plexusAV

PlexusAV P-AVN-VA

Plexus Visual Array

User Manual

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About PlexusAV

PlexusAV is an engineering leader in the development of high-quality signal transmission solutions for the broadcast, cable, satellite, IPTV, telecommunications, and professional audio/video markets. The company's world-class portfolio includes video delivery products, system monitoring and analysis solutions, and test and measurement equipment, all designed to support system interoperability and backed by best-in-class customer support. PlexusAV meets the rapidly changing needs of modern media by ensuring the efficient delivery of high-quality video from the source to the home. For more information, visit www.plexusav.com.

Revision History

Date (MM/DD/YYYY)	Version	Description	Author
05/19/2024	0.01	First Draft	BCR

Safety Instructions

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with dry cloth
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- The mains plug of the power supply cord shall remain readily operable.
- **Damage Requiring Service**: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power-supply cord or plug is damaged.
    - If liquid has been spilled, or objects have fallen into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    - If the product has been dropped or damaged in any way.
    - The product exhibits a distinct change in performance.
- **Replacement Parts**: When replacement parts are required, be sure the service technician uses replacement parts specified by PlexusAV, or parts having the same operating characteristics as the original parts. Unauthorized part substitutions made may result in fire, electric shock, or other hazards.

SAFETY PRECAUTIONS

There is always a danger present when using electronic equipment.

Unexpected high voltages can be present at unusual locations in defective equipment and signal distribution systems. Become familiar with the equipment that you are working with and observe the following safety precautions.

- Every precaution has been taken in the design of your product to ensure that it is as safe as possible. However, safe operation depends on you the operator.
- Always be sure your equipment is in good working order. Ensure that all points of connection are secure to the chassis and that protective covers are in place and secured with fasteners.
- Never work alone when working in hazardous conditions. Always have another person close by in case of an accident.
- Always refer to the manual for safe operation. If you have a question about the application or operation email ProCare@plexusav.com
- WARNING – To reduce the risk of fire or electrical shock never allow your equipment to be exposed to water, rain, or high moisture environments. If exposed to a liquid, remove power safely (at the breaker) and send your equipment to be serviced by a qualified technician.
- To reduce the risk of shock the power supply must be connected to a mains socket outlet with a protective earthing connection.
- For the mains plug, the main disconnect should always remain readily accessible and operable.
- When utilizing DC power supply, the power supply MUST be used in conjunction with an over-current protective device rated at 50 V, 5 A, type: Slow-blo, as part of battery-supply circuit.
- To reduce the risk of shock and damage to equipment, it is recommended to ground the unit to the installation's rack, the vehicle's chassis, the battery's negative terminal, and/or earth ground.

⚠Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Package Contents

The following is a list of the items that are included:

1. P-AVN-VA Chassis
2. P-AVN-VA Software
3. Quick Start Guide

If any of these items were omitted from the packaging, please email ProCare@PlexusAV.com to obtain a replacement.

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Section 1 Overview

Introduction

This section includes the following topics:

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1.1 Product Introduction

The P-AVN-VA (PlexusAV Visual Array) is a scalable centralized management platform to be used for any deployments involving multiple P-AVN-4's (PlexusAV IPMX Transceivers). The Visual Array also engages the 'Video Wall' feature, where multiple Transceivers in Decoder mode are utilized as individual segments of a single multi-screen video display. The Visual Array comes with a built-in fully functional web interface, with preparedness to quickly detect and control all P-AVN-4's in any IPMX environment.

Input Interfaces

- DC Power Adapter Port
- x3 USB3.2 Gen2 Ports
- x1 USB 2.0 port
- x1 USB4 port (40Gbps, Full Functionality)

Output Interfaces

- 3.5mm Audio Jack (HP and MIC)
- 4K 60Hz HDMI 2.0
- Display Port (4K 60Hz)

Data Interfaces

- LAN RJ45 (up to 2.5G Link Speed)
- Protocols: Web UI Management and IPMX Transceiver Control

Management

- Web UI: On-board web interface
- External Control: REST API
- NMOS Controller for IPMX Transceivers

Dimensions and Power

- Size: 113 mm x 126mm x 42mm (4.45" x 4.96" x 1.65")
- Weight: 1.43 lbs. (0.65 kg)
- Power: 19V DC / 6.32A
- Supplies: 1x External power supply (sold separately)

1.2 Front Panel Overview

1. Clear CMOS Key
    - Please do not use this key unless instructed to do so by a PlexusAV technical representative
2. x2 USB 3.2 Ports
3. x1 USB 4.0 Port
4. Headphone and MIC Input, 3.5mm Mini-jack
5. Power button and indicator light

1.3 Rear Panel Overview

1. RJ45 LAN Port (up to 2.5Gbps Link, Web UI Management and Transceiver Control Port)
2. x1 USB 3.2 Port
3. x1 USB 2.0 Port
4. Display Port, 4K 60Hz
5. HDMI Port, 4K 60Hz
6. DC Power Input

Section 2 Installation

Introduction

This section includes the following topics:

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2.2 POWER CONNECTION 14
2.3 MAINTENANCE 14
2.4 NETWORK SETUP 14

2.1 Installation

The P-AVN-VA (PlexusAV Visual Array) can easily be deployed almost anyplace. The size is small enough that the unit can be placed on top of a desk, test equipment rack, or shelf on a test bench.

2.2 Power Connection

The P-AVN-VA (PlexusAV Visual Array) physical unit comes with the necessary AC Adaptor and Power Cord provided. To make the power connection:

- Mate the Power Cord to the Adaptor
- Mate the Adaptor to the DC Power Jack on the back of the P-AVN-VA Unit
- Then mate the power plug to a protected AC.

2.3 Maintenance

The P-AVN-VA (PlexusAV Visual Array) VA is a maintenance-free piece of equipment. There are no user-serviceable parts on the inside or outside of the unit. If maintenance is required on the physical unit, please send an email request to ProCare@plexusAV.com for assistance. This same contact should also be used when requesting the latest PlexusAV software, release notes, or other documentation.

2.4 Network Setup

1. Initial Check: Ensure the P-AVN-VA is powered on and properly connected to network infrastructure or PC via Ethernet cable.
2. It is recommended to connect an HDMI Sink to the Visual Array, this way a display can be
3. The device will first attempt to acquire an IP Address via DHCP; if this operation times out, it will instead default to static IP 192.168.1.10
4. Access Device: Open a web browser on a computer connected to the same network as the P-AVN-VA and navigate to https://192.168.1.10 (or https://<acquiredDHCPAddress>)
5. Enter the default user and password combination into the login prompt
   - User: admin
   - Password: plexusav

For additional information on the initial network configuration menu, please see the PlexusAV P-AVN-VA Quick-Start-Guide documentation.

Section 3 Web-Interface Operation

Introduction

This section includes the following topics:

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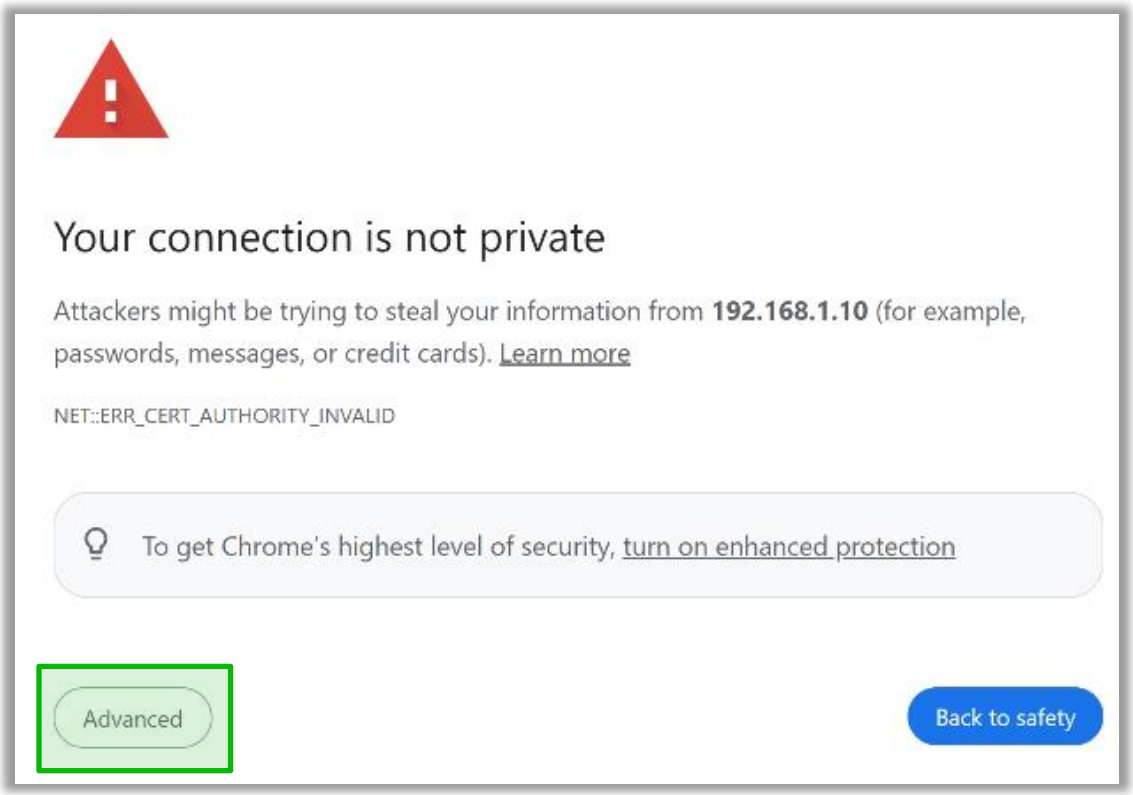
3.1 Logging into the P-AVN-VA Web Interface

To open the P-AVN-VA web interface, use one of the following supported browsers and navigate to the unit's IP address via HTTPs:

- Internet Explorer 7 & above
- Firefox 3.5 & above
- Google Chrome
- Microsoft Edge

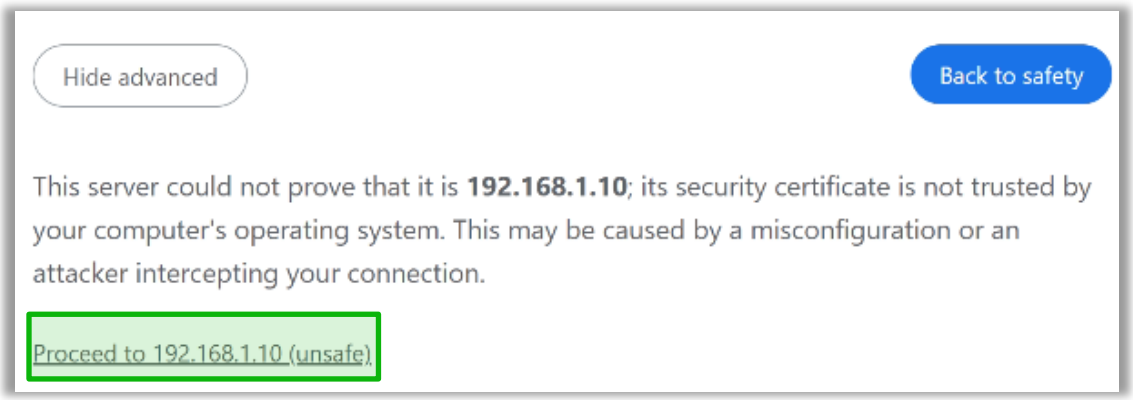
If this is the first time the given PC or Browser is accessing the Visual Array, the following HTTPS prompt will be presented:



First Time HTTPS Sign-In Prompt

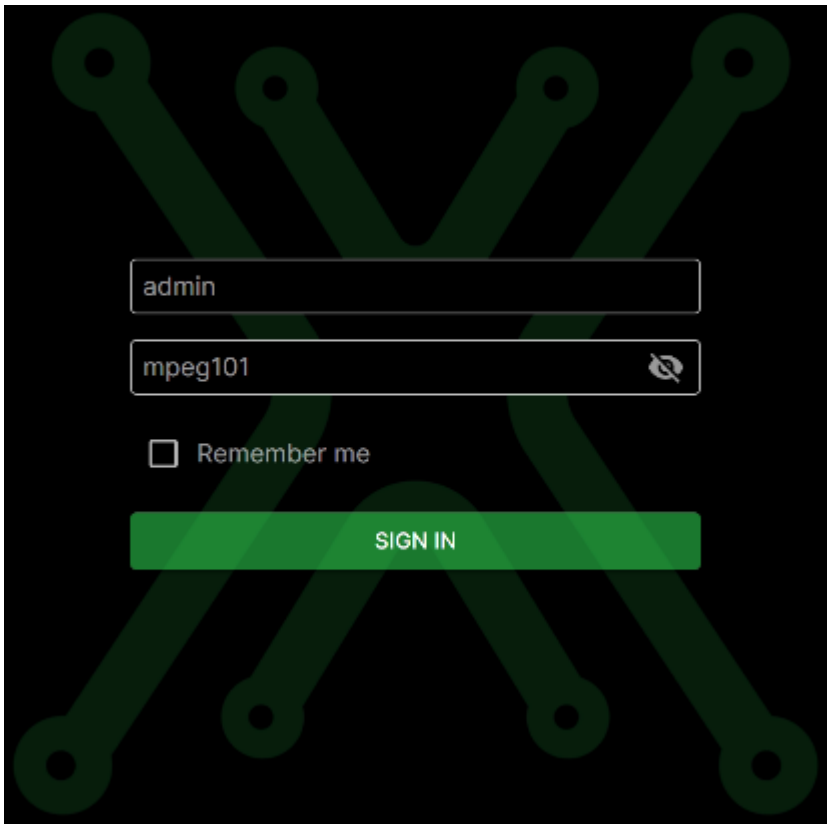
Click "Advanced" to expose the "Proceed to 192.168.1.10" hyperlink.

Click the “Proceed to 192.168.1.10” option to complete first time connection to the Visual Array Web Client. Going forward, the browser will cache the certificate from the device.



Proceed to Management IP Link

Once finished with the first-time HTTPs prompt, the following Sign In page is presented.



Login Prompt

After entering the Default Credentials, press ‘ENTER’, or click the ‘SIGN IN’ button to complete login to the web interface.

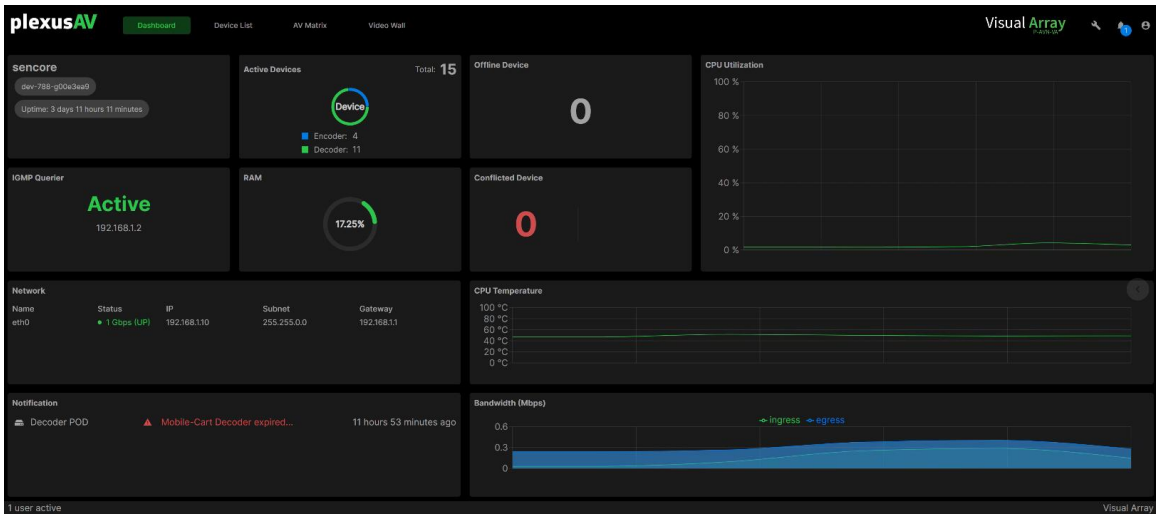
DEFAULT CREDENTIALS

User: admin

Pass: plexusav

3.2 Web GUI Overview

The first page presented upon login is the Dashboard, which will be explained in more detail in Section 3.3.



Web Overview

There are four main tabs along the top left-side of the web client:

Main Tabs

General Description

Main Tab	Description
Dashboard	User-friendly customizable widget based view of system and device metrics
Device List	P-AVN-4 Transceivers will automatically populate this page via NMOS discovery for general grouping and organization
AV Matrix	Dynamic, graphical view used to configure routing of IPMX Flows between P-AVN-4 Transceivers
Video Wall	Create a single multi-screen display, utilizing synchronized outputs of multiple P-AVN-4 Transceivers

Along the top right side of the web client, there are three operative icons

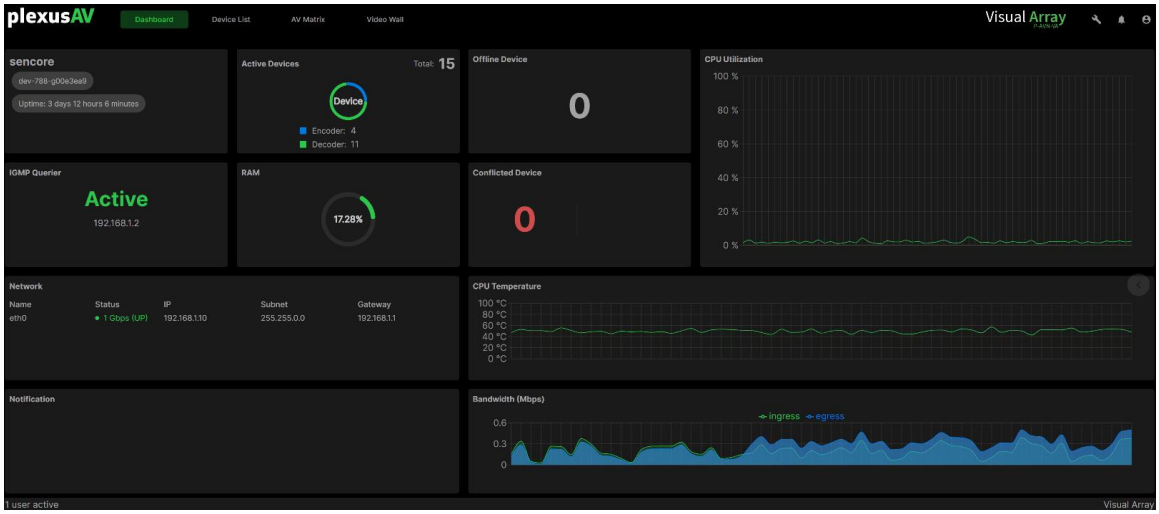
Operative Icons

General Description

Icon	Name	Description
	Tools	General administrative and reporting functions for the system. Information about these options is available in Section 3.7.
	Notifications	Toggleable sidebar to quickly display active alarms. More information on the Notifications Pane can be found in Section 3.14.
	User Information	This menu allows for changes to be made to the password and is where the system logout button resides. Additional details on User Information are present in Section 3.15.

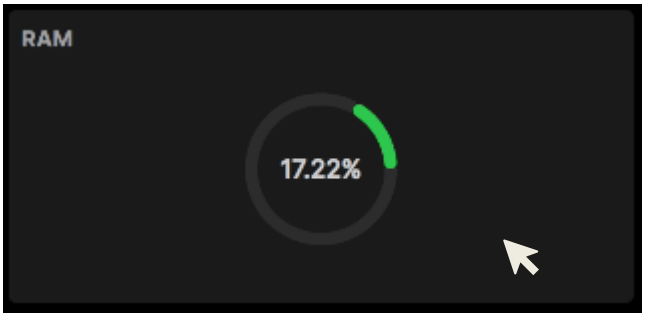
3.3 Dashboard

The Dashboard is the first visible page upon login and is organized in an array of movable, hidable rectangular widgets. By default, all widgets will be enabled for display.



Dashboard Page (Full View)

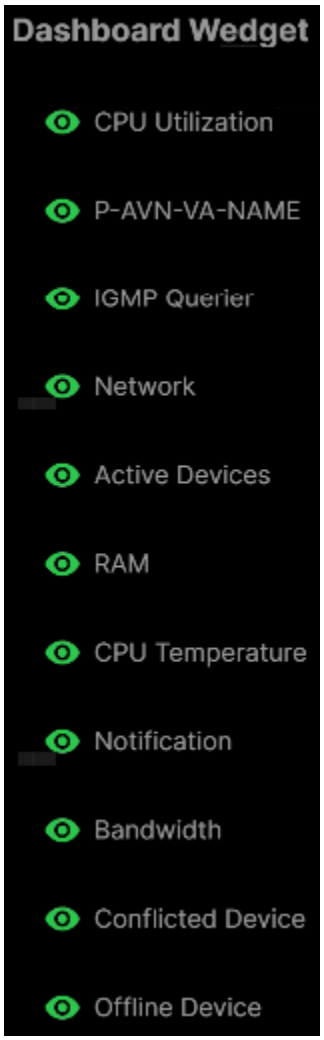
Widgets can be moved by dragging and dropping them from anywhere within their boundaries.



Single Widget View

To expose or hide widgets, navigate to the far right center of the Dashboard, and click the circular arrow icon to view the Dashboard Widget menu:

Upon clicking the icon, the Dashboard Widget menu will be presented on the right.



Dashboard Widget Menu

Each Widget is toggleable:

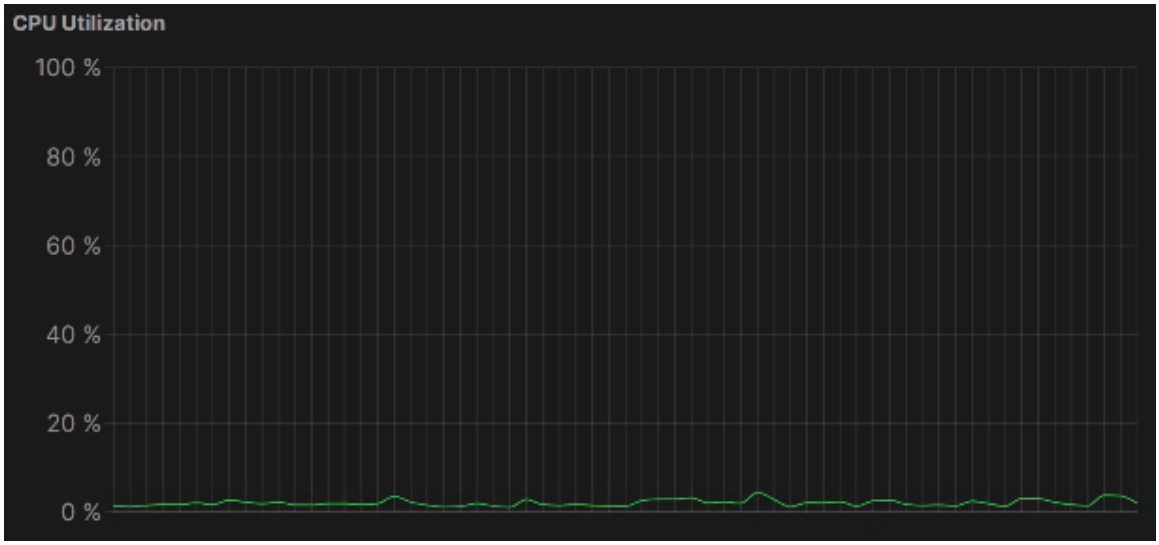
means the Widget is active and will display on the Dashboard.

means the Widget is inactive and will not display on the Dashboard.

Once finished, click anywhere on the GUI outside of the menu to exit the Dashboard Widget.

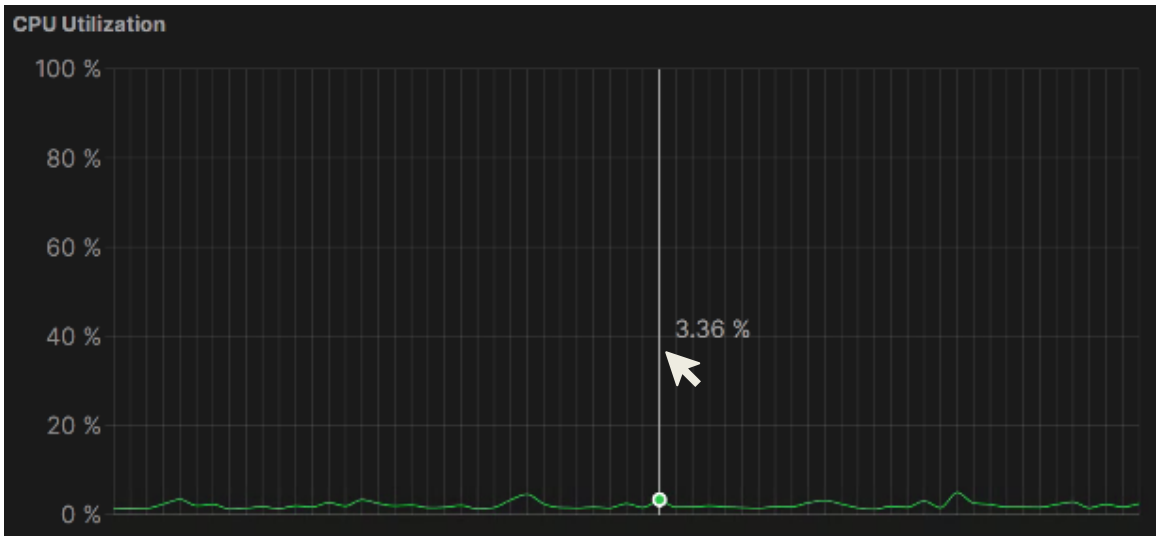
3.3.1 CPU Utilization Widget

A crawling graphical display of the system CPU Utilization over the span of the last three minutes.



CPU Utilization Widget

Hover anywhere over the graph with the mouse to show the specific CPU percentage at a given moment.

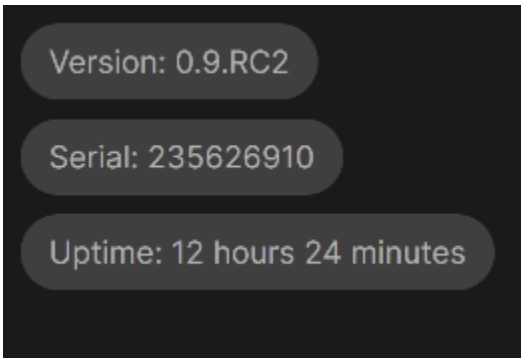


Hover-over View

Best practice for CPU Utilization is not to exceed 75% at any given moment.

3.3.2 P-AVN-VA-NAME Widget

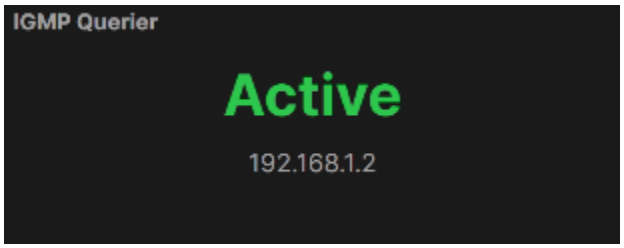
Displays the Visual Array Server software version, serial number, and system uptime.



P-AVN-VA-NAME Widget

3.3.3 IGMP Querier Widget

Indicator that shows the current running status of the IGMP Querier, as well as its source IP.

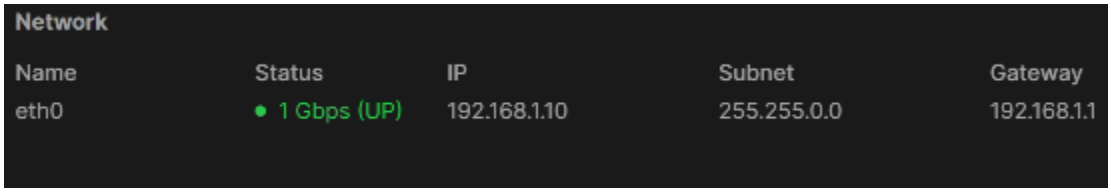


IGMP Querier Widget

The IGMP Querier will be the IP address of the managed switch connecting the P-AVN-VA (Visual Array) to the P-AVN-4 (IPMX Transceivers) throughout the network.

3.3.4 Network Widget

The Network Widget will display all available NICs on the system (those on-board as well as any provided via USB or PCIe ports).



Network Widget

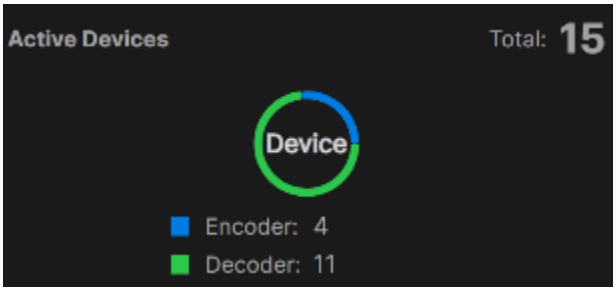
The ‘Status’ Column will display the current link status and speed:

- Green for ‘UP’
- Red for ‘DOWN’

The Name, IP, Subnet, and Gateway columns will reflect user configurations as set in the Administration pane, as described in Section 3.8.2.2.

3.3.5 Active Devices Widget

This widget indicates the total number of distinct P-AVN-4 IPMX Transceivers that have been detected by the Visual Array, as well as how many are currently in ‘Encode Mode’ as opposed to ‘Decode Mode’ (please see PlexusAV P-AVN-4 Manual FORM8244, Section 4.1.1, for additional information on Encode and Decode modes)..

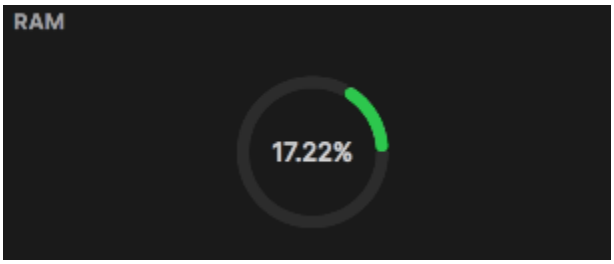


Active Devices Widget

The circular graphic displays proportionally the ratio of detected Encode and Decode devices. For instance, in the above sample, there are more Decoders than Encoders in this workflow, so the circle is predominantly green (Decoders) with a smaller percentage of blue (Encoders).

3.3.6 RAM Widget

The RAM Widget displays the current total available and used memory at a given time.



RAM Widget

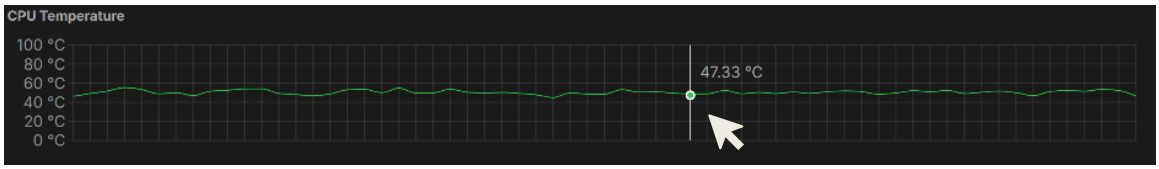
As RAM (Random Access Memory) becomes used, the circular graphic will fill in clockwise fashion, with the percentage in the middle reflecting the total used RAM. It is best practice to always keep this value at or below 75%.

3.3.7 CPU Temperature Widget

A crawling graphical display of the system CPU Temperature over the span of the last three minutes.

CPU Temperature Widget

Hover anywhere over the graph with the mouse to show the specific CPU Temperature at a given moment.

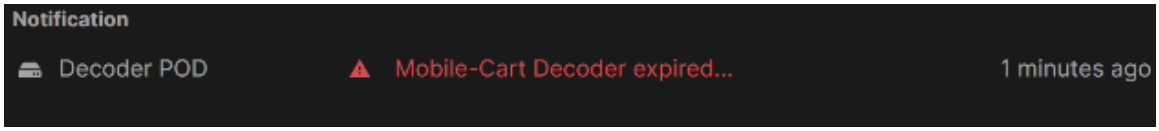


Hover Over View

For information on safe operational temperature, please review the specifications for the provided Visual Array appliance in Appendix BLAH.

3.3.8 Notification Widget

This Widget will display any currently active alarms.

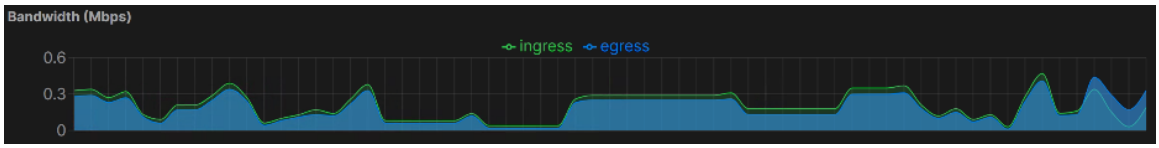


Notification Widget

Alarms presented in this will correspond directly to any messages on the Notifications pane as described in Section 3.14.

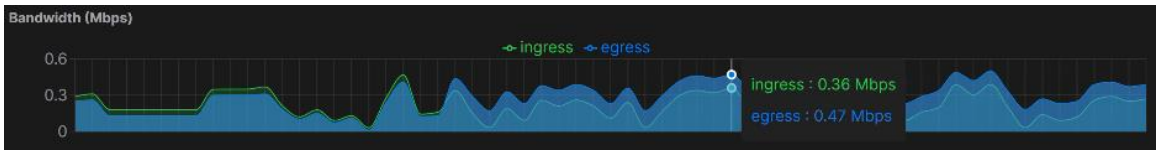
3.3.9 Bandwidth Widget

A crawling graphical display of the aggregate Ingress (green) and Egress (blue) traffic over the span of the last three minutes.



Bandwidth Widget

Hover anywhere over the graph with the mouse to show the specific CPU Temperature at a given moment.

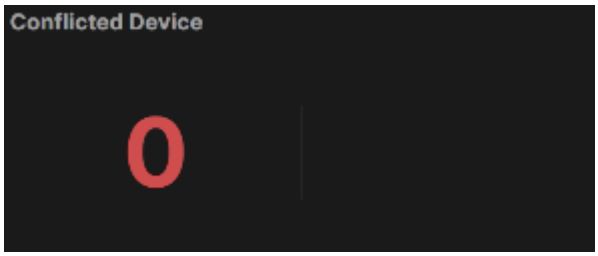


Hover-Over View

It is worth noting that the Ingress and Egress traffic is specific to the Visual Array's communication to the IPMX transceivers, and not the actual Payload of the IPMX flows routed between devices.

3.3.10 Conflicted Device Widget

If two or more P-AVN-4 transceivers are vying for the same network address in the network, this number will indicate how many total devices are in direct IP conflict.



Conflicted Device Widget

If this number is greater than 0, to prevent performance issues with commands, any devices in IP Conflict should be addressed before attempting to further configure groups and flows throughout the system.

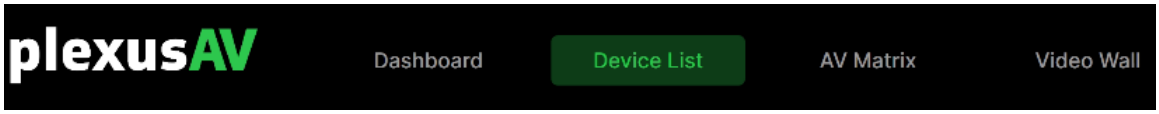
3.3.11 Offline Device Widget

This Widget will show how many total P-AVN-4 Transceivers that have been detected in the past are currently inactive.

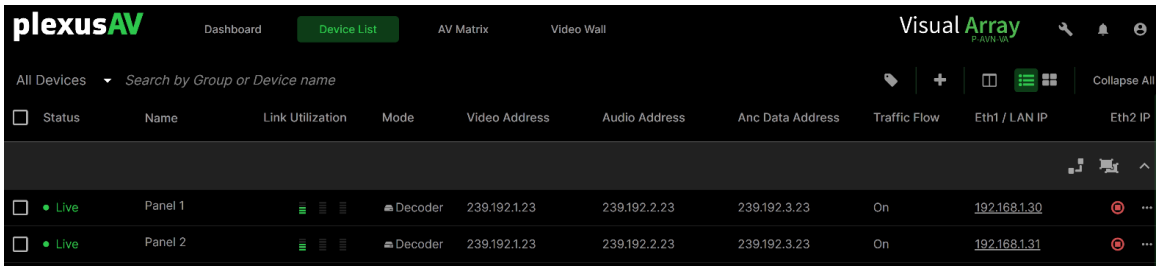
Offline Device Widget

Inactive in this case would mean rebooting, powered down or otherwise incapable of returning ping response and API returns to the Visual Array. This field will reference the 'Status' column as described in Section 3.4.2 (under the Device List tab). The total number of devices that show 'Offline' will be counted, totaled, and displayed on the Dashboard.

3.4 Device List



When the P-AVN-VA is connected to the same network (and on the same subnet) as one or more P-AVN-4 Transceivers, the Device List will automatically be populated with Encoders and Decoders.



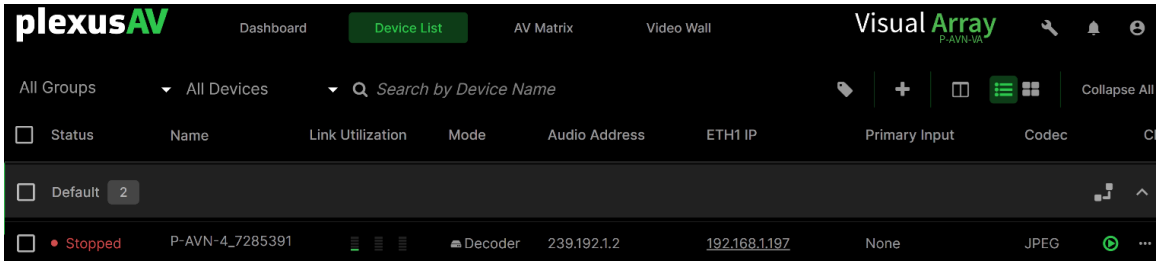
Device List Overview

The Visual Array will poll all accessible IP's, searching for P-AVN-4's. Upon initial acquisition of a device, the Visual Array will track the device going forward using the acquired Unit Alias. This way, if any Transceiver IP's change, the Visual Array will retain the settings and mappings for that device.

When Transceiver devices become part of the list, they can be labeled, sorted into groups and tags, rebooted, or upgraded. Device configurations may be exported and imported for mass configuration. Devices must populate this list before they can be used in the AV Matrix or Video Wall.

3.4.1 Adding a Device to the List

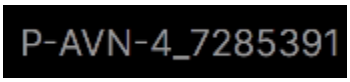
To add a device to the list, connect a P-AVN-4 IPMX Transceiver to the same Network Switch as the P-AVN-VA (Visual Array). Ensure that the IPMX Transceiver is on the same network subnet as the Visual Array. The Visual Array polls for its provided subnet and will quickly acquire the device before pushing it into the 'Default' group.



First Time Device Addition

Looking closer at the newly added device, observe that the default alias that populates will be formatted as:

- PlexusAV Model Number (in this case P-AVN-4)
- PlexusAV Serial Number (in this case 7285391)
- The above logic renders this sample as 'P-AVN-4_7285391' upon first time detection

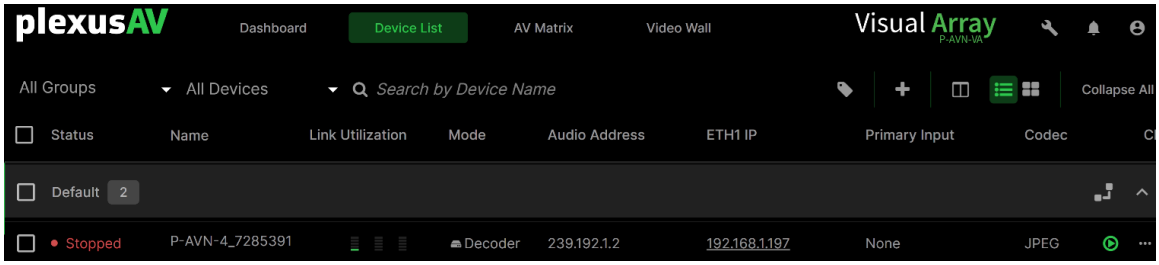


If the P-AVN-4 already has a Name assigned, the VA will detect this instead and populate accordingly. See P-AVN-4 Manual, Section 4.1.4, for information on assigning the NMOS Discovery Name to the P-AVN-4.

Upon population, a bi-directional communication lane is formed via API (Port 443) between the Visual Array and the P-AVN-4. As the P-AVN-4 status and configuration changes, those changes will be reflected in the Visual Array after it polls the metric again. The reverse is also true, if the Visual Array makes changes to the device, those fields will also be reflected in the P-AVN-4 Web UI going forward as well.

3.4.2 Viewing and Changing Device Status

The leftmost column (after the selection column) is for ‘Status’. This is used to confirm that the device is both active and online.



Stopped Device

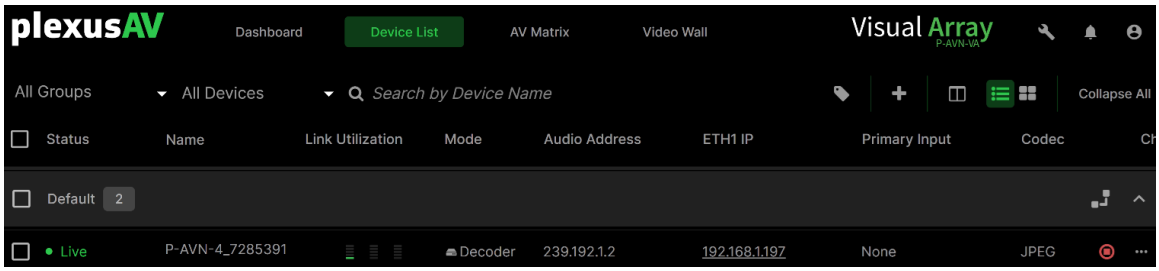
For the above device, observe the following:

1) The first leftmost column indicates ‘Stopped’

2) The second to rightmost column displays a green ‘play’ icon

The above notes are indicating that the new P-AVN-4 device has been detected but currently is in the ‘Stopped’ status.

Click the second to rightmost green ‘play’ icon to toggle the Status from ‘Stopped’ to ‘Live’. Note that, after a few moments, the indicators now toggle.



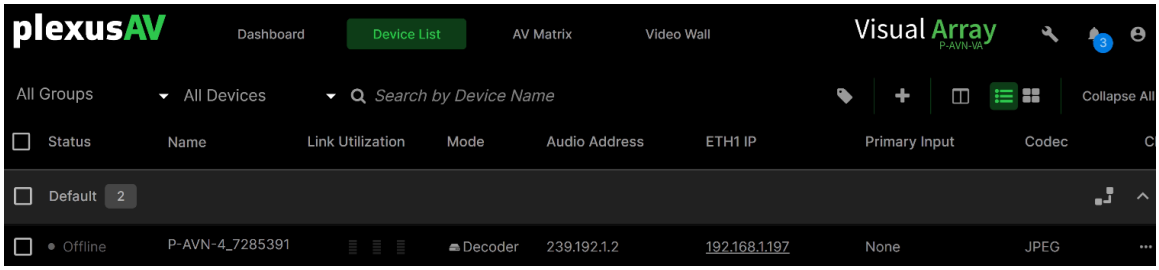
Live Device

1) The first leftmost column now indicates ‘Live’

2) The final rightmost column displays a red ‘stop’ icon

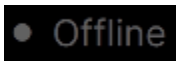
Stop and Start Devices to quickly remove bitrate or re-initialize services. This toggle and status indication corresponds directly to the Start and Stop icons as described in Section 4.1.1 of the P-AVN-4 Manual. The device may also be stopped and started directly from the P-AVN-4.

If connection to the P-AVN-4 is broken, either as the device reboots or if the IP connection is broken, the status will change to the grayed view as shown below..



Offline Device

In this scenario, the status will read as ‘Offline’



Offline devices will be cached in the Visual Array’s memory via ‘Name’ until they are removed. When the connection is restored, the Visual Array will re-poll status and configurations from the device before otherwise resuming operation as normal.

3.4.3 Table Columns

There are many columns in the Device List table, and this view is customizable.

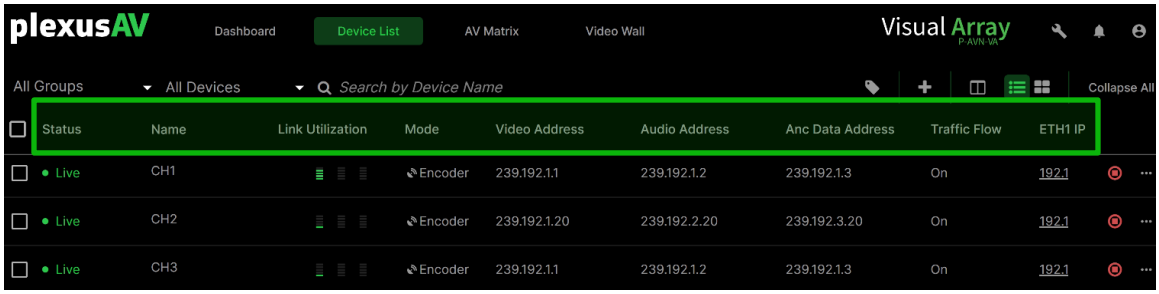


Table Columns View

Columns can be added or removed to ensure the most pertinent view. To customize which options are visible, click the Table icon near to the top right of the page to open the Table Columns Menu.

Table Icon:

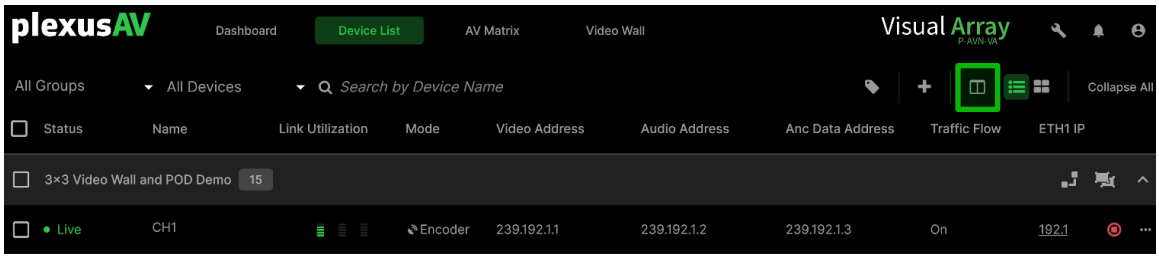


Table Icon Location

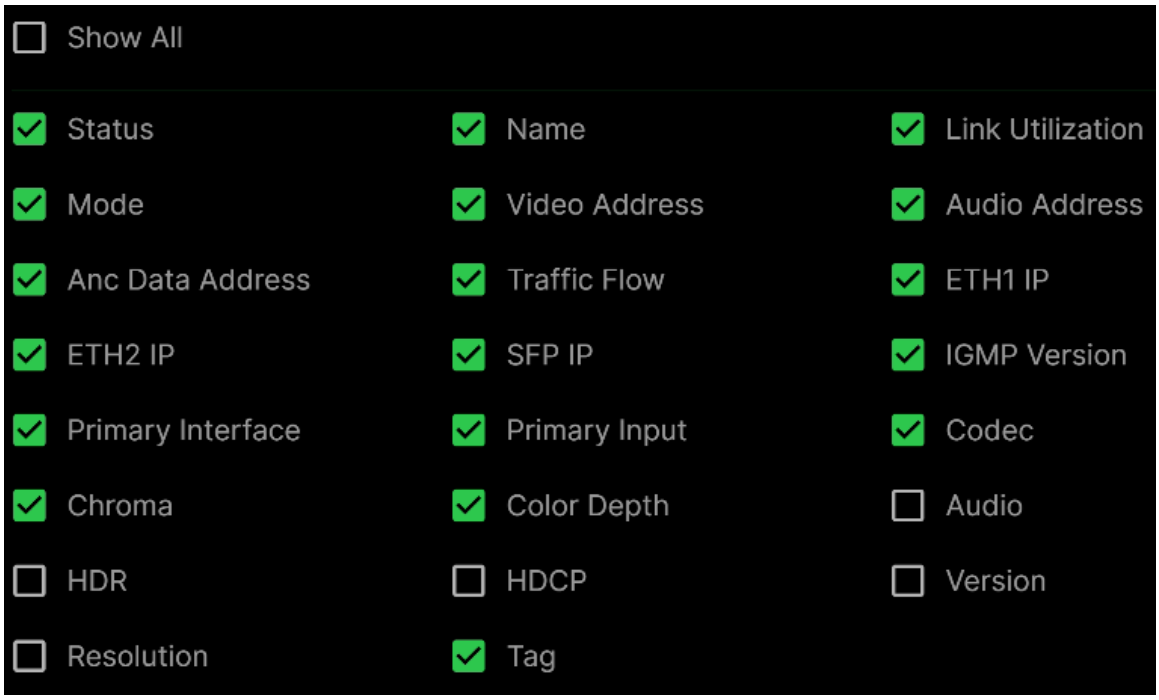
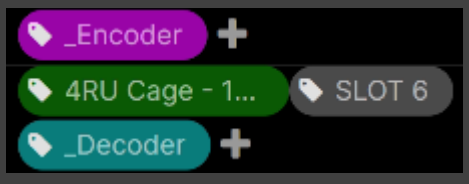


Table Columns Menu

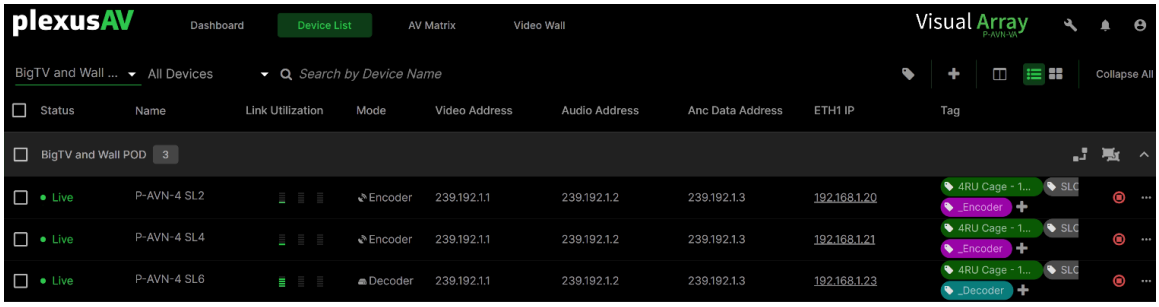
General Description

Checkbox	Description
Show All	Clicking this option will toggle selection for all columns. Clicking while one or more columns are enabled will enable the rest; clicking while all columns are enabled will disable all options.
Status	Shows the Device status (Live, Stopped, Offline). See Section 3.4.2 for more information on Device Status. This is an important field and should be enabled.
Name	This is the NMOS Discovery name for the P-AVN-4 Transceiver. This is an important field and generally is recommended to be left on.
Link Utilization	This is a graphical view of link usage for each of the x3 on-board NICs. The leftmost icon is for the Device's ETH1/POE port, the middle is for ETH2, and the third rightmost icon is for the SFP port. As the link sees more bandwidth, the graphic will fil. Hover-over the graphical to view concise percent usage for the given NIC.
Mode	Indicates if the IPMX Transceiver is in 'Encoder' or 'Decoder' mode. This is an important field and should be enabled.

Video Address	The Configured Destination IP address for the Video Essence of the given Encoder or Decoder. Useful when checking for conflicts between multiple encoders but otherwise optional.
Audio Address	The Configured Destination IP address for the Audio Essence of the given Encoder or Decoder. Useful when checking for conflicts between multiple encoders but otherwise optional.
Anc Data Address	The Configured Destination IP address for the ANC Essence of the given Encoder or Decoder. Useful when checking for conflicts between multiple encoders but otherwise optional.
Traffic Flow	Indicates that Traffic Flow settings are enabled. See more information for Traffic Flow when configuring Basic Settings as per Section 3.4.7.2.
ETH1 IP	The Configured IPv4 address of the ETH1/POE NIC for the P-AVN-4. It is recommended to leave exposed whichever NIC is being accessed by the P-AVN-VA. Click the IP to navigate to the Web UI of the P-AVN-4.
ETH2 IP	The Configured IPv4 address of the ETH2 NIC for the P-AVN-4. It is recommended to leave exposed whichever NIC is being accessed by the P-AVN-VA. Click the IP to navigate to the Web UI of the P-AVN-4.
SFP IP	The Configured IPv4 address of the SFP NIC for the P-AVN-4. It is recommended to leave exposed whichever NIC is being accessed by the P-AVN-VA. Click the IP to navigate to the Web UI of the P-AVN-4.
IGMP Version	This status indicator shows the IGMP Version of the network connected to the P-AVN-4 device. v2 means no Source IP is required when making multicast joins, and v3 denotes that SSM (Source Specific Multicast) is required. Blank means no join rules are in place.
Primary Interface	The interface being used by the Primary Input of the Encoder or Decoder
Primary Input	The current input powering the encoder or decoder
Codec	The detected (or selected) Video CODEC for the given encoder or decoder; generally JPEG XS or FIP (Flawless Image Profiling)
Chroma	The color format for the encoder or decoder
Color Depth	The bit depth for the encoder or decoder (12 bit, 10 bit, 8 bit)
Audio	Indicates the audio format of the encoder or decoder
HDR	Detects the HDR formatting for the input (or selected for the output)
HDCP	Indicates whether HDCP Decryption is selected
Version	Software version of the P-AVN-4 Device
Resolution	The detected (or selected) video resolution and framerate for the encoder or decoder
Tag	Customizable tags to help with added filtering throughout the system.  More information on Tags is available in Section 3.9.

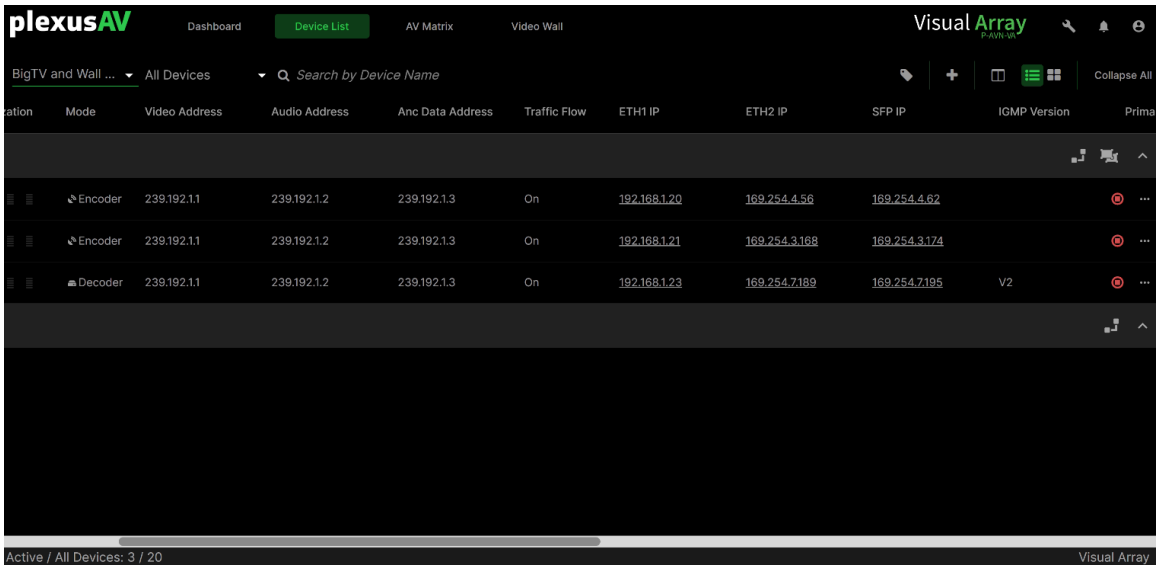
A strong basic set of enabled columns is:

- Status
- Name
- Link Utilization
- Mode
- Video Address
- Audio Address
- Anc Data Address
- ETH1 IP (or whichever IP is used for the P-AVN-4's to connect to the P-AVN-VA)
- Tag



Basic Set View

If more columns are enabled than there is room to display, a scroll bar along the bottom of the Device List page is used to cycle through all the columns.

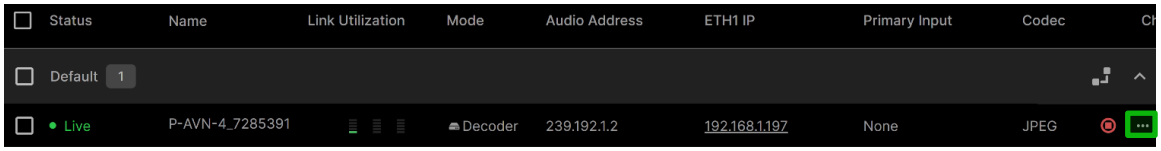


Scroll Bar Along Bottom

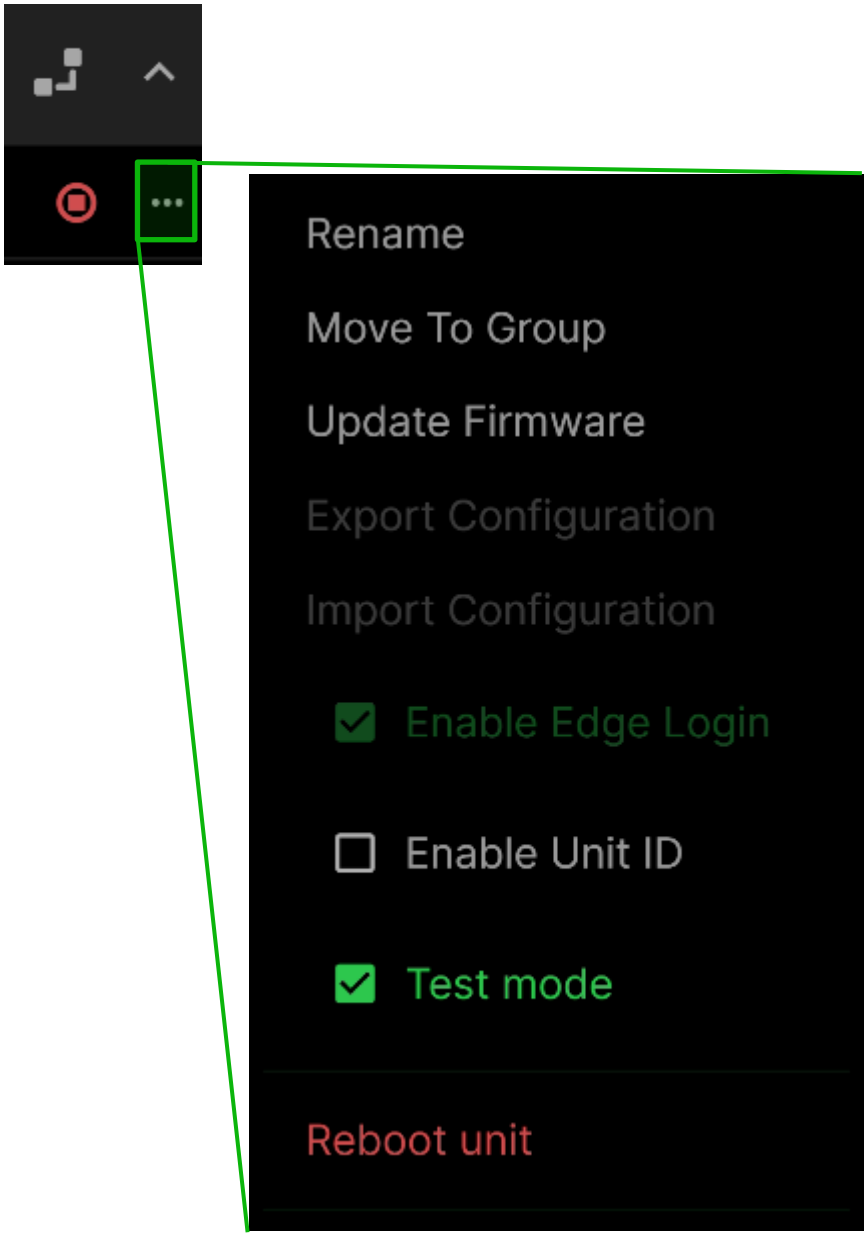
Regardless of the size of the view, the Device Action Menu (Section 3.4.4) and Stop/Start button are always available on the far right side of the table.

3.4.4 Single Device Action Menu

To perform actions upon a single P-AVN-4 Device, click the rightmost '…' icon to access the Action Menu for a single P-AVN-4 Device.



Menu Location



To leave the Device Menu, click anywhere in the GUI outside of the menu to hide it again.

General Description for Online Device Menu

Field	Description
Rename	Apply a new name to the device
Move to Group	P-AVN-4 Transceivers will automatically populate this page via NMOS discovery for general grouping and organization
Update Firmware	Upgrade the software of the P-AVN-4
Export Configuration	Export a configuration file from the P-AVN-4 for future upload
Import Configuration	Import a local configuration file to the P-AVN-4
Enable Edge Login	In future releases, can be enabled to prevent direct login to the P-AVN-4, meaning only the P-AVN-VA can access. This will be to prevent on-site viewers from reading the front panel IP and attempting to access.
Enable Unit ID	Turn the identifying LED on for the physical unit, making it easy to visually identify a single P-AVN-4 from a large group
Test Mode	Used to turn on a color bar stream for an Encoder or Decoder, so testing can still be performed in the IPMX network even when no local content is available for testing.
Reboot Unit	This will reboot the target device

Note that this same menu will display only the ‘Delete’ Option for Offline Devices.

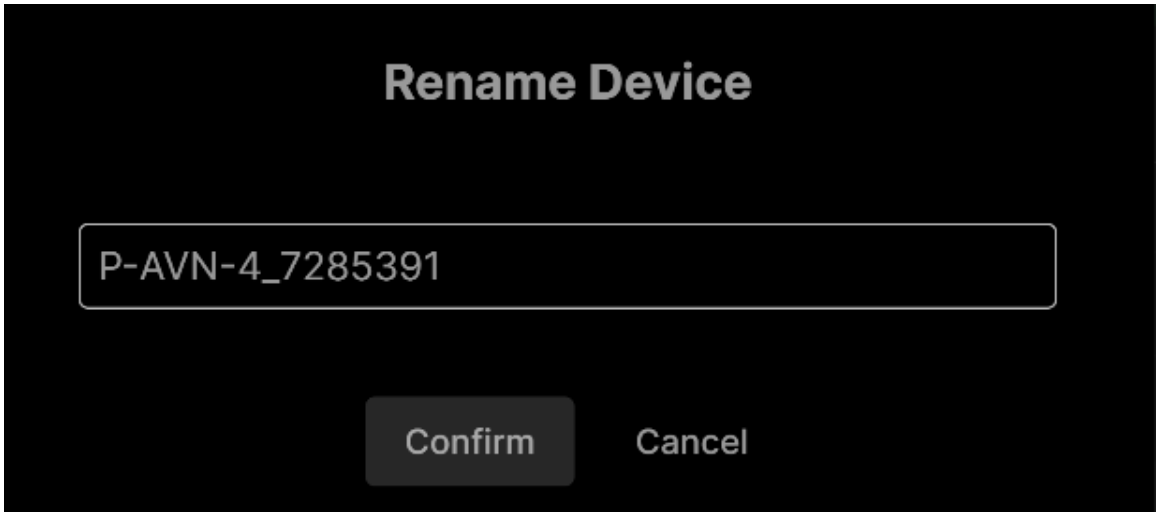
General Description for Offline Device Menu

Field	Description
Delete	Remove an Offline Device from the Device List

The sub-sequent 3.4.4.x Sections describe each of these Action Menu items in greater detail.

3.4.4.1 Renaming a Single Device

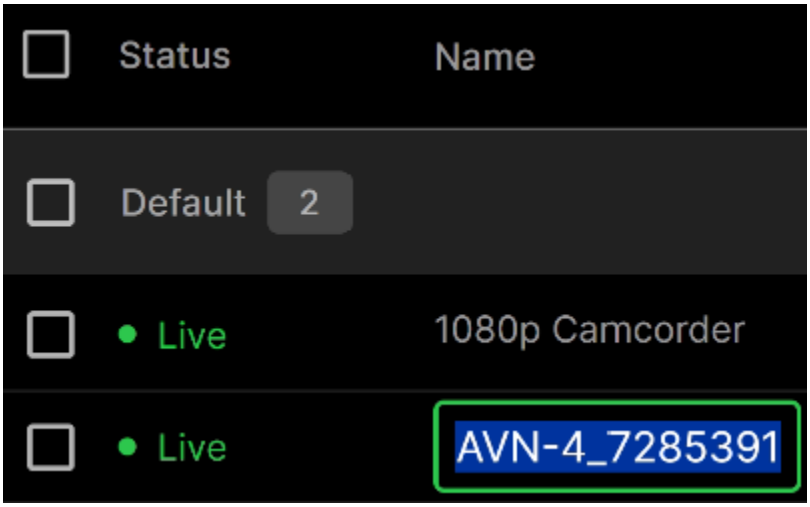
After navigating to the Online Device Action menu as described in Section 3.4.4, upon choosing the “Rename” option, the following prompt is presented.



Rename Device Menu

Enter any string into the prompt, then click ‘Confirm’ to push the Name change to the device. This change will update both the Device List as well as the P-AVN-4 going forward. If the P-AVN-4’s Name is changed directly from the GUI that will also reflect in the Visual Array going forward.

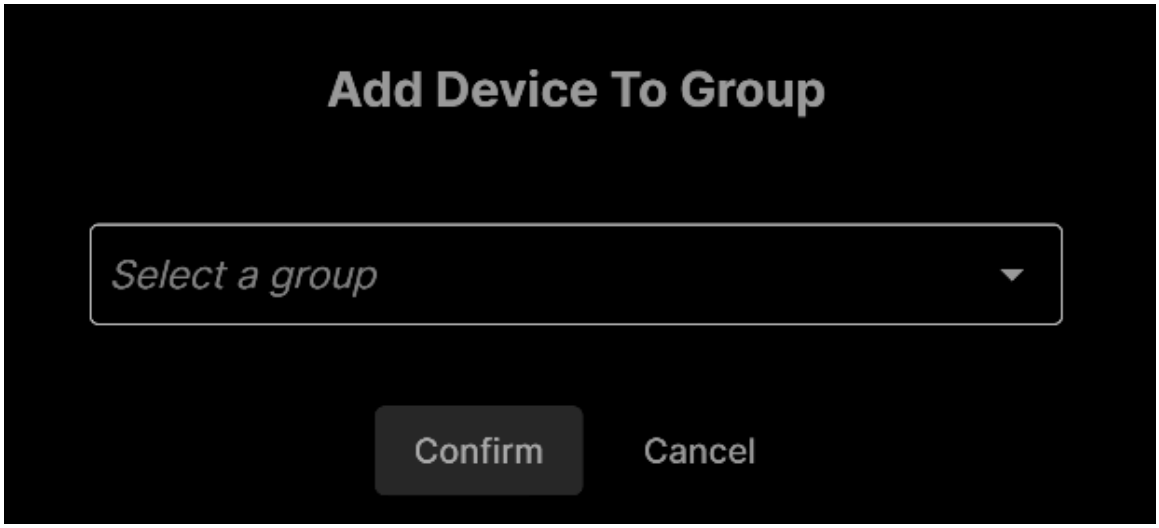
Note that the Device Name may also be changed directly from the Device List menu on the ‘Name’ Column by clicking on the corresponding row.



Editing Device Name Directly from Table

3.4.4.2 Moving a Single Device to an Existing Group

After navigating to the Online Device Action menu as described in Section 3.4.4, upon choosing the “Move to Group” option, the following prompt is presented.

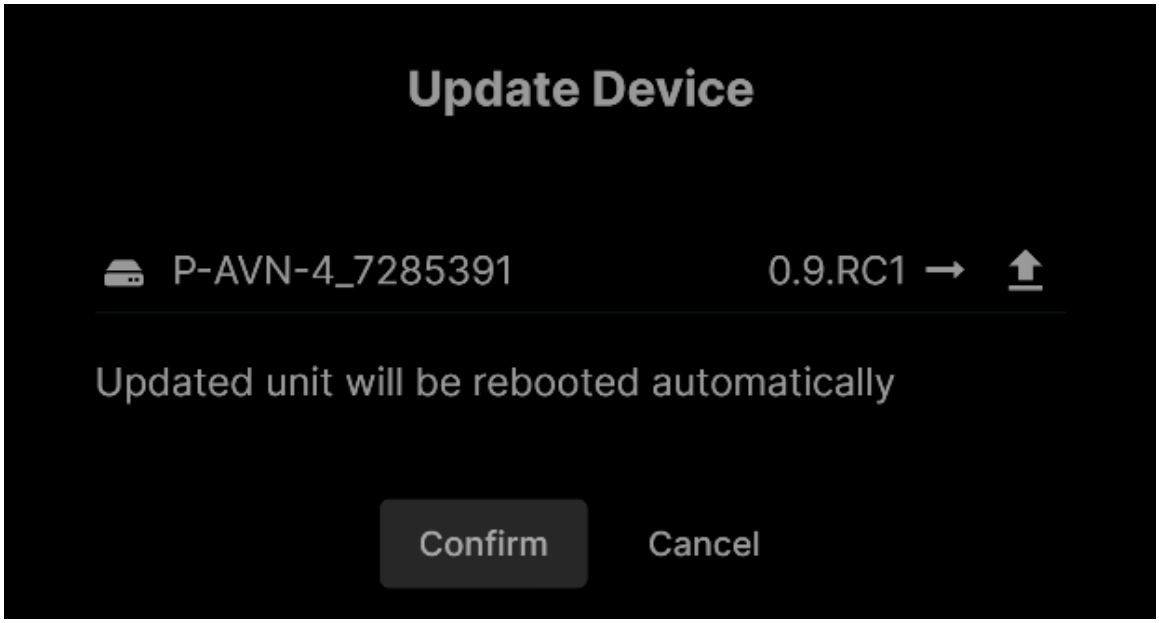


Move to Group Menu

Use the drop-down menu to choose the destination group to push the device into. If only the Default group exists, this return will be empty. For more information on groups, visit Section 3.4.4.

3.4.4.3 Updating Firmware on a Single P-AVN-4

After navigating to the Online Device Action menu as described in Section 3.4.4, upon choosing the “Update Device” option, the following prompt is presented.



Update Device Menu

Click the Upload icon to open the Local PC’s File Explorer:

Navigate to a valid P-AVN-4 Upgrade File to upload the software to the device, then click ‘Confirm’ to initiate the upgrade. Note that upgrades will require a reboot to the unit, so plan during an available maintenance period if the P-AVN-4 is currently being used in production. To obtain the latest software for the P-AVN-4, please contact procare@plexusav.com.

3.4.4.4 Exporting a Configuration from a Single Device

After navigating to the Online Device Action menu as described in Section 3.4.4, the “Export Configuration” option will be available later.

3.4.4.5 Importing Configuration to a Single Device

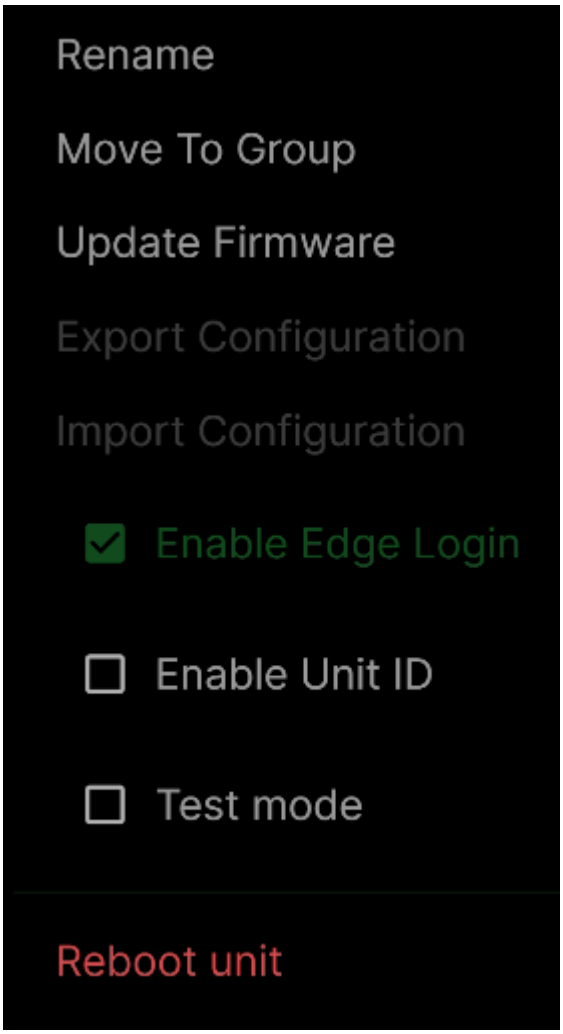
After navigating to the Online Device Action menu as described in Section 3.4.4, the “Import Configuration” option will be available later.

3.4.4.6 Enable Edge Login on a Single Device

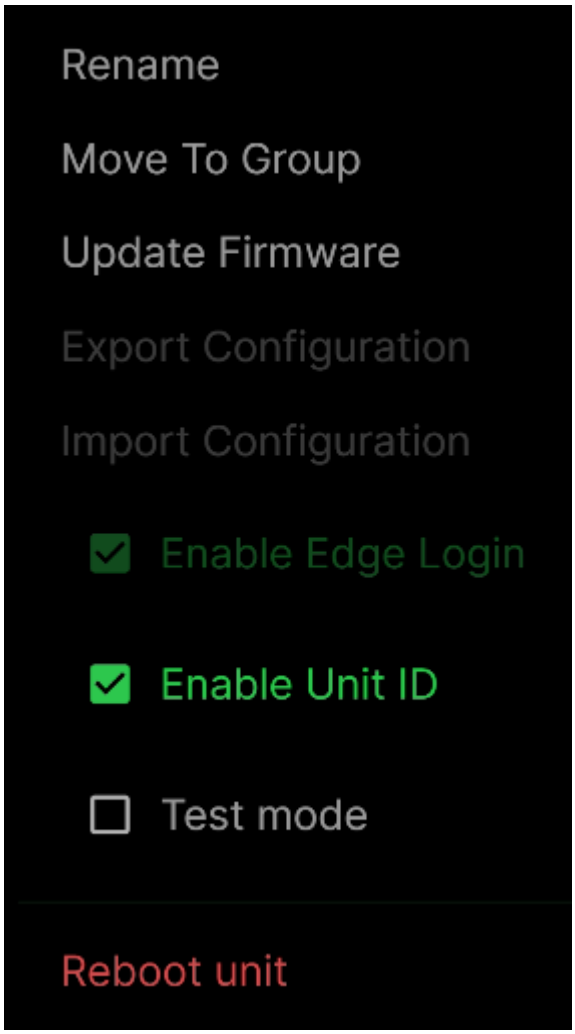
After navigating to the Online Device Action menu as described in Section 3.4.4, check or uncheck the “Enable Edge Login” to instantly apply the setting.

3.4.4.7 Enabling Unit ID on a Single Device

After navigating to the Online Device Action menu as described in Section 3.4.4, check or uncheck the “Enable Unit ID” option to instantly apply the setting.



Unit ID Disabled

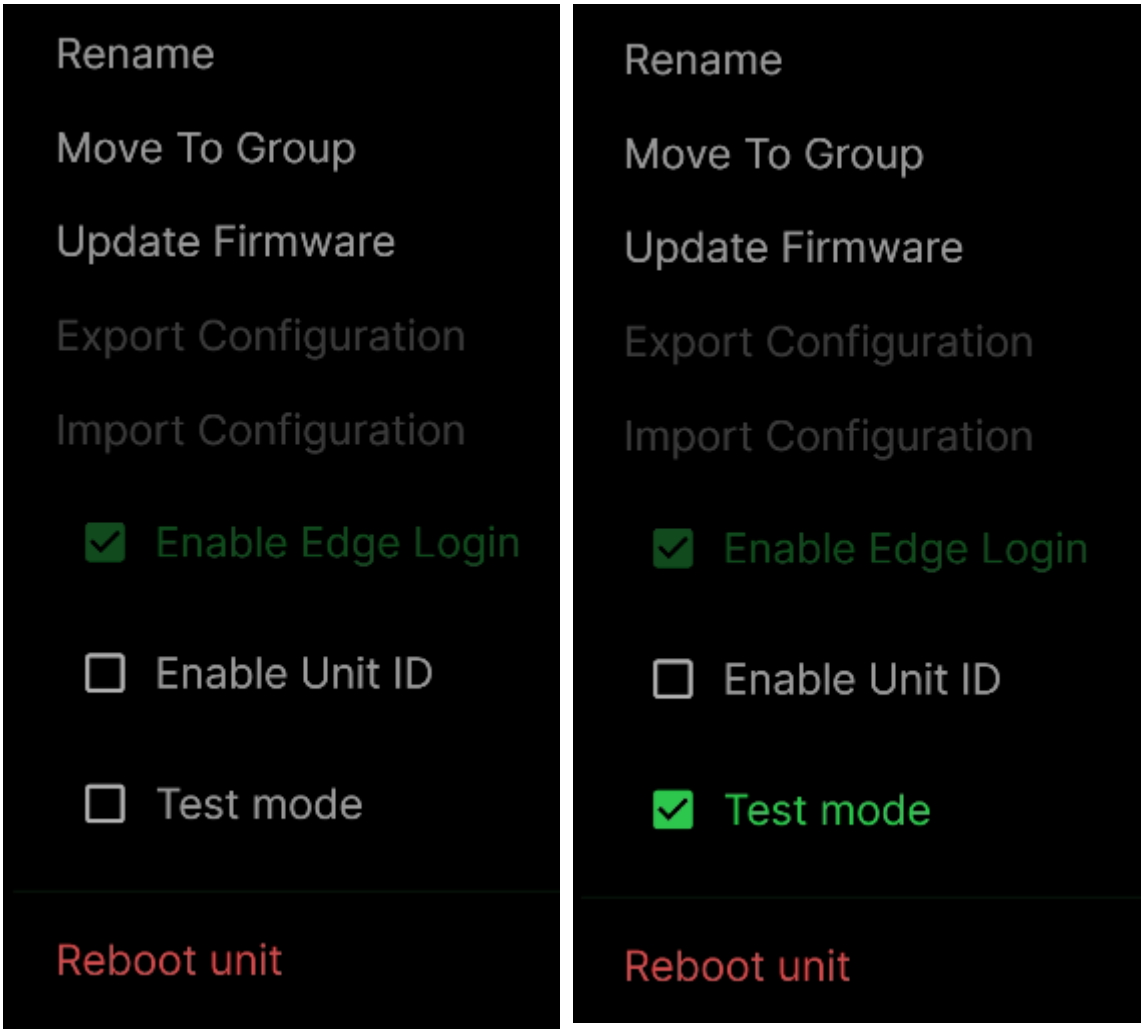


Unit ID Enabled

Unit ID is a toggleable LED on the front of the physical unit. This allows for easy single-unit distinction if several P-AVN-4’s are together in the same space.

3.4.4.8 Enable Test Mode on a Single Device

After navigating to the Online Device Action menu as described in Section 3.4.4, check or uncheck the “Test Mode” option to instantly apply the setting.

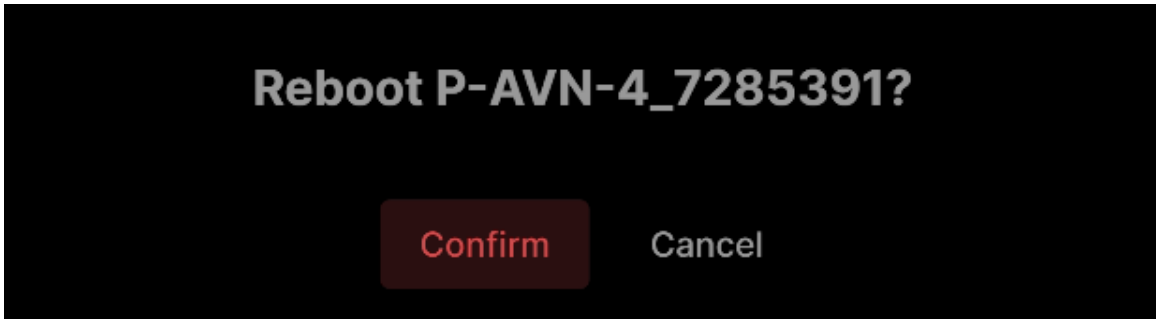


Test Mode Disabled **Test Mode Enabled**

Test mode is different depending upon the P-AVN-4 Mode. If the unit is in Encoder Mode and there is no valid Baseband Input, the device will create a test pattern of its own and transmit as IPMX. If the unit is in Decoder Mode, it will output on all the available Baseband Interfaces the same test pattern. This allows for testing the IPMX network and NMOS functionality with only P-AVN-4’s in the event no signals are available.

3.4.4.9 Reboot a Single Device

After navigating to the Online Device Action menu as described in Section 3.4.4, upon choosing the “Reboot” option, the following prompt is presented.



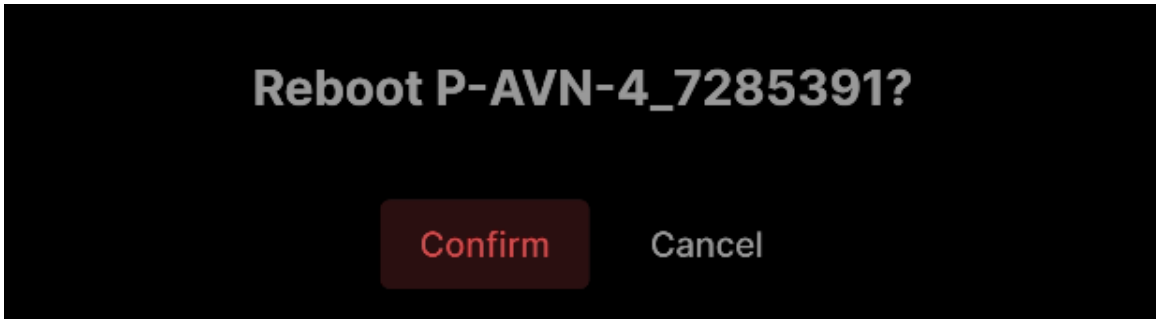
Reboot Prompt

Click ‘Confirm’ to reboot the unit (this will take down the channel during the time the P-AVN-4 is rebooting. Click ‘Cancel’ to leave this menu without rebooting the P-AVN-4.

Note that, while the unit is rebooting, it is expected within 10 seconds that the device status will read as ‘Offline’ and remain that way until the P-AVN-4 finishes rebooting and is detected by the Visual Array. For more information on the Device Status, view Section 3.4.2.

3.4.4.10 Delete a Single Device

After navigating to the Offline Device Action menu as described in Section 3.4.4, upon choosing the “Delete” option, the following prompt is presented.



Delete Prompt

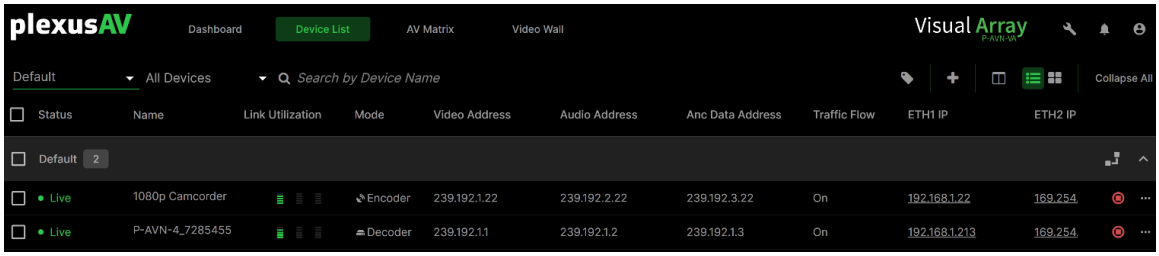
Note that the ‘Delete’ option will only be present on devices currently in the ‘Offline’ status. For more information on Device Status, view Section 3.4.2.

Deleting the P-AVN-4 IPMX Transceiver from the Visual Array will not push any direct changes or reset settings on the Device itself, it only removes it from the Visual Array Device List, AV Matrix, and Video Wall. If needing to factory reset the device, use the Advanced Settings menu as described in Section 3.4.8.1.

Deleting a Device that is rebooting is neither harmful nor helpful, as the P-AVN-4 will simply re-populate the field into the Default Group as soon as it comes back online. For more information on this interaction, see Section 3.4.1 (Adding a Device to the List).

3.4.5 Device Groups

Upon first time use, all newly recognized P-AVN-4 devices will be pushed into the ‘Default’ group.

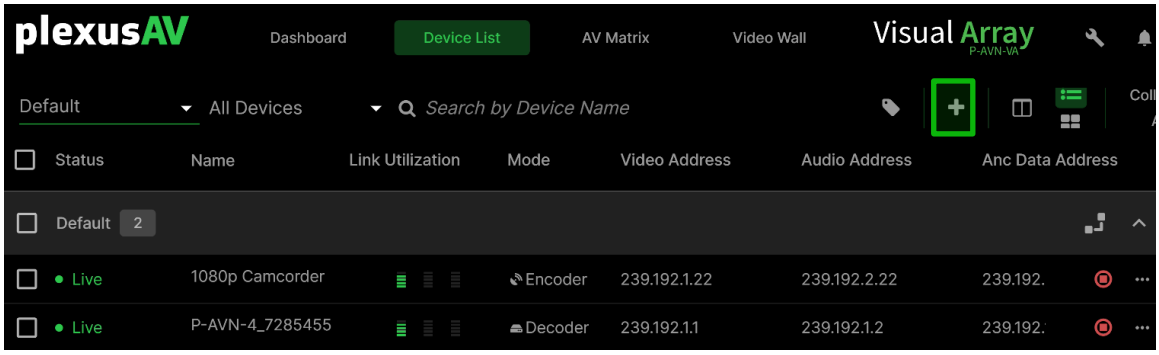


Default Group View

The Default Group will always be present on-board the Visual Array. Groups are essential to the IPMX workflow, from both the perspective of device organization but also core functionality (flow routing, video wall). Distinct groups help to organize device purpose and location. The AV Matrix and Video Wall features will also utilize group information.

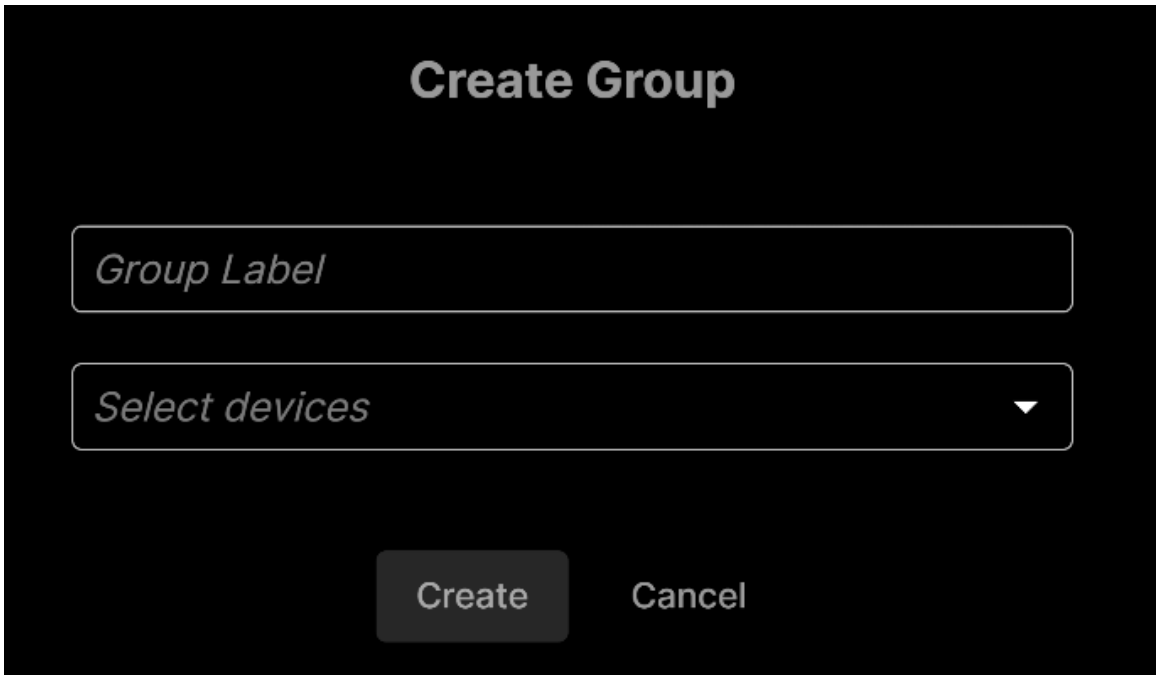
3.4.5.1 Create and Edit Groups on Device List Page

To create a new group, click the '+' icon on the upper right side view of the Device List page.



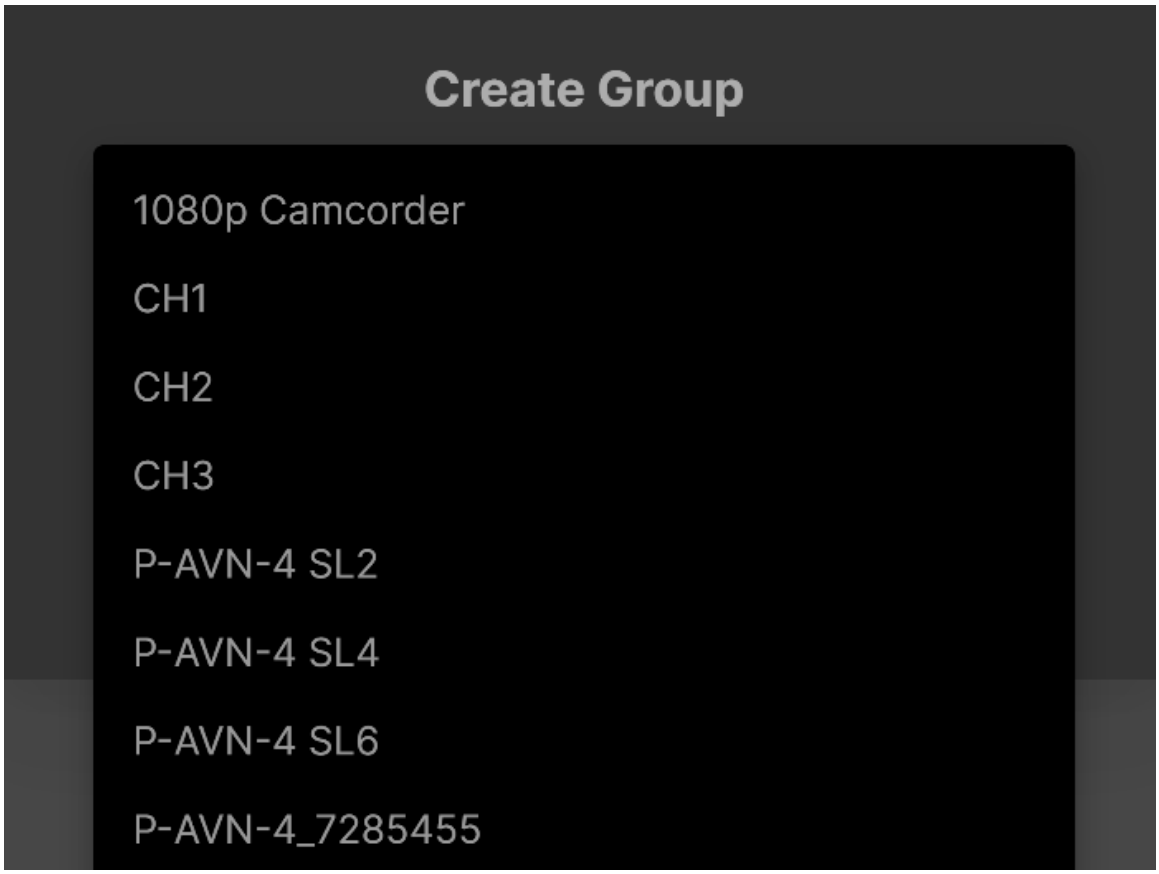
Create Group Location

Upon clicking the icon, the following prompt is presented:



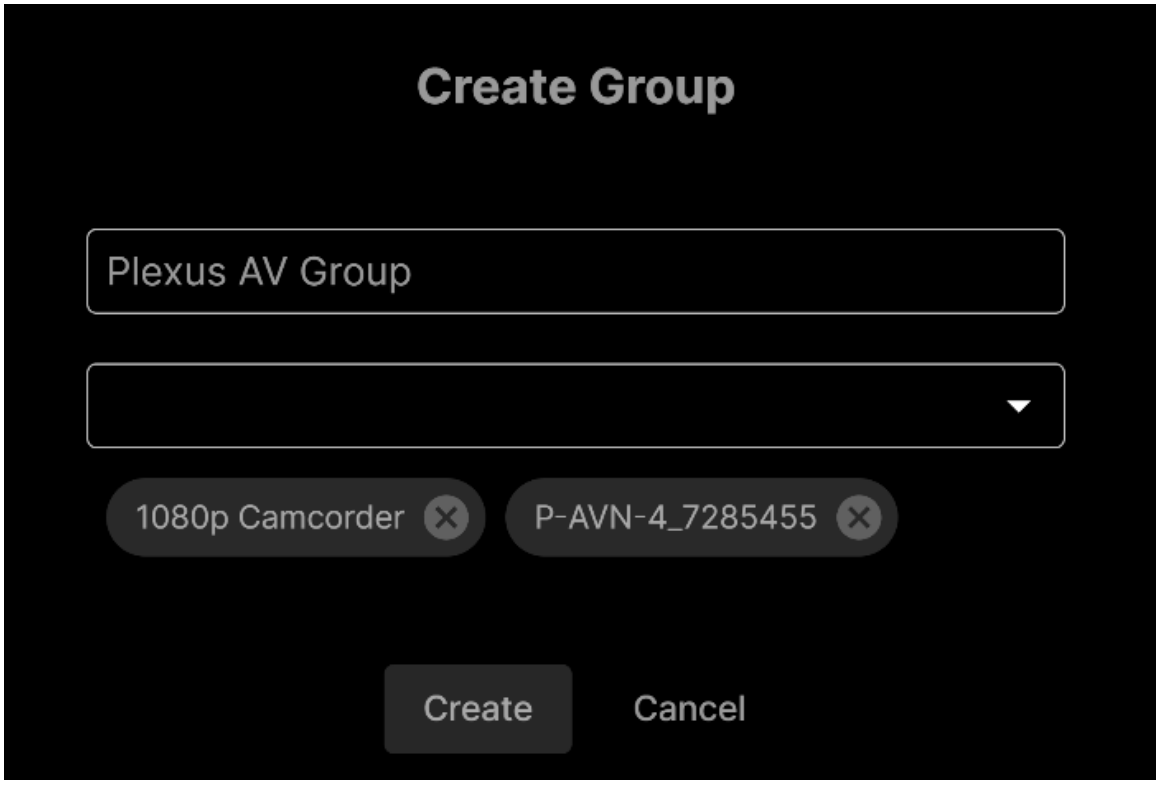
Create Group Menu

Enter a Group Label to name the new group. The "Select Devices" is a dropdown option that allows for multiple devices to be added.



Select Devices Dropdown

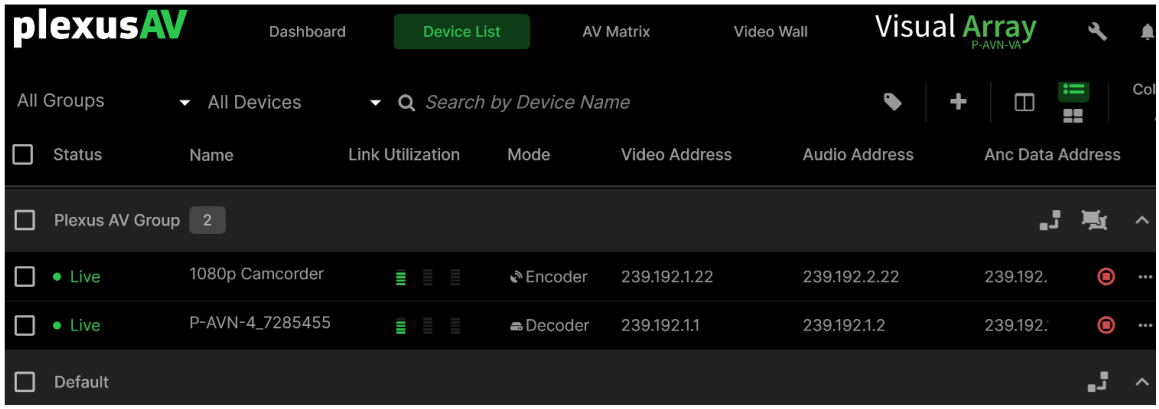
Use the mouse scrollbar to cycle up and down through the devices, then click the device to add it to the group. Add as many devices as are available and intended for the group, then click anywhere outside of the dropdown space to view the selected devices.



Newly Selected Devices

For a given device, click the gray ‘x’ icon to remove it from the list prior to group creation.. A device can only be in one group at a time. Creating a new group with the selected devices will move them out of whichever group they previously occupied before populating the newly created group. There is another method of moving devices into an existing group using the Batch Naming Step described in Section 3.4.7.1.

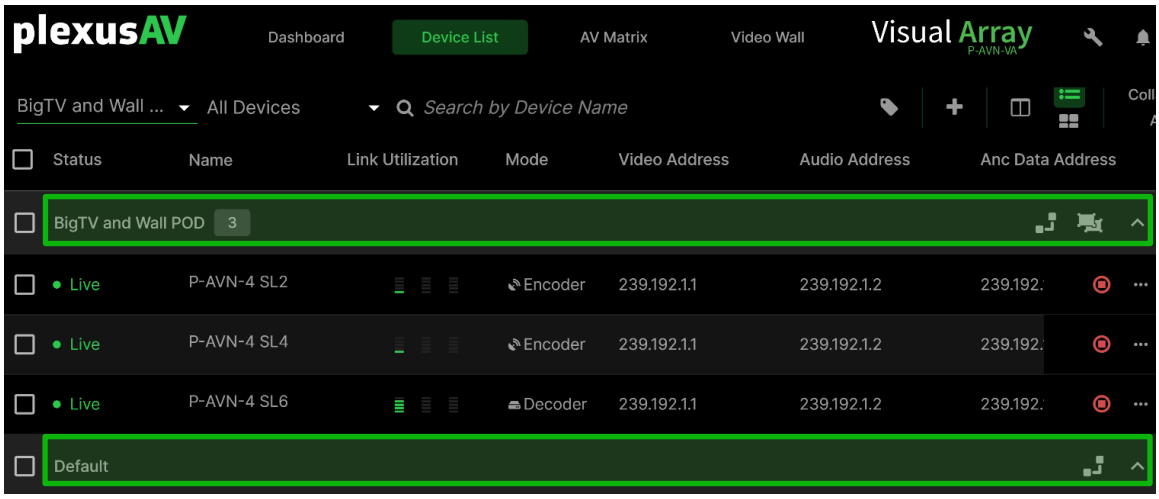
The dropdown may be re-entered to add more devices prior to group creation. Once all intended devices are in the group list, click ‘Create’ to push the devices into the new group.



Newly Created Group

3.4.5.2 Group Information and Action Icons

Observe the columns and available icons at the top of a given group.



Group Rows

Along the leftmost side of the row, the Group Name is available. To the right of the group name is a number that indicates how many devices are inside of that group.

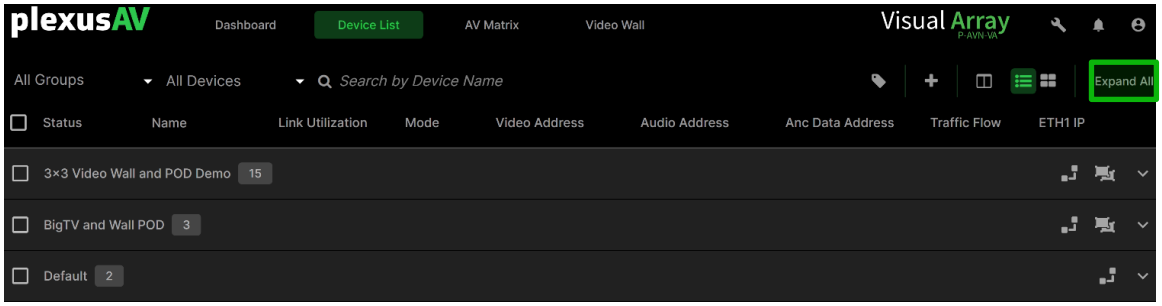
At the rightmost side of the group header row, there are three general icons for a group.

Operative Icons

General Description

Icon	Name	Description
	Go to AV Matrix	This option will automatically navigate to a filtered view of the AV Matrix, that only shows this group. For more information on AV Matrix, see Section x.x.x.
	Ungroup	A confirmation prompt will be present upon clicking this icon. Upon clicking 'Yes, ungroup', the group will be deleted, any device that was previously in the group will be pushed back into the 'Default' group. This option isn't available for the 'Default' group, as it must always remain on the system.
	Hide/Expose Group	Expand or shrink the group display to help reduce the scope of view. Additional clutter-filter options are described in Section x.x.x.

With regards to the Hide/Expose Group icons, an additional option to ‘Collapse All’ or ‘Expand’ is present at the top right of the Device List page.



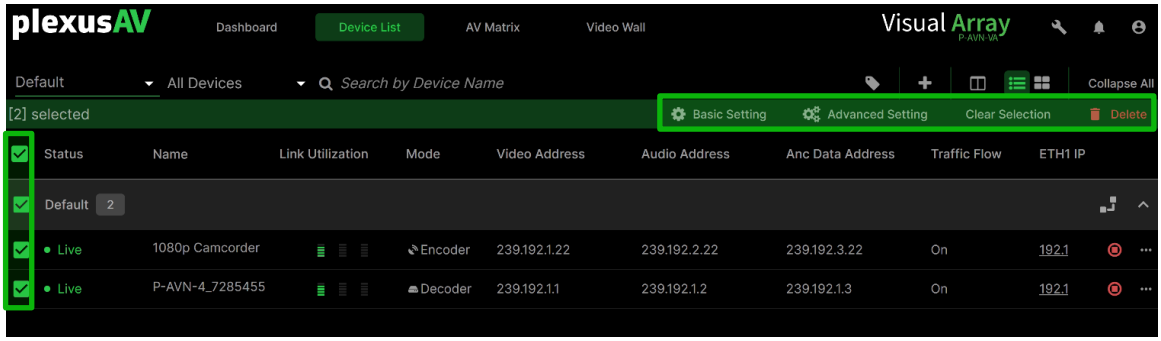
Collapsed View

‘Expand All’ is the general default view of the Device List page. ‘Collapse All’ to quickly view all created groups and number of devices within each group.

Additional group management tools are available under the ‘Groups and Tags’ menu within the Tools pane; see Section x.x.x for more details.

3.4.6 Selecting Bulk Setting Menus

To expose the bulk options menus, click the leftmost checkbox to select any number of groups and devices. A new green row will be presented above the Device List table and below the Filter Options as indicated below.



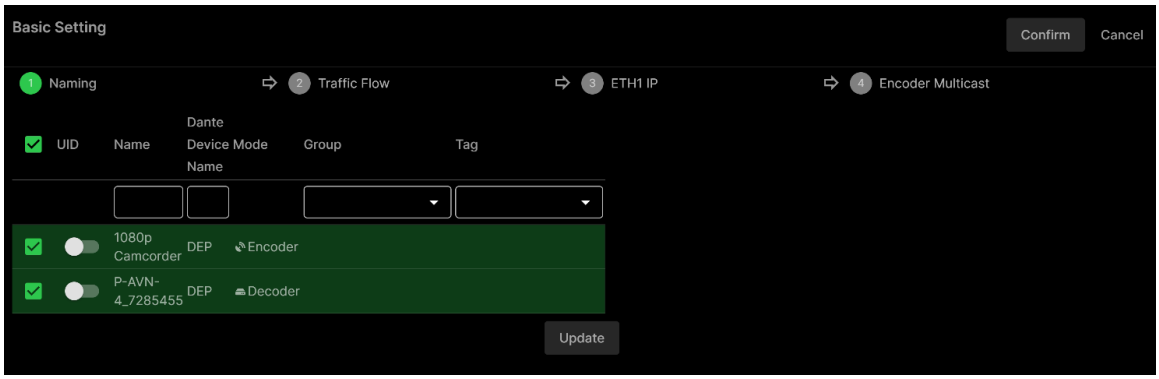
Bulk Options Menu

General Description

Checkbox	Description
Basic Setting	Device naming and grouping, traffic controls, IP assignment and multicast addressing
Advanced Setting	Several operations, from administrative (push configuration files, software upgrades, new password credentials, encode/decode mode among others) to device specific settings. Device specific settings include but are not limited to IO type, EDID negation, Encode or Decode settings among others
Clear Selection	Unchecks all selected rows and puts away the Bulk Settings Menus
Delete	Bulk delete of Offline devices, see Section x.x.x for more information on Device Status.
Mode	Indicates if the IPMX Transceiver is in 'Encoder' or 'Decoder' mode. This is an important field and should be enabled.

3.4.7 Bulk Basic Settings

After choosing the Basic Setting for one or more devices as described in Section 3.4.6, the Basic Settings Menu is displayed for the units.



Basic Settings Menu Overview

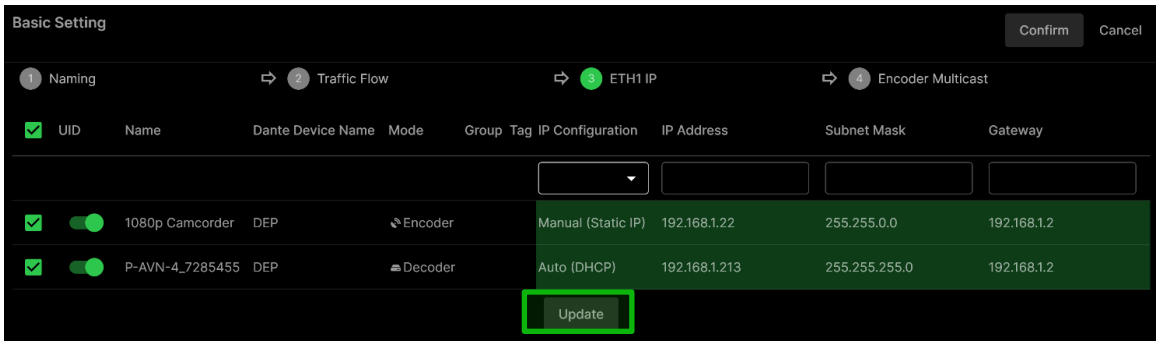
The Basic Settings Menu is split into four clickable major steps:

1) Naming – assign device names, groups, and tags
2) Traffic Flow – route IP traffic through specific NICs for each device
3) ETH1 IP – assign management IPs to existing devices
4) Encoder Multicast – assign

Basic Setting Steps

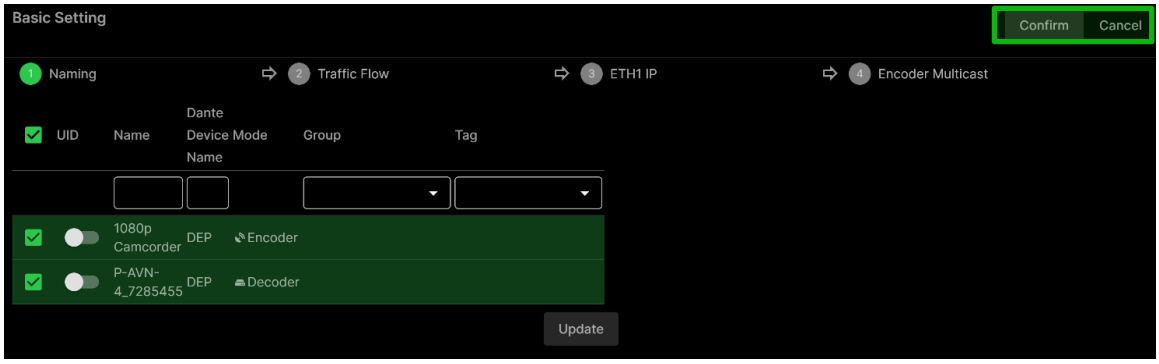
After finishing configuration for a given step, click the next step to move on, changing the menu view along the way.

Along the bottom of each menu, clicking ‘Update’ will push the changes to the devices right away, but while remaining inside the Basic Settings menu.



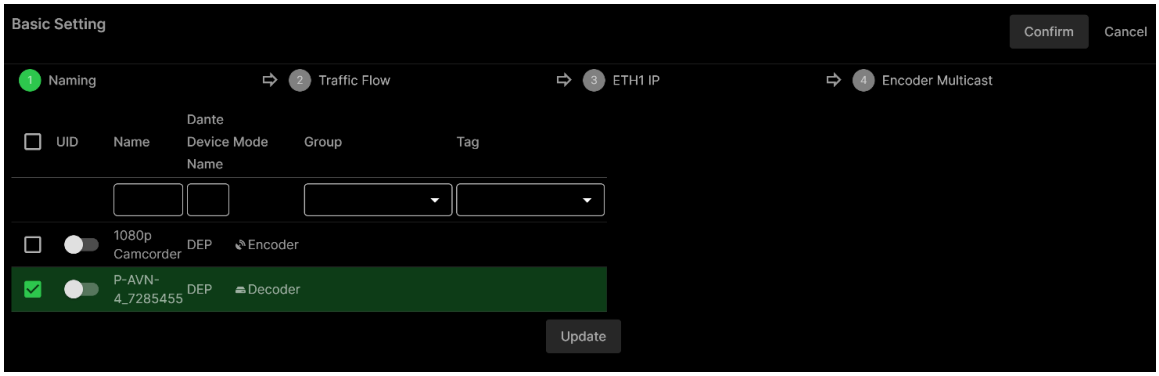
Update Key Location

In the top rightmost corner, the ‘Confirm’ button will instantly push all new setting changes made to any Steps before leaving the Basic Settings menu and returning to the Device List page. The Cancel button will return to the Device List page without pushing any new settings to the Selected Devices.



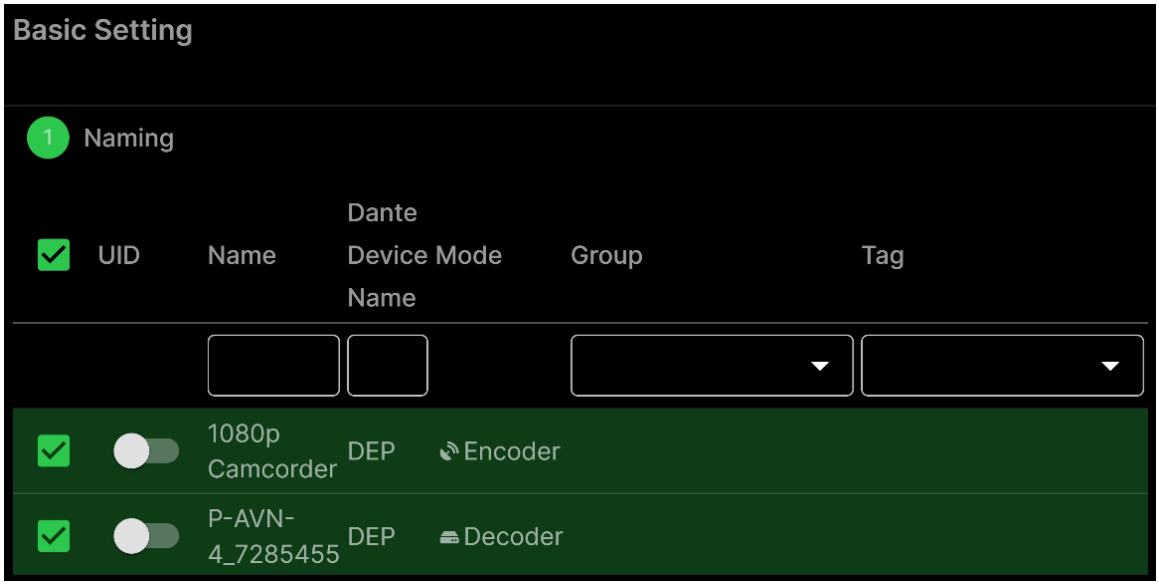
Confirm and Cancel Buttons

At any time, devices can be unselected and re-selected individually within this menu.



Unselecting Devices within Menu

3.4.7.1 Naming Step



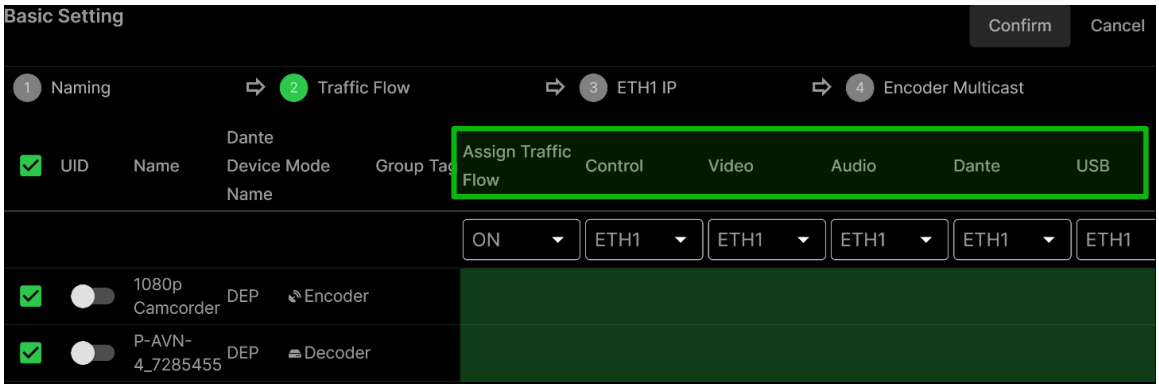
Naming Step View

General Description

Checkbox	Description
UID	Enable or disable the UID for any number of devices by moving the slider to the left or the right.
Name	Name multiple devices in numerical ascending order
Dante Device Mode Name	For Dante, each audio device has a distinct name as part of the routing. With this option all the devices are named in ascending numerical order.
Group	Move the devices into a pre-existing group.
Tag	Before using this menu, declare at least one tag as described in Section x.x.x. Push one or more tags to the selected devices.

3.4.7.2 Traffic Flow Step

When moving onto the Traffic Flow step, the options for this are presented on the right. Traffic Flow is useful for segmented networks if management and content data need to be in separate paths. Generally, IPMX networks are all 'flat', meaning both management and content data are in the same network. It is this way as most NMOS networks have 'in-band' management, meaning the NMOS targeting data is in the same network as the IPMX payload itself.

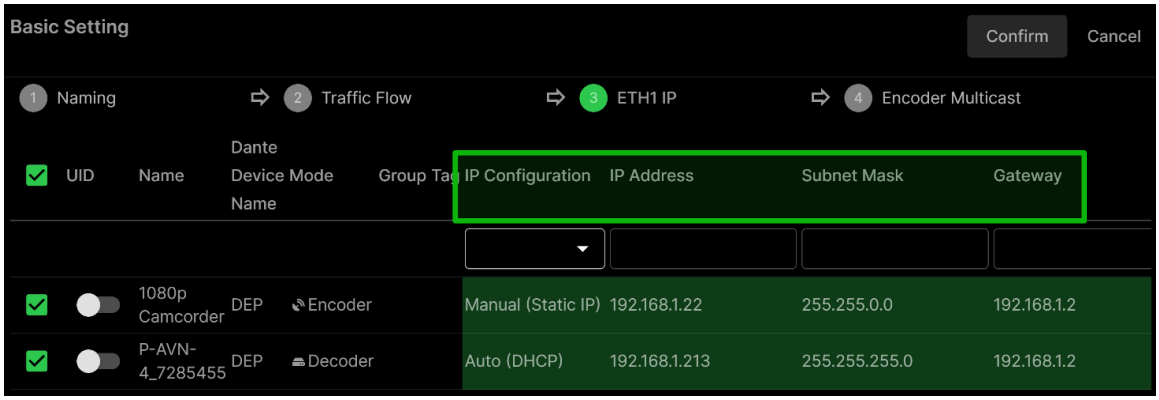


Traffic Flow Step View

General Description

Checkbox	Options	Description
Assign Traffic Flow	N/A	Always ON
Control	ETH1, ETH2 or SFP	Choose which NIC Control Data goes through. Make certain this remains on the same subnet and network as the P-AVN-VA (Visual Array).
Video	ETH1, ETH2 or SFP	Choose which network Video essences travel over
Audio	ETH1, ETH2 or SFP	Choose which network Audio essences travel over
Dante	ETH1, ETH2 or SFP	Choose which network Dante Audio travels over
USB	ETH1, ETH2 or SFP	Choose which network USB data travels over

3.4.7.3 Management IP Step



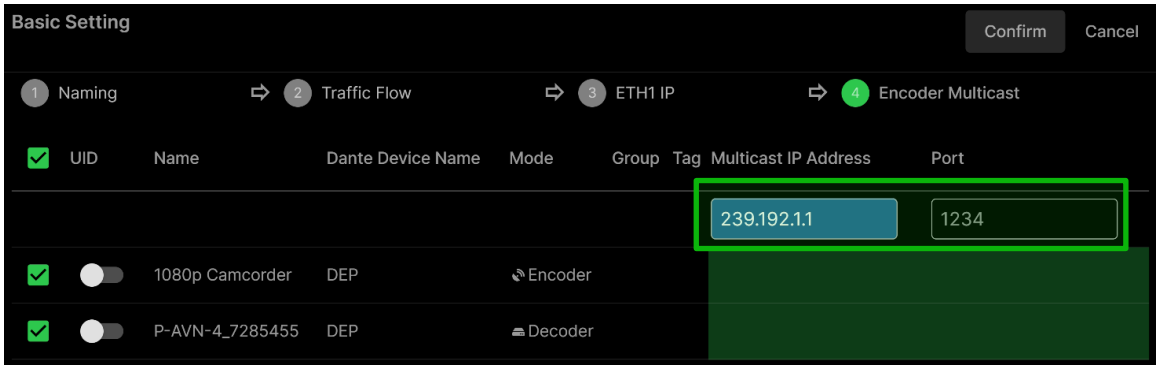
Management IP Step View

General Description

Checkbox	Options	Description
IP Configuration	Manual (Static) Auto (DHCP)	Choose the IP mode. In Static, the user will define the address, mask, and gateway. In DHCP, an external DHCP host will provide the IP settings.
IP Address	xxx.xxx.xxx.xxx	Enter the IPv4 Address for the system
Subnet Mask	xxx.xxx.xxx.xxx	Enter the Subnet Mask
Gateway	xxx.xxx.xxx.xxx	Enter the Network Gateway

Be careful with these settings, as entering an IP that puts the P-AVN-4's into an inaccessible subnet can potentially push them out of the P-AVN-VA's Device List. If this occurs, the devices will go to 'Offline' status on account of broken connection and need to be re-configured directly to restore connectivity.

3.4.7.4 Encoder Multicast Step



Encoder Multicast Step View

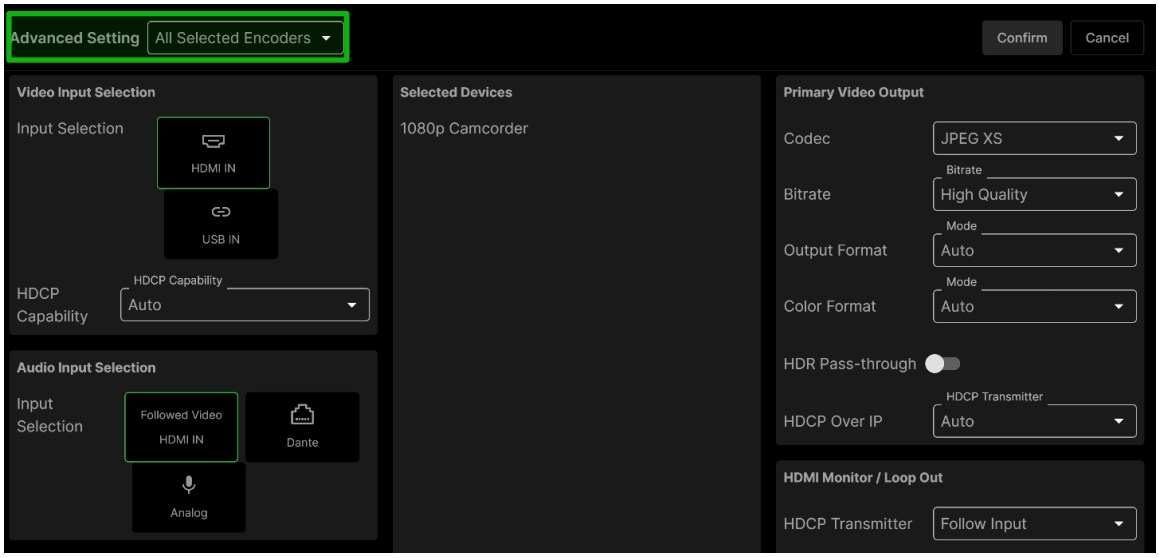
General Description

Checkbox	Options	Description
Multicast IP Address	224.0.0.0 to 239.255.255.255	Define the base destination address for the Video, Audio and ANC essences. Upon declaring an IPv4 address, the Video IP will match the entered IP, the Audio IP will increment by one, and the ANC will increment by two.
Port	1025 - 65535	Enter the IPv4 Address for the system

Be careful with these settings, as entering an duplicate Essence IP's between two Encoders in an IGMPv2 network can cause an IP conflict. If this occurs, there will be alarm messages, and the 'Conflicted Device' widget will increment to show the conflict. See Section 3.3.10 for information on the Conflicted Device widget.

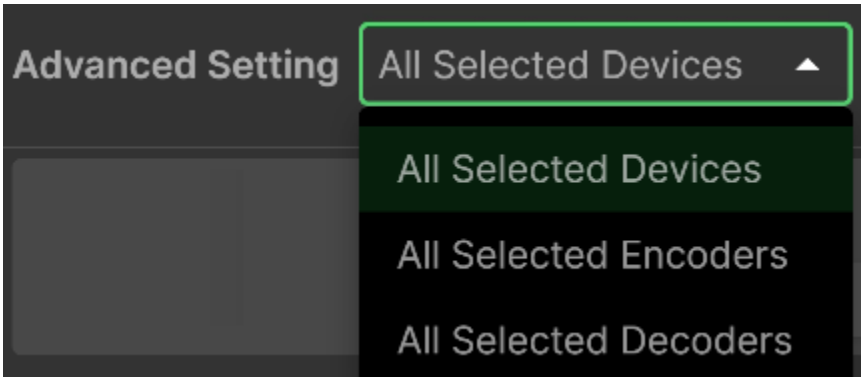
3.4.8 Bulk Advanced Settings

After choosing the Advanced Setting for one or more devices as described in Section 3.4.6, there are three main views displayed for the units, all depending upon the Advanced Setting dropdown chosen at the top left of the screen.



Advanced Setting Location

Click the ‘Advanced Setting’ dropdown to choose from one of the following views.



Advanced Setting Dropdown

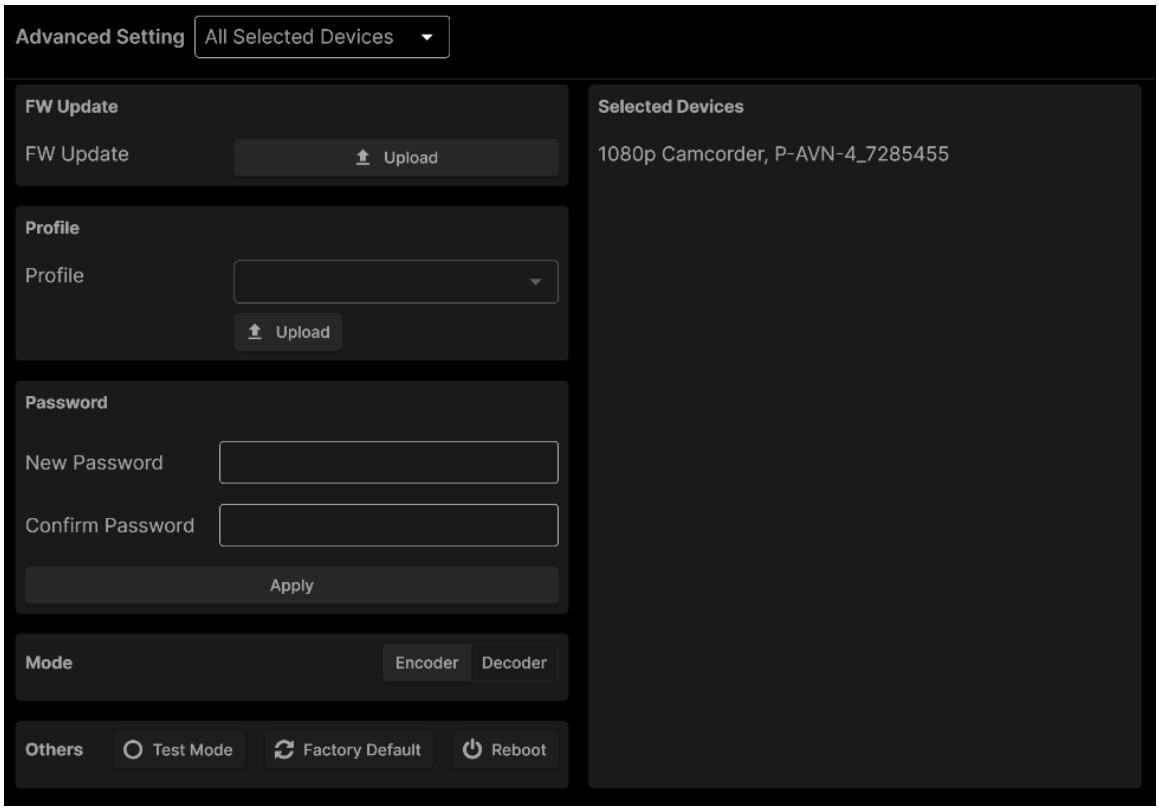
.

General Description

Advanced Setting	Description
All Selected Devices	This view allows for changes to be made to all devices, both Encoders and Decoders. This would be for dense changing of software, configuration files, user-password and Transceiver Mode (encoder/decoder).
All Selected Encoders	This view will enable changes to be made in masse to all selected Encoders, from the input type, EDID negotiation and encoding format.
All Selected Decoders	This view will enable changes to be made in masse to all selected Decoders, from the input type, decode format and baseband output options.

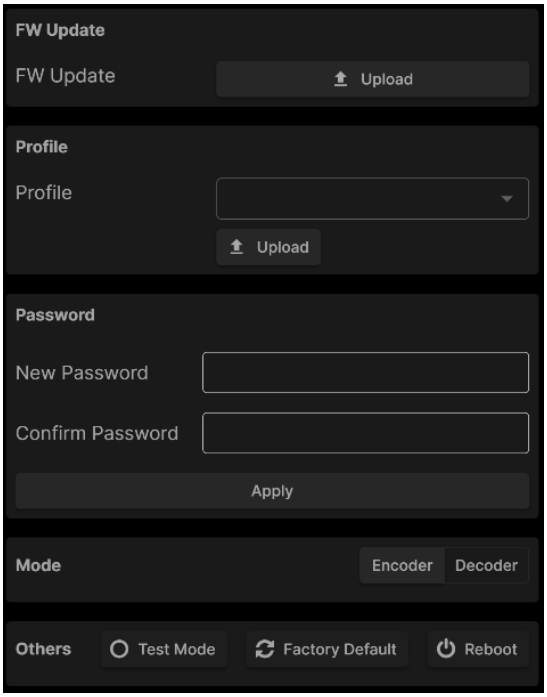
3.4.8.1 Settings for All Devices

Upon choosing the 'All Selected Devices' view as described in Section 3.4.8, the following view is available.

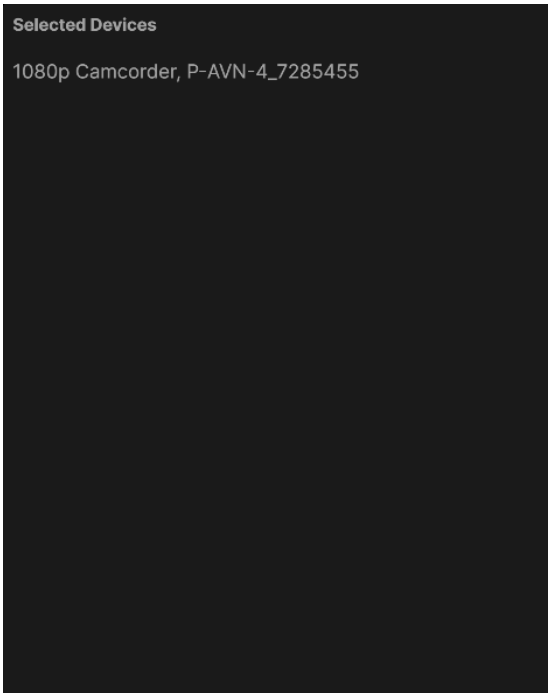


All Devices View

The left side of the menu is used for the bulk device operation, while the right side shows the Selected Devices (both Encoders and Decoders) that will be affected by the operations.



Performable Operations



Targets Selected for Operation

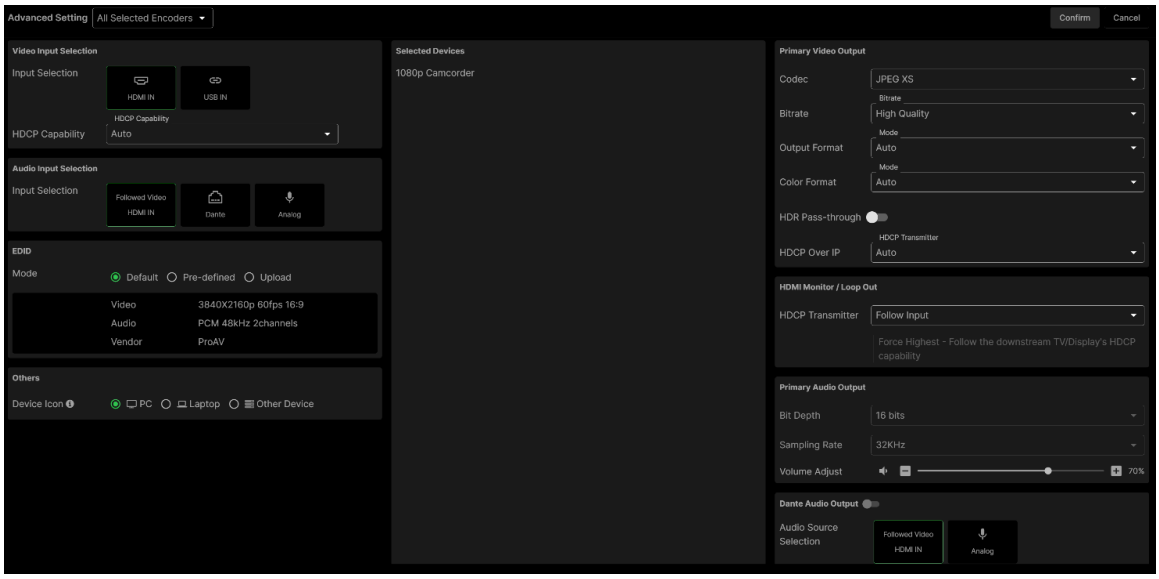
General Description of Operations

Section	Options	Description
FW Update	Upload	Upload software that will be applied to all devices. Only apply software if instructed to do so by a PlexusAV Representative. This will trigger a reboot upon completion for each device.
Profile	Dropdown Menu Upload	The dropdown menu is used to cycle through available profiles. The Upload key is used to push Transceiver profiles into the selected devices.
Password	User Entry Apply	Apply a new admin-password to all selected devices by entering the new password twice and click 'Apply'
Mode	Encoder or Decoder	Change the Transceiver mode in bulk between Encoder and Decoder modes.
Test Mode	Test Mode	Use Test Mode to push color-bar content through the Encoders and Decoders to test the IPMX flows when other sources are unavailable.

Factory Default	Factory Default	Factory Default will restore the Selected Encoders and Decoders to their original settings before rebooting
Reboot	Reboot	Reboot will push a mass reboot to all selected devices

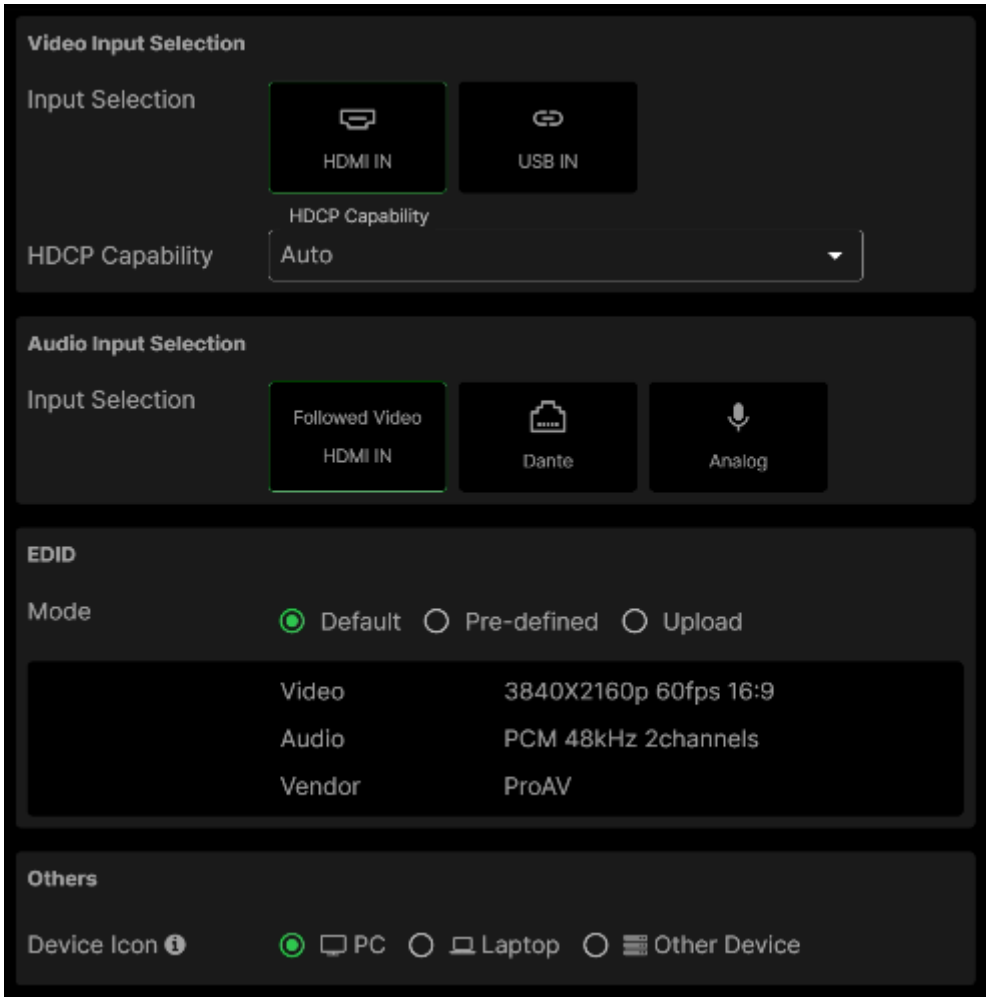
3.4.8.2 Settings for All Encoders

Upon choosing the ‘All Selected Encoders’ view as described in Section 3.4.8, the following view is available.



All Encoders View

The left side of the page is used for Input Related Settings, while the center of the page shows all Selected Encoders that will be pushed upon clicking the 'Confirm' key in the top-right corner. The right side of the page is specific to encode settings before pushing to the output side.



Input Related Options (Left-side Menus)

The following subsequent tables describe the Input Related Options.

Video Input Selection

Section	Options	Description
Input Selection	HDMI IN USB IN	Choose the baseband input video to source the Encoders with.
HDCP Capability	Auto	Currently the Encoders will natively auto-detect incoming HDCP

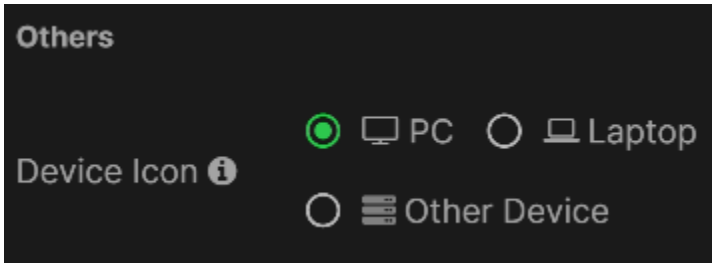
Audio Input Selection

Section	Options	Description
Input Selection	Followed Video Dante Analog	Choose the baseband input audio to source the Encoders with. When choosing 'Followed Video', this will pull the embedded audio from either the incoming HDMI or USB.

EDID Option Modes

Options	Description
Default	When 'Default', the Encoders will always negotiate the highest available video resolution upon HDMI connection, and the Audio will negotiate PCM Stereo.
Pre-defined	Hard-set the HDMI Sinks (Encoders) for the following subset: • 1080p60 Video, LPCM 2ch Audio, HDR • 4Kp60 Video, LPCM 2ch Audio, HDR • 720p60 Video, LPCM 2ch Audio, no HDR
Upload	Use the 'Upload' icon to push EDID configurations to the Visual Array Database. Use the Dropdown menu to cycle through uploaded EDID configurations, then click 'Apply' to commit the selected EDID configuration to the Encoders.

The final menu on the left-most input side is the 'Others' Option. Choose what type of device is expected to be provisioning the HDMI or USB input to the Encoder.

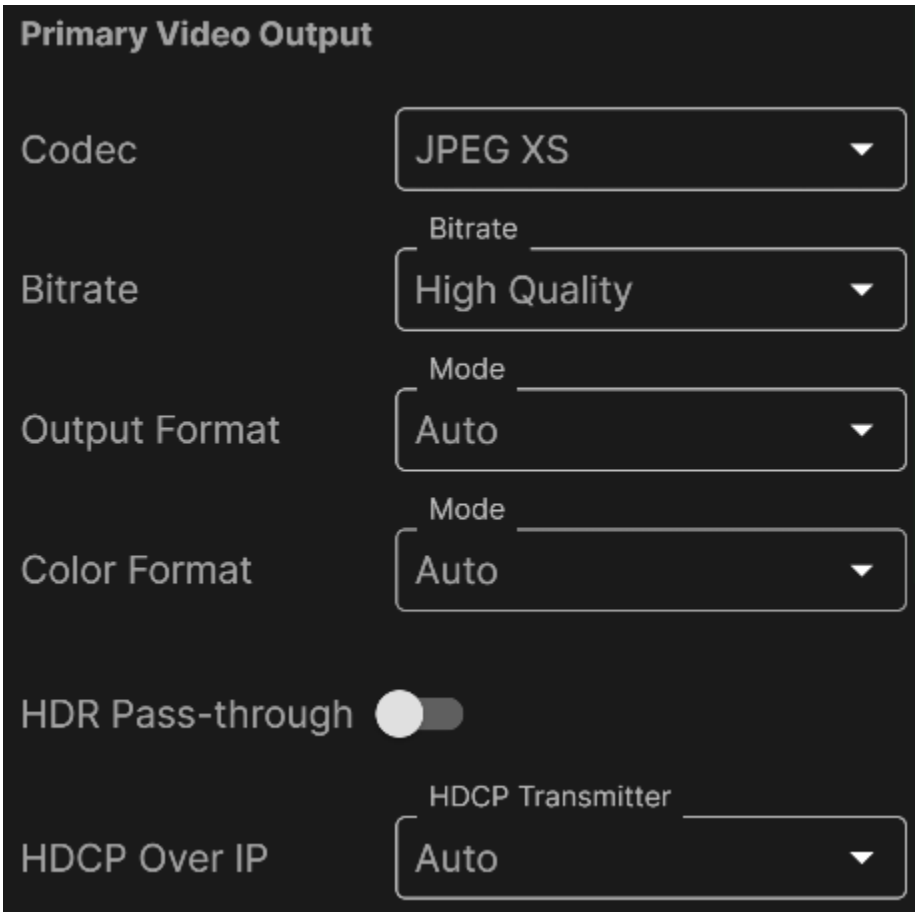


'Others' Option

The Center View shows which encoders will be affected by changes pushed on the input and encode/output settings.

Selected Devices Display

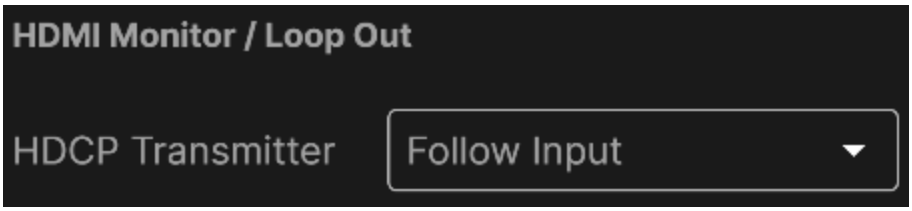
The remainder of this section discusses the Output-related options found on the right-most side of the Encoder Advanced Settings page.



Primary Video Output Options

Primary Video Output Options

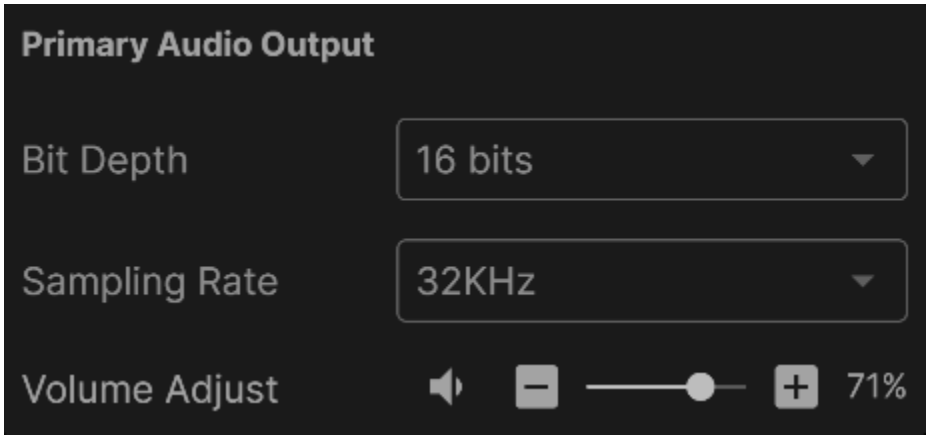
Section	Options	Description
Codec	JPEG XS FIP	Choose the video CODEC to be encoded for the IPMX output.
Bitrate	Economy Mode Balanced Mode High Quality Mode Manual	Choose from one of three pre-determined bitrate options, or manually define the bitrate. Economy Mode will attempt to lower bitrate (~130Mbps). Balanced mode generally will send 250Mbps, while High Quality mode will send about 400Mbps. Manual has a variety of dropdown options, varying from 250Mbps to 745Mbps. Bandwidth and video quality will be directly proportional.
Output Format	Auto 4K UHD 3840x2160p Full HD 1920x1080p HD Ready 1280x720p	Choose to automatically follow the input resolution, or manually convert the resolution. Available framerates for each resolution are 60fps, 50fps, 30fps and 25fps.
Color Format	Auto RGB 8-Bit YUV 12-Bit	Choose to automatically follow the incoming Color Chroma or manually change on the IPMX output.
HDR Pass-through	Enable or Disable	Choose to passthrough the HDR metadata as part of the Encode.
HDCP Over IP	Auto	Currently the Encoders will natively auto-detect incoming HDCP



HDMI Monitor / Loop Out Options

Primary Video Output Options

Section	Options	Description
HDCP Transmitter	Follow Input Force Highest	Follow Input will take whichever HDCP encryption standard is present on the HDMI input. Force Highest will adhere instead to the downstream HDMI Sink's HDCP highest capability

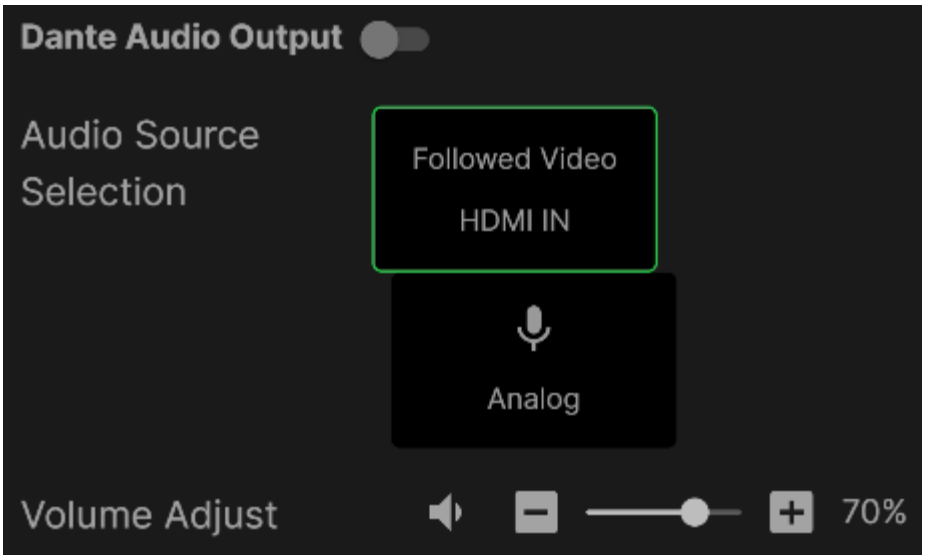


Audio Output Options

For now, the Bit Depth can only be 16 bits while the Sampling Rate can only be 32KHz.

Audio Volume Adjustment Buttons

Section	Description
+	Increase the Encoder Volume
−	Decrease the Encoder Volume
🔊	Toggle the Mute and Unmute

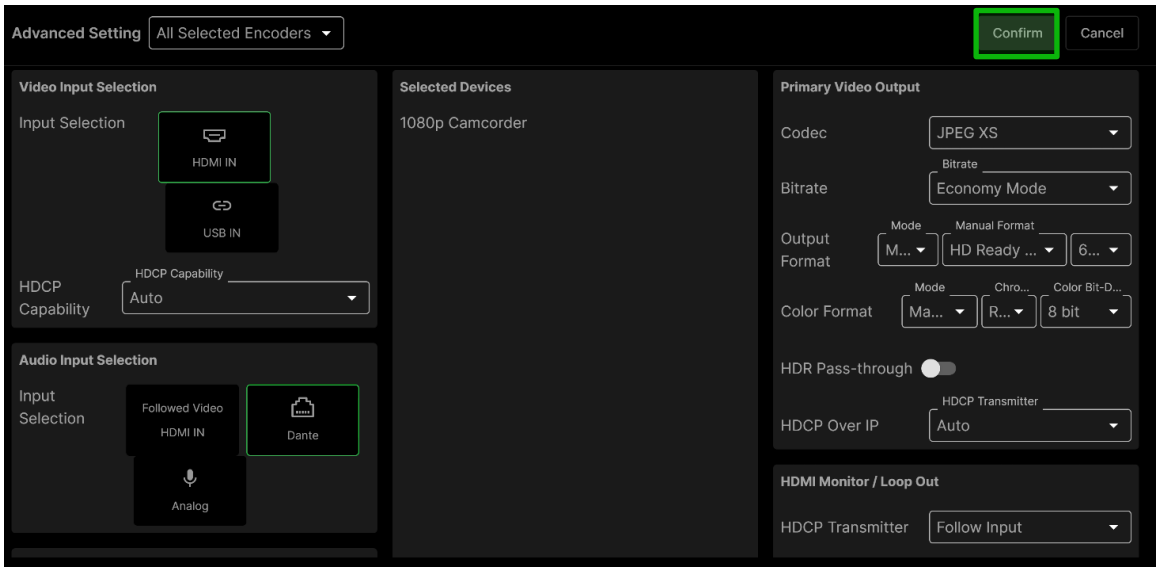


Dante Audio Output Options

Dante Audio Output Options

Section	Options	Description
Audio Source Selection	Followed Video Analog	When choosing Followed Video, the Audio will take on the embedded audio from the HDMI or USB.
+	N/A	Increase the Encoder Volume
−	N/A	Decrease the Encoder Volume
🔊	N/A	Toggle the Mute and Unmute

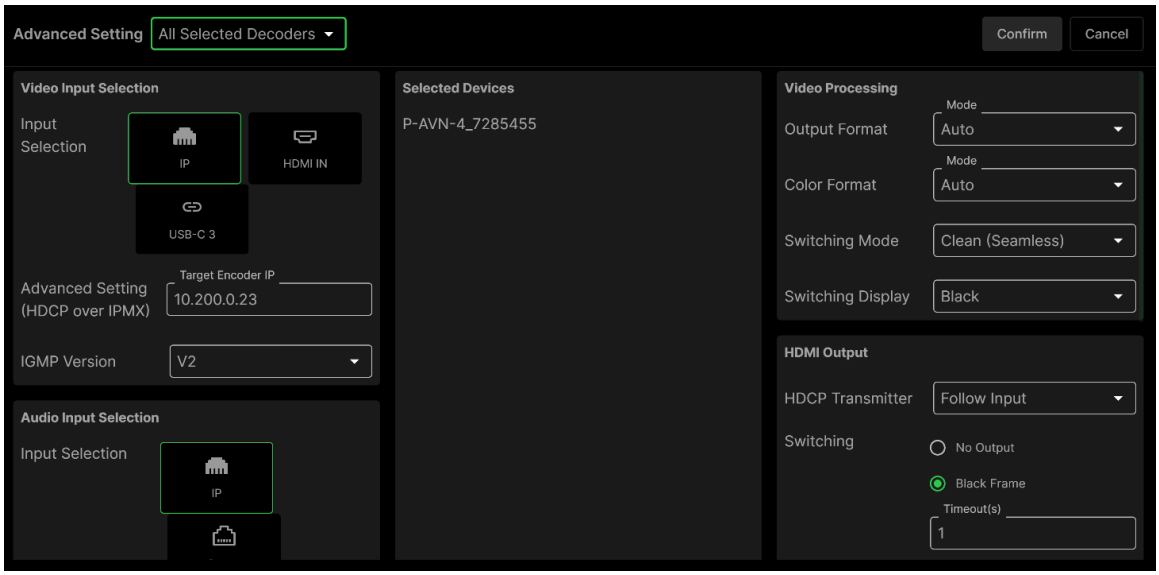
After completing all changes to be pushed, click ‘Confirm’ in the upper right corner to push all new Input and Output Settings to the list of Selected Encoders.



Confirm Button Location

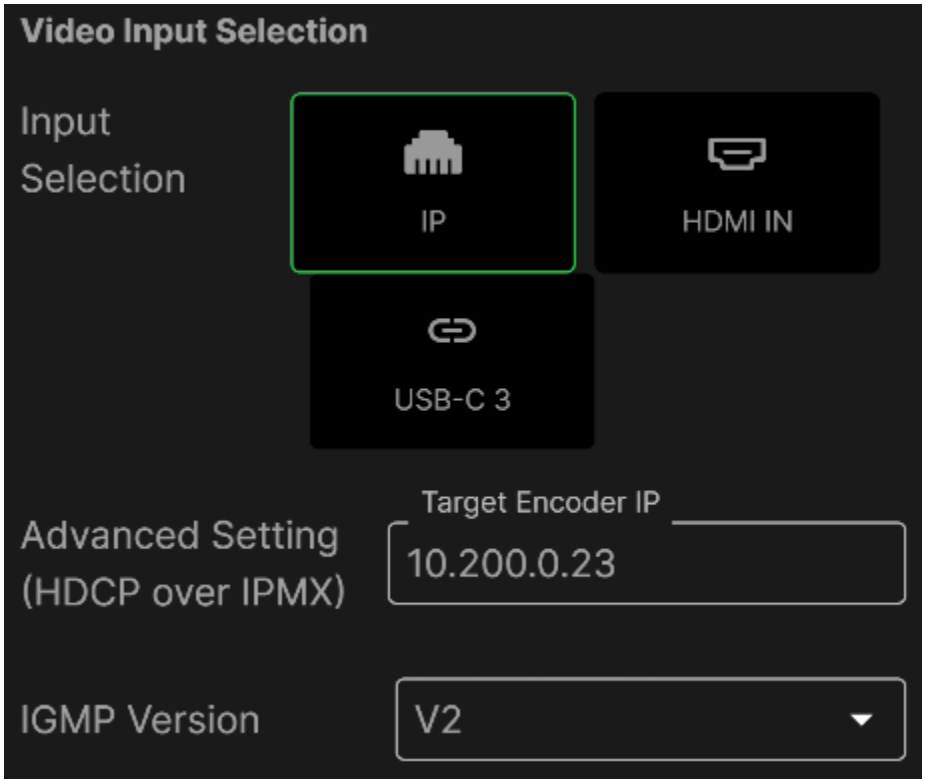
3.4.8.3 Settings for All Decoders

Upon choosing the ‘All Selected Decoders’ view as described in Section 3.4.8, the following view is available.



All Decoders View

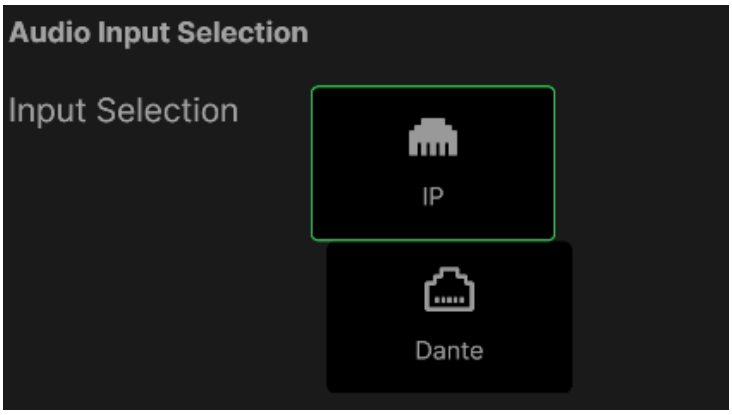
The left side of the page is used for Input Related Settings, while the center of the page shows all Selected Decoders that will be pushed upon clicking the ‘Confirm’ key in the top-right corner. The right side of the page is specific to decode settings before pushing to the output side.



Video Input Selection Menu

Video Input Selection

Section	Options	Description
Input Selection	IP, HDMI IN, USB-C 3	Choose the input interface option for the Decoder to target.
Advanced Setting (HDCP over IPMX)	Target Encoder IP	If an upstream Encoder is sending HDCP over IPMX, the Decoder can source the same encryption format from that service by pointing at the original Encoder.
IGMP Version	V2 or V3	V2 is used for networks where Source Specific Multicast is not required, and V3 is when Source Specific Multicast is needed.

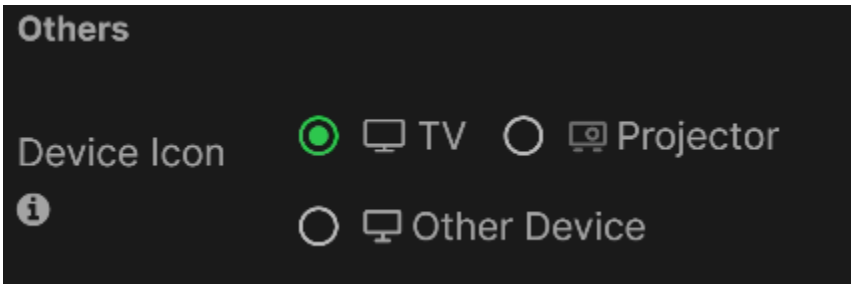


Audio Input Selection Menu

Audio Input Selection

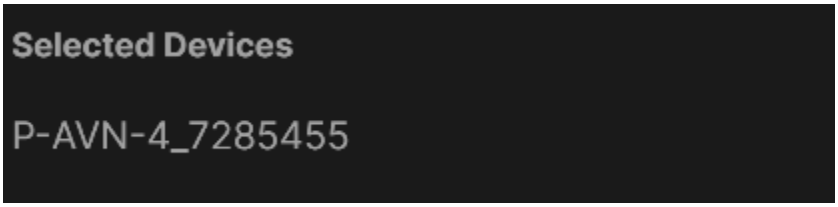
Section	Options	Description
Input Selection	IP Dante	Choose whether the incoming Audio is pulled from IPMX or an external Dante host.

The final menu on the left-most input side is the ‘Others’ Option. Choose what type of device is expected to be receiving the HDMI output from the Decoder.



‘Others’ Option

The Center View shows which decoders will be affected by changes pushed on the input and decode/output settings.



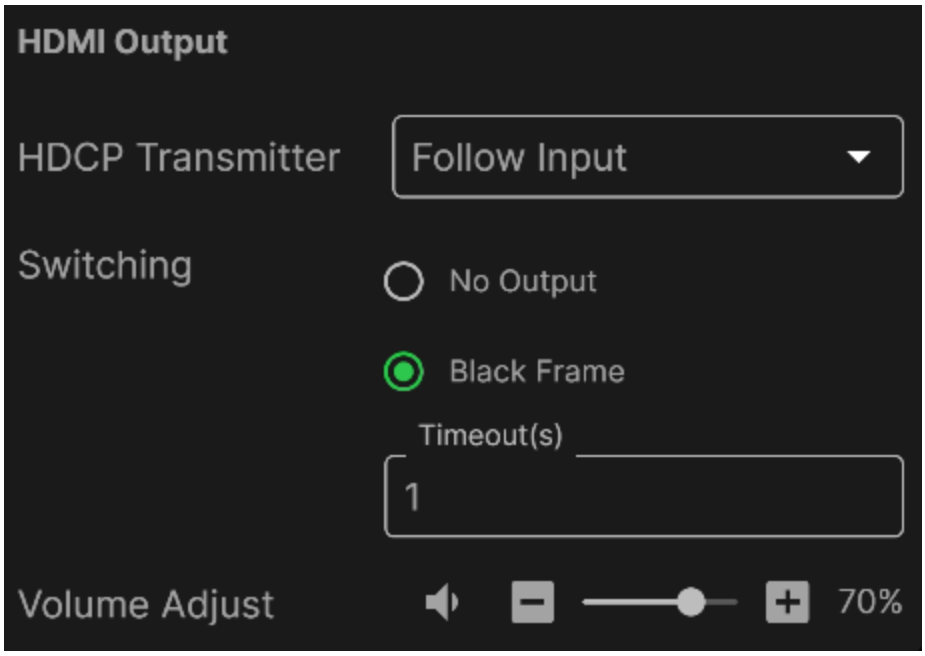
Selected Devices Display

The remainder of this section discusses the Output-related options found on the right-most side of the Decoder Advanced Settings page.

Video Processing Options

Video Processing Options

Section	Options	Description
Output Format	Auto Manual	Auto will follow the Decoder input. When set for Manual, 2160p, 1080p and 720p can be manually output at 60fps, 50fps, 30fps or 25fps
Color Format	Auto Manual	When auto, the color format will follow the Decoder input. When set for manual, RGB 8-Bit or YUV 12-bit can be selected.
Switching Mode	Clean Fast	Choose how the decoder output interacts with loss of input. Clean (Seamless) will make a slower switch with a smoother display while Fast (Latency) will be a faster but more visually noticeable switch.
Switching Display	Black Last Frame	Black will output a black raster screen while the input source is switching, while Last Frame will output the last decoded frame. Last Frame works well for digital signage applications if switching between static displays.



HDMI Output Settings

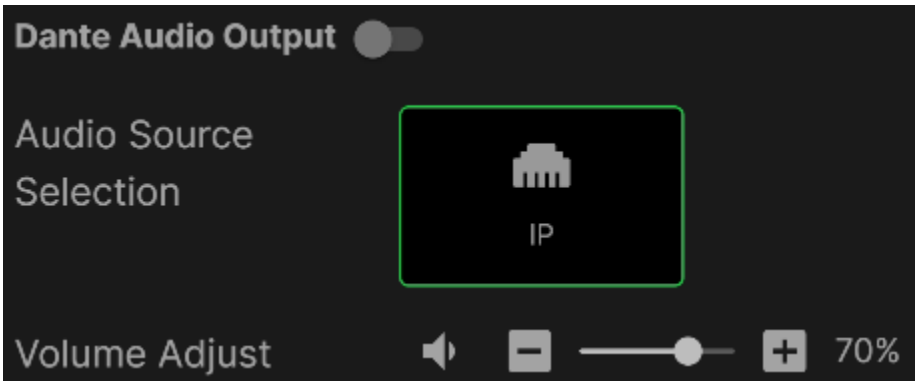
HDMI Output Options

Section	Options	Description
HDCP Transmitter	Follow Input Force Highest	Follow Input will take whichever HDCP encryption standard is present on the HDMI input. Force Highest will adhere instead to the downstream HDMI Sink's HDCP highest capability
Switching	No Output Black Frame	When set to No Output, the HDMI will be turned off (no signal or EDID transmit on the output). When set to Black Frame, the Decoder still will send a Black Screen with the selected Resolution and Framerate.
+	N/A	Increase the Encoder Volume
−	N/A	Decrease the Encoder Volume
🔊	N/A	Toggle the Mute and Unmute

Analog Audio Output Options

Analog Audio Output Options

Section	Options	Description
	Enable Disable	Turn on or turn off the Analog Audio Output
Analog Source Selection	IP Dante	Choose whether the incoming Audio is pulled from IPMX or an external Dante host.
	N/A	Increase the Encoder Volume
	N/A	Decrease the Encoder Volume
	N/A	Toggle the Mute and Unmute

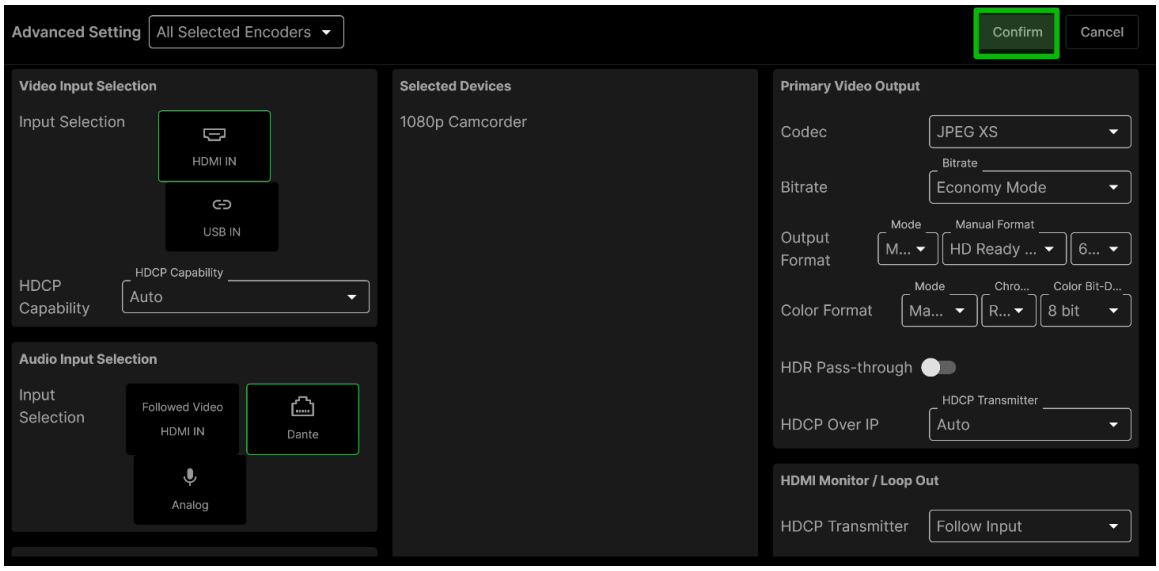


Dante Audio Output Options

Dante Audio Output Options

Section	Options	Description
Audio Source Selection	IP	Choose what input the Dante Audio comes from
+	N/A	Increase the Encoder Volume
−	N/A	Decrease the Encoder Volume
	N/A	Toggle the Mute and Unmute

After completing all changes to be pushed, click ‘Confirm’ in the upper right corner to push all new Input and Output Settings to the list of Selected Encoders.



Confirm Button Location

3.4.9 Added Device List Navigation and Filter Options

As the number of devices, groups and flows increases, so does the need for organizational options. These next sections describe some additional tilters and navigational options within the Device List to help with clutter management.

3.4.9.1 Tile View vs Table View

The default Device List view is table view. Along the top right corner, there are two icons to toggle this view between table and tile view.

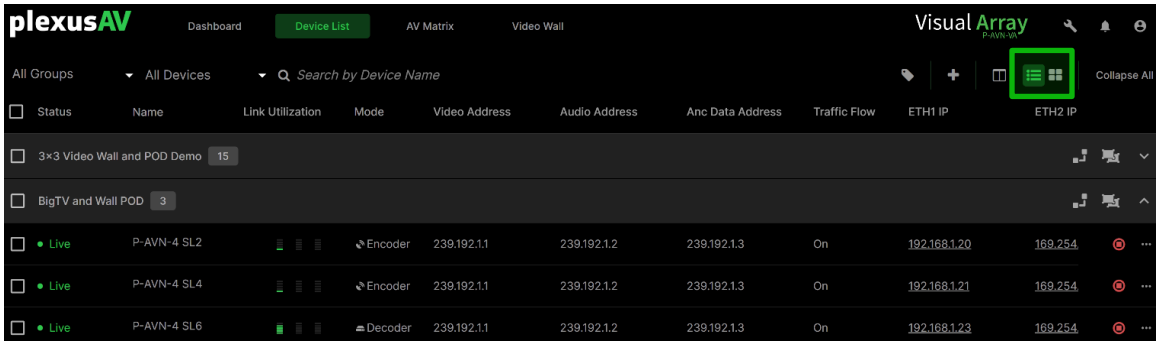
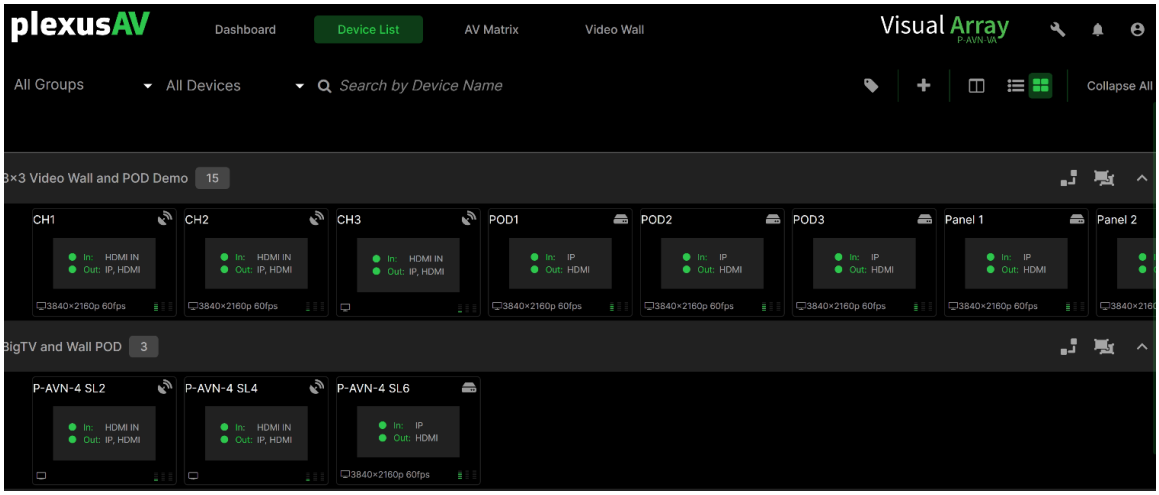


Table View and Icon Location

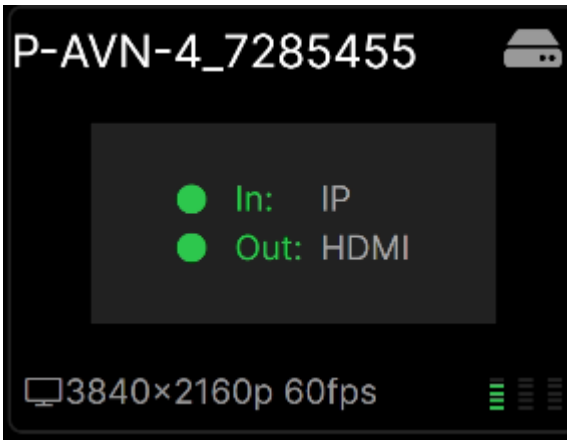
Table View

Tile View

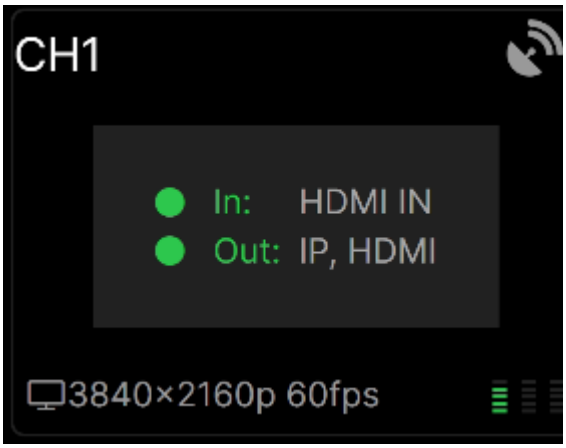
The Tile View is more graphical than the Table View and is used to drag and drop devices between groups in real-time. Aside from group assignment, no other settings can be changed for the devices from this menu. This is the fastest and easiest way to move devices back and forth between the groups.



Tile View



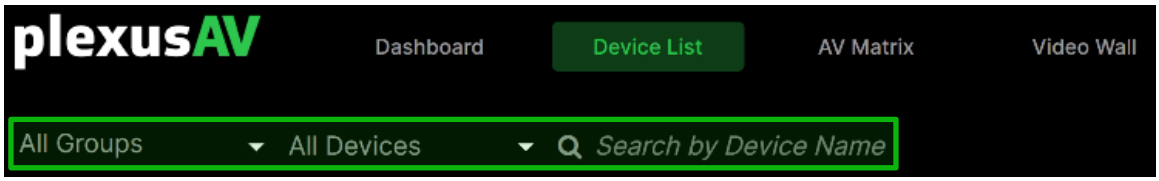
Sample Decoder View



Sample Encoder View

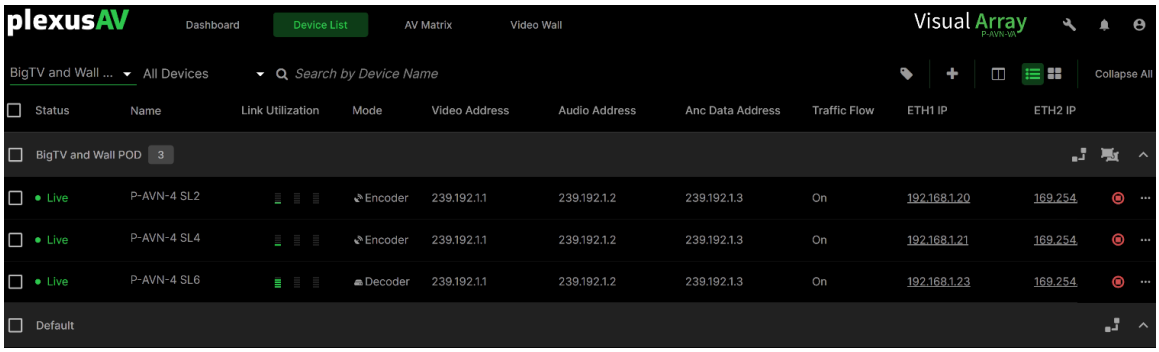
3.4.9.2 Device Filter Options

Along the top left of the Device List page, there are three filter option fields.



Filter Options Location

The first leftmost dropdown is used to filter by group, and only devices from the selected group will be shown.



Group Filtered View

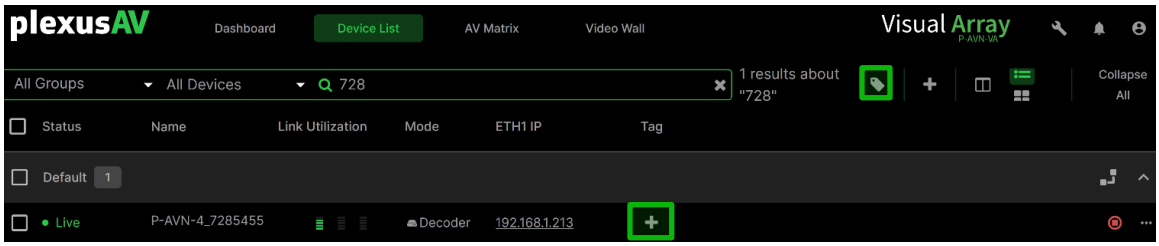
The second dropdown will filter by Active and Inactive devices. Use this option to quickly located ‘Offline’ devices.

The third option is a search bar by Device Name, which corresponds to the NMOS Discovery name for the given P-AVN-4 device(s).

Both the Table and Tile View will be pruned by the options selected in the Filter settings.

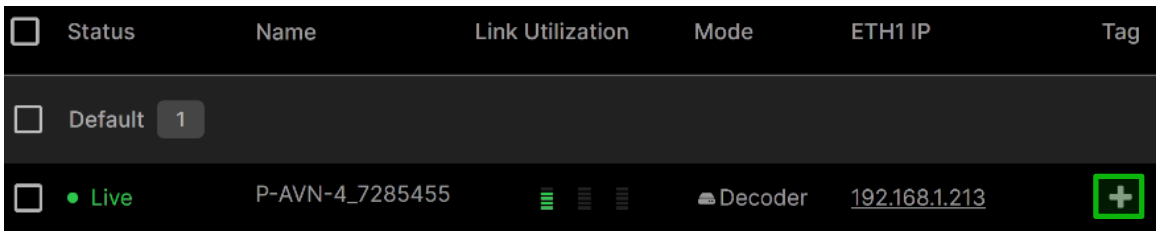
3.4.9.3 Assigning and Filtering by Tag

Before attempting to use this filter option, define one or more tags in the ‘Groups and Tags’ menu as described in Section 3.9. Filtering by tag allows for maximal customization, sorting by user-entered label and color.



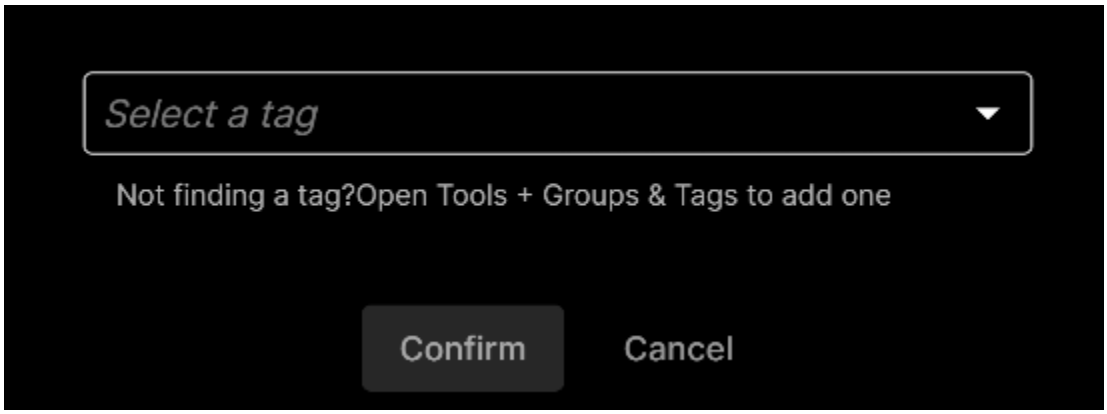
Tag Pertinent Icon Locations

To filter by tag, first assign a tag to each device by clicking the ‘+’ icon in the corresponding row.



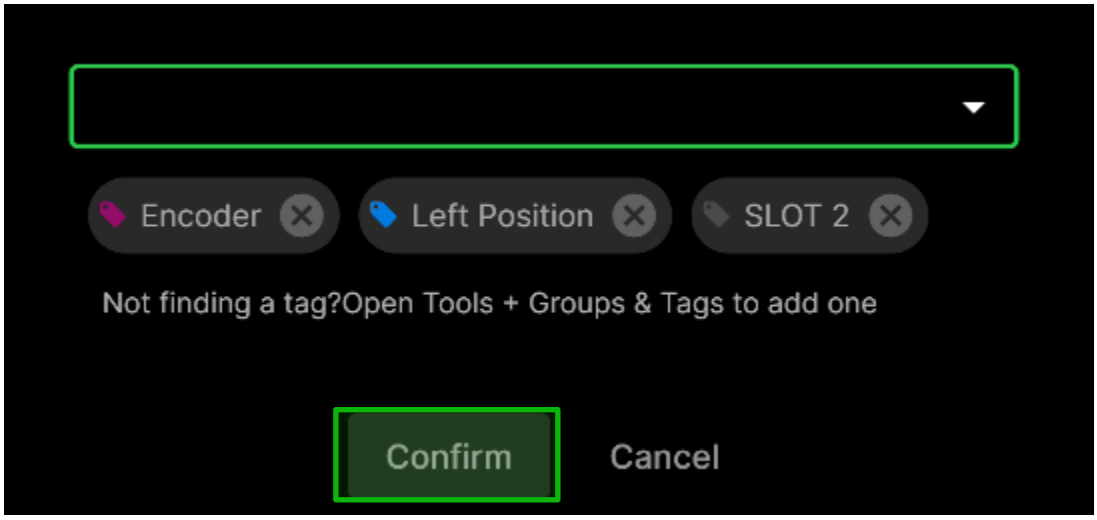
Plus Icon Location

Once there, the Tag Selection prompt for that device will be presented.

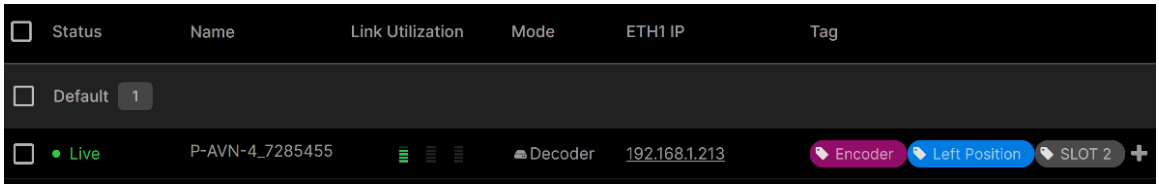


Tag Selection Prompt

Click the ‘Select a tag’ dropdown and select as many or as few tags as desired before pressing the ‘Confirm’ key.



Confirm Tag Selections

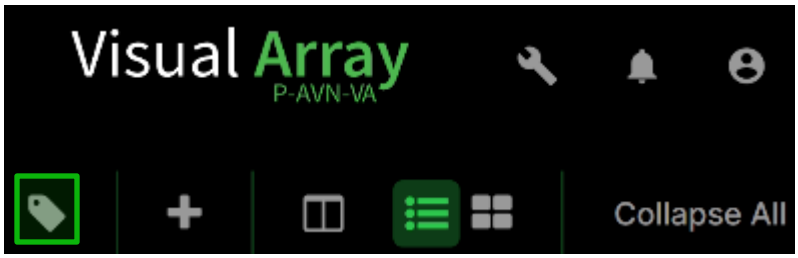


Tag Field Populated

In this sample, the P-AVN-4 device will now appear in any of the following Tag Filter selections:

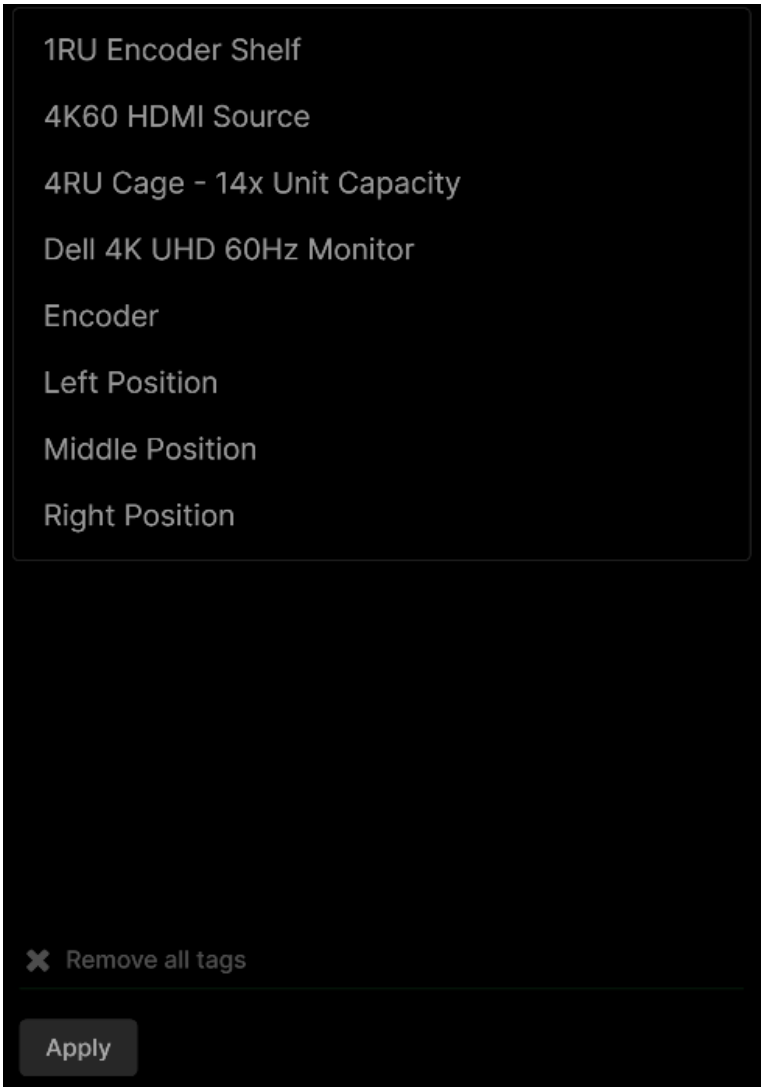
- Encoder
- Left Position
- Slot 2

To filter the Table or Tile view by tag, click the Tag icon as indicated, then select the ‘Tag’ icon.



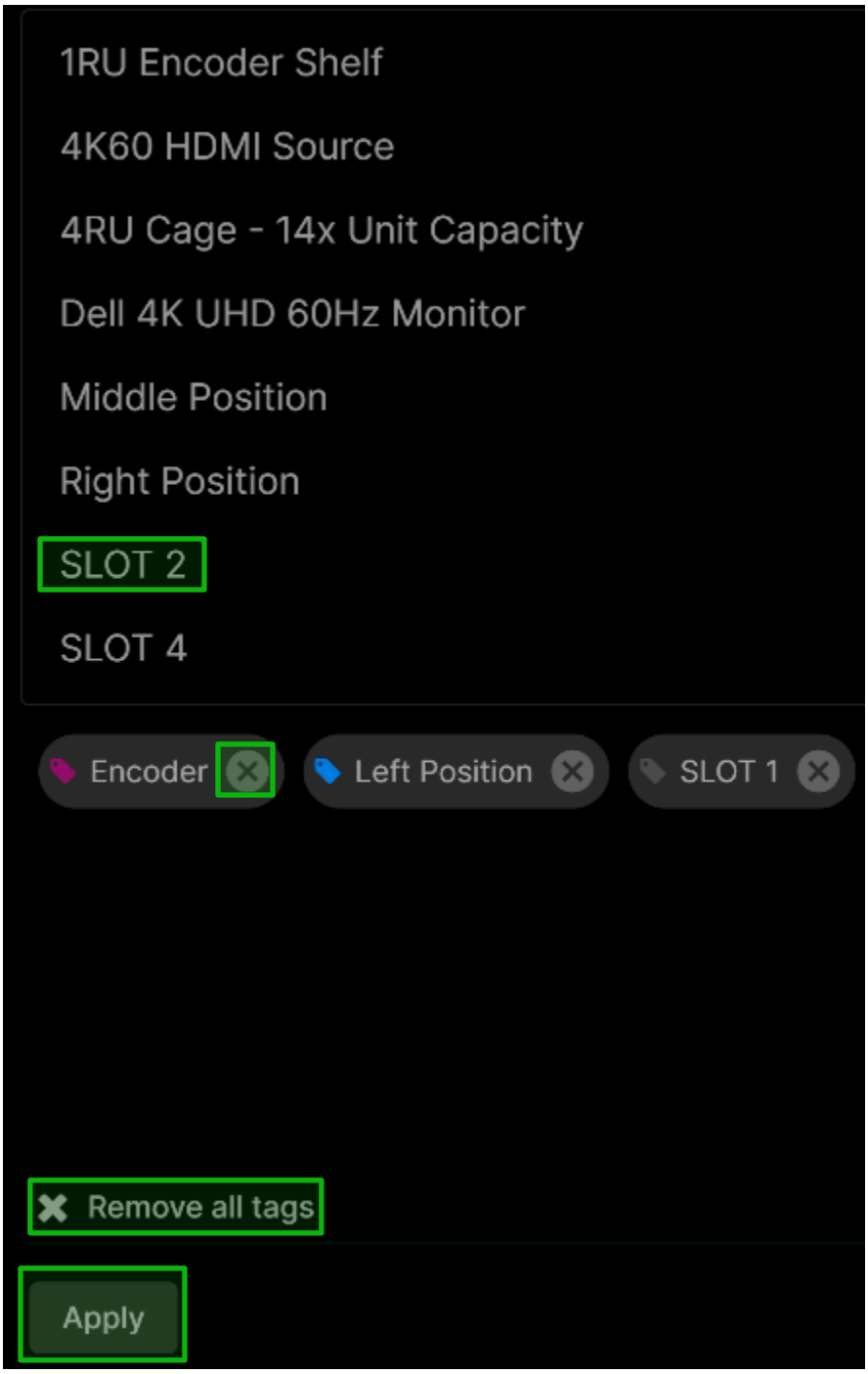
Tag Icon Location

After clicking the tag icon, the Tag Selection Prompt will be presented as shown.

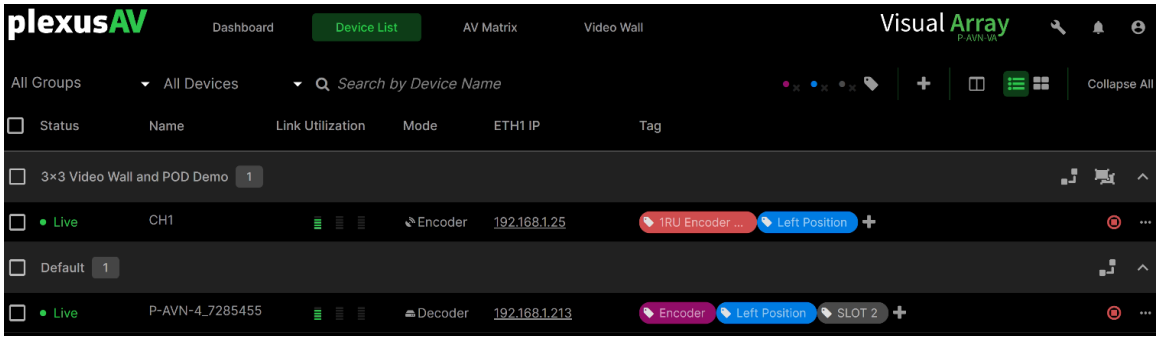


Tag Selection Prompt

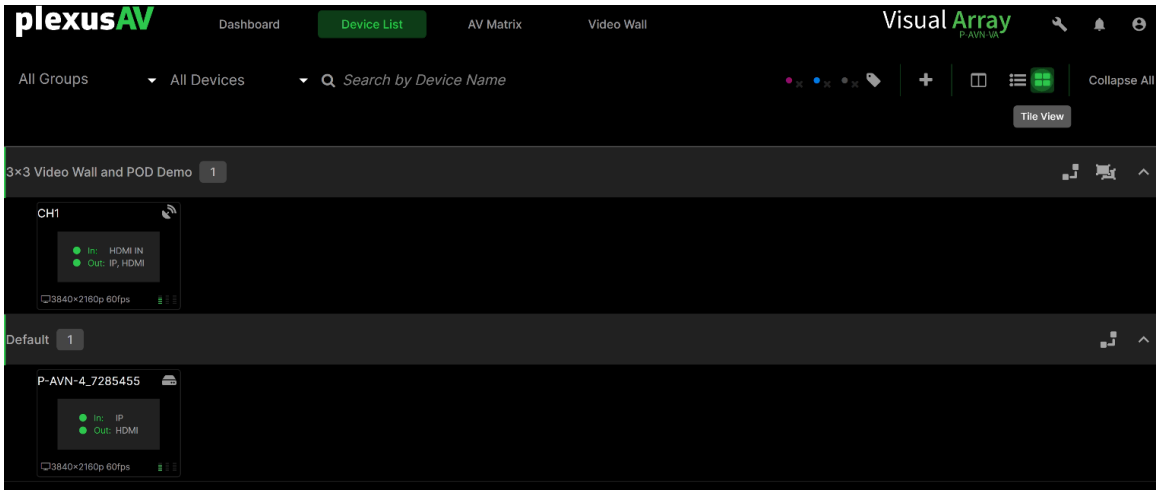
Click the Tag names to add as many or as few tags to the filtered tags as desired. Click the ‘Apply’ button to apply the filtered view or click ‘Remove all tags’ to clear the filter completely. Clicking the ‘x’ within the bounds of a single tag will remove the singular tag from the filter.



Tag Selections



Tag Filtered Table View



Tag Filtered Tile View

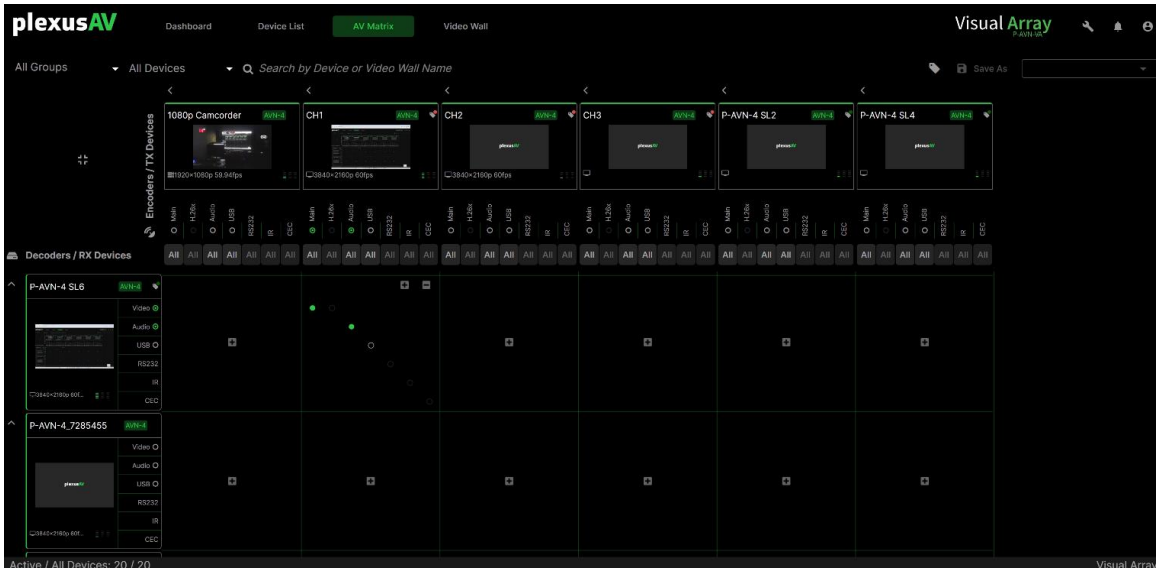
Any device with one or more of the applied tags will be present in the view.

3.5 AV Matrix

AV Matrix Page

3.5.1 AV Matrix Feature Overview

The AV Matrix is a page specifically designed for flow management across all the Encoder (TX) and Decoder (RX) devices in the enter P-AVN-VA ecosystem. Instead of having to configure RX and TX settings directly on the P-AVN-4 GUI's, all IPMX IO is managed through this single page via NMOS and API.

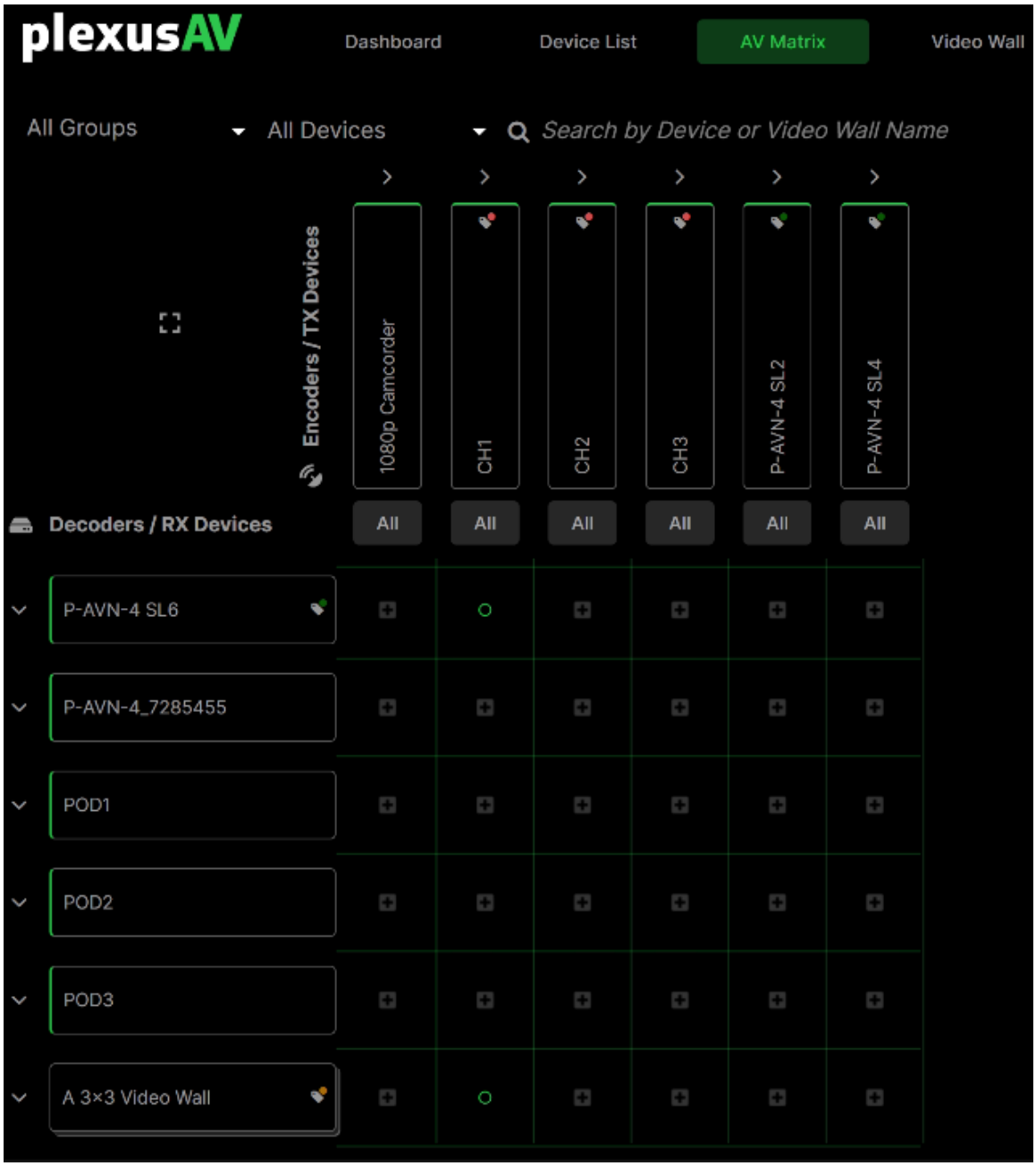


AV Matrix Page

The grid occupying the area between the Decoders row and Encoders column is used to point streams quickly and easily between devices, connecting the IO without having to log into the web page for either P-AVN-4.

3.5.2 AV Matrix Page Architecture

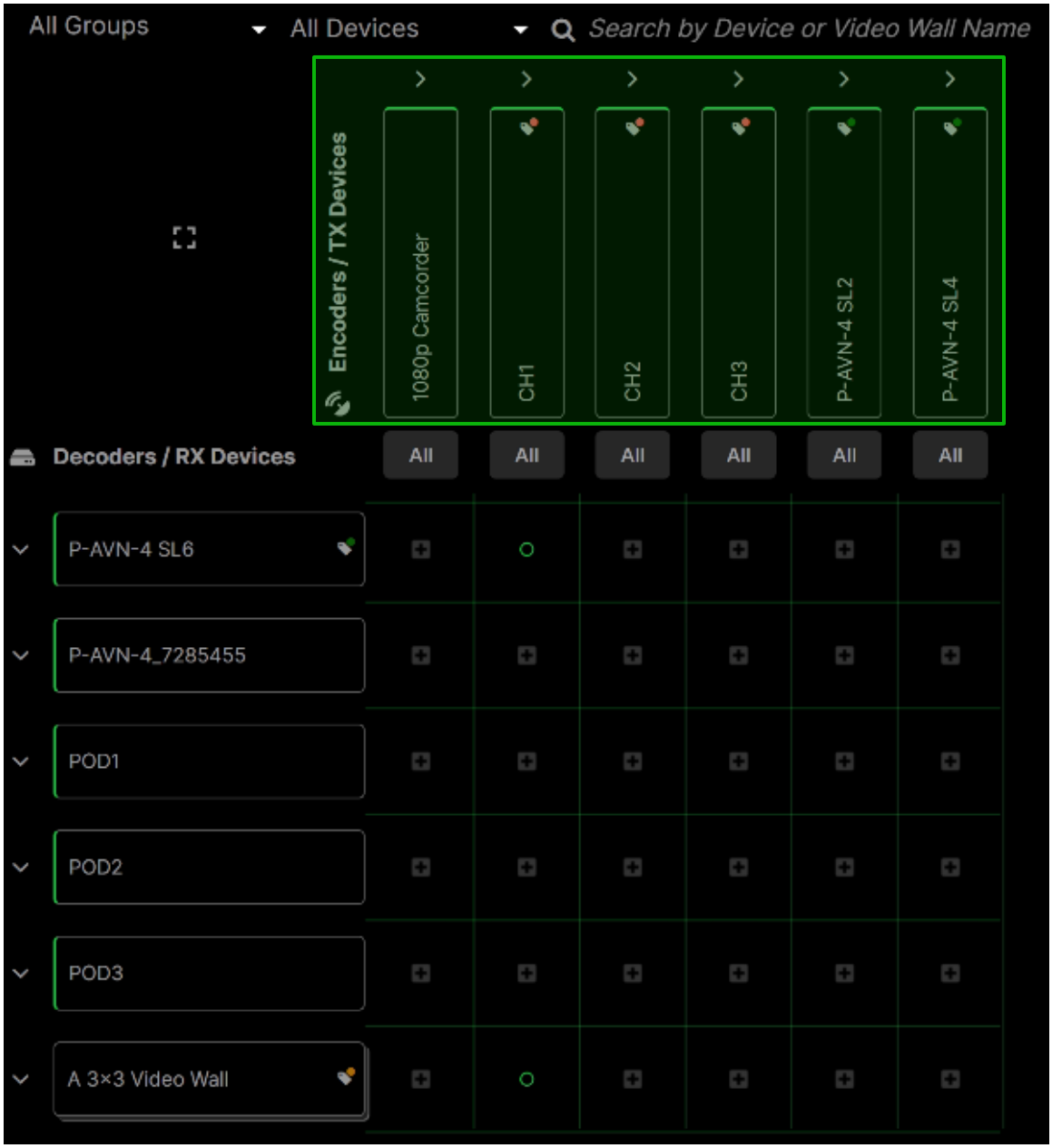
The default view for the AV Matrix page is an unfiltered collapsed view.



Default AV Matrix View

3.5.2.1 Encoders

The Row along the top of the grid shows all Encoders in the workflow.

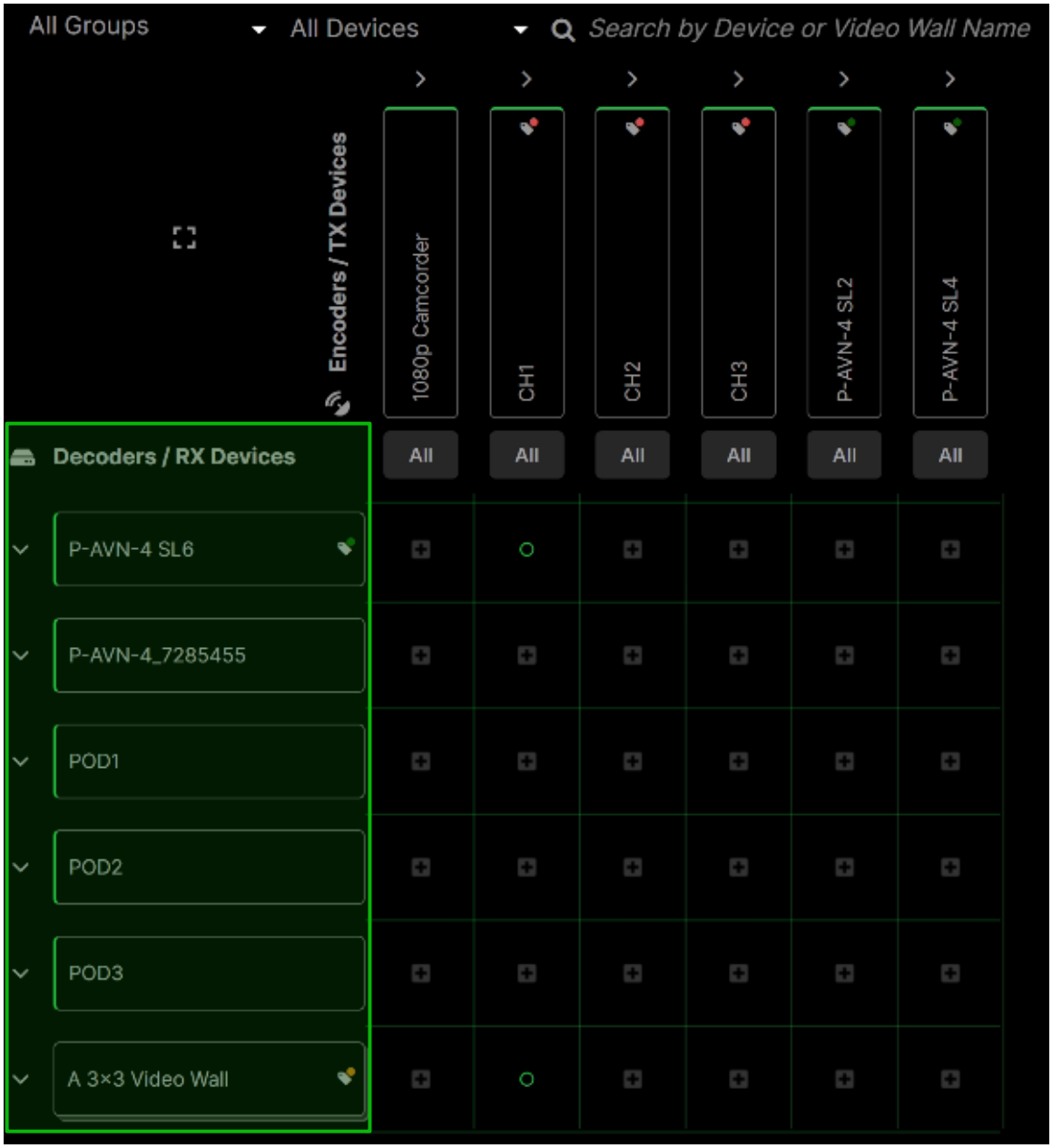


Encoders

Encoders are flow startpoints, and act as content providers for Decoders in the AV Workflow.

3.5.2.2 Decoders

The Column along the side of the grid shows all Decoders (and Video Walls) in the workflow.



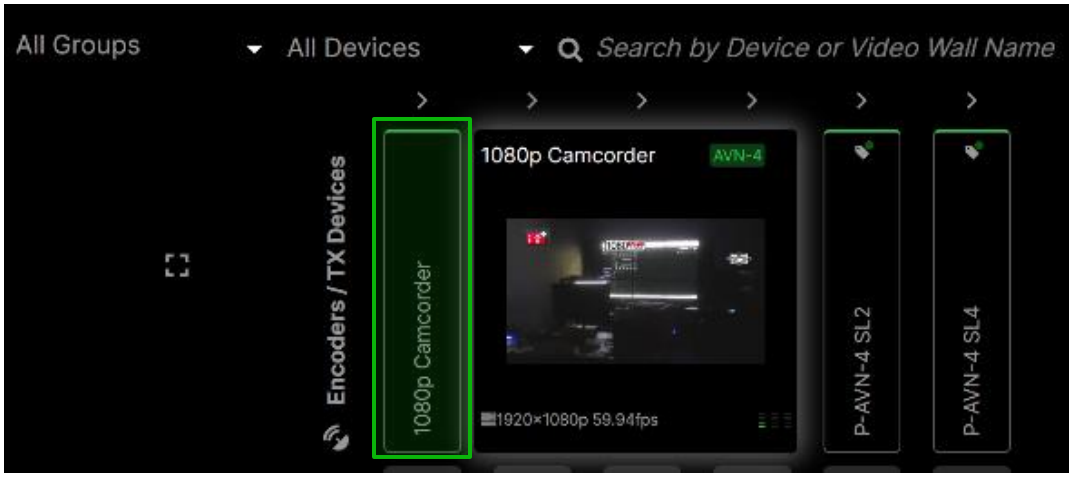
Decoders

Decoders are flow endpoints, and act as content receivers from Encoders in the AV Workflow. Their baseband outputs power panels, TVs, and Video Walls. Note it may be

required to use the scroll bar to cycle up and down through all decoders in an unfiltered view where many devices are present.

3.5.2.3 Expanding Encoder and Decoder Views

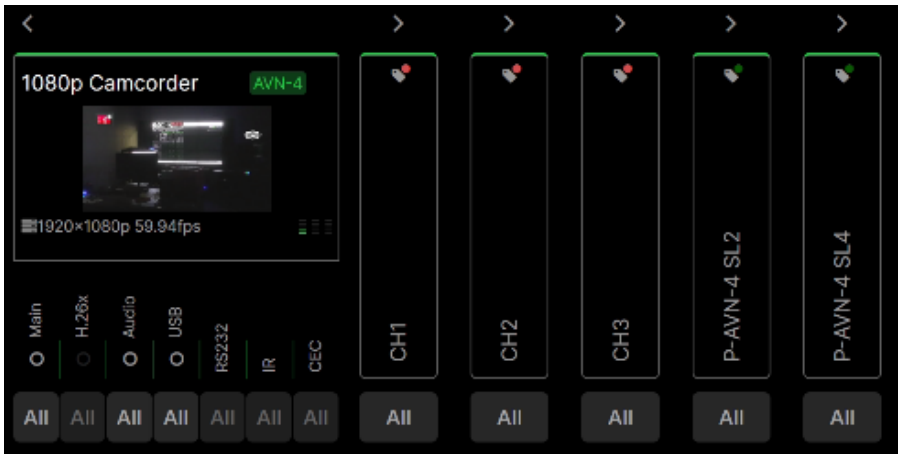
Hover over Encoder and Decoder devices to preview the expanded view for the device.



Hover Over Indicated Encoder Result

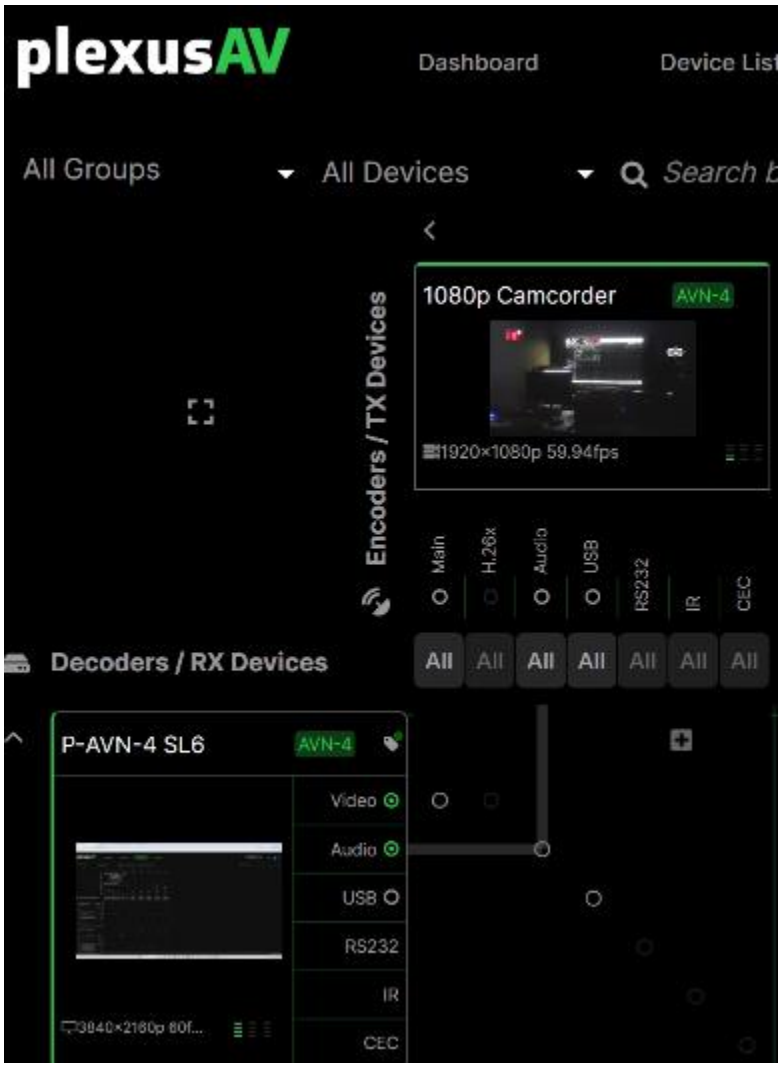
This thumbnail will show a view of the encoded (or decoded content), the name of the Transceiver and the resolution and framerate that is being pushed. Note that, in order to get the Thumbnail content from the P-AVN-4, the P-AVN-VA is opening an HTTPs Tunnel. To make the Thumbnail view available here it is necessary to access the target P-AVN-4 GUI at least once to complete the certificate check as described in Section 3.1.

Click the icon above (or to the left of) the Encoder or Decoder device to permanently toggle the expanded preview.



Expanded View – Single Device

Note that, along the bottom of the expanded device, some more options are presented. All essences from Encoders can be routed separately to individual receive components on Decoders.



Expanded View – Single Encoder and Single Decoder

This component level mapping allows for mixing and matching of individual encode components between multiple decodes and their respective interfaces.

The Video Wall when expanded will show all the devices inside that make up the array. See Section 3.6 for more information on creating Video Walls.

Expanded Video Wall Endpoint

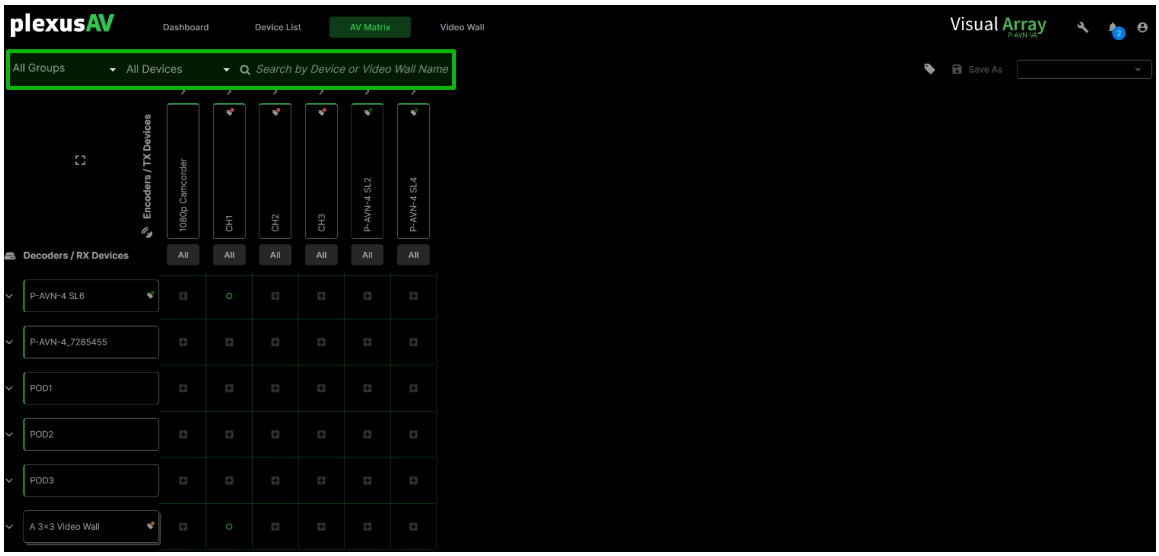
The left-and-upmost block can be used to expand and collapse the expanded view between all devices to simplify the view.

Fully Expanded View

Fully Collapsed View

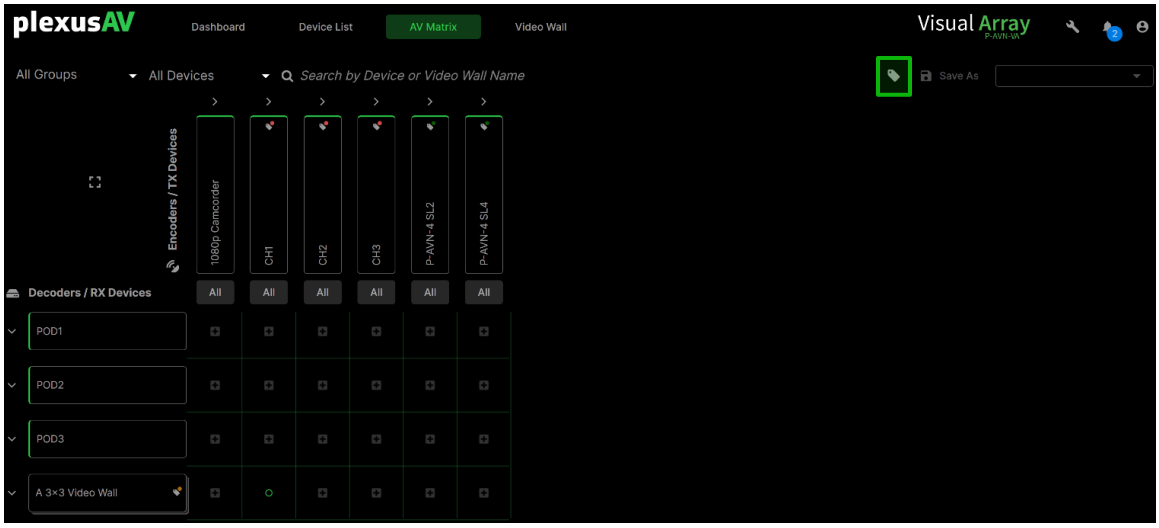
3.5.2.4 Filter Options

To help reduce clutter, filter options are available to hide unneeded decoders and encoders from view.

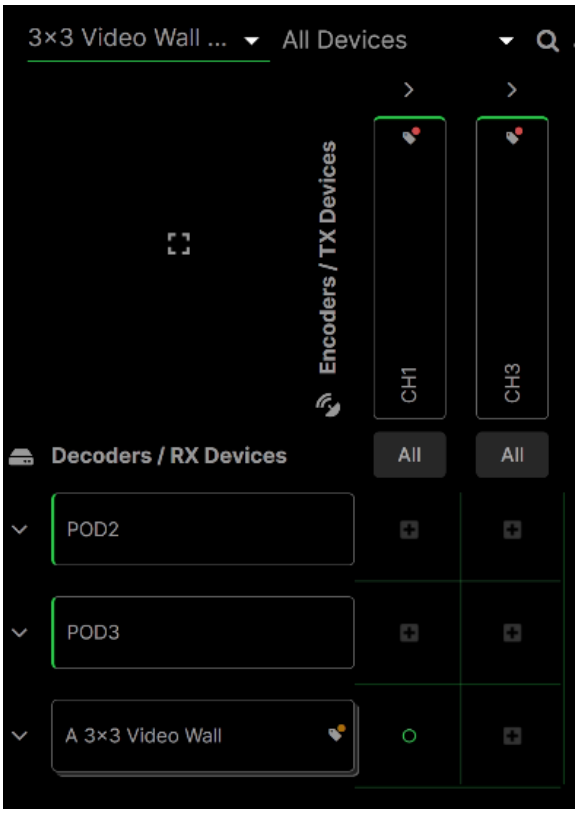


Filter Option Location

Filtering by Tag is also available on this page. Note that, to filter by Tag on this menu, it is necessary to define one or more tags as described in Section x.x.x and assign one or more tags to the Encoder and Decoder devices as described in Section 3.4.9.3.



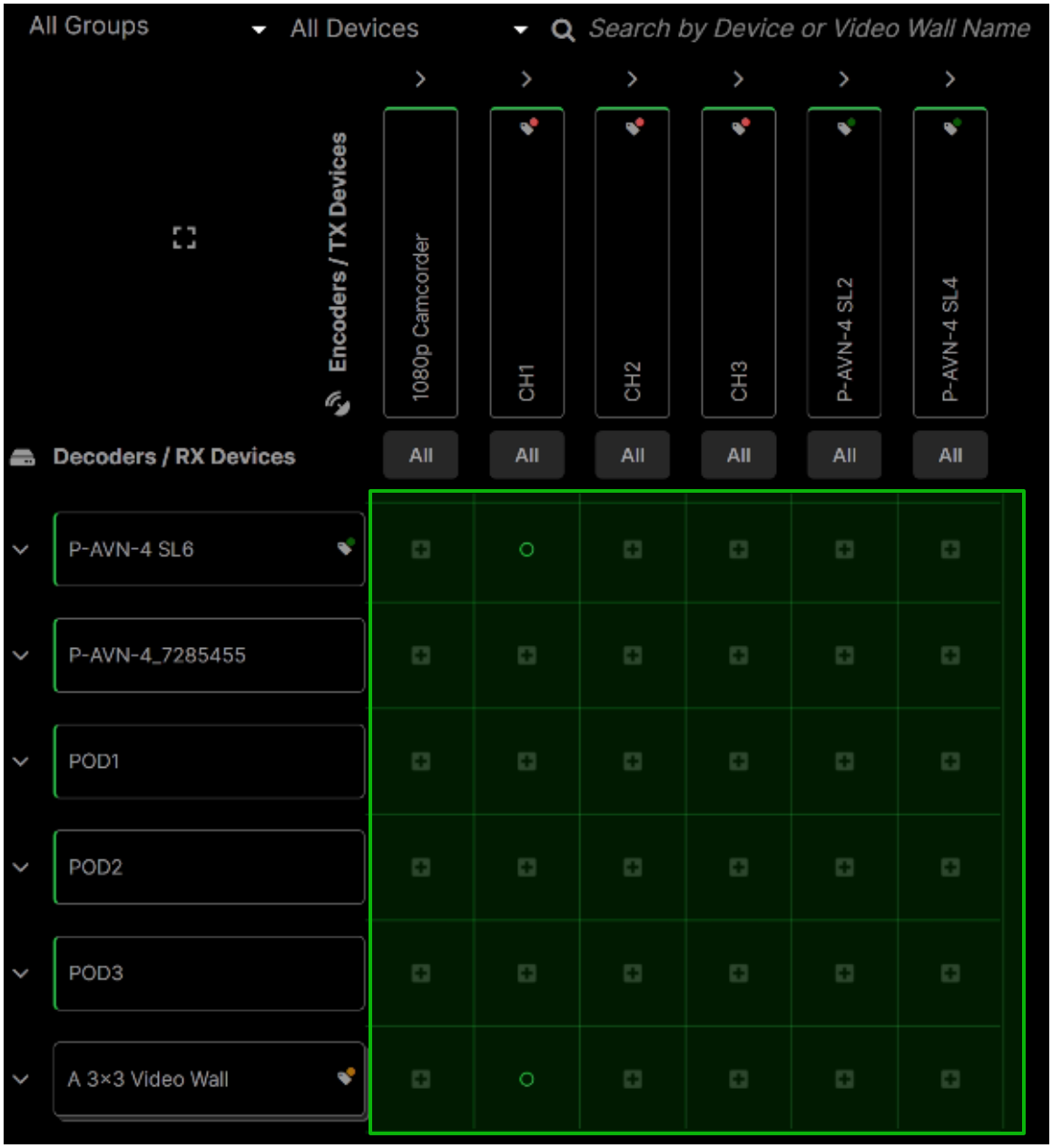
Tag Filter Icon Location



Filtered View – Reduced Scope

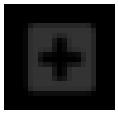
3.5.2.5 AV Grid Overview

The grid itself will show available and used points of connection between Encoders and Decoders.

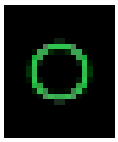


AV Matrix Grid

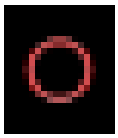
Throughout the grid, there are multiple icons that represent current flow status.



No flow is configured between the start and endpoint.

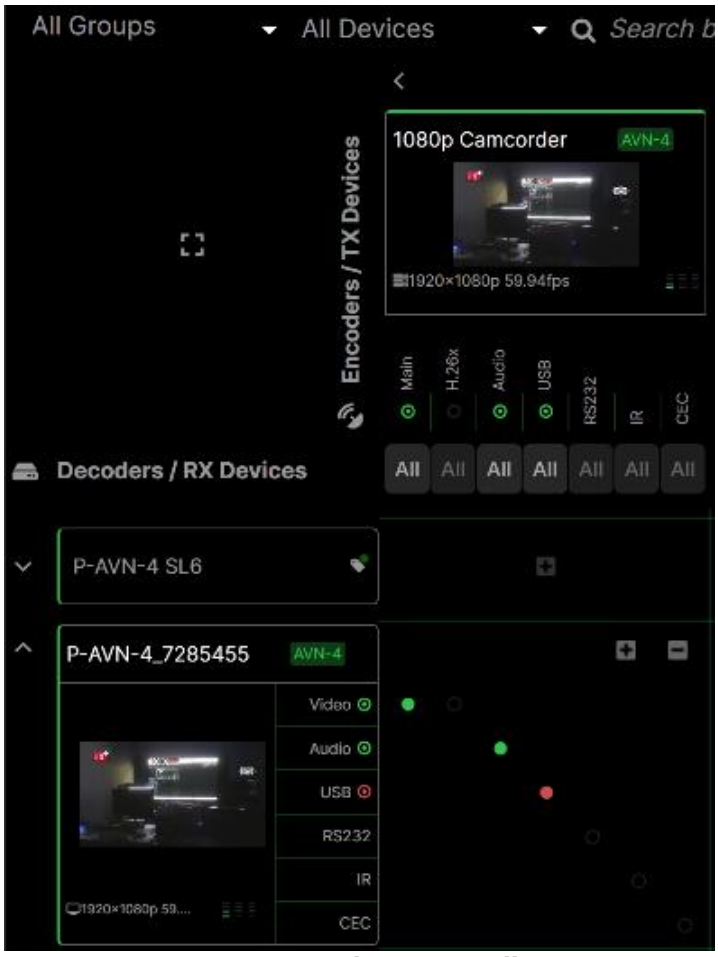


Flow is configured and healthy between this start and endpoint



Flow is configured and unwell between this start and endpoint

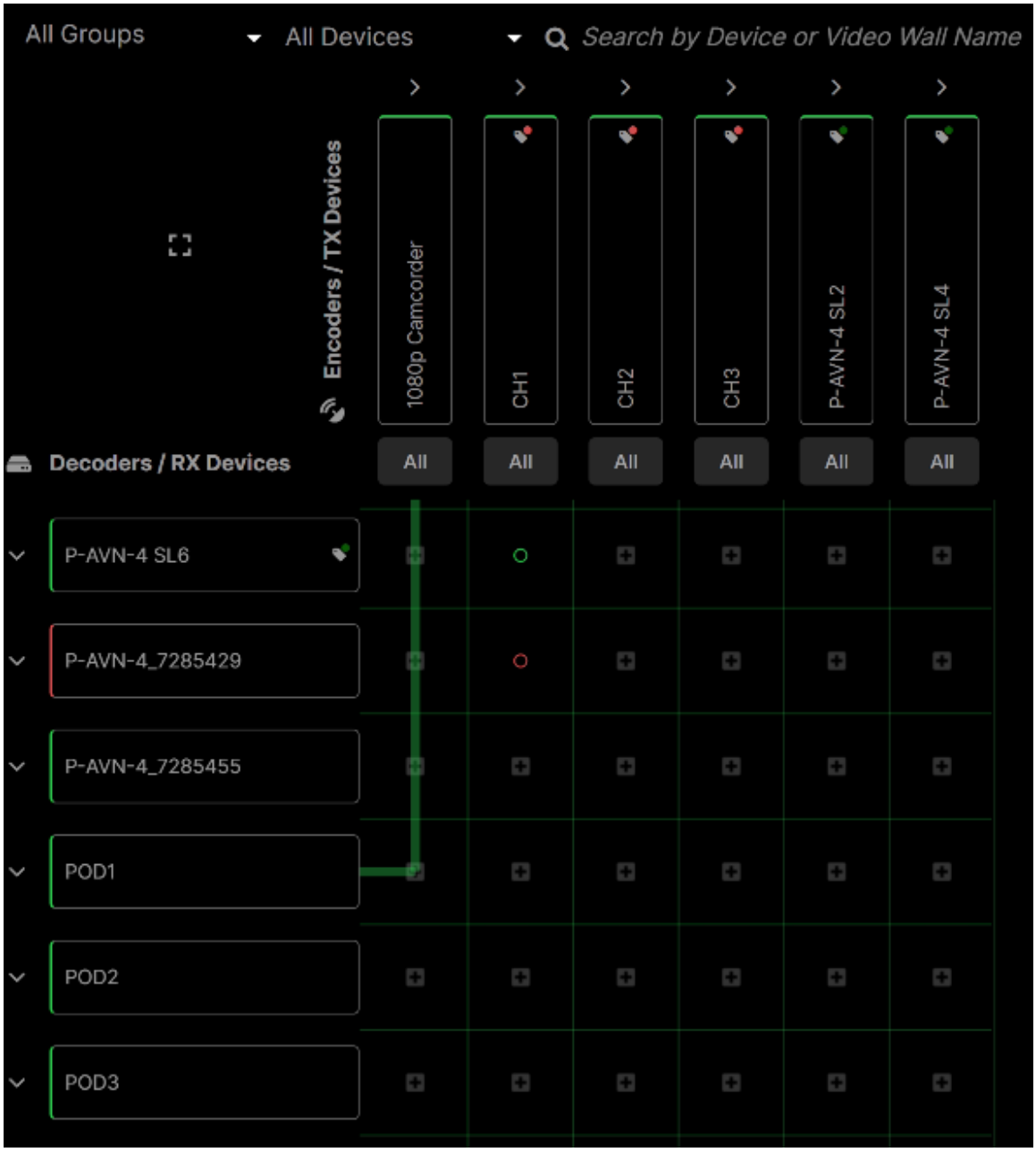
The icons are similar but instead filled in for the expanded point of view (for the per component-level routing).



Component-Level Status Indicators

3.5.3 Mapping Flows

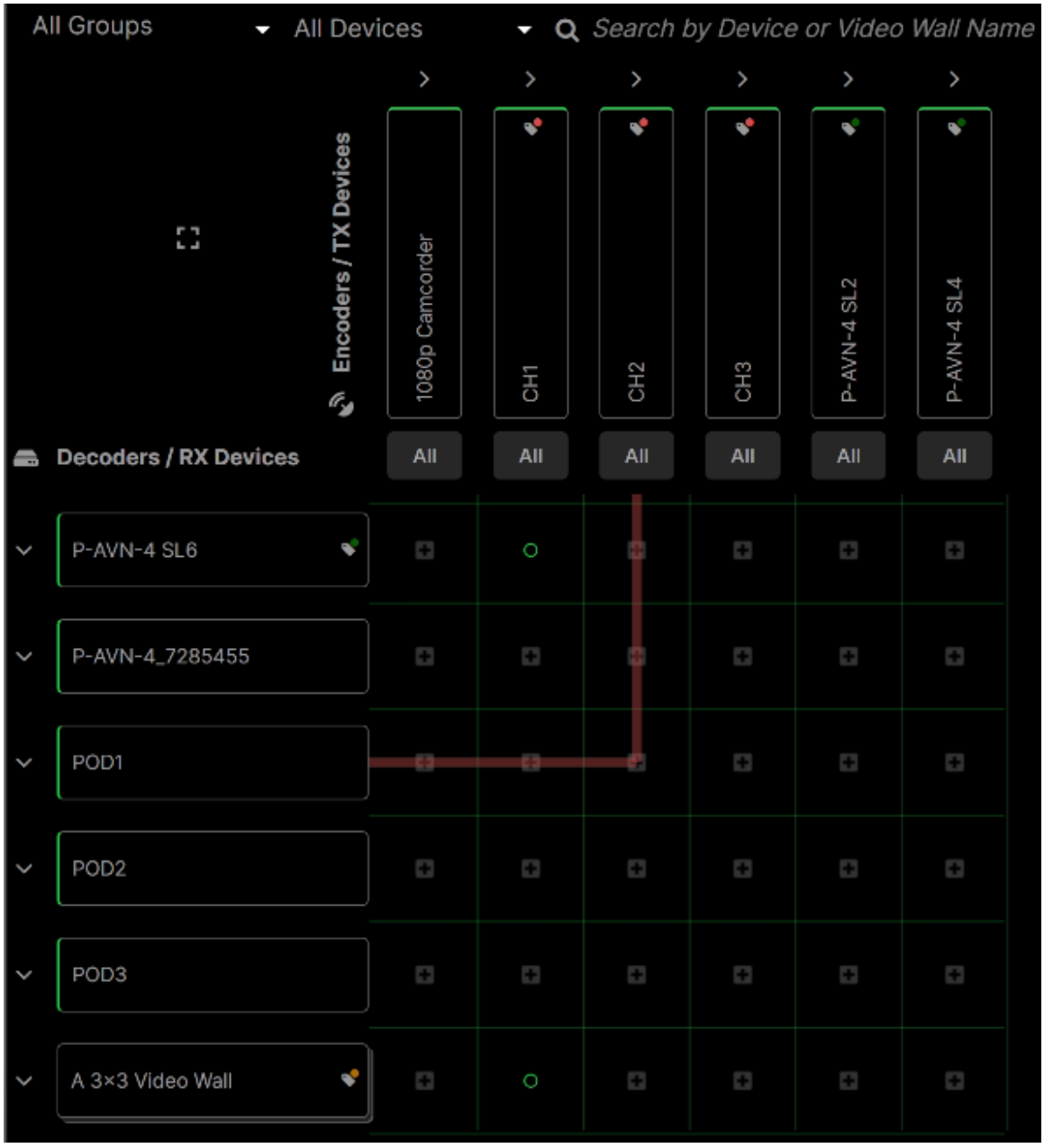
In the most basic view, both the Encoder and Decoder will be collapsed, and only one icon will be present in between start and endpoints. Use the mouse to hover over different points in the grid. Any flow mapping that is available will be denoted by a green connector line.



Eligible Path

Clicking in this scenario is considered ‘Basic Mapping’, and will attempt to push only the Video (with ANC) and Audio Essences from the Encoder to the Decoder.

Any flow mapping that is unavailable will be denoted instead by a red line.



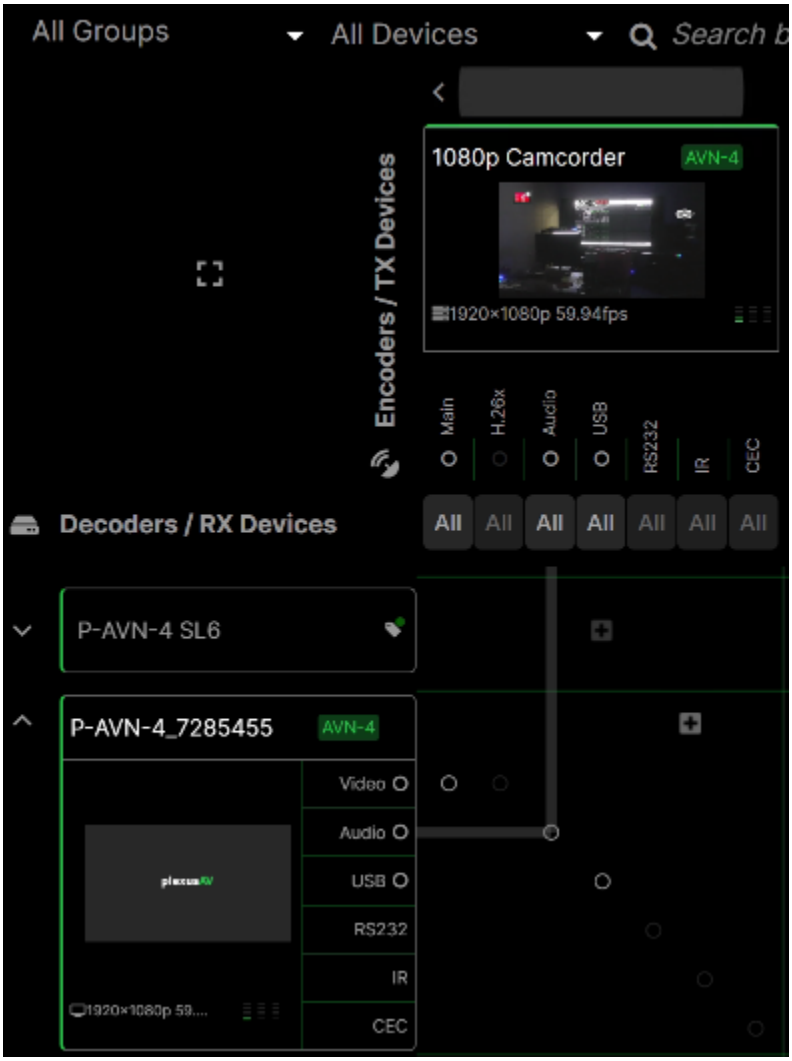
Ineligible Path

Here are some possibilities that can cause a path to be ineligible:

- The encoder and/or decoder are offline
- The encoder and/or decoder are online, but the IPMX connection is not present
- The encoder does not have an input available (and therefore no output)
- The decoder is disabled

3.5.3.1 Advanced Mappings

When both the Encoder and Decoder (or both) are expanded as described in Section 3.5.2.3, more connectors are available than just the single line. Hovering over individual components will expose instead a gray line. Click any node to attempt to push the component from the Encoder Component to the Decoder Receive Component.



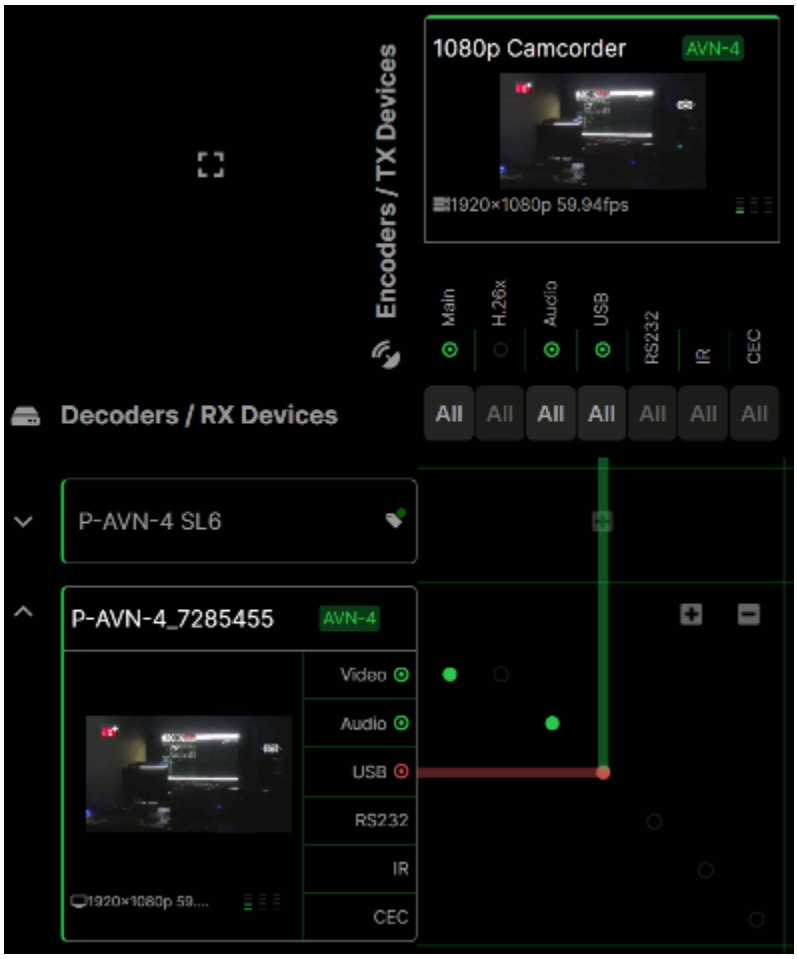
Component Level Mapping

If only one of the two devices is expanded, then only the Basic Flow mapping as described in Section 3.5.3 will be visible. Clicking the 'plus' icon will also be the equivalent of pushing the Basic Mapping (Video/ANC and Audio Essences only).

After mapping one or more components between Encoder and Decoder, the status will populate with red or green status indicators to show the connection was a success.

Fully Mapped Flow

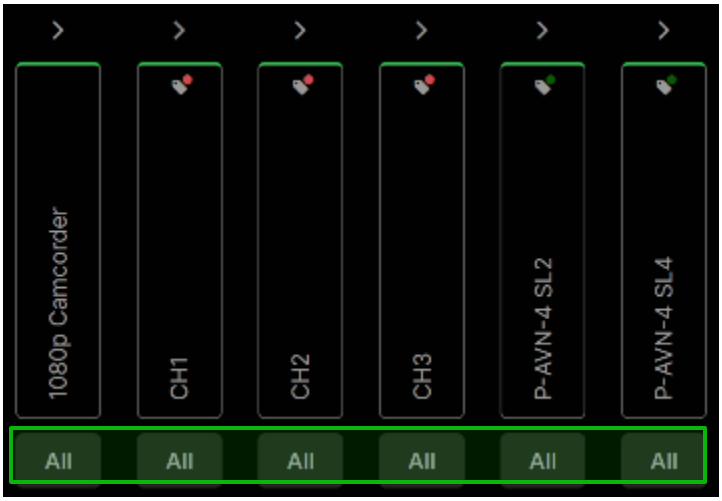
In this view, the hover-over action will also expose point of failure in the connection if it is broken.



Status Indicator Shows Which Device Fails Connection

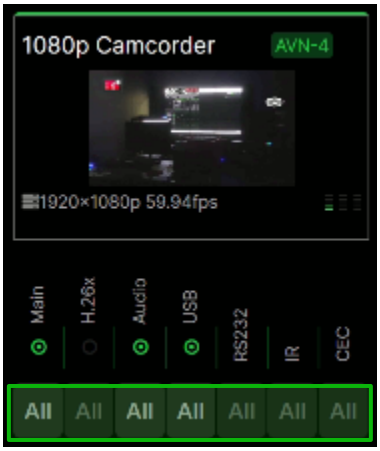
3.5.3.2 Mass Encoder Mapping

Note the ‘All’ icon under each Encoder / Start point. Clicking this will open a prompt to push that Encoder channel to every eligible Decoder in the workflow simultaneously.



‘All’ Button Location

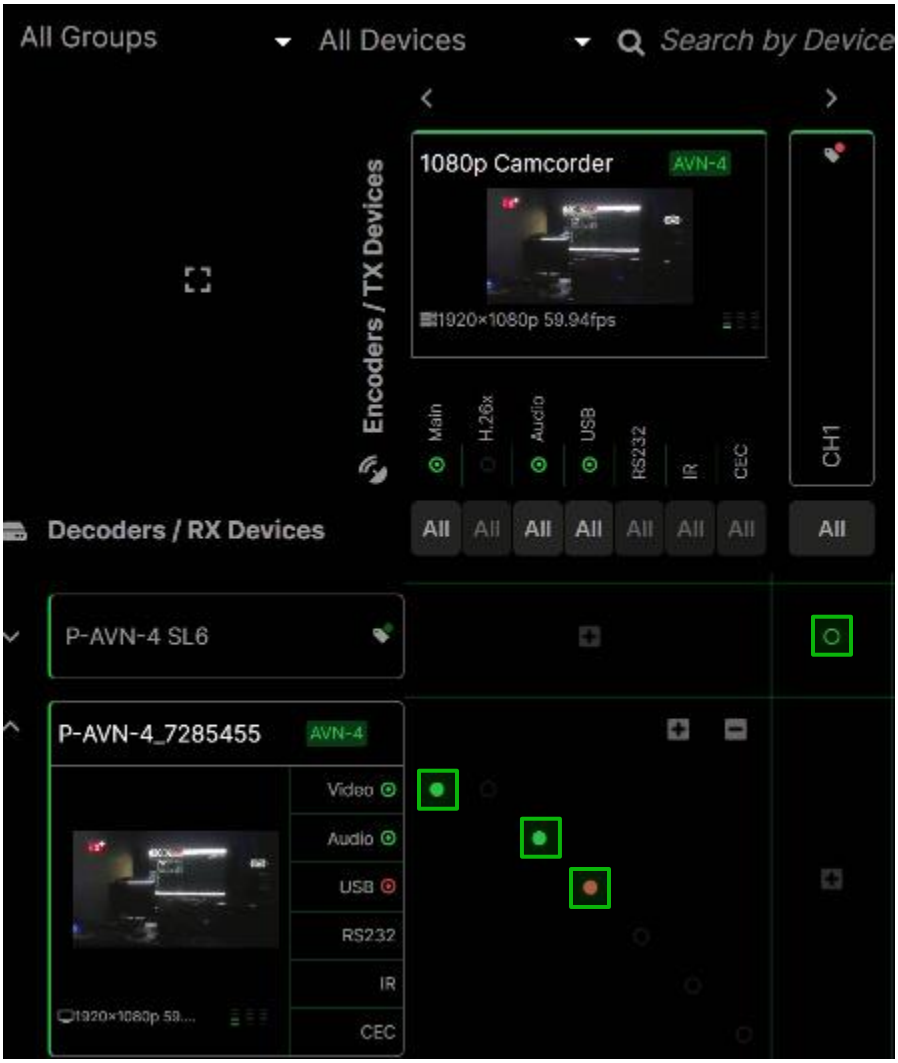
When the Encoder is expanded as described in Section 3.5.2.3, the individual components are also available for Mass Encoder Mapping.



Component-Level View

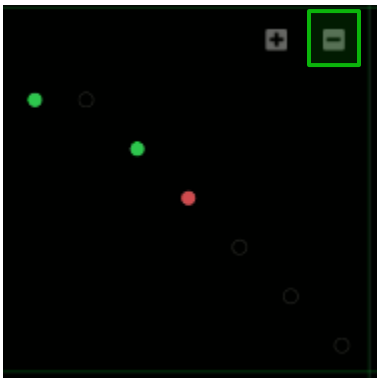
3.5.3.3 Removing Mappings

To remove mappings, simply click again on any configured flow (be it at the Basic full-flow level or at the Advanced component-flow level view) to render it to an unconfigured state.



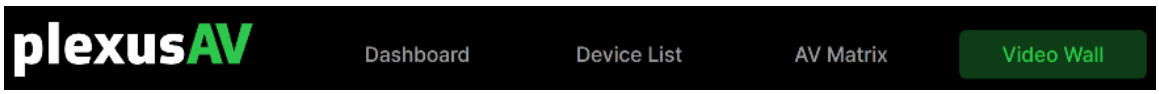
Click Any Active Flow to Remove

While inside of an Advanced mapping, the ‘minus’ icon can be used to pull all components from the mapping as opposed to clicking each individual one.



Remove All Components Option

3.6 Video Wall



Video Wall Page

3.6.1 Video Wall Feature Overview

The Video Wall feature is used to create a single, multiscreen display using a group of Decoders working together in tandem to power grid coordinates in a size x by y display.

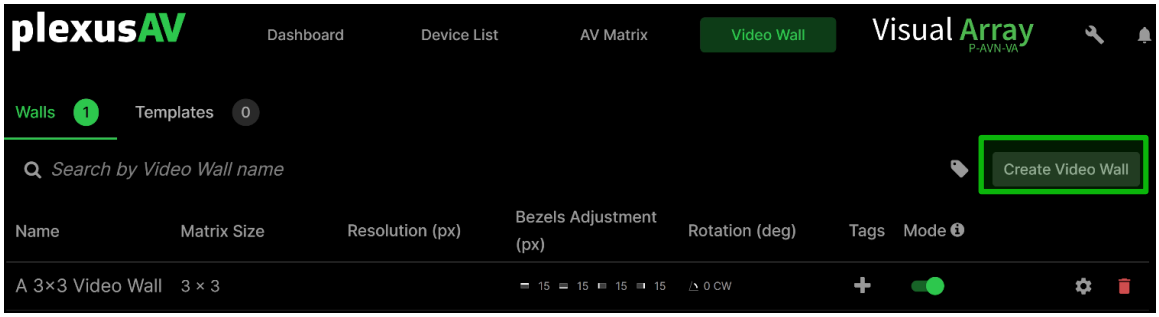
2 x 2 Video Wall Sample

In this above sample, four decoders are used for each of the coordinates (A1, A2, B1 and B2). In this case, each decoder outputs one of the four quadrants with the same timing as the other three.

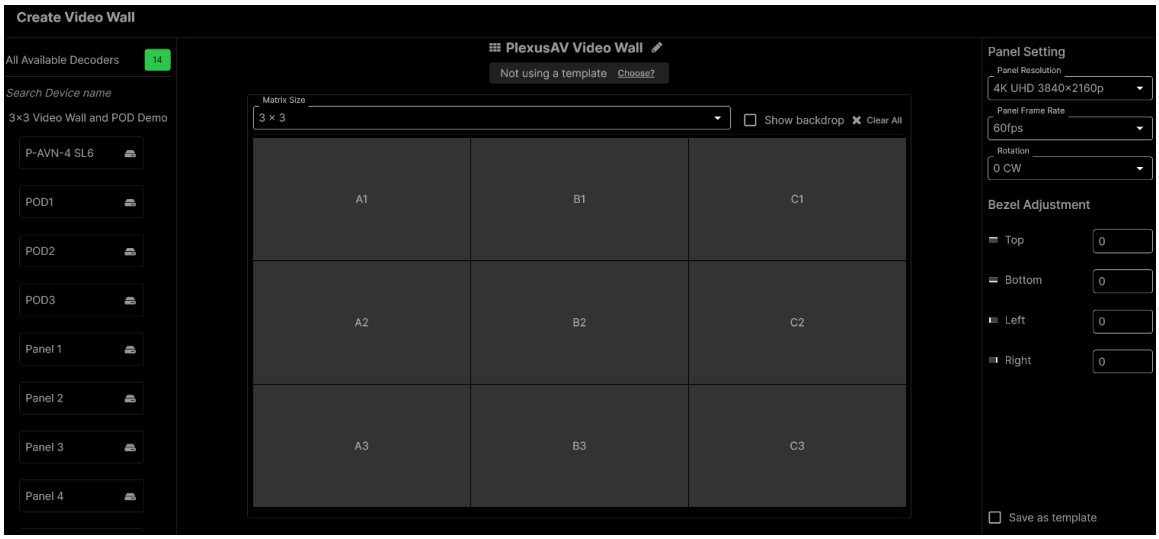
The options available in this menu to modify the display range from target decoders, output panel resolution, and size of bezel. The content powering the display is chosen in the AV Matrix as described in Section 3.5.

3.6.2 Creating a Video Wall

To begin creating a Video Wall, click the ‘Create Video Wall’ Option as shown.

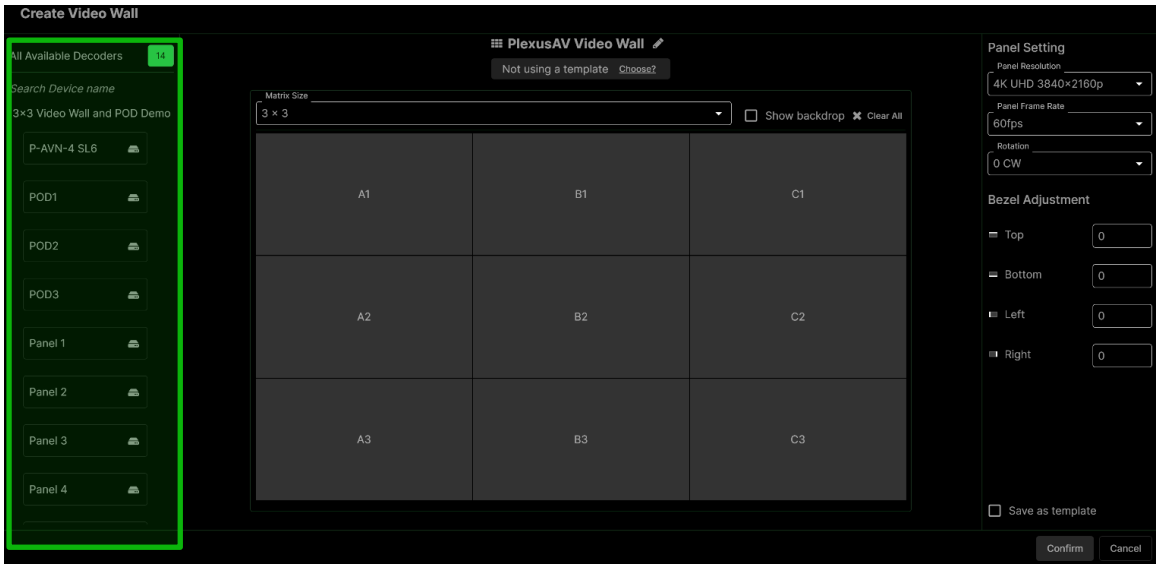


Create Video Wall Icon



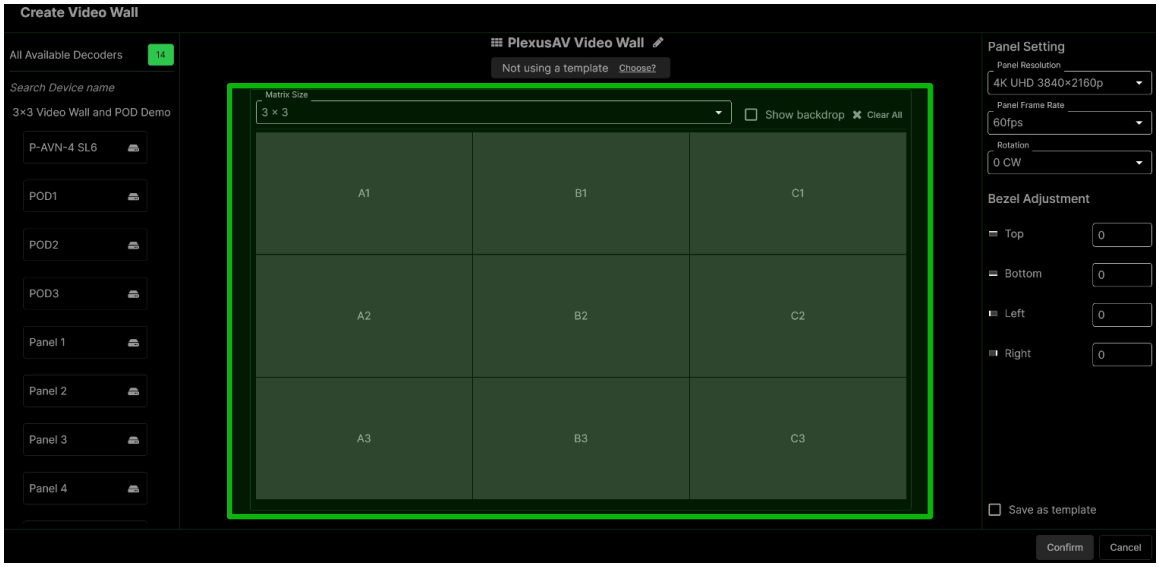
Create Video Wall Menu

The leftmost side of the page will show the list of Available Decoders that are available to power the display. Decoders in this view can be searched by Device Name. The Decoders in this list also will be sorted by Group as defined in Section 3.4.5. Each decoder may only be used to power one display at a time. It is not required for devices to be grouped for the Video Wall, but it does help organizationally to group devices by Wall.



Decoders Available for Selection

The center view will show the demonstrable working area of the Video Wall, including the location of each decoder, size and impact of the configured bezels, and the total number of tiles in the grid.

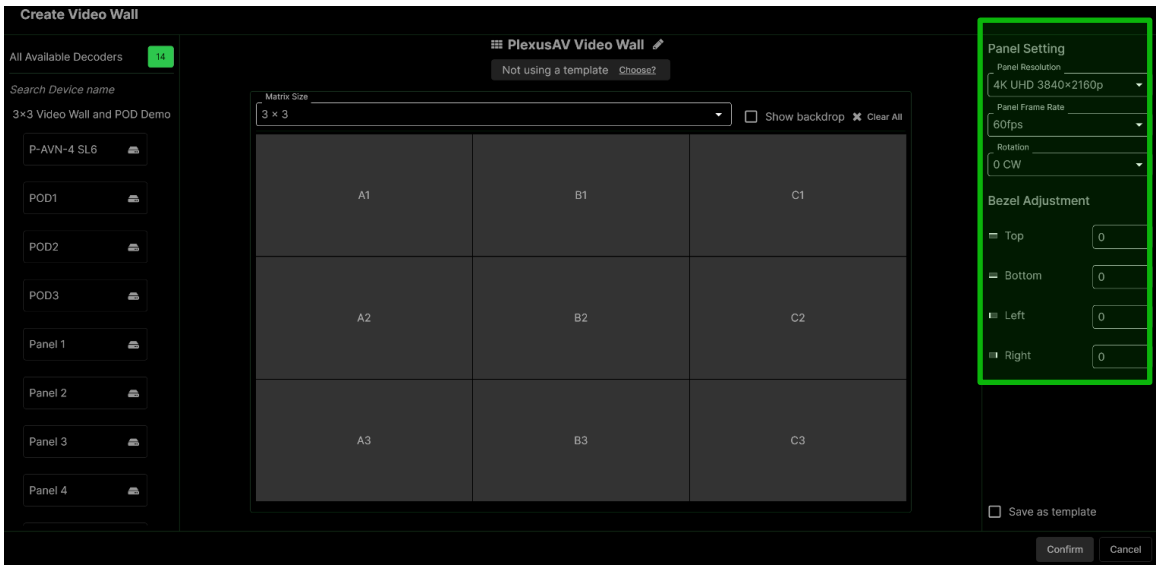


Center Display View

Click the pencil icon to name the Video Wall, then click anywhere outside of the naming menu when manual entry is completed.. This name will be used throughout the GUI, including in this Video Wall table as well as in the AV Matrix as an endpoint. In this same location, templates can be applied for rapid configuration (so long as at least one template exists in the P-AVN-VA. For more information on Templates, see Section 3.6.4.

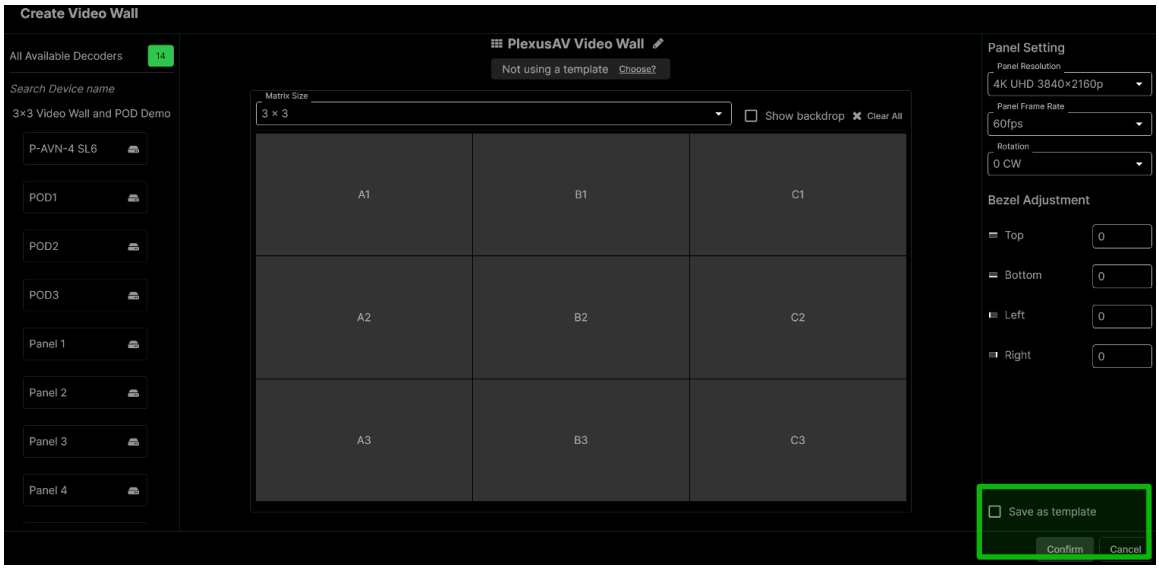
Naming Menu Location

The rightmost view is for settings specific to the panel display itself, including resolution and framerate and bezel size.



Panel Settings Location

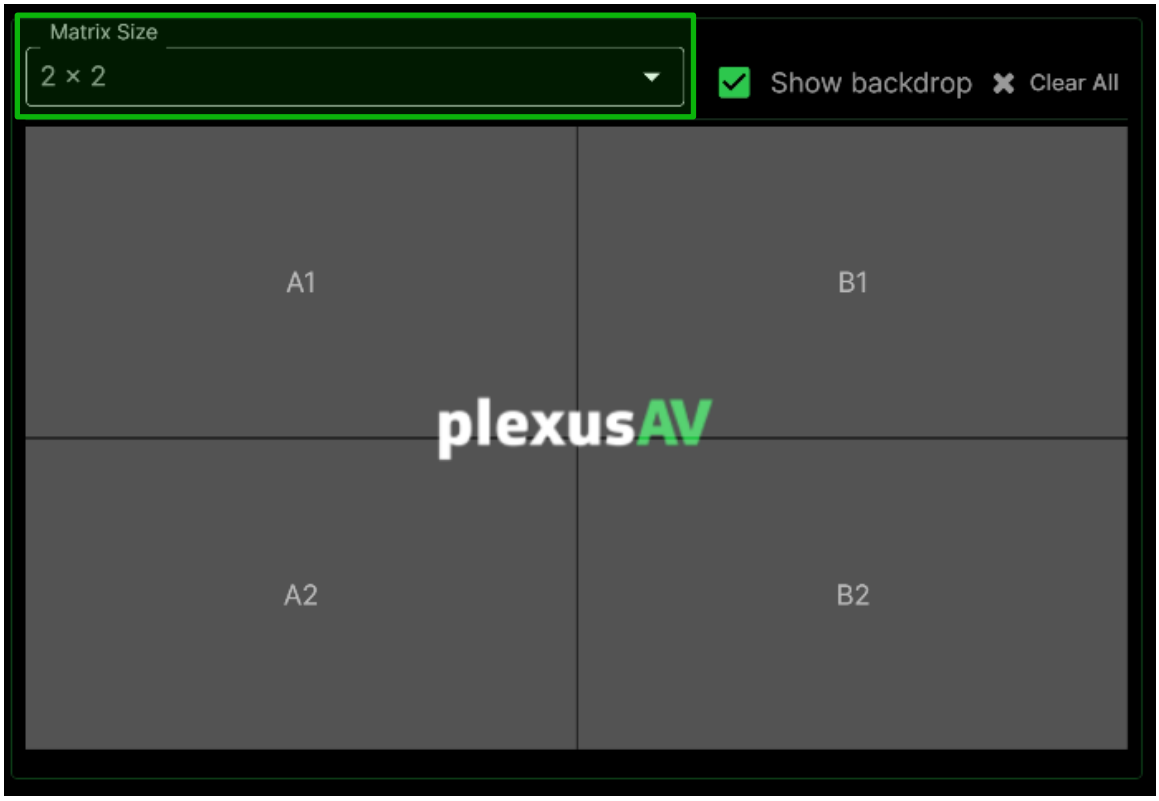
Upon finishing configuration of the Video Wall, the Confirm button will push it to the Video Wall table as described in Section 3.6.3. If the 'Save As Template' box is checked at the time the 'Confirm' button is pressed, the Video Wall will also be saved as a template for future use in configuring additional walls.



Confirm Button Location

3.6.2.1 Choosing Matrix Size

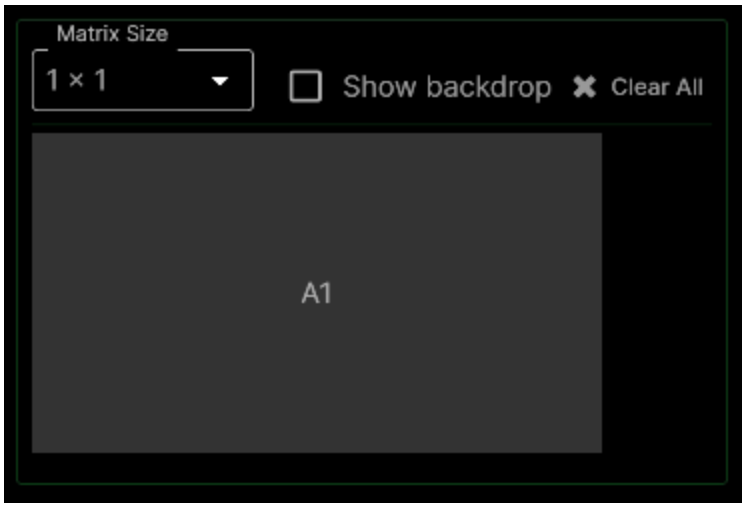
The matrix size dictates how many panels will be used in the Video Wall (and by extension how many decoders will be required to power it).



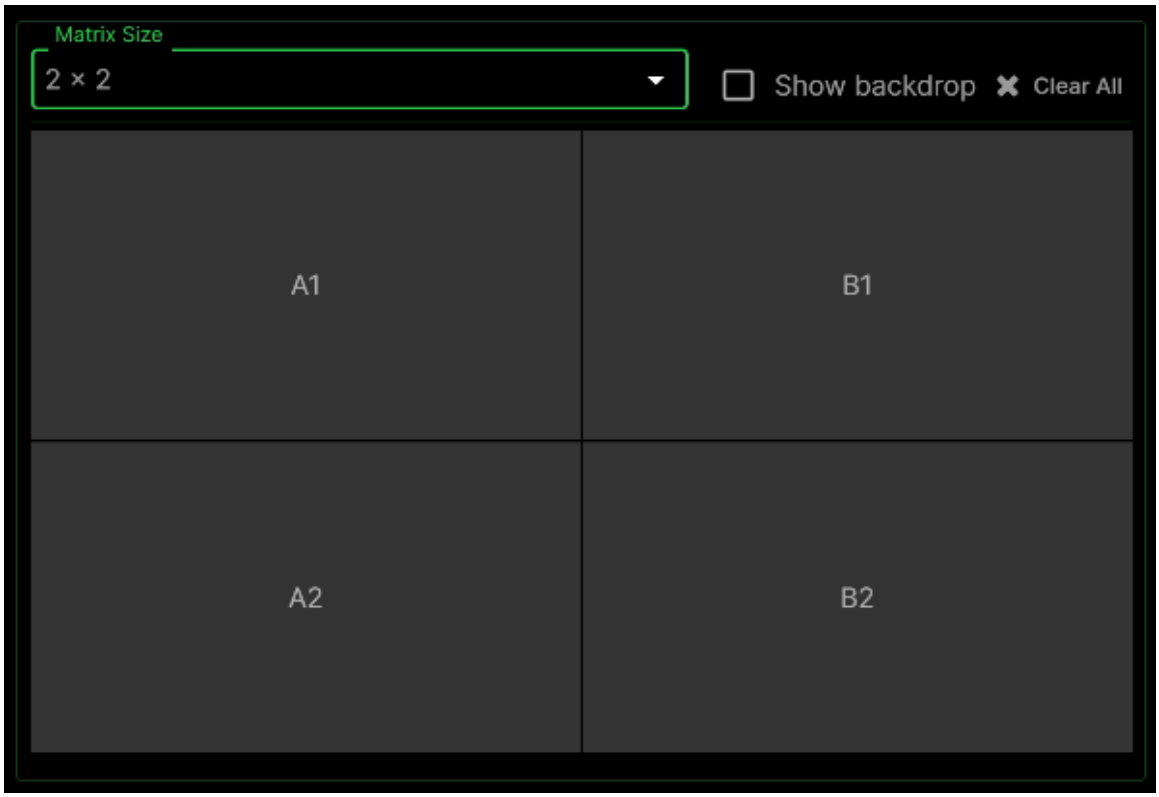
Matrix Size Dropdown Location

There are currently five total dropdown options for the Matrix Size:

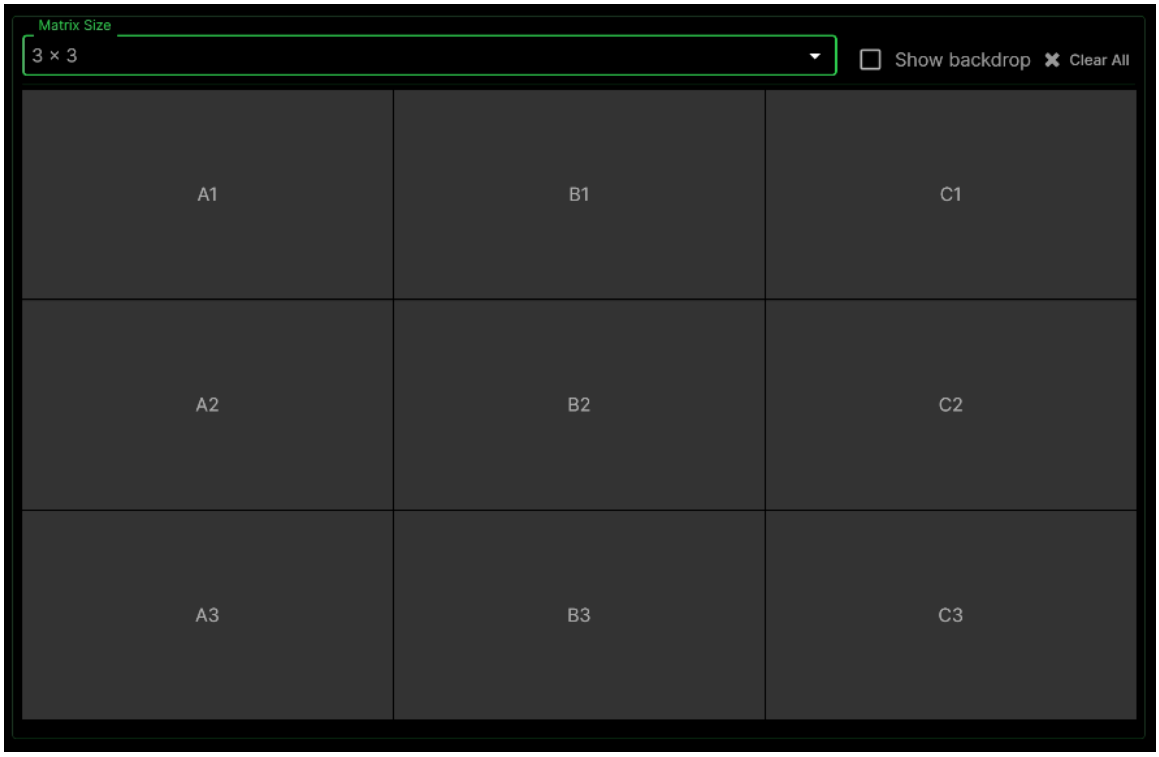
- 1x1 (1 device required)
- 2x2 (4 devices required)
- 3x3 (9 devices required)
- 1x3 (3 devices required)
- 3x1 (3 devices required)



1 x 1 Matrix Size

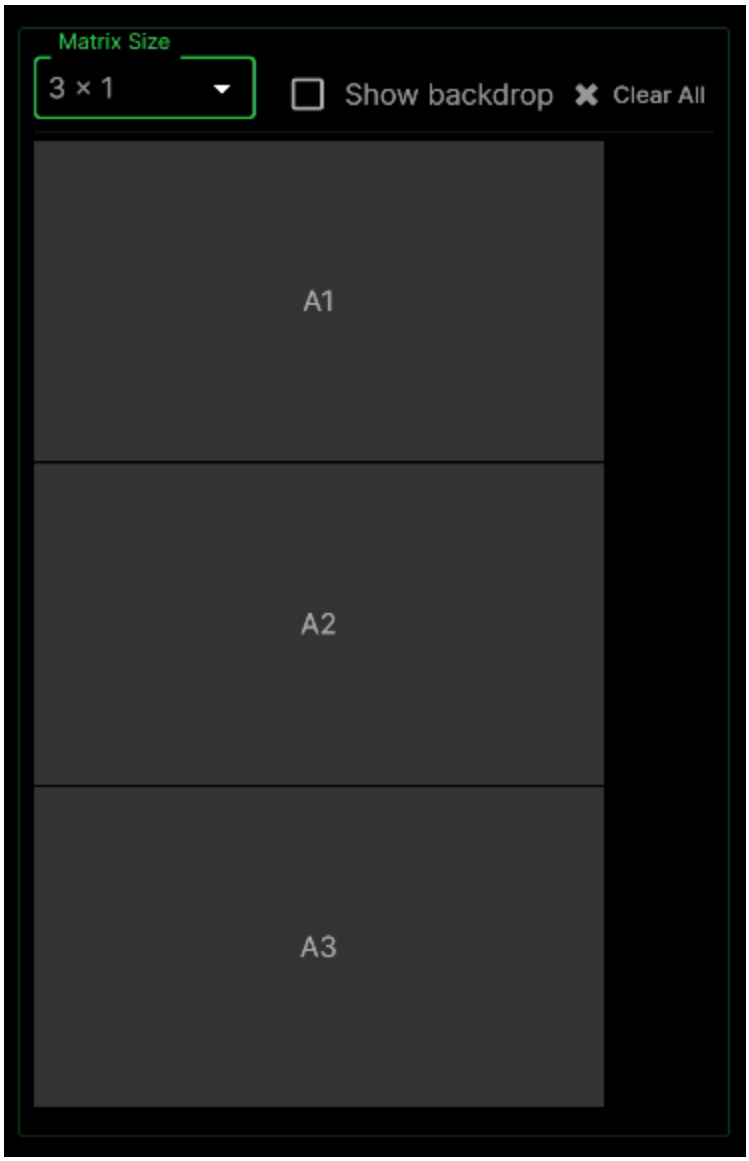


2 x 2 Matrix Size



3 x 3 Matrix Size

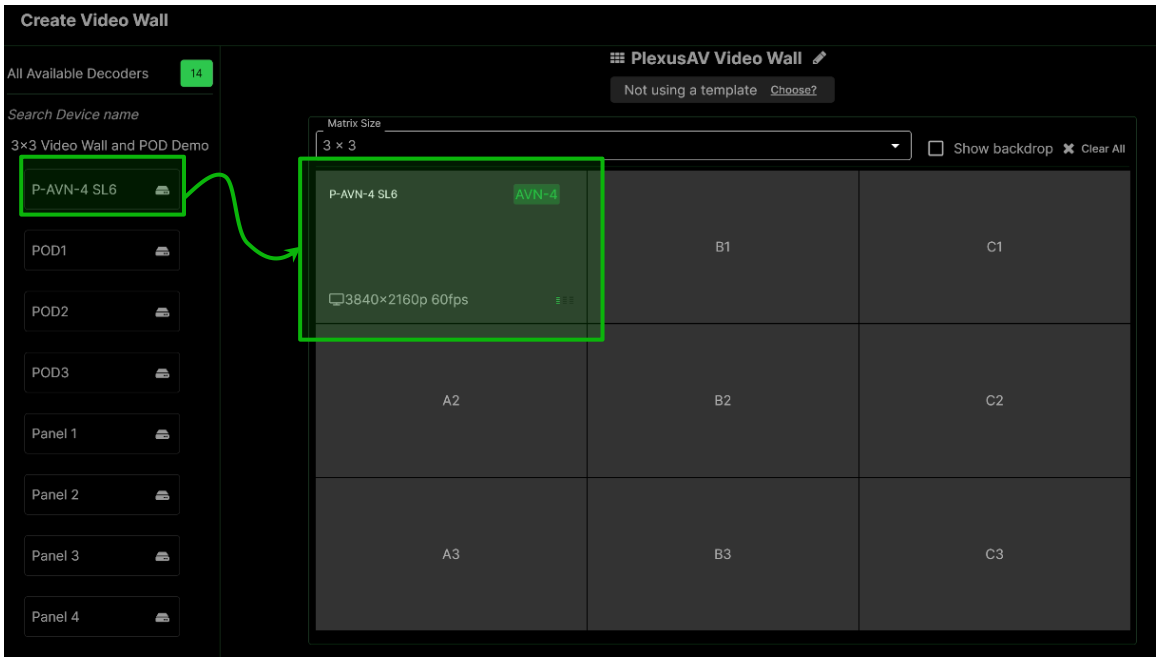
1 x 3 Matrix Size



3 x 1 Matrix Size

3.6.2.2 Adding Devices to the Video Wall

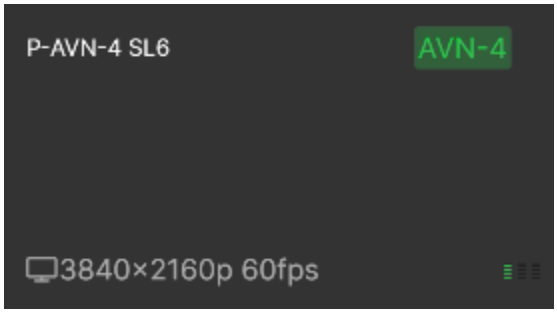
After declaring the size of the Video Wall, populate the panels by dragging Decoders from the available list on the left and dropping them into the grid location (A/B 1/2/3).



Drag and Drop Action Area

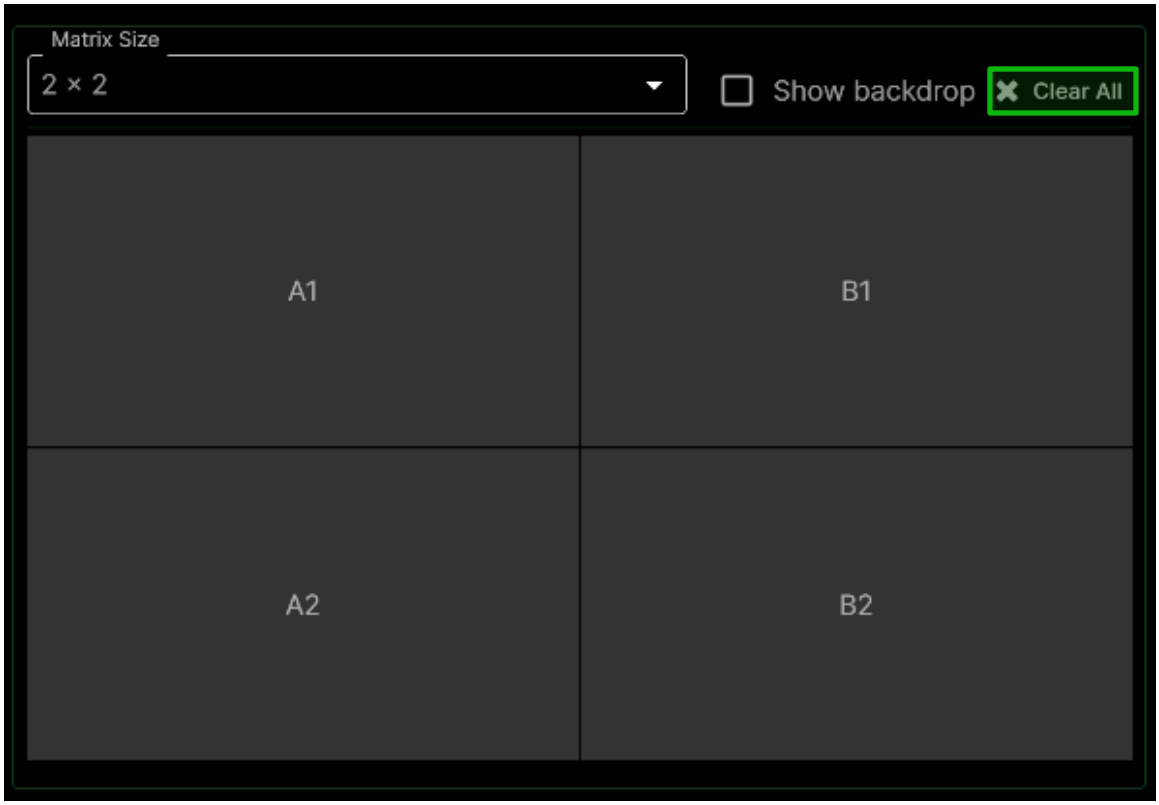
Upon dropping the Decoder into the selected grid, the target panel will update its display with the following information from the decoder:

- Decoder Name (top left corner)
- Model Number (top right corner)
- Video Resolution (bottom left corner)
- Link Usage (bottom right corner)



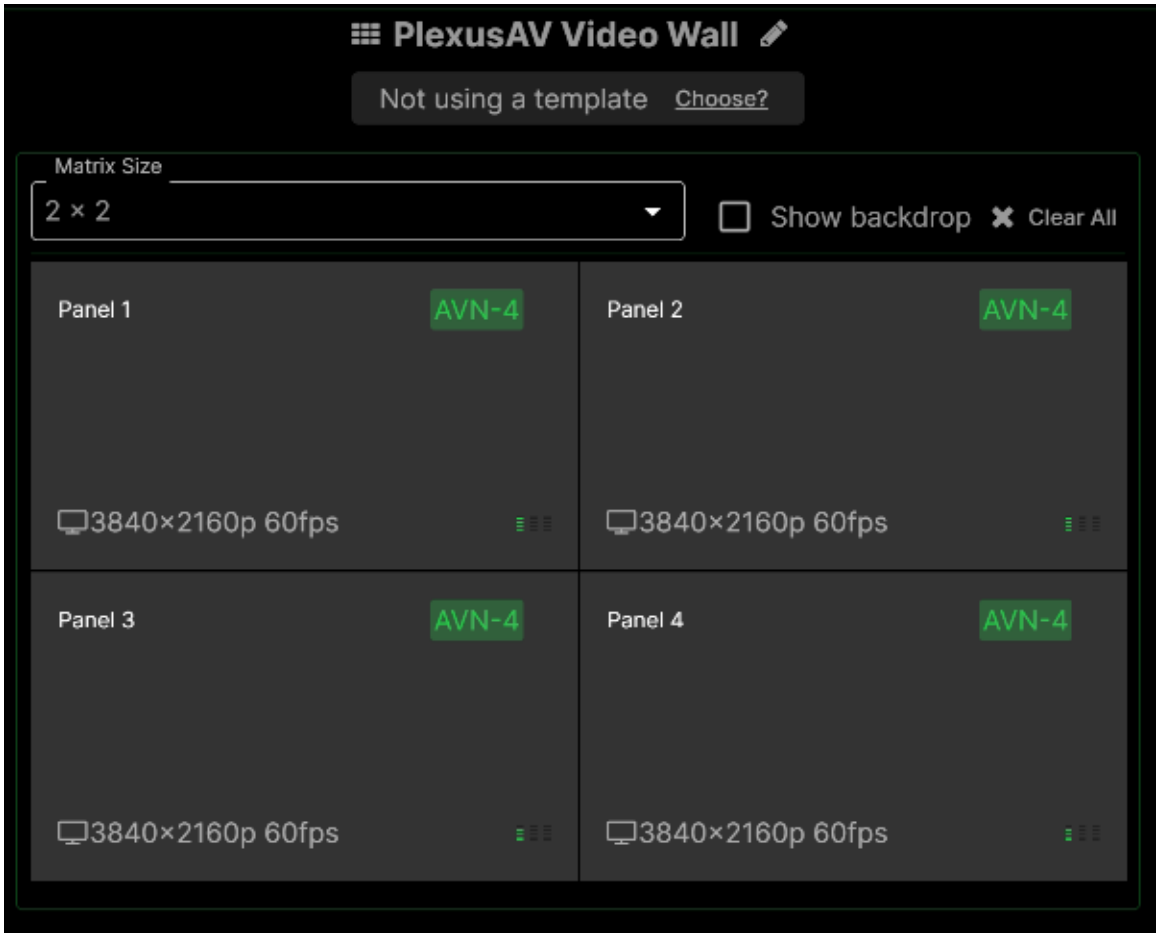
Target Panel Information

Click the ‘Clear All’ option to remove all assigned Decoders from the Video Wall.



Clear All Button Location

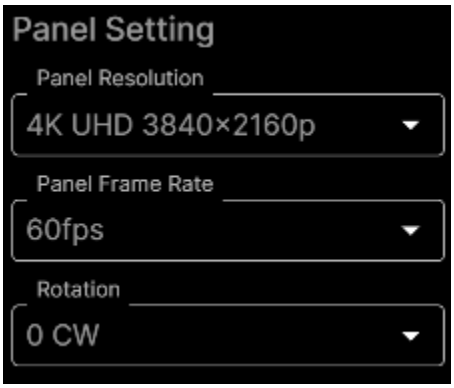
Add a decoder to each of the available panes before moving onto the Panel Settings.



Fully Populated 2 x 2 Video Wall

3.6.2.3 Panel Settings

Panel Settings are used for the overall grid display after devices are assigned.



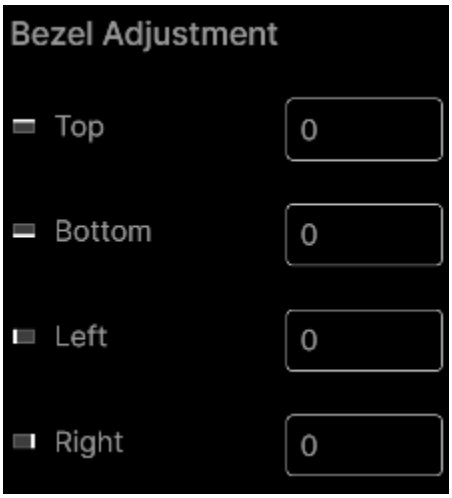
Panel Settings

Panel Settings

Section	Options	Description
Panel Resolution	4K UHD 3840x2160p Full HD 1920x1080p HD Ready 1280x720p	The video resolution of the full panel display.
Panel Frame Rate	60fps 50fps 30fps 25fps	The frame rate of the full panel display.
Rotation	0 CW 90° CW 180° CW 90° CCW	Rotate the panel display.

3.6.2.4 Bezel Adjustment

Depending upon the model and physical characteristics of the physical panels used in the Video Wall display, it may be useful to add a Bezel to the connecting edges of the screens. The Bezel Adjustment is present to adjust the size and location of the added Bezels. Adding a non-zero Bezel will push a blue bar onto the edges of the GUI display, and a black bar onto the edges of the physical video display with correspondence to the GUI view.



Bezel Adjustment Menu

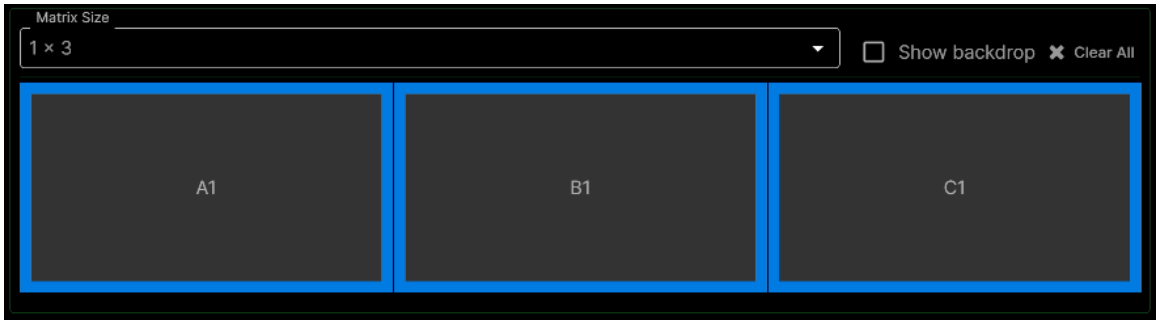
Any of the above fields will accept positive integer values, though it generally is recommended to use size 10 to 15 for most displays.

These samples display size 10 Bezel Adjustment on the 1 x 3 Matrix view.

Top

Top and Bottom

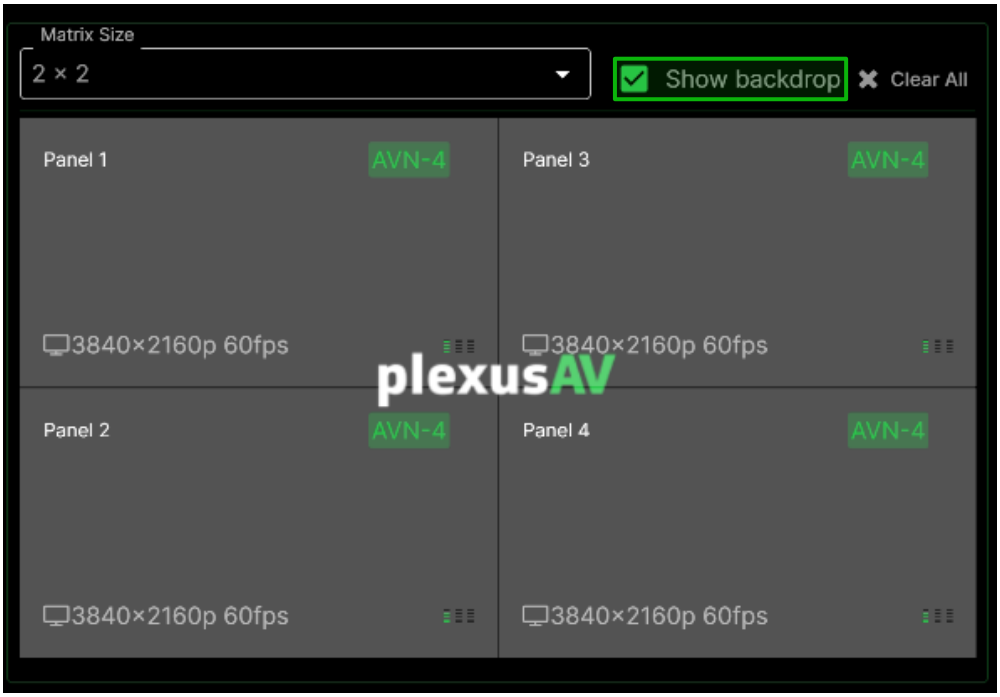
Top, Bottom, and Left



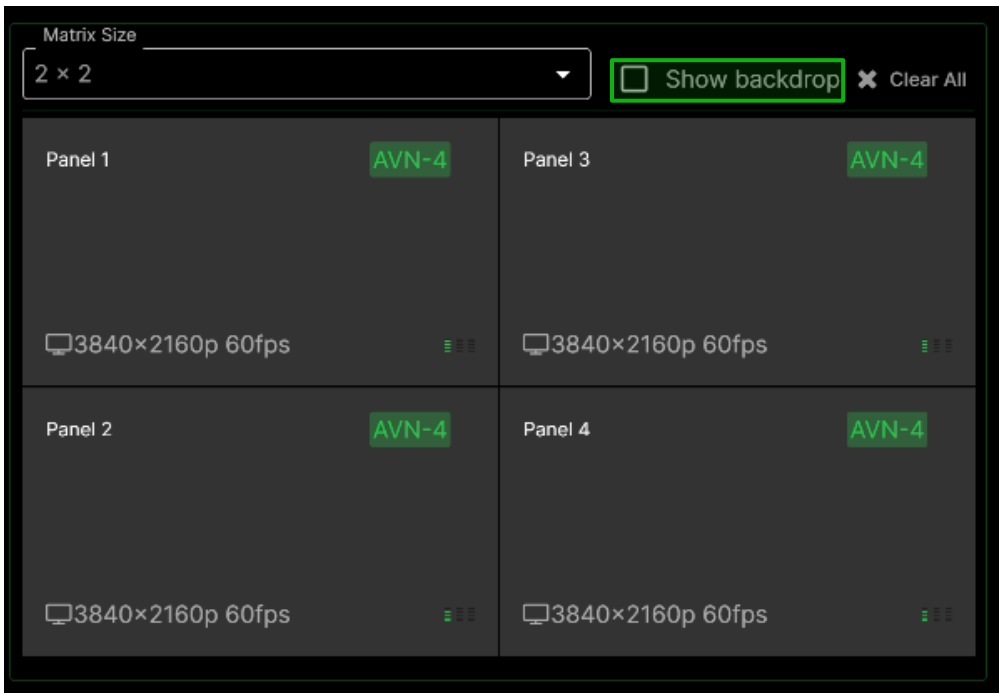
Top, Bottom, Left, and Right

3.6.2.5 Show Backdrop Option

When choosing matrix and bezel size, it can be useful to preview how the grid-view will look with the applied changes. With the 'Show Backdrop' button, a graphic is inserted in the GUI to show how the Decoders would segment the image.



Backdrop Enabled



Backdrop Disabled

3.6.3 Walls Menu

After creating one or more Video Walls, the Walls page will populate with the new entry.

Walls Page

Walls Page Table

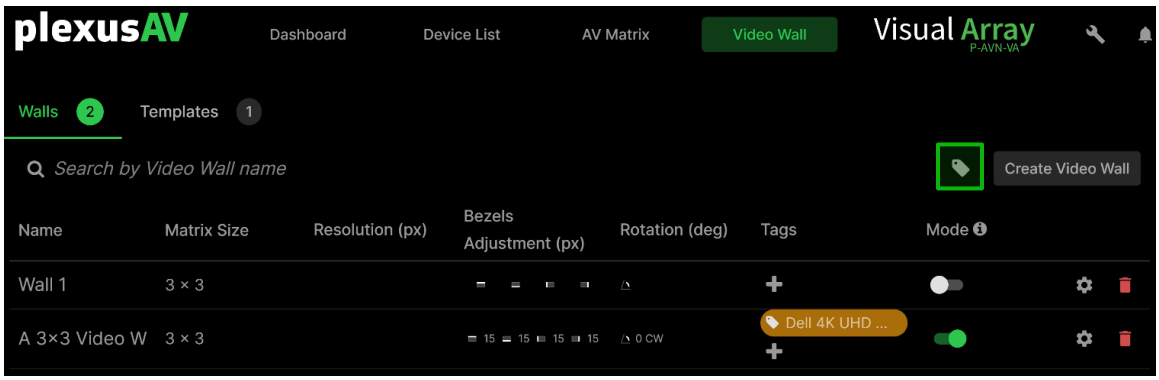
Section	Options	Description
Name	User-Defined Entry	The label assigned to the Video Wall
Matrix Size	1x1, 2x2, 3x3, 1x3, 3x1	The configured Matrix size
Resolution (px)	4K UHD 3840x2160p Full HD 1920x1080p HD Ready 1280x720p 60fps, 50fps, 30fps, 25fps	The configured Resolution and Framerate of the Video Wall
Bezels Adjustment	Top – integer Bottom – integer Left – integer Right – integer	The configured Bezel Adjustment values. All four of the edges will be displayed on this column.
Rotation (deg)	0 CW, 90° CW, 180° CW, 90° CCW	The configured panel rotation setting.
Tags		After creating one or more tags as described in Section x.x.x, use the plus icon to assign tags to the Video Wall for additional filtering options.
Mode		Enable to add the Video Wall as a single endpoint for flow routing on the AV Matrix. It is recommended to leave this setting enabled for ease of routing content to the Video Wall.
	N/A	Launches the Video Wall menu described in Section 3.6.2.
	N/A	Delete the Video Wall Entry

3.6.3.1 Walls Filtering Options

When many Video Walls are created, it will become useful for declutter to utilize available filtering options. Use the ‘Search by Video Wall Name’ bar to narrow down the table view.

Search Bar Location

Assign Tags to existing Video Walls to add filter-by-tag functionality. Before attempting to apply tags to a Video Wall, make certain one or more tags are created as described in Section x.x.x. To filter the view by tag, click on the tag icon as indicated below, then choose the tags that need to be viewed.



Without Tag Filter Applied

With Tag Filter Applied

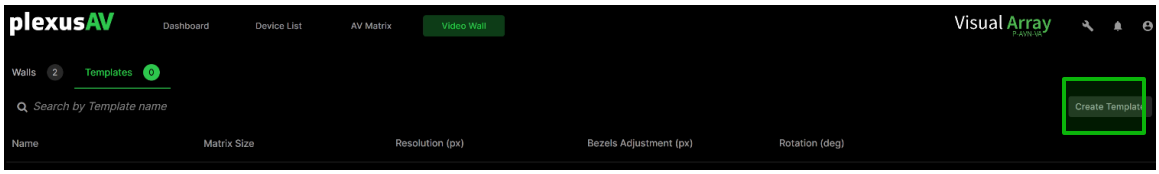
The selected Tag filter view will also apply to Templates as described in Section 3.6.4.

3.6.4 Templates Menu

Templates are useful to reduce time spent with redundant configurations across multiple Video Walls. When a template is created, it will be available for future use to push all settings into new Video Walls going forward.

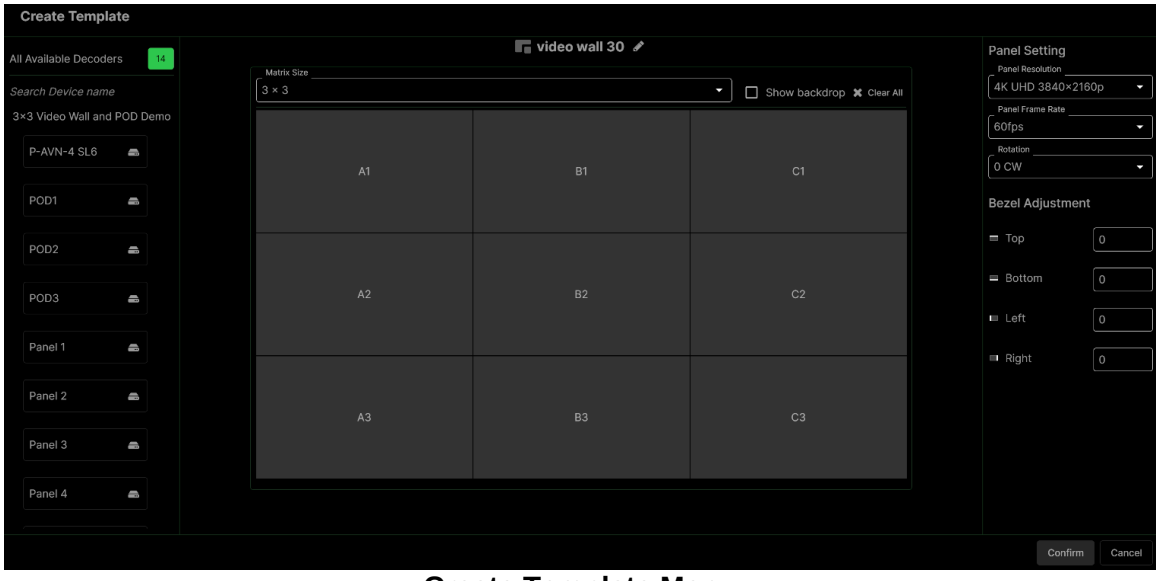
There are two ways to create Templates:

1) Use the 'Save As Template' option while creating the Video Wall (as described in Section 3.6.2)
2) Use the 'Create Template' option as shown



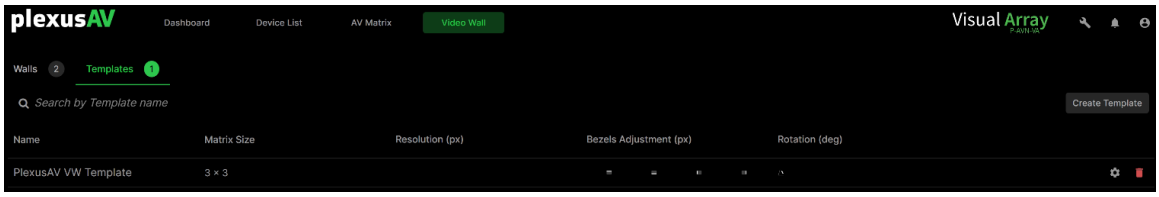
Create Template

When clicking 'Create Template', the menu shown here is nearly identical to that described in Section 3.6.2 (exception of 'Save As Template' and 'Apply Template' options).



Create Template Menu

After creating a Template, the new entry will be available on the Templates page.

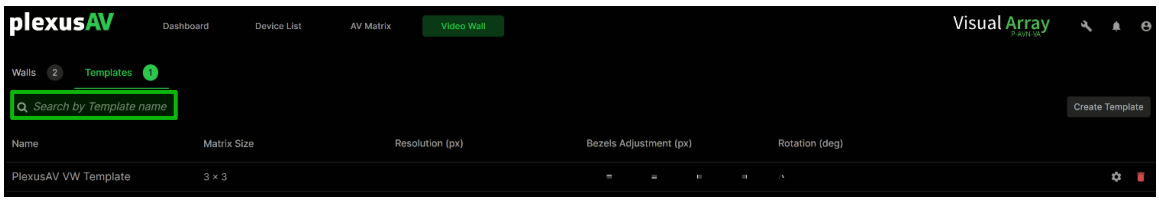


Added Template

Templates Page Table

Section	Options	Description
Name	User-Defined Entry	The label assigned to the Template
Matrix Size	1x1, 2x2, 3x3, 1x3, 3x1	The configured Matrix size
Resolution (px)	4K UHD 3840x2160p Full HD 1920x1080p HD Ready 1280x720p 60fps, 50fps, 30fps, 25fps	The configured Resolution and Framerate of the Video Wall
Bezels Adjustment	Top – integer Bottom – integer Left – integer Right – integer	The configured Bezel Adjustment values. All four of the edges will be displayed on this column.
Rotation (deg)	0 CW, 90° CW, 180° CW, 90° CCW	The configured panel rotation setting.
	N/A	Launches the Template menu for editing.
	N/A	Delete the Template Entry

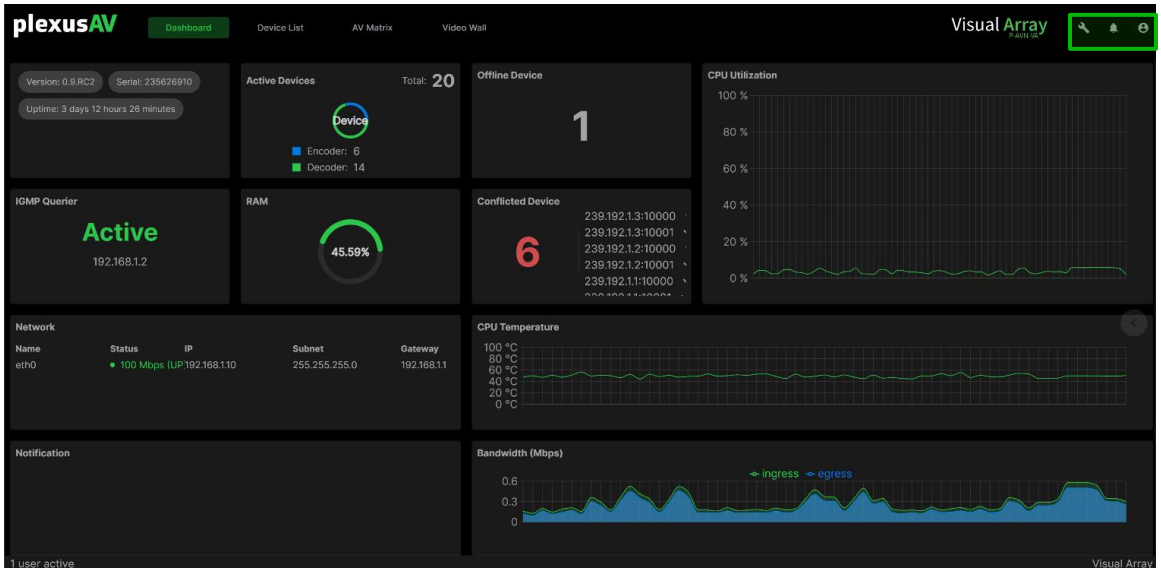
If needed, use the Search Bar to filter through Templates by name.



Search Bar Location

3.7 Tools Menu

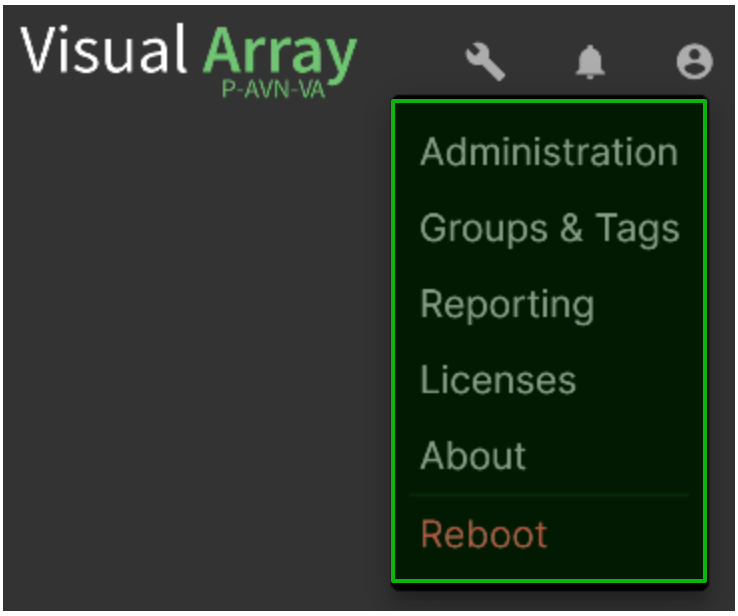
The Tools Pane is used for several Administrative functions and also contains the alarming and logging that corresponds to the Notifications section. To access the Tools Pane, there are three icons at the top right of the menu.



Icons Location

To access the Tools Pane, click the wrench icon to launch the menu.

Tools Access Icon



Tools Menu

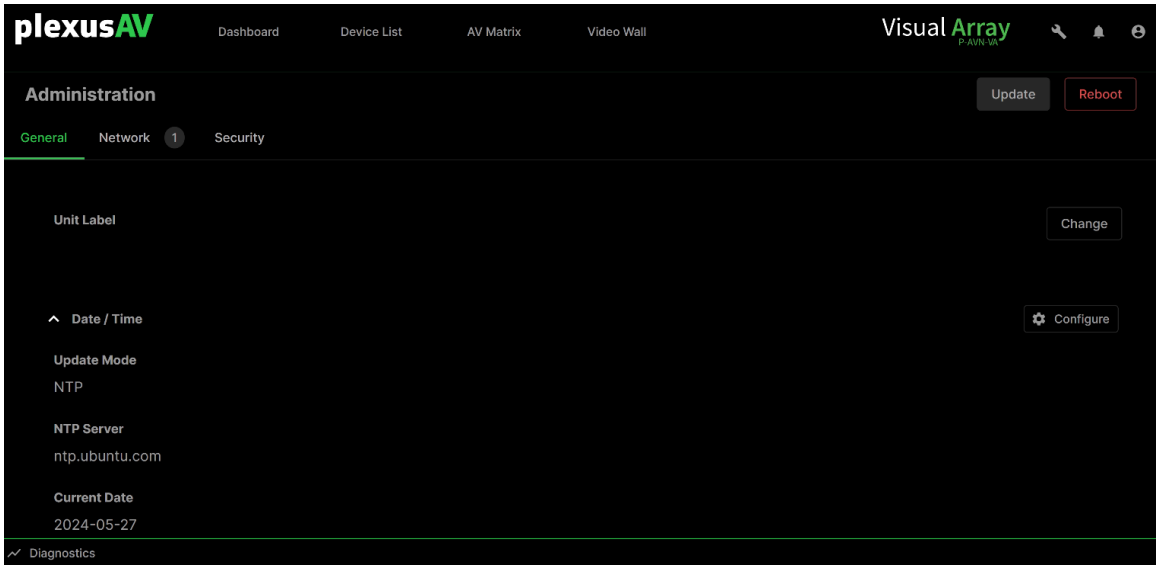
The Tools menu can be hidden again by clicking anywhere in the GUI, outside of the Tools menu.

General Description

Section	Description
Administration	General administrative features such as Time, Networking, CA Certificate settings.
Groups & Tags	Define and organize Groups and Tags utilized throughout the System.
Reporting	Aggregates active and alarm logs for organized view.
Licenses	View and change the system licensing.
About	System Information such as Software Version , Serial Number, UUID.
Reboot	Reboot the P-AVN-VA.

3.8 Administration

While in the Tools Menu as described in Section 3.7, clicking ‘Administration’ will navigate to the Administration page. This page is used for general system level options, namely date/time, networking, and CA Certificate options (for the HTTPs).



Administration Page

There are three tabs on this menu:

- General – unit alias and datetime
- Network – Configure the networking for the system
- Security – CA Certificate options

3.8.1 Unit General Settings

After accessing the Administration menu as described in Section 3.8, the General Tab has two features for use. Configure unit label and configure datetime.

3.8.1.1 Configuring Unit Label

After accessing the General Tab as described in Section 3.8.1, to configure the Unit Label, click the 'Change' tab as shown:

Unit Label

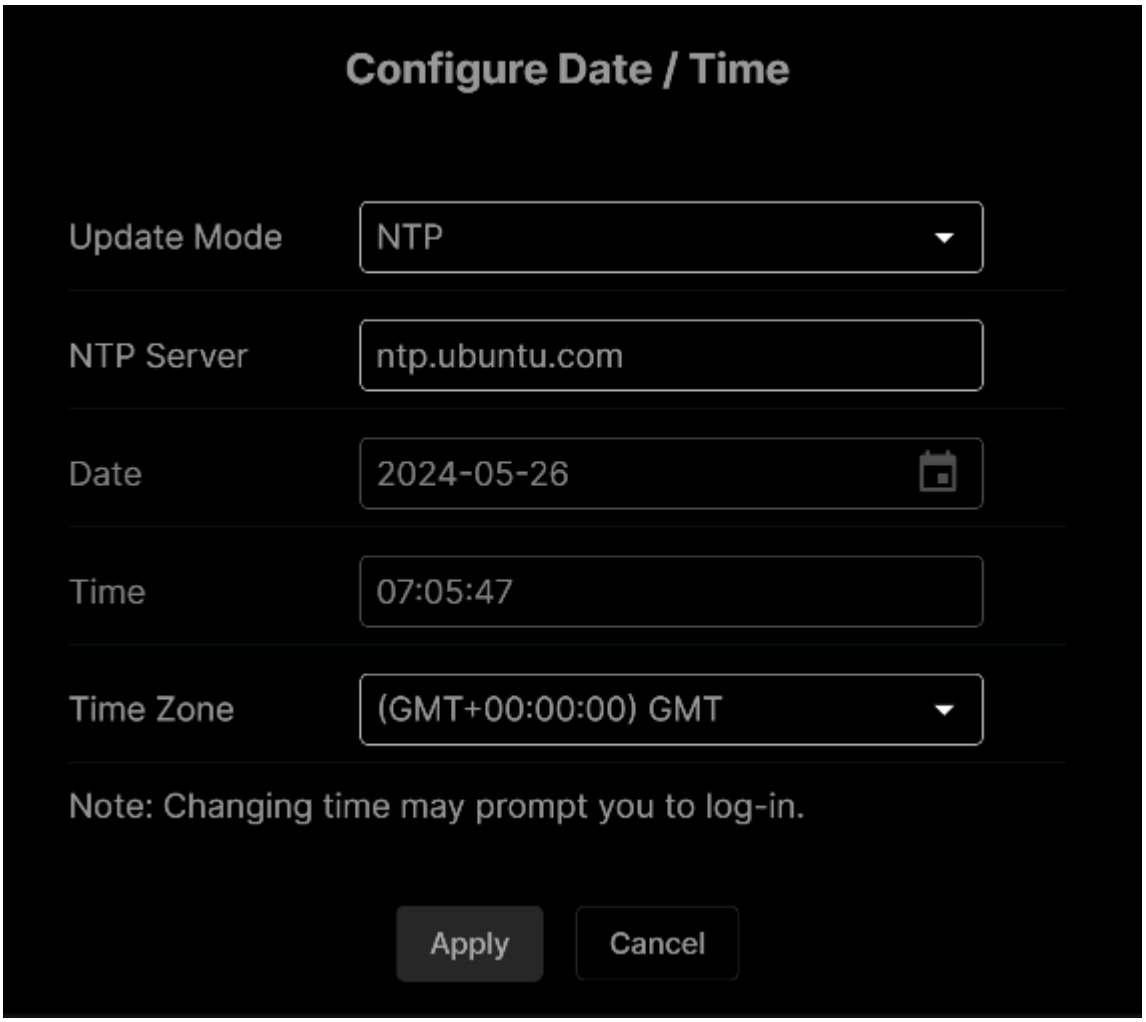
Editing Unit Label

After entering any string into the 'Unit Label' field, click the OK button to apply or the 'Cancel' button to discard changes.

3.8.1.2 Configuring Unit Date and Time

After accessing the General Tab as described in Section 3.8.1, to configure the Unit Label, click the 'Change' tab as shown:

Configure Button Location



Configure Date / Time Menu

Date and Time Menu Description

Section	Options	Description
Update Mode	NTP or Manual	When set to NTP, the user provides location information of the NTP server for date and time sync. When Manual, the user will define system Date and Time
NTP Server	XXX.XXX.XXX.XXX Domain Name	Defines IP Address or Domain Name of the NTP server to be used for NTP mode.
Date	YYYY/MM/DD	Manual mode setting format for the system date. The calendar widget may be used for efficiency

Time	00:00:00 – 24:00:00	Manual mode setting for the system time. The time is based on a 24-hour clock
Time Zone	-12:00:00 ~ +13:00:00	Applies a time offset. Useful for time zone changes or daylight savings time

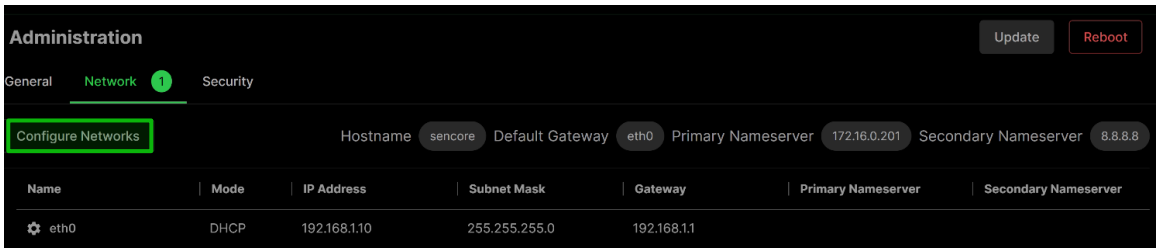
When finished configuring the Date and Time for the system, click ‘Apply’ to push the new settings to the unit.

3.8.2 Unit Networking Settings

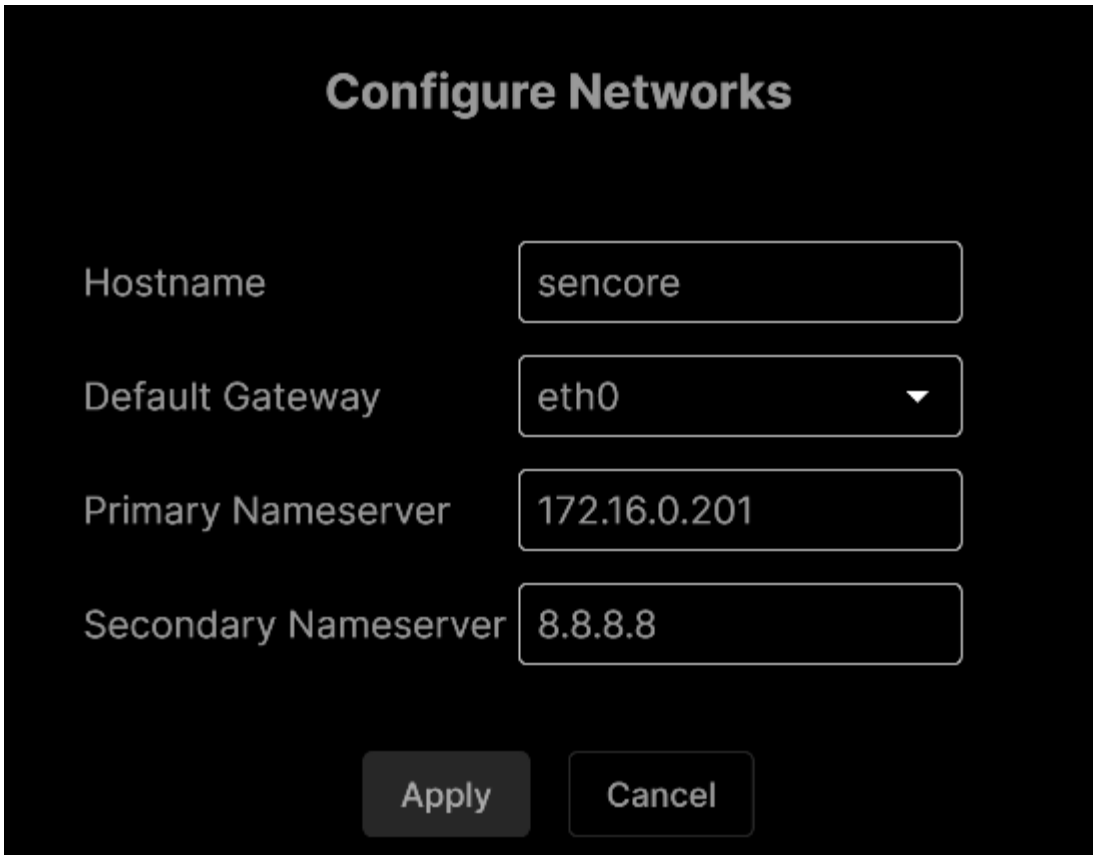
After accessing the Administration menu as described in Section 3.8, the Network Tab is used to configure the Hostname, DNS and NIC Settings. There are also other metrics displayed such as NIC MAC address, Link and TX/RX Rate.

3.8.2.1 Configuring Hostname and DNS

Click the ‘Configure Networks’ as shown in the image below:



Configure Networks Option Location



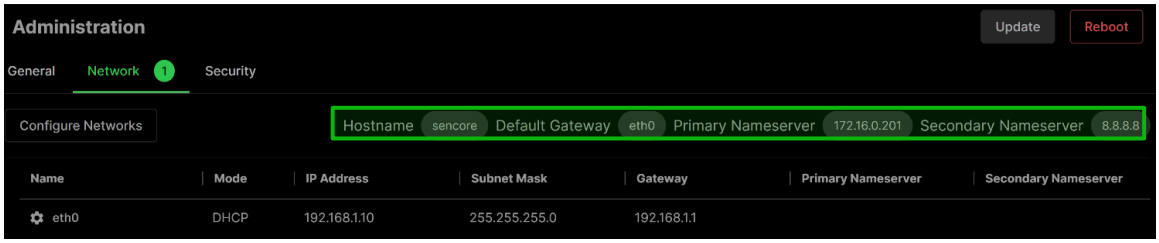
Configure Networks Menu

Group Table Description

Name	Range	Description
Hostname	Alphanumeric, no spaces allowed	Defines optional system name
Default Gateway	Eth0, Eth1	Defines which physical port gateway address is to be used
Primary Nameserver	xxx.xxx.xxx.xxx	IP address of Primary (DNS) nameserver
Secondary Nameserver	xxx.xxx.xxx.xxx	IP address of Secondary (DNS) nameserver

After entering the hostname, gateway and nameserver settings, click the ‘Apply’ key to push the changes to the P-AVN-VA.

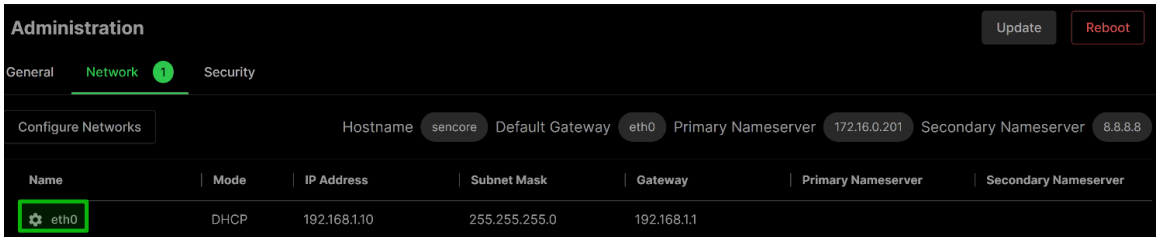
The setting changes will be available for view in the ‘Network’ page as shown below:



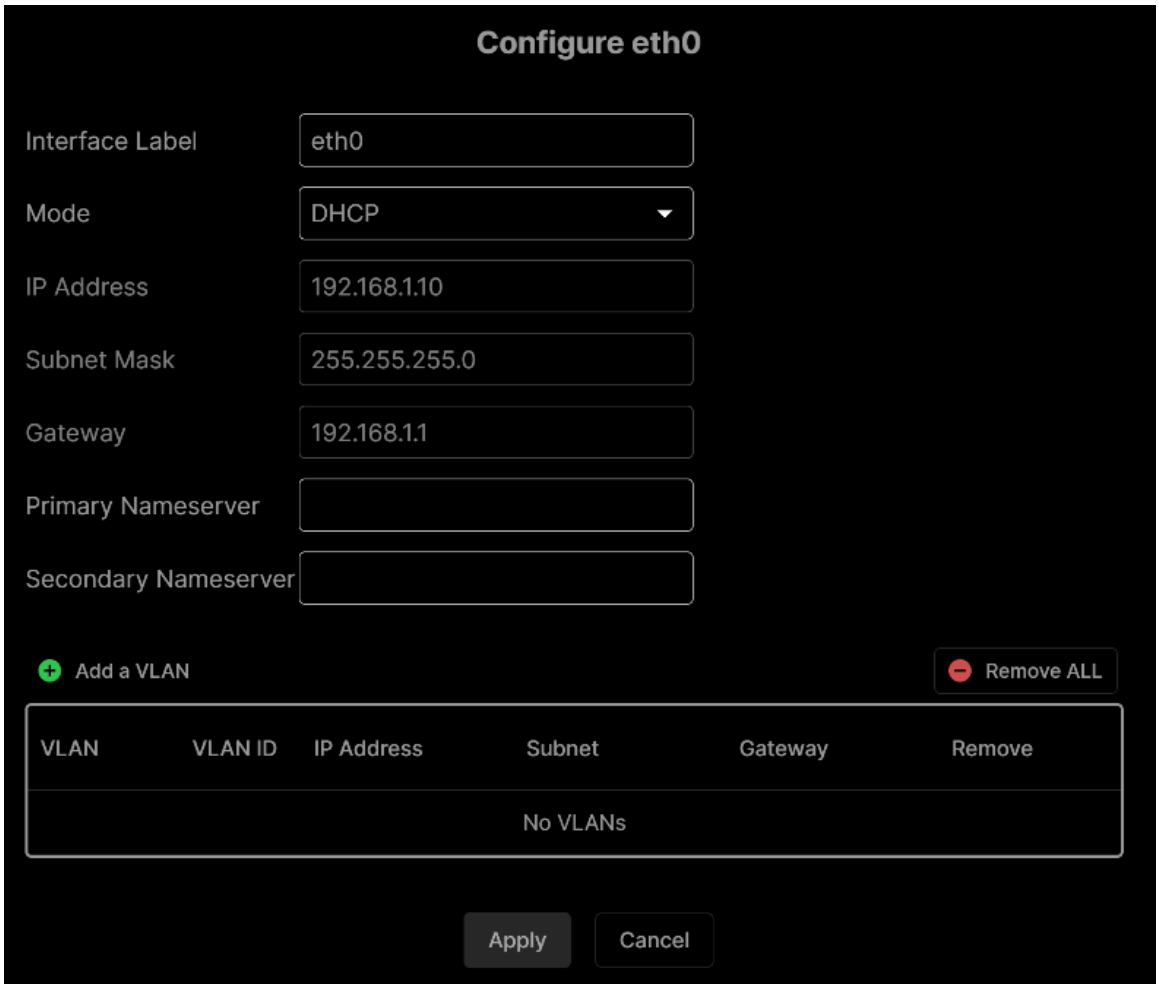
Viewing Hostname and DNS Settings

3.8.2.2 Configuring NIC-Settings

To change the NIC-Level Settings for the P-AVN-VA, click the ‘Cog’ icon as shown:



NIC Configuration Location



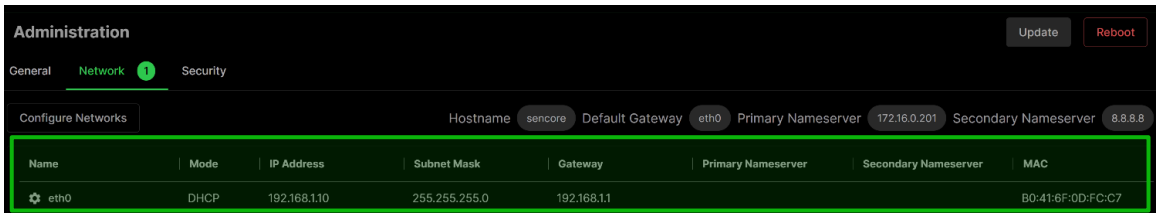
Configure NIC Menu

Group Table Description

Section	Options	Description
Interface Label	User Entered (eth0 by default)	User defined port names
Mode	DHCP, Static	*DHCP* allows network server to provide IP address. *Static* requires the user to define the IP address to be used
IP Address	xxx.xxx.xxx.xxx	Static Mode IP address entry
Subnet Mask	xxx.xxx.xxx.xxx	Static Mode subnet mask entry
Gateway	xxx.xxx.xxx.xxx	Static Mode gateway entry

After finishing changes, click the apply button. [*Note: Edit these menus carefully; the web-interface is only accessible from the IP address of this Ethernet port.]*

NIC settings and statuses are viewed in the table below the 'Configure Networks' button.

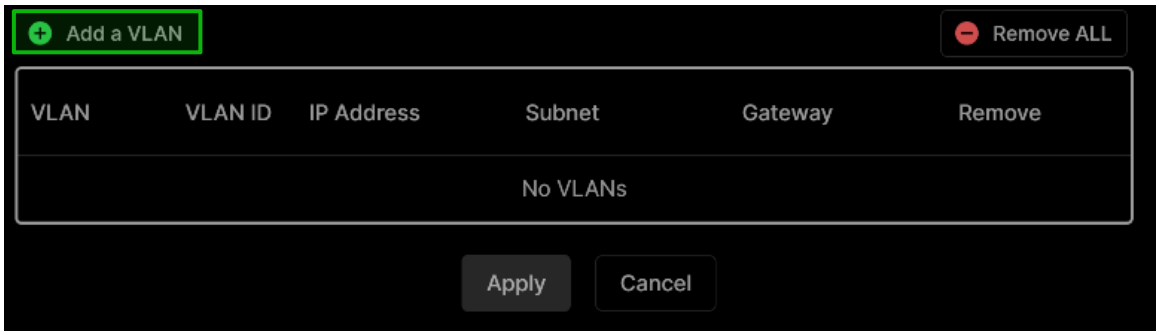


NIC Status and Configuration View

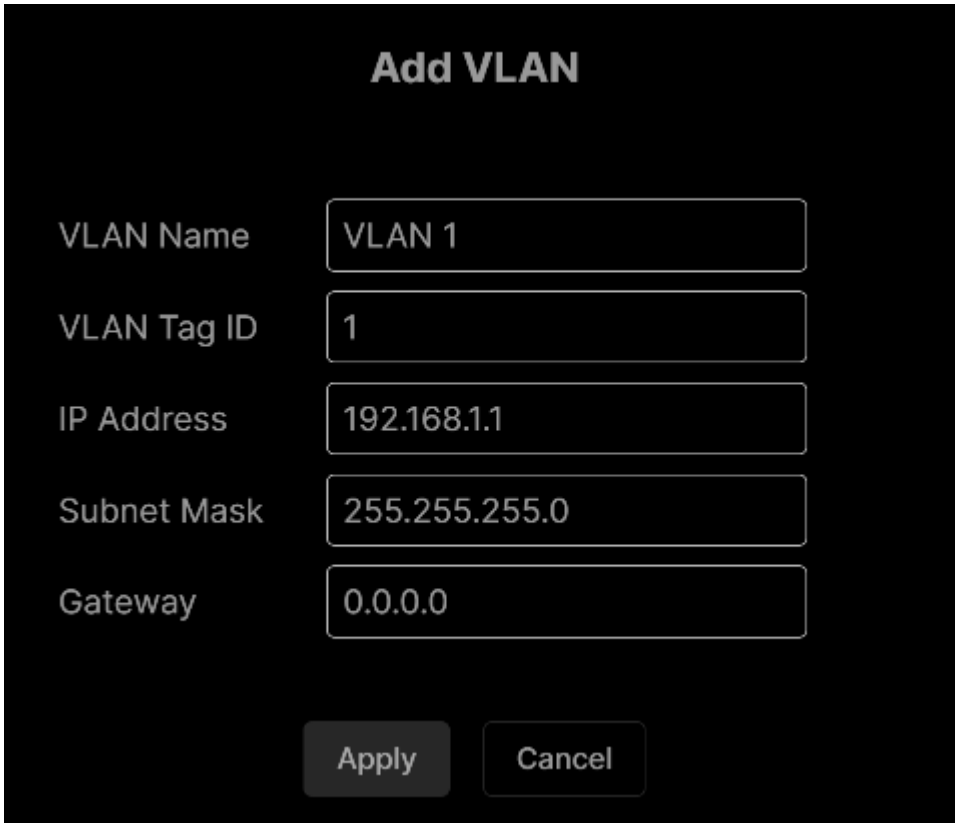
Group Table Description

Column	Description
Name	The name selected for the NIC
Mode	DHCP or Manual
IP Address	Negotiated or assigned IP Address
Subnet Mask	Negotiated or assigned Subnet Mask
Gateway	Negotiated or assigned Gateway
MAC	Physical MAC of the NIC (xx:xx:xx:xx:xx:xx)
Link Status	Negotiated Link Rate (UP/DOWN)
Tx	Aggregate NIC Tx Rate, in Mbps
Rx	Aggregate NIC Rx Rate, in Mbps

To add a VLAN to the NIC, click the “Add a VLAN” button to expose the “Add VLAN” menu.



Add VLAN Icon



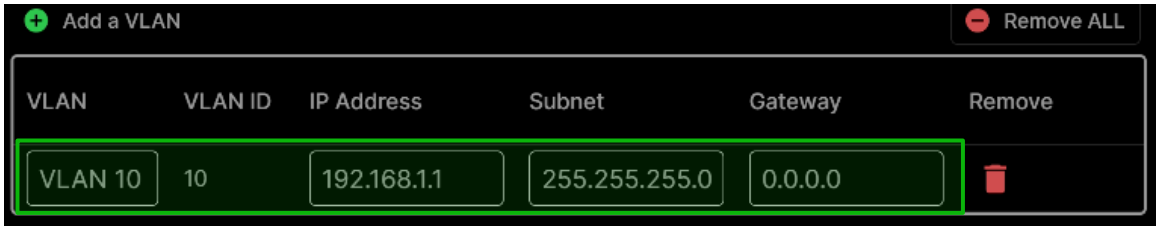
Add VLAN Window

Add VLAN Window

Section	Options	Description
VLAN Name	User Entered	Label the VLAN interface

VLAN Tag ID	1 – 4094	The VLAN Tag to be assigned to outgoing streams and filtered for incoming streams
IP Address	xxx.xxx.xxx.xxx	Static Mode IP address entry
Subnet Mask	xxx.xxx.xxx.xxx	Static Mode subnet mask entry
Gateway	xxx.xxx.xxx.xxx	Static Mode gateway entry

After clicking “Apply”, any newly created VLAN will now be present on the VLAN list. After a VLAN is created, all its fields except the VLAN ID are eligible for change except the VLAN ID. Use the textboxes to edit settings on existing VLANs.



Editing VLANs

To remove individual VLANs, click the red icon under the “Remove” column for the corresponding row. To remove all VLANs, click the “Remove ALL” button.

Removing One or All Configured VLANs

3.8.3 Unit Security Settings

When accessing the Administration menu as described in Section 3.8, use the ‘Security’ tab to edit the following security settings: Login Password, CSRs, and SSL/TLS Certificates.

Security Tab

3.8.3.1 Changing Unit Password

The default admin-password is ‘plexusav’. To change the password, click the “Change” button.

Password Section

After clicking “Change” the Password field will become editable. Manually enter the intended string, and then click “OK” to commit the changes (or “Cancel” to revert them).

Password Change Menu

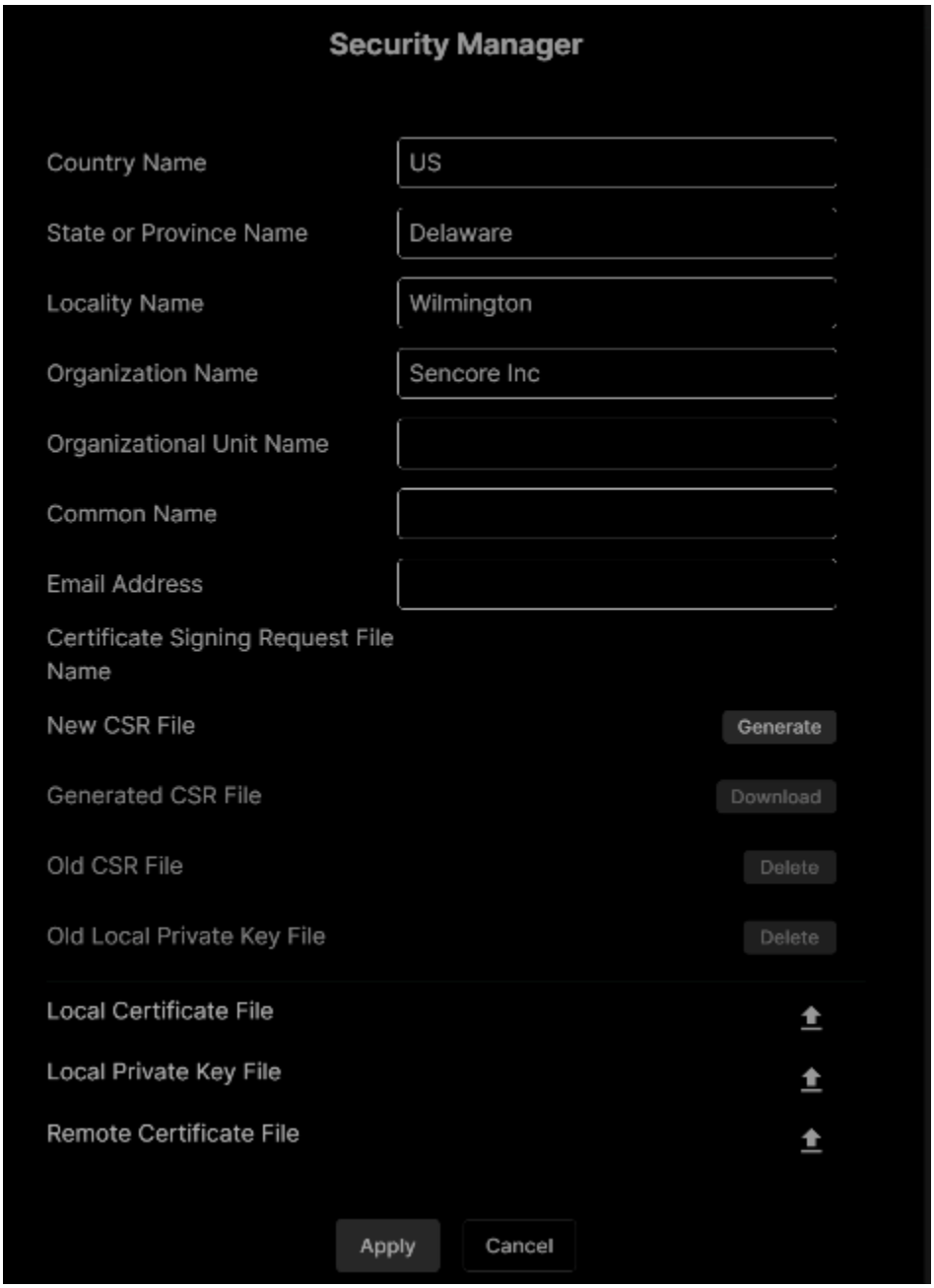
After the password is applied, the change will go into effect upon the next sign-in.

The password can also be changed from the User Information Pane as described in Section 3.15.

3.8.3.2 Security Manager

The Security Manager is used to configure CSR certificate information.

Security Manager Section



Security Manager Menu

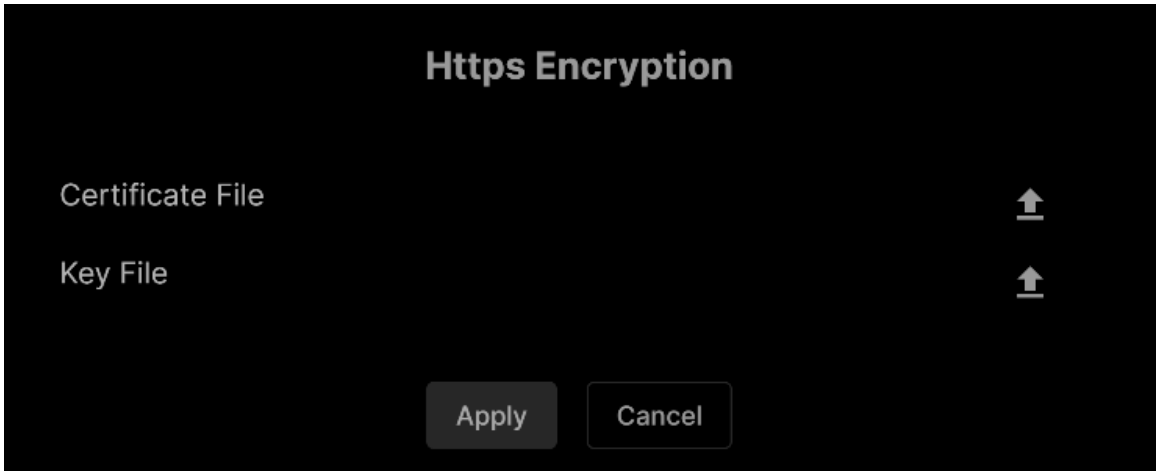
Setting	Range	Description
Country Name	User entry	Country Name for generated CSR file
State or Province Name	User entry	State/Province Name for generated CSR file
Locality Name	User entry	Locality Name for generated CSR file
Organization Name	User entry	Organization Name for the generated CSR file
Organizational Unit Name	User entry	Organizational Unit Name for the generated CSR file
Common Name	User entry	Common Name for the generated CSR file
Email Address	User entry	Email Address for reference on the generated CSR file
Generate New CSR File	Generate	This icon will generate a new Certificate Signing Request file (CSR) using the configured IP from eth0 for the CSR file name. Additionally, the Security Manager will generate a local private key file to be used with the downstream
Download Generated CSR File	Download	This icon will download the locally generated CSR file onto a remote machine
Delete Old CSR File	Delete	This icon will delete the locally generated CSR file
Delete Old Local Private Key File	Delete	This icon will delete the locally generated private key file
Local Certificate File		Use this icon to upload the local certificate file
Local Private Key File		Use this icon to upload the local private key file
Remote Certificate File		Use this file to upload the remote certificate file

Upon clicking Generate, the system will generate a new CSR file and local private key for use with the downstream receiver.

3.8.3.3 HTTPs Encryption

The HTTPs manager is used to configure CA Certificate Information.

HTTPs Encryption Upload Button



HTTPs Encryption Menu

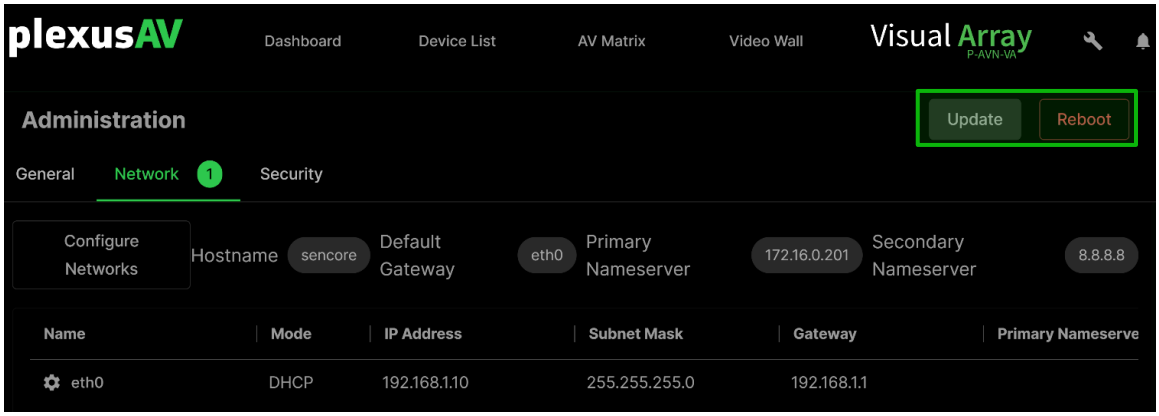
Without applying a Certificate File, the HTTPs device will use a 'self-signed' certificate to satisfy the handshake.

For maximal security, it is best practice to use an externally generated CA certificate to make certain that the unit is not part of a man-in-the-middle attack. Upload the Certificate and Key Files to update the P-AVN-VA's Certificate information.

Note that, upon so doing, the PC will have to re-negotiate the HTTPs negotiation as described in Section

3.8.4 Updating or Rebooting the Unit from Administration

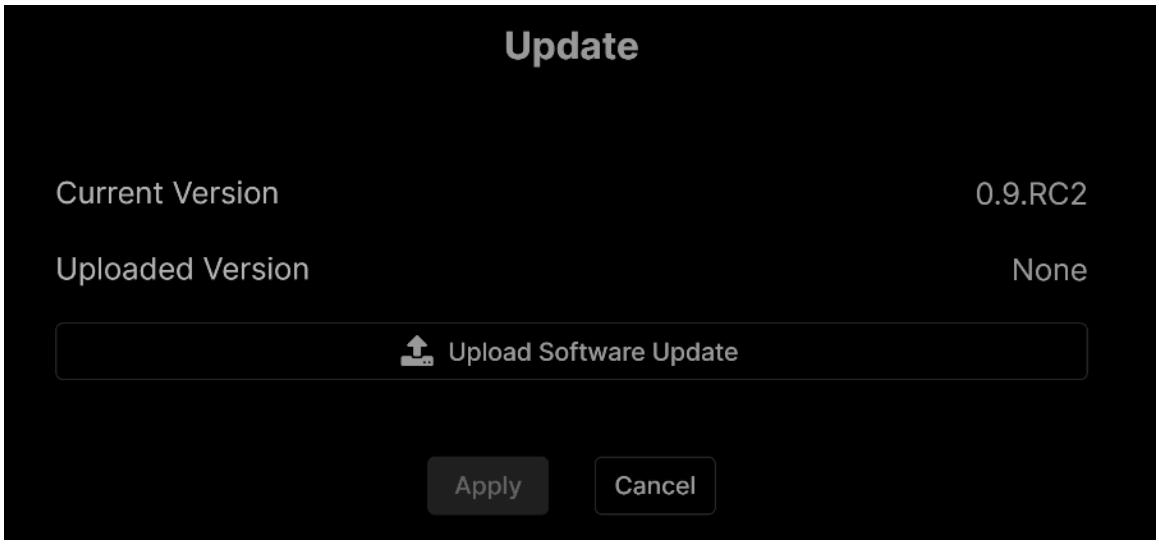
To update or reboot the unit, navigate to the ‘Administration’ page as described in Section 3.8 and click the indicated buttons.



Update and Reboot Buttons

The Reboot functionality is described in detail in Section 3.13.

Clicking ‘Update’ will open the Update menu as shown:

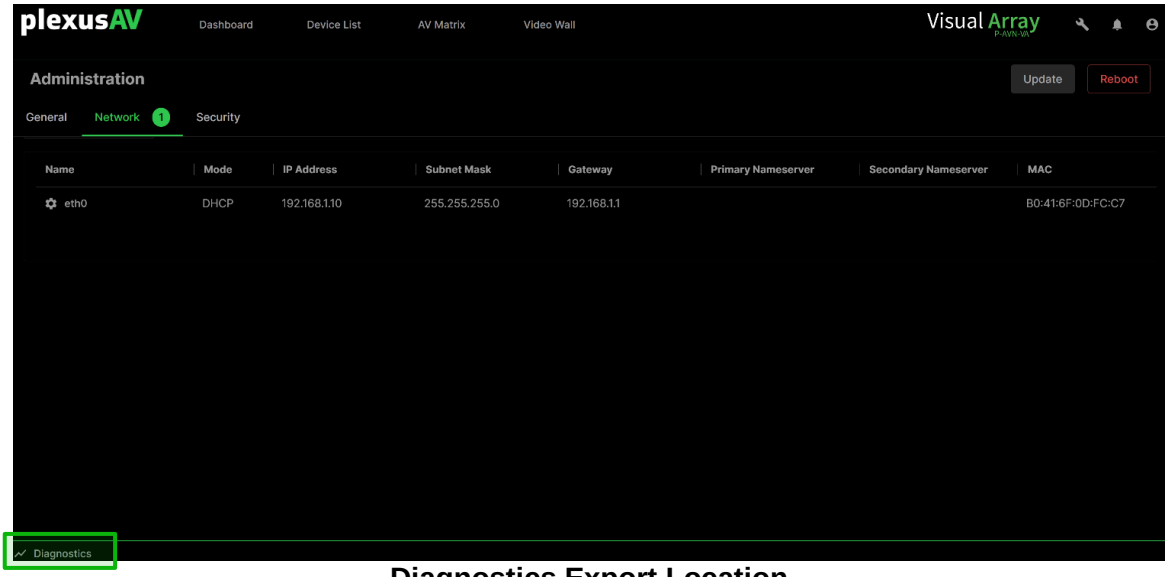


Update Menu

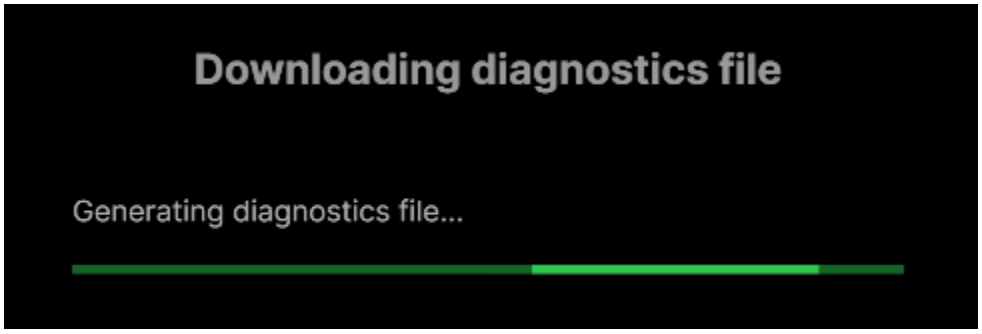
Please do not attempt to upgrade the unit unless prompted to do so by a PlexusAV Representative. If needing to upgrade, click the ‘Upload Software Update’ option, then press ‘Apply’ to push the software upgrade to the unit. Note this will trigger a reboot, so plan during an available maintenance window.

3.8.5 Generating System Diagnostics

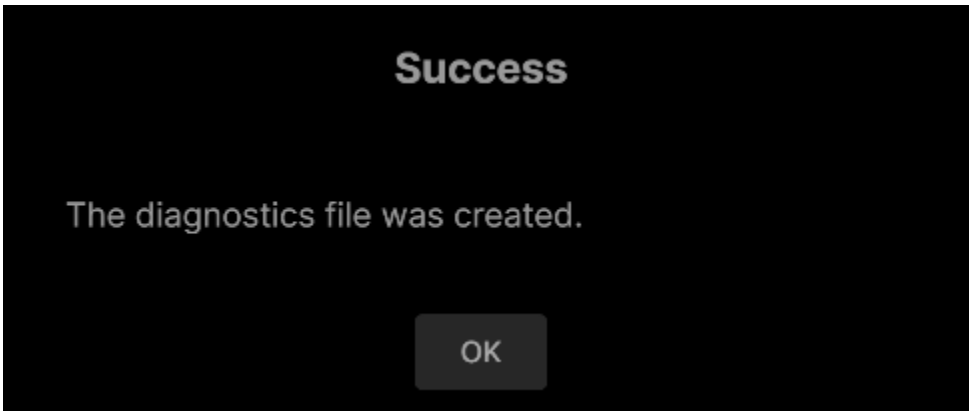
System diagnostics can be generated and downloaded from the unit by navigating to the Administration menu as described in Section 3.8, then clicking the ‘Diagnostics’ option at the very bottom left corner of the screen.



Diagnostics Export Location



Downloading Status Window

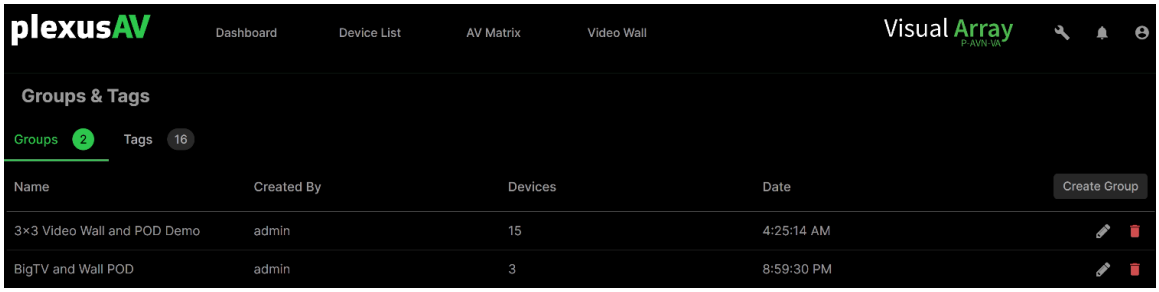


Generation Completed

When the success prompt is finished, the diagnostics are available for download to the PC from the Web Browser (Chrome, Firefox, Edge function).

3.9 Groups & Tags

While in the Tools Menu as described in Section 3.7, clicking 'Groups & Tags' will navigate to the Groups & Tags page. This page is used to create new and edit new groups as well as tags. Groups and Tags are both referenced in nearly every page of the P-AVN-VA.

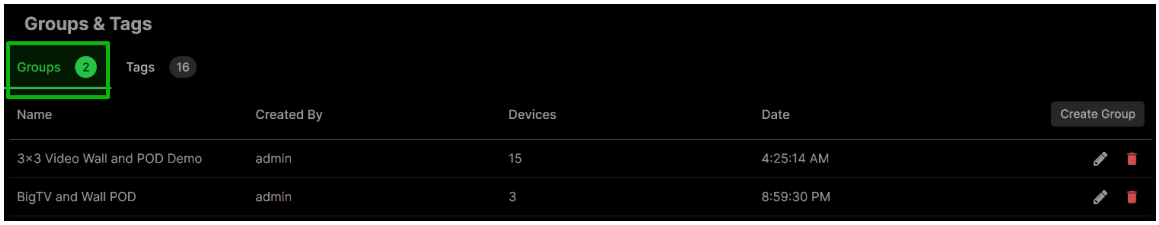


Groups & Tags Page – Groups View

Groups are used to band P-AVN-4 devices into a single category for dense setting change and configuration. Tags are used for fully customizable device view filtering as a quality of life enhancement for user experience.

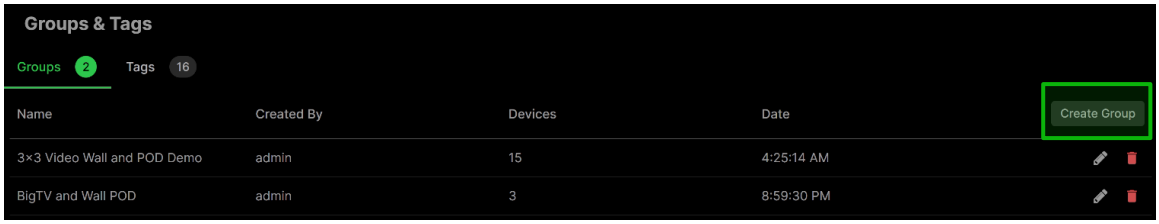
3.9.1 Viewing and Creating Groups on Groups & Tags Page

Click the 'Groups' tab to access the Groups section.



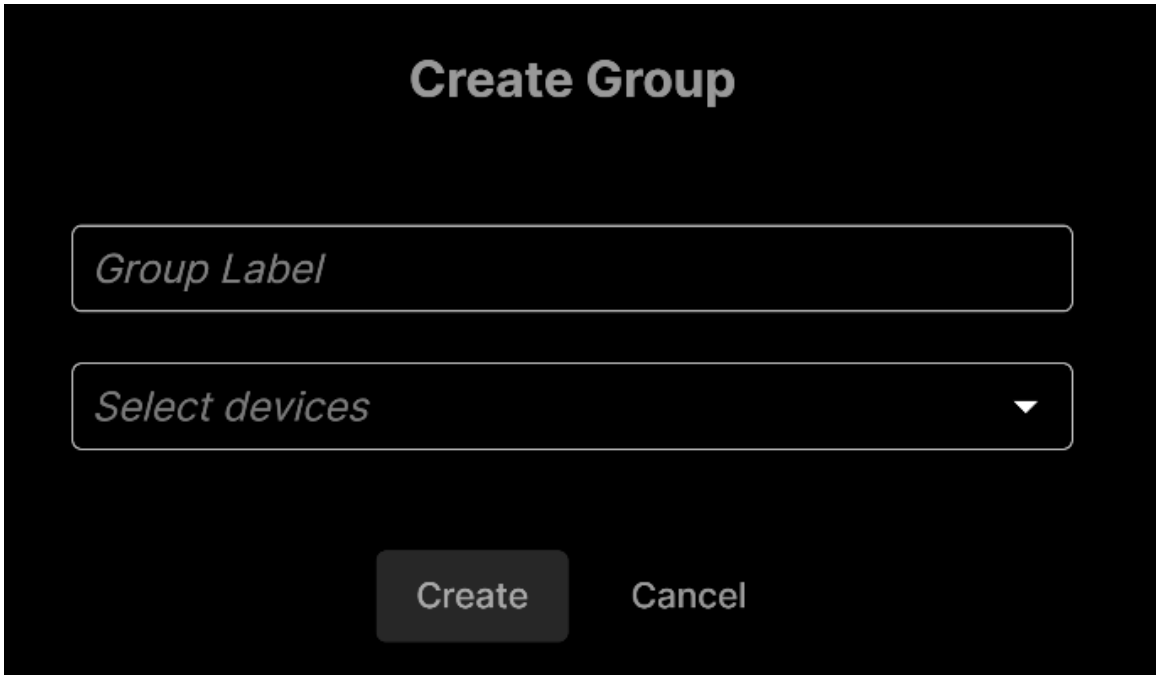
Groups Tab

To create a new group, click the 'Create Group' button as shown below.



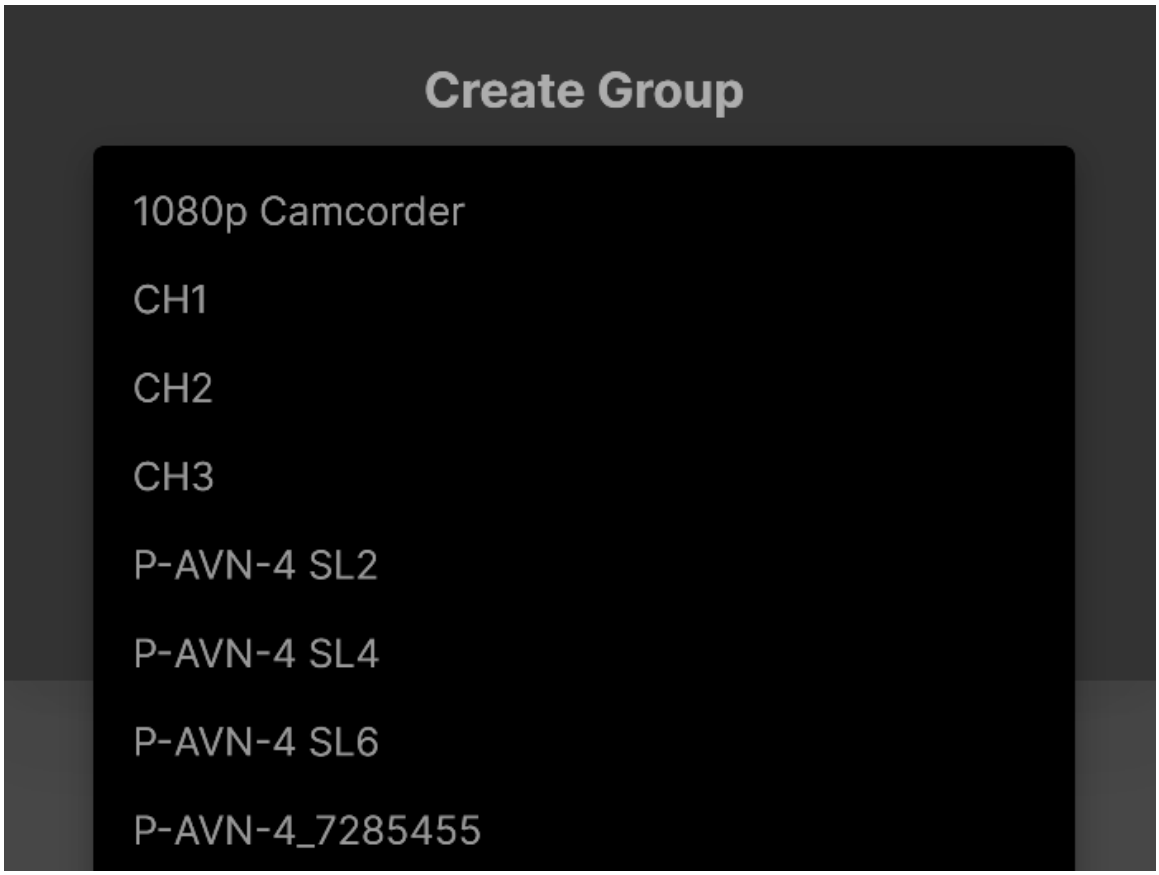
Create Groups Button Location

Upon clicking the icon, the following prompt is presented:



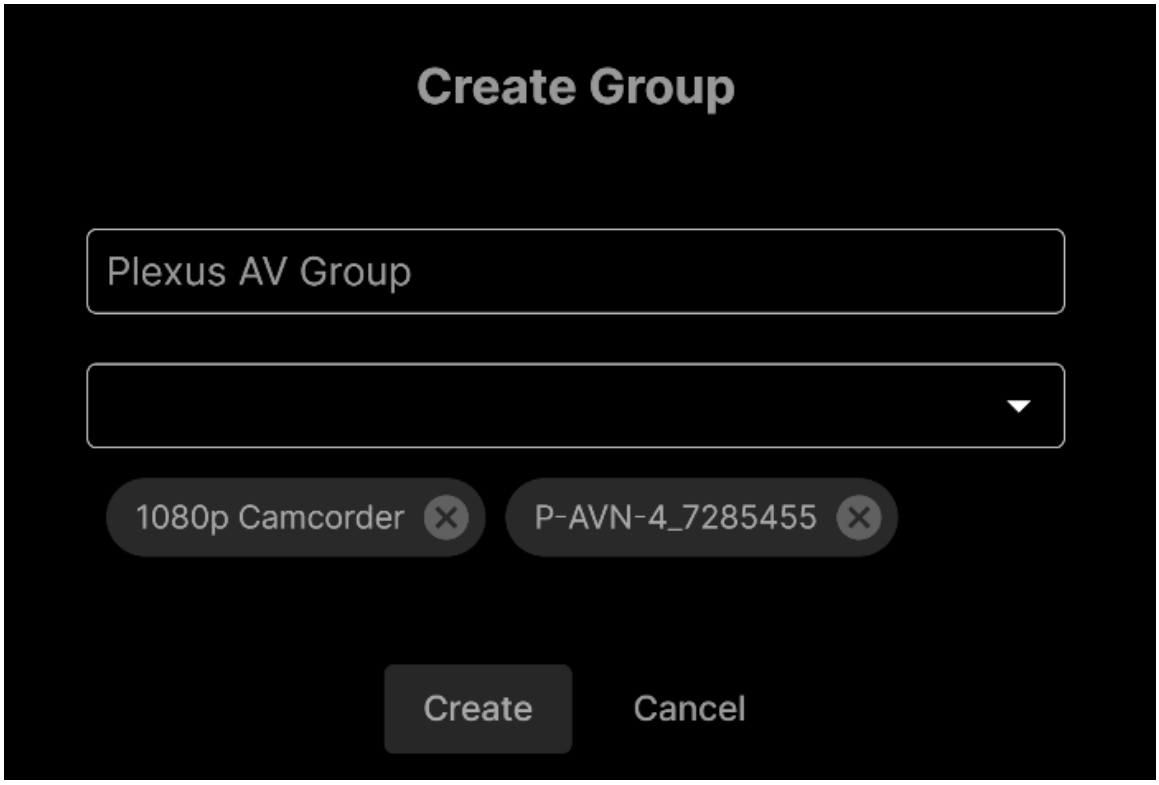
Create Group Menu

Enter a Group Label to name the new group. The "Select Devices" is a dropdown option that allows for multiple devices to be added. Note, the Devices must be populated in the system as described in Section 3.4.1 for any to populate the 'Select devices' list.



Select Devices Dropdown

Use the mouse scrollbar to cycle up and down through the devices, then click the device to add it to the group. Add as many devices as are available and intended for the group, then click anywhere outside of the dropdown space to view the selected devices.

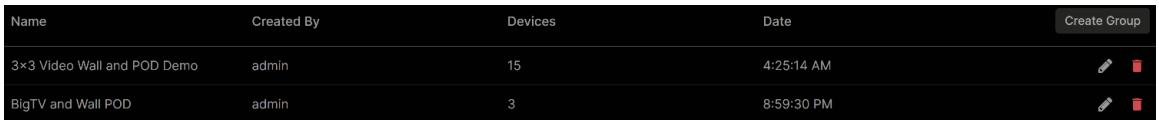


Newly Selected Devices

For a given device, click the gray ‘x’ icon to remove it from the list prior to group creation.. A device can only be in one group at a time. Creating a new group with the selected devices will move them out of whichever group they previously occupied before populating the newly created group. There is another method of moving devices into an existing group using the Batch Naming Step described in Section 3.4.7.1.

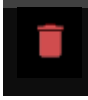
The dropdown may be re-entered to add more devices prior to group creation. Once all intended devices are in the group list, click ‘Create’ to push the devices into the new group.

After a group is added, it is available for view in the Groups Table as shown below.



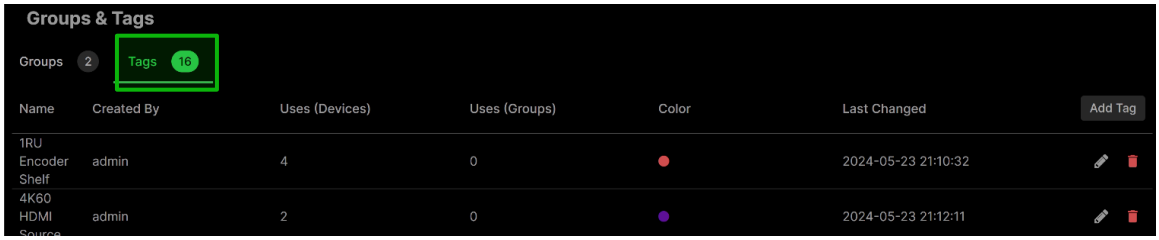
Newly Added Groups

Group Table Description

Column	Description
Name	The name assigned to the group
Created By	For now, only ‘admin’, but when multiple users are added this field will be subject to change
Devices	Total number of devices currently populating the group
Date	Last time the Group was modified
	Rename the group
	Delete the group

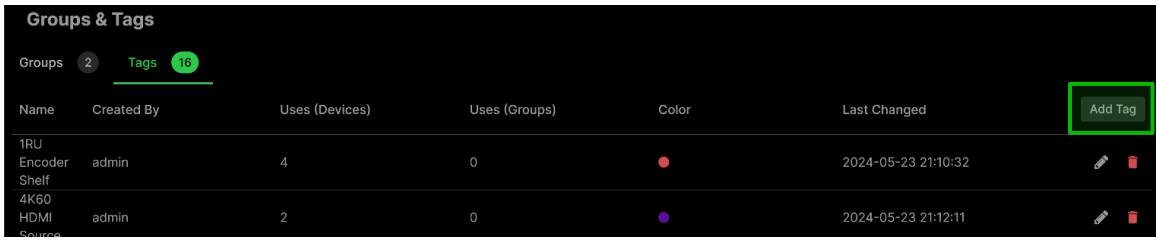
3.9.2 Defining Tags

Click the ‘Tags’ tab to access the Groups section.

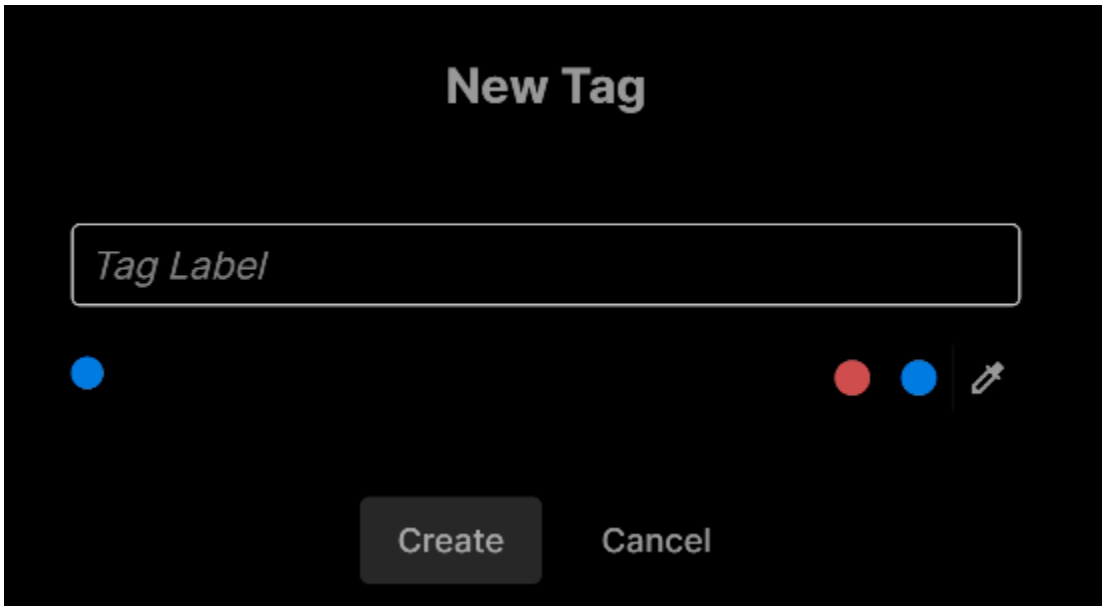


Tags Tab

To create a new Tag, click the ‘Add Tag’ button as shown below.



Tags Tab



New Tag Menu

To create a new tag, enter a label for the tag, and then assign a color. If the color is already in the system, then it can be readily applied.

If no color is shown, then use the icon to expose the color wheel and customize a brand new color for the tag.

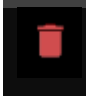
Color Wheel Options

Upon entering the label and color options, click ‘Create’ to finish adding the Tag to the Tags table.

Newly Added Tags

Tags Table Description

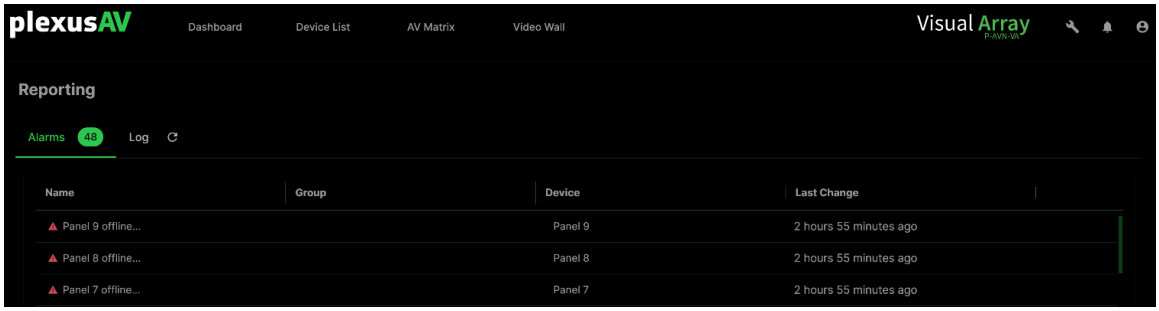
Column	Description
Name	The name assigned to the group
Created By	For now, only ‘admin’, but when multiple users are added this field will be subject to change

Uses (Devices)	Total number of devices assigned this tag
Uses (Groups)	Total number of groups assigned this tag
Color	Displays the selected color for the tag
Last Changed	Date time of last edit made to the Tag
	Rename the group
	Delete the group

Once defined, any device or group throughout the system may be assigned the Tag for added filtering options. Filtering will help to reduce scope of view in larger deployments from an organizational perspective.

3.10 Reporting Active and Logged Alarms

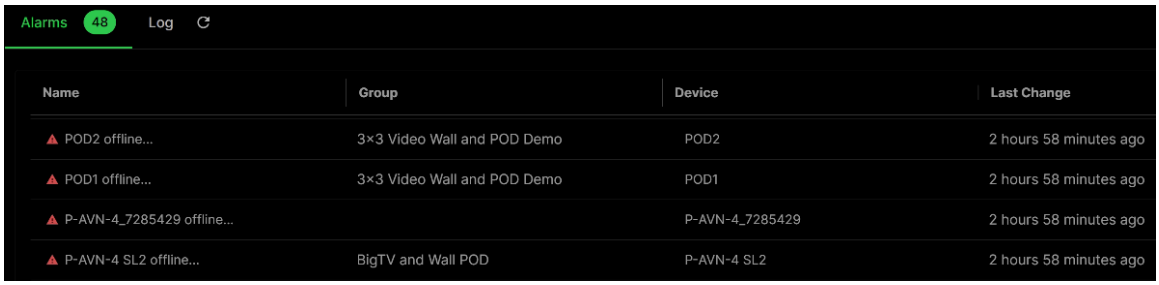
Click the 'Reporting' button from the Tools Menu described in Section 3.7, the Reporting Page is presented.



Reporting Page

3.10.1 Active Alarms Page

Click the Alarms Tab to access Active Alarms. This shows alarms that are currently active that have not yet been cleared.



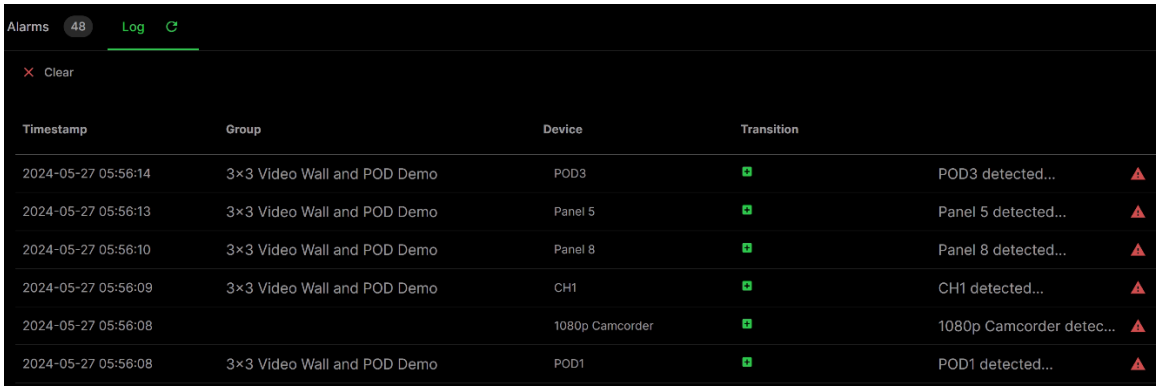
Active Alarms

Active Alarm Table Description

Column	Description
Name	Name of the triggered alarm message.
Group	Point of origin of the triggered alarm message; if the alarming device is assigned to a group this field will populate.
Device	The name of the alarming device
Last Change	When the status of the alarm last changed

3.10.2 Logged Alarms Page

When alarms that were active become cleared, they will push into the Logs page, where data is stored over an extended period. Up to 10000 alarm entries may be stored.



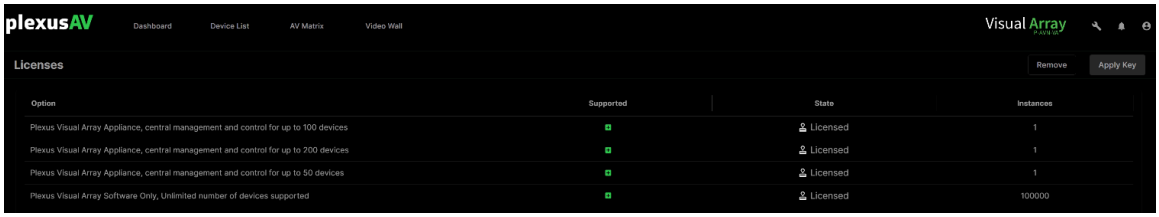
Logs Tab

Group Table Description

Column	Description
Timestamp	The date and time the error was raised or cleared. Timestamps here are determined with the Date and Time settings configured in Section 3.8.1.2.
Group	Point of origin of the triggered alarm message; if the alarming device is assigned to a group this field will populate.
Device	The name of the alarming device
Transition	The green plus icon denotes that the alarm has moved from a non-working to working state, while the red minus: icon indicates movement from a working to non-working state
Alarm Message	The right-most column will show the alarm name. For more information on alarm names and their descriptions, see Appendix B

3.11 Licenses

While in the Tools Menu as described in Section 3.7, clicking 'Licenses' will navigate to the Licenses page. This page is used to view the current installed licenses and, if prompted by a PlexusAV Representative, change the current licensing by applying a provided key.



Licenses Page

3.11.1 Viewing License Status

Use the Licenses page to view the following table that displays licensing availability and status.

Option	Supported	State	Instances
Plexus Visual Array Appliance, central management and control for up to 100 devices	✓	Licensed	1
Plexus Visual Array Appliance, central management and control for up to 200 devices	✓	Licensed	1
Plexus Visual Array Appliance, central management and control for up to 50 devices	✓	Licensed	1
Plexus Visual Array Software Only, Unlimited number of devices supported	✓	Licensed	100000

Licenses Table

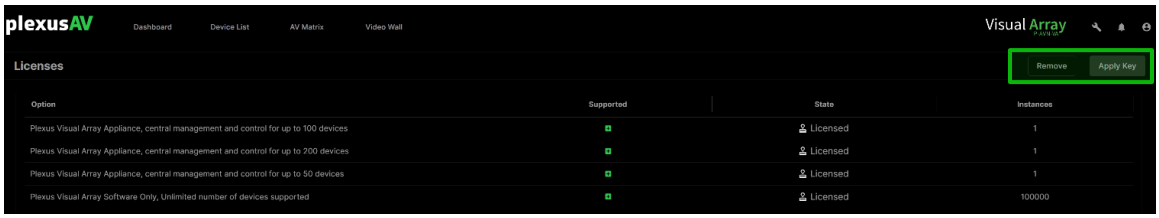
The first three rows are Boolean toggles for package deals on number of devices. Licensing for the Visual array can be added for:

- 50 Devices
- 100 Devices
- 200 Devices

3.11.2 Changing Licensing

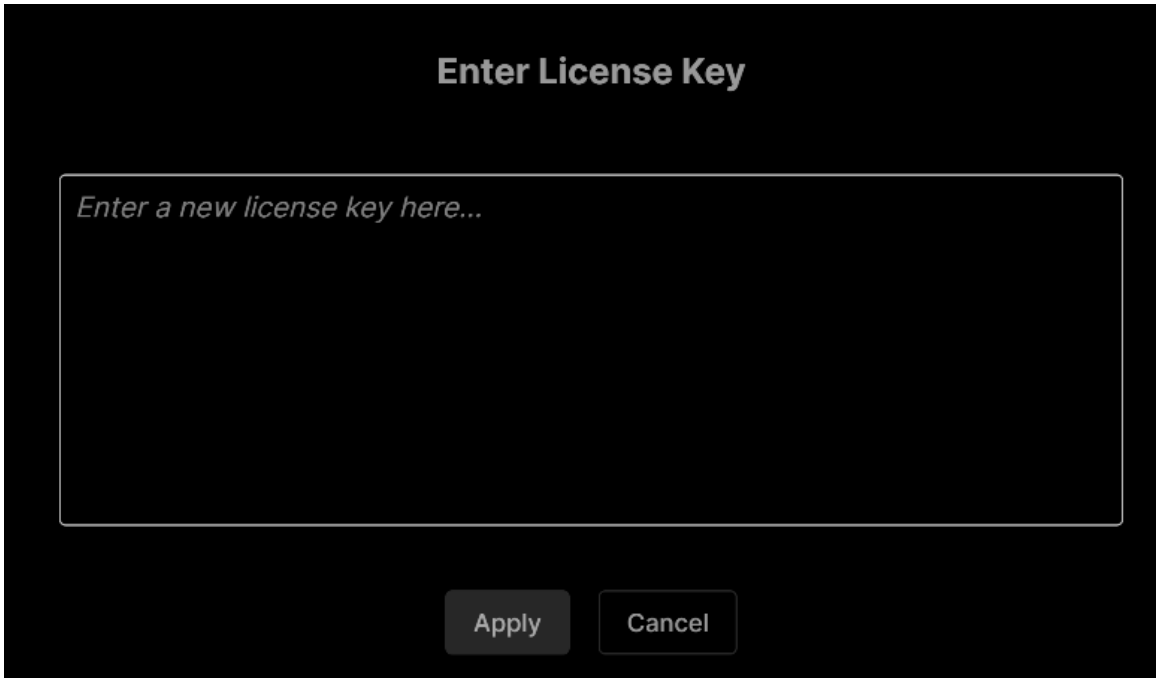
Along the top right of the ‘Licenses’ Page, there are two buttons:

- Remove – remove licensing from the unit (please do not press this unless prompted by a PlexusAV Representative.
- Apply Key – used to a apply a new license key provided by PlexusAV.



Remove and Apply Key Button Locations

Clicking the ‘Apply Key’ Button will open the following prompt.

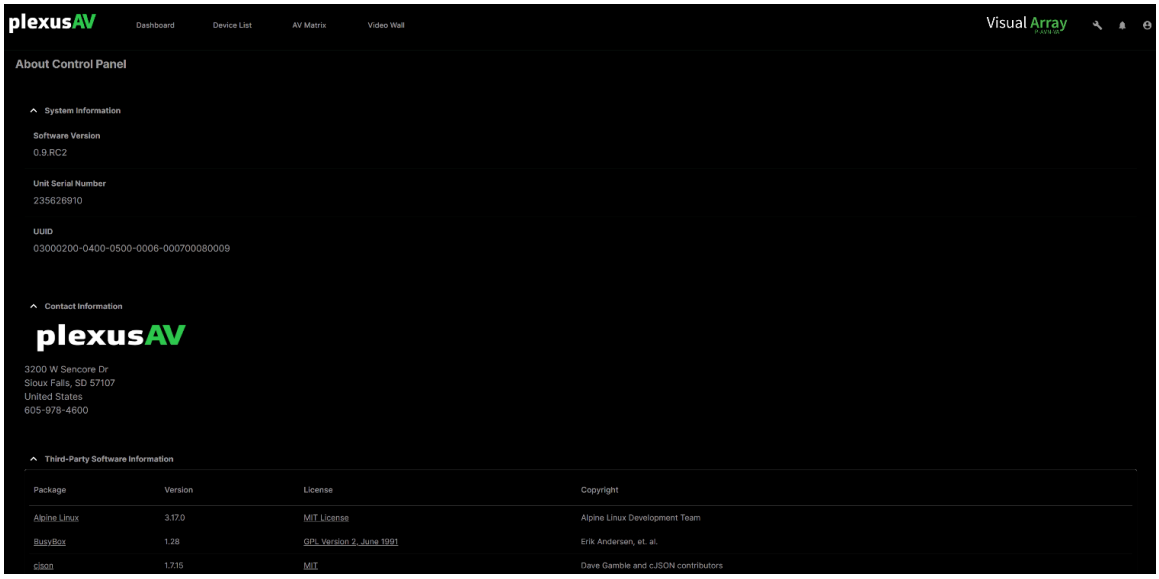


Enter License Key Menu

License Keys are provided in *.txt files; open the *.txt file and copy/paste its contents into the ‘Enter a new license key here…’ prompt before clicking ‘Apply’ to push the updated license to the unit.

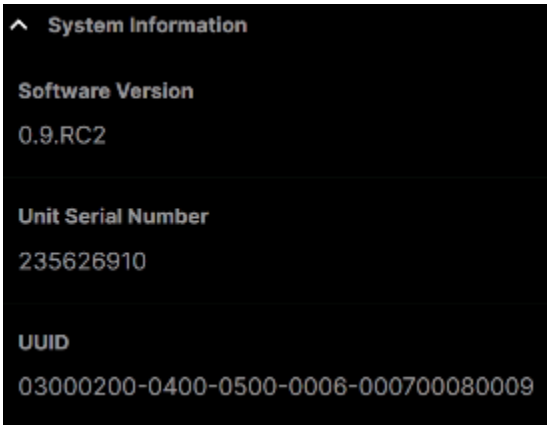
3.12 About

While in the Tools Menu as described in Section 3.7, clicking ‘About’ will navigate to the About page. This page is meant for Read Only usage to display some more information about the P-AVN-VA.



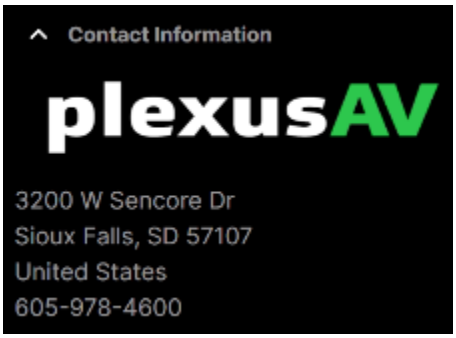
About Page

The ‘System information’ dropdown will include information on the Software Version, Unit Serial Number, and UUID. The Software Version and Unit Serial Number are available in the ‘P-AVN-VA-NAME Widget’ as described in Section 3.3.2.



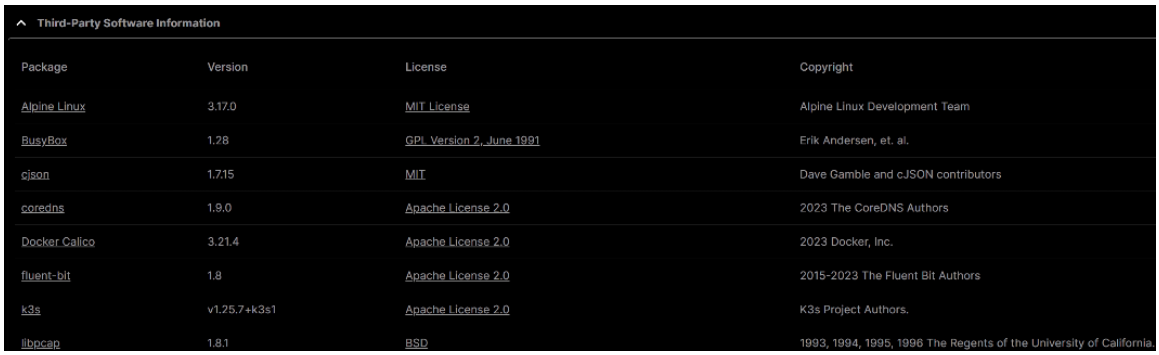
System Information Dropdown

The ‘Contact Information’ dropdown contains information on contacting PlexusAV, including address and phone number.



Contact Information Dropdown

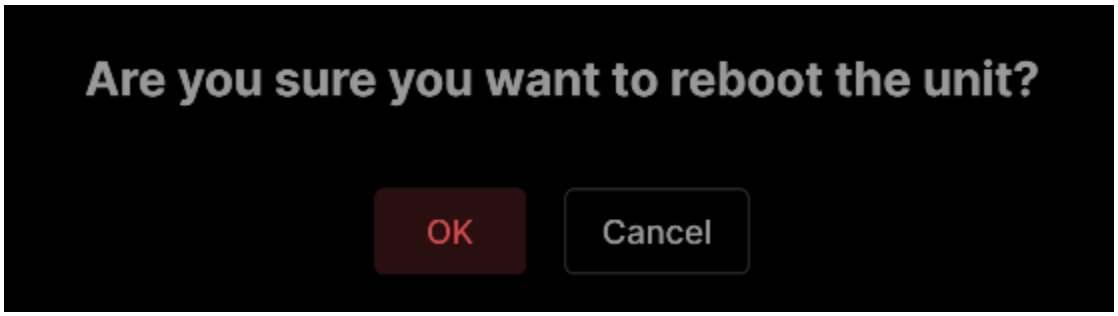
The ‘Third-Party Software Information shows any referenced open-source and proprietary Packages used by PlexusAV in the making of the P-AVN-4. A full list of these Packages is available in Appendix D.



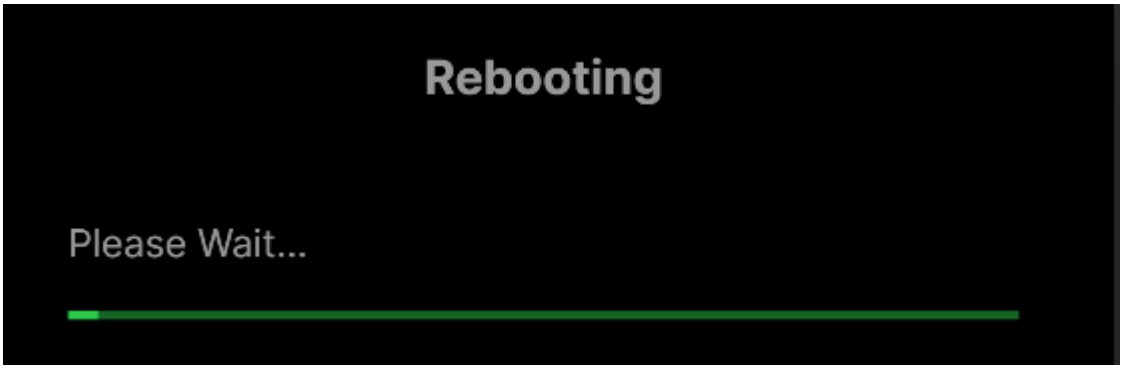
Third-Party Software Information

3.13 Rebooting the Unit from Tools

Clicking Reboot within the Tools Menu (Section 3.7) or the Administration page (Section 3.8.4) will perform a soft reboot of the system. Ping response from the P-AVN-VA will be lost, and any device statuses and settings changes made to the P-AVN-4's will have to be pulled from the P-AVN-VA after it returns. P-AVN-4 operation is not contingent upon the P-AVN-VA remaining active, so any flows and video walls configured prior to P-AVN-4 are expected to remain active during and after the system reboot.



Reboot Unit Prompt



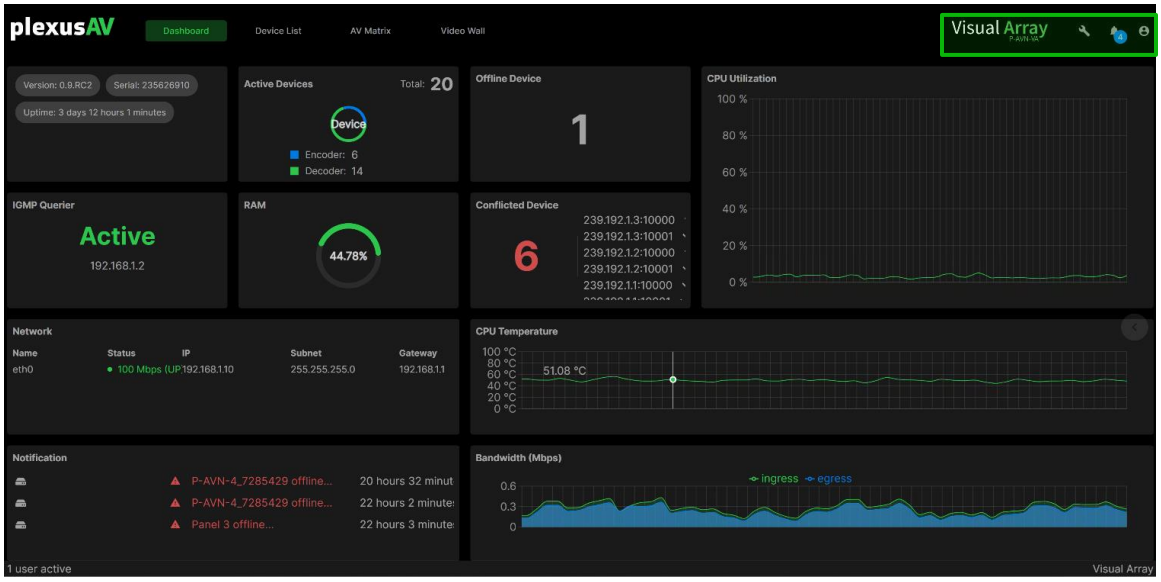
Rebooting Response

When the unit completes reboot, the Login prompt as described in Section 3.1 will be presented for returning to the unit Dashboard..

3.14 Notifications Pane

The Notifications Pane will store any alarms that became active since the last time it was cleared; while those alarms may or may not remain active, the Notification will remain so that the user can be alerted to investigate.

Along the top right side of the GUI, there are three icons; the Bell in the middle is used to toggle the Notifications Pane. The Notifications Pane is interactive and can be toggled at any time, regardless of the current menu location.

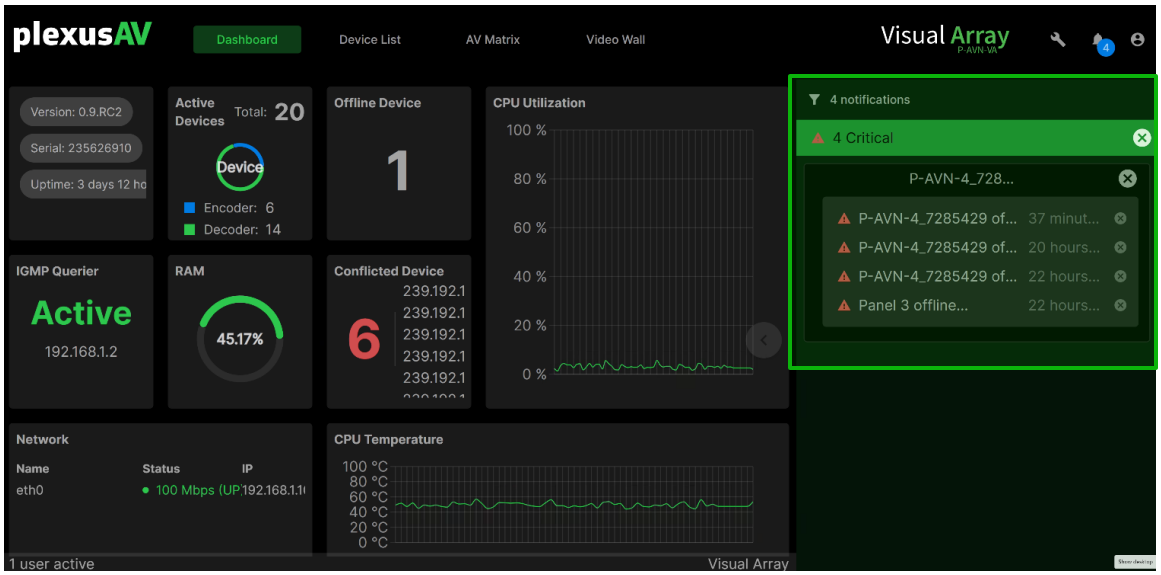


Icons Location

Notifications Location

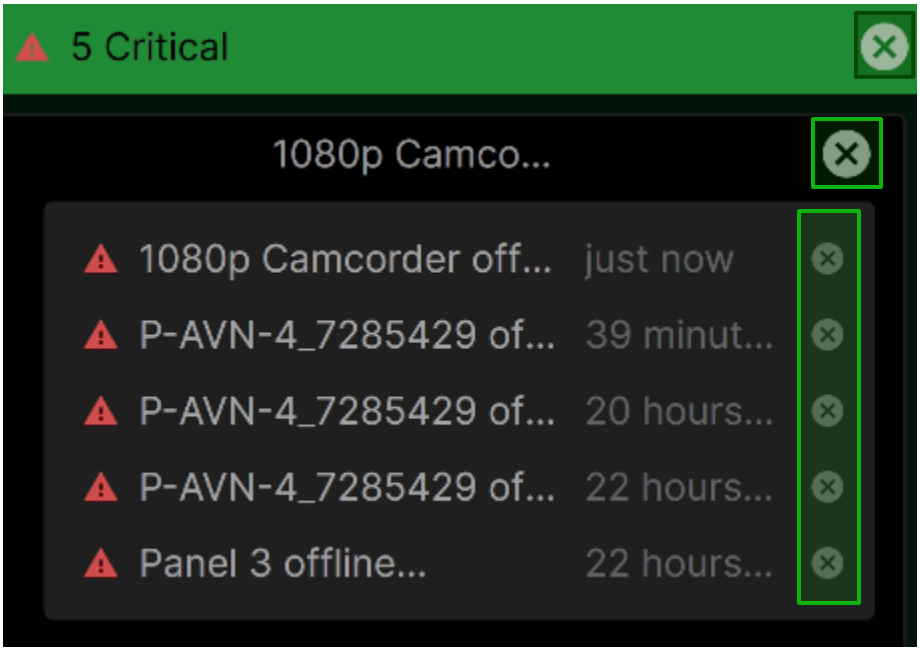
If there are any new Notifications, then there will be a blue circle by the icon with the number of new alerts.

Opening the icon will push the Notifications Menu into the current GUI view (in this case it's in the Dashboard).



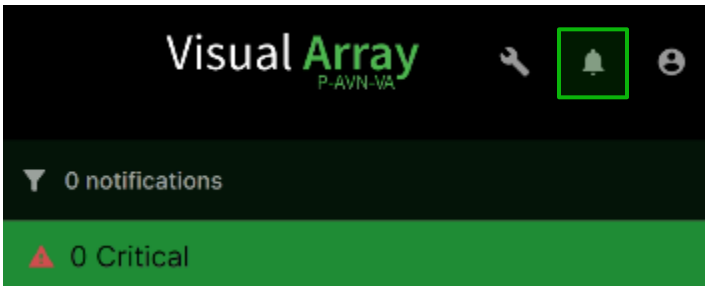
Notifications Pane

The current content of the Notifications Pane will also correspond directly to the Notifications Widget as described in Section 3.3.8. To clear notifications, click the 'x' icon to remove any number of Notifications. Clearing Notifications will not remove any entries from the Active or Logged alerts on the Reporting tab.



Clearing Notifications

To hide the Notifications Pane, click the same icon that was used to expose them.



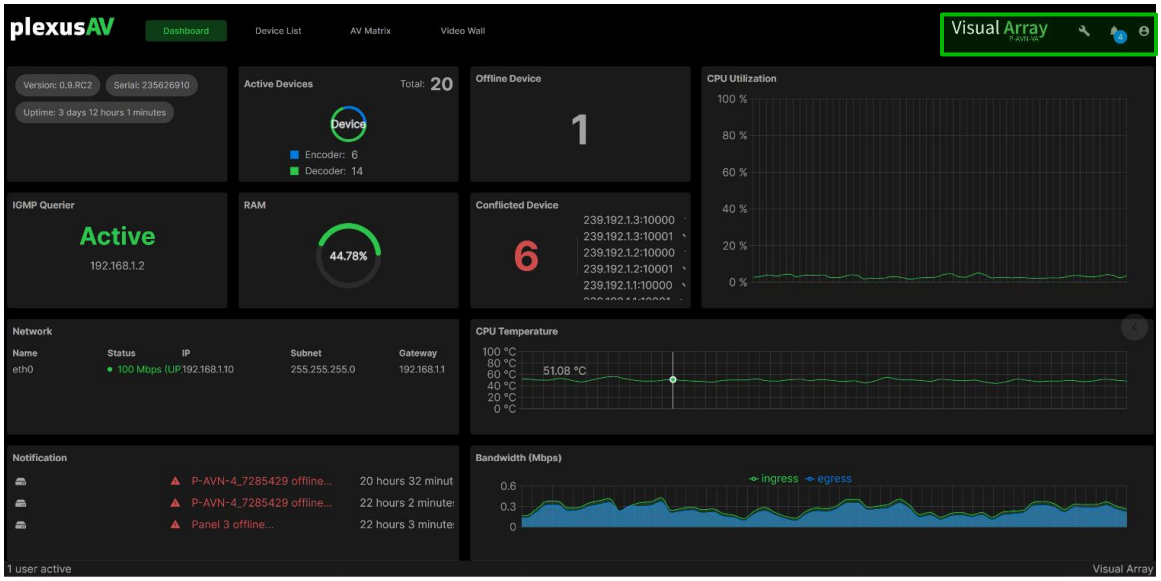
Click the Same Bell to Hide Notifications

3.15 User Information Pane

The User Information has two uses:

1) Change the password information for the P-AVN-VA
2) Logout of the P-AVN-VA

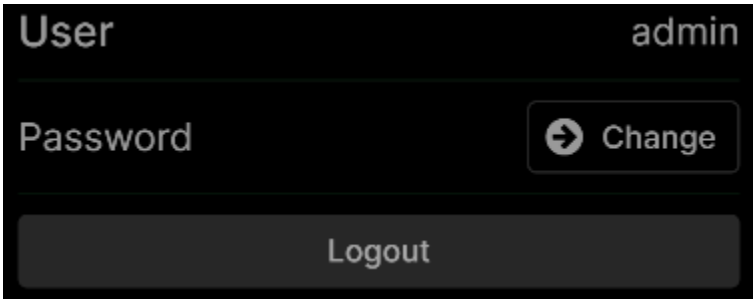
Along the top right side of the GUI, there are three icons.



Icons Location

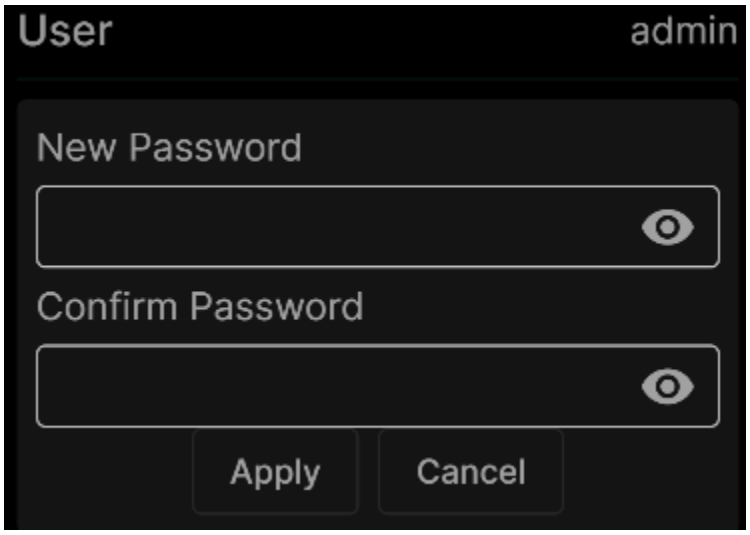
The rightmost icon, with the person inside, is used to access the User Information Menu.

User Information Icon



User Information Menu

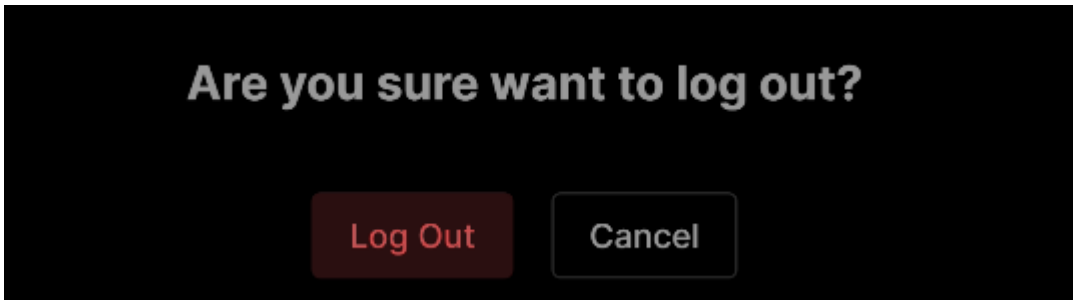
Click ‘Change’ to expose the Change Password menu.



Change Password Menu

After entering the password, re-entering the password, and clicking the ‘Apply’ key, Password changes will take effect immediately. While the current login will remain active, upon next time login the new password will be required.

Clicking Logout will engage the following confirmation prompt:



Logout Prompt

Logging out will return the current active browser tab to the Login page as described in Section 3.1. If the password was changed as described above, the next entry will need the changed password as opposed to the default ‘plexusav’ password.

Section 4 Appendices

Introduction

This section includes the following appendices:

APPENDIX A – ACRONYMS AND GLOSSARY **164**
APPENDIX B – ERROR AND EVENT LIST **165**
APPENDIX C – SPECIFICATIONS **166**
APPENDIX D – OPEN-SOURCE SOFTWARE **167**
APPENDIX E – WARRANTY **168**
APPENDIX F – SUPPORT AND CONTACT INFORMATION **168**

Appendix A – Acronyms and Glossary

AC-3: Also known as Dolby Digital
AES: Audio Engineering Society
ATSC: Advanced Television Systems Committee
BISS: Basic Interoperable Scrambling System
Bit Rate: The rate at which the compressed bit stream is delivered from the channel to the input of a decoder.
BNC: British Naval Connector
dB: Decibel
DHCP: Dynamic Host Configuration Protocol
DVB: Digital Video Broadcasting
Event: An event is defined as a collection of elementary streams with a common time base, an associated start time, and an associated end time.
FCC: Federal Communications Commission
HD: High Definition
I/O: Input/Output
IP: Internet Protocol
IPMX: Internet Protocol Media Experience; a set of open standards and specifications used to carry compressed and uncompressed audio and data over IP networks for the Pro AV Market
Kbps: 1000 bit per second
LED: Light Emitting Diode
Mbps: 1,000,000 bits per second.
MPEG: Refers to standards developed by the ISO/IEC JTC1/SC29 WG11, *Moving Picture Experts Group.* MPEG may also refer to the Group.
MPEG-2: Refers to ISO/IEC standards 13818-1 (Systems), 13818-2 (Video), 13818-3 (Audio), 13818-4
NMOS: Networked Media Open Specifications
NTP: Networking Time Protocol
PCM: Pulse-Code Modulation
RDS: Registration and Discovery Server
RU: Rack Unit
SD: Standard Definition
SDI: Serial Digital Interface
SI: System Information
SMPTE: Society of Motion Pictures and Television Engineers
SNMP: Simple Network Management Protocol
SRT: Secure Reliable Transport
TS: Transport Stream

Appendix B – Error and Event List

Error	Description
Expiring State Error	Data conditions are no longer valid or relevant.
NTP Server Unreachable	The NTP server was unable to be reached.
Network Interface Link Down	Triggers an alarm if the physical interface is not detected as active.
HDMI Connection Error	HDMI connection not detected.
Video Not Decoding	The video payload in the selected service cannot be decoded.
Video Not Encoding	The video payload in the selected service cannot be encoded.
Reboot Required for HTTPS Certificate to be Removed	An External Security certificate that was added (per Section 3.3.6) has since been removed, and a reboot is required to revert to using Self-Signed Certificates for FTPS/Samba.

Event	Description
Software Update Failed	An attempted software update was unsuccessful.
Software Update Succeeded	An attempted software update succeeded.
Unit Booted	The system completed a boot process.
NTP Updated	The NTP Date/Time was updated.
Demo Key Expired	The demonstration period for software has ended.
Date/Time Changed	The Date/Time setting of the system was changed.

Appendix C – Specifications

Input Interfaces

- DC Power Adapter Port
- x3 USB3.2 Gen2 Ports
- x1 USB 2.0 port
- x1 USB4 port (40Gbps, Full Functionality)

Output Interfaces

- 3.5mm Audio Jack (HP and MIC)
- 4K 60Hz HDMI 2.0
- Display Port (4K 60Hz)

Data Interfaces

- LAN RJ45 (up to 2.5G Link Speed)
- Protocols: Web UI Management and IPMX Transceiver Control

Management

- Web UI: On-board web interface
- External Control: REST API
- NMOS Controller for IPMX Transceivers

Dimensions and Power

- Size: 113 mm x 126mm x 42mm (4.45” x 4.96” x 1.65”)
- Weight: 1.43 lbs. (0.65 kg)
- Power: 19V DC / 6.32A

Supplies: 1x External power supply (sold separately)

Appendix D – Open-Source Software

The P-AVN-VA includes:

Package	Version	License	Copyright
Alpine Linux	3.17.0	MIT License	Alpine Linux Development Team
BusyBox	1.28	GPL Version 2, June 1991	Erik Andersen, et. al.
cjson	1.7.15	MIT	Dave Gamble and cJSON contributors
coredns	1.9.0	Apache License 2.0	2023 The CoreDNS Authors
Docker Calico	3.21.4	Apache License 2.0	2023 Docker, Inc.
fluent-bit	1.8	Apache License 2.0	2015-2023 The Fluent Bit Authors
k3s	v1.25.7+k3s1	Apache License 2.0	K3s Project Authors.
libpcap	1.8.1	BSD	1993, 1994, 1995, 1996 The Regents of the University of California.
Log4cpp	1.1.3	LGPL Version 2.1, February 1999	Bastiaan Bakker
nodejs	node:14-alpine	MIT License	Node.js contributors
OpenSSL	1.0.2u	BSD-Like	1998-2008 The OpenSSL Project, 1995-1998 Eric Young
redis	5	BSD-Like	2006-2020, Salvatore Sanfilippo

Appendix E – Warranty

PlexusAV Hardware One-Year Warranty

PlexusAV warrants this instrument against defects from any cause, except acts of God and abusive use, for a period of 1 (one) year from date of purchase. During this warranty period, PlexusAV will correct any covered defects without charge for parts, labor, or recalibration.

Appendix F – Support and Contact Information

Returning Products for Service or Calibration

The P-AVN-4 is a delicate piece of equipment and needs to be serviced and repaired by PlexusAV. Periodically it is necessary to return a product for repair or calibration. To expedite this process please carefully read the instructions below.

RMA Number

Before any product can be returned for service or calibration, an RMA number must be obtained. To obtain an RMA number, use the following steps:

1. Contact the PlexusAV service department by going online to www.plexusav.com and select Support.
2. Select Service and Repair from the options given.
3. Fill in the following required information:
    a. First & Last Name
    b. Company
    c. Email
    d. Phone Number
    e. Ship and Bill to Address
    f. Unit Model and Serial Numbers
4. An RMA number will be emailed you shortly after completing the form with return instructions.

Shipping the Product

Once an RMA number has been issued, the unit needs to be packaged and shipped back to PlexusAV. It's best to use the original box and packaging for the product but if this not available, check with the customer service representative for the proper packaging instructions.

Note: DO NOT return any power cables or accessories unless instructed to do so by the customer service representative

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