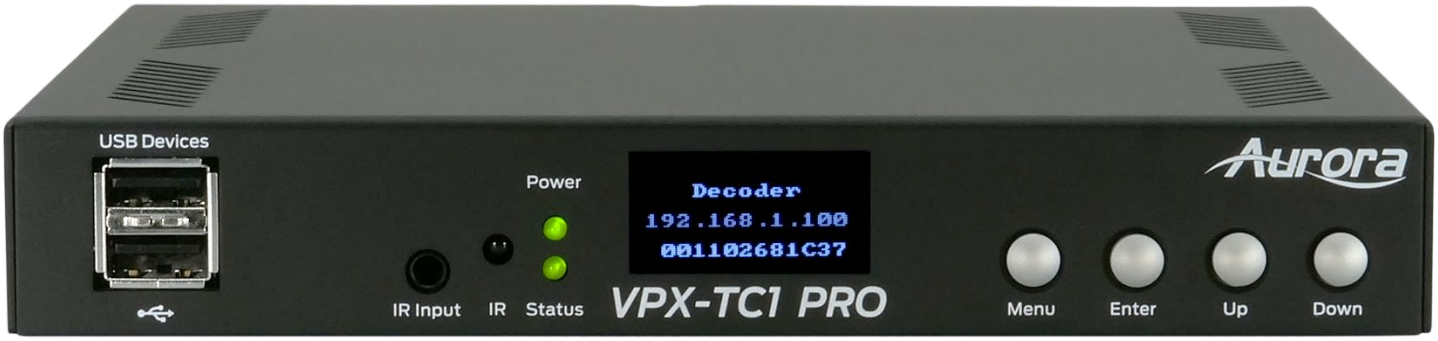
- Configure as Encoder or Decoder
- 4K60 4:4:4 (Pro) 4K30 4:4:4 (LT) UHD 120m over 1G CAT 5e
- HDMI 2.0b, HDCP 2.2
- HDR10, HDR10+, Dolby Vision
- LPCM up to 12-channels with 2-channel embedding and de-embedding
- Dolby Digital Plus, Dolby TrueHD DTS HD Master Audio & ATMOS passthrough
- 12-bit color depth processing
- Enterprise Security (AES 256, 802.1x, HTTPS, & SSH)
- Zero Frame Latency (as low as 1.78ms)
- Low Power Design
- Seamless Switching
- MJPEG Preview at 720p30 (Pro) & 480p15 (LT)
- Video Wall with Image Rotation
- 1G LAN PoE and SFP for Fiber or 2nd RJ-45
- 2 HDMI Inputs (Pro), 1 HDMI Input (LT), 1 HDMI Output
- Line In/Out Stereo
- RS-232 Serial Port and IR (In/Out)
- Channel Mapping with EPG & On-Screen Preview
- Picture in Picture (Pro)
- Integrated Web Server for Configuration
- 2 USB 2.0 Type-A for Cameras, HID Devices, Mass Storage, etc. (Devices)
- 1 USB 2.0 Type-C for Computer (Host)
- Dante® 2x2/8x8 Ch Audio License Options & Dante Controller
- Rack and Under Table Mounting (box version)
- Wall Plate Available in White or Black

Note: Wall plate versions require full 2 gang electrical box space. Some electrical boxes and mud rings do not accommodate the full size. Read specifications for dimensions.

VPX Model Comparison Table

	VPX-TC1 Pro	VPX-TC1 LT	VPX-TC1-WP2
Enclosure Type	Box	Box	Wall Plate
Unit Type	Transceiver (Encode or Decode)	Transceiver (Encode or Decode)	Transceiver (Encode or Decode)
Network Type	1Gbps	1Gbps	1Gbps
Max Video Resolution	4K60 4:4:4	4K30 4:4:4	4K60 4:4:4
Compression Type	Mimix CODEC	Mimix CODEC	Mimix CODEC
Compression Ratio	13:1	13:1	13:1
Latency (end to end)	0 Frame (1.78ms)	0 Frame (1.78ms)	0 Frame (1.78ms)
HDMI/HDCP Version	2.0/2.2	2.0/2.2	2.0/2.2
Content Encryption	Yes	Yes	Yes
HDMI In	**2**	1	1
HDMI Out	1	1	1
USB DP In	0	0	1
Seamless Switching	Seamless (300ms)	Seamless (300ms)	Seamless (300ms)
Scaling	Yes	Yes	Yes
Fiber	Yes	Yes	No
Copper	Yes	Yes	Yes
PoE Type	PoE (802.3af)	PoE (802.3af)	PoE (802.3af)
USB Ports	3 x USB 2.0	3 x USB 2.0	2 x USB 2.0
RS-232	Yes	Yes	Yes
IR In	1	1	No
IR Out	1	1	No
CEC	Yes	Yes	Yes
Videowall	8x8	8x8	8x8
Image Rotation	Yes	Yes	Yes
Windowing	Yes up to 4	No	Yes up to 4
Dante/AES67	Software License	Software License	Software License
Audio Downmixing	Yes	Yes	Yes
Analog Audio In/Out	Yes	Yes	Yes
Channel Mapping	Yes (EPG)	Yes (EPG)	Yes (EPG)
Auto Sense Switching	Yes	Yes	Yes
Video Preview	Yes (720p30)	Yes (480p15)	Yes (720p30)
Front OLED Display	Yes	Yes	No
Management Software	Yes (Free)	Yes (Free)	Yes (Free)
Power Consumption	8 Watts	8 Watts	8 Watts
Enclosure Size	174.8 x 150.7 x 26.7mm [6.88” x 5.93” x 1.05”]	174.8 x 150.7 x 26.7mm [6.88” x 5.93” x 1.05”]	2 Gang Decora
Warranty	5 Years	5 Years	5 Years

VPX-TC1-PRO & LT Front



LEDs

- **Power:** Power will light green when unit is on or in standby.
- **Status:** Status will blink at a normal pace during regular operation and slower pace when in standby.

OLED Display

Using the buttons as described below, the OLED display will show firmware version, mode (encoder/decoder), IP address, serial number, MAC address, subnet mask, USB mode, active source information, and more.

Buttons

- **Menu Button:** Cycle through info screens. Press and hold for 6 seconds switch between encode and decode mode.
- **Up Button:** Select next input source.
- **Down Button:** Select previous input.
- **Enter Button:** Confirms selection.

Miscellaneous

- **IR Window:** IR remote and IR pass through.
- **IR Input:** For use with external IR Receiver. If utilized, front IR window will become disabled.

  Note: It is important to use 5V only photo receiver which is with carrier and inverted. Use a stereo 3.5mm TRS connector.

- **USB 2.0:** Dual Type A USB 2.0 Connectors for peripherals (Camera, Bluetooth, Memory, etc.) & keyboard/mouse for HID functionality. This port has up to 200Mbps throughput.

Special Functions

- **Factory Default:** Press and hold MENU and ENTER for 6 seconds. The OLED display will show “FACTORY RESET” while the device is resetting, followed by an automatic reboot. This will not change the current set device mode.

- **Secondary Firmware Image Mode:** Press and hold UP and DOWN while applying power. The OLED display will show “Secondary” mode alongside the device IP.

Default Settings

- **Baud Rate:** 9600
- **IP Mode:** DHCP
- **Fallback IP Mode (no DHCP Present):** Auto-IP 169.254.xxx.xxx range
- **Autosense:** Off

VPX-TC1-PRO & LT Rear

Rear

From left to right:

- **48VDC:** 48 Volt isolated power input
- **LAN Connector LED's:**
  - Left LED Green = 1G Link Speed (1G Link speed is required for operation)
  - Left LED Orange = 10/100 Mbps Link Speed (Device will NOT operate at 10/100 speeds)
  - Right LED is Orange, for general LAN Activity

LAN is PoE and PoE+ capable based on needs. The VPX-TC1-Pro uses 8 watts of power. Standard PoE is 12.9 watts. When USB is utilized, some peripherals may require extra power. If more than 5 watts is required for USB, PoE+ can be used to extend the power range to 20 watts for 7 additional watts of power.

- **SFP:** SFP Cage for Multi-mode or Single-mode Fiber and RJ-45 LAN with optional modules available from Aurora. This can be used for daisy chaining or to control nearby LAN product.
- **Audio In:** Analog stereo audio input.
- **Audio Out:** Analog stereo audio output. De-embedded audio output from HDMI stream or Dante/AES67. HDMI multichannel audio (up to 7.1) is down mixed (PCM) to stereo (2 channel).
- **HDMI In 1/ In 2:** Two HDMI inputs up to 4K60 4:4:4 for PRO model. LT has 1 Input up to 4K30 4:4:4.
- **HDMI Out:** HDMI Output to Display up to 4K60 4:4:4 (PRO)/4K30 4:4:4 (LT). Output can be native or scaled (Ex. from 1080p to 4K60/4:4:4). When in encoder mode the HDMI output is a loop out of the HDMI input(s). When in decoder mode the HDMI output will show the remote stream as well as loop out the local HDMI input(s). Remote stream is the only source that can be scaled or seamlessly switched. Local inputs are not scaled nor can they seamless switch.
- **Control RS-232:** Serial port pass-through and control up to 115Kbps.
- **Control IR Out:** Infrared control output 30kHz-60kHz. IR emitter must be mono 3.5mm TS.
- **USB 2.0:** 200Mbps USB 2.0 Type C to be connected to a host (PC) for peripherals from routed decoder.

VPX-TC1-WP2 Front

Buttons

- **Video In 1:** Selects HDMI Input 1 (Illuminates when selected or autosensed from last plugged).
- **Video In 2:** Selects USB-C Input 2 (Illuminates when selected or autosensed from last plugged).
- **Stream:** When in decoder mode this selects remote encoder stream to Video Out. If held for 6 seconds, it will switch between encoder and decoder mode. When in encoder mode the stream button will be lit solid blue all the time in addition to the Video In ½ being selected.

Connectors

- **HDMI Video In 1:** HDMI inputs up to 4K60 4:4:4 (Auto sense feature available)
- **USB-C Video In 2:** USB Type C to be connected to a host (PC) for Video and USB 2.0 Data
- **USB Type A:** To be connected to a device (i.e., Mouse, keyboard, etc.).
- **HDMI Video Out:** HDMI Output to Display up to 4K60 4:4:4. Output can be native or scaled (Ex. from 1080p to 4K60/4:4:4). When in encoder mode the HDMI output is a loop out of the HDMI input(s). When in decoder mode the HDMI output will also loop out the local HDMI input(s) or show the remote stream. Remote stream is the only source that can be scaled or seamlessly switched. Local inputs are not scaled nor can they seamless switch.

Special Functions

- **Factory Default:** Press [IN1] and [IN2] button till white LED turns on for a second. Release the switches once the white LED turns on, on both the buttons. The unit will reboot automatically after factory default.
- **Reboot:** Press [In1] button for 5 seconds.All lit LEDs will be off now and the board reboots.
- **Secondary Firmware Image Mode:** Press [In1] and [In2] button while powering up for 5 seconds. The LED in buttons In1 and In2 will light Red once the board has finished booting to indicate secondary mode. This may be necessary if for some reason the firmware becomes corrupted during a firmware update.

LED Indications

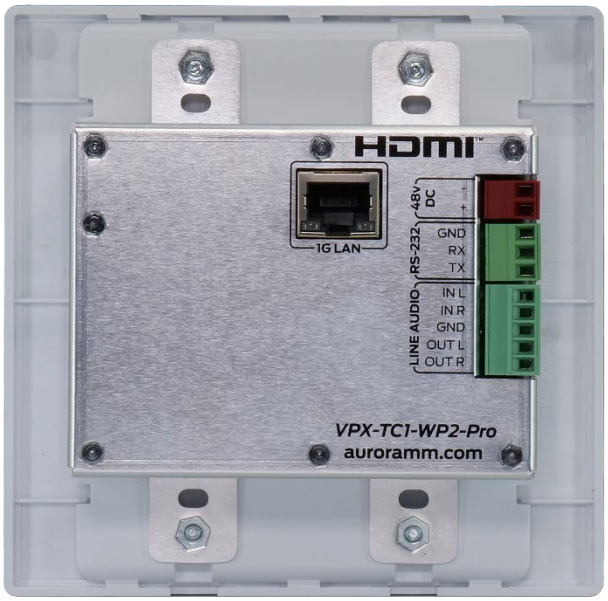
- **Source Indication:** Red LED to be lit on the button corresponding to the source.
- When power is first applied, all front LEDs will light white for a second.
- All LEDs will be lit white to indicate that the firmware update is in progress.
- Selected input source LED will light red.
- Both In1 and In2 LEDs will light Red to indicate secondary mode.

Default Settings

- **Baud Rate:** 9600
- **IP Mode:** DHCP
- **Fallback IP Mode (no DHCP Present):** Auto-IP 169.254.xxx.xxx range
- **Autosense:** Off

Note: When using the USB-C port make certain it is a properly rated cable for video and data. Although most USB-C cables look similar, many are not rated for the video capability.

VPX-TC1-WP2 Rear



Rear

- **48VDC:** 48 Volt DC isolated power input
- **LAN:** 10/100/1000Mbps LAN. Can power the unit with PoE from injector or switch.
- **RS-232:** Serial port pass-through and control up to 115Kbps.
- **Audio In:** Analog stereo audio input.
- **Audio Out:** Analog stereo audio output. De-embedded audio output from HDMI stream or Dante/AES67. HDMI LPCM multichannel audio (up to 7.1) is down mixed to stereo (2 channel). Can be used to connect to another 1 Gang Audio Input/Output connector plate for enhanced usability.

Note: Wall plate versions require full 2 gang electrical box space. Some electrical boxes and mud rings do not accommodate the full size. VPX-TCW2 wall box dimensions are 3.728" x 2.83" x 1.404".

UNDERSTANDING THE BASICS

Direct Connection with No Ethernet Switch

The VPX Series is designed to automatically tunnel the video, audio, USB, RS-232, and IR if they are connected without an Ethernet switch once they have been connected for the first time with an Ethernet switch or through the secondary SFP port. Point to point will require a power supply at both ends or a PoE injector on one end in addition to the local power supply.

1GbE Ethernet Switch

It is important to use a non-blocking IGMP capable 1GbE switch that supports IGMP Snooping and Querier. Consider uplink ports of adequate bandwidth if extra port capacity is required for future expansion. The VPX, when set to encoder (TX), determines the bandwidth that will be multicast across the network. 24bit 4k@60Hz can peak at about 800Mbps (Data Rate in bits per second = Color Depth x Horizontal Resolution x Vertical Resolution x Frame Rate) but typically varies with content as it is dynamic compression for full motion 4K video. This does not include the 10/100 LAN passthrough, up to 200Mbps USB, RS-232, IR over the same transmission if required. If 10 units are set as encoders, and 4K@60Hz is the desired video resolution, then 8Gbps of bandwidth will be needed if uplinked to another switch. If the available bandwidth between the two 1GbE switches is less than 8Gbps, then packets will drop, and information will be lost. It is also good to consider overhead and assume 15% bandwidth loss to play it safe. Since each port is bi-directional at 1Gbps, it enables any port to be used as an encoder or decoder. The AV industry is used to standard distribution topology limitations of 4x4, 8x8, 16x16, etc. With networked based video distribution, a 48 port 1GbE switch as an example can be 24x24, 1x47, 47x1, 12x36, etc. (see Ethernet Bandwidth Usage section for more detailed information).

VPX Network Switch Requirements

It is ideal to use a non-blocking 1G PoE Ethernet switch with enough power for a standard 15 watts per port if the infrastructure is RJ-45. PoE+ can be used as well but it is not necessary. If multiple switches are used there should be only 1 IGMP Querier per VLAN for the network.

- **IGMPv2 Snooping:** Enabled
- **IGMP Fast Leave:** Enabled
- **Unregistered Multicast Flooding:** Disabled
- **IGMP Querier:** Enabled (Note: There can only be 1 querier per VLAN for the network.)
- **QOS:** Disabled (Note: If using separate VLAN for the VPX Dante, QOS can be used on Dante VLAN only.)
- DHCP if utilized, can only be on the VPX video VLAN. Do NOT use DHCP on the video VLAN and Dante VLAN as there is only one MAC address for both IP address and VLANs. When separate VLAN is used for Dante, the IP address must be static.

Network Infrastructure

The raw network cabling as well as the patch cables are as important as the switch. When using copper, CAT5e, 6, or 6a cable is preferred for optimal performance and is important to follow the standard rules for running Ethernet cables. No sharp bends, coiling, putting near power lines, grouping unshielded cables tightly together with other LAN cables, etc. Shielding is not necessary but can be used for noisy environments.

Isolated Network or Users Network

When discussing a networked based video solution, many times it is assumed it must be on the client's network. This is not true. The application determines the type of network to be used. For example, if it is simply being used as a typical AV matrix switch with no distribution throughout the facility, then a 1GbE switch can be used just for that room. Just because it is Ethernet based does not mean it has to be used on the main network. The Ethernet switch is simply used as the end point for all the cables and the glue that holds everything together. In other words, it takes the place of the standard AV

matrix switch topology. If only remote control is required from the main network, then connect the 1GbE switch to the main network and allow the control data between the 1GbE switch VLAN and the main network. Even if the VLAN is part of the main network it does not mean you will use all the bandwidth. The purpose of IGMP is to only send the multicast data to the ports specified, which would be where the VPX units are connected to. A non-blocking switch assures full bandwidth is available for all ports as required.

Overall, Aurora recommends allowing the integrator to supply and configure the switch as this will allow for a smooth installation. This does not mean it cannot be connected to the client network or even use the same brand switch as the client's. It does allow the integrator and Aurora better access for making changes as needed for the AV over IP system on site while maintaining job sites security protocols.

Network Switch Support

While Aurora will do its best to assist in the network setup, the service and support of the switch will be borne by the Manufacturer of the switch. It is also highly recommended to have personnel, or a consultant certified in the brand being deployed for the facility. Typical single switch typology is straightforward, however, once there is more than one switch, VLANs, and other specifications required for the solution require a certain level of expertise in the brand chosen. Aurora will work with most brands, and they do have a wealth of documentation and support services.

Netgear Resources

Support
https://www.netgear.com/av/services/proav-designsupport/

Documentation
https://www.netgear.com/hub/business/av/av-tech-guides/

Controlling the VPX

To simplify control of the VPX, each unit can be controlled via the Aurora IPBaseT Manager server, either running on a PC or on a dedicated control appliance (Aurora RXS-2). It can also be controlled from other Aurora control products or third-party control systems with the available VPX Control API. To obtain the VPX Control API commands you must have dealer status otherwise an NDA is required and is at the discretion of Aurora. The VPX can also work without the server as a third-party control can communicate directly to each unit to change settings or make routes. This makes the VPX extremely flexible and for low-cost smaller systems very cost effective.

Controlling the VPX for Redundancy

Multiple control systems can run on the same network for redundancy. It is important only one communicates at any given time or incomplete commands may occur between units communicating simultaneously.

EDID and its Importance

One of the most forgotten setup procedures in AV systems is EDID management. The EDID comes from the destination (display, VTC, recorder, etc.) and must be saved into the encoder and decoder HDMI input ports. This allows the source (Blu-ray, computers, etc.) to know the capabilities of the destination. This includes the audio type if any, video resolution and timing, color space, color depth, and more. If no EDID is present an HDMI device will revert to its lowest resolution in DVI mode which also means no audio. If the wrong EDID is used, the image may look pink, green, or have no image at all. To make matters more complex, if different destinations/displays are in use in a matrix configuration, then it is important to use an EDID with a common denominator or only one or the other destination may work. In an ideal installation, all the destinations should have the same capabilities for optimal performance. If this is not possible a scaler may have to be implemented to assist in compatibility.

For example, there are 2 displays, one is 1080p and the other is 4k UHD. If the EDID of the 4K display is used, the 1080p display will not see an image if it receives a 4K signal. If the EDID of the 1080p display is used, then both will see the image. However, signals will be limited to 1080p causing the 4K display to need to upscale the content. In a situation where this is unacceptable, a scaler can be implemented to down-scale the 4K signal to 1080p. This will allow the 4K display to receive an optimal signal, however it can potentially degrade image quality on the 1080P display. Therefore, it is always ideal to use destinations with similar capabilities for optimal performance.

Audio can be impacted just as easily. The most common mismatch is an audio format mismatch. For example, if a destination is 5.1-channel Dolby/DTS surround sound capable and the other destination is only LPCM, then the EDID from the 5.1 Dolby/DTS destination cannot be used, or there will be no audio on the other destination. Also, channel count can also cause issues. For example, if you have a 5.1-channel capable destination and the other destination can only support 2-channel audio, then there may be limited or incorrect audio at the 2-channel destination. In most commercial installations, it should not be an issue to choose the lowest common denominator, which is 2-channel LPCM audio, but in cases where you must have surround sound then a down-mixer for the 2-channel destination must be used.

In some cases, a custom EDID could be created, as the audio and video are mismatched between the destinations. This can occur for example, when one destination has 4K 2-channel LPCM audio and the other 1080p with multichannel Dolby/DTS surround sound. If the EDID of the 1080p destination is used, audio will not be present on the 4K destination. If the 4K EDID is used, there will be no video present on the 1080p destination. The only way to solve this issue is a new EDID combining the common features. In this case an EDID which is set at 1080p with 2-channel LPCM audio is the solution.

Video Wall Capabilities

The VPX video wall mode can take in up to a 4K UHD signal and create a low latency high quality video wall up to 8x8 in size. The way the mode works is by dividing the input resolution by the number of displays. For example, a 2x2 video wall will become four 1080p signals from a 4K UHD signal. The VPX also has bezel compensation to create a seamless windowpane effect.

Ethernet Bandwidth Usage

The VPX streaming bandwidth is dynamic with compression at 14:1 compression for 4K60 4:4:4. With no USB activity and a still image fed into a decoder the VPX will use as little as 92Mbps of network bandwidth. Maximum throughput is 800Mbps without USB data. With USB data the VPX will consume up to a full 1Gbps of bandwidth.

USB Network Bandwidth Requirements

- When USB devices are attached but there is no activity, the network bandwidth requirement is almost 0. For non-isochronous USB devices, network performance only impacts the performance of the USB device. It will not impact USB devices' functionality.
- For isochronous USB devices (for example, USB audio), the network latency may impact the functionality of this kind of device. If the network latency is too high, ISO packets may be discarded and cause audio glitches. It is important to use fast-leave high quality switches for this application.
- For most USB devices, the network bandwidth requirement will be the same as a local USB bus.

Typical Video Network Bandwidth

- **Still Frame:** < 100Mbps
- **Web Browsing:** 200~600Mbps (3840x2160) 60fps
- **YouTube Full Screen:** 600~800Mbps (3840x2160) 60fps

Bandwidth Table

The following table is the network bandwidth requirement matrix which measured from playing a video clip. The average network bandwidth is measured by profiling Ethernet MAC layer traffic. The value in () is the performance variation.

Video Resolution	Quality Level	Maximum Frame Rate	Average Network Bandwidth (Mbps)
3840x2160 (2160p60)	Auto	60	442 (93~800)
3840x2160 (2160p30)	Auto	30	261 (92~423)
1920x1080 (1080p)	Auto	60	187 (99~525)
1280x720 (720p)	Auto	60	119 (78~330)

HARDWARE INSTALLATION

Network Setup

1. It is ideal to use a non-blocking 1G PoE Ethernet switch with enough power for a standard 15 watts per port if the infrastructure is RJ-45. PoE+ can be used as well but it is not necessary. If multiple switches are used there should be only 1 IGMP Querier per VLAN for the network.

    - **IGMPv2 Snooping:** Enabled
    - **IGMP Fast Leave:** Enabled
    - **Unregistered Multicast Flooding:** Disabled
    - **IGMP Querier:** Enabled (Note: There can only be 1 querier per VLAN for the network.)
    - **QOS:** Disabled (Note: If using separate VLAN for the VPX Dante, QOS can be used on Dante VLAN only.)
    - DHCP if utilized, can only be on the VPX video VLAN. Do NOT use DHCP on the video VLAN and Dante VLAN as there is only one MAC address for both IP address and VLANs. When separate VLAN is used for Dante, the IP address must be static.

2. Connect CAT cable RJ-45 accordingly to the network switch and to the VPX unit main RJ-45 port or SFP port accordingly.

Encoder Setup

1. Plug HDMI source(s) into the inputs. Local display should be connected to the HDMI output. Connect any other RS-232, IR, USB, or audio accordingly.

2. Connect power via 48v red terminal connector or PoE via LAN connection. Unit will take about 40 seconds to initialize.

3. Make certain the unit's OLED states Encoder. If not, press the MENU button for 6 seconds to switch modes. The VPX-TC1-WP2 requires the stream button to be pressed for 6 seconds to switch modes.

4. For the box version use the UP and DOWN buttons to cycle between HDMI 1 and HDMI 2. The OLED display will show the current active input. For the VPX-TC1-WP2, press the respective input button. The LED on the button will illuminate to show the active input.

5. Every VPX unit has a unique MAC and IP addresses. The IP address can be changed using the built-in setup web pages. It is important to make certain each unit has its own unique IP and Host Name.

Decoder Setup

1. Plug the display into the HDMI output. If local sources are also connected to the decoder, use the HDMI inputs 1 and/or 2. Connect any RS-232, IR, USB, or audio accordingly.

2. Connect power via 48v red terminal connector or PoE via LAN connection. Unit will take about 30 seconds to initialize.

3. Make certain the unit's OLED states Decoder. If not, press the MENU button for 6 seconds to switch modes. The VPX-TC1-WP2 requires the stream button to be pressed for 6 seconds to switch modes.

4. For the box version use the UP and DOWN buttons to cycle between HDMI 1, HDMI 2, and STREAM inputs. The OLED display will show the current active input.

5. Every VPX unit has a unique MAC and IP addresses. The IP address can be changed using the built-in web setup pages. It is important to make certain each unit has its own unique IP and Host Name.

Control Setup

1. If the network has a DHCP server, make sure the PC is set to DHCP. If not, make sure the PC is set to a 169.254.xxx.xxx IP address. If the VPX units have previously been set to a static IP address, make sure the PC is set to an IP address in the same subnet.

2. Launch the windows application IPBaseT Manager available on the Aurora customer portal.

3. The units on the network will populate into the encoder and decoder fields accordingly.

4. This will allow you to initially identify and communicate with the built-in web pages to set up each unit or to communicate directly with the VPX protocol.

Dante®/AES67 License Option

This is done with licensing which can be obtained by an authorized Aurora dealer. Once the license is enabled, Dante/AES67 will be operational.

Encoder Mode

Line in audio can be routed either to Dante® or HDMI (to replace HDMI audio). Selection of this can be done from web page or API.

Decoder Mode

Line out audio can be from Dante® or HDMI.

Important:

- ***For optimal switching speed, make sure the decoder scaler is turned on as well as genlock.***
- ***When updating to version 0.18.1 or higher from any version prior to 0.18.1, only update from the device web page. Updating through IPBaseT manager or TFTP can cause firmware corruption due to a bug fixed in 0.18.1. Any update method can be used for firmware versions higher than 0.18.1 if the unit is running at least version 0.18.1.***
- ***Make certain all units are using the latest firmware 3.2.6 or higher.***
- ***Remember to set up EDID for proper operation.***

WEB SETUP PAGES

Web Setup pages can be accessed by typing in the IP address of the unit (example: 192.168.100.1). You will then be prompted for a username and password. The default username and password are “admin.” It is highly advisable to change the units to a unique username and password for security reasons. Make certain if all the VPX units are already connected to the 1GbE network that each VPX web server has a unique IP Address or there will be communication issues. The images below may change with firmware revisions as we are always enhancing the capabilities.

Note: All setup and configuration options available in the web setup pages can also be accessed through IPBaseT Manager using a unified, intuitive interface. IPBaseT Manager also allows for mass actions, such as updating firmware to all units at once.

Encoder Mode Web Pages

The Encoder pages are comprised of 2 tabs, Settings, and Preview. Settings has 9 sub selections as described below.

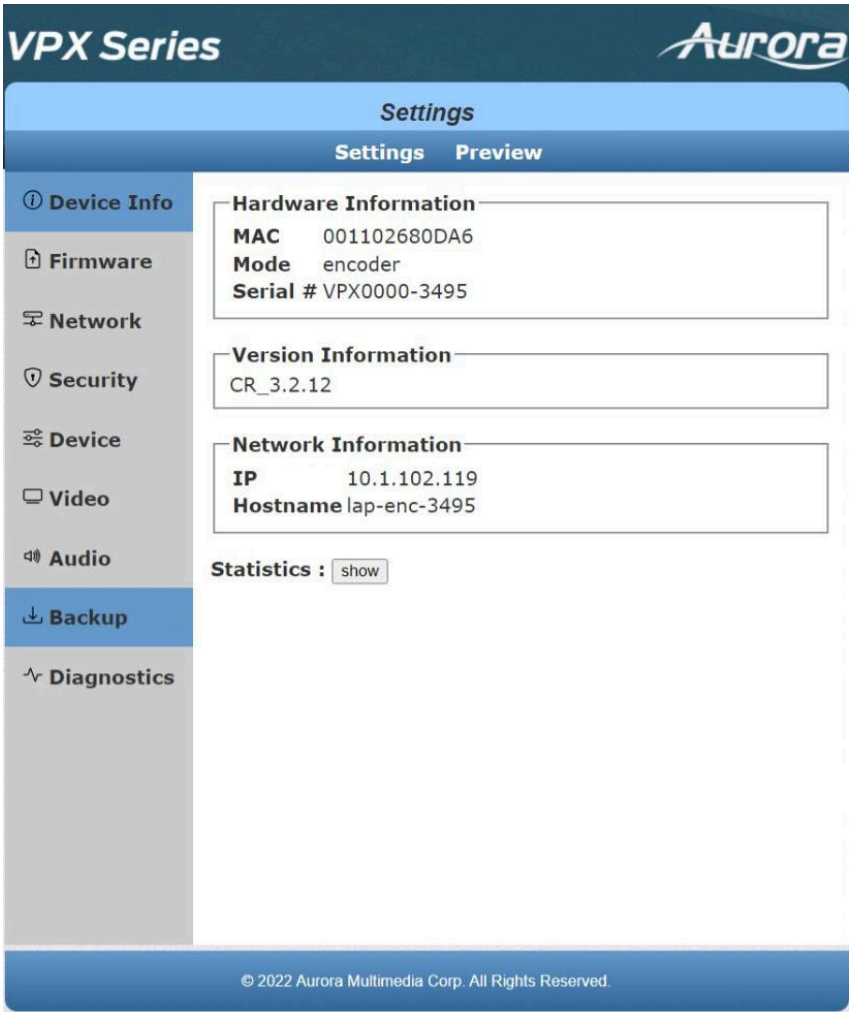
Device Info

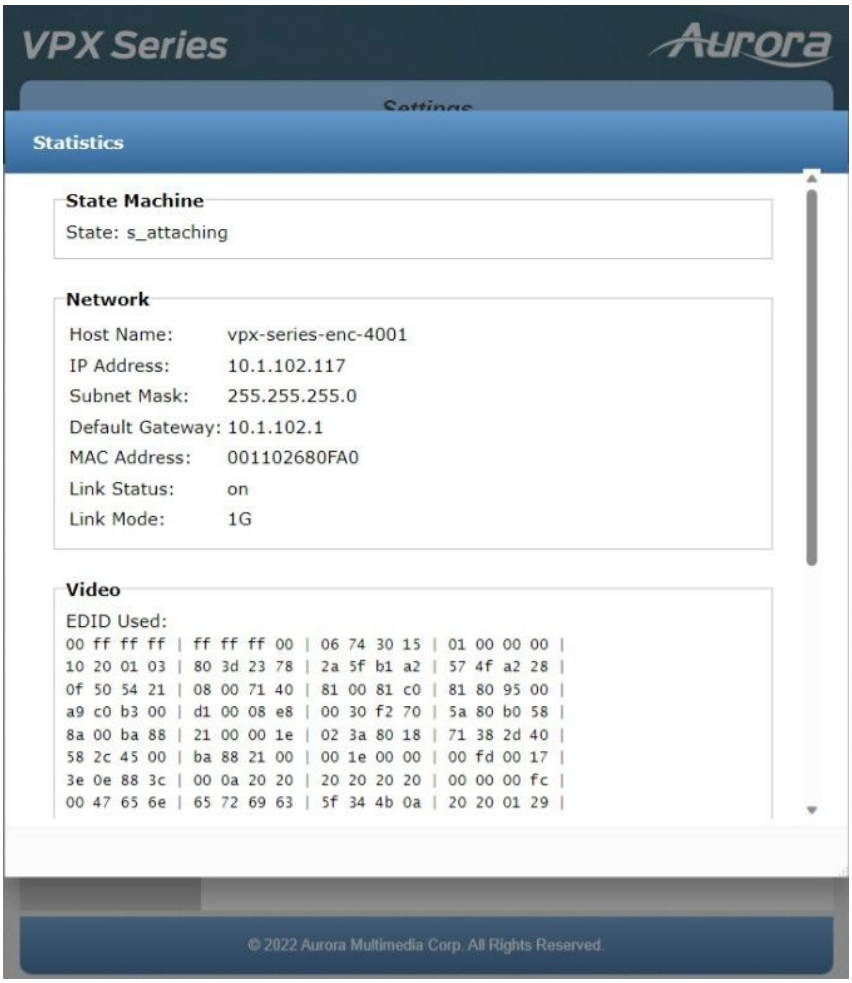
Hardware Information shows the units MAC Address, Serial Number and Mode.

Version Information reports back the current firmware version. This will help to not only make choices for updating firmware if necessary but by knowing the firmware the user will know the current capabilities that can be expected of the unit.

Network Information shows the units IP Address and Hostname.

Statistics is especially useful when diagnosing the unit as it reveals valuable information about the unit itself. Everything from MAC, IP, EDID detail, Video Timing and more is all available to help see the state of the unit.




VPX Series
Aurora
Statistics
State Machine
State: s_attaching
Network
Host Name: vpx-series-enc-4001
IP Address: 10.1.102.117
Subnet Mask: 255.255.255.0
Default Gateway: 10.1.102.1
MAC Address: 001102680FA0
Link Status: on
Link Mode: 1G
Video
EDID Used:
00 ff ff ff | ff ff ff 00 | 06 74 30 15 | 01 00 00 00 |
10 20 01 03 | 80 3d 23 78 | 2a 5f b1 a2 | 57 4f a2 28 |
0f 50 54 21 | 08 00 71 40 | 81 00 81 c0 | 81 80 95 00 |
a9 c0 b3 00 | d1 00 08 e8 | 00 30 f2 70 | 5a 80 b0 58 |
8a 00 ba 88 | 21 00 00 1e | 02 3a 80 18 | 71 38 2d 40 |
58 2c 45 00 | ba 88 21 00 | 00 1e 00 00 | 00 fd 00 17 |
3e 0e 88 3c | 00 0a 20 20 | 20 20 20 20 | 00 00 00 fc |
00 47 65 6e | 65 72 69 63 | 5f 34 4b 0a | 20 20 01 29 |
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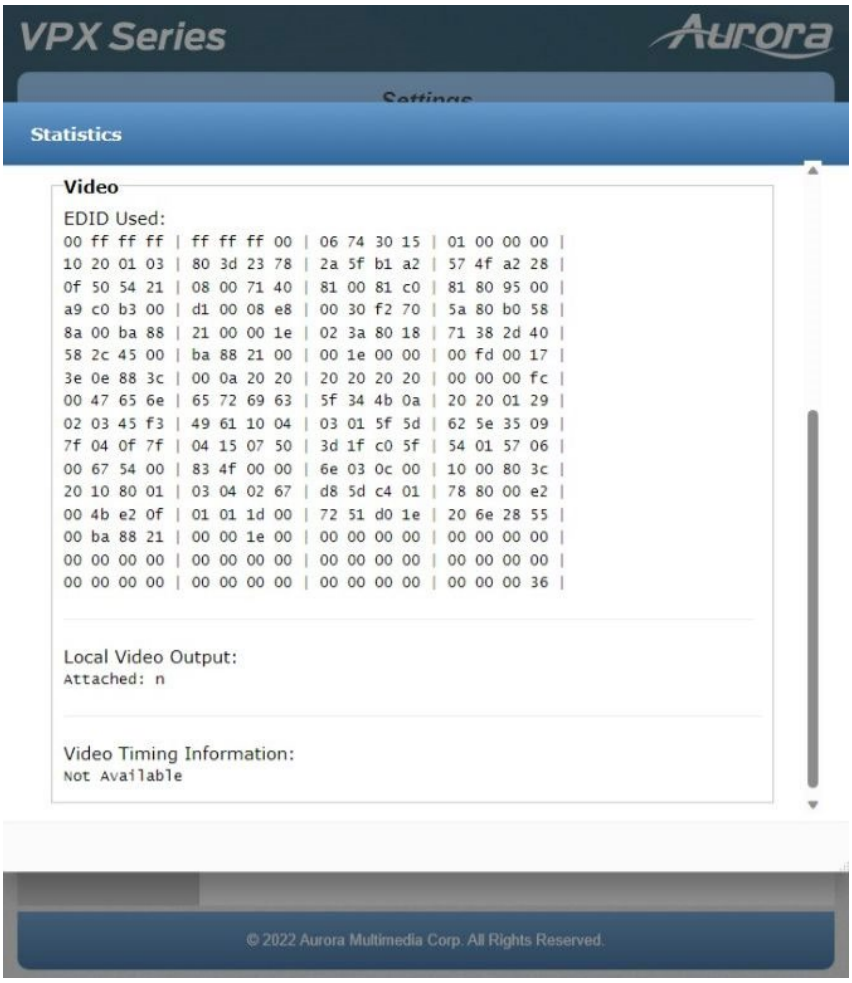
VPX Series
Aurora
Statistics
Video
EDID Used:
00 ff ff ff | ff ff ff 00 | 06 74 30 15 | 01 00 00 00 |
10 20 01 03 | 80 3d 23 78 | 2a 5f b1 a2 | 57 4f a2 28 |
0f 50 54 21 | 08 00 71 40 | 81 00 81 c0 | 81 80 95 00 |
a9 c0 b3 00 | d1 00 08 e8 | 00 30 f2 70 | 5a 80 b0 58 |
8a 00 ba 88 | 21 00 00 1e | 02 3a 80 18 | 71 38 2d 40 |
58 2c 45 00 | ba 88 21 00 | 00 1e 00 00 | 00 fd 00 17 |
3e 0e 88 3c | 00 0a 20 20 | 20 20 20 20 | 00 00 00 fc |
00 47 65 6e | 65 72 69 63 | 5f 34 4b 0a | 20 20 01 29 |
02 03 45 f3 | 49 61 10 04 | 03 01 5f 5d | 62 5e 35 09 |
7f 04 0f 7f | 04 15 07 50 | 3d 1f c0 5f | 54 01 57 06 |
00 67 54 00 | 83 4f 00 00 | 6e 03 0c 00 | 10 00 80 3c |
20 10 80 01 | 03 04 02 67 | d8 5d c4 01 | 78 80 00 e2 |
00 4b e2 0f | 01 01 1d 00 | 72 51 d0 1e | 20 6e 28 55 |
00 ba 88 21 | 00 00 1e 00 | 00 00 00 00 | 00 00 00 00 |
00 00 00 00 | 00 00 00 00 | 00 00 00 00 | 00 00 00 00 |
00 00 00 00 | 00 00 00 00 | 00 00 00 00 | 00 00 00 36 |
Local Video Output:
Attached: n
Video Timing Information:
Not Available
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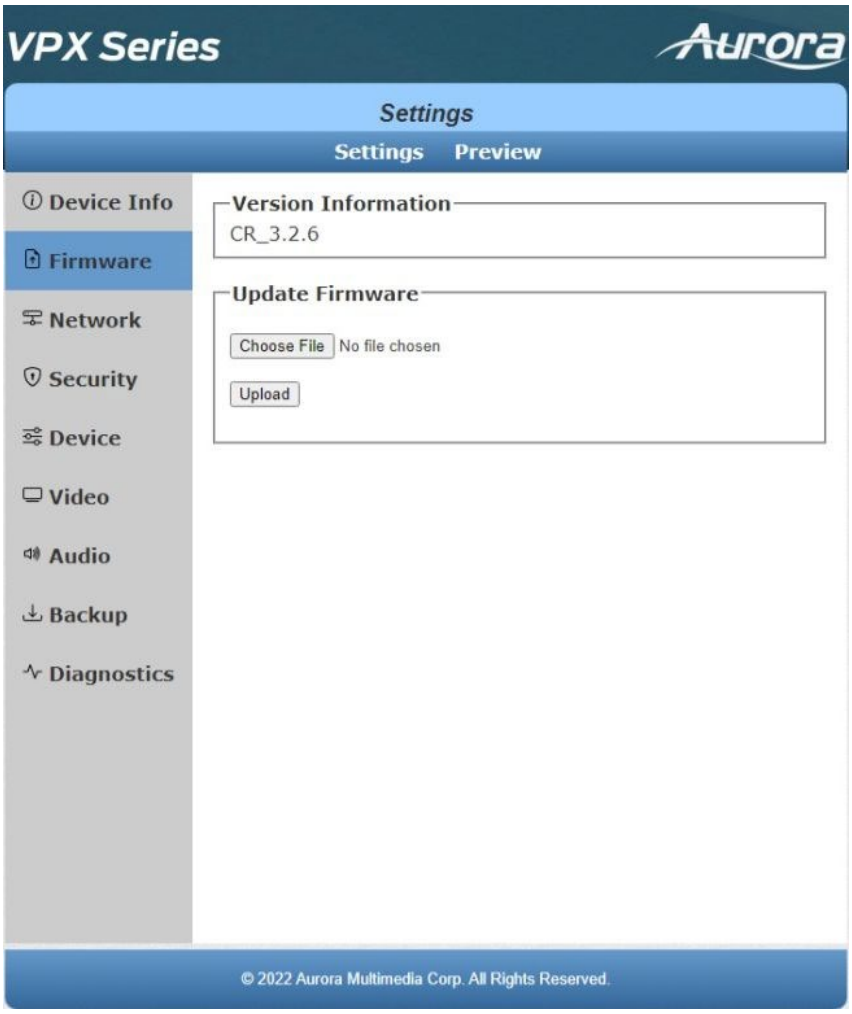
Firmware

If updating firmware is necessary, this selection allows a user to select the firmware file and upload it to the unit. When the process is done, a notification will appear.

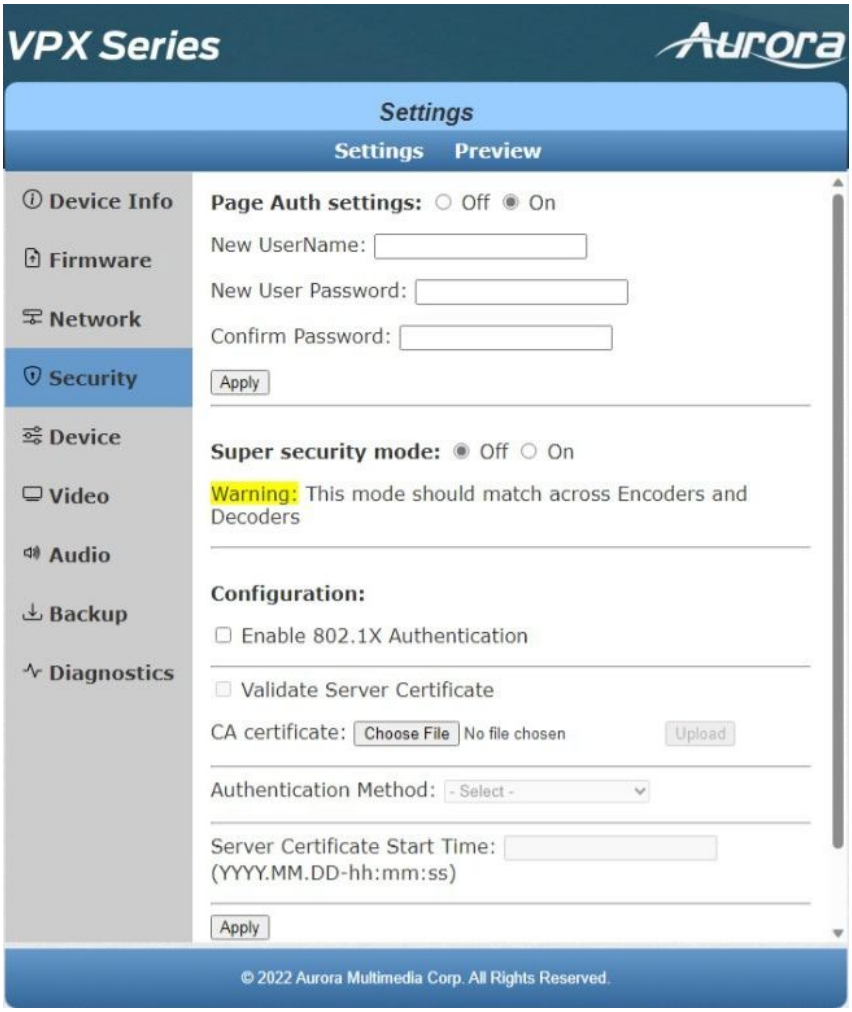


Network

The Network tab allows the setup of the IP address, subnet mask, and gateway. The Host ID and Hostname Prefix must be unique for every unit, as the multicast IPs are generated based on the Host ID. The VPX has an internal network switch, and another excellent feature is the ability to set VLAN for the Video and the Dante Audio.

Security

Change the password settings for the VPX from this web page. Super security mode adds an additional 256-bit encryption to the stream. To use super security mode, all devices must have it enabled as well as jumbo frames configured on the switch. You can also enable and configure 802.1X authentication from this page.



Device

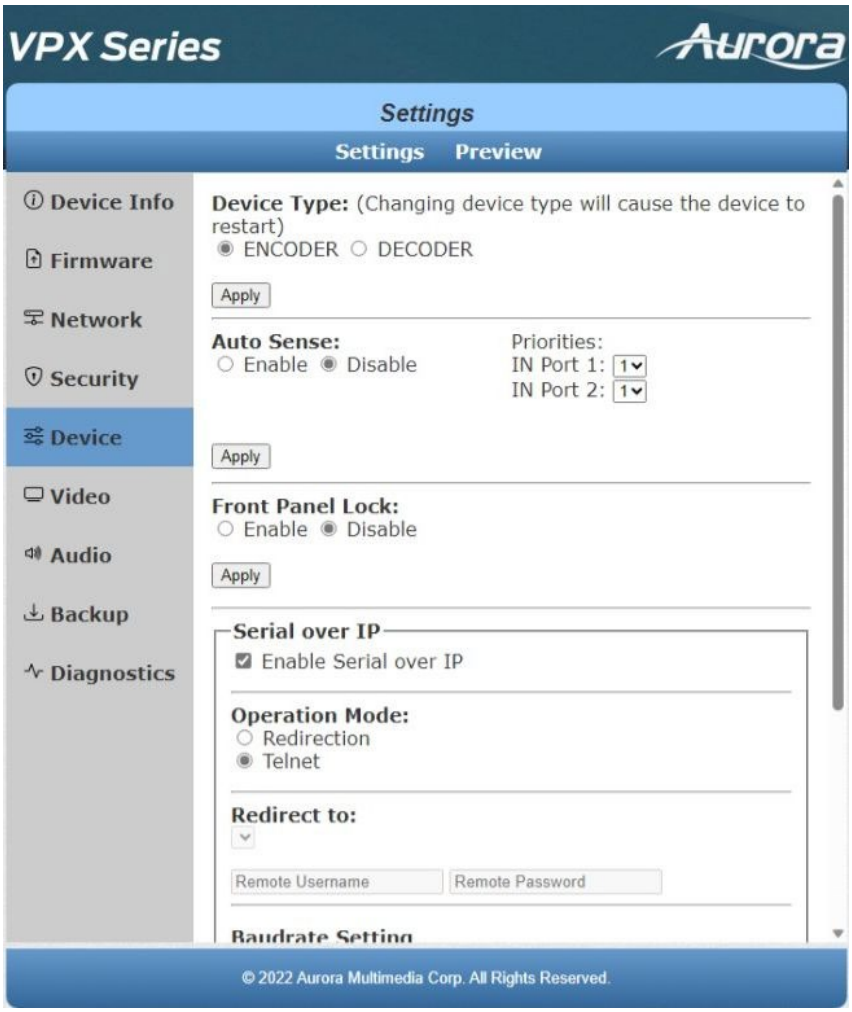
Device type can be set between encoder and decoder. Note the unit will need to be rebooted for the change to take effect.

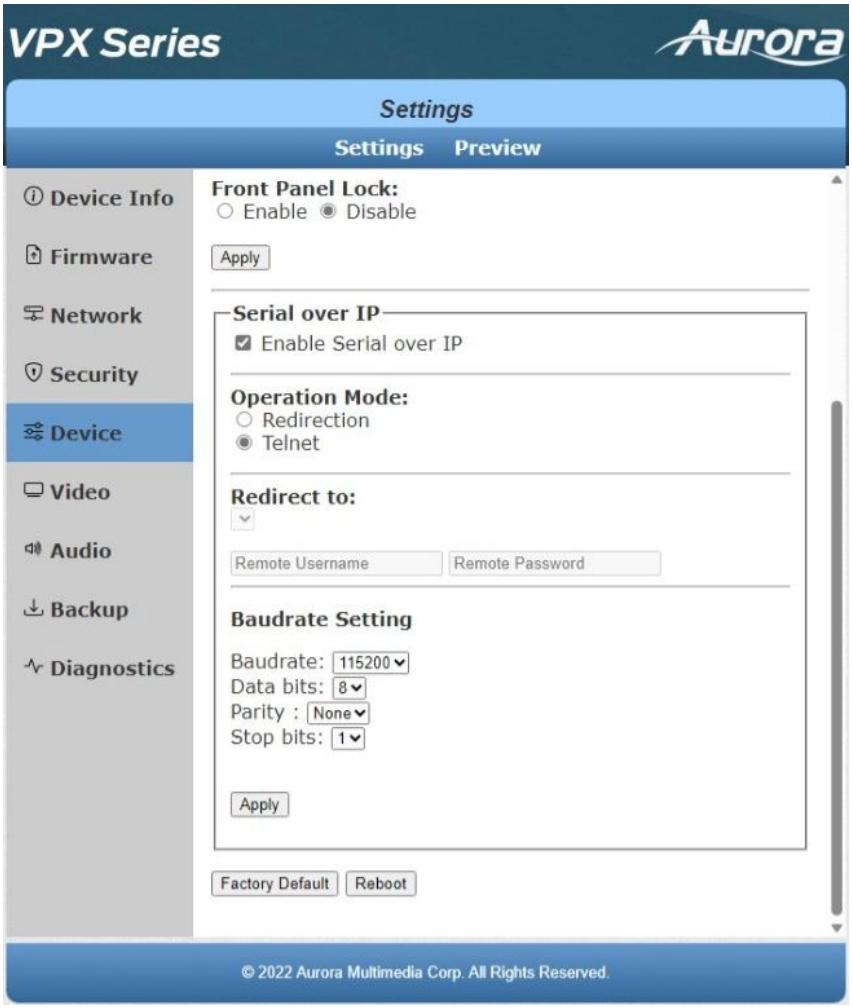
Auto Sense is for the rear HDMI connectors to automatically switch between the 2 inputs based on the last active.

Front Panel Lock will disable the front buttons to eliminate access to people who may have physical access to the box in a more public location.

Serial over IP allows you to enable and configure Serial over IP. It also allows you to set the operation mode, baud rate, data bits, parity, and stop bits of the serial port.

Factory default and reboot can also be selected from this page.




VPX Series
Settings
Settings
Preview
Device Info
Firmware
Network
Security
Device
Video
Audio
Backup
Diagnostics
Front Panel Lock:
Enable
Disable
Apply
Serial over IP
Enable Serial over IP
Operation Mode:
Redirection
Telnet
Redirect to:
Remote Username
Remote Password
Baudrate Setting
Baudrate: 115200
Data bits: 8
Parity : None
Stop bits: 1
Apply
Factory Default
Reboot
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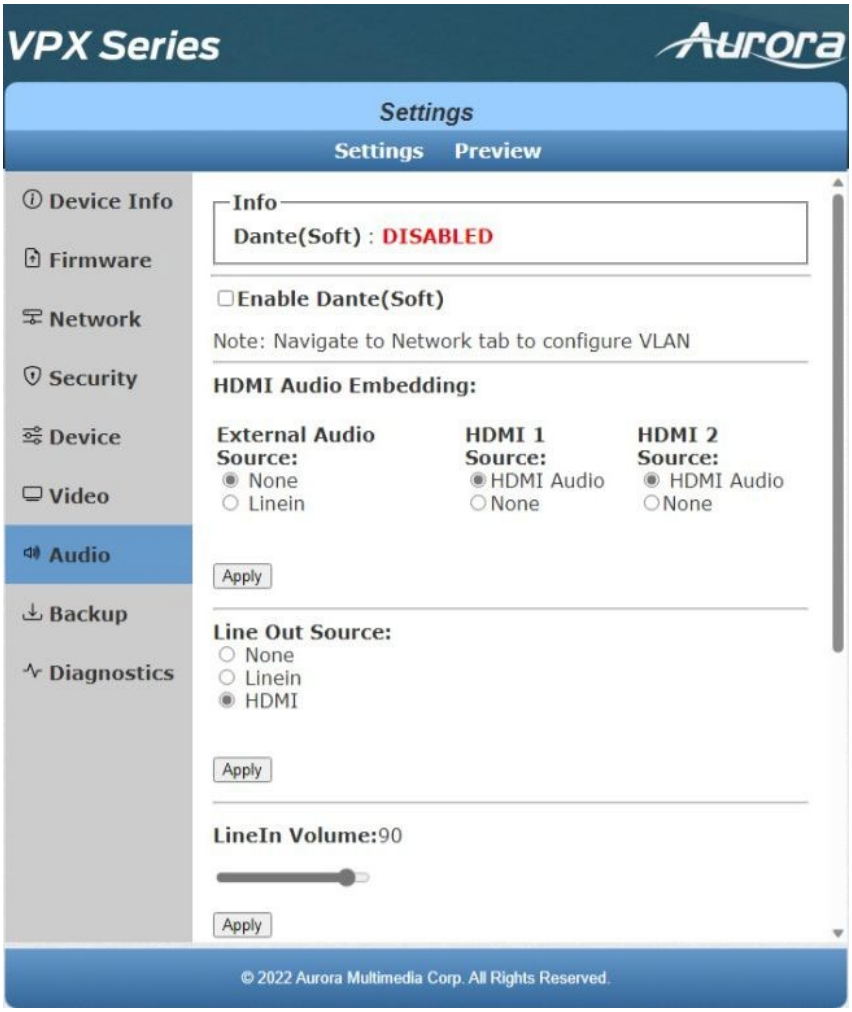
Video

From this page you can select the output source. On an Encoder HDMI1 or HDMI2 can be sent to both the local output as well as the stream. On a Decoder, HDMI1, HDMI2, or Stream can be sent to the local output. In addition, the HDCP for the encoder can be set for compatibility or to turn it off so it forces a device to no HDCP which is useful for Video Conferencing devices.

The HDCP Version comes in handy for interoperability with older devices or a CODEC (Ex. Cisco or Polycom) that cannot accept HDCP inputs. This can also be controlled by API when used in a mixed system with a control system.

Audio

Audio allows the routing of the various audio combinations including volume levels. It is also where Dante/AES67 is enabled and routed as well. Note, if using separate VLANs for Dante vs the video stream, the Dante IP must be set static as there is only one MAC address shared between the two VLANs. The Video VLAN has priority for DHCP addressing.




VPX Series
Aurora
Settings
Settings
Preview
Device Info
Firmware
Network
Security
Device
Video
Audio
Backup
Diagnostics
Line Out Source:
None
Linein
HDMI
Apply
LineIn Volume:90
Apply
LineIn Mute:
Mute
Unmute
Apply
LineOut Volume:90
Apply
LineOut Mute:
Mute
Unmute
Apply
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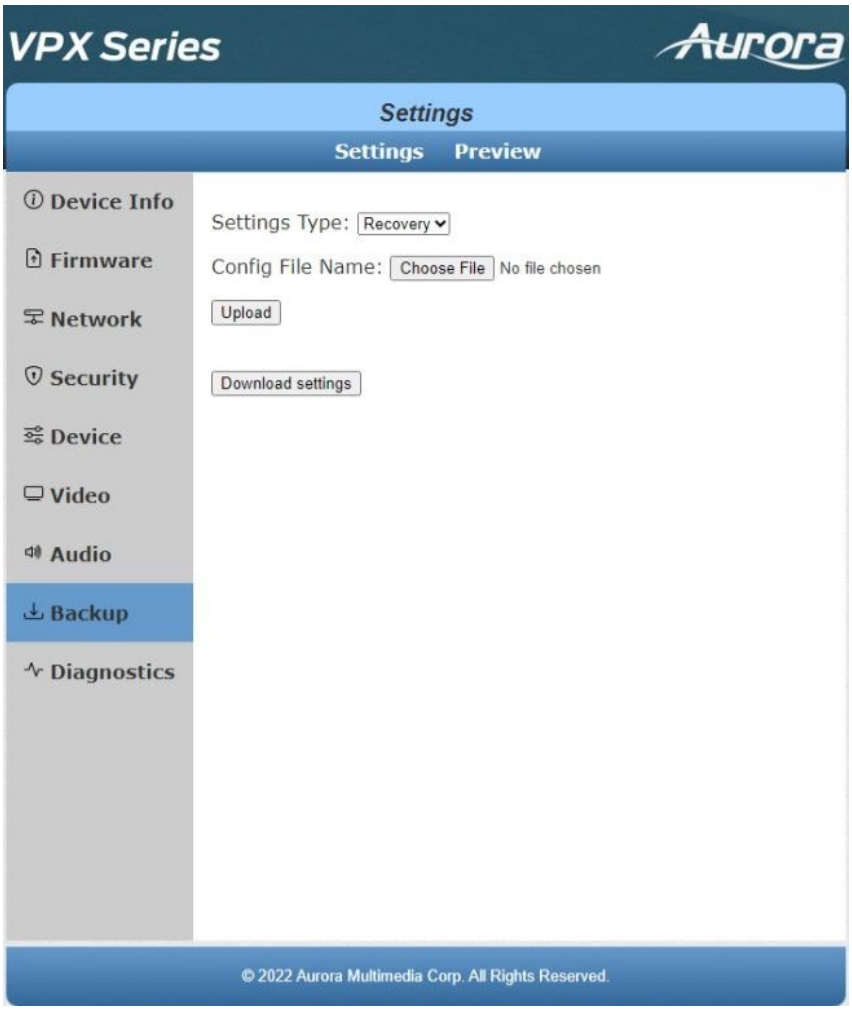
Backup

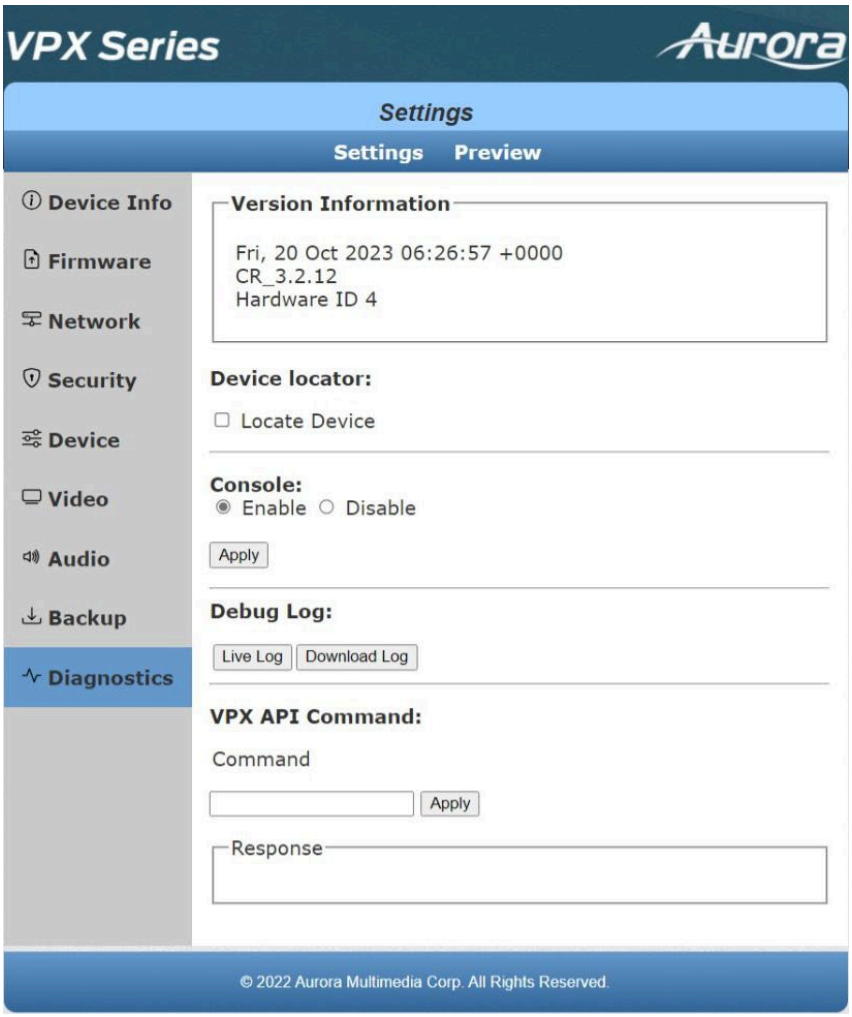
The Backup page is to save the configuration of the VPX unit in the event it needs to be replaced and cloned.

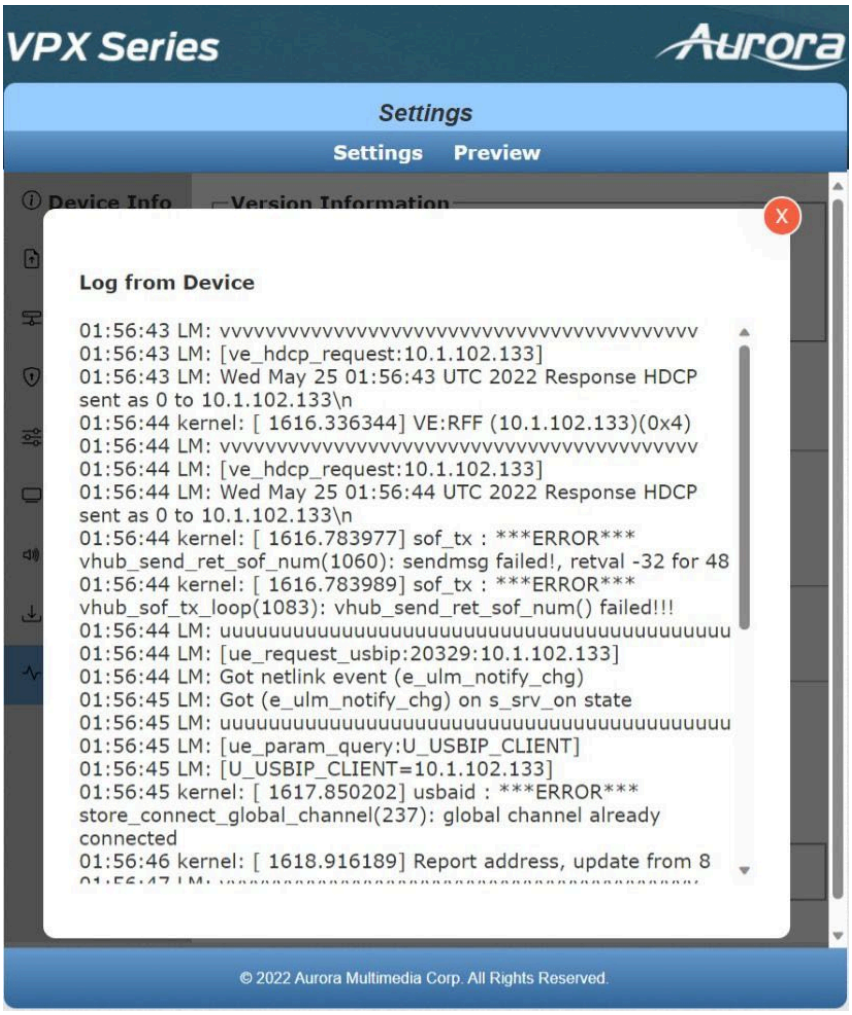


Diagnostics

This page is for This page is for advanced troubleshooting of the VPX. It also has a handy feature called Locate Device which puts an indicator on the units display to help find which physical unit it is. It is particularly useful when there are many units in a rack to quickly identify the location.

You can also enable the debug console for advanced logging out the RS-232 port as well as the LAN port using the Live Log function. To test the VPX IP commands, there is a VPX API command to test right from the web page.




VPX Series
Aurora
Settings
Settings
Preview
Device Info
Version Information
X
Log from Device
01:56:43 LM: vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
01:56:43 LM: [ve_hdcp_request:10.1.102.133]
01:56:43 LM: Wed May 25 01:56:43 UTC 2022 Response HDCP sent as 0 to 10.1.102.133\n
01:56:44 kernel: [1616.336344] VE:RFF (10.1.102.133)(0x4)
01:56:44 LM: vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
01:56:44 LM: [ve_hdcp_request:10.1.102.133]
01:56:44 LM: Wed May 25 01:56:44 UTC 2022 Response HDCP sent as 0 to 10.1.102.133\n
01:56:44 kernel: [1616.783977] sof_tx : ***ERROR*** vhub_send_ret_sof_num(1060): sendmsg failed!, retval -32 for 48
01:56:44 kernel: [1616.783989] sof_tx : ***ERROR*** vhub_sof_tx_loop(1083): vhub_send_ret_sof_num() failed!!!
01:56:44 LM: uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
01:56:44 LM: [ue_request_usbip:20329:10.1.102.133]
01:56:44 LM: Got netlink event (e_ulm_notify_chg)
01:56:45 LM: Got (e_ulm_notify_chg) on s_srv_on state
01:56:45 LM: uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
01:56:45 LM: [ue_param_query:U_USBIP_CLIENT]
01:56:45 LM: [U_USBIP_CLIENT=10.1.102.133]
01:56:45 kernel: [1617.850202] usbaid : ***ERROR*** store_connect_global_channel(237): global channel already connected
01:56:46 kernel: [1618.916189] Report address, update from 8
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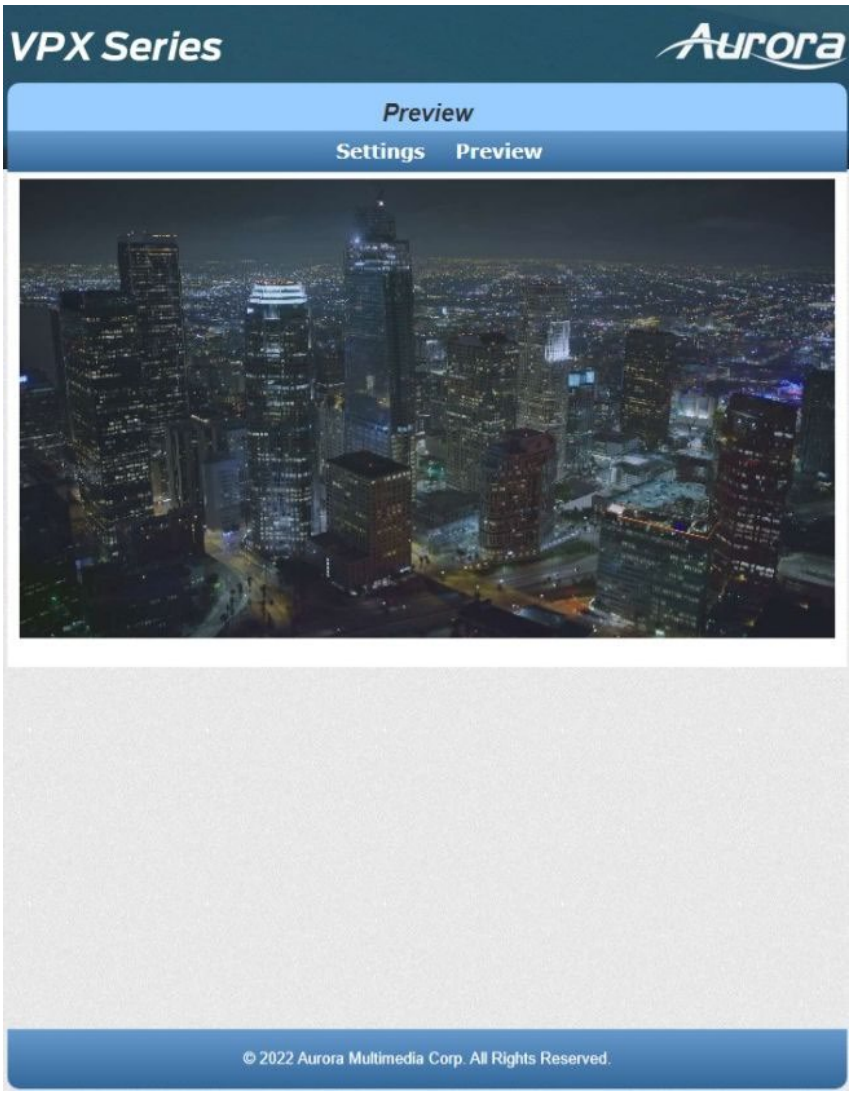
Preview Tab

The Preview tab allows you to look at the active video source. No preview will be displayed if there is no active signal.



Decoder Mode Web Pages

Device Info

Hardware Information shows the units MAC Address, Serial Number and Mode.

Version Information reports back the current firmware version. This will help to not only make choices for updating firmware if necessary but by knowing the firmware the user will know the current capabilities that can be expected of the unit.

Network Information shows the units IP Address and Hostname.

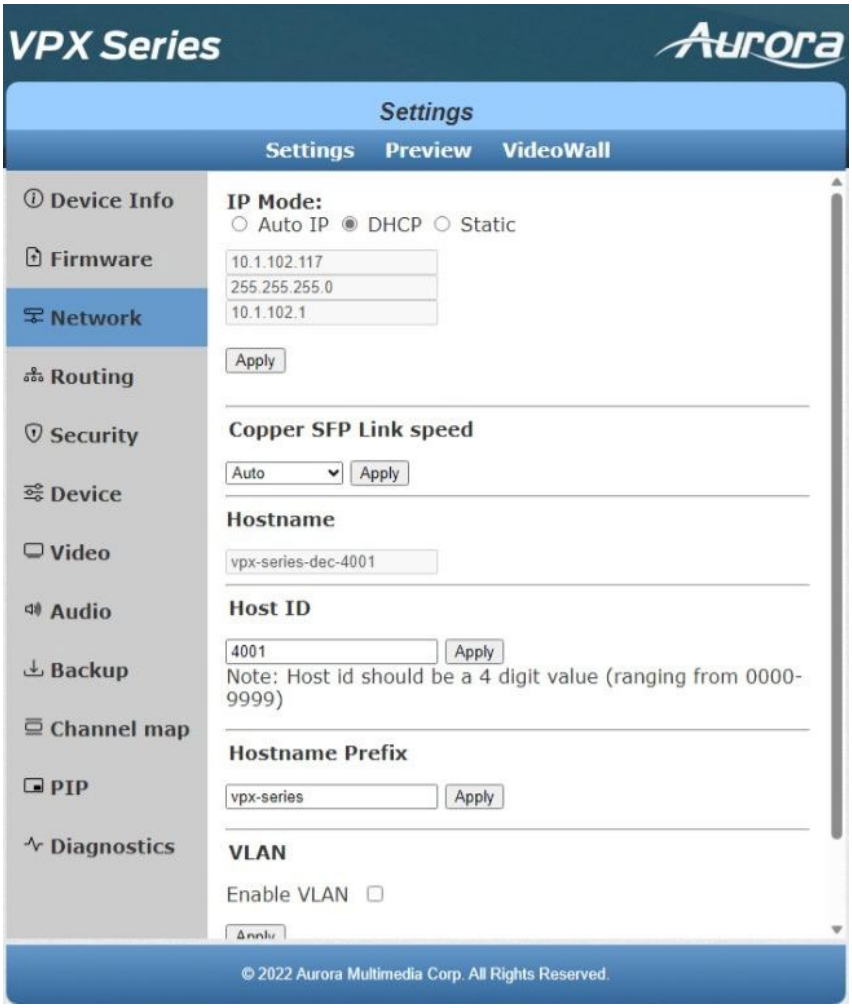
Statistics is extremely useful when diagnosing the unit as it reveals valuable information about the unit itself. Everything from MAC, IP, EDID detail, Video Timing and more is all available to help see the state of the unit.

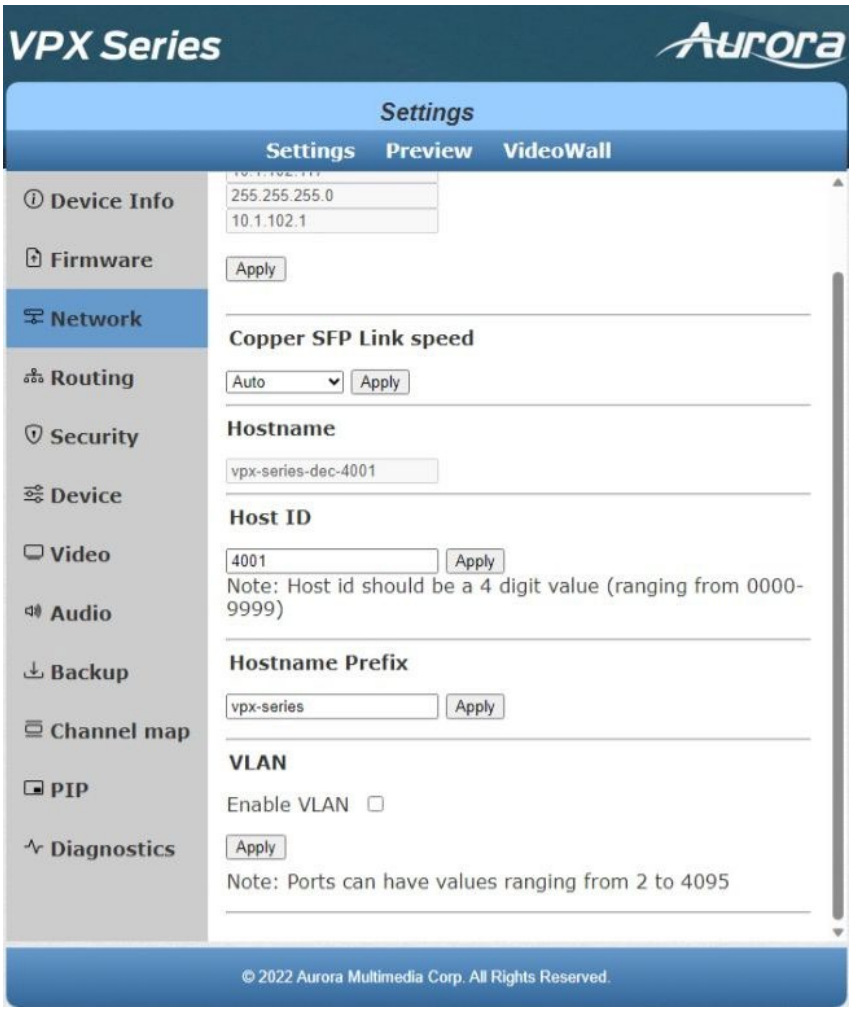
Firmware

If updating firmware is necessary, this selection allows a user to select the firmware file and upload it to the unit. When the process is done, a notification will appear.

Network

The Network tab allows the setup of the IP address, subnet mask, and gateway. The Host ID and Hostname Prefix must be unique for every unit, as the multicast IPs are generated based on the Host ID. The VPX has an internal network switch, and another excellent feature is the ability to set VLAN for the Video and the Dante Audio.




VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
255.255.255.0
10.1.102.1
Apply
Copper SFP Link speed
Auto
Apply
Hostname
vpx-series-dec-4001
Host ID
4001
Apply
Note: Host id should be a 4 digit value (ranging from 0000-9999)
Hostname Prefix
vpx-series
Apply
VLAN
Enable VLAN
Apply
Note: Ports can have values ranging from 2 to 4095
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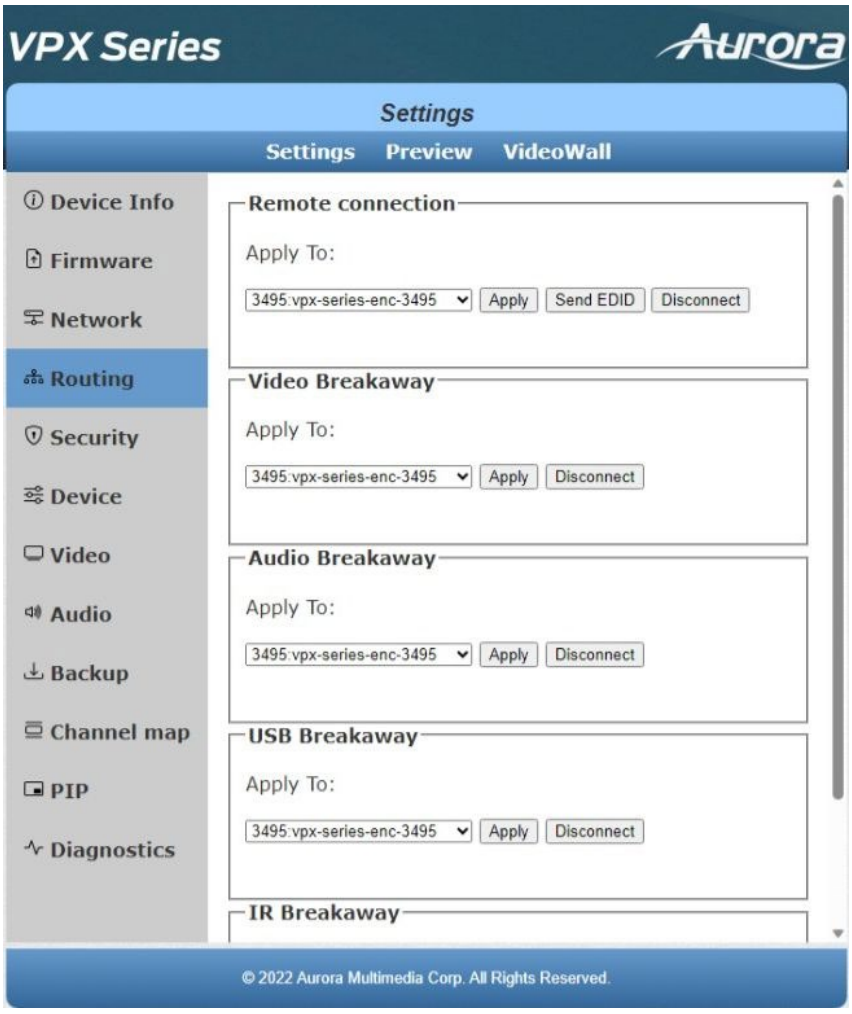
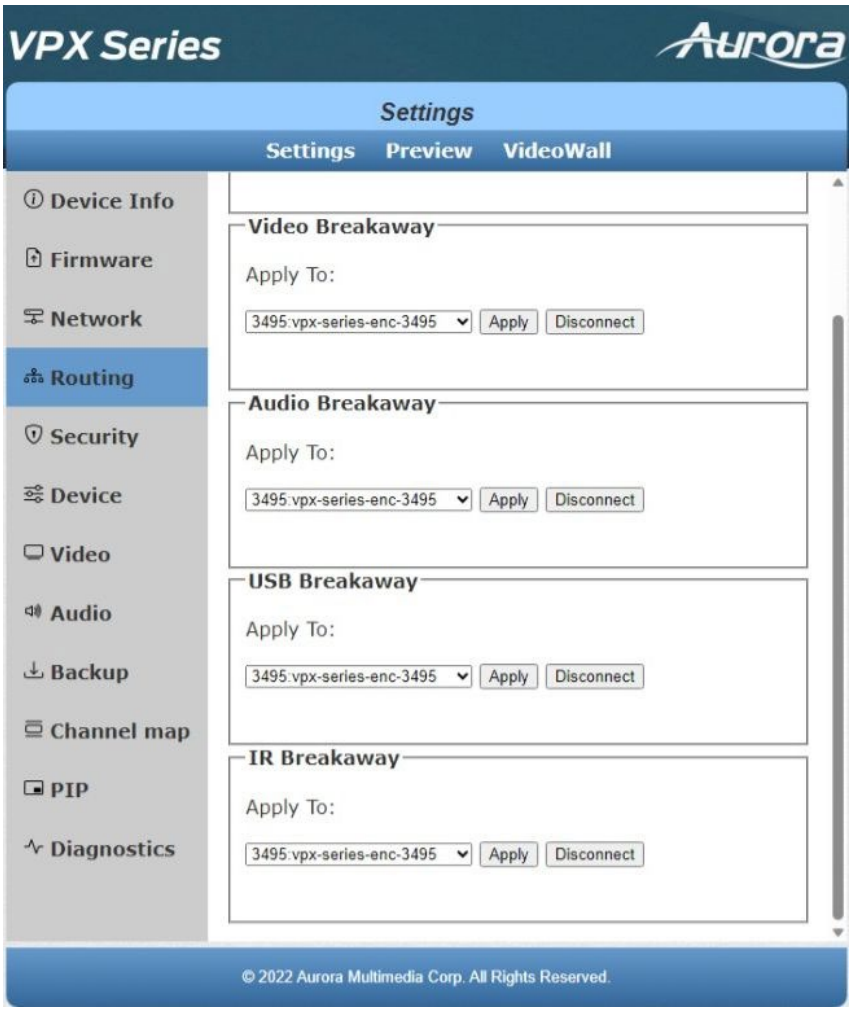
Routing

This page allows routing to any encoder on the network and will do breakaway routing as well.




VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Video Breakaway
Apply To:
3495:vpx-series-enc-3495
Apply
Disconnect
Audio Breakaway
Apply To:
3495:vpx-series-enc-3495
Apply
Disconnect
USB Breakaway
Apply To:
3495:vpx-series-enc-3495
Apply
Disconnect
IR Breakaway
Apply To:
3495:vpx-series-enc-3495
Apply
Disconnect
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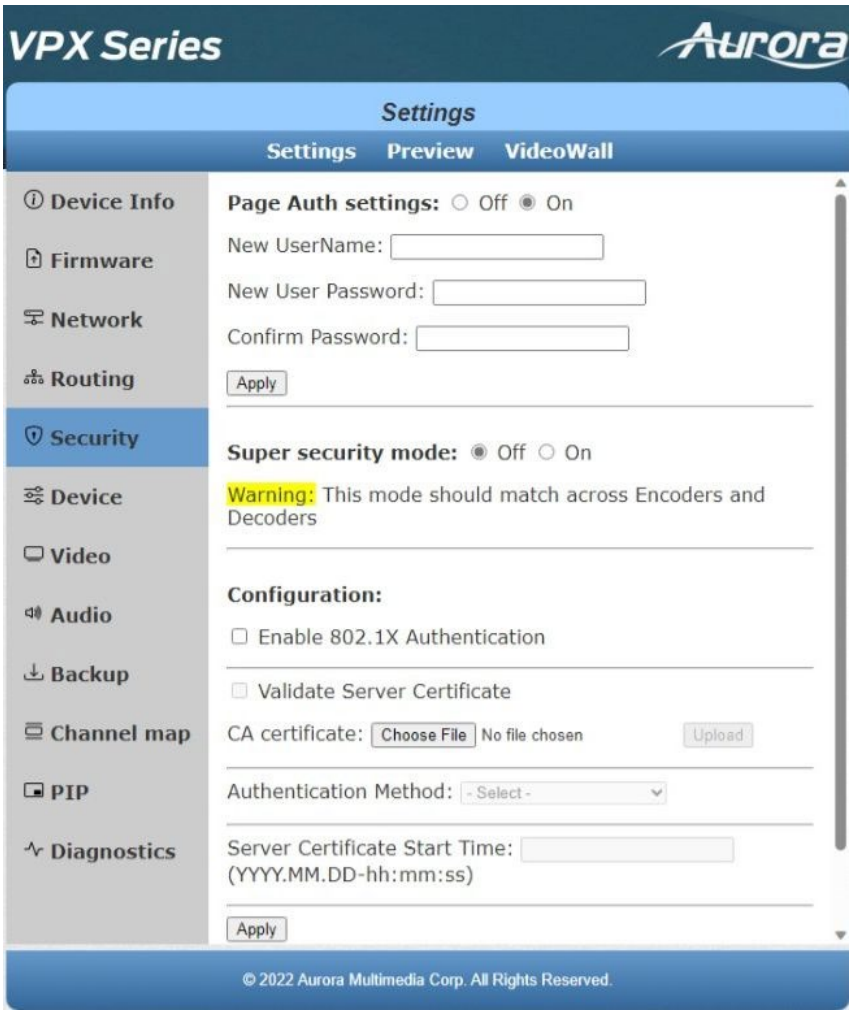
Security

Change the password settings for the VPX from this web page. Super security mode adds an additional 256-bit encryption to the stream. To use super security mode, all devices must have it enabled as well as jumbo frames configured on the switch. You can also enable and configure 802.1X authentication from this page.



Device

Device type can be set between encoder and decoder. Note the unit will need to be rebooted for the change to take effect.

Auto Sense is for the rear HDMI connectors to automatically switch between the 2 inputs and stream based on the last active input as well as the priority settings.

CEC allows the testing of CEC commands (On, Off, and Source).

Front Panel Lock will disable the front buttons to eliminate access to people who may have physical access to the box in a more public location.

Device Info enables or disables displaying debug information such as the hostname and IP address shown on the no signal screen.

Video Standby Setting sets the behavior when the stream signal is lost, either displaying the no signal screen or disabling all video output.

Serial over IP allows you to enable and configure Serial over IP. It also allows you to set the operation mode, baud rate, data bits, parity, and stop bits of the serial port.

Factory default and reboot can also be selected from this page.


VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Video standby setting:
Video off
No signal screen
Apply
Video Lost Timeout:
10 seconds
Apply
Serial over IP
Enable Serial over IP
Operation Mode:
Redirection
Telnet
Redirect to:
Remote Username
Remote Password
Baudrate Setting
Baudrate: 115200
Data bits: 8
Parity : None
Stop bits: 1
Apply
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Video

From this page you can select the source and set scaler resolutions. Setting the scaler to the display's native resolution will improve switching speed by removing the need for the display to re-sync when switching to a source with differing resolution/frame rate/color space.

Auto Scaler

The decoder will read the EDID of the device connected to the HDMI Output and automatically select the best resolution based on the EDID's native resolution.

Scaler Output Mode

Pass-Through will take the resolution from the encoder and pass it directly to the output of the decoder with no scaling. Otherwise, you can select from a list of various resolutions and color spaces to match the display. If the scaler is not turned on the seamless switch will not work.

Video Genlock

This allows the VPX to slightly adjust output timings to closer match the input signal's timings. Normally it should be left enabled as it will ensure proper videowall sync and faster switching time between encoders. Sometimes you may need to disable it, as certain devices are too sensitive to the signal. We have seen some CODECs and projectors with this issue.

HDCP Handling

Allows the choice of adhering to the HDCP of the display at the decoder or the forced settings of the encoder. Sometimes with CODECs you will need to disable the HDCP at the encoder, so the source does not send HDCP allowing the image to pass. If the source must be encrypted, then it will not work with non-HDCP devices as per the HDCP guidelines.

Ultra Low Latency Mode

This mode will reduce the latency from 1 frame (16.6ms to 1.78ms). Note that seamless switch will not work unless it is same resolution and frame rate to same resolution and frame rate. This mode is intended for broadcast situations or other latency critical applications. The network must also be stable as this mode is less tolerant of dropped packets.

Splash Screen Custom 'No Signal' Graphics

The VPX contains a 'No Signal' image, which will display when the input signal is lost. This graphic can be replaced with a custom graphic. This feature is often used to include the client and/or integrator logo on the VPX when no signal is present.

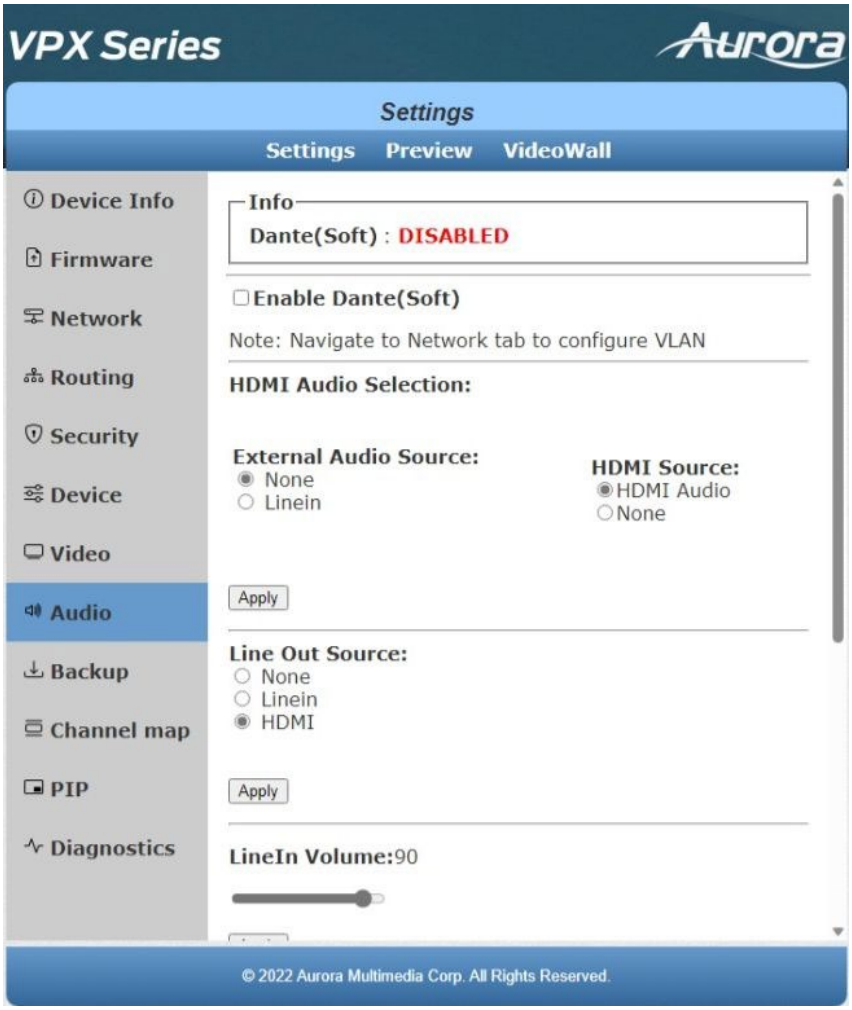
To create a custom graphic, use a graphic editing tool to create a JPEG image. The image resolutions must be 1920x1080px (1080p).

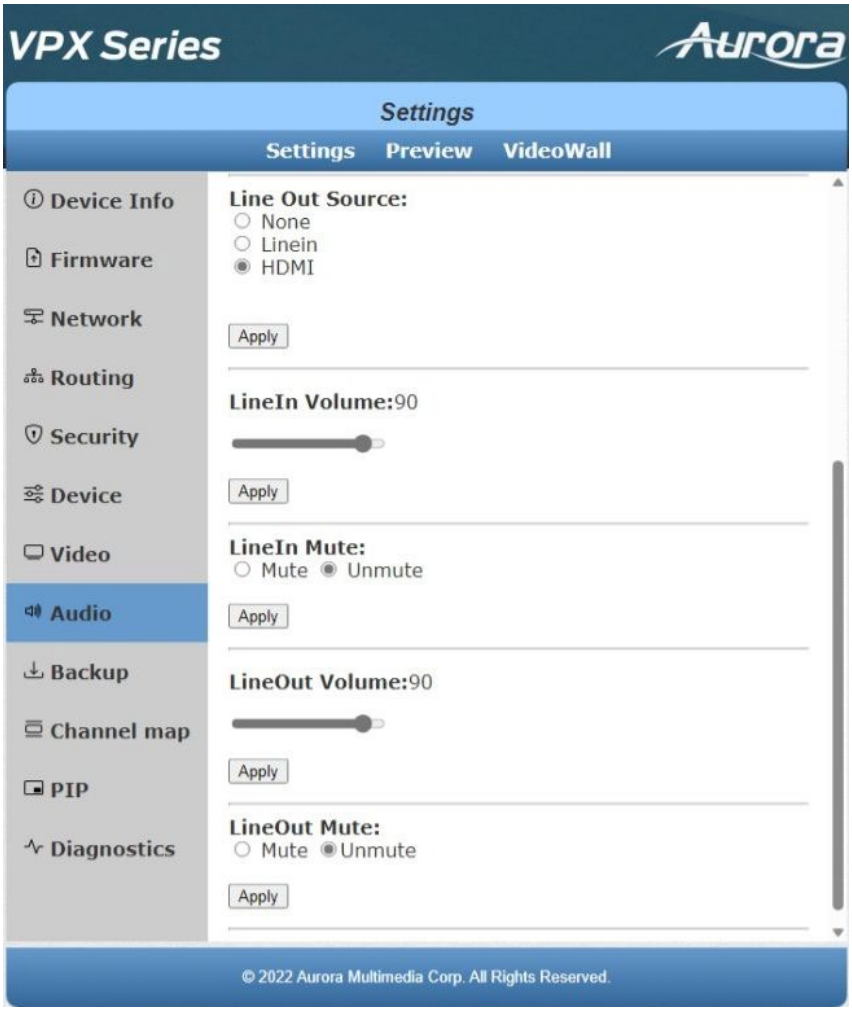
Once saved in JPEG format, navigate to the *Video* tab on the web setup page of the VPX decoder. Under *Splash Screen Setting*, press the *Choose file* button, then select and upload your custom graphic. Once uploaded, select the new file from the *Select JPEG File* dropdown menu, and press apply. On this page, you can also delete files, view the disk space used, and erase the JPEG/channel map storage disk.

NOTE: When the No Signal screen is showing on the screen, there is some small information text in the lower corners which can be helpful for diagnostics. This text is white and will be overlaid over any graphic. Using a light or white background in this region may make the debug text unreadable.

Audio

Audio allows the routing of the various audio combinations including volume levels. It is also where Dante/AES67 is enabled and routed as well. Note, if using separate VLANs for Dante vs the video stream, the Dante IP must be set static as there is only one MAC address shared between the two VLANs. The Video VLAN has priority for DHCP addressing.




VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Line Out Source:
None
Linein
HDMI
Apply
LineIn Volume:90
Apply
LineIn Mute:
Mute
Unmute
Apply
LineOut Volume:90
Apply
LineOut Mute:
Mute
Unmute
Apply
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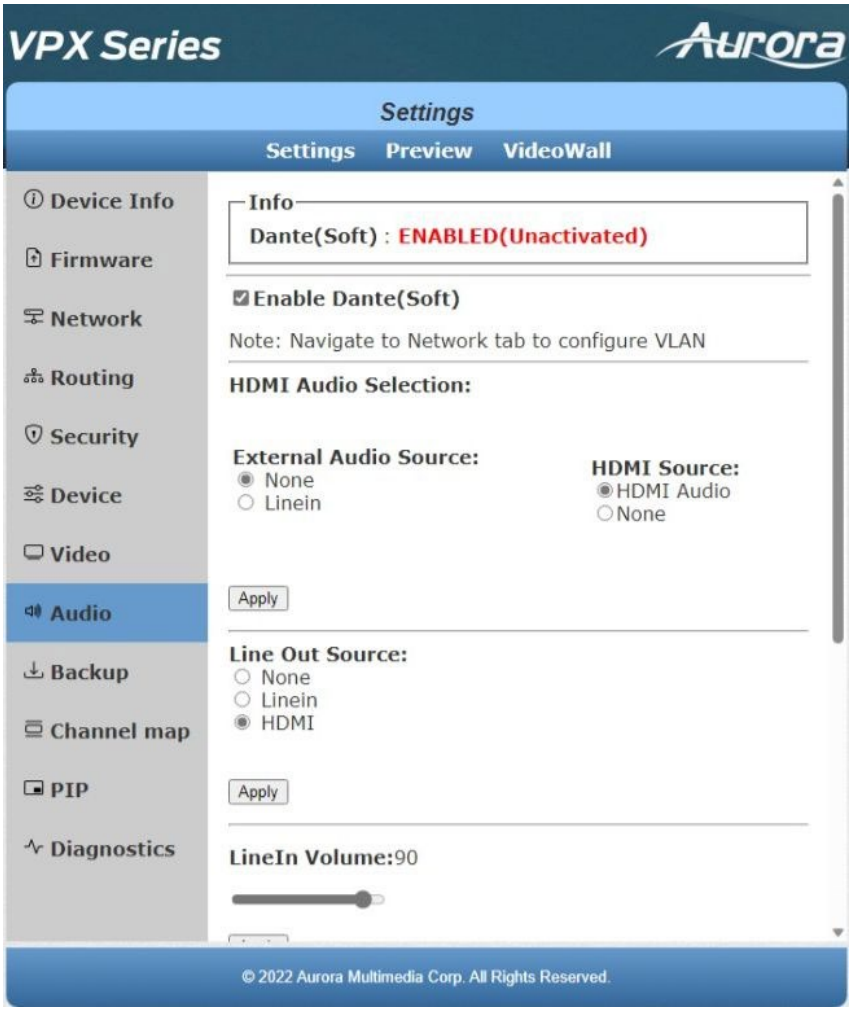
VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Info
Dante(Soft) : ENABLED(Unactivated)
Enable Dante(Soft)
Note: Navigate to Network tab to configure VLAN
HDMI Audio Selection:
External Audio Source:
None
Linein
HDMI Source:
HDMI Audio
None
Apply
Line Out Source:
None
Linein
HDMI
Apply
LineIn Volume:90
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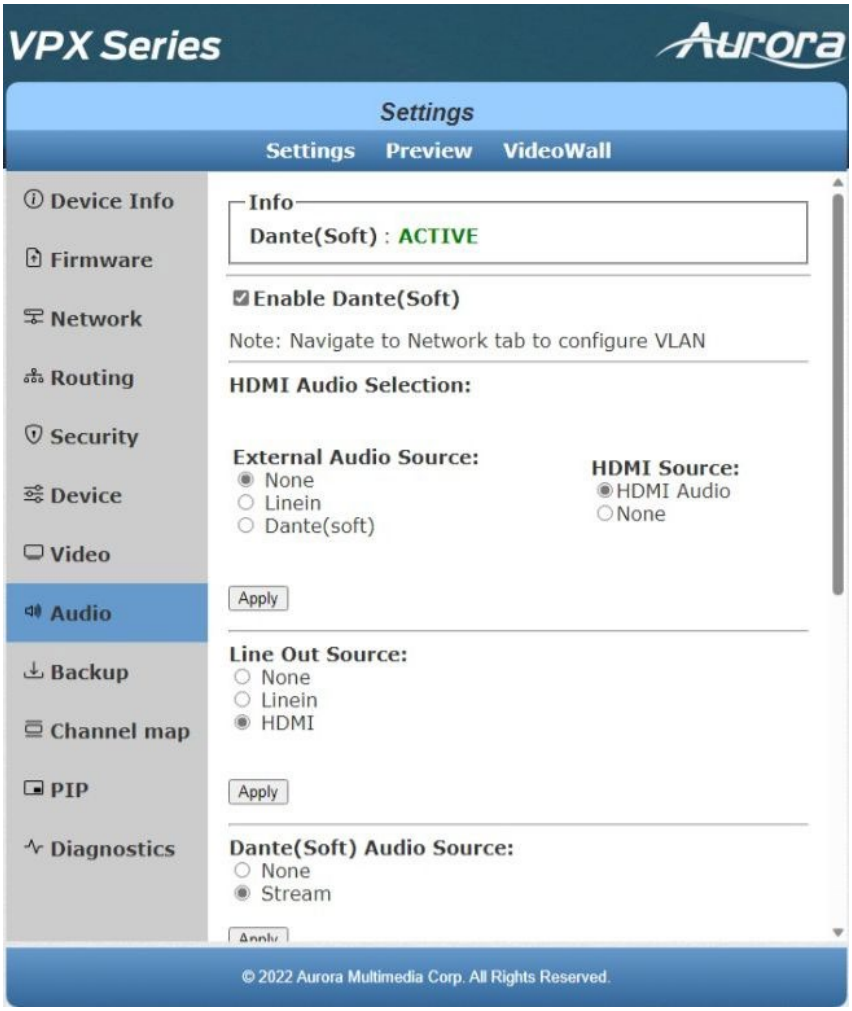
VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Info
Dante(Soft) : ACTIVE
Enable Dante(Soft)
Note: Navigate to Network tab to configure VLAN
HDMI Audio Selection:
External Audio Source:
None
Linein
Dante(soft)
HDMI Source:
HDMI Audio
None
Apply
Line Out Source:
None
Linein
HDMI
Apply
Dante(Soft) Audio Source:
None
Stream
Apply
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VPX Series
Aurora
Settings
Settings
Preview
VideoWall
Device Info
Firmware
Network
Routing
Security
Device
Video
Audio
Backup
Channel map
PIP
Diagnostics
Dante(Soft) Audio Source:
None
Stream
Apply
LineIn Volume:90
Apply
LineIn Mute:
Mute
Unmute
Apply
LineOut Volume:90
Apply
LineOut Mute:
Mute
Unmute
Apply
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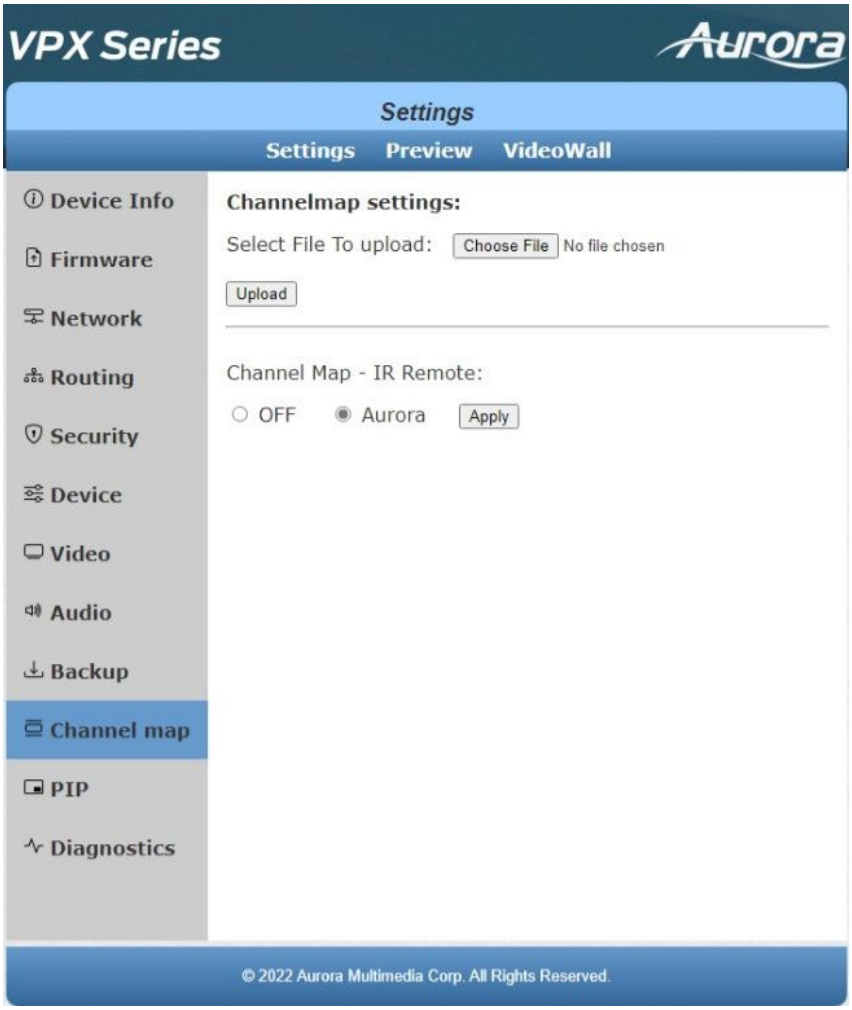
Backup

The Backup page is to save the configuration of the VPX unit in the event it needs to be replaced and cloned.

Channel Map

Channel mapping is a feature that allows you to assign VPX streams to a virtual channel, much like a TV tuner. Once enabled, you can use the channel up/down buttons on the Aurora IRC-11 IR remote control to change streams. You can also optionally enable the up/down front panel buttons of the VPX-TC1 to use this feature. This provides a simple and familiar alternative method of control for certain applications.



To use channel mapping, you will need to create a simple CSV file to define the mapping. This can be done using a text editor like Notepad, or a spreadsheet editor like Excel. The file starts with the header row:

ChNo,ChName,HostName,HostID,Description

The second, and subsequent lines will contain the actual definitions of the channels.

- **ChNo**[5] (channel number) - The virtual channel number of the stream, like a TV tuner
- **ChName** (channel name) - The virtual name of the stream, as displayed on the OSD
- **HostName**[6] - The host name of the VPX encoder to be assigned to this virtual channel
- **HostID**[6] - The host ID of the VPX encoder to be assigned to the virtual channel
- **Description** - An extended description of the virtual channel

[5] *Channel numbers must be sequential, starting with 0 (zero).*
[6] *For more info on host name and host ID, see the 'join command' section above, on page 3.*

Channel Mapping sample in text editor:

```
ChNo,ChName,HostName,HostID,Description
0,Laptop,vlx-series,0231,Desktop wall plate
1,Desktop,vlx-series,0133,Room computer for meetings
2,Digital Signage,vlx-series,0089,Corporate signage feed
3,Cable TV,vlx-series,5201,Television tuner
4,Media Player,vlx-series,2832,Streaming media services.
```

Channel Mapping sample in Excel:

NOTE: When opening or editing the channel mapping CSV file in a spreadsheet editor like Excel, it may format the device IDs as numbers, automatically removing the leading zeros. You must format the HostID column as text to prevent automatic number formatting.

	A	B	C	D	E
1	ChNo	ChName	HostName	HostID	Description
2	0	Laptop	vlx-series	231	Desktop wall plate
3	1	Desktop	vlx-series	133	Room computer for meetings
4	2	Digital Signage	vlx-series	89	Corporate signage feed
5	3	Cable TV	vlx-series	5201	Television tuner
6	4	Media Player	vlx-series	2832	Streaming media services.

Incorrectly formatted HostID (Excel default)

	A	B	C	D	E
1	ChNo	ChName	HostName	HostID	Description
2	0	Laptop	vlx-series	0231	Desktop wall plate
3	1	Desktop	vlx-series	0133	Room computer for meetings
4	2	Digital Signage	vlx-series	0089	Corporate signage feed
5	3	Cable TV	vlx-series	5201	Television tuner
6	4	Media Player	vlx-series	2832	Streaming media services.

Correctly formatted HostID (column formatting set to 'text')

After you create and save your file, navigate to the *Management* tab on the VPX decoder web setup pages. Under *Bitmap/Channel Map*, press the *Choose file* button, then select and upload your CSV file. Then, press the upload button.

To enable channel mapping to the IR remote control buttons and VPX front panel buttons, enable the appropriate options in the web setup pages.

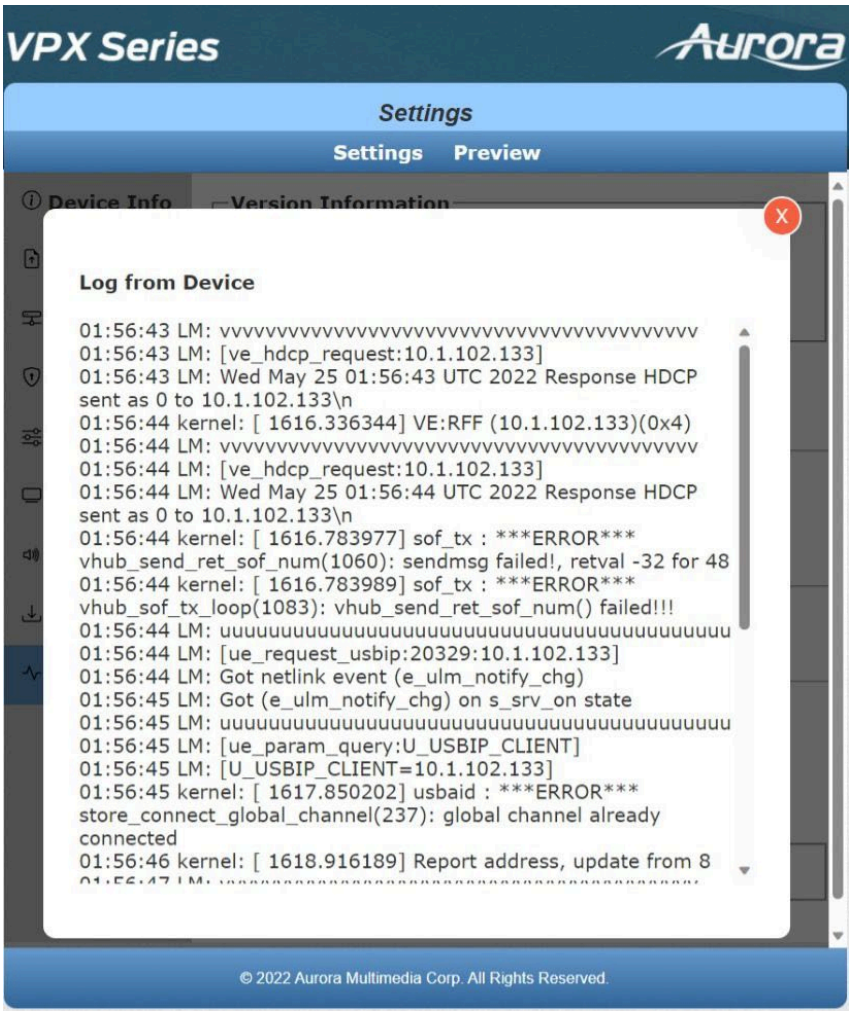
PiP

This will enable or disable the Picture in Picture function on the VPX. You can also set the transparency and position. PiP is limited to 15 frames per second.

Diagnostics

This page is for advanced troubleshooting of the VPX. It also has a handy feature called Locate Device which puts an indicator on the units display to help find which physical unit it is. It is particularly useful when there are many units in a rack to quickly identify the location.

You can also enable the debug console for advanced logging out the RS-232 port as well as the LAN port using the Live Log function. To test the VPX IP commands, there is a VPX API command to test right from the web page.


VPX Series
Settings
Settings
Preview
Device Info
Version Information
Log from Device
01:56:43 LM: vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
01:56:43 LM: [ve_hdcp_request:10.1.102.133]
01:56:43 LM: Wed May 25 01:56:43 UTC 2022 Response HDCP sent as 0 to 10.1.102.133\n
01:56:44 kernel: [1616.336344] VE:RFF (10.1.102.133)(0x4)
01:56:44 LM: vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
01:56:44 LM: [ve_hdcp_request:10.1.102.133]
01:56:44 LM: Wed May 25 01:56:44 UTC 2022 Response HDCP sent as 0 to 10.1.102.133\n
01:56:44 kernel: [1616.783977] sof_tx : ***ERROR*** vhub_send_ret_sof_num(1060): sendmsg failed!, retval -32 for 48
01:56:44 kernel: [1616.783989] sof_tx : ***ERROR*** vhub_sof_tx_loop(1083): vhub_send_ret_sof_num() failed!!!
01:56:44 LM: uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
01:56:44 LM: [ue_request_usbip:20329:10.1.102.133]
01:56:44 LM: Got netlink event (e_ulm_notify_chg)
01:56:45 LM: Got (e_ulm_notify_chg) on s_srv_on state
01:56:45 LM: uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
01:56:45 LM: [ue_param_query:U_USBIP_CLIENT]
01:56:45 LM: [U_USBIP_CLIENT=10.1.102.133]
01:56:45 kernel: [1617.850202] usbaid : ***ERROR*** store_connect_global_channel(237): global channel already connected
01:56:46 kernel: [1618.916189] Report address, update from 8
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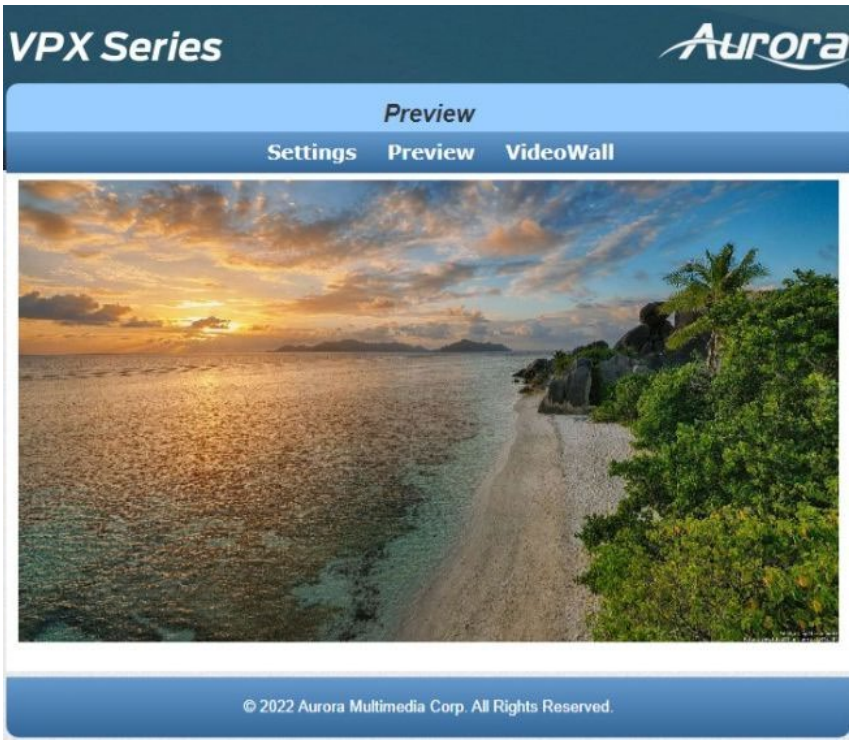
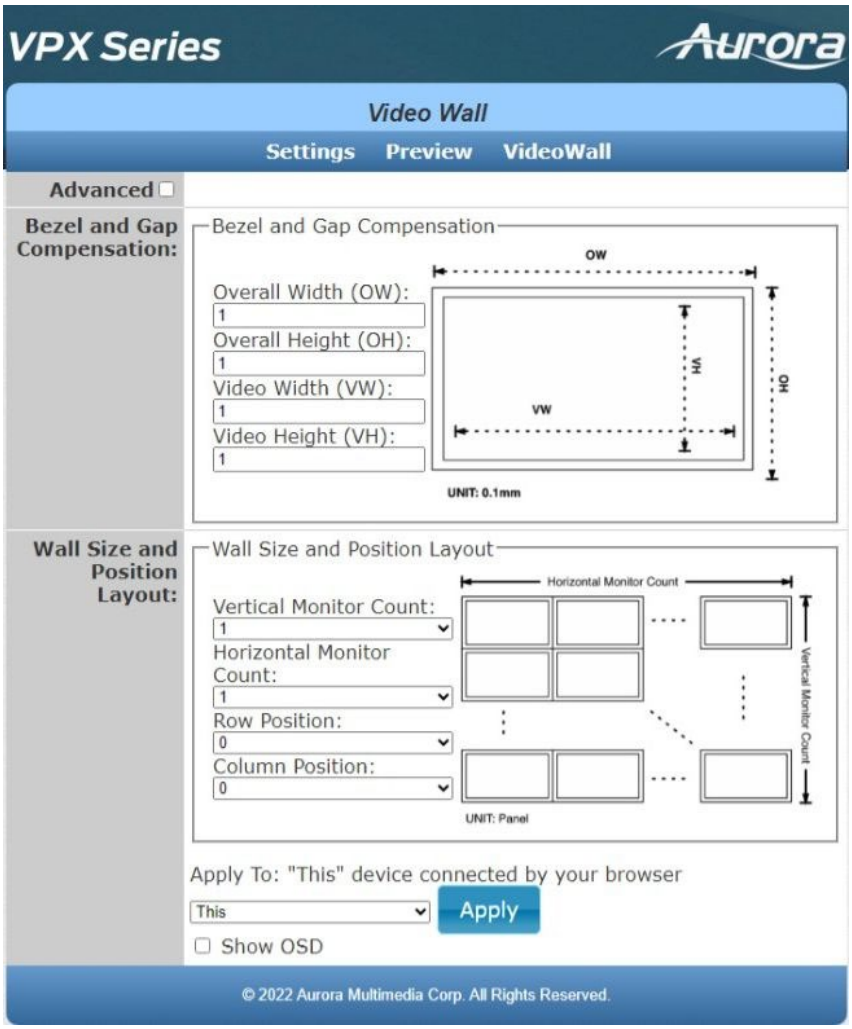
Preview Tab

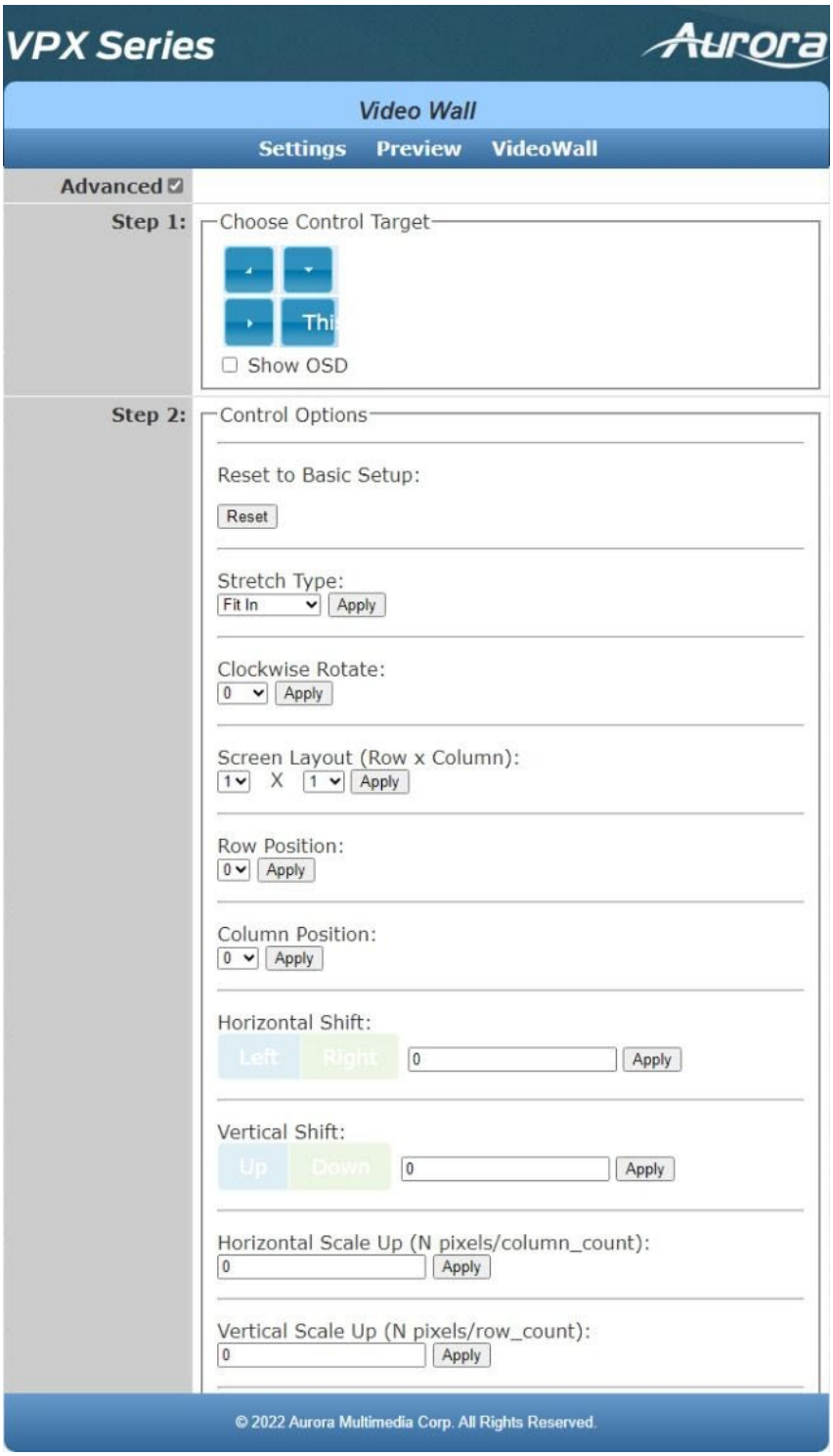
The Preview tab allows you to look at the active video source. If no source is available, it will show the No Signal image.



Videowall Tab

From this page up to an 8x8 videowall can be configured.




VPX Series
Aurora
Video Wall
Settings
Preview
VideoWall
Advanced
Step 1:
Choose Control Target
Thi
Show OSD
Step 2:
Control Options
Reset to Basic Setup:
Reset
Stretch Type:
Fit In
Apply
Clockwise Rotate:
0
Apply
Screen Layout (Row x Column):
1
X
1
Apply
Row Position:
0
Apply
Column Position:
0
Apply
Horizontal Shift:
Left
Right
0
Apply
Vertical Shift:
Up
Down
0
Apply
Horizontal Scale Up (N pixels/column_count):
0
Apply
Vertical Scale Up (N pixels/row_count):
0
Apply
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EPG (Electronic Programming Guide)

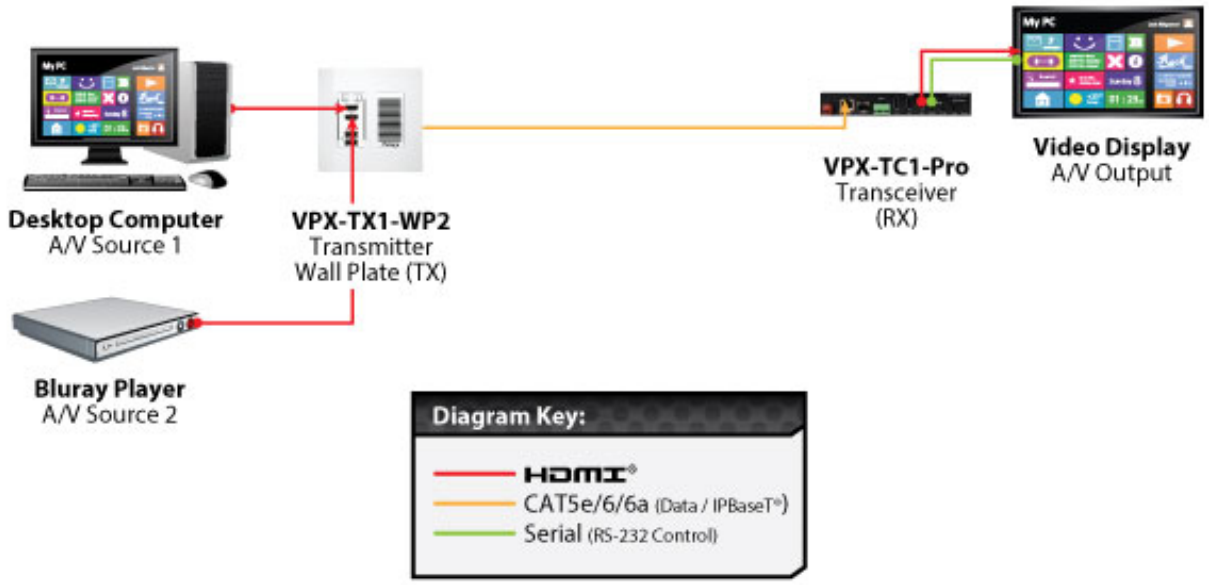
The EPG works with the channel mapping feature when a unit is set to a decoder. First, make a spreadsheet (.csv format) with 4 columns for channel number, Encoder IP or Host name, OSD channel label, and Description. Load it into the decoder unit through the built-in web page as per prior section. Once loaded, the decoders front up and down arrows, IR remote, or IP commands will change the channels entered in the spreadsheet. When the EPG is not selected, the channel number and label will appear in the upper corner and the channels will change accordingly just like a TV cable unit. When the EPG is selected to appear, a graphic with the spreadsheet listing will appear. The up and down will scroll through and enter will select the channel to change. While scrolling a preview will appear in the upper right. The lower right will show the current channel information. See **Channel Map** section for instructions on how to create and upload.

APPLICATIONS

Example 1: Point-to-Point Operation

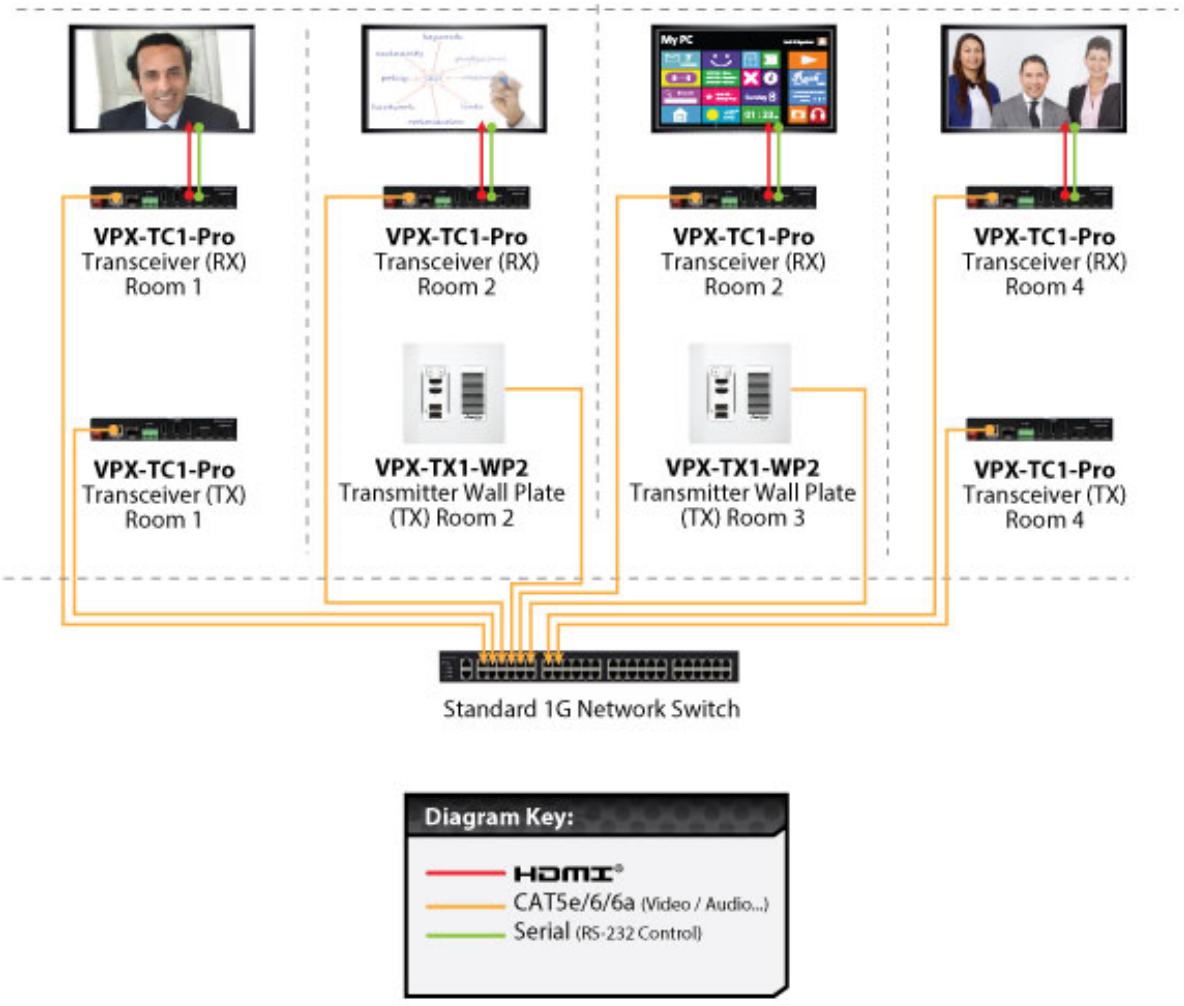
When the VPX Series is connected point to point, an initial configuration is required, however, the units will remember the last settings even after reboot or power loss. Note when in point-to-point mode each side will need a power supply. You can also use 2 power supplies on one side provided one of the supplies is a PoE injector for the far end unit.

To initially set up the units, either connect to a 1Gbps network switch with a PC or use the SFP slot and install the RJ-45 SFP (Aurora Part# IPA-SFP-RJ45-1) to allow connection of the PC into the pair. Then go to the decoder units IP Address and setup pages and make the connection to the encoder and any other settings like baud rate or scaler.



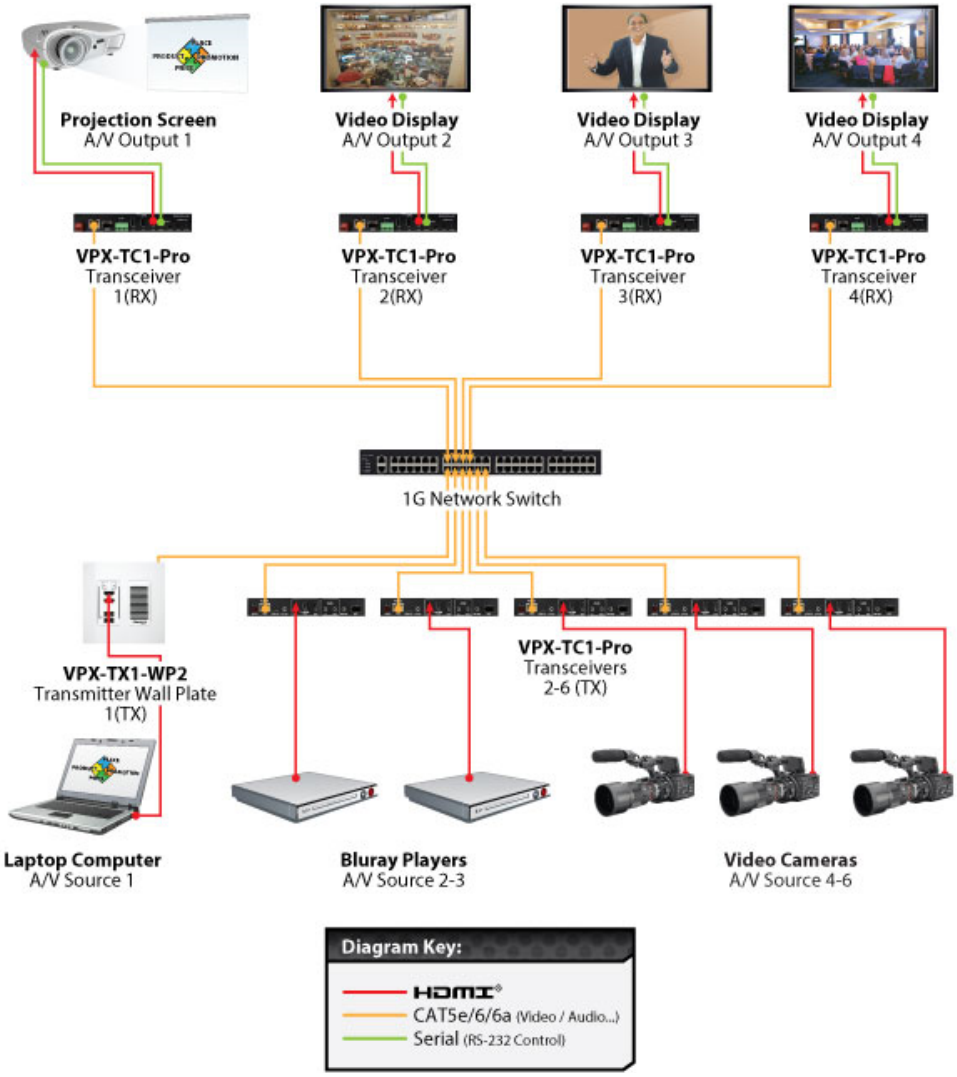
Example 2: VPX Multi-Room

The VPX Series is perfect for multi-room applications with its flexibility. An unlimited number of rooms can share video, audio, data, and control in real-time. The scalability is only limited by the size of the network switch and infrastructure.



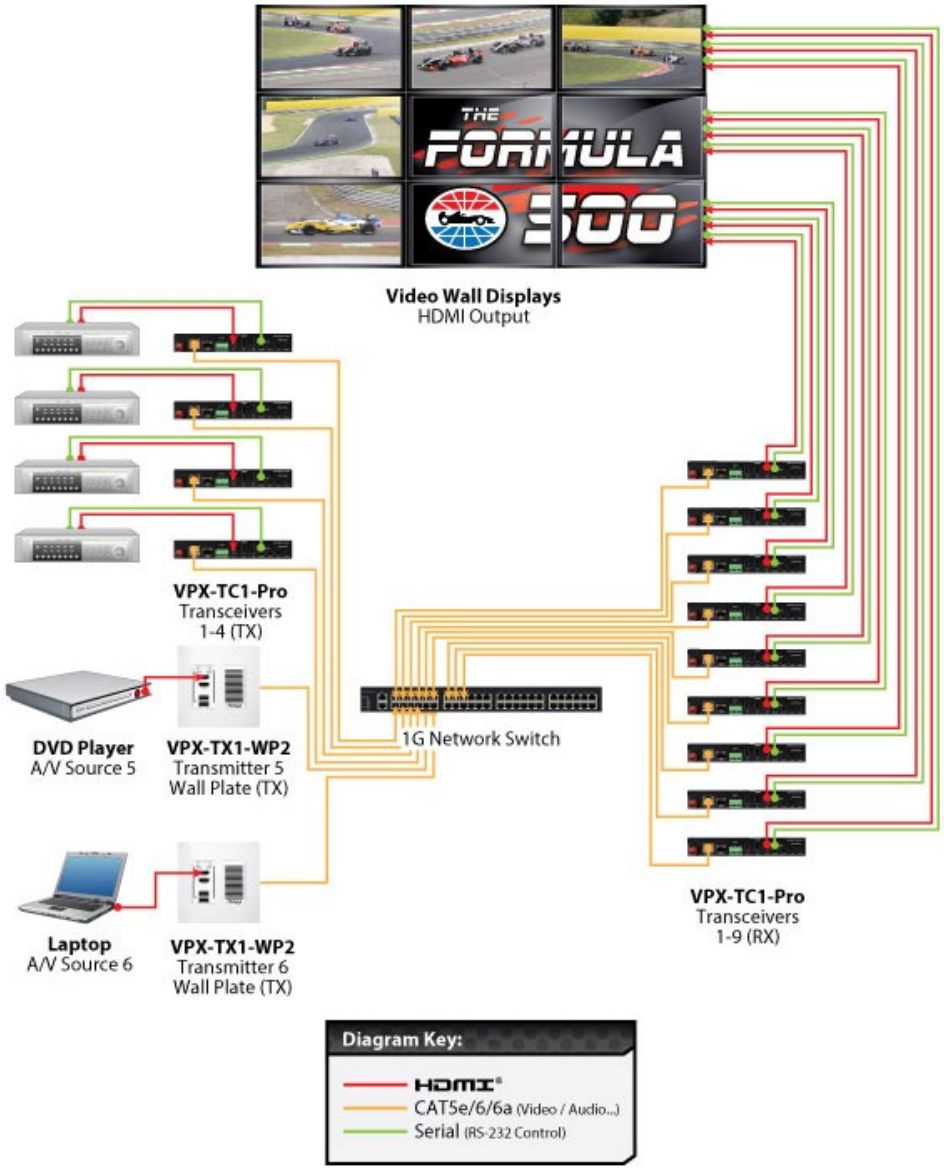
Example 3: Matrix – Multiple VPX to Multiple VPX

The VPX can take the place of any typical card cage matrix system, adding flexibility and performance never seen before. Even features like fast switch are no longer a premium.



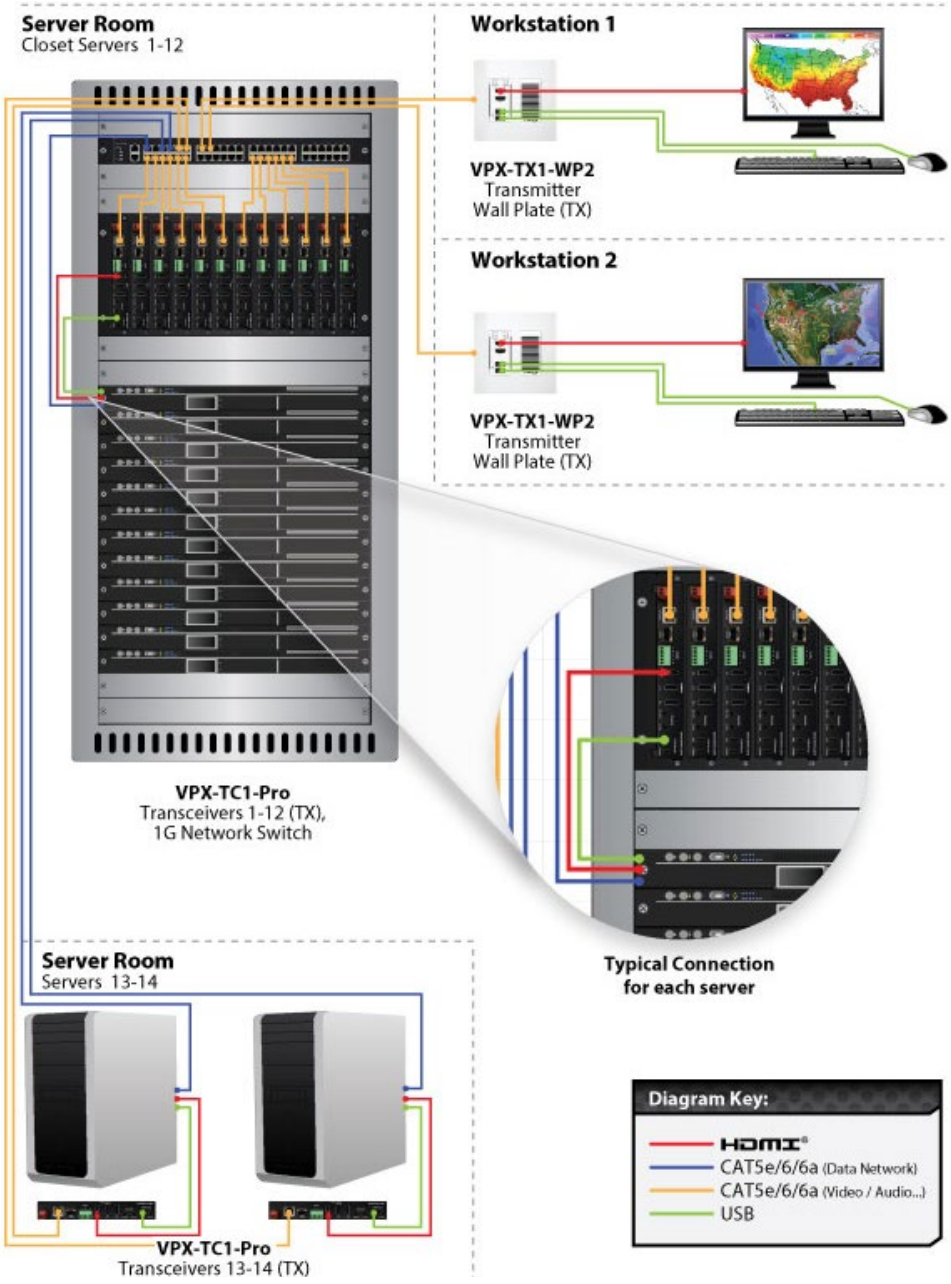
Example 4: Video Wall

The VPX Series is capable of 4K video walls. Up to 8x8 size can be created with 4K input.



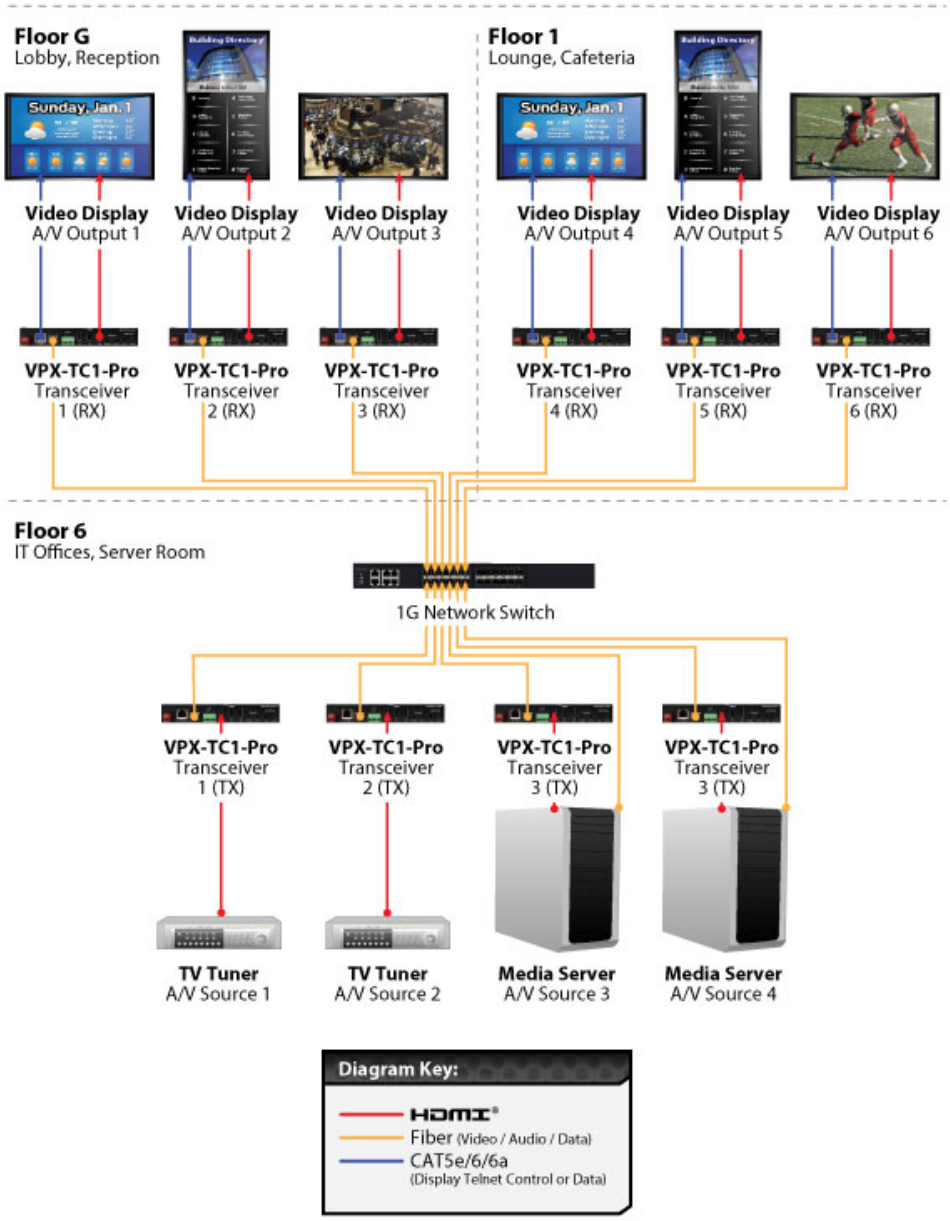
Example 5: KVM Utilizing USB 2.0

Command & Control and NOC centers are perfect for the VPX Series, especially with the USB 2.0 running at a full 200Mbps. With the VPX it is no longer just keyboard and mouse but full USB peripheral routing as well. To make this feature easy, the VPX has floating mouse and hot key functions. The roaming mouse will automatically move the mouse to the next encoder/PC accordingly based on the direction it was traveling. The hotkey function allows a button on the keyboard to be selected that will bring up a menu on the decoder to show the choses of the encoders to select and switch to.



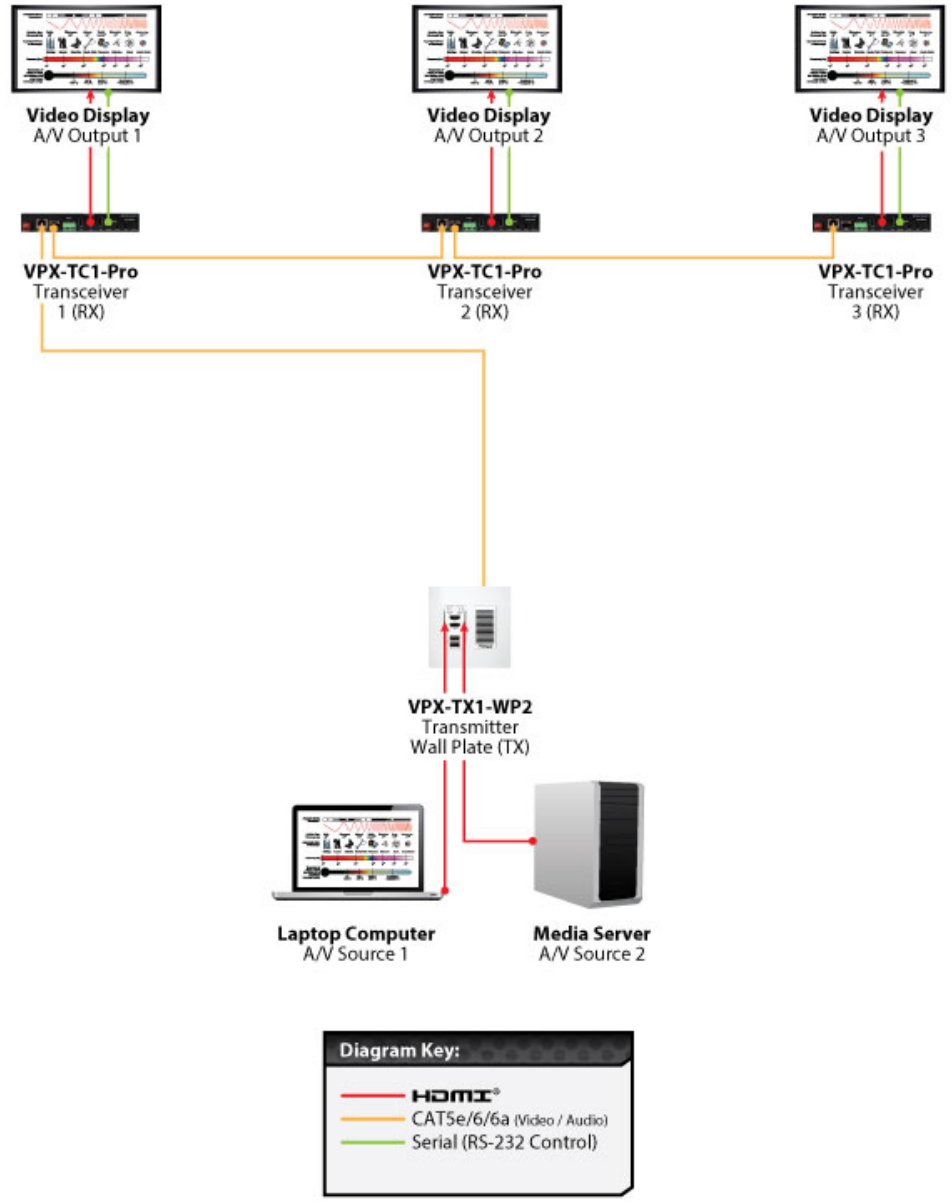
Example 6: VPX-TC1-PRO with Local Ethernet Control

Using the SFP a multimode fiber, single-mode fiber, or RJ-45 Copper, the VPX can connect to an ethernet switch and to a local device that requires Ethernet. If a copper switch is used with PoE the same can be accomplished by using the main RJ-45 to power and the SFP to do the local control.



Example 7: VPX-TC1-PRO Daisy Chain

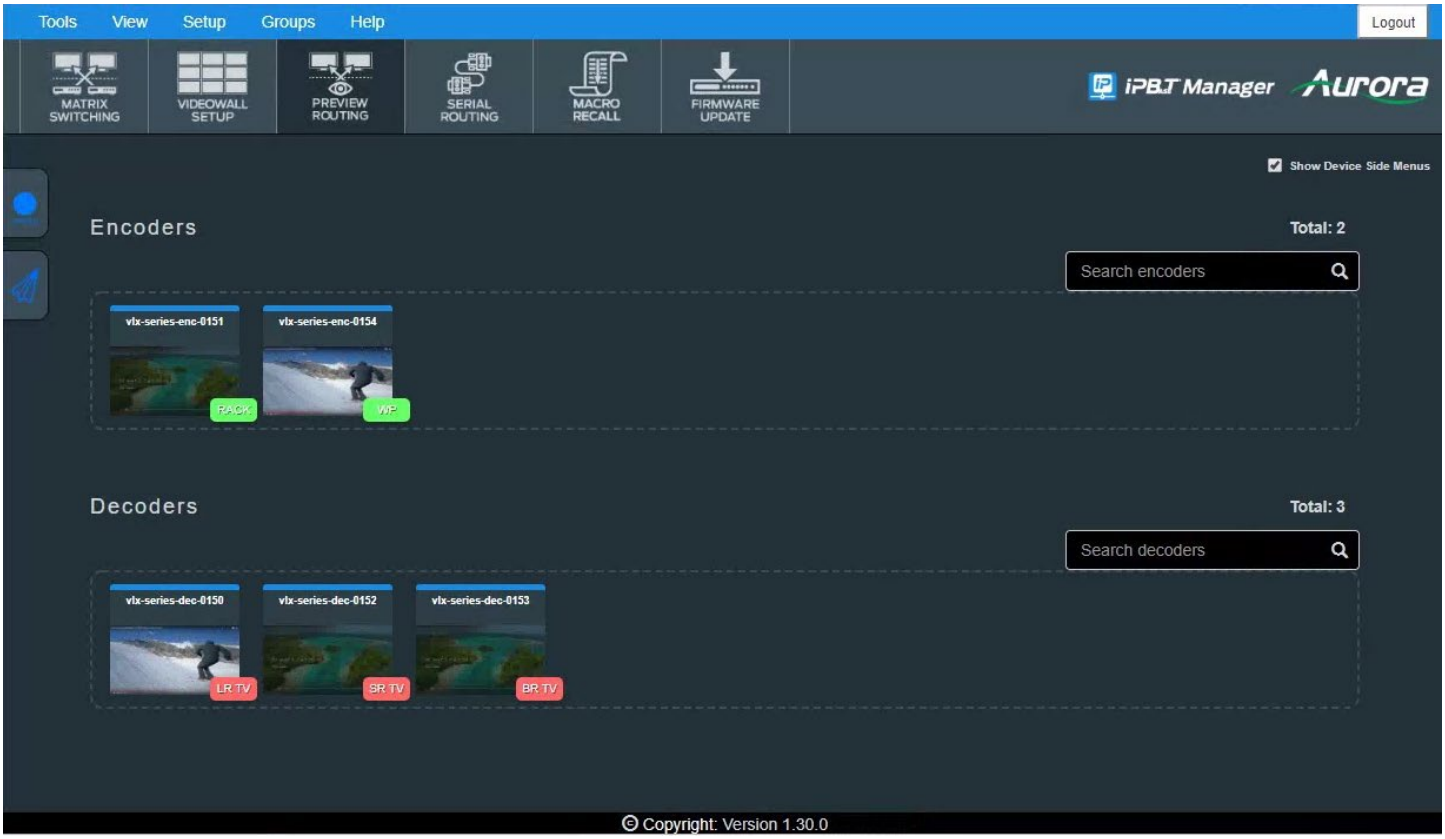
The VPX-TC1-PRO can be used in a Daisy chain mode with RJ-45 to RJ-45 or a mix of fiber. Note when using daisy chain only the first unit can be powered by PoE. The following units would require local power. If a unit in the chain is not powered or has an issue the remaining units in the chain will no longer function.



SOFTWARE

IPBaseT Manager PC Control & Setup Tool

The IPBaseT Manager is Windows® based software available at the Aurora customer portal on www.auroramm.com.



IPBaseT Manager allows a user to control the various capabilities of VPX series products on a network. While the IPBaseT manager is client software, the IPBaseT Server handles all the communication handling and is the target for all communication. This allows for centralized communications and the ability to run many clients on a network seamlessly. The VPX can also work decentralized as well for smaller installations.

Features

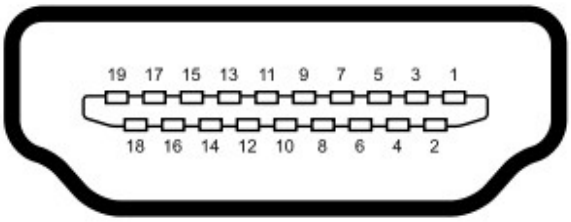
- Matrix Switching
- Video Wall Setup and Control
- RS-232 Routing and Control
- IR (Infrared) Remote Control Routing
- Horizontal and Vertical Viewing
- Macro Store and Recall
- Connection Manager

- Advanced Debug Logging
- Touch Screen Friendly Layout
- Configuration File for Cloning Presets and Connections on Other PCs
- Firmware Updating
- High-Resolution Previews
- Macro Recording
- Light/Dark Themes
- Embedded User Guide
- User Logging and Profiles
- Device Grouping
- Tagging
- Preview routing
- EDID editor
- Rapid deployment tool
- Touch screen/mobile friendly layout
- User and group management
- Macro recording

For full details of the IPBaseT Manager Software tool and setup, the manual can be found at the Aurora website www.auroramm.com.

CONNECTOR PIN DEFINITION

HDMI

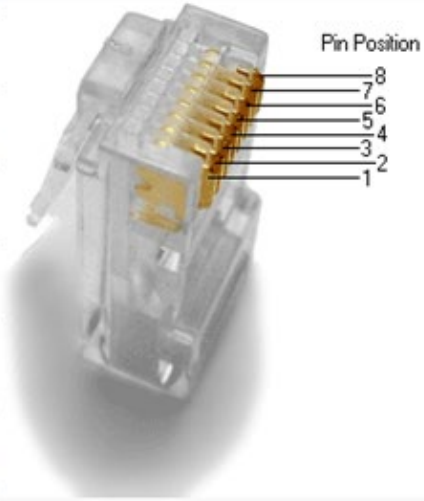


Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	**Pin 8**	TMDS Data0 Shield	**Pin 15**	SCL
Pin 2	TMDS Data2 Shield	**Pin 9**	TMDS Data0–	**Pin 16**	SDA
Pin 3	TMDS Data2–	**Pin 10**	TMDS Clock+	**Pin 17**	DDC/CEC Ground
Pin 4	TMDS Data1+	**Pin 11**	TMDS Clock Shield	**Pin 18**	+5 V Power
Pin 5	TMDS Data1 Shield	**Pin 12**	TMDS Clock–	**Pin 19**	Hot Plug Detect
Pin 6	TMDS Data1–	**Pin 13**	CEC		
Pin 7	TMDS Data0+	**Pin 14**	Reserved (N.C. on device)		

CAT5e/6/6A

T568A and T568B Wiring

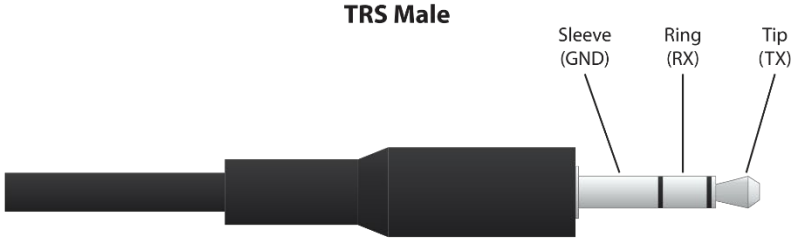
Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	white/green stripe	white/orange stripe	
2	3	2	ring	green solid	orange solid	
3	2	3	tip	white/orange stripe	white/green stripe	
4	1	1	ring	blue solid	blue solid	
5	1	1	tip	white/blue stripe	white/blue stripe	
6	2	3	ring	orange solid	green solid	
7	4	4	tip	white/brown stripe	white/brown stripe	
8	4	4	ring	brown solid	brown solid	

RS-232

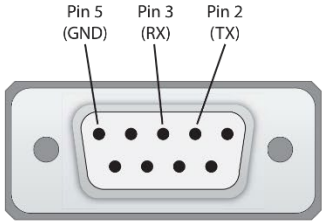
The RS-232 is a 3.5mm TRS connector. Tip is TX (output), ring is RX (input), and Sleeve is ground. To simplify connections Aurora offers pre-molded RS-232 cables in null and none nulled in male and female DB9.

CA0052 Selection Guide

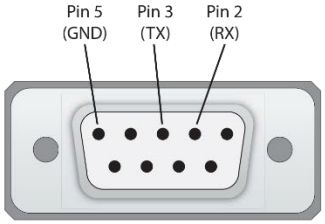
CA0052 (all versions)
TRS Male



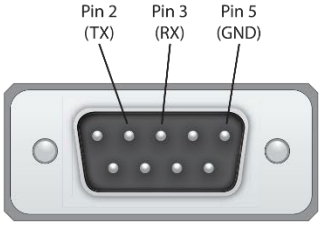
CA0052-F2T3R
DB9 Female (Crossover)



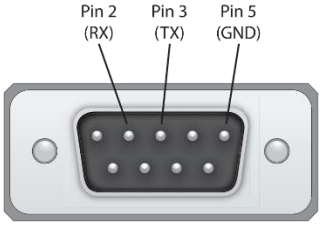
CA0052-F3T2R
DB9 Female (Straight)



CA0052-M2T3R
DB9 Male (Crossover)



CA0052-M3T2R
DB9 Male (Straight)



IR (Infrared)

It will autosense a TS or a TRS connector to determine if an IR emitter (TS) or IR receiver (TRS) is inserted. The IR receiver must be with carrier inverted to work. The tip is signal, ring is 5V, and sleeve is ground.

IR Receiver CA0026-1 (30kHz – 60kHz)

IR Receiver CA0026-1 (30kHz – 60kHz)

APPENDIX 1

Troubleshooting

It is advisable to make certain all units are using the latest firmware before troubleshooting. Also make sure all network connections are operating on 1G.

VPX Web Server is Not Responding

- Make certain every VPX unit has a unique IP Address set for the webserver. Disconnect unit from 1G network and connect PC directly to 1G LAN and check to see if webserver appears in browser. If not trying restoring defaults and try again. Repeat this for every unit. Another method is using the server to issue commands to change the webserver IP settings over the 1G.
- Make certain PC is on same VLAN as the VPX
- Check to see if the PC is on the same network IP address and subnet range as the VPX.

Display Will Not Show Encoder Video or the No Signal Image

- All devices are powered on.
- Unit is set properly for Decoder. OLED status will show this.
- Check routing with IPBaseT Manager.
- Display is set to the correct signal source input mode using display's remote. Example, switching to HDMI 1 if HDMI 1 interface is connected to the RX via a HDMI cable.
- Verify the cables are good or rated for the distance. Also, check the switch to see there is a 1G link. If not, that would indicate a bad cable.
- Look at the status LED and make certain unit is linked. The enter button on the front changes the link status.
- Try turning off the Genlock feature on the decoder. Also, try turning on the scaler.

Display Will Not Show Encoder Video but Does Show the No Signal Image

- Check if the switch IGMP snooping and unregistered multicast set up correctly. Also, make certain if multiple switches are uplink together there is only one switch with the querier enabled for the VLAN the VPX is on. More than one querier will cause issues.
- Make sure all units have the same firmware.
- Make sure the Super Secure Mode is either off on all units (factory default) or all on if desired.
- If Super Secure mode is used, the switch must be set up for Jumbo packets of at least 1600 MTU.
- If using the USB-C on the wall plate, make certain the cable is rated to do video.

Switching Speed Between Encoders is Slow

- Make certain scaler is enabled and genlock are on. Check switch configuration. Fast Leave should be enabled. If switching time is longer than 1 second with the above enabled, it will most likely be switch settings. If not enabled for other requirements switching time should take no longer than 4 seconds typically.

Switching Time Between Local HDMI Inputs Takes Longer

- The VPX can only fast switch between encoders. Locally on an encoder or decoder it can take up to 4 sec depending on the destination. They also do not have scaling like the stream output on the decoder.

VPX with Dante/AES67 Enabled Intermittently Locking Up

- If Dante or AES67 is on separate VLAN, Dante must be static only as there is only 1 MAC Address for both IP. Only one DHCP can be assigned and that will be for the main video stream. Check if QOS is set for Dante related products. Note that only the VPX Dante VLAN when separated could be set to QOS. Otherwise avoid QOS on video VLAN.

Dante/AES67 Not Working

- This must be enabled in the audio setup page. If enabled, check to see if it is registered. Note: Dante/AES67 requires a license key to be bought, installed, and registered. If this has been done check audio pathway settings.
- Please ensure all applicable settings and configurations are applied in Dante Controller Software.

Display Has Image with Wrong Color

- Make certain to learn the EDID from the display and save into each unit HDMI input ports.
- If different displays are used with the same source, an EDID with a common denominator must be used. For example, if one destination is 4K UHD and the other is 1080p and the 4K EDID is utilized, the 1080p screen will not get an image if the source is 4K capable. In this case it would be better to use a 1080p EDID.

Audio Not Working

- Make certain correct audio path is selected. The IPX can choose between analog input and HDMI.
- Verify correct EDID usage. If EDID has 5.1 surround sound listed and display cannot do 5.1 there will be no audio. Lack of EDID will also cause a source to output DVI which lacks audio.
- Check the volume on the display or amplifier.

VPX RS-232 Control is Not Working

- Check wiring for RX, TX, and Ground. (VPX 3.5mm Tip is TX, Ring is RX, Sleeve is GND).
- Check the baud rate of the unit.
- Confirm the protocol being utilized with a terminal program.
- Ensure the proper serial control mode is selected (SoIP) and the correct IP port as per the Protocol document.

Routing a Source to Multiple Displays is Tearing

- Check network switch is properly configured for IGMP.

VPX Server is Responding Poorly

- Check network switch is properly configured for IGMP with snooping.

Displays Not Showing Same Video Frame as Others

- If displays are different brands this can happen depending on the scaler circuitry utilized inside the display and the amount of buffering used.
- If displays are different brands trying using same native resolution of the displays or set to game mode. Some displays will not scale or use memory and just sync to the native signal.
- Check to see if Genlock is enabled on the VPX decoder.
- Check to see if decoders are set up similar with scaler turn on for example.

Audio Latency is Different Between Displays

- If the displays are different brands this can happen based on the design. It is always ideal to use the same models for consistency or a central source for audio to keep in sync.

Unit Won't Load Firmware or Displaying "Secondary" Mode

- Use the internal web pages to load the firmware into the unit. Versions prior to 0.18.1 only update firmware through the web interface of the unit. If 0.18.1 or higher, which will also update firmware through IPBaseT Manager or TFTP, make certain you are using the latest IPBaseT Manager version that supports the VPX. This can be found on the Aurora portal. If not in secondary mode, to re-attempt firmware update press and hold UP and DOWN while applying power. The OLED display will show "Secondary" mode alongside the device IP.

APPENDIX 2

Firmware Update

For the latest firmware updates please go www.auroramm.com.

You must sign up to the Customer Portal to download firmware with instructions on how to update.

Note: Aurora suggests using IPBaseT Manager for performing batch firmware updates. IPBaseT Manager will download the latest VPX firmware when the program is installed or updates.

Note: If updating from a firmware prior to 0.18.1, only use the device web page to update firmware. Updating via IPBaseT manager or TFTP can cause firmware corruption resulting in the need to use secondary mode followed by loading via web page.

APPENDIX 3

Protocol

For the latest protocol please go www.auroramm.com.

You must sign up to the Customer Portal to download the VPX protocol. The protocol is only available to authorized Aurora dealers.

APPENDIX 4

Recommended Cabling

Cat 5e UTP (Unshielded): 100m (330ft)
Any brand on the market is made to Category 5e or better specification.

Cat 6 UTP (Unshielded): 143m (470ft)
Cable Brand: West Penn Wire
Part Number: 4246. Cat 6 UTP CMR Part Number: 254246. Cat 6 UTP CMP

Cat 6A UTP (Unshielded): 182m (600ft)
Cable Brand: West Penn Wire
Part Number: 4246A. Cat6 A UTP CMR Part Number: 254246A. Cat6A UTP CMP

APPENDIX 5

Recommended Network Switches

The VPX will work with most non-blocking IGMP capable 1Gbps network switch. Layer 3 will allow more control for uplinks in larger systems; however, Layer 2 will work as well especially if it is non-blocking typology. It is highly recommended to communicate with the representative of the desired network switch brand to confirm configuration and capabilities. Below are some models that have been tested with the VPX Series.

Switch Speed

The VPX Series requires the switch to be a 1GbE.

VPX Series technology is used to transmit visually lossless 14:1 compress video up to 4K60 4:4:4 along with other AV signals such as audio, USB and control signals. For video alone, it means raw bandwidth of about 218Mbps average/800Mbps peak for 4K60 and that is just for audio and video. It is therefore easy to understand why the VPX requires 1GbE network switches.

Packets Routing

To enable the transmission of a source to multiple destinations, VPX devices make use of Multicast. The default behavior of layer 2 Ethernet switch is to broadcast those packets which means that every packet will be transmitted to all destinations. This is why any network switch used with VPX Series must support IGMP Snooping. VPX end points use IGMP protocol to assign the end points into multicast groups and the router uses IGMP snooping to efficiently route multicast packets only to receivers that want to receive them.

Many switches have the IGMP Snooping feature disabled by default and manual configuration is required. Often, a simple check mark near “Enable IGMP Snooping” is the only thing needed to enable IGMP Snooping. However, the implementation of IGMP Snooping is vendor specific and additional configuration is often needed.

An Ethernet switch can be informed that a device wants to leave a multicast channel by sending it an IGMP LEAVE GROUP packet. Once received, the time it takes for the switch to apply the new configuration may vary from one switch to the other. Most switches implement and include a FASTLEAVE configuration option. When enabled, it takes much less time for a particular port to leave a multicast group to assign the port to a different multicast group. The end results are a noticeably shorter video switching time. Aurora recommends always enabling the FASTLEAVE option when available.

Ethernet Switch Configuration

The following list includes all network switch configuration options that Aurora Engineers have come across so far. Look for these or similar options when configuring your switch.

1. Enable IGMP Snooping
    a. Must be enabled.
2. Enable IGMP Snooping on VLAN 1
    a. Must be enabled when all ports default to VLAN1.
3. Filter/Drop Unregistered Multicast Traffic
    a. If not applied, the behavior of the switch will be to broadcast multicast packets if the switch has no known destination for that packet.
    b. Must be enabled if found.

4. Unregistered Multicast Flooding

    a. Must be disabled if found.

5. Filter Unregistered Multicast (different wording than number 4 above)

    a. Must be enabled if found.

6. Enable IGMP Querier
    a. This must be enabled on the primary AV switch and must only be enabled on a single switch.
    b. If doing a multi-switch deployment, this should be enabled only on the core switch.

7. Enable IGMP Querier on VLAN1
    a. This must be enabled on the primary AV switch and must only be enabled on a single switch.
    b. If doing a multi-switch deployment, this should be enabled only on the core switch.

8. Set IGMP Version to IGMP V2

    a. Must be set if found.

9. Enable FASTLEAVE on Port X

    a. This is optional. Should be enabled, if found.

10. Enable FASTLEAVE for VLAN1

    a. This is optional. Should be enabled if found.

11. Jumbo/MTU Packets are not required. Only if the Super Secure mode (defaulted off) is selected will Jumbo packets be required.

PoE/PoE+ (Power over Ethernet)

The VPX Series uses around 8 watts of power (standard PoE 12.9 Watts), however, the PoE can supply up to 20 watts with PoE+ as the USB ports on the VPX can supply up to 5 watts. When selecting a PoE switch always make certain the power supply of the PoE switch is proper to the port count (15.4W x qty of ports). For example, a 24 port PoE switch must have at least 369.6 Watts (24 at 15.4W) for it to properly supply all 24 VPX devices. Some switches can only supply a certain number of ports with PoE. If it is necessary to use a particular switch, then PoE injectors for the remaining ports can be used or the local power supply for the VPX but you may need to disable the detection of the PoE for those ports in the Ethernet switch.

APPENDIX 6

Technical Specifications

Model Name	VPX-TC1-PRO/VPX-TC1-LT
Technical	
Compression	Mimix™ 14:1
Latency	Zero Frames (1.78ms)
HDMI Input(s)	2 HDMI 2.0b, HDCP 2.2 (Pro), 1 HDMI 2.0b, HDCP 2.2 (LT)
HDMI Output	HDMI 2.0b, HDCP 2.2
Encryption	AES 256
Audio Analog	Stereo Line In/Out (3.5mm TRS)
1G Ethernet	RJ-45 and SFP
LAN	RJ-45 10/100/1000M PoE
Video Bandwidth	600MHz
Video Support	Up to 4K2K 4:4:4 @ 60Hz (Pro), Up to 4K2K 4:4:4 @ 30Hz (LT),
Audio Support	Up to 12 Channels
Video Stream Bandwidth	93Mbps – 800Mbps (4K60 4:4:4) Packet Size Under 1600 1Gbps with USB and Audio
USB Bandwidth	200Mbps (Camera), 170Mbps (HID/Mass Storage Devices)
RS-232	Up to 115k Baud (3.5mm TRS)
IR In	3.5mm TRS (Tip Signal, Ring – 5V, Sleeve – Ground)
IR Out	3.5mm TS (Tip Signal, Sleeve – Ground)
USB Connector	1 USB Type C USB 2.0 Data (Host) Two USB 2.0 Type A for Camera/HID/Mass Storage Devices (Devices)
Expansion Port	Dante® 2Ch/8Ch and ReAX™
Interface	IR or Keyboard via OSD, Web Server
Mechanical	
Housing	Black Aluminum Enclosure
Dimensions (L x W x H)	177.04 x 150.7 x 26.42mm [6.97” x 5.93” x 1.04”]
Weight	.453kg [1lbs]
Mounting	Optional: Rack Mount Vertical, Rack Mount Horizontal, Under Table Mount

Power Supply	48v DC (2 Pin Euro) or PoE+ (LAN)
Power Consumption	8 Watts, up to 20 Watts allowable with USB & PoE+
Operation Temperature	0~40° C [32~104° F]
Storage Temperature	-20~60° C [-4~140° F]
Relative Humidity	20~90% RH [No Condensation]
Package Contents	1x VPX-TC1-PRO, 2x Mounting Ears

Note: Specifications subject to change without notice.

Model Name	VPX-TC1-WP2
Technical	
Compression	Mimix™ 14:1
Latency	Zero Frames (1.78ms)
HDMI Input	HDMI 2.0b, HDCP 2.2
HDMI Output	HDMI 2.0b, HDCP 2.2
Analog Audio	Euro Connector Stereo Line In/Line Out
Encryption	AES 256
1G Ethernet	RJ-45 and SFP
LAN	RJ-45 10/100/1000M PoE
Video Bandwidth	600MHz
Video Support	Up to 4K2K 4:4:4 @ 60Hz
Audio Support	Up to 12 Channels
Video Stream Bandwidth	93Mbps – 800Mbps (4K60 4:4:4) Packet Size Under 1600 1Gbps with USB and Audio
USB Bandwidth	200Mbps
RS-232	Up to 115k Baud (Euro 4 Pin)
USB Connector	1 USB Type C for Video and USB 2.0 Data (Host) 1 USB 2.0 Type A (Devices)
Interface	IR or Keyboard via OSD, Web Server
Mechanical	
Housing	Aluminum
Dimensions [L x W x H]	2 Gang 3.728” x 2.83” (4.331” with tabs) x 1.404”
Weight	1.13g [2.5lbs]
Mounting	Wall-mounting Decora® 2 Gang
Power supply	48V DC (2 pin Euro) or PoE (LAN)
Power consumption	8 Watts
Operation temperature	0~40°C [32~104°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]
Package Contents	1x VPX-TC1-WP2

Note: Specifications subject to change without notice.

APPENDIX 7

Warranty

Limited 5 Year Warranty

Aurora Multimedia Corporation (“Manufacturer”) warrants that this product is free of defects in both materials and workmanship for a period of 5 years as defined herein for parts and labor from date of purchase. This Limited Warranty covers products purchased in the year of 2019 and after. Motorized mechanical parts (Hard Drives, DVD, etc.), mechanical parts (buttons, doors, etc.), remotes and cables are covered for a period of 1 year. Touch screen displays are covered for 1 year; touch screen overlay components are covered for 90 days. Supplied batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product lifetime warranty period.

This warranty shall not apply if any of the following:

A. The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,

B. The product has not been operated in accordance with procedures specified in operating instructions: or,

C. The product has been repaired and or altered by other than manufacturer or authorized service center; or,

D. The product's original serial number has been modified or removed; or,

E. External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product; or,

F. Part(s) are no longer available for product.

In the event the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period. This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage. This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.

Aurora Multimedia Corporation

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