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Binary MoIP Installation Guide

Required materials:

- 1× MoIP transmitter per source
- 1× MoIP receiver per source
- 1× MoIP controller B-900-MoIP-4K-CTRL
- 1× Layer 2 managed switch
- Sources, displays, HDMI cables, and category cabling

Note: B-960 and B-900 devices cannot pass video to each other. Only audio.

Caution: Firmware versions 4.0+ moves MoIP configuration to OvrC. Click here to view the Install Guide for firmware version 3.2.1.2 and below.

Read these tips before you begin

- Always configure the network first.
- Connect all MoIP devices to one dedicated switch when possible.

  Note: B-960 configurations must use an Araknis 920 switch.

- Document the MAC address and Service Tag of the MoIP devices and notate which input or display they're connected to.
- Perform available firmware updates.
- Configure the system using OvrC's **MoIP System Management**, found under the **Configure** tab of the MoIP controller.
- Use downmixing transmitters for installations using a mix of AV receiver and stereo zones.
- Disable power-saving settings on connected devices to help maintain the video stream.

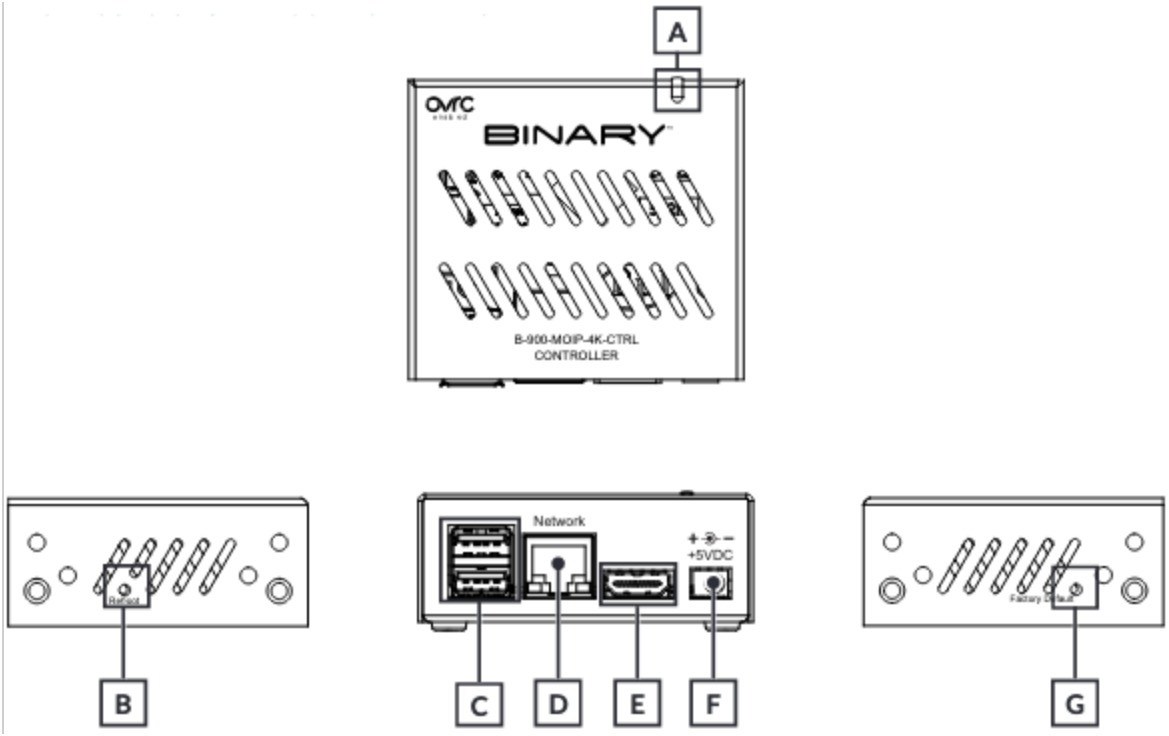
Quick links

- **Using B-960 transceivers**
- **Araknis 620/920 switch configuration**
- **Araknis 210/310 switch configuration**
- **Pakedge MS switch configuration**
- **MoIP configuration in OvrC**
- **Ryff to MoIP**

L- e- gal notice

B-900 MoIP devices

MoIP Controller (B-900-MoIP-4K-CTRL)



A. **Status LED** - Solid during the startup process. Blinks during normal operation.

B. **Reboot button** - Use a pin to press the recessed button to restart the controller.

C. **USB ports** - For use with a USB-to-Ethernet adapter. See the Network Troubleshooting section for more information.

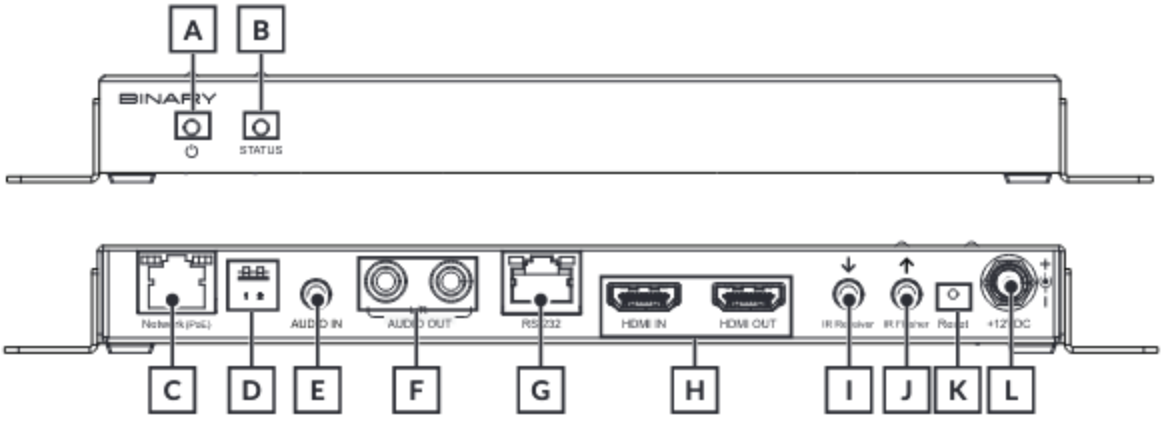
D. **Network/LAN port** - Connect to the MoIP switch to provide access to MoIP transmitters and receivers.

E. **HDMI port** - Not used for the MoIP system.

F. **12VDC power connection** - Connect the provided power supply.

G. **Factory Default button** - Use a pin to press the recessed button 3 times within 10 seconds to restore factory settings.

MoIP Video Transmitter (B-900-MoIP-4K-TX)



A. **Power indicator** - On: Powered on | Blinking: Starting up | Off: Powered off.

B. **System status light** - On: Connected to network and detecting a source | Off: Does not detect a network connection| Blinking: Detects a network connection but not a source.

C. **Network port** - Provides access to the network and Power-over-Ethernet (PoE).

D. **DIP switches** - Switch 1: IR receiver on/off | Switch 2: DTE/DCE.

E. **3.5 mm Input** - Analog audio embedding to replace HDMI audio.

F. **L/R Audio Out** - RCA analog audio de-embedding of 2-channel PCM audio.

G. **RS-232** - RJ45, RS-232, (TX, RX, Ground), EIA-561 pinout.

H. **HDMI In/Out** - HDMI source input and HDMI loop output for local display.

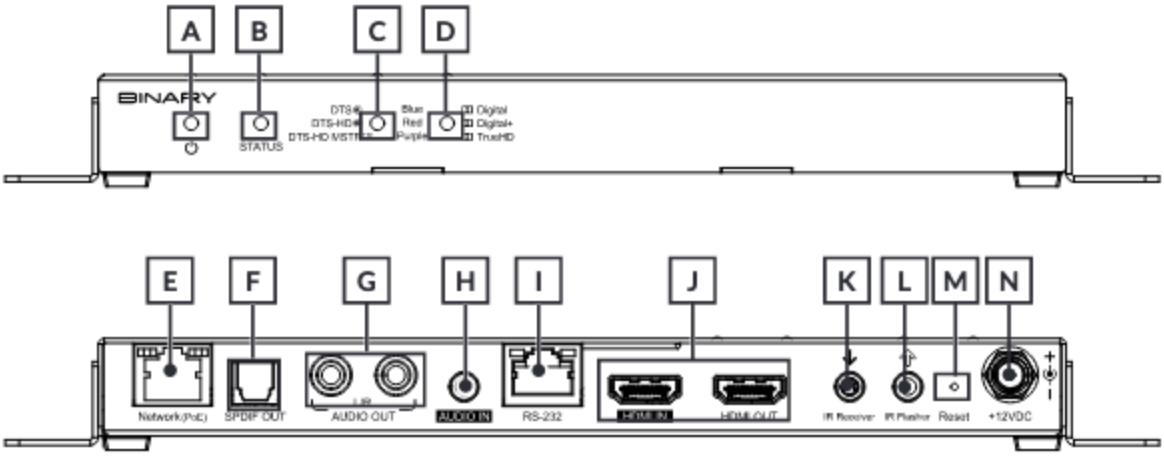
I. **IR Receiver** - 3.5 mm mini mono/stereo for external receivers.

J. **IR Flasher** - 3.5 mm mini mono output to IR emitter.

K. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

L. **12V 2A power connection** - Optional 12VDC 2A locking connection for external power supply (not included).

MoIP Video Downmixing Transmitter (B-900-MoIP-4K-TX-2AC)



A. **Power indicator** - On: powered on | Blinking: starting up | Off: powered off.

B. **System status light** - On: Connected to network and detecting a source | Off: Does not detect a network connection| Blinking: Detects a network connection but not a source.

C. **DTS LED** - Blue = DTS Surround; Red = DTS HD; Purple =DTS HD Master Audio.

D. **Dolby LED** - Blue = Dolby Digital; Red = Dolby Digital Plus; Purple = Dolby True HD.

E. **Network port** - Provides access to the network and Power-over-Ethernet (POE).

F. **SPDIF Out** - For future use.

G. **L/R Audio Out** - RCA analog output for downmixed and de-embedded 2-channel PCM audio with a bitstream up to the DSP's max capability.

H. **3.5 mm Input**— Analog audio embedding with the option to replace HDMI audio.

I. **RS-232** - RJ45, RS-232, (TX, RX, Ground), EIA-561 pinout.

J. **HDMI In/Out** - HDMI source input and HDMI loop output for local display.

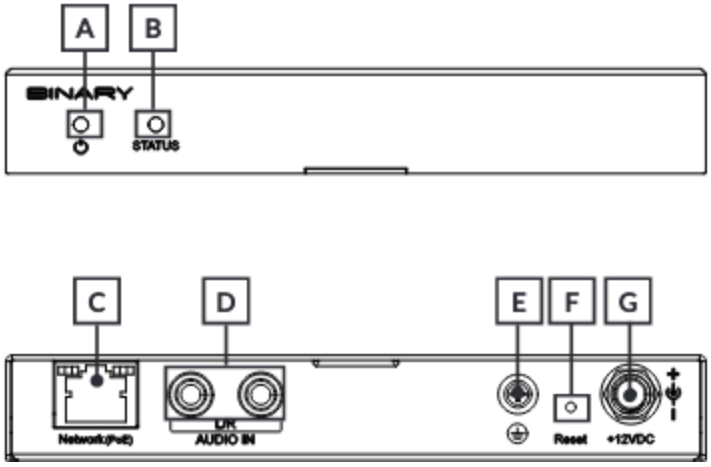
K. **IR Receiver** - 3.5 mm mini mono/stereo for external receivers.

L. **IR Flasher** - 3.5 mm mini mono output to IR emitter.

M. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

N. **12V 2A power connection** - Optional 12VDC 2A locking connection for external power supply (not included).

MoIP Audio Transmitter (B-900-MoIP-AUDIO-TX)



A. **Power indicator** - On: Powered on | Blinking: Starting up | Off: Powered off.

B. **System Status light** - On: Connected to network and detecting a source | Off: Does not detect a network connection| Blinking: Detects a network connection but not a source.

C. **Network port** - Provides access to the network and Power-over-Ethernet (PoE).

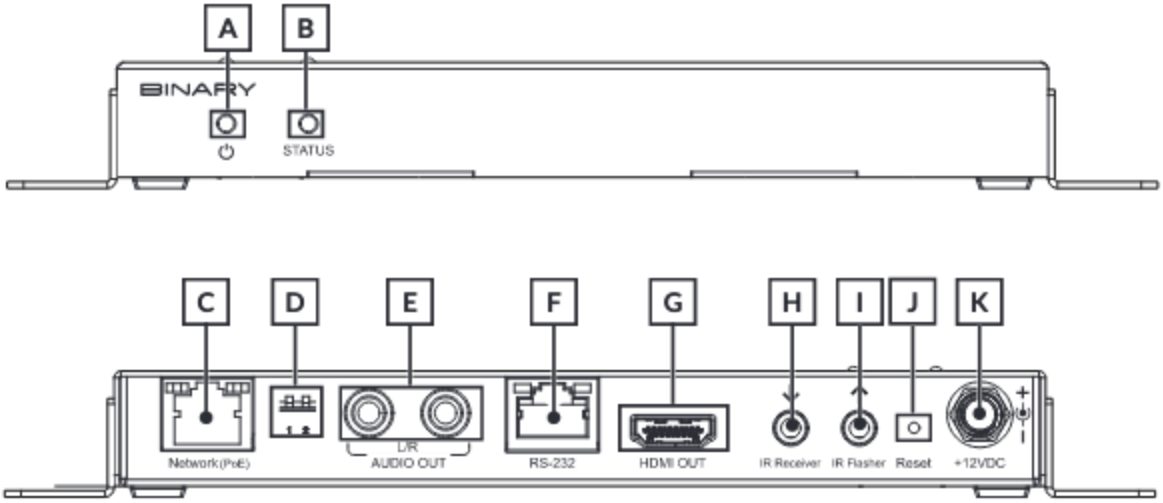
D. **L/R Audio In** - RCA analog audio input.

E. **Ground screw (optional)** - For ground-related noise issues, connect the ground screw terminal to a local AC ground.

F. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

G. **12V 2A power connection** - Optional 12VDC 2A locking connection for external power supply (not included).

MoIP Video Receiver (B-900-MoIP-4K-RX)



A. **Power indicator** - On: Powered on | Blinking: Starting up | Off: Powered off.

B. **System Status light** - On: Connected to the network and subscribed to a transmitter stream | Blinking: Connected to the network and not subscribed to a transmitter stream.

C. **Network port** - Provides access to the network and Power-over-Ethernet (PoE).

D. **DIP switches** - Switch 1: IR receiver On/Off | Switch 2: DTE/DCE.

E. **L/R Audio Out** - RCA analog 2-channel audio.

F. **RS-232** - RJ45, RS-232, (TX, RX, Ground), EIA-561 pinout.

G. **HDMI OUT** - HDMI output for display.

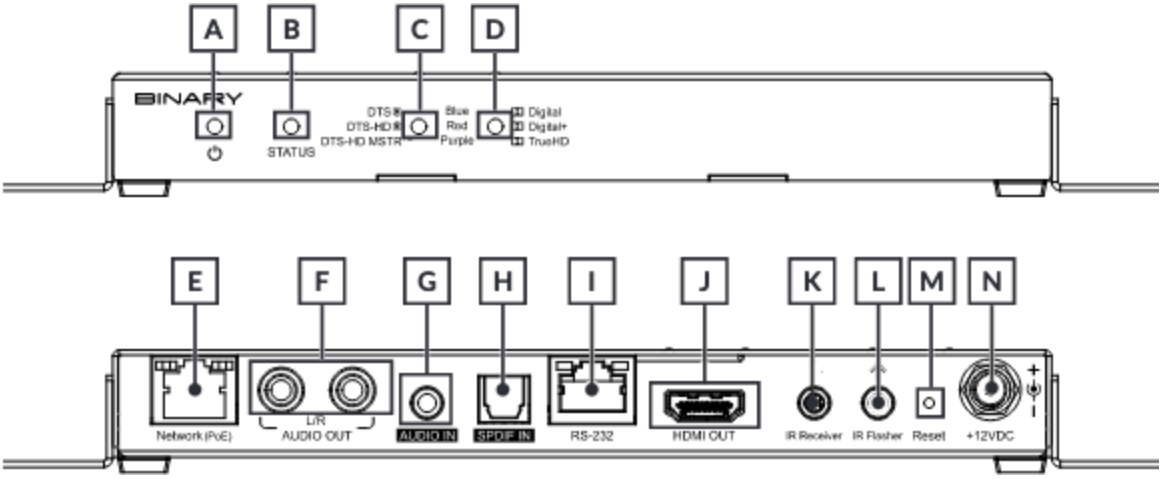
H. **IR Receiver** - 3.5 mm mini mono/stereo for external receivers.

I. **IR Flasher** - 3.5 mm mini mono output to IR emitter/flasher.

J. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

K. **12V 2A power connection** - Optional 12VDC 2A locking connection for external power supply (not included).

MoIP Video Downmixing Receiver (B-900-MoIP-4K-RX-2AC)



A. **Power Indicator** - On: Powered on | Blinking: Starting up | Off: Powered off.

B. **System Status Light** - On: Connected to the network and subscribed to a transmitter stream | Blinking: Connected to the network and not subscribed to a transmitter stream.

C. **DTS LED** - Blue = DTS Surround; Red = DTS HD; Purple =DTS HD Master Audio.

D. **Dolby LED** - Blue = Dolby Digital; Red = Dolby Digital Plus; Purple = Dolby True HD.

E. **Network Port** - Provides access to the network and Power-over-Ethernet (POE).

F. **L/R Audio Out** - RCA analog 2-channel audio output for audio return.

G. **Audio In** - 3.5 mm input for embedding audio to replace HDMI audio.

H. **SPDIF In** - Digital audio output for audio return.

I. **RS-232** - RJ45, RS-232, (TX, RX, Ground), EIA-561 pinout.

J. **HDMI OUT** - HDMI output for display.

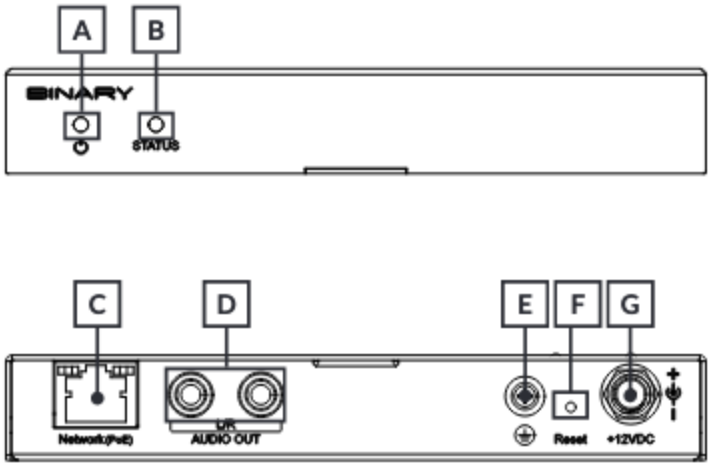
K. **IR Receiver** - 3.5 mm mini mono/stereo for external receivers.

L. **IR Flasher** - 3.5 mm mini mono output to IR emitter/flasher.

M. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

N. **12V 2A Power Connection** - Optional 12VDC 2A locking connection for external power supply (not included).

MoIP Audio Receiver (B-900-MoIP-AUDIO-RX)



A. **Power Indicator** - On: Powered on | Blinking: Starting up | Off: Powered off.

B. **System Status Light** -On: Connected to the network and subscribed to a transmitter stream | Blinking: Connected to the network and not subscribed to a transmitter stream.

C. **Network Port** - Provides access to the network and Power-over-Ethernet (POE).

D. **L/R Audio Out** - RCA analog audio output.

E. **Ground screw (optional)** - For ground-related noise issues, connect the ground screw terminal to a local AC ground.

F. **Factory Reset** - Press and hold for 10 seconds to restore to factory settings.

G. **12V 2A Power Connection** - Optional 12VDC 2A locking connection for external power supply (not included).

Network configuration guides

Switch features and configurations vary between manufacturers. Refer to the manufacturer's user manual when configuring the required features to support MoIP.

Caution: Configure the network before connecting MoIP devices to avoid network flooding and overall instability.

Terms to understand

- **Core Network Switch** — The backbone of your local area network. This switch connects directly to your router and all other switches connect to this switch.
- **Edge Network Switch** — A switch connected to your Core Network switch.
- **Core MoIP Switch** — This is where your MoIP network starts. Think of it as its own topology within the larger network, dedicated to MoIP.
- **Edge MoIP Switch** — A switch connected to your Core MoIP switch.
- **IGMP Snooping** — This switch function listens for Internet Group Management Protocol (IGMP) messages to create an internal list of what devices have requested which IP multicast transmissions to be forwarded to them.
- **IGMP Snooping Querier** — Periodically requests all client devices on the network to report in with the multicast groups they wish to be joined with, to make sure that the IGMP snooping groups are updated to prevent multicast traffic loss.
- **Multicast Routing** — The forwarding of multicast traffic between segments of a network. Primarily VLANs and the LAN.
- **Unregistered Multicast** — Multicast traffic sent across a network that has had no IGMP messages associated with it. A network switch can decide to continue flooding this traffic through the network or to drop this traffic until an IGMP message has been seen for that multicast group.

- **Fast Leave** — A network switch function that causes a port to act on an IGMP leave message to remove the associated multicast group from the port without waiting for the normal leave to expire.

Read **Understanding Multicast & IGMP** to learn more.

You must apply the following settings to all the managed switches in the network:

- IGMP snooping must be enabled and set to v2.
- Unregistered multicast behavior set to drop.
- MRouter/Router Auto-learn enabled.
- Fast Leave enabled on ports with B-960 devices connected to them. This does not include switch uplinks.

The core MoIP switch must have:

- Querier state enabled and set to v2.

Edge switches must have the following settings configured:

- Querier state disabled.

Using VLANs for MoIP

Caution: Ryff to MoIP does not currently support VLANs.

Follow these guidelines when isolating MoIP to a VLAN:

- When configuring a MoIP VLAN, make sure your IGMP settings are only enabled for the MoIP VLAN and not the rest of the network.
- Configure Trunk ports between the router and switch to allow VLAN Traffic to flow to the MoIP switches.
- MoIP devices must be connected to MoIP VLAN Access Ports.
- When sharing a switch with Control4 and MoIP, enable IGMP on the MoIP and Control4 VLAN.

Read **Understanding Multicast & IGMP** to better understand why the network must be configured this way.

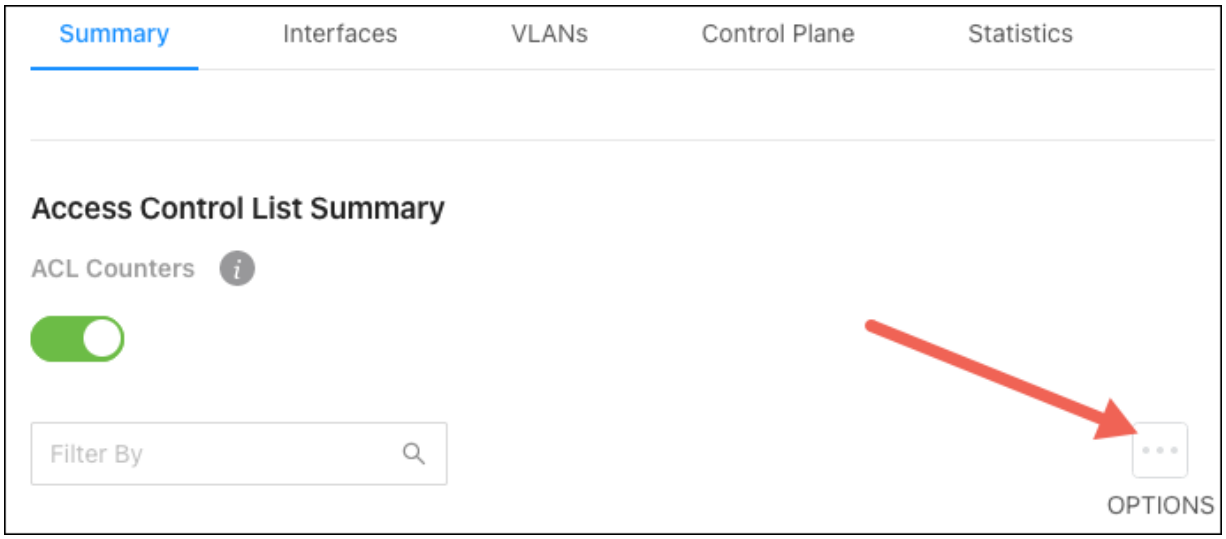
Araknis 620/920 switch configuration

Note: 960 MoIP devices must be connected to an Araknis 920 switch.

Enable these settings for every Araknis 620 and 920 switch on the network.

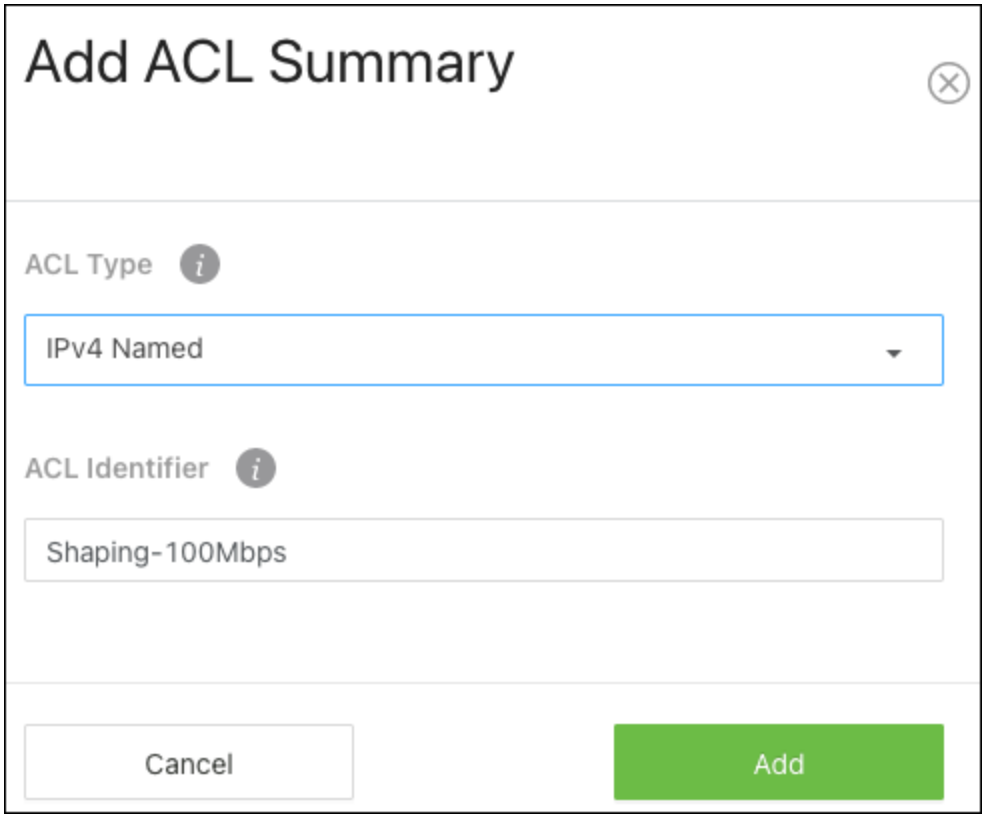
ACL Setup for B-960 devices on 920 switches

1. Navigate to **Advanced** > **QoS** > **ACL Rules**.
2. Verify **ACL Counters** are enabled, then click **Options** > **Add.**

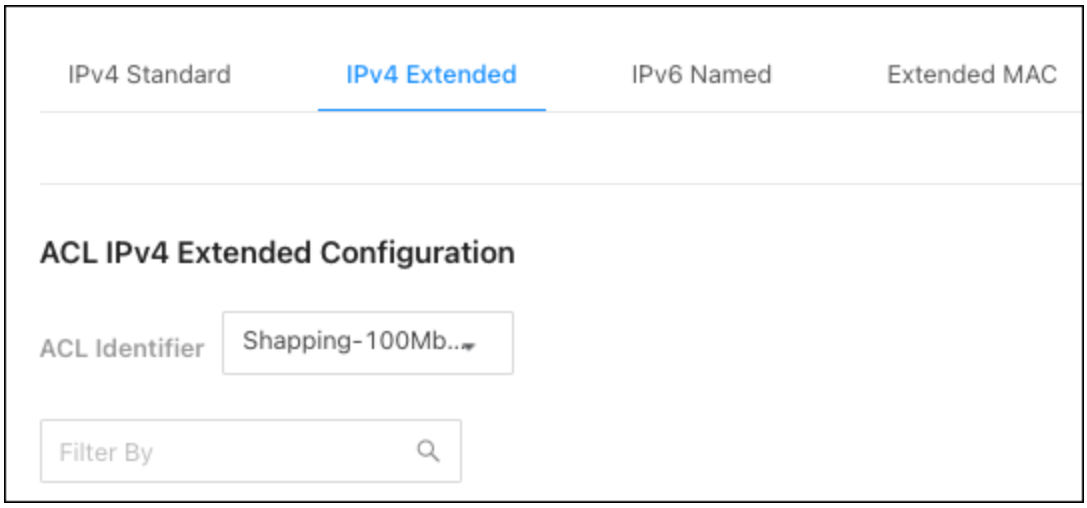


3. For **ACL Type**, select **IPv4 Named**.

4. Name it **Shaping-100Mbps**, then click **Add.** When the window closes, click **Apply** at the top of the page.



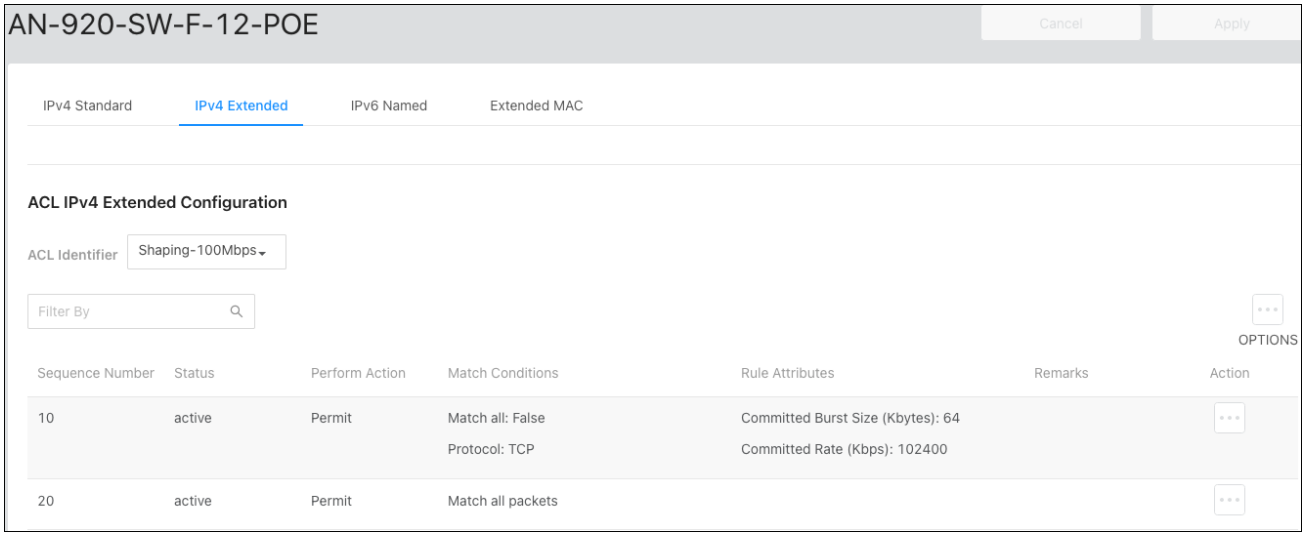
5. Navigate to the **Advanced > QoS > ACL Configuration** page and select the **IPv4 Extended** header.



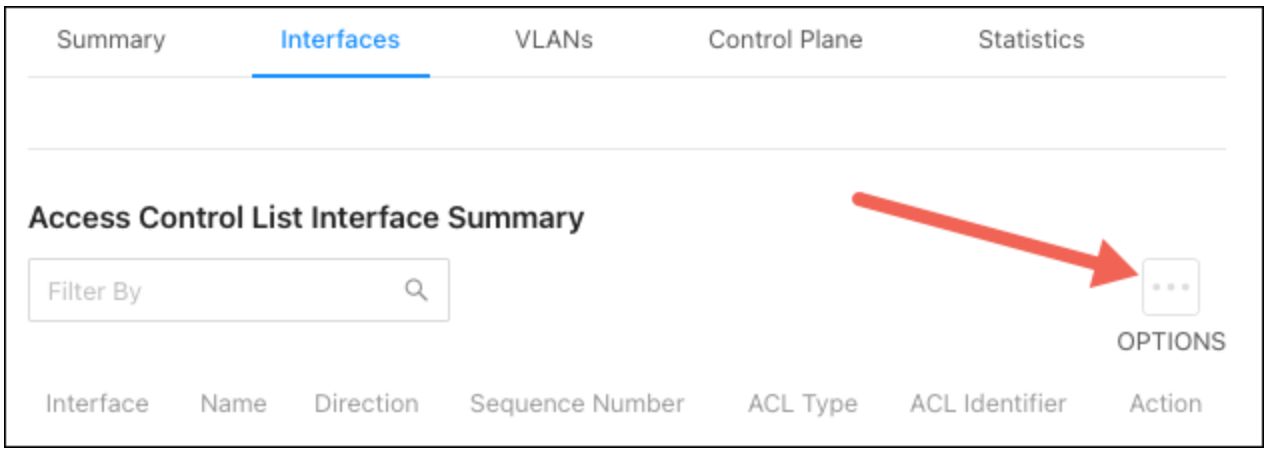
6. Verify **Shaping-100Mbps** is selected as the **ACL Identifier**, then click **Options** > **Add** to create the IPv4 Extended ACL Rules in steps 7 through 10.

Note: These values must be typed in. Be sure to click **Add** at the bottom of each window.

7. Enter the following values:
    - **Sequence Number:** 10
    - **Perform Action:** Permit
    - **Protocol:** TCP
    - **Committed Rate:** 102400
    - **Burst Size:** 64
8. Add another IPv4 Extended ACL Rule with the following values:
    - **Sequence Number:** 20
    - **Perform Action:** Permit
    - **Every:** Enable
9. Press **Apply** at the top of the page.

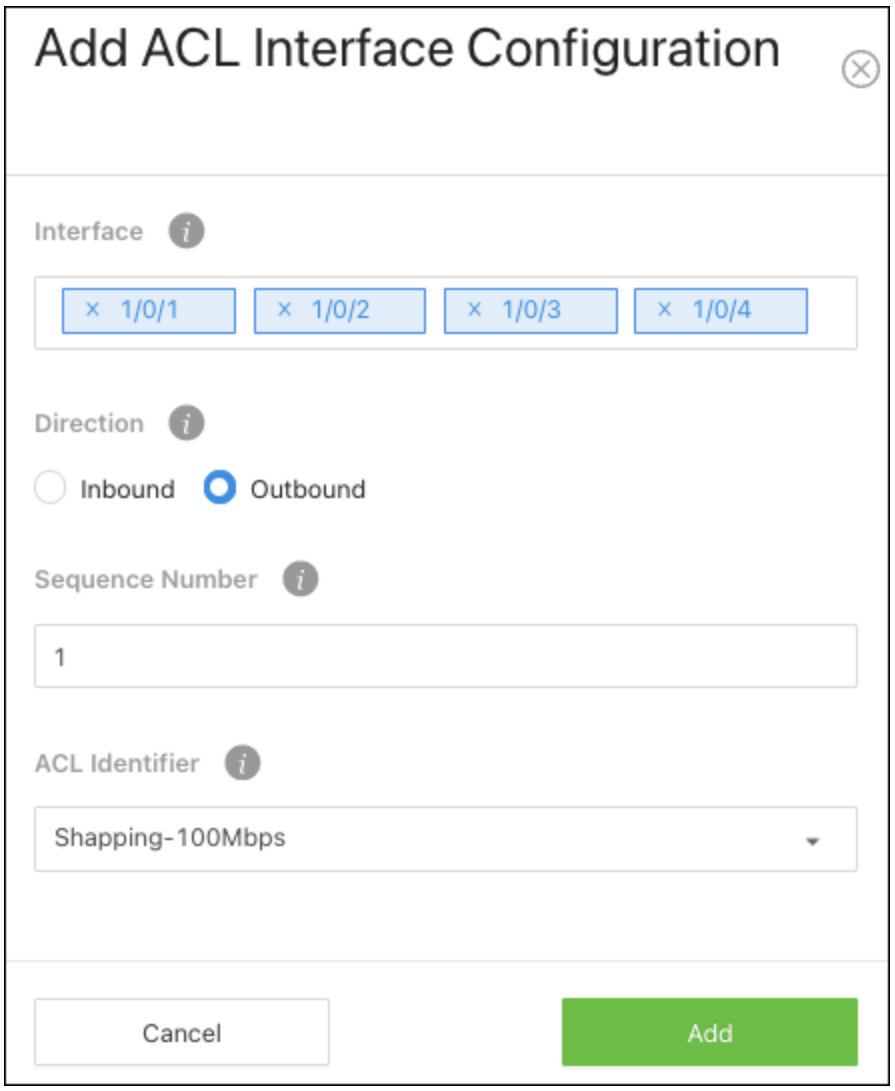


11. Navigate to the **Advanced** > **QoS** > **ACL Rules** page and select the **Interfaces** header.
12. Click the **Options** button > **Add**.



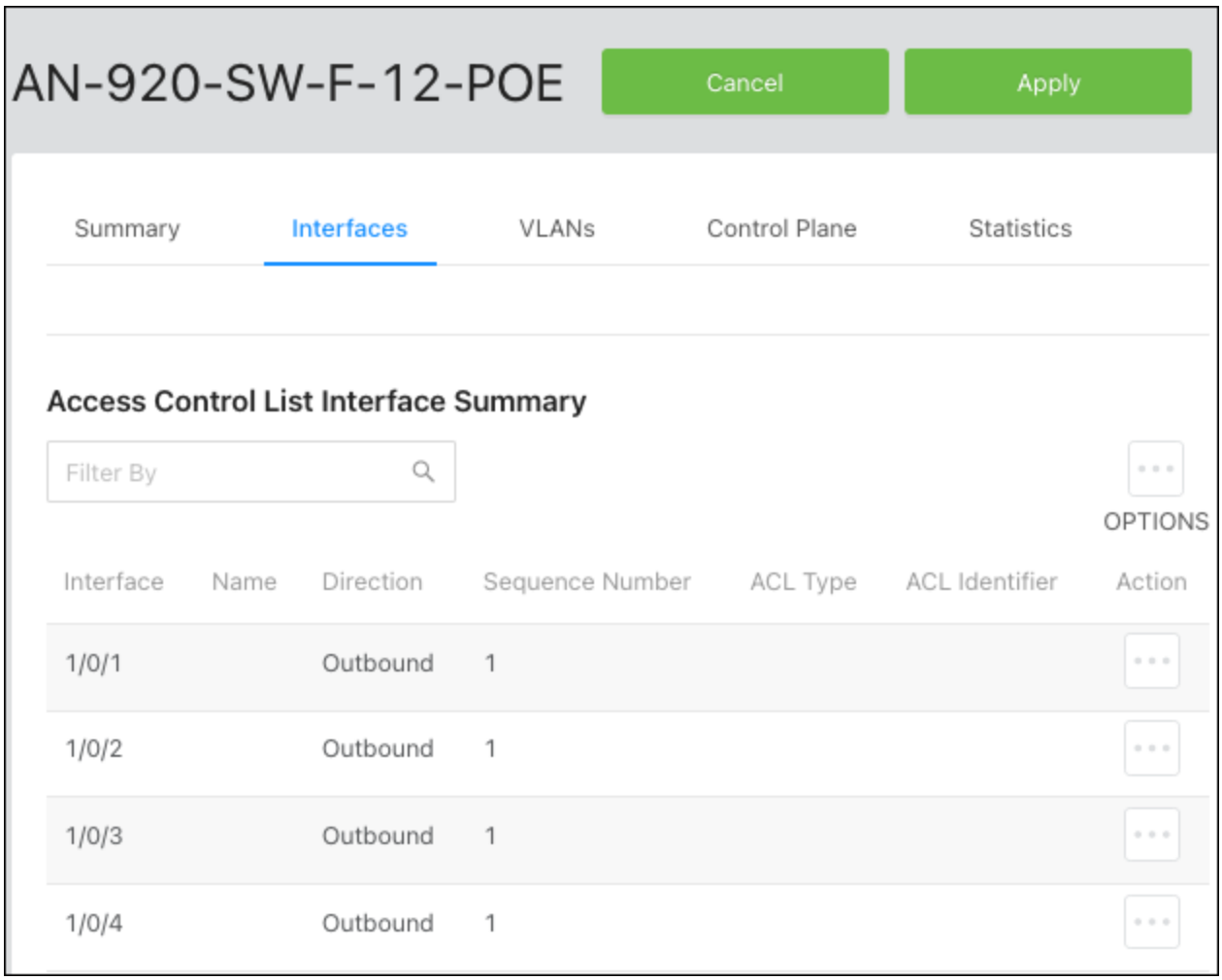
13. Apply the **Shaping-100Mbps ACL** to switch interfaces:

    - Select all the **Interfaces** connected to a MoIP device.
    - **Direction:** Outbound
    - **Sequence Number:** 1
    - **ACL Identifier:** Shaping-100Mbps



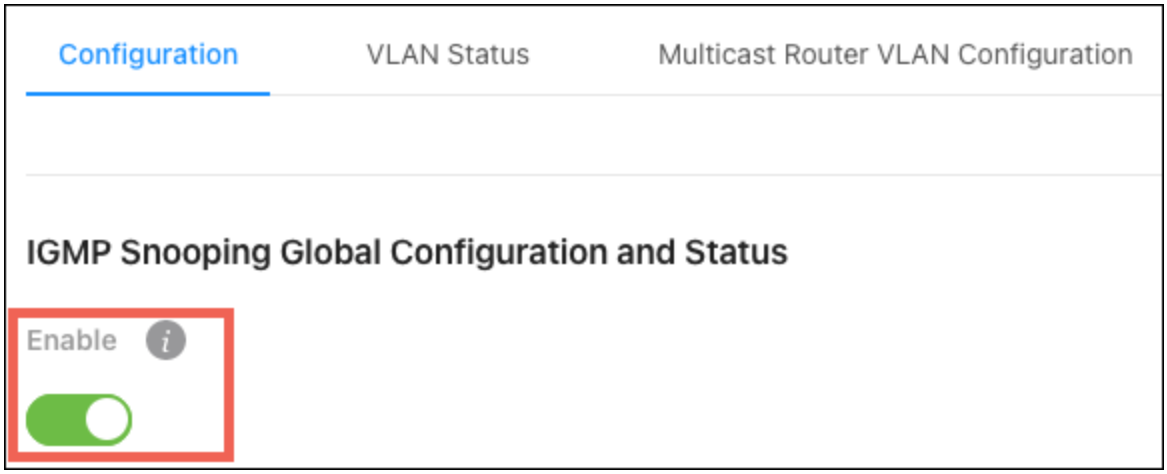
14. Click **Add** to close the window, then **Apply** at the top of the page.

Note: Step 13 must be repeated if the MoIP devices are not on sequential ports.

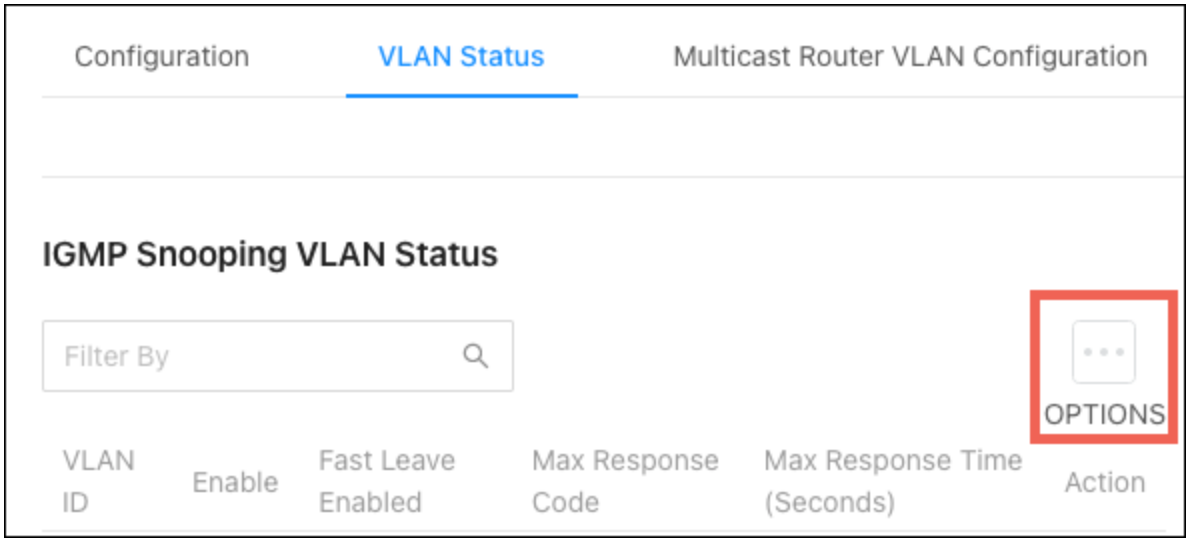


IGMP Setup

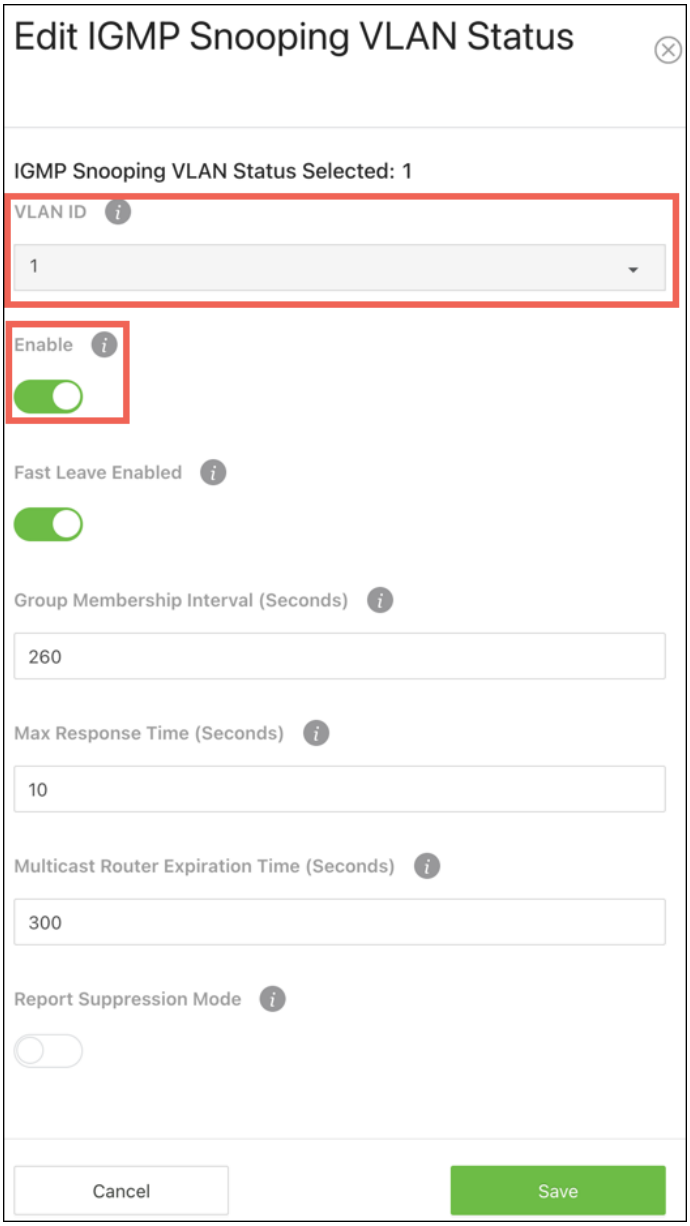
1. Navigate to the **Advanced** > **Switching** > **IGMP Snooping** page and select the **Configuration** tab.
2. Toggle **Enable** to turn IGMP Snooping on and press **Apply.**



3. Select the **VLAN Status** tab on the same page, then click the **Options** button.

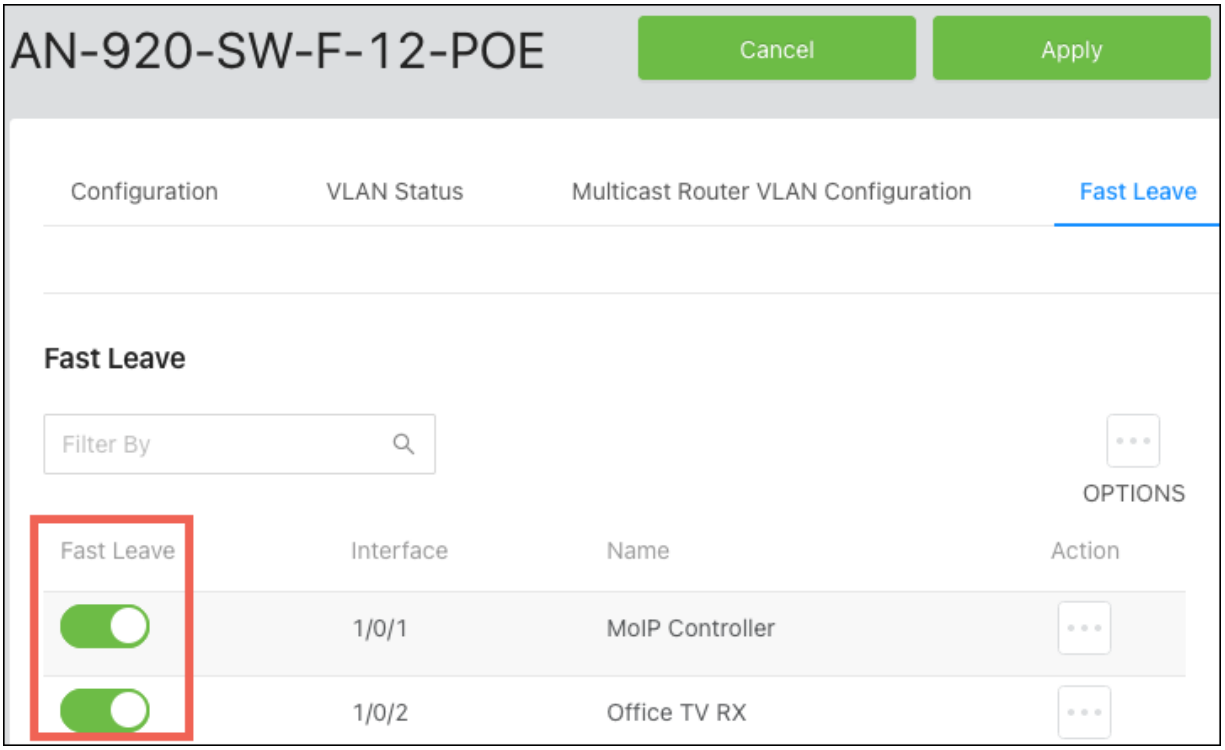


4. Select the **VLAN ID** MoIP is configured on, enable **Fast Leave**, then click **Add** to close the window.



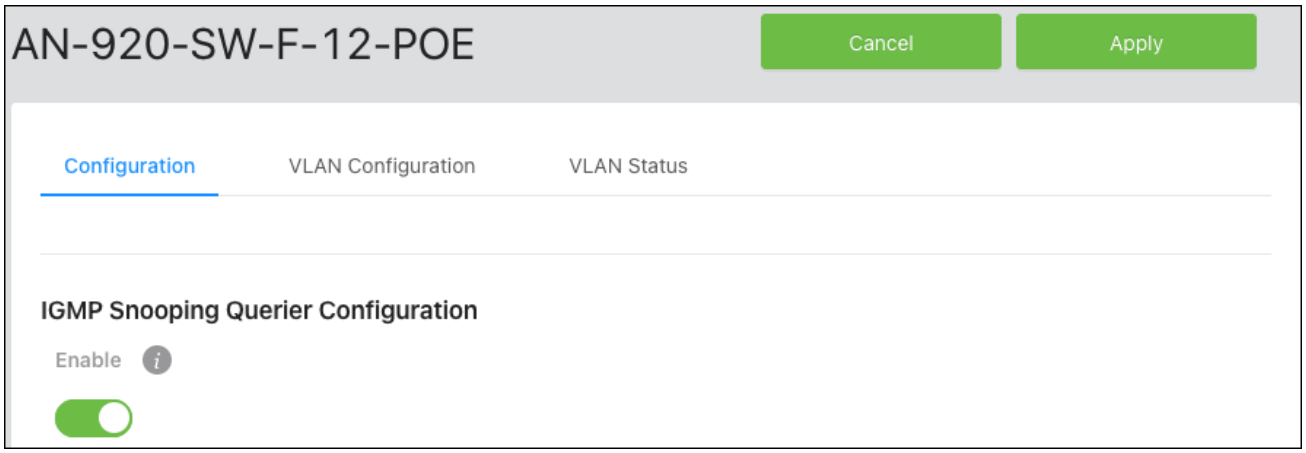
5. Enable **Fast Leave** on ports with MoIP devices connected to them, then click **Apply** at the top of the page.

Caution: Do not enable Fast Leave on uplink ports.

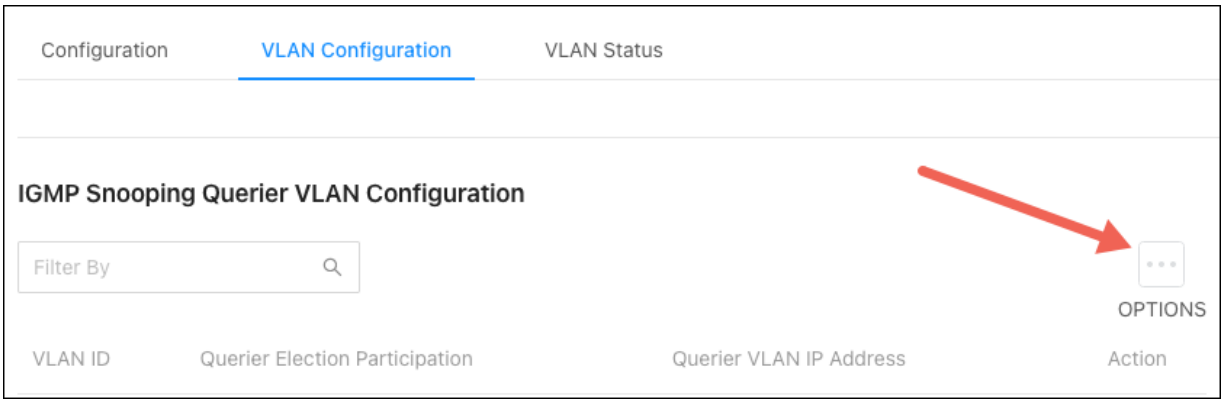


6. Navigate to **Advanced** > **Switching** > **IGMP Snooping Querier** and select the **Configuration** tab (**VLAN Configuration** for 620 switches).

7. Toggle **Enable** to turn the IGMPv2 Querier feature on, then click **Apply** at the top of the page.

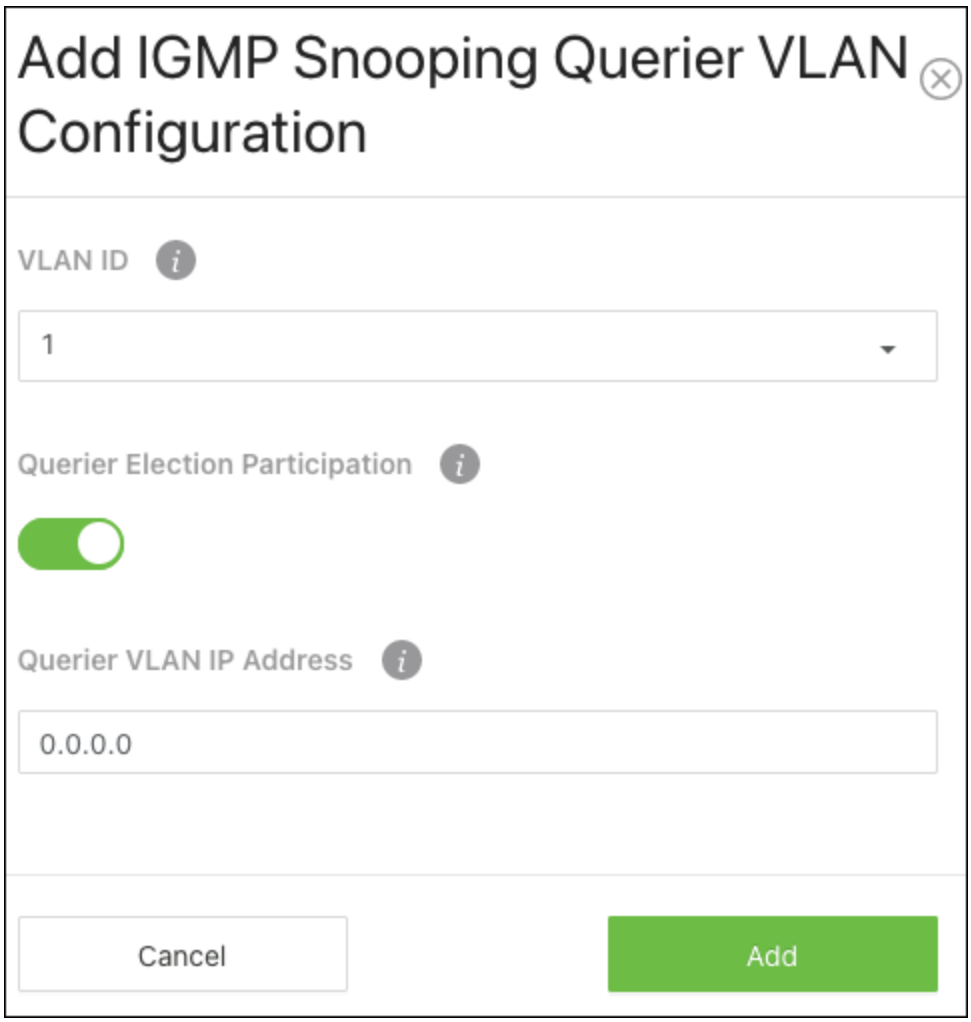


8. Select the **VLAN Configuration** tab on the same page, then click **Options** > **Add**.



9. Verify the **VLAN ID**, enable **Querier Election Participations**, then click **Add**.

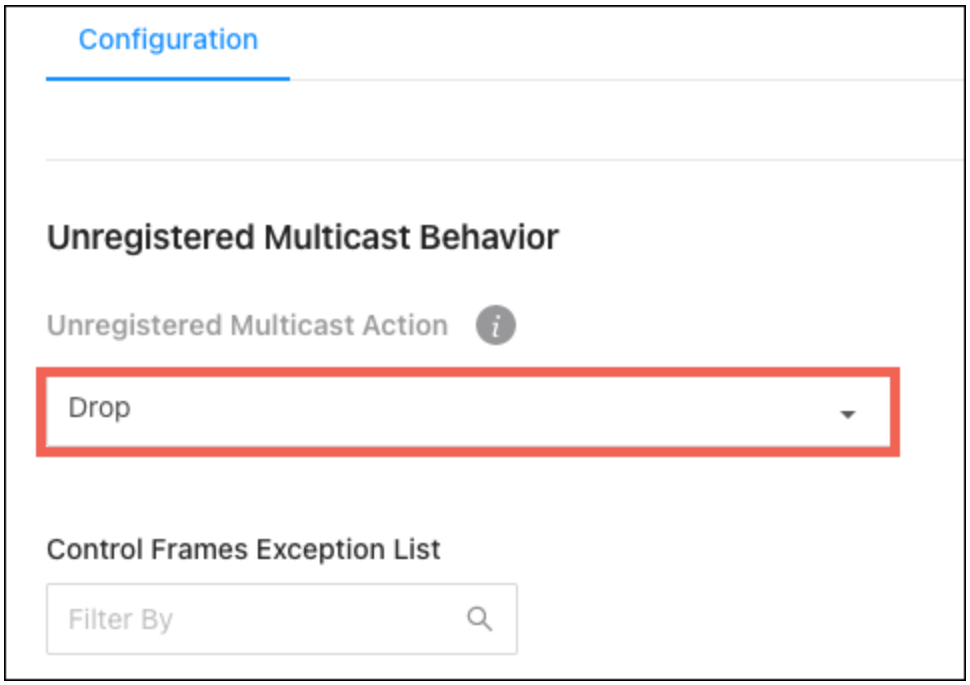
Note: For 620 switches, you only need to verify the VLAN ID and click Add.



10. Press **Apply** at the top of the page.

Disable forwarding of unregistered multicast traffic

1. Navigate to **Advanced** > **Switching** > **Unregistered Multicast Behavior**.
2. Set the Unregistered Multicast Action to **Drop.**



Araknis 210/310 switch configuration

Enable these settings on every managed switch on the network, unless a step specifically states it is for a core switch.

1. Navigate to **Advanced** > **IGMP Snooping**.
2. For **Status**, click **Enabled**.
3. Verify the **Version** is set to **V2**.
4. Set the **Unregistered Multicast Behavior** to **Drop**.

Settings

Status	(•) Enabled ( ) Disabled
Version	(•) V2 ( ) V3
Report Suppression	(•) Enabled ( ) Disabled
Unregistered Multicast Behavior	( ) Flood (•) Drop

5. Under VLAN settings, enable **IGMP Snooping Status** on the **VLAN ID** the MoIP devices are configured on and verify **Fast Leave** is **Disabled**.

VLAN Settings

VLAN ID	IGMP Snooping Status	Fast Leave
1	Enabled	Disabled
2	Disabled	Disabled

6. On core switches, set the **Querier State** to **Enabled**. Verify the **Querier Version** is **v2**.

Querier Settings

VLAN ID	Querier State	Querier Vers...	Querier Status	Querier IP	Robustness	Interval
1	Enabled				2	125
2	Disabled	v2	Non-Querier	---	2	125

Core MoIP switch only

Note: In Araknis x10 switch firmware v1.3.10 and earlier, IGMP Querier auto-election is currently unavailable. Set all edge switches to Querier Disabled to avoid issues.

A firmware update is in development to resolve this issue.

7. 7. Under **Router Settings**, at the bottom of the page, set the **Router Ports Auto-Learned** to **Enabled** on all VLANs.

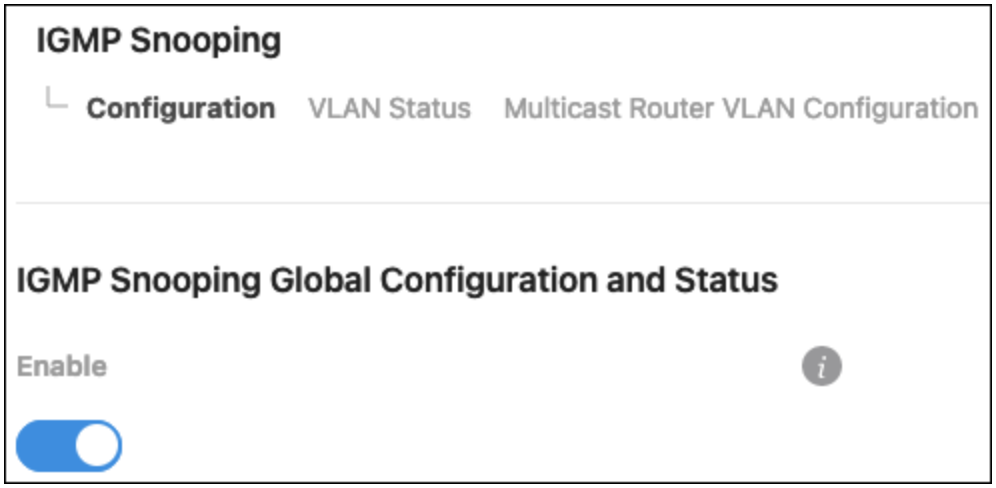
Router Settings

VLAN ID	Router Ports Auto-Learned	Dynamic Port List	Static Port List	Forbidden Port List
1	Enabled			
2	Enabled			

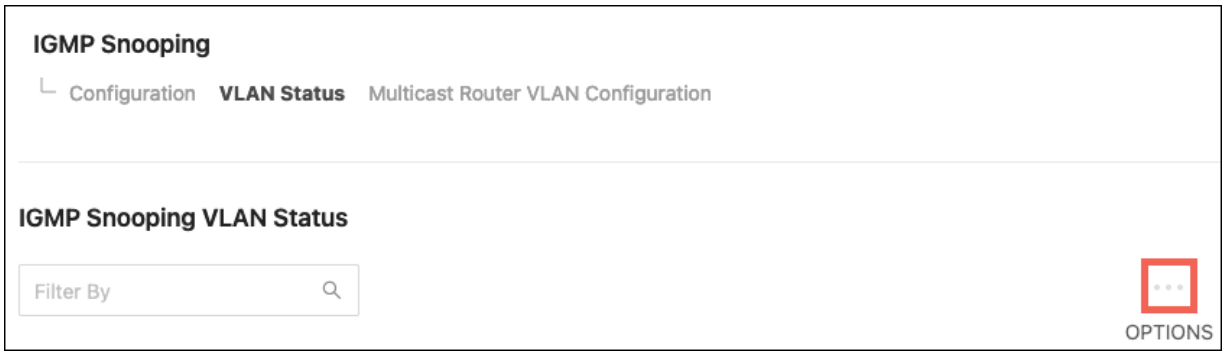
Pakedge MS Series switches configuration

Enable these settings on every managed switch on the network, unless a step specifically states it is for a core switch.

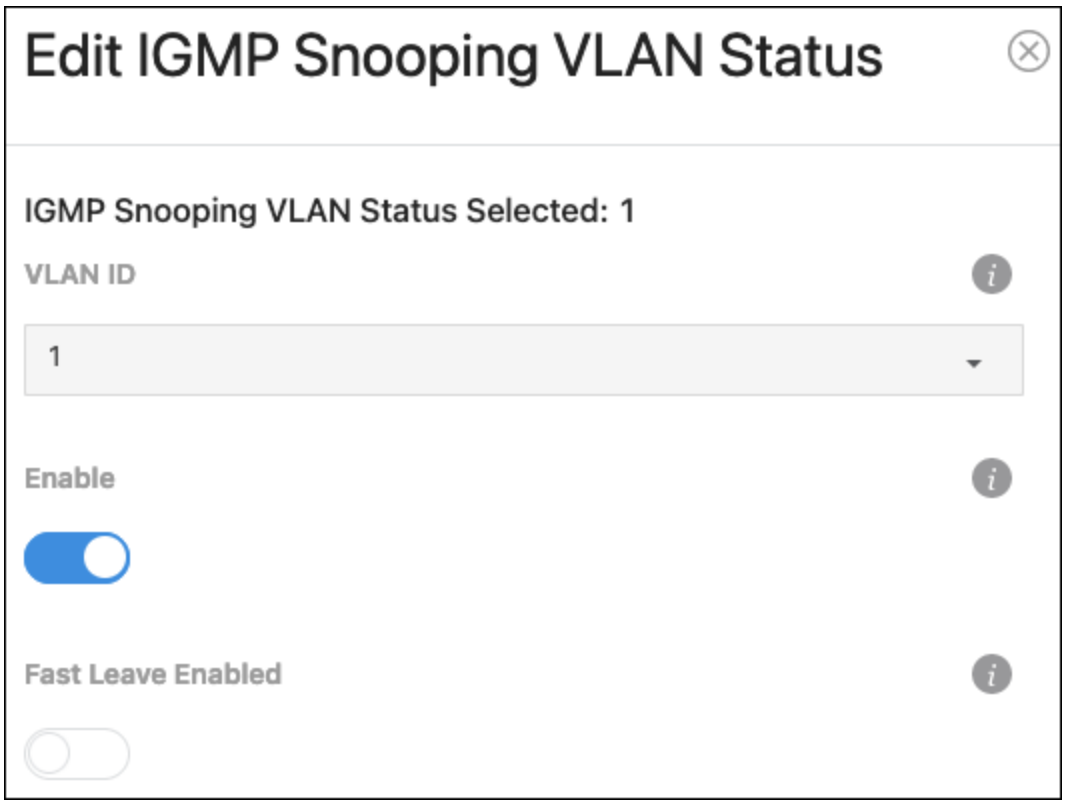
1. Navigate to **Advanced** > **IGMP Snooping** > **Configuration**.
2. Set **IGMP Snooping Global Configuration and Status** to **Enable**, then click **Apply** at the top of the page.



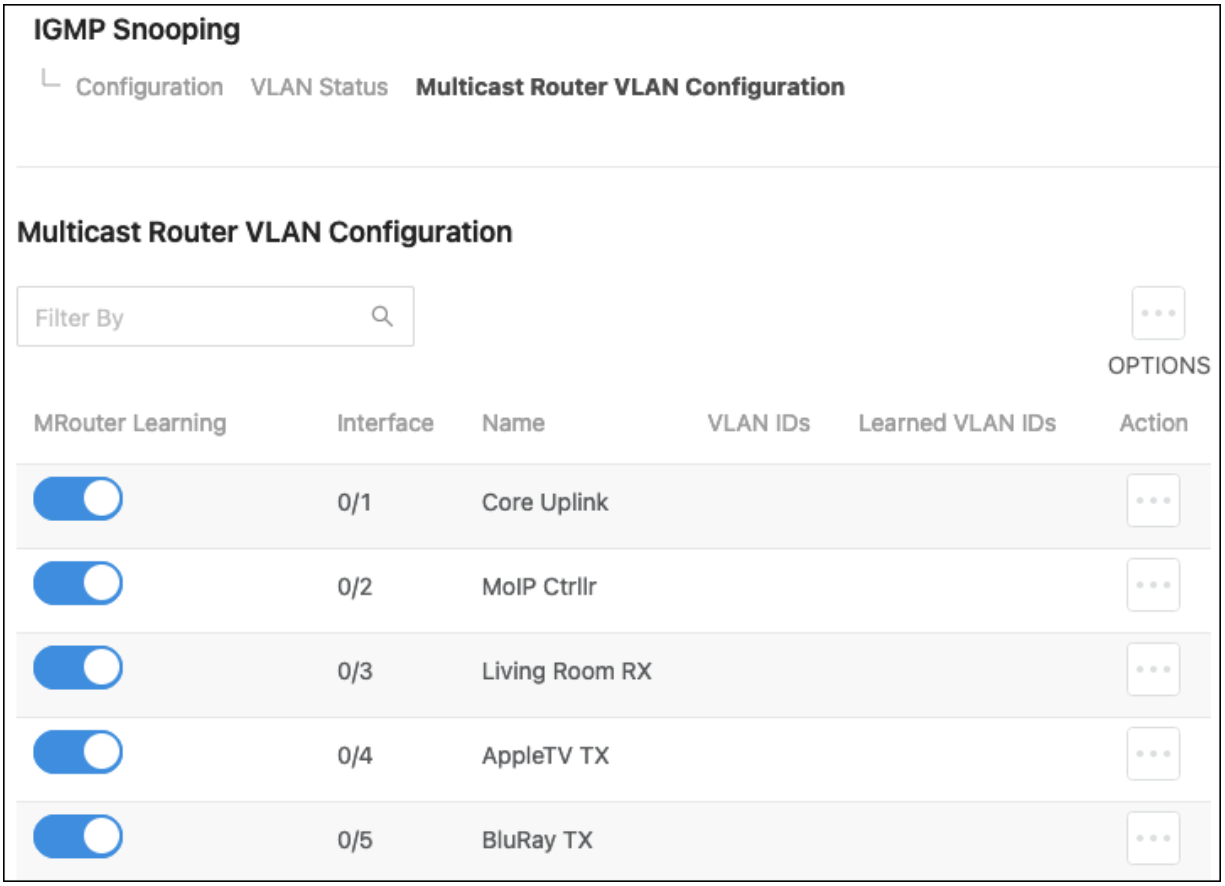
3. Move to the **VLAN Status** page and click the **Options** button to **Add** a VLAN entry.



4. Select the VLAN ID the MoIP devices are configured on and set **Fast Leave** to **Disabled** for all switches.



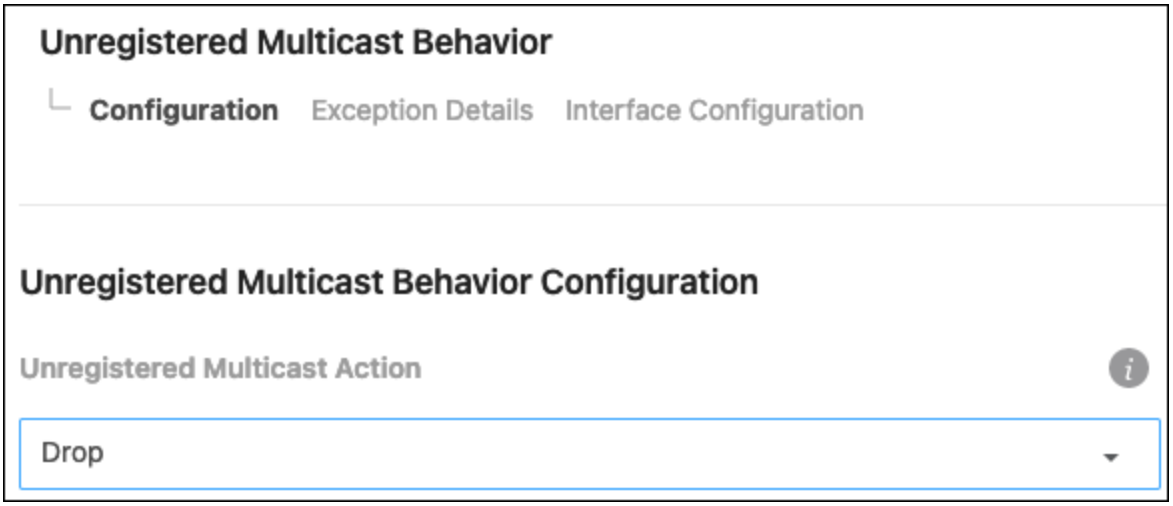
5. Click **Add**, then **Apply** at the top of the page.
6. Click the **Multicast Router VLAN Configuration** tab. Toggle **MRouter Learning** on for all ports, then click **Apply**.



Note: In Pakedge MS switch Firmware v1.03.0 and earlier, in a multi-switch MoIP topology, MoIP traffic between switches may not traverse as expected when using an MS switch as the core switch. The toggle may indicate that MRouter Learning is enabled, even when it is not.

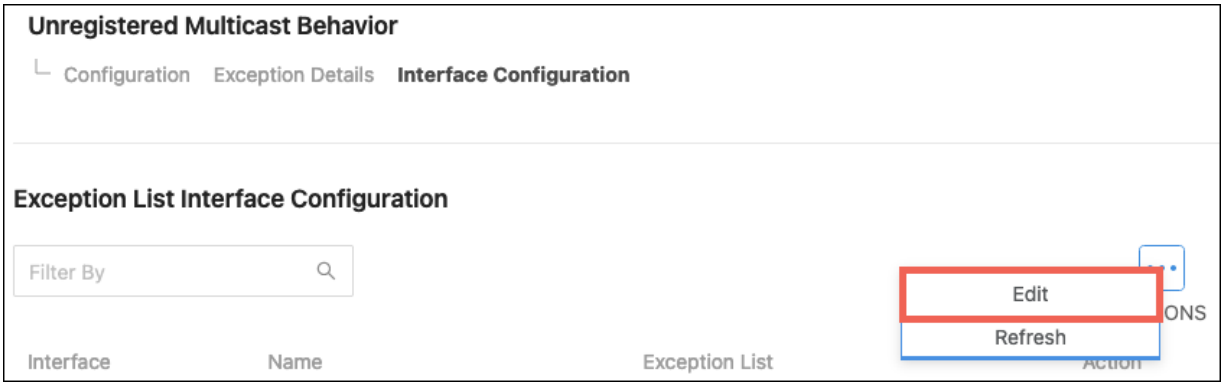
A firmware update is in development to resolve this issue.

6. Go to **Advanced** > **Unregistered Multicast Behavior** > **Configuration**.
7. Set **Unregistered Multicast Behavior Configuration** to **Drop**, then click **Apply**.



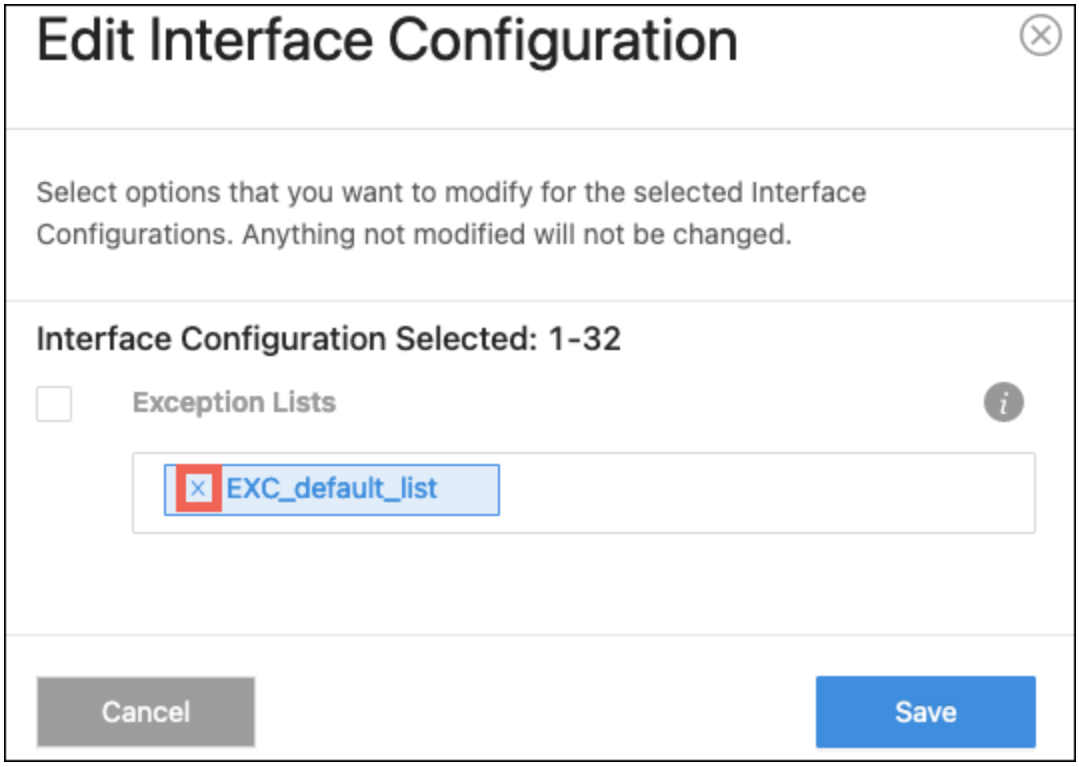
8. If you see an entry for **EXC_default_list** under the **Exceptions list**, continue to the following steps. If not, your configuration is complete.

9. Click the **Interface Configuration** tab, then click **Options**, and **Edit**.



10. Select each entry for **EXC_default_list**. If that's each entry in the list, click the box next to Interface to select all. Then click **Edit Selected**.

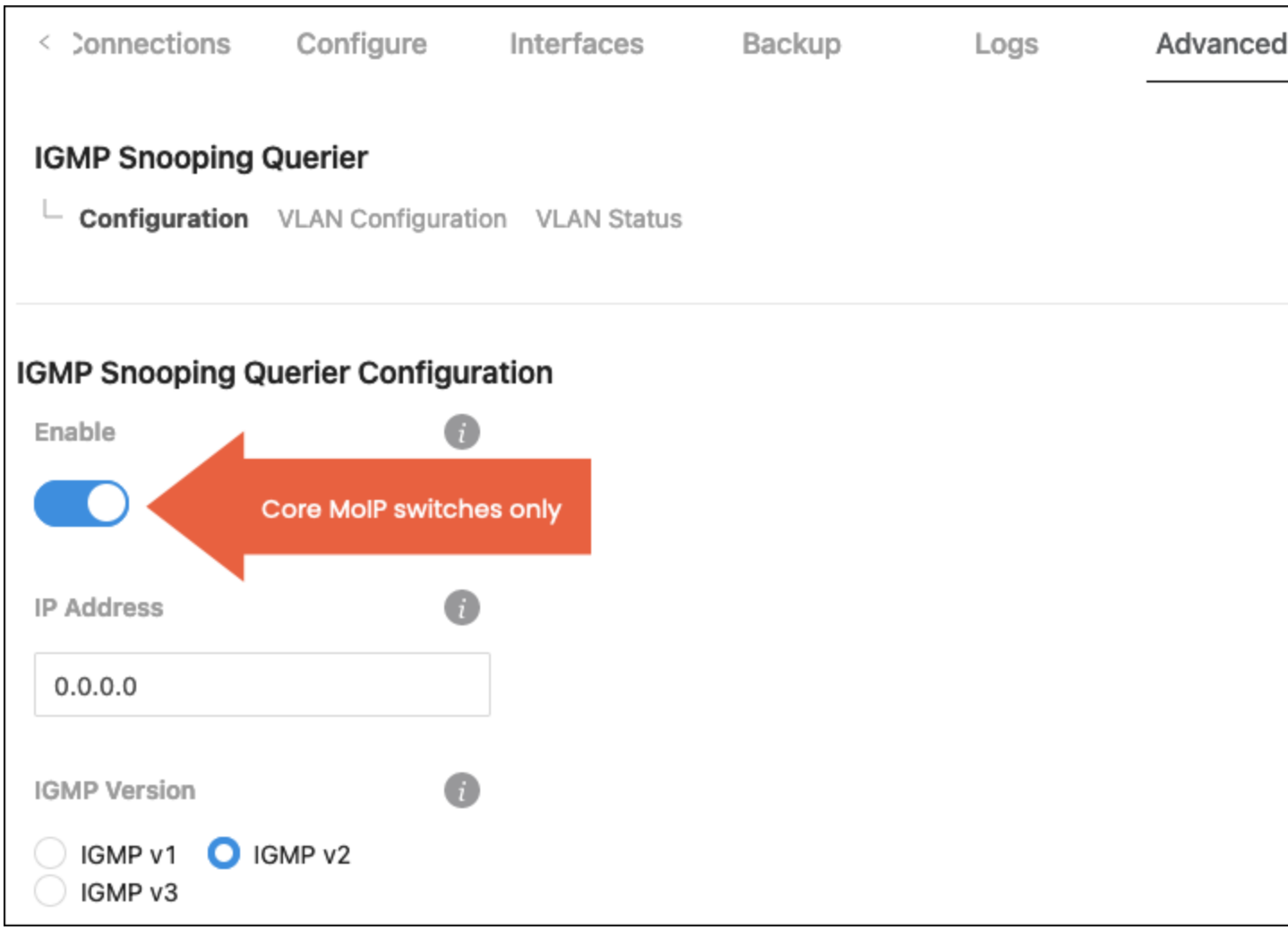
11. Click the “x” in the **EXC_default_list** object to delete it.



12. **Click Save**, then **Apply** at the top of the page.

Core MoIP swich configuration

1. Navigate to **Advanced** > **IGMP Snooping Querier** > **Configuration**. Click **Enable** and very the **IGMP Version** is set to **V2**. Then click **Apply**.



2. Navigate to **Advanced** > **IGMP Snooping Querier** > **VLAN Configuration**, then click the **Options** button to **Add** an entry.
3. Leave **Querier Election Participation** at **Disabled** and the **Querier VLAN IP Address** at **0.0.0.0**.
4. Click **Add**, then click **Apply** at the top of the page.

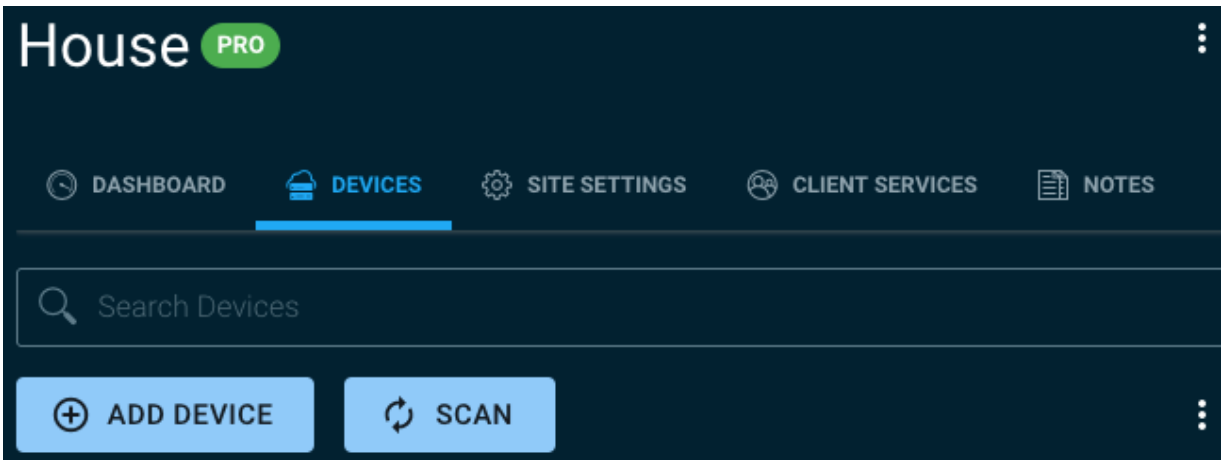
MoIP configuration

Before you begin

- Verify the network has been properly configured before connecting MoIP devices.
- Document the MAC address and Service Tag of the MoIP devices and notate which input or display they're connected to.
- Perform available firmware updates.

Adding and configuring the MoIP system in OvrC

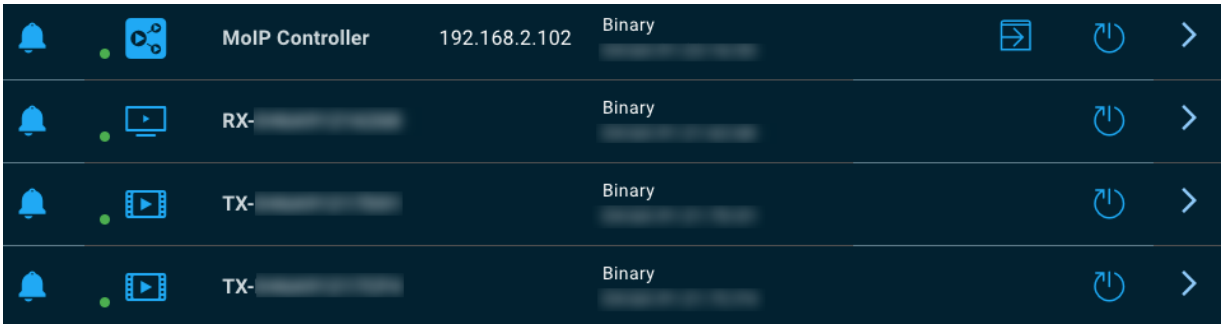
1. Connect the controller to the MoIP switch and use the included power supply to connect it to an AC outlet. Then, claim the MoIP controller on OvrC by clicking **Add Device** or **Scan**, if there's an OvrC Pro device on the network.



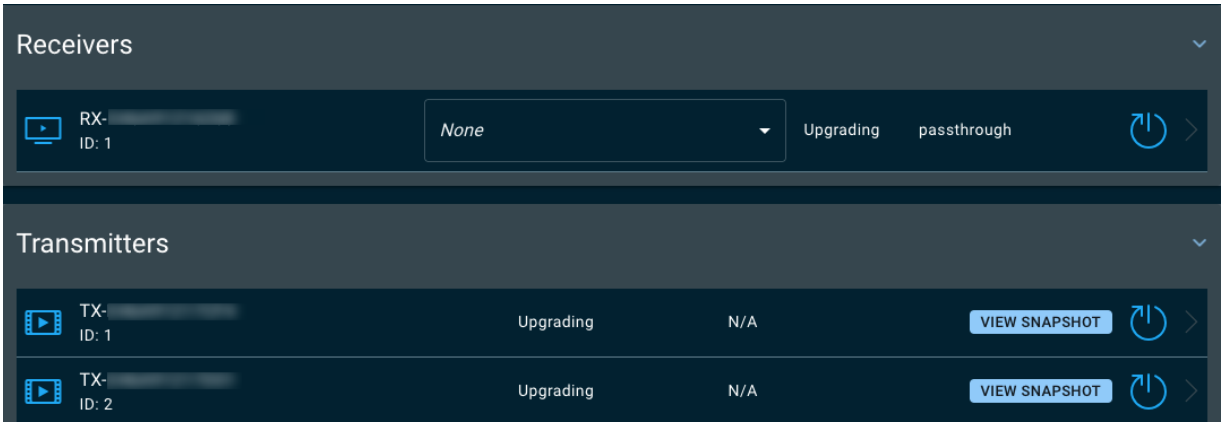
Note: You must have the MAC address and Serial Tag of the MoIP controller to manually add the device to OvrC.

2. Verify the MoIP controller's firmware is up to date. If not, you must update the firmware before continuing.

3. Power off the MoIP switch(es), then make all the necessary audio and video connections to the MoIP devices.
4. Connect the MoIP devices to the MoIP switch(es). If you're powering any of the MoIP devices with a power supply instead of PoE, connect them to power.
5. The MoIP controller scans for new transmitters and receivers every minute. Once discovered, they appear in the device list.

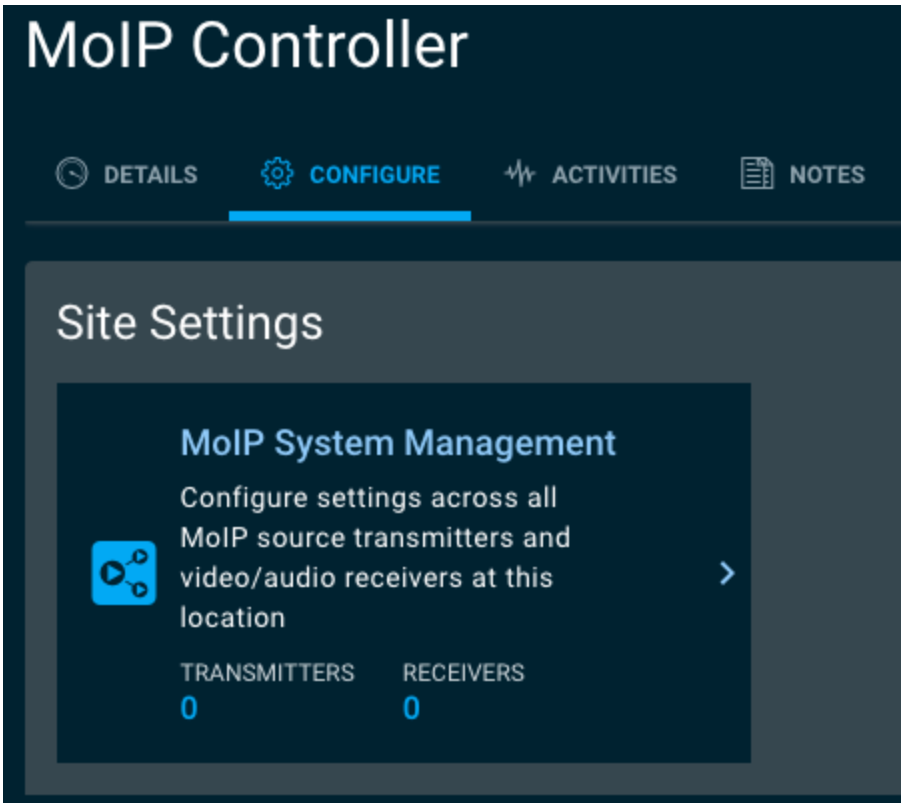


6. The MoIP controller automatically detects if the transmitters and receivers require a firmware update and delivers updates, as needed. Click the MoIP controller to see the update process.



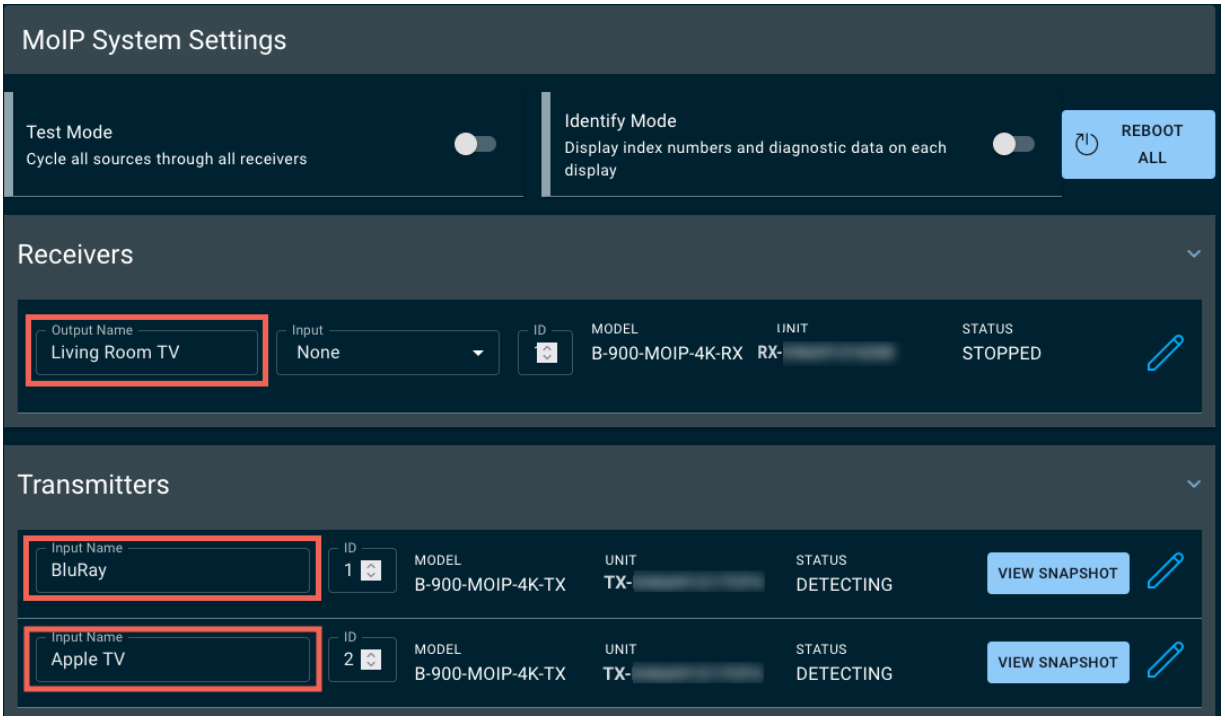
Devices are discovered and assigned a transmitter or receiver number, which correlates directly with the inputs or outputs for control system integration, similar to traditional matrix switchers.

7. When the updates are complete, click the **Configure** tab. If you'd like to use a static IP address, scroll down to the IP Settings, turn off **Use DHCP**, and enter the static address. Otherwise, click **MoIP System Management**.

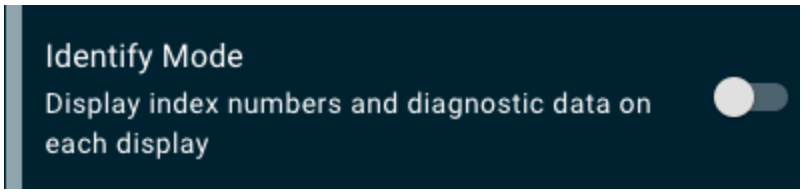


Pro Tip: Use a MAC reservation instead of a static IP address to avoid potential IP conflicts.

8. Give a meaningful name to each receiver and transmitter. Like the name of the output or input and where it's located.

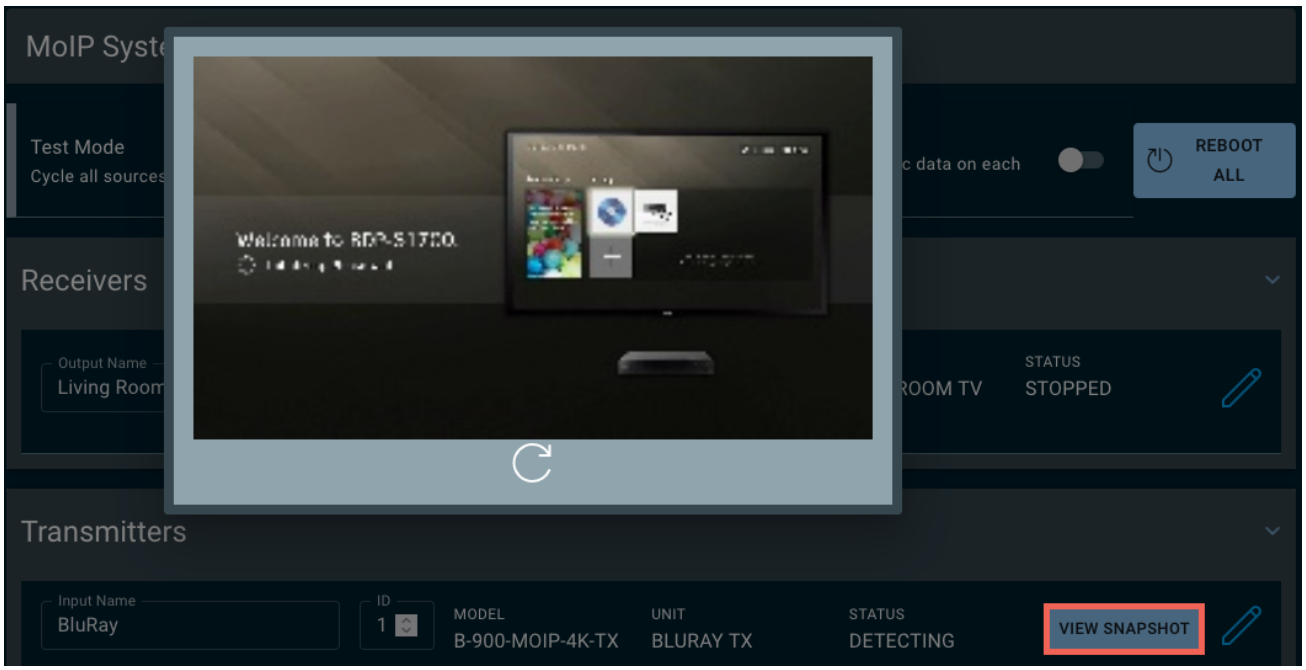


If you're unsure which receiver is connected to which output, enable **Identify Mode** to display the MoIP device's MAC address on the display.

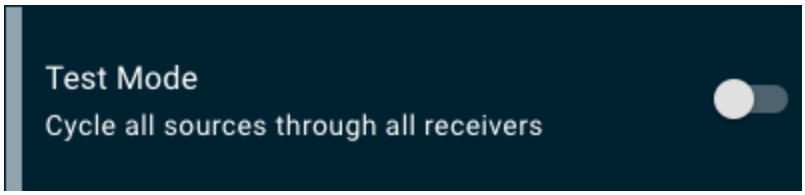


Note: B-960 devices do not support Identify Mode.

If you're unsure which source device is connected to a transmitter, verify the source is powered on and click View Snapshot.



11. Enable **Test Mode** to cycle all the discovered transmitter's sources through the receivers and their displays.



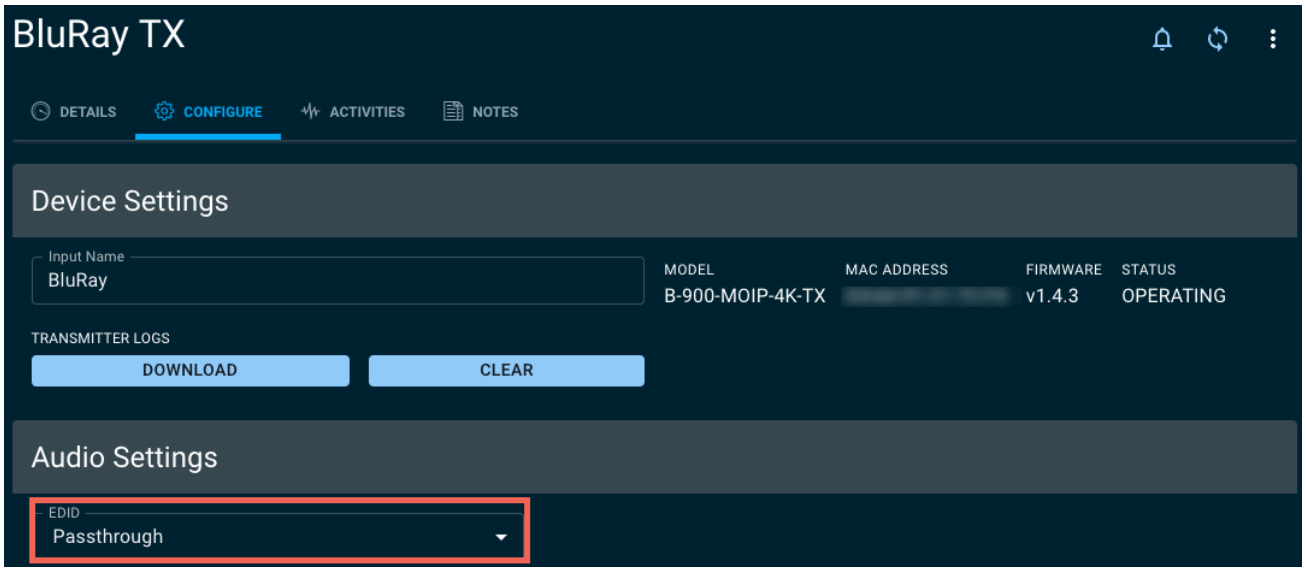
Note: In test mode, 4K content does not display on a 1080p TV or a 1.4 HDCP connection. To fix this, downscale the receiver's video passthrough settings by clicking the receiver's edit icon and using the appropriate dropdown menus. **Read more about configuring video receivers.**

Note: B-960 devices do not support Identify Mode.

Configuring MoIP Video Transmitters

All MoIP video transmitters allow you to set the audio EDID (Extended Display Identification Data).

Pro Tip: Disable power-saving settings on connected devices to help maintain the video stream.



The audio EDID can be fixed to a 2-channel stereo or 5.1 multichannel. The default setting is Passthrough, which allows all multichannel high audio resolution formats including DTS-X, Dolby ATMOS, DTS HD Master Audio, and Dolby True HD.

Caution: Setting an audio EDID on a transmitter forces the audio resolution to all receivers in the system. Consider using a downmixing transmitter (B-900-MoIP-4K-TX-2AC) for systems that require simultaneous delivery to zones capable of multichannel audio as well as 2-channel only.

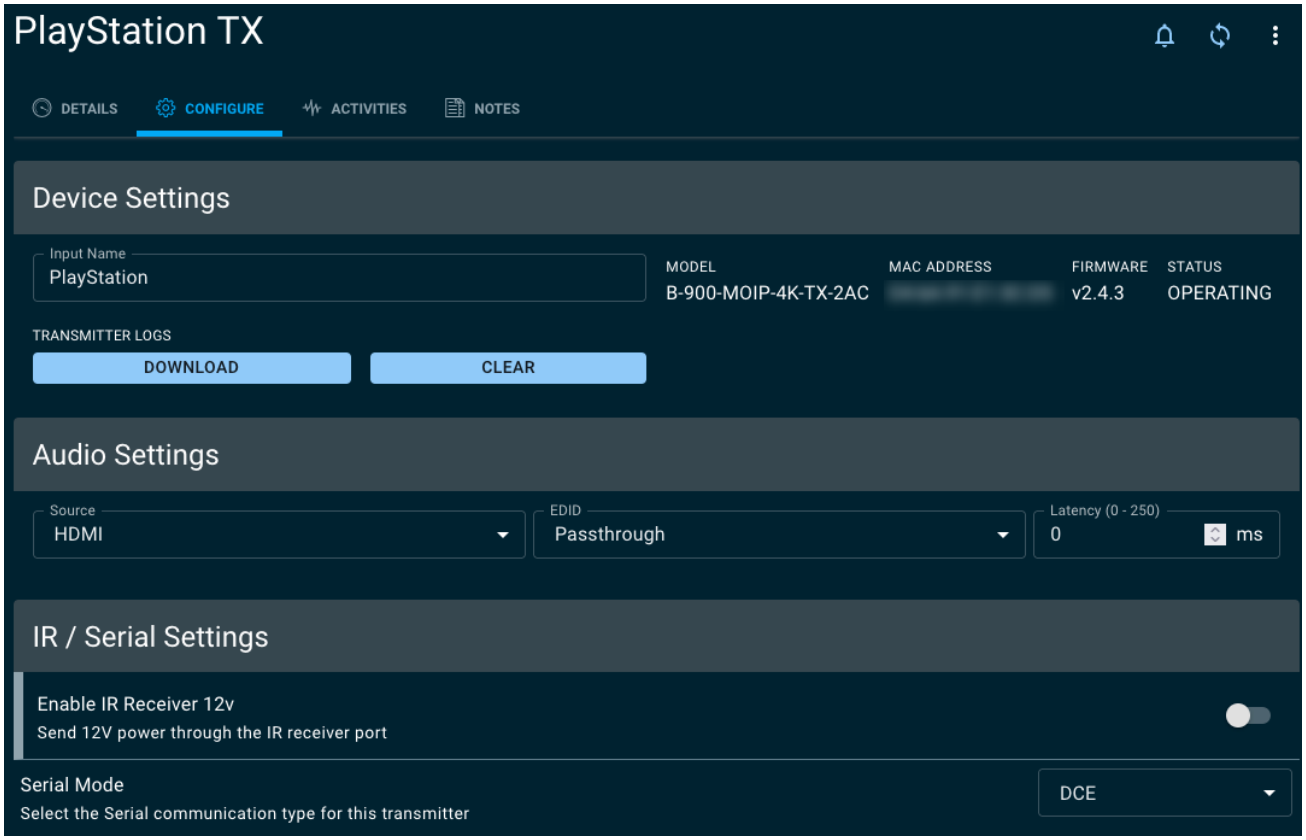
Pro Tip: A downmixing receiver provides the best experience.

How to select an audio EDID

- **Full - 7.1 DD ATMOS, DTS-X** - Allows any audio format to pass through to the endpoint. This includes object-oriented formats like Dolby Atmos and DTS X for the best available surround sound performance. When using this mode, and encountering a Dolby Atmos or DTS:X signal, there will be no output from the 2-channel analog output.
- **Passthrough - 7.1 TrHD/HDMSTR** - Allows any format that is capable of being decoded by the built-in downmixer. Use this mode when using downmixing endpoints to ensure you always get output from the analog outputs. This mode does not support Dolby Atmos or DTS-X .
- **5.1 - 5.1 DD/DTS** - Forces the stream to only support 5.1 channel surround formats.
- **2-channel** – Use this mode when the endpoints are only cable of 2-channel PCM audio.

Downmixing transmitters

Downmixing transmitters (B-900-MoIP-4K-TX-2AC) add the ability to select a **Source** for the audio EDID (HDMI or analog) and configure **Audio Latency** (up to 250 milliseconds).



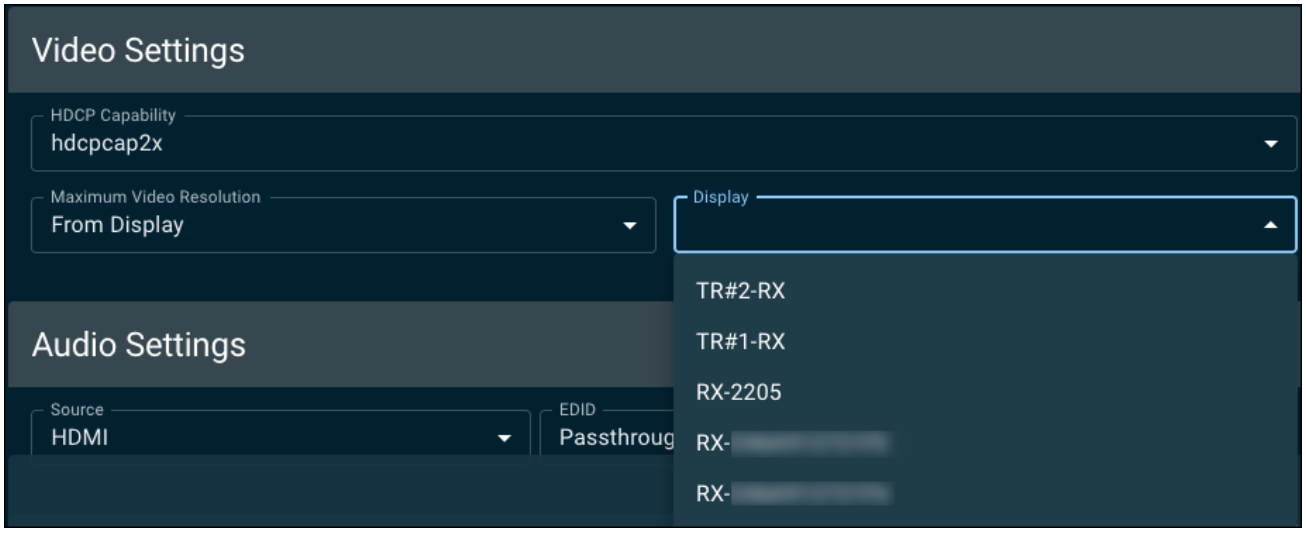
Enable **IR Receiver 12v** if you need to supply power to a connected IR emitter.

Available **Serial Modes** are DCE and DTE.

B-960 transmitters

B-960 transmitters (B-960-4K-TX-A) and transceivers (B-960-MOIP-4K-TR) include an **HDCP Capability (hdcpcap)** dropdown that allows you to force the hdcpcap to 2.2 or 1.4.

They also include extra EDID options under **Maximum Video Resolution**, such as **From Display**. This option lets you choose a **Display** to copy the EDID from and present it to the source. Use this option to enable Dolby Vision for capable displays.



Click **Save**, at the bottom of the page to apply settings.

Configuring MoIP Audio Transmitters

The **Audio Resolution** and **Sampling Frequency** can be modified using the dropdown menu. Available Audio Resolutions include 16-bit or 24-bit, and the Sampling Frequency can be set to 48 kHz, 96 kHz, or 192 kHz.

Common audio resolution and sampling frequency settings include:

- A MoIP video receiver over HDMI supports 24-bit / 192 kHz. However, if using the analog outputs of the MoIP video receiver to distribute audio, you must set the MoIP audio transmitter to a maximum Sampling Frequency of 96 kHz.
- A MoIP audio transmitter communicating with a MoIP audio receiver has no restrictions. Set the transmitter to 24-bit / 192 kHz.

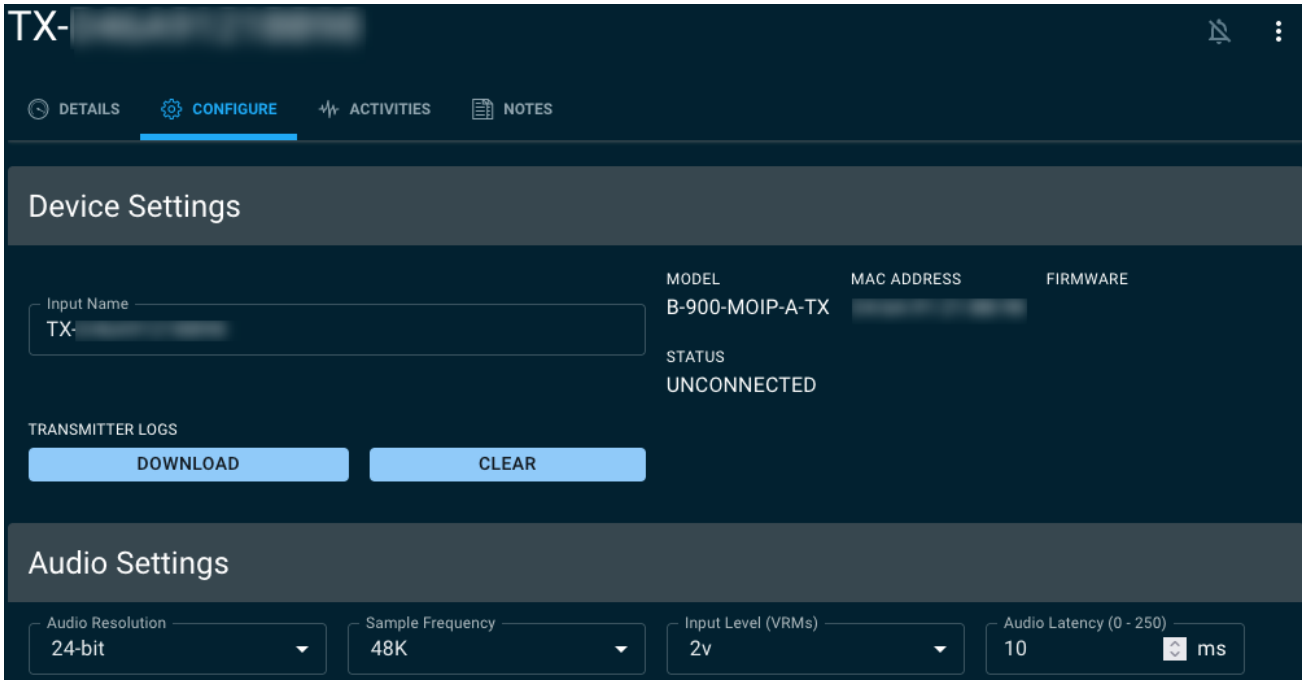
Pro Tip: Some devices have limitations on the type of audio signals they can receive, which a MoIP system may not detect. If you aren't getting audio and you've verified all your physical connections, check the connected device's maximum audio resolution and sampling frequency.

The **Maximum Input Level** is adjustable to deliver the best possible signal-to-noise ratio performance. This is dependent on the output signal level of the connected source device.

For example, if the source device is capable of outputting a maximum of 1 Volt RMS (Vrms), set the Maximum Input Level to 1 Vrms to provide the best system performance.

Caution: If the source device is capable of outputting more than 1 Vrms, set the Maximum Input Level to 2 Vrms, or clipping may occur.

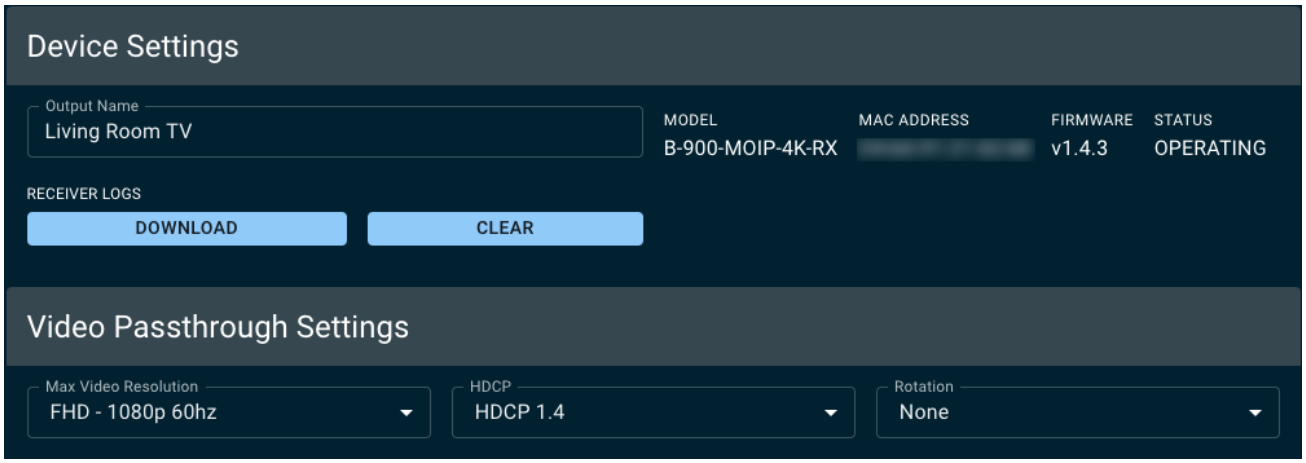
MoIP audio transmitters provide up to 250 milliseconds of **Audio Latency** adjustment. If the audio signal from the source needs to be delayed at every location, make the adjustment on the transmitter. If you need to set a delay for a specific zone, adjust the latency on the receiver.



Click **Save**, at the bottom of the page to apply settings.

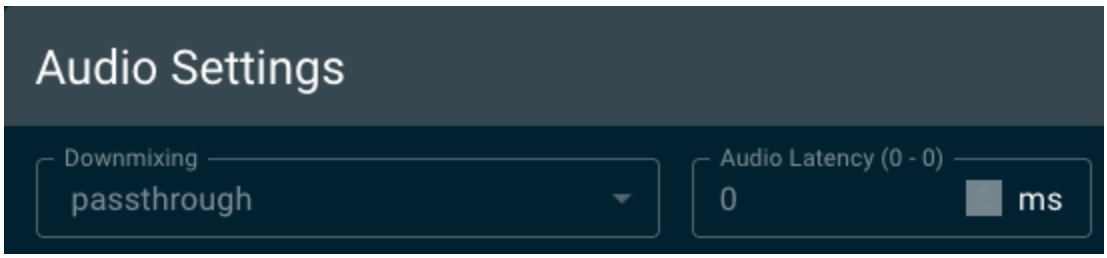
Configuring MoIP Video Receivers

Configure the **Max Video Resolution** and **HDCP** that the connected display supports. Select **Passthrough** for displays that support 4K HDR to allow the HDR metadata to pass, resulting in 4K HDR 30Hz.



If needed, set a **Rotation** for the video signal. 180 degrees is the most common for the top row of video walls where TVs are hung upside down, so the display's bezel logos are right-side up.

When using a downmixing receiver (B-900-MoIP-4K-RX-2AC), you can configure **Audio Downmixing** (Auto, 2CH, or Bypass) and **Audio Latency** (up to 250 milliseconds).

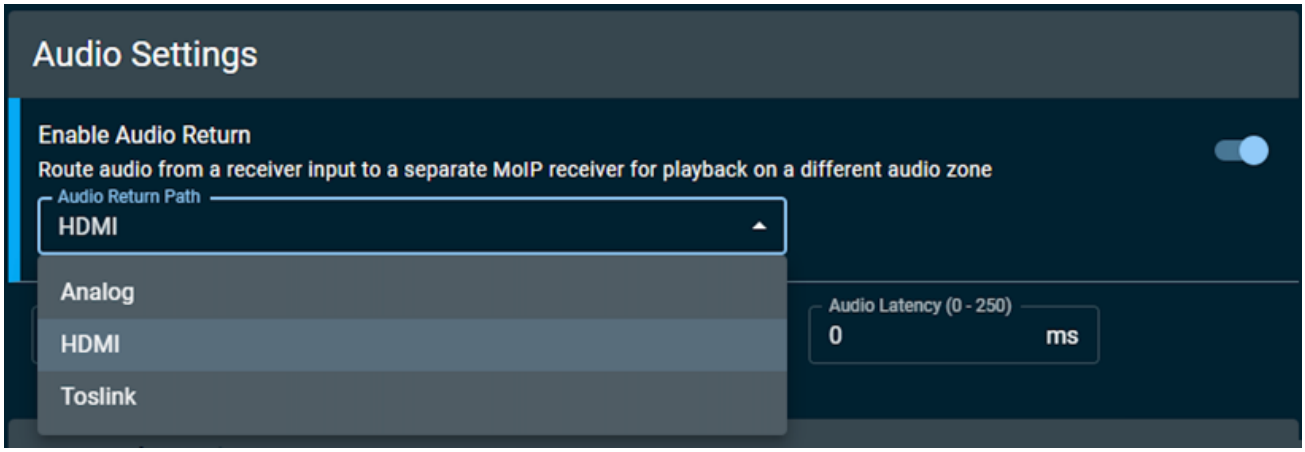


Configuring Audio Return Channel

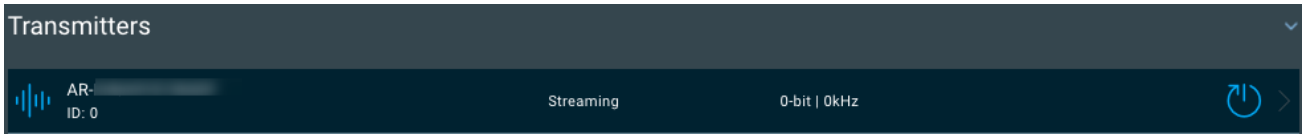
Downmixing receivers support Audio Return Channel (ARC) and can pass this audio to other MoIP receivers.

To configure ARC:

1. Click the **edit** icon next to the downmixing receiver.
2. Toggle **Audio Return** on, then click **Save**.



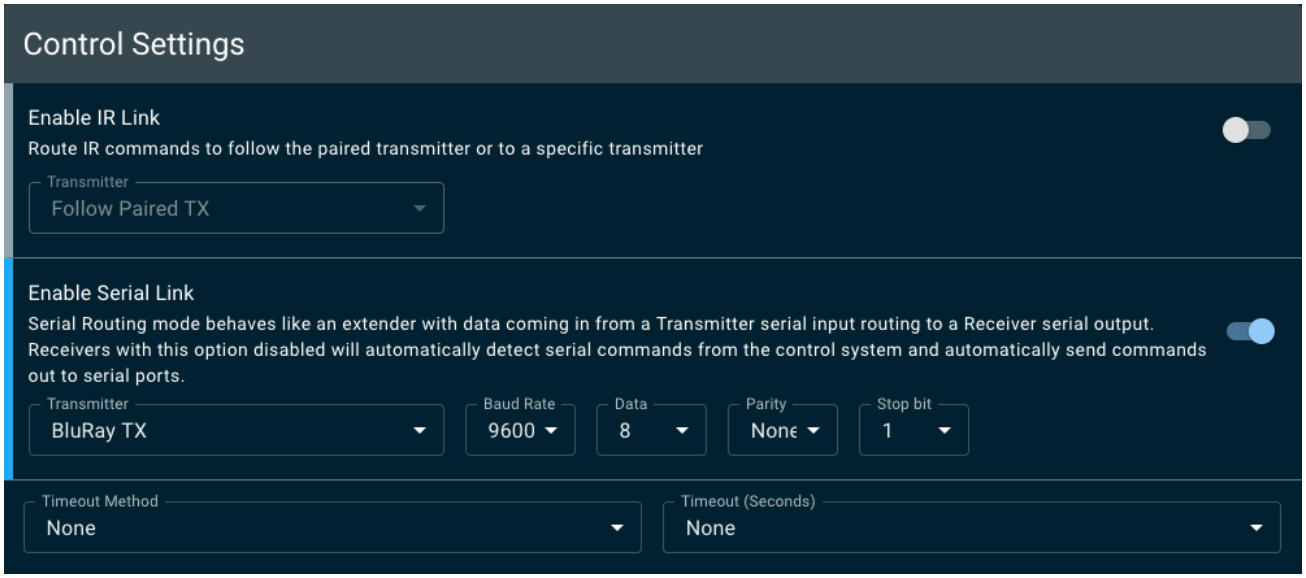
This creates a selectable Audio Return Transmitter without a Transmitter ID.



Note: You must enter an ID for Audio Transmitter to select it.

Control Settings

Enable **IR link** to tell the receiver which receiver it should take IR commands from. If enabled, you can also select a specific transmitter to follow, or for the receiver to follow the paired transmitter.



Alternatively, you can enable Serial Link to set a fixed transmitter or to follow the paired transmitter.

Configurable serial settings include:

- Baud Rate
- Data
- Parity
- Stop bit
- Timeout method
- Timeout (seconds)

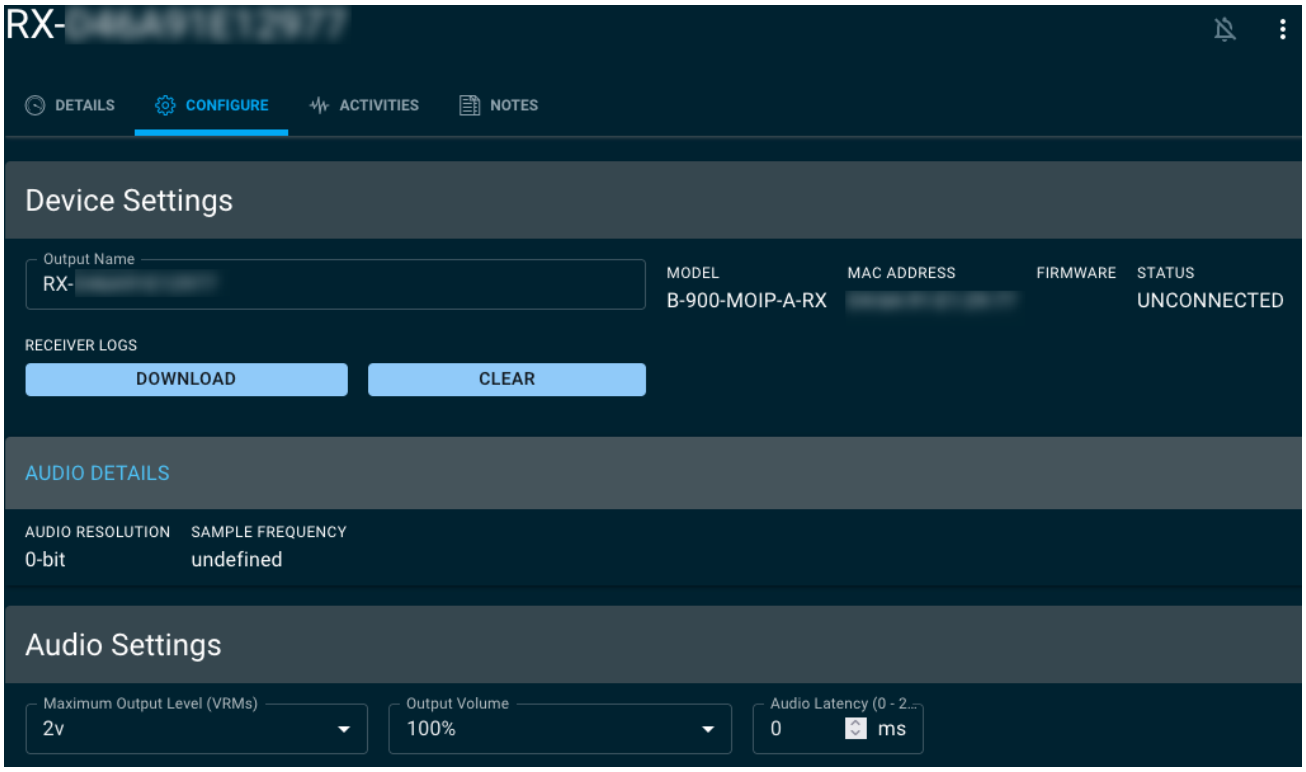
Click **Save**, at the bottom of the page to apply settings.

Configuring MoIP Audio Receivers

The **Maximum Output Level** can be set to 1 or 2 Volts RMS (Vrms). Verify the maximum voltage level of the line level input of the connected amplifier, switcher, or preamp before configuring this setting. If the connected device is only capable of outputting 1 Vrms, set the Maximum Output Level to 1 Vrms for the best system performance.

The **Output Volume** is adjustable for use with an amplifier without an adjustable volume level. If the connected device has its own volume control, leave this setting at 100%.

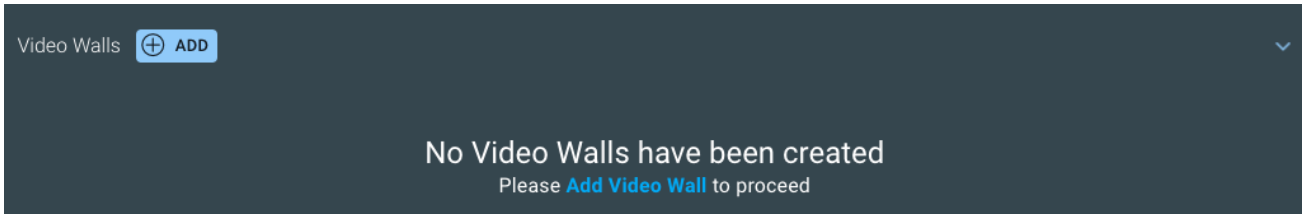
MoIP audio receivers provide up to 250 milliseconds of **Audio Latency** adjustment. If the audio needs to be delayed in a specific location, make the adjustment on the receiver. If the delay needs to be configured globally, configure it on the transmitter.



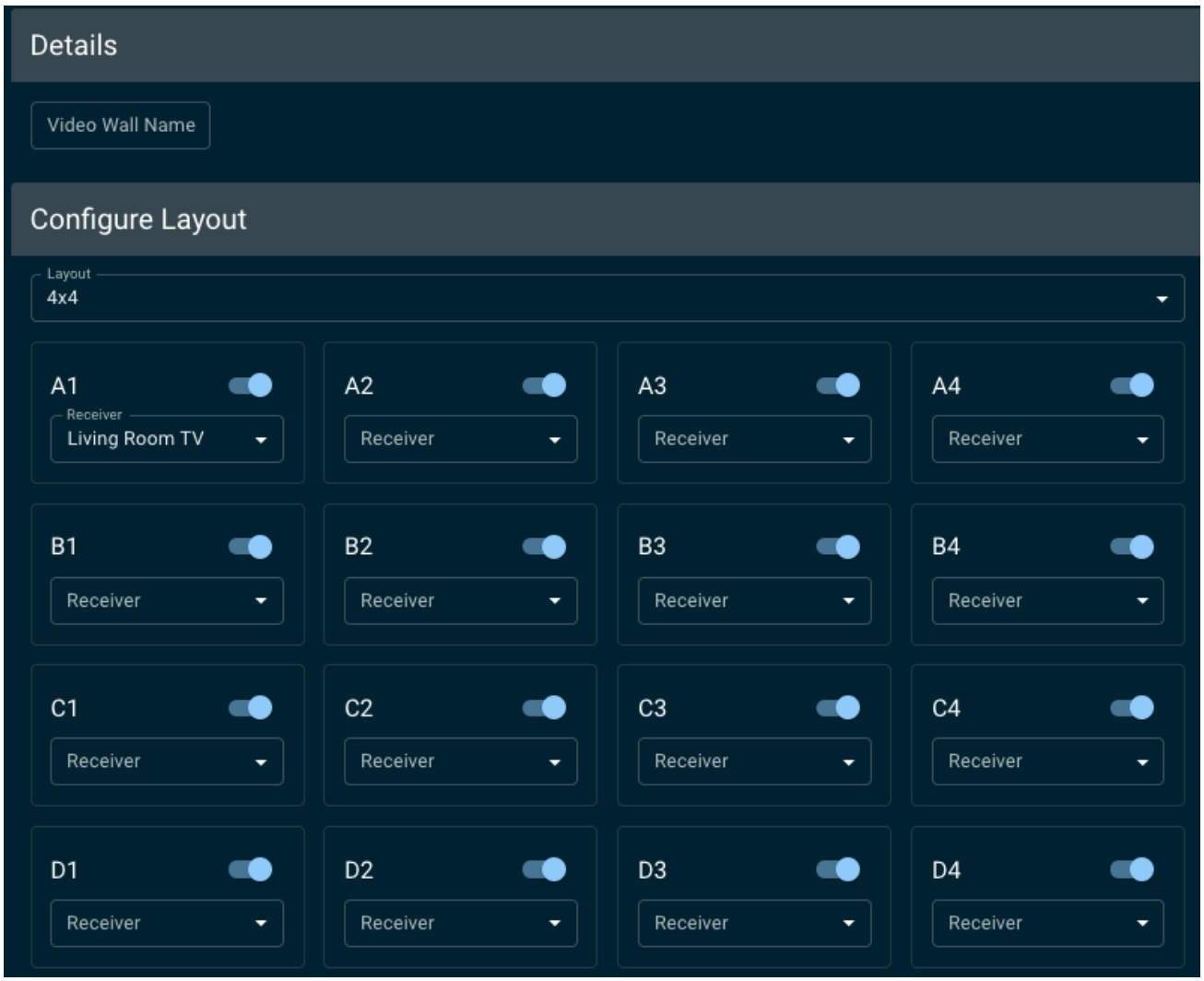
Click **Save**, at the bottom of the page to apply settings.

Creating a B-900 Video Wall

1. Scroll to the bottom of the MoIP System Management Page and click **Add Video Wall**.



2. Give the video wall a meaningful name.
3. Use the **Layout** dropdown to select the number of rows and Columns, up to 4x4.



4. Enable **Bezel Correction** to adjust the video signal if you're using displays with visible bezels. Use the guide to help you measure before entering the dimensions.
5. Click **Save** and the video wall appears at the bottom of the MoIP System Management Page. Click the **Add** button to another video wall.

Control system setup

Integrating MoIP with a control system is similar to integrating a matrix switcher. The Binary team has developed custom drivers and worked with control system manufacturers to certify the following control system drivers:

Control4 CRESTRON ELAN URC

This page provides basic information on the control capabilities. Refer to the driver documentation for specific instructions, features, and capabilities.

For greater control and integration, the MoIP controller's full application programming interface (API) is available for download on the support tab.

Basic switching control

An IP control system is required for transmitter-receiver switching. No serial or IR system switching control is supported.

RS-232/Serial Generation

RS-232/Serial commands are generated at each transmitter and receiver. Make connections from the receiver or transmitter endpoints directly to the devices to be controlled. RS-232 commands are sent over IP and are generated at each endpoint. In the control system driver, link each transmitter and receiver's serial port to the devices to be controlled. Refer to the **Serial & IR Control document** for more information.

Infrared (IR) Routing

Infrared control signals are passed bi-directionally over the static routes configured on MoIP receivers under **Control Settings** > **IR Link**. These routes create virtual connections, so you don't have to run another wire for IR. To configure these static 2-way IR routes with the control system, link the control system's IR outputs directly to the device to be controlled based on the IR Link settings. Refer to the **Serial & IR Control document** for more information.

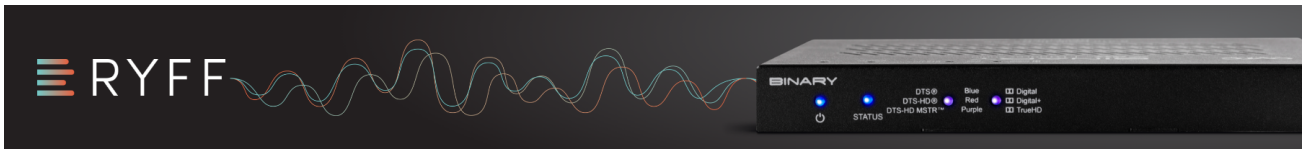
CEC Stand-by & Power On

CEC can be enabled in the control system driver and supports Stand-by and Power On commands. See the driver documentation for specific details. CEC compatibility varies between display manufacturers and should be tested for each display to ensure maximum reliability. Other control options may be required.

Audio De-embedding

When using stereo connections, the stereo audio outputs on the transmitter and receiver extract the audio for convenient input into multi-room audio distribution systems. No control system integration is necessary.

Ryff to MoIP



Ryff to MoIP allows for a controller's audio output to either be output from its physical audio output (analog, digital, HDMI) or through the network to a MoIP receiver. For example, a CORE 3 has 4 streams, so you could use 2 physical streams and 2 MoIP streams.

In a system with CORE 3 and a Triad One, the MoIP system can receive up to 5 audio streams. Those five streams can be listened to in any number of rooms that have MoIP receivers. If there is a MoIP receiver in the Living Room, Theater, Bedroom, and Bathroom, those units could listen to a Pandora station at the same time, while the MoIP receivers in the Kitchen and Kids' Rooms listen to TuneIn.

The total number of MoIP streams is not additive to physical streams. For example, a CORE 1 has 2 physical (HDMI and coax) audio streams. Based on the compatibility below table, a CORE 1 supports two MoIP streams. This does not mean you gain two additional streams for a total of four streams. With Ryff to MoIP, a system with only a CORE 1 has a total of 2 streams available, which would be any combination of physical or virtual MoIP streams.

Ryff to MoIP-compatible hardware and supported streams

C4 digital audio servers	Physical streams	MoIP streams available	Total streams available
EA-1	1	1	1
EA-3	3	3	3
EA-5	5	5	5

C4 digital audio servers	Physical streams	MoIP streams available	Total streams available
Triad One	1	1	1
CORE 1	2	2	2
CORE 3	4	4	4
CORE 5	7	7	7

In addition to online streaming services, MoIP receivers can also listen to devices connected directly to a supported Ryff device. For instance, if a turntable is connected directly to a Triad One, you can listen to the turntable in any room with a MoIP receiver.

System requirements:

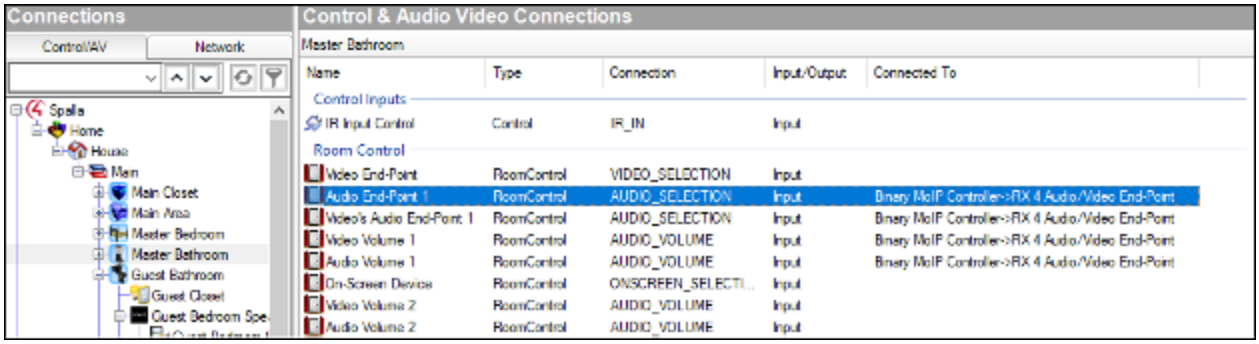
- MoIP driver v39 or above
- An EA or CORE controller running Control4 OS 3.3.2 or above
- MoIP controller firmware v4.0 or above

Example use cases

- Listen to Pandora or TuneIn in a home theater AVR connected to a MoIP receiver.
- Listen to TIDAL or Spotify on a TV's active soundbar connection driven by a MoIP receiver connected to the TV's HDMI input.
- Extend lossless audio over the network to a remote location using a MoIP audio receiver connected to a 2-channel amplifier with a pair of speakers.
- Listen to a turntable connected to a Triad One analog input in any of the above examples.

Installation

1. Ensure that all switches which have Ryff-enabled devices are configured properly to support MoIP traffic. Read the **network configuration guides** for help.
2. Update your MoIP controller firmware to v 4.0 or later, using OvrC.
3. Ensure your MoIP system is functioning properly after the update. Verify video is switching, audio is working, etc. Verify control through Control4 works as well.
4. Update the Control4 MoIP controller driver to v36 or above using the Control4 Online Driver Database.
5. In the MoIP driver, click **Enable Ryff** on the Driver Settings page.
6. Bind Audio End-Points to rooms with Ryff-enabled MoIP receivers.



At this point, Ryff streams and streaming services should now be available in rooms with MoIP audio receivers.

Note: After changing Max Quality in the digital audio driver, MoIP receivers may require a reboot to pass Ryff audio to certain AVRs.

Known Limitations

- At this time, Ryff to MoIP discovery does not support VLANs. Snap One is continuing to investigate this limitation. Read the **network configuration guides** for more information on MoIP networking configurations.
- "Mixed" Ryff to MoIP and Controller environments where both are bound to the same audio endpoint device, like an AMS or matrix amplifier, is not supported.
- Announcements are not currently supported by Ryff to MoI. MoIP receiver audio endpoints cannot receive announcement audio.
- 192 kHz / 24-bit audio is not supported by MoIP receivers. Enable or disable Ryff to MoIP in the MoIP controller's driver.
    - When enabled, Ryff streams are available in MoIP rooms and Max Quality in the Digital Audio driver is locked to 96Khz.
    - When disabled, Ryff to MoIP will not function, and 192Khz audio is available. MoIP operates as it did before the introduction of this feature.
    - When toggling Ryff to MoIP on or off, it may take up to a minute for digital audio and MoIP to re-negotiate and configure streams for audio to pass. This is enabled by default.

MoIP Firmware v4.1.2.4 Release Notes

New features

- Adds support or B-960 devices

Improvements

- HTTPS is now the default
- The local user interface password is now force-change on initial login

v4.0.2.4

Improvements

- Updates non-AC devices to firmware v1.5.5 and AC devices to v2.5.5
- Improved compatibility with Direct TV Genie C61k-700 to resolve black screen issues.

Known issues

We are actively investigating an issue when using the v39 C4 driver and the MoIP 4.0 FW where a Binary blue screen may occur when using the audio output of a MoIP TX connected to an audio matrix. This firmware update does not address this specific issue. We anticipate a resolution in the form of a Control4 driver update soon. We apologize for the inconvenience.

Version 4.0

New features

Enhanced configuration and monitoring features are now available in OvrC

- MoIP firmware version 4.0 moves the MoIP configuration from the local interface to OvrC's MoIP System Management, found under the MoIP controller's Configure tab. All configuration options are now only available in OvrC.
- MoIP Endpoint status: All MoIP TX and RXes now appear as individual devices within the OvrC device list, providing real-time status and notification support.
- Easier Configuration: With all configurations now available in OvrC, making changes to the MoIP system is now much more convenient and easier.
- Platform Updates: With this transition to a new technical architecture for MoIP in OvrC, Snap One can deliver additional features in the future which would not have been possible otherwise, such as increased network visibility, health status, and more.

Caution: If you cannot use OvrC at the location, do not upgrade to firmware v4.0.

Caution: The MoIP Client Control App is no longer available in MoIP 4.0. If your client requires this feature, do not upgrade to MoIP 4.0.

Note: The MoIP controller local interface now only displays general status information of each endpoint, as well as the ability to change sources on receivers.

Ryff to MoIP

The Ryff to MoIP feature, available in Control4 OS 3.3.2, enables Ryff audio streams (formerly Control4 Digital Audio) to be sent over the network without the use of physical audio cabling and output to any MoIP receiver.

System requirements:

- MoIP driver v39 or above
- An EA or CORE controller running Control4 OS 3.3.2 or above
- MoIP controller firmware v4.0 or above

This is the first step to bridge the Control4 Ryff audio platform with MoIP in order to ease pain points in installation and deliver audio experiences around the home where it may have been impractical before.

Read the **Ryff to MoIP** page for installation instructions and more information.

Example use cases

- Listen to Pandora or TuneIn in a home theater AVR connected to a MoIP receiver.
- Listen to TIDAL or Spotify on a TV's active soundbar connection driven by a MoIP receiver connected to the TV's HDMI input.
- Extend lossless audio over the network to a remote location using a MoIP audio receiver connected to a 2-channel amplifier with a pair of speakers.
- Listen to a turntable connected to a Triad One analog input in any of the above examples.

Version 3.2.1.2

- Supports multiple versions of PoE, HDCP, and MCU modules.

Version 3.2.0.8

The key area of focus in this release is a modification that allows for much faster switching times. The switching process has been completely rewritten based on our historical experience with the platform, and a much more efficient process was implemented that eliminates some redundancy. In addition to that functional change, some audio related bugs have also been addressed.

Note: If the MoIP system is connected to Pakedge MS Series network switches (MS-1212, MS-2400, MS-2416, MS-2424, MS-4424) follow the instructions in **this article**.

Change Logs for 3.2.0.8

- Updated source switching process for faster switching times
- Resolved issue where audio format change could cause DSP-lockup
- Resolved an issue where some instances of DTS HD Master audio could be improperly decoded

Version 3.1.0.4

Caution: This firmware is required before adding B-900-MoIP-AUDIO-RX and B-900-MoIP-AUDIO-TX devices.

Key area of focus is the addition of audio return support via HDMI ARC and Toslink. This functionality is currently enabled to pass audio from the B-900-MoIP-4K-RX-2AC to another receiver, either another B-900-MoIP-4K-RX-2AC, a B-900-MoIP-4K-RX or a B-900-MoIP-AUDIO-RX.

Also updated are the EDID settings to support full pass-through of Dolby Atmos and DTS-X. This can be enabled in the Audio EDID setting drop-down option of the transmitter by selecting the Full Pass-Through option.

Change Logs for 3.1.0.4

- Update webPagePort in dxGetNetworkSettings to return dynamic port (so OvrC knows whether to show the HTTP or HTTPS WebConnect options)
- Reverted change to SDDP messaging that caused some to lose integration

Change Logs for 3.1.0.2

- Added audio return support
- Added “full pass-through” to support Dolby Atmos and DTS-X
- Re-pair RXs and TXs after upgrade
- Increased maximum IR code length to accept up to 2046 characters
- Added support for dynamic IR routing feature
- Removed colons from MAC in SDDP messages
- Added support for HDMI audio mute and exposed commands via control API
- Updates for cyber security
- Modified mobile view to render input box instead of slider for volume control
- Enhanced logging capabilities on Download log button as well as individual RX and TX details pages
- Enabled firmware update via control API and automated upgrade/downgrade test cases
- Generate HTTPS certificate before reboot if necessary
- Updated local UI TX and RX cards from overflowing with long names
- Fixed video details page from showing garbage data for offline devices