Savant® IP Video Deployment Guide

Document Number:	009-1977-07
Document Date:	February 2023
Document Supports:	da Vinci 8.7 or higher

This document will guide the installer through the process of installing, configuring, and adding Savant IP Video to a RacePoint Blueprint™ configuration.

- Savant ProAV 8 Video Input IP Transmitter 4K UHD with Control [PAV-VIM8S]
- Savant ProAV 4 Video Input IP Transmitter 4K UHD with Control [PAV-VIM4S]
- IP Video 8 Input Transmitter 4K UHD with Audio Processing and Control [PAV-VIMAP8S]
- IP Video 4 Input Transmitter 4K UHD with Audio Processing and Control [PAV-VIMAP4S]
- Savant IP Video Single Input Transmitter 4K UHD with Control - Fiber [PAV-VIMVP1F]
- Savant IP Video Single Input Transmitter 4K UHD with Control - Copper [PAV-VIMVP1C]
- IP Video SINGLE Input Transmitter 4K UHD with Control (Copper) [PAV-VIM1C]
- Savant ProAV Single Port 4K UHD Video Output IP Receiver with Video Processing and Control (Fiber) [PAV-VOMVP1F]
- Savant ProAV Single Port 4K UHD Video Output IP Receiver with Video Processing and Control (Copper) [PAV-VOMVP1C]
- IP Video Single Output Receiver 4K UHD with Control (Copper) [PAV-VOM1C]
- IP Video Single Output Receiver 4K UHD With Control (Copper W/PoE) [PAV-VOM1CP2]
- IP Video Single Output Receiver 4K With PoE+ (Copper) [PAV-VOMVP1CP2]
- IP Video Single Output Receiver 4K With PoE+ (Fiber) [PAV-VOMVP1F2]

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Important Safety Information - Read First

Before installing, configuring, or operating any equipment, Savant recommends that each dealer, integrator, installer, etc. access and read all relevant technical documentation. Savant technical documentation can be located by visiting Savant.com. Vendor documentation is supplied with the equipment.

Read and understand all safety instructions, cautions, and warnings in this document and the labels on the equipment.

Safety Classifications In this Document

NOTE:	Provides special information for installing, configuring, and operating the equipment.
IMPORTANT!	Provides special information that is critical to installing, configuring, and operating the equipment.
CAUTION!	Provides special information for avoiding situations that may cause damage to equipment.
WARNING!	Provides special information for avoiding situations that may cause physical danger to the installer, end user, etc.

Electric Shock Prevention

ELECTRIC SHOCK!	The source power poses an electric shock hazard that has the potential to cause serious injury to installers and end users.
ELECTRICAL DISCONNECT:	The source power outlet and power supply input power sockets should be easily accessible to disconnect power in the event of an electrical hazard or malfunction.

Weight Injury Prevention

WEIGHT INJURY!	Installing some of the Savant equipment requires two installers to ensure safe handling during installation. Failure to use two installers may result in injury.

Safety Statements

All safety instructions below should be read, understood, and applied under all relevant circumstances when working with this equipment.

1. Follow all input power ratings marked on product near power input!
2. If fuse replacement is required, replacement fuse should match fuse rating marked on the product.
3. Do not use equipment near water.
4. Clean only with dry cloth.
5. Do not block any ventilation openings or install near any heat sources such as heat registers, stoves, radiators, amplifiers, etc.
6. Refer all servicing to qualified service personnel. Servicing is required when any part of the apparatus has been damaged in any way, or fails to operate normally for any reason.
7. Use only attachments/accessories specified by the manufacturer, following all relevant safety precautions for any such attachments/accessories.
8. For applicable equipment, use the included power cord with the grounding prong intact to insure proper grounding of the device.
9. If the provided plug does not fit the desired outlet, contact a licensed electrician to replace the obsolete outlet.
10. Protect any power cord from being walked on, pinched, strained, or otherwise potentially damaged, especially at the outlet or device connections.
11. Disconnect any outlet powered apparatus from its power source during lightning storms or when unused for long periods of time.
12. To completely disconnect equipment from AC mains power, disconnect the power supply cord plug from the AC receptacle on the device.
13. For any hardwired or fixed in-wall apparatus, carefully follow all wiring diagrams and instructions. All electrical wiring and servicing should be performed by a properly licensed electrician.

1. Before You Begin

Read through this document in its entirety and ensure that the following required items are available:

Unique IDs (UID) of the Savant IP Video Products ☐
(located on the back or bottom of the units)

Savant Development Environment (SDE/MacBook) ☐
For minimum supported RacePoint Blueprint da Vinci release, see table below for details.

Ethernet network meeting Savant requirements ☐
See **Savant Device Networking Guidelines** on the Savant Customer Community

10G Network Switch that meets Savant requirements ☐
See **Savant IP Video Network Configuration Guide** on the Savant Customer Community

Source equipment that will be used in the system ☐

Displays that will be used in the system ☐

Supported Release

Device	Minimum Supported Release
PAV-VIMxS	da Vinci 8.7
PAV-VIMVP1x	da Vinci 8.7
PAV-VIMAPxS	da Vinci 8.8
PAV-VIM1C	da Vinci 8.8
PAV-VIM1CP2	da Vinci 9.4
PAV-VIMAPxS2	da Vinci 10.1.2
PAV-VOMVP1x	da Vinci 8.7
PAV-VOM1C	da Vinci 8.8
PAV-VOM1CP2	da Vinci 9.4
PAV-VOMVP1F2	da Vinci 9.4.3
PAV-VOMVP1CP2	da Vinci 9.4.3

Feature	Minimum Supported Release
Mac based Pro Host	da Vinci 8.7
Netgear System Monitor Info tab	da Vinci 8.8
Tiling*	da Vinci 8.10
SHC-2000 Host (No Video Tiling)	da Vinci 9.1
SHR-2000 Host (No Video Tiling)	da Vinci 9.2
Added support for 120Hz refresh rate at 1920x1080 only.	da Vinci 10.2

* All IP Video devices must have video processing. From more information on this feature see the **IP Video Tiling Deployment Guide** on the Savant Customer Community

2. Deployment Steps

Follow these steps to successfully deploy a Savant IP Video Product. This page can be used as a checklist to record which steps have been completed.

Review product specifications and connection details ..... ☐
See the device's Quick Reference Guide on the Savant Customer Community.

Install the Savant IP Video devices ..... ☐
See Installation

Add the Savant IP Video devices into a RacePoint Blueprint™ configuration ..... ☐
See Blueprint Configuration

3. Wiring and Connections

This section provides general information about the input and output connections of devices supported.

3.1. HDMI Cables

High quality HDMI cables are very important when passing UHD. Adding deep color and HDR raises the need for high quality cables.

3.2. Audio Connections

PAV-VIM1C/PAV-VIMVP1x

These devices have a 3.5 mm (1/8 in) analog audio output. The analog audio port outputs 2-channel PCM audio if the connected HDMI device is outputting 2 or 8 channel PCM audio. All other audio formats must be routed though a digital signal processor (DSP) at the endpoint.

They output a direct line level 2.1-V_{RMS}

PAV-VOM1C/PAV-VOMVP1x/PAV-VOM1CP2/PAV-VOMVP1CP2/PAV-VOMVP1F2

These devices have a 3.5 mm (1/8 in) analog audio output. The analog audio port outputs 2-channel PCM audio. Audio source must be either a compatible PCM audio format or be routed though an Audio Processing chassis (PAV-VIMAPxS).

They output a direct line level 2.1-V_{RMS}

PAV-VIMxS

These chassis have RCA analog audio outputs. These outputs require the HDMI input of the same number to be receiving 2 or 8 channel PCM audio.

They output a direct line level 2.1-V_{RMS}.

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3.3. 10G Ethernet

Fiber (SFP+)

Enhanced small form-factor pluggable connection. Use Savant certified fiber cable, fiber connectors, and Savant certified SFP+ modules.

Transport Distance	
OM3 Fiber Optic Patch Cable	1,2, or 3 Meter
OM3 multi-mode Fiber	984 ft (300 m)

Copper (RJ-45)

RJ-45 10G Ethernet connection.

Transport Distance	
Cat5e	98 ft (30 m)
Cat6	98 ft (30 m)
Cat6a	328 ft (100 m)
Cat7	328 ft (100 m)

TIP!

- The distances in the above Copper table are tested with two patch cables included. If the cable is a homerun (single unbroken length) the distance can be up to 147 ft (45 m) for Cat5e/Cat6.
- Both Copper and Fiber connections can be used at the same time.

3.4. 1G Ethernet/LAN

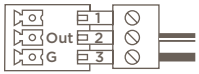
Standard RJ-45 port that uses 1G reserved data bandwidth commonly used to connect any network compliant device to transmit its data onto the Ethernet network by sharing the 10G network link. This is a courtesy port it will not work for all network functions. Example: Spanning tree devices are not supported by this port.

IMPORTANT! Do not connect this port to a network switch.

3.5. IR Wiring

PAV-VIMxS/PAV-VIMAPxS

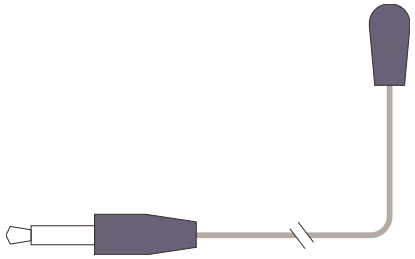
IR connections are made using a 3-pin Control Connector supplied with the device. The wire slips into the hole and locks with a screw located at the top of the connector.



PIN 1	Not Used
PIN 2	IR +
PIN 3	IR -

PAV-VOMVP1x/PAV-VOM1C/PAV-VOM1CP2/PAV-VOMVP1F2/PAV-VIMVP1x/PAV-VIM1C/PAV-VIM1CP2

IR connection are made using 3.5 mm IR Emitter supplied with the device.



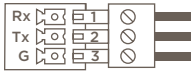
IMPORTANT: IR Wiring Precautions

- Ensure that all IR emitters are within 15 feet (4.6 meters) from the controller's location.
- Use of 3rd party blinking IR emitters with Talk Back is not recommended. These types of emitters can draw voltage away from the IR signal that can degrade IR performance.

3.6. RS-232 Wiring

PAV-VIMxS/PAV-VIMAPxS

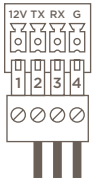
Serial control connections are made using a 3-pin Control Connector supplied with the device. The wire slips into the hole and locks with a screw located at the top of the connector.



PIN 1	Receive
PIN 2	Transmit
PIN 3	Ground

PAV-VIMVP1x/PAV-VOMVP1x/PAV-VIM1C/PAV-VOM1C

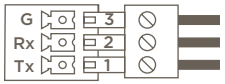
Serial control connection are made using a 4-pin Control Connector supplied with the device. The wire slips into the hole and locks with a screw located at the top of the connector.



PIN 1	12V Do Not Use
PIN 2	Transmit
PIN 3	Receive
PIN 4	Ground

PAV-VIM1CP2/PAV-VOM1CP2

Serial control connection are made using a 3-pin Control Connector supplied with the device. The wire slips into the hole and locks with a screw located at the top of the connector.



PIN 1	Transmit
PIN 2	Receive
PIN 3	Ground

3.7. Network

PAV-VIMxS - Uses a standard RJ-45 port complying with IEEE 802.3 Ethernet standards. This port is used for communication with the Savant Host.

PAV-VIMAPxS - Uses a standard RJ-45 port complying with IEEE 802.3 Ethernet standards. This port supports AVB/TSN for communication with the Savant Host and with Savant IP Audio devices. If the breakout down-mixed audio is going to be used this port must be connected to a Savant qualified AVB switch.

VOMVP1x - Uses a shared Ethernet connection from its 10G connection.

3.8. AC Power

The IP Audio Products have an AC Power connection.

SURGE PROTECTION!
Use a surge-protected circuit for all components and power supplies requiring 100/240V (AC 50/60 Hz) source power.

ELECTRICAL DISCONNECT!
The source power outlet and power supply input power sockets should be easily accessible, to disconnect power in the event of an electrical hazard or malfunction.

Power Management Recommendations

Savant recommends a pure sine wave uninterruptible power supply (UPS) with the ability to shut down the Savant Host before the battery runs out of power. Never remove power from the Savant IP Video devices before shutting down. See **Savant Battery Backup and Surge Suppression Requirements** on the Savant Customer Community.

3.9. Checking and Replacing the Fuse

Only the PAV-VIMxS/PAV-VIMAPxS has a field replaceable fuse. For fuse information, refer to the Quick Reference Guide for each product..

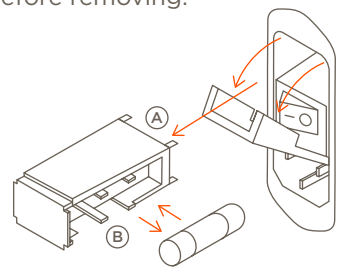
ELECTRIC SHOCK HAZARD: This device must be disconnected from AC power by removing the power cord from the AC outlet and the unit before checking or replacing the fuse.

IMPORTANT! The orientation of the cartridge within the unit and location of the fuse within the cartridge are crucial to proper operation. Make note of the orientation of the cartridge and the fuse location within the cartridge before removing.

1. Disconnect the unit from AC power by removing the power cord.
2. Open the fuse cover on the AC power input using a flat head screwdriver or similar thin flat head tool. This will allow access to the fuse cartridge.
3. Using a flat head screwdriver or similar thin flat head tool, gently loosen the cartridge and pull the cartridge out of the unit slowly. As the cartridge is removed, make note of the orientation, as it is important to proper operation.

TIP: Mark the chassis and fuse holder with a marker in order to align when replacing.

4. Remove the old fuse from the cartridge and discard.
5. Gently place the new fuse in the cartridge and place the cartridge part way into the receptacle aligning it as defined in the diagram.
6. Gently press on the cartridge the rest of the way until it seats into the terminals at the rear of the slot.



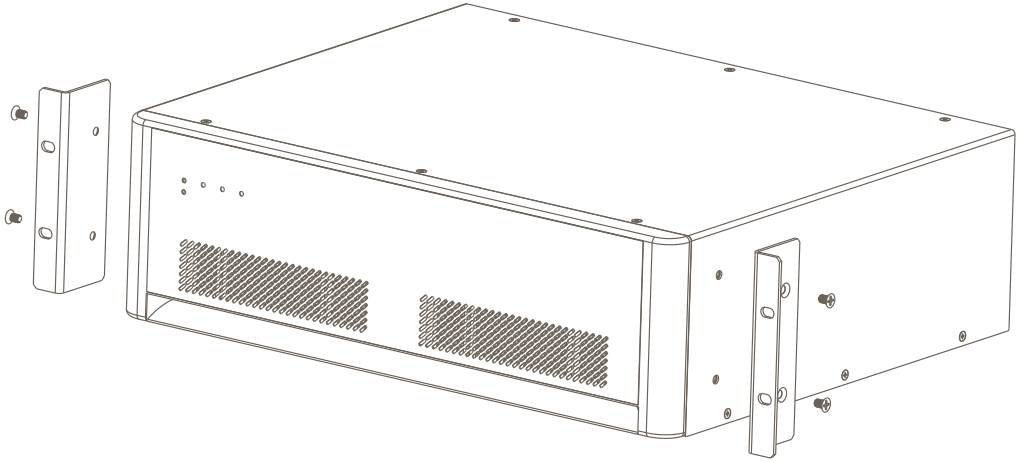
Ⓐ Connection Pins Towards Unit
Ⓑ Open Side of Cartridge Towards Power Switch

NOTE: If strong resistance encountered while seating cartridge, DO NOT apply more pressure. Remove, check orientation, then repeat.

4. Installation

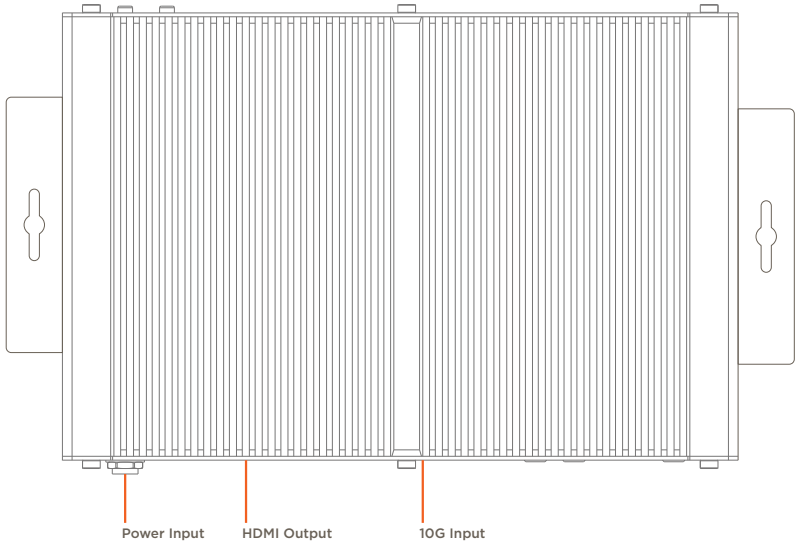
4.1. PAV-VIMxS/PAV-VIMAPxS/PAV-VIMAPxS2

The Savant IP Video Transmitter can be mounted in a 3U rack style enclosure and is compatible with all standard 19-inch NEMA rack mounts. The rack ears need to be attached prior to installing in a rack.



4.2. PAV-VIMVP1x/PAV-VOMVP1x

The Savant IP Video Receiver or Transmitter can be placed on a solid flat surface or can be mounted on a wall with the included mounting brackets. If installing this unit behind a display, ensure enough air can pass though the grooves on the top of the unit. This will maximize heat dissipation. Savant recommends aligning the grooves vertically as shown below.



4.3. PAV-VIM1C/PAV-VIM1CP2/PAV-VOM1C/PAV-VOM1CP2

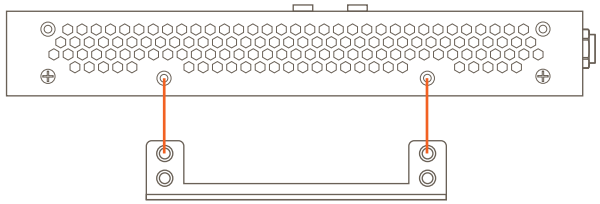
Wall Mounted

To install the PAV-VIM1C/PAV-VIM1CP2/PAV-VOM1C/PAV-VOM1CP2 the installer must remove two of the chassis screws on each side and use them to attach the included mounting brackets, following the steps below.

1. Remove the two case screws in the center of the device (shown in the image below).
2. Align the bracket using the top holes.

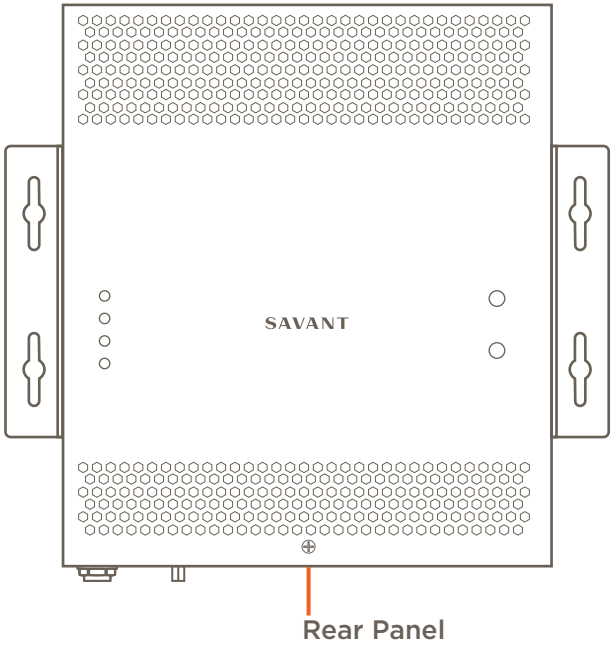
NOTE: This will leave an air gap behind the device.

3. Replace the case screws attaching the bracket.

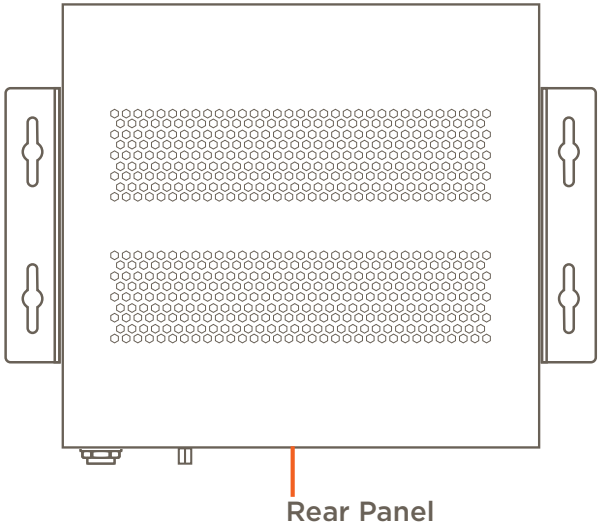


If the device is going to be mounted vertically Savant recommends aligning the device with the rear of the device facing down. This will allow the best heat dissipation.

PAV-VIM1C/PAV-VOM1C



PAV-VIM1CP2/PAV-VOM1CP2

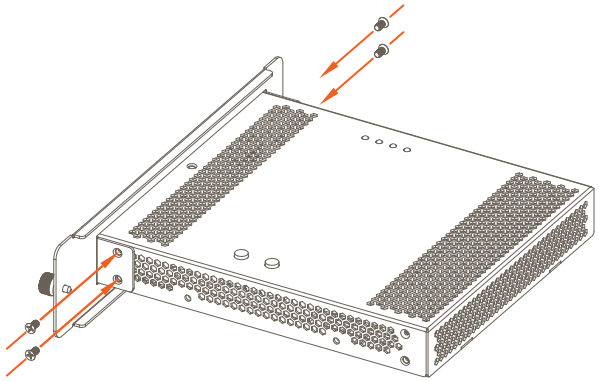


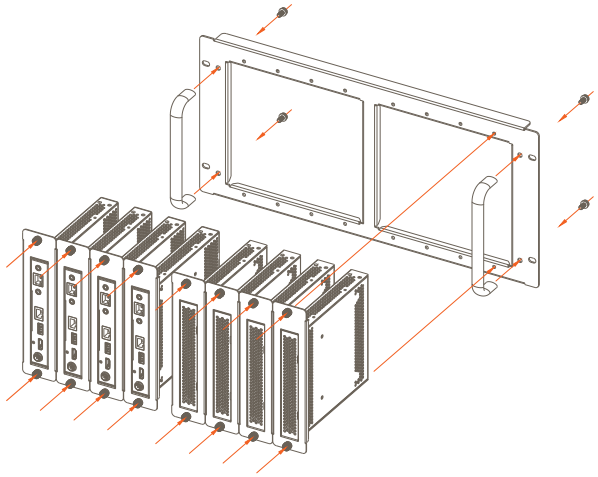
⚠ **IMPORTANT!** The PAV-VOM1C/PAVVOM1CP2 is not supported for audio only applications.

Rack Install

The PAV-VIM1C can be attached to a rack with the connections facing front or rear, to fit the needs of the installation. To attach a PAV-VIM1C do the following:

1. Remove the brackets for all the PAV-VIM1C to be installed.
2. Remove the four case screws from one end of the PAV-VIM1C.
3. Align the case screws with the bracket.
4. Replace the screws attaching the bracket.
5. Repeat steps 2 to 4 for each PAV-VIM1C.
6. Align the handle with screw holes.
7. Attach the handle with the screws provided.
8. Repeat steps 6 and 7 for the second handle.
9. Install the shelf in the rack using rack screws (not supplied).
10. Install each PAV-VIM1C with the bracket attached using the captive screws on the bracket.





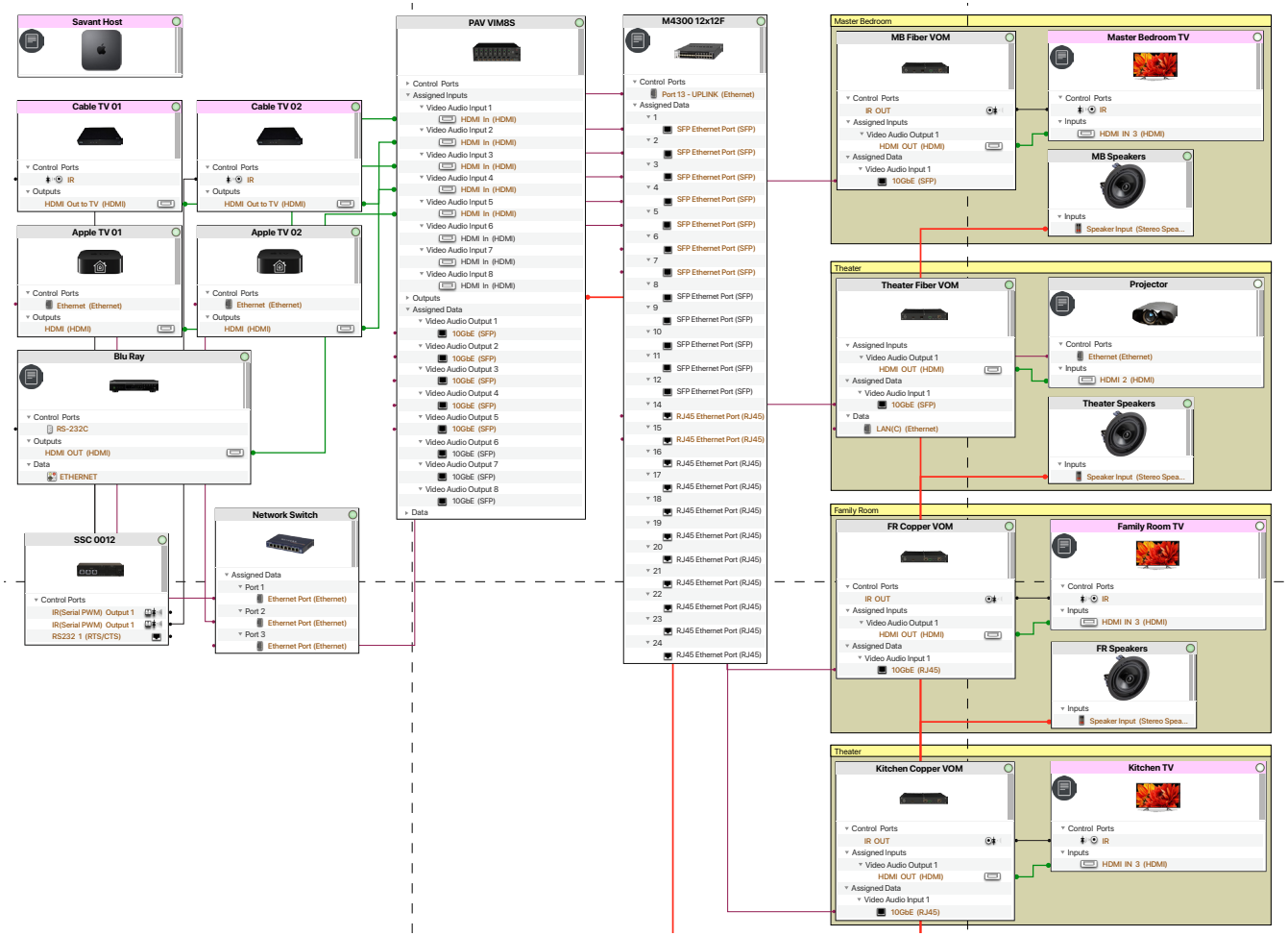
TIP! Savant recommends to space out the PAV-VIM1Cs when using the RCK-PAVVM8, if the rack mount is not full.

5. Blueprint Configuration

Required Devices

- Savant Host
- IP Video Transmitter
- IP Video Receivers
- 10G Network Switch
- Video Sources
- HD/UHD Displays

5.1. Basic Blueprint Layout



5.2. Adding a PAV-VIMxS/PAV-VIMAPxS to a Configuration

In an open Blueprint configuration do the following:

1. Click Show Library.

2. In the Search bar enter the devices SKU.
   Example: PAV-VIM8S

3. Select the Video Input IP Transmitter that is needed and drag it into a Shared Equipment zone.

HELPFUL INFO: It is recommended to place any type of A/V switch in a Shared Equipment zone. If placed in a User zone the outputs cannot leave that zone.

4. Name the Device.

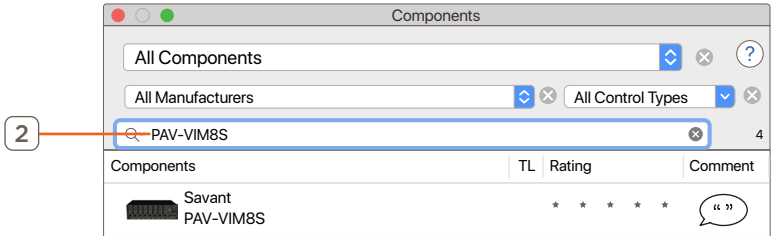
5. Place the Video IP Transmitter in the layout window.

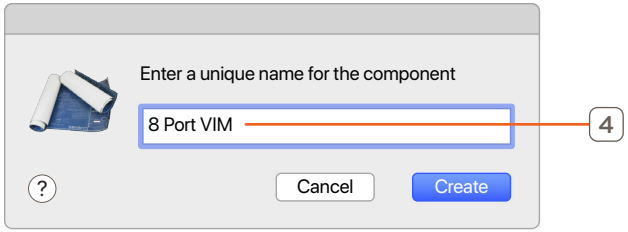
6. Select the Video Input IP Transmitter.

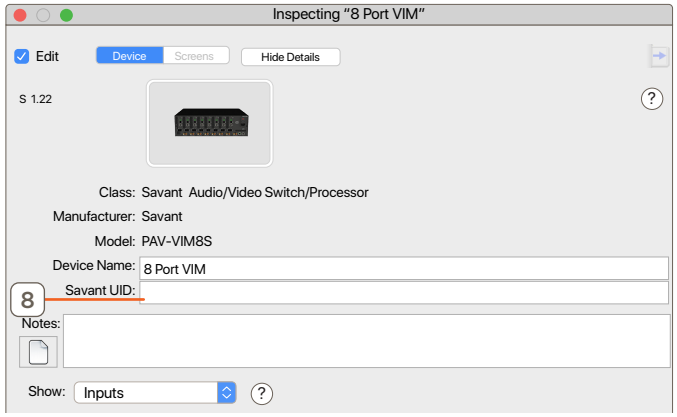
7. Open Inspector.

8. Enter the UID.

IMPORTANT NOTE: The PAV-VIM1CP2 and PAV-VOM1CP2 will generate two MAC addresses when connected to the network (10G PHY UID and MCU MAC address). Only the MCU MAC address is used to configure these devices.



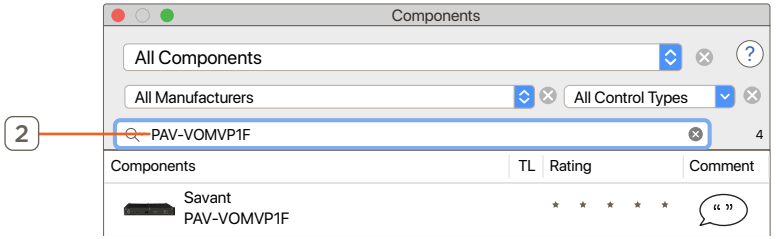


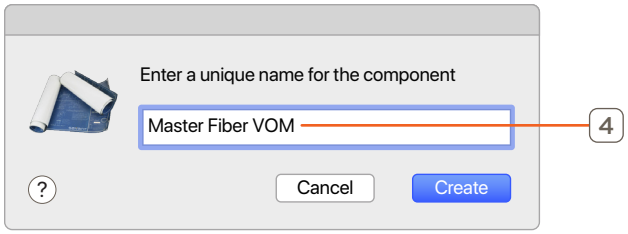


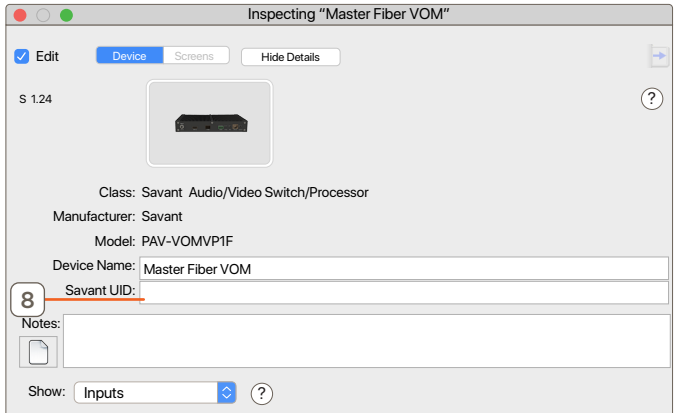
5.3. Adding a IP Video Receiver to a Configuration

In an open Blueprint configuration do the following:

1. Click Show Library.
2. In the Search bar enter the devices SKU.
   Example: PAV-VOMVP1F
3. Select the IP Video Receiver that is needed and drag it into he User zone that is will be used.
4. Name the Device.
5. Place the IP Video Receiver in the layout window.
6. Select the IP Video Receiver.
7. Open Inspector.
8. Enter the UID.



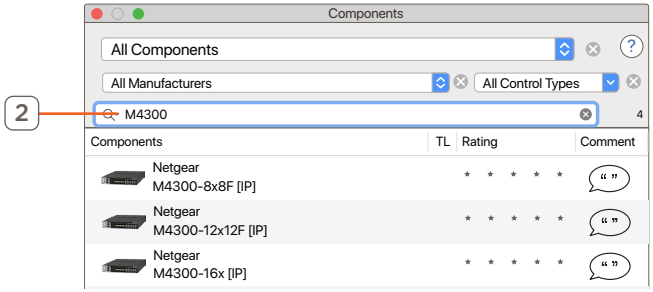


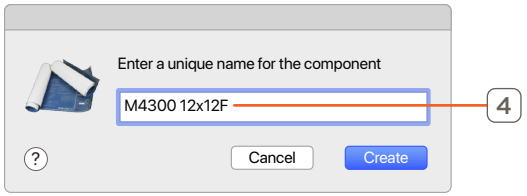


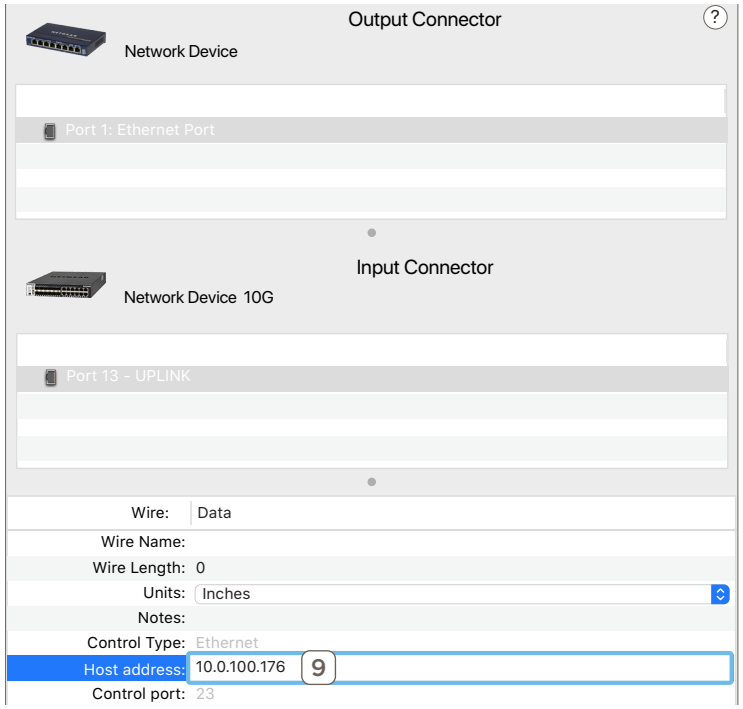
5.4. Adding a 10G Switch to a Configuration

This process is to add a NetGear ProSafe M4300 10G network switch to the configuration. See **Savant IP Video Network Configuration Guide** on the Savant Customer Community for information on how to set up this device before its video connections are made. In an open Blueprint configuration do the following.

1. Click Show Library.
2. In the Search bar type M4300.
3. Select the M4300 10G switch that is being used in the deployment and drag it into a Shared Equipment zone.
4. Name the Device.
5. Place the M4300 10G switch in the Layout window.
6. Make Control Connection.
7. Select the Control Connection.
8. Open Inspector.
9. Enter the IP Address of the switch on the Host address field.







NOTES:

- The control connection is required for services to generate correctly.
- The IP address is needed for System Monitor information to populate (This feature as added in da Vinci 8.8 release).
- In the physical installation this control connection uses one of the RJ-45 10G connections. This is the switch's uplink port that is configured in the Savant IP Video Network Configuration Guide.

5.5. Making 10G Connections

This section is an example of how to correctly make the 10G Blueprint connections. All components must be added to the configuration and placed in the Layout window first. Connecting sources and endpoints is not detailed in this example.

The example below uses the following components:

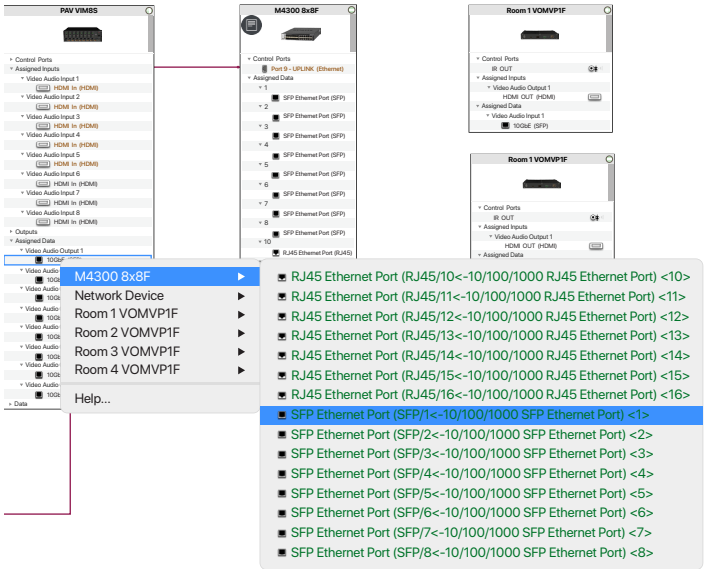
(1) - PAV-VIM8S

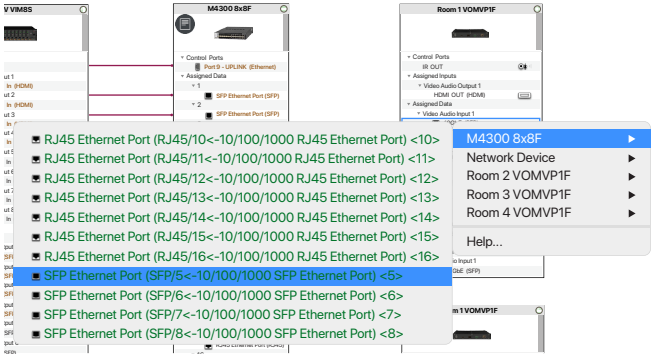
(4) - PAV-VOMVP1F

(1) - NetGear M4300 8x8F switch

1. Select the VIM8S.
2. Right-click on the first 10GbE (SFP) port.
3. Highlight the M4300 8x8F then the desired SFP port and left-click.
4. Repeat steps 1 to 3 for each Input that is used.
5. Select the first PAV-VOMVP1F.
6. Right-click on the 10GbE (SFP) port.
7. Highlight the M4300 8x8F then the desired SFP port and left-click.
8. Repeat steps 5 to 7 for each Output in the system.

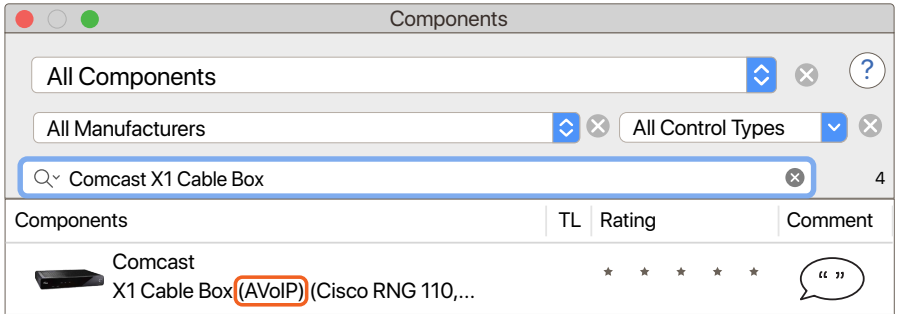
NOTE: The 10G connections in Blueprint are not required to match the physical connections on the 10G Switch





5.6. Source Profiles

Some device profiles require an “AVoIP” version of the profile to be compatible with the control connections of the Video over IP devices. Below is an image of one of these profiles with the AVoIP tag highlighted.



This example applies to a number of device types. If multiple Profiles matching the model appear in the Library, select the version with the AVoIP tag as shown if the unit will be controlled via an Audio/Video over IP port. For more information on available profiles see the Savant IP Video: AV Devices May Require Alternate Profile for IR Control Application Note on the Savant Customer Community.

IMPORTANT! AVoIP Profiles are only required with da Vinci 8.7.1 and lower runtime software.

5.7. Expansion

The Savant IP Video system has unlimited scalability. The limit is the amount of ports on the 10G switch. For instance, on a 96 port 10G Network switch: 1x95, 2x94, and so on up to 95x1. In addition, add as many receivers required in the installation based on the number of displays.

Every source and display require a port on the 10G switch.

5.8. AVB Expansion

Savant IP Audio devices and IP Video devices with Audio Processing can be connected using a Savant certified AVB/TSN switch.

IMPORTANT! The maximum number of AVB devices is governed by the active da Vinci version. For the exact maximum in the system being deployed reference the Release Readme for that release found on the Savant Customer Community.

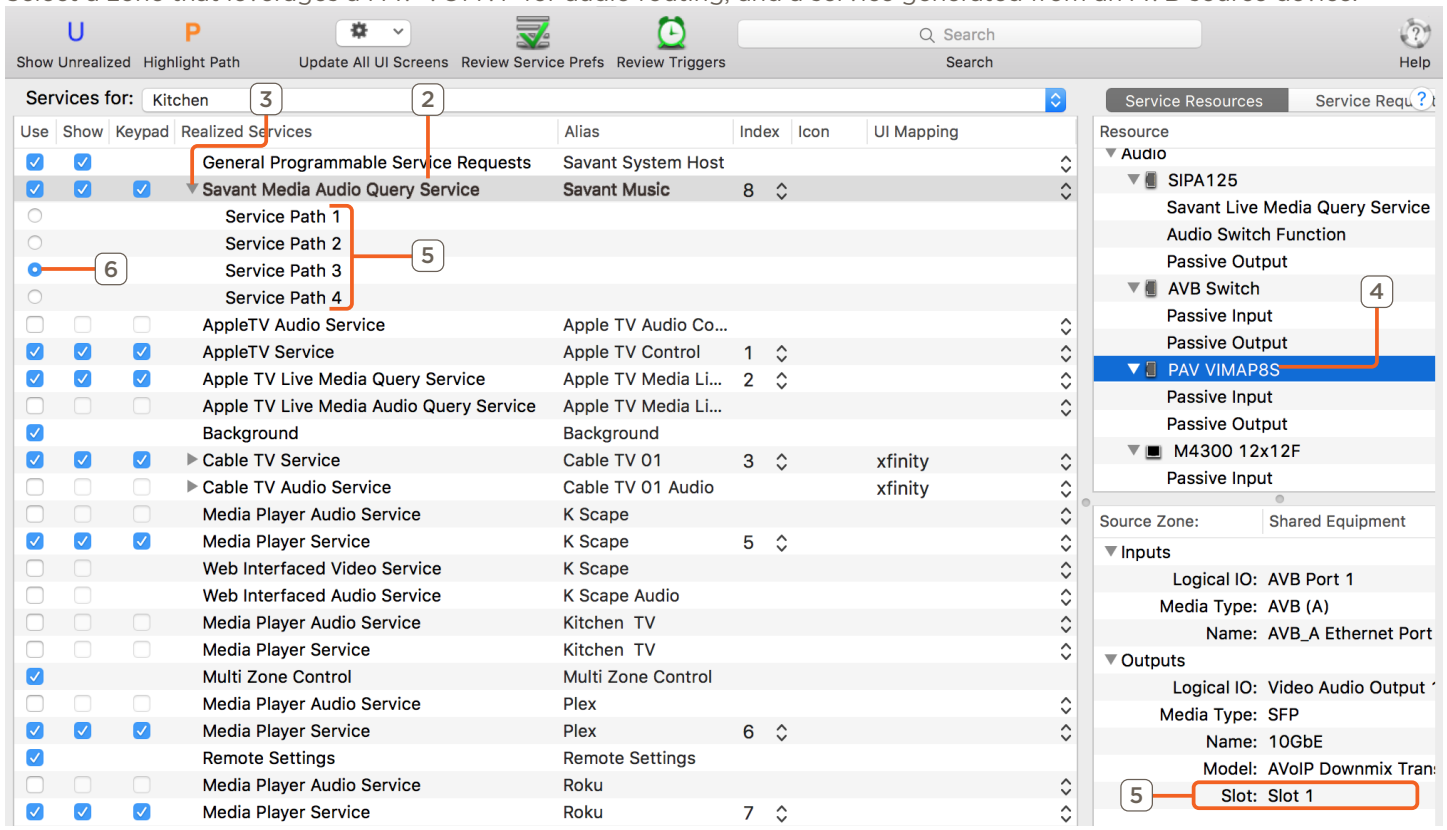
5.9. External AVB Sources

The Savant IP Video with Audio Processing Input chassis can be used to pass AVB audio to IP Video endpoints. There is a 4 stream limit per PAV-VIMAPxS. The audio service path must be set in Blueprint. Below is an example of how to configure AVB services for PAV-VOM endpoints.

IMPORTANT! PAV-VOM1C do not support this feature.

In an open Blueprint configuration do the following:

1. Open the Services Window.
2. Select a zone that leverages a PAV-VOMVP for audio routing, and a service generated from an AVB source device.



3. Click the disclosure triangle to expand the available Service Paths.
4. Select the PAV-VIMAP8S in the Service Resources Window.
5. Highlight each service path to view input and output details at the lower right. In this example, Service Path 3 uses the desired output Slot 1.
6. Select the desired Service path.

TIP! Service paths are generated in random order for each service. Therefore, the input and output details may differ across service for a given path number. Use the same slot number for a given service in every zone.

For more information on service path selection see Service Selection RacePoint Blueprint Programming Guide on the Savant Customer Community.

6. Best Practices

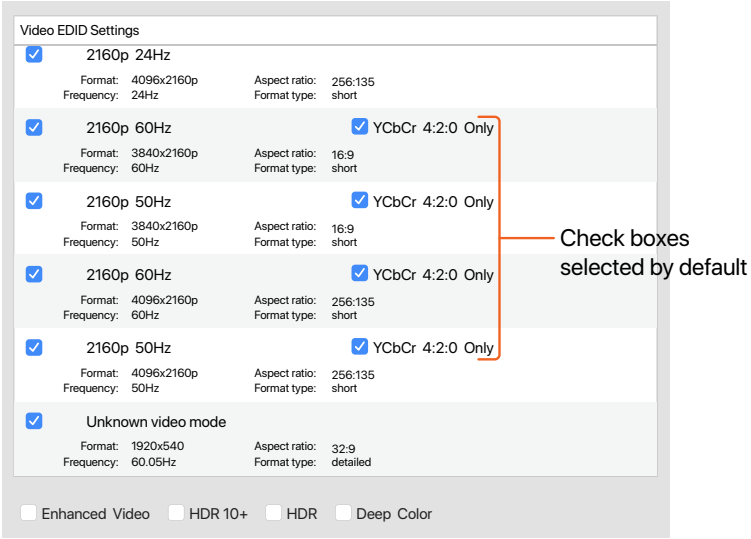
Once the system is installed and the configuration has been uploaded to the Host, this section shows some best practices for testing a Savant IP Video system.

PAV-VIMxS/PAV-VIMVP1x/PAV-VIM1C/PAV-VIM1CP2

Initial Audio and Video setup/testing should be done using the default Extended Display Identification Data (EDID). The default EDID has support for PCM audio up to 8 channels and video resolutions up to 4k 60hz 4:2:0 8-bit.

PAV-VIMAPxS

Initial Audio and Video setup/testing should be done using the default EDID. The default EDID has support for video resolutions up to 4k 60hz 4:2:0 8-bit, and most encoded audio formats.



6.1. Testing

Every source should be tested with every A/V zone. Savant recommends testing a single source with one A/V zone at a time.

1. Activate the first Video source to a single Zone.
2. Does Video pass?
   A. NO: Check System Monitor for the resolution of the Input and then the output, if using a video processing VOM scale the VOM to 1080p. If 1080P passes, the TV or the HDMI cable may not support the current resolution of the source that is being routed to the TV through the Savant Video system.
   B. YES: Check Audio
3. Does Audio pass?
   C. NO: In System Monitor set the audio path policy for the PAV-VOM to “Downmix”. If audio is still not present verify audio is enabled on the source.
   D. YES: Continue to the next Zone.
4. Repeat with the same source until all Video zones have been tested. Repeat with all other Video sources in the same manner as shown above.

After this testing is complete. Add more advanced EDIDs and test again.

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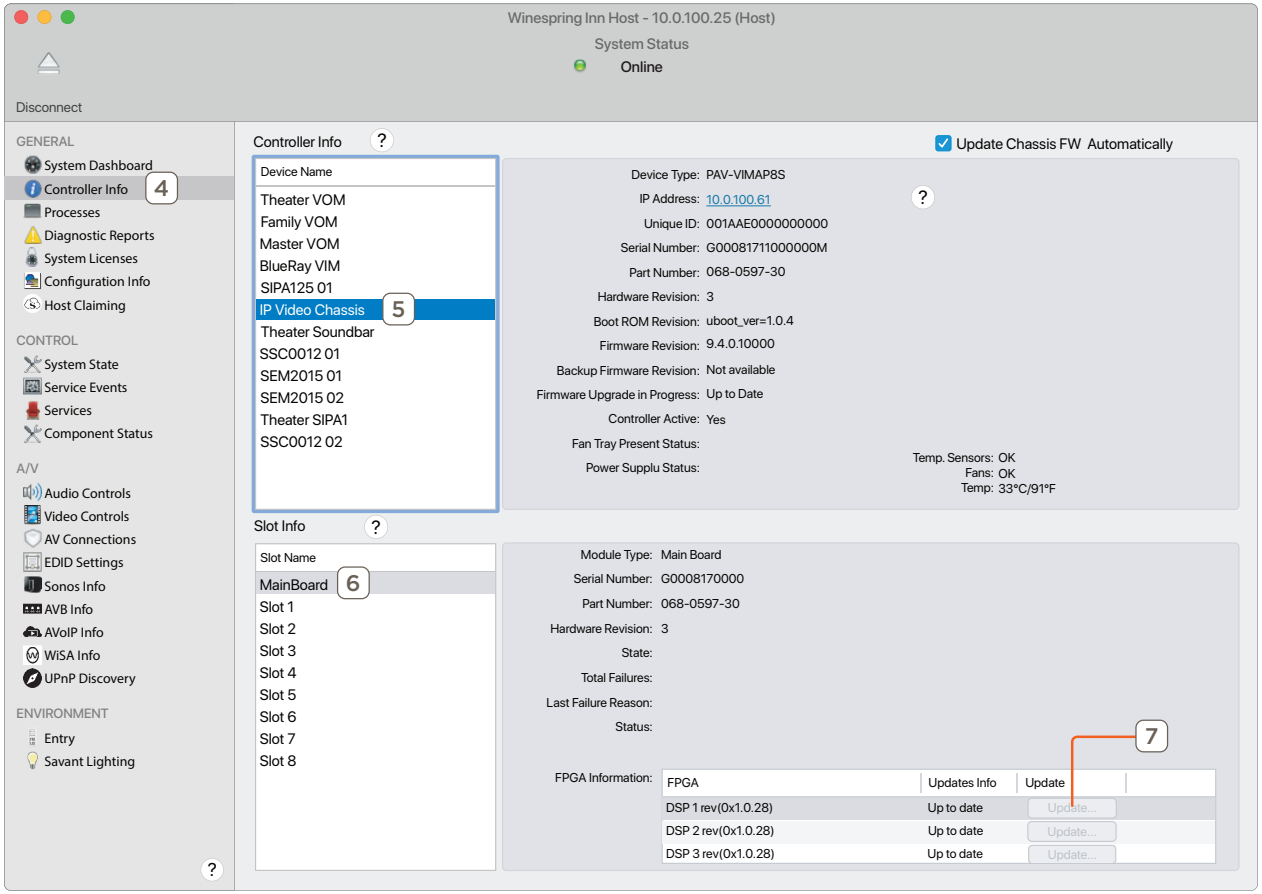
6.2. FPGA Updates

When using an IP Video with Audio Processing chassis, the Field Programmable Gate Arrays (FPGAs) must be updated manually. This should be done whenever the Runtime is changed.

To update the chassis FPGAs do the following:

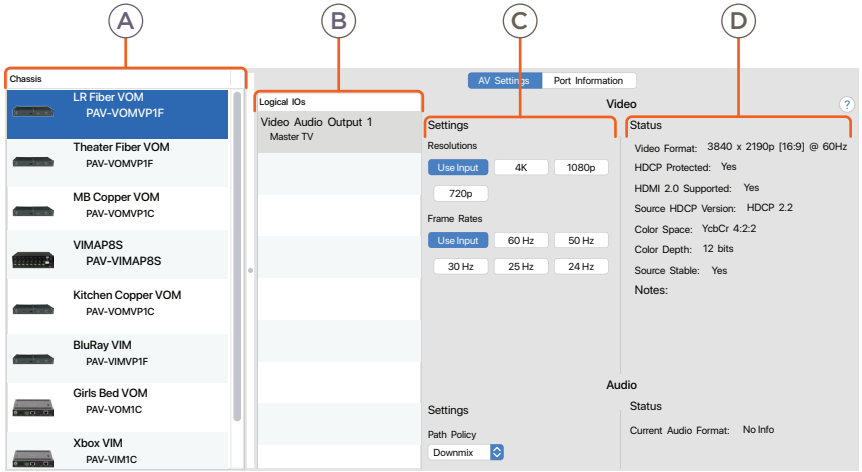
1. Open System Monitor.
2. Select the Host for the system.
3. Click Connect.
4. Click Controller Info.
5. Select the IP Video Chassis.
6. Select Main Board.
7. Click Update for all FPGAs required.
8. Repeat steps 6 and 7 for all slots.



TIP! When troubleshooting, ensure that all FPGAs are fully up to date.

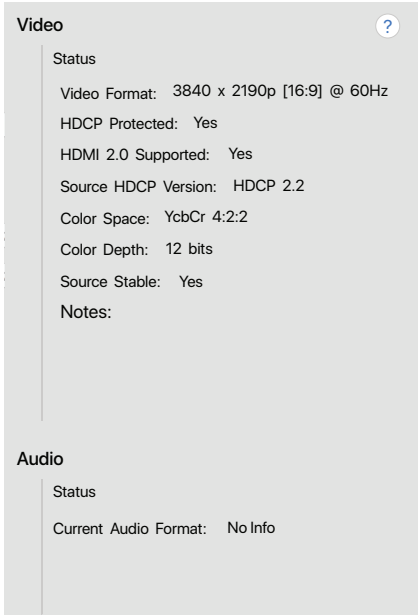
7. System Monitor

In System Monitor, there is an AVoIP Info tab for information gathering and changing settings. This System Monitor tab will only display in a system that has the Video over IP device in the configuration.



A	Chassis	List of Video over IP devices in the configuration.
B	Logical IOs	List of inputs or outputs on the device selected in the Chassis window.
C	Settings	Video and Audio settings, down mixing audio or video scaling settings can be changed in this section. See Video/ Audio Settings section below for more information.
D	Status	Displays the current status of selected I/O. See Video/ Audio Status section below for more information.

7.1. Video/Audio Status



Video Format – Displays active video resolution and frame rate.

HDCP Protected – Displays if HDCP is enabled

HDMI 2.0 Supported – Displays if the connected device supports HDMI 2.0.

Source HDCP Version – Displays the HDCP version from the source content.

Color Space – Displays the color format used in the current Video

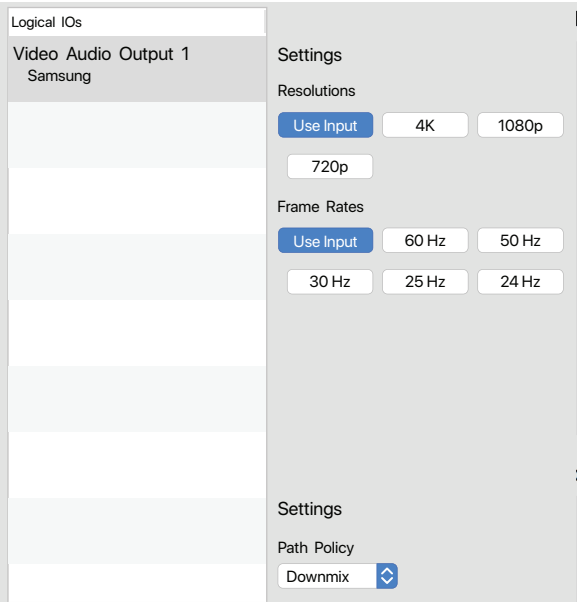
Color Depth – Displays the active number of bits for color data.

Source Stable – Displays if video is received from the connected source.

Current Audio Format – Displays current audio format. Not supported on the PAV-VIMxS, PAV-VIMVP1x, and PAV-VIM1C.

7.2. Video/Audio Settings (Output Only)

These settings are only available on output chassis.



Resolutions

- **Use Input**: Will pass the received video resolution to the endpoint.
- **4K**: Scale to UHD (3840x2160).
- **1080p**: Scale to Full HD (1920x1080)
- **720p**: Scale to HD (1280x720)

Frame Rates

- **Use Input**: Will pass the received video frame rate to the endpoint.
- **60 Hz**: Fixed Frame Rate of 60 frames per second.
- **50 Hz**: Fixed Frame Rate of 50 frames per second.
- **30 Hz**: Fixed Frame Rate of 30 frames per second.
- **25 Hz**: Fixed Frame Rate of 25 frames per second.
- **24 Hz**: Fixed Frame Rate of 24 frames per second.

Path Policy (PAV-VIMAPxS only) – Dropdown menu with the following options.

- **Dynamic**: Uses the EDID read from the connected endpoint. If the endpoint EDID supports the current source's incoming audio format, the pass-through path will be used. If the endpoint's EDID does not support the current source's incoming audio format, the down mixed path will be used.
- **Pass-thru**: Pass-thru the HDMI audio format to the endpoint.
- **Downmix**: Uses audio processing to downmix the audio to 2 channel PCM.

Path Policy (PAV-VIMxS/PAV-VIM1C/PAV-VIMVP1x/PAV-VIM1CP2) – Dropdown menu with the following options.

- **Dynamic**: Enables the multi-channel to 2 channel PCM.
- **Pass-thru**: Pass-through the HDMI audio format to the endpoint.
- **Downmix**: Enables the multi-channel to 2 channel PCM.

IMPORTANT!

- This will only downmix Multi-channel PCM audio to Stereo PCM. It is not compatible with encoded Bit stream audio formats.
- Routing Bitstream audio from any non-audio processing device to a PAV-VOM device that has an audio configuration setting of Dynamic or Down mix will result in no audio from the PAV-VOM. To support bitstream audio from any non-audio processing device, the PAV-VOM device should be configured with a Pass-through audio setting in the AVoIP Info tab of System Monitor.

NOTE: Scaling HDCP 2.2 sources to an HDCP 1.4 sync device requires the resolution input of the HDCP 2.2 source to be 4K 60 4:2:0 8Bit or below. For a basic understanding of how these options affect the system review the information below:

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Use Input resolution and frame rate

- Virtually no switching latency, always less than 120 microseconds of video latency.
- Output colorspace is the same as the source.
- Video latency depends on display to source synchronization time.
- HDR supported.
- 3D modes supported.

Scale video output resolution only

- Very low switching latency (less than 4ms).
- Output colorspace is always RGB 8bit.
- Video latency depends on display to source synchronization time.

Fixed Frame Rate used

- Display timing remains constant. There is no need to resync on input changes.
- Switching time is dependent on the network switch. For switches with the IGMP FASTLEAVE feature enabled, switching time is < 0.1 seconds.
- Output colorspace is always RGB 8bit
- Latency is never less than one frame, but never more than two frames.
- Video stutter may occur due to frame rate conversion frame slips.

Video Latency

This section provides general video latency information when use the IP Video system.

Device/Feature	Video Mode	Latency
PAV-VOM1C/PAV-VOMVPx1	Pass-Though (Use Input)	< 30 µS
PAV-VOMVPx1	Resolution fixed in System Monitor	1/4 Frame
PAV-VOMVPx1	Resolution and Frame Rate fixed in System Monitor	1 to 2 Frames
IP Video Tiling	N/A	1 to 2 Frames

NOTES:

- Frame rate doesn't effect the delay in Pass-Though mode. Frame rates above 60Hz can be used, but only up to 120Hz has been tested.)
- 1/4 frame latency:
  ~4ms for 60Hz source
  ~10ms for 24Hz source
  ~2ms for 120Hz (TV would need to support 120Hz).
- 1 frame latency:
  ~16ms for 60Hz source
  ~41ms for 24Hz source
  ~8ms for 120Hz (TV would need to support 120Hz).
- 1 to 2 frames latency:
  When scaling a 24Hz frame to 60Hz, this would be 1 input frame plus up to 1 output frame If a source was 120Hz and being scaled to 60Hz, the delay would be ~8ms to 24ms
- µS is the abbreviation for micro second, which is one millionth of a second (0.000001 seconds).

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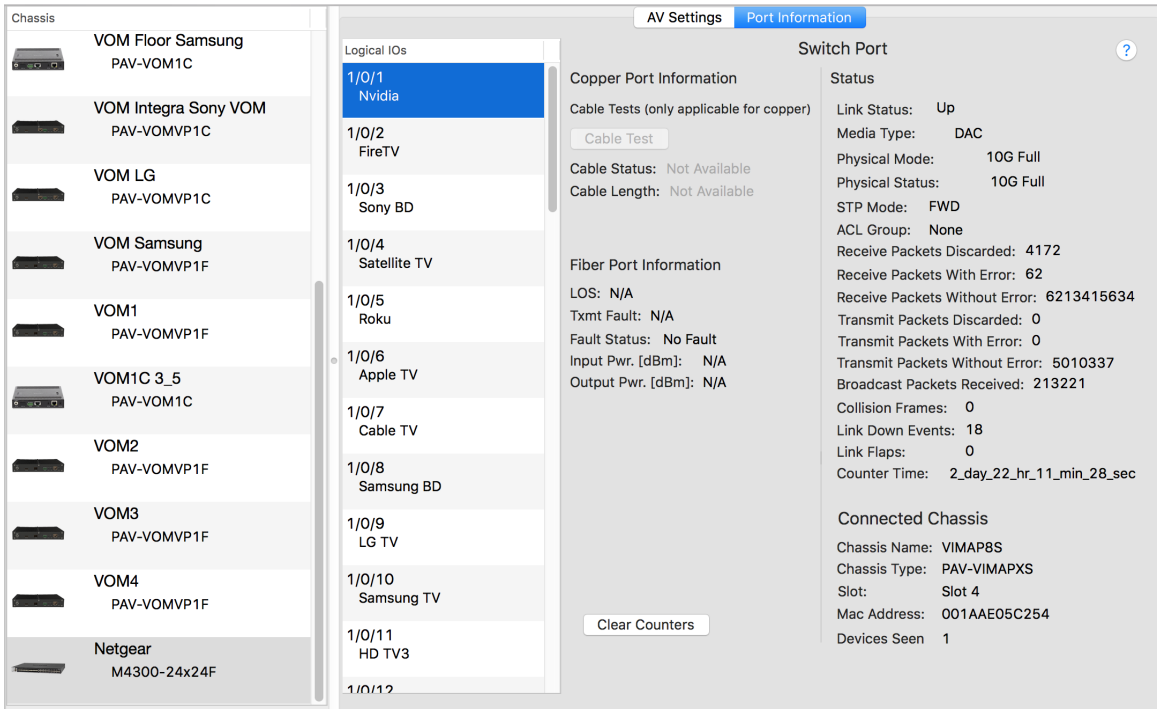
7.3. NetGear Switch Information

The NetGear M4300 switches display status information in System Monitor. This requires a control connection to be made in Blueprint and the IP address of the NetGear switch to be defined. This feature requires da Vinci 8.8 or higher.



Logical IOs – Lists port number and the name of the connected device. The port numbering displays as 1/0/x. The last number is the port number. The SFP+ ports start at 1. Selecting a Logical IO can take up to 20 seconds for the status information to fully populate.

Port Information – Displays connection status of the connected port. This information is mainly used it troubleshooting.

7.4. EDID Settings

For more information on EDID settings in System Monitor see **System Monitor - EDID Settings** on the Savant Customer Community.

Appendix A: Accessories

SKU	Description	Image
CON-FSFP1-00 CON-FSFP10-00	Fiber Transceiver Module (Single or 10 Pack)	
CON-F2010-00	LC Multimode OM3 Fiber Connectors (10 Pack)	
CBL-F2500-00	Duplex OM3 Indoor/Outdoor Plenum Rated Multi-Mode Fiber (1000ft)	
CBL-HDMI2M1-00 CBL-HDMI2M2-00 CBL-HDMI2M3-00	High Speed Category HDMI 2.0 Cable (1,2, or 3 Meter)	
CBL-OM3MM1M-00 CBL-OM3MM3M-00 CBL-OM3MM5M-00	OM3 Fiber Optic Patch Cable (1,2, or 3 Meter)	
FTK-F2000-01	Fiber Termination Kit	
FTK-FTEST-00	Fiber Test Kit	

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Appendix B: EDID Optimization

Enhanced HDMI source capabilities can create compatibility issue with less capable displays. Below are tables to show examples of possible EDID changes for testing and use.

Default EDID (4K@60hz 4:2:0 8 bit video, PCM audio up to 8 channel)

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Native HDMI audio (Multichannel PCM)	Native HDMI audio (Multichannel PCM)	All HDMI audio	Source audio input 2 channel PCM only

EDID: 4K@60hz 4:2:0 8 bit video, PCM audio up to 8 channel, DTS surround audio

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Native HDMI audio	Native HDMI audio	Native HDMI audio	Source audio input 2 channel PCM only (If encoded audio is used by the source analog outputs will output audio noise)

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EDID: 4K@60hz 4:2:0 8 bit video, PCM audio up to 8 channel, DTS surround audio

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output)	Native HDMI audio	Native HDMI audio	Native HDMI audio	Source audio input 2 channel PCM only (If encoded audio is used by the source analog outputs will output audio noise)

EDID: 4K@60hz 4:2:0 8 bit video, PCM audio up to 8 channel, DTS surround audio, HBR audio

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	Pass-Though (Use Input)	Pass-Though (Use Input)	Resolution Scaled to 1080p	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output) (TVs are not HBR audio capable)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output) (TVs are not HBR audio capable)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output) (TVs are not HBR audio capable)	Multi to 2 Channel checked (If DTS is used they will be passed to the HDMI output) (TVs are not HBR audio capable)	Native HDMI audio	Native HDMI audio	Native HDMI audio	Source audio input 2 channel PCM only (If encoded audio is used by the source analog outputs will output audio noise)

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EDID: 4K@60hz 4:4:4 8 bit video, PCM audio up to 8 channel)

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input)	Pass-Though (Use Input) (4:4:4 content will need to be scaled)	Resolution Scaled to 1080p (If source uses HDCP 2.2 video will NOT display)	Pass-Though (Use Input)	Pass-Though (Use Input) (4:4:4 content will need to be scaled)	Resolution Scaled to 1080p (If source uses HDCP 2.2 video will NOT display)	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Native HDMI audio (Multichannel PCM)	Native HDMI audio (Multichannel PCM)	All HDMI audio	Source audio input 2 channel PCM only

EDID: 4K@60hz 4:4:4 8 bit video, HDR and Deep Color enabled, PCM audio up to 8 channel)

	HDCP 1.4 Source	HDCP 2.2 4K@60Hz 4:4:4 HDR capable TV	HDCP 2.2 4K@60hz 4:4:4 non-HDR capable TV	HDCP 2.2 4K@60hz 4:2:0 non-HDR capable TV	HDCP 1.4 1080p TV	HDCP 2.2 4K@60hz 4:4:4 HDR AVR HBR audio capable	HDCP 2.2 4K@60hz 4:2:0 non-HDR AVR HBR audio capable	HDCP 1.4 1080p AVR audio capable	Analog audio output on the VIM chassis in use
VOM Video Mode	N/A	Pass-Though (Use Input)	Pass-Though (Use Input) (Video will display but will not be in HDR)	Pass-Though (Use Input) (Video will display but will not be in HDR) (4:4:4 content will need to be scaled)	Resolution Scaled to 1080p (If source uses HDCP 2.2 video will NOT display)	Pass-Though (Use Input)	Pass-Though (Use Input) (Video will display but will not be in HDR) (4:4:4 content will need to be scaled)	Resolution Scaled to 1080p (If source uses HDCP 2.2 video will NOT display)	N/A
VOM Audio Mode	N/A	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Multi to 2 Channel checked	Native HDMI audio (Multichannel PCM)	Native HDMI audio (Multichannel PCM)	All HDMI audio	Source audio input 2 channel PCM only

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