BINARY

INSTALLATION & SETUP GUIDE

DOLBY dts 2.0+Digital Out FC CE

IMPORTANT SAFETY INSTRUCTIONS

To reduce the risk of fire or electric shock, read and follow all instructions and warnings in this manual. Keep this manual for future reference.

1. Do not expose to water.

2. Do not remove cover. No user serviceable parts inside.

3. Clean only with a dry cloth.

4. Leave sufficient space between devices and do not block ventilation holes for proper cooling.

5. Do not stack transmitter or receivers on top of each other.

6. Do not install near any device or source that generates heat.

7. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.

8. Do not override the safety purpose of the polarized or grounding plug. A polarized plug has two blades, one of which is wider than the other. A grounding plug has two matching blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

9. Protect the power cord from being walked on or pinched, particularly at the plug end and where the power cord is attached to the apparatus.

10. Only use manufacturer's recommended power supply if the use of an external power supply for the transmitter and receiver is necessary.

11. Only use attachments and accessories specified by the manufacturer.

12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power supply cord or plug is damaged, liquid has been spilled on or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, the apparatus does not operate normally, or it has been dropped.

13. Disconnect the power supply cord from the power outlet, or disconnect the transmitter and receivers from the network PoE connections or remove the network switch power cord from the outlet, to completely disconnect the controller from power.

LEGAL NOTICE

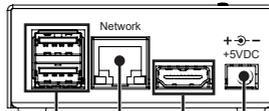## GETTING STARTED

To get started, you need:

- 1× per source: MoIP Transmitter
- 1× per display: MoIP Receiver
- 1× MoIP Controller B-900-MOIP-4K-CTRL
- 1× Layer 2 Managed switch
- Sources, Displays, HDMI cables and category cabling
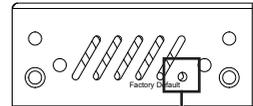
MoIP Controller B-900-MOIP-4K-CTRL
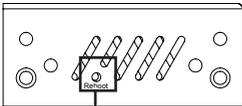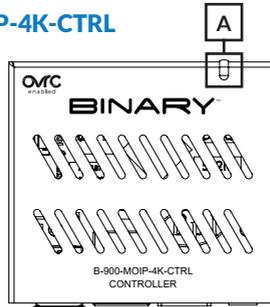
A. Status LED

Solid during system boot | 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 MoIP switch to provide access to MoIP transmitters and receivers.

E. HDMI Port

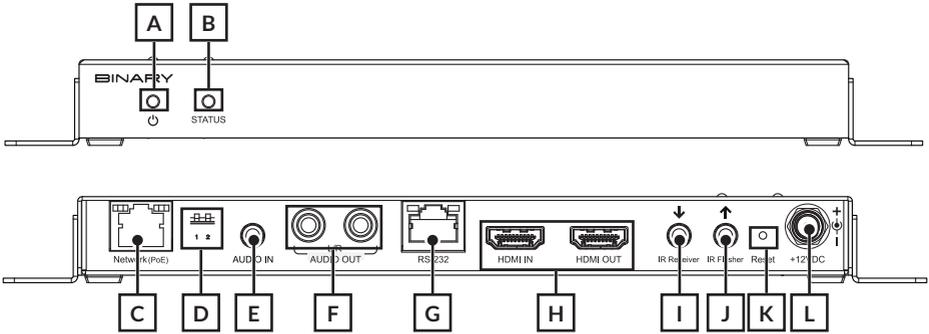Not used for the MoIP system.

F. 12 VDC 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 Transmitter B-900-MOIP-4K-TX

A. **Power Indicator**

On: Power on | Blinking: Booting | Off: Power off

B. **System Status Light**

On: Connected to network with source present | Off: Not connected to network | Blinking: Connected to network and no source present.

C. **Network Port**

Provides access to network and power via 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 pin out.

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. **12 V 2A Power Connection**

12VDC 2A locking connection for external power supply (not included).

MoIP Transmitter B-900-MOIP-4K-TX-2AC
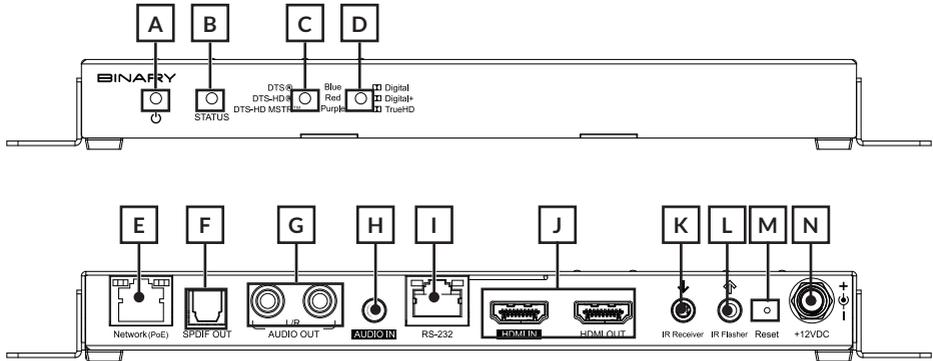
A. Power Indicator

On: Power on | Blinking: Booting | Off: Power off

B. System Status Light

On: Connected to network with source present | Off: Not connected to network | Blinking: Connected to network and no source present.

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 network and power via Power-over-Ethernet (POE).

F. SPDIF Out

For future use only.

G. L/R Audio Out

RCA analog audio de-embedding of 2-channel PCM audio.

H. Audio In

3.5 mm input for embedding audio to replace HDMI audio.

I. RS-232

RJ45, RS-232, (TX, RX, Ground), EIA-561 pin out.

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. 12 V 2A Power Connection

12VDC 2A locking connection for external power supply (not included).

MoIP Audio Transmitter B-900-MOIP-AUDIO-TX

A. **Power Indicator**

On: Power On | Blinking: Booting | Off: Power off

B. **System Status Light**

On: Connected to network with source present | Off: Not connected to network | Blinking: Connected to network and no source present.

C. **Network Port**

Provides access to network and power via Power-over-Ethernet (POE).

D. **L/R Audio In**

RCA analog audio input.

E. **Ground Screw (optional)**

In certain installations, ground related audio noise issues may occur. This noise can be suppressed by connecting this ground screw terminal to a local AC ground.
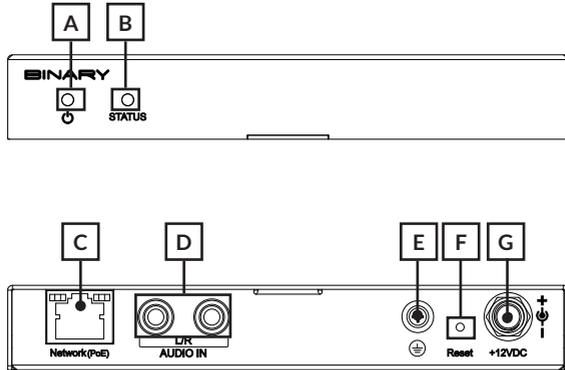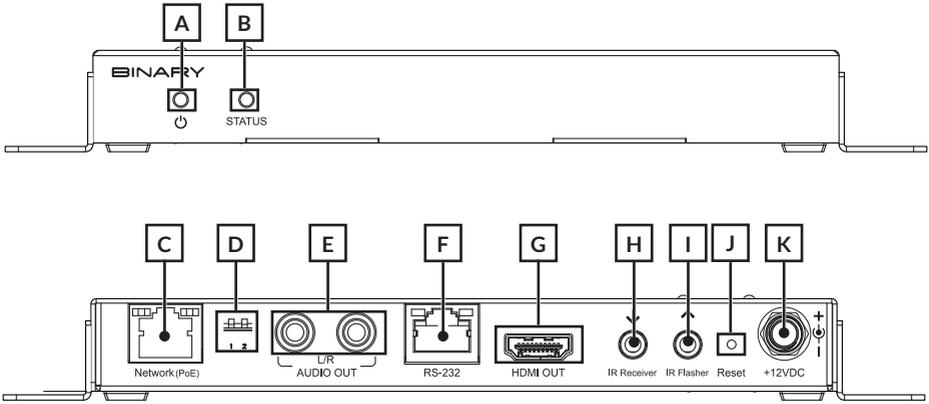
F. **Factory Reset**

Press and hold for 10 seconds to restore to factory settings.

G. **12 V 2A Power Connection**

12VDC 2A locking connection for external power supply (not included).

MoIP Receiver B-900-MOIP-4K-RX

A. Power Indicator

On: Power on | Blinking: Booting | Off: Power off

B. System Status Light

On: Connected to network and not subscribed to transmitter stream | Off: Not connected to network | Blinking: Connected to network and subscribed to transmitter stream.

C. Network Port

Provides access to network and power via 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 pin out.

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. 12 V 2A Power Connection

12VDC 2A locking connection for external power supply (not included).

MoIP Receiver B-900-MOIP-4K-RX-2AC
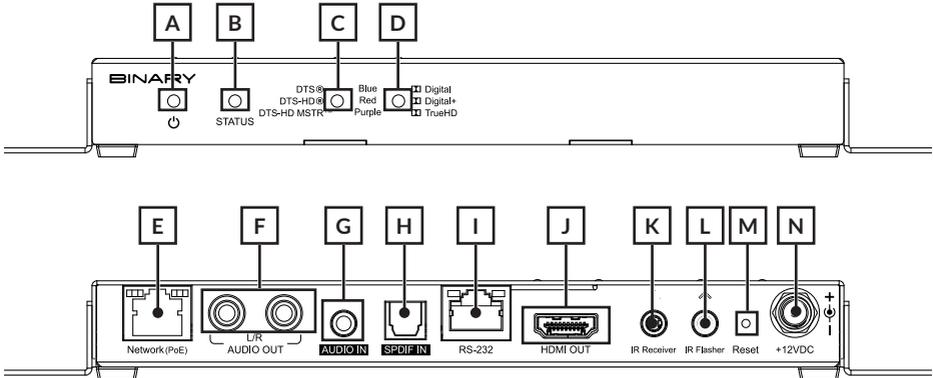
A. Power Indicator

On: Power on | Blinking: Booting | Off: Power off

B. System Status Light

On: Connected to network and not subscribed to transmitter stream | Off: Not connected to network | Blinking: Connected to network and subscribed to 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 network and power via Power-over-Ethernet (POE).

F. L/R Audio Out

RCA analog 2-channel audio.

G. Audio In

3.5 mm input for embedding audio to replace HDMI audio .

H. SPDIF In

For future use only.

I. RS-232

RJ45, RS-232, (TX, RX, Ground), EIA-561 pin out.

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. 12 V 2A Power Connection

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

MoIP Audio Receiver B-900-MOIP-AUDIO-RX

A. Power Indicator

On: Power on | Blinking: Booting | Off: Power off

B. System Status Light

On: Connected to network with source present | Off: Not connected to network | Blinking: Connected to network and no source present.

C. Network Port

Provides access to network and power via Power-over-Ethernet (POE).

D. L/R Audio In

RCA analog audio output.

E. Ground Screw (optional)

In certain installations, ground related audio noise issues may occur. This noise can be suppressed by connecting this ground screw terminal to a local AC ground.
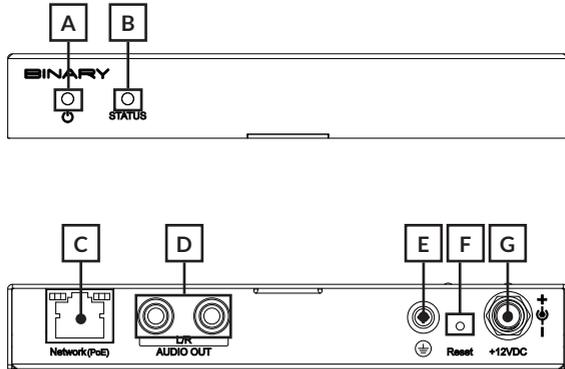
F. Factory Reset

Press and hold for 10 seconds to restore to factory settings.

G. 12 V 2A Power Connection

12VDC 2A locking connection for external power supply (not included).

NETWORKING

This section details the networking requirements, recommendations and limitations when configuring a Binary B-900 Series Media over IP system (MoIP) system, which can be used to deploy MoIP on any compatible network switch. Included are steps to configure an Araknis 210 Series PoE and 310 Series PoE Layer 2 managed switch in a single switch MoIP deployment as well as basic guidelines, requirements for single and multiple switch MoIP setups.

IMPORTANT: Network switches directly connected to MoIP transmitters and MoIP receivers should always be configured prior to connecting any of these components.

RECOMMENDED NETWORK SWITCHES

Single Switch Deployments

Araknis Switch Model	Ethernet Ports (1 Gbps)	SFP Ports (1 Gbps)	PoE Budget (Watts)
AN-210-SW-F-48-PoE	48	4	375
AN-210-SW-F/R-24-PoE	24	2	190
AN-210-SW-F/R-16-PoE	16	2	130
AN-210-SW-F/R-8-PoE	8	2	65
AN-310-SW-F/R-24-PoE	24	2	375
AN-310-SW-F/R-16-PoE	16	2	250
AN-310-SW-F/R-8-PoE	8	2	130

Multiple Switch Deployments

Araknis switches do NOT support multiple switch setups at this time. In setups where MoIP transmitters and receivers must be connected on multiple extended switches, multiple gigabit uplinks between switches is required. Numerous network switch manufacturers offer switches with multiple gigabit uplink/SFP ports to support multiple switch deployments. **Check our website for the latest supported switches.**

SELECTING A NETWORK SWITCH

Network Switch Requirements

The Ethernet PoE switch selected is critical for the optimal performance of the MoIP system. Araknis 210 Series and 310 Series PoE switches are recommended. Switch functionality, capability and reliability can vary greatly from one manufacturer to the next. Configuration varies by manufacturer. Refer to the manufacturers user manual to enable required features to support MoIP. Some brands of switches may have limited support of required functions, bandwidth across the entire switch, and necessary total PoE power to support all MoIP transmitters and receivers.

Network Switch Minimum Requirements

A network switch selected for a MoIP system must meet the requirements below or support the following features:

Single Switch Deployments

- Layer 2 or Layer 3 Managed
- 1 Gigabit Ethernet Port Throughput (minimum)
- Simultaneous 7.5 Watts PoE across all ports (minimum)
- Multicast forwarding or filtering
- IGMP Snooping
- IGMP Querier
- Jumbo Frames (8000 bytes or larger)
    - Also known as Jumbo Packets or Maximum Transmission Unit

If a **multiple switch deployment** is required, the switches must also support:

- Dynamic Multicast Router Port
- Forwarding Unknown Multicast to Multicast Router Port Only

Number of Ports

Given the flexibility and scalability of Binary's B-900 Series Media over IP system, it is recommended that a switch with more Ethernet ports than needed for the MoIP system be used to allow quick addition of devices in the future. Utilizing an Araknis 210 Series 48-port PoE switch, a MoIP system maximum size limit is 47 total MoIP Transmitters and MoIP Receivers, unless you use SFP adapters for the switch uplink and MoIP Controller. Larger systems utilizing other manufacturer's switch is possible in both single and multiple switch deployments.

When calculating the size of switch needed, count one port for each the following devices:

- Number of sources (MoIP transmitters)
- Number of displays (MoIP receivers)
- MoIP controller
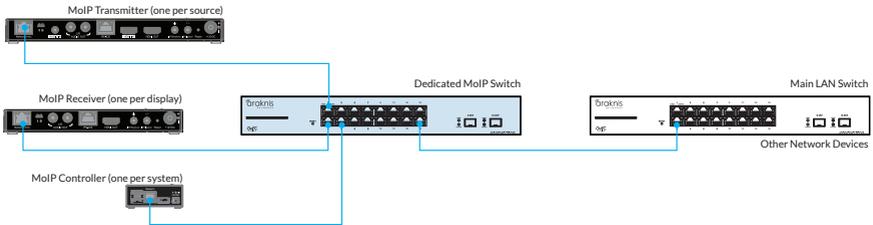- LAN connection to main network for OvrC (if applicable)

Power

MoIP transmitters and MoIP receivers can be powered by **Power-over-Ethernet (PoE)** or a separate **12V power supply (not included)**. The separate power supply is available only as a replacement part only. Each transmitter and receiver utilize no more than 7.5 watt of power. Snap AV recommends using PoE to power the MoIP transmitter and receiver units. The MoIP controller is NOT powered by PoE and requires the use of the included 5V power supply.
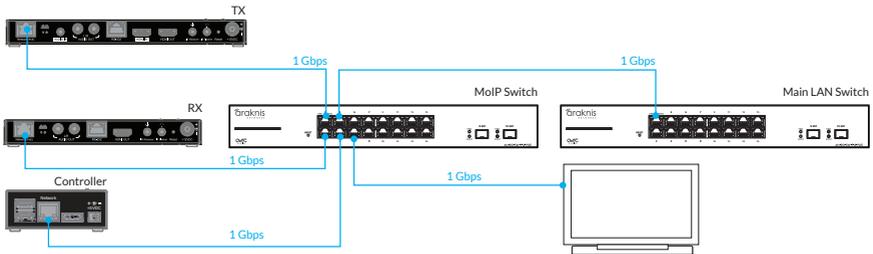
MoIP System Network Setups

Single switch MoIP network configurations are supported by Araknis 210 PoE and 310 PoE Series switches. Integrators familiar with the above requirements and the configuration of stackable and cascaded switches with multi-gigabit uplinks are able to create larger MoIP deployments.
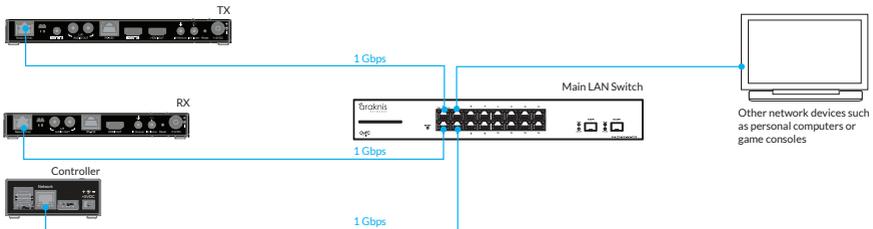
Single Switch

Dedicated MoIP Switch (RECOMMENDED)

MoIP Transmitter (one per source)

Dedicated MoIP Switch

Main LAN Switch

MoIP Receiver (one per display)

Other Network Devices

MoIP Controller (one per system)

Shared MoIP Switch

TX

1 Gbps

1 Gbps

RX

MoIP Switch

Main LAN Switch

1 Gbps

1 Gbps

Controller

1 Gbps

MoIP on Main LAN Switch

TX

1 Gbps

RX

Main LAN Switch

Other network devices such as personal computers or game consoles

1 Gbps

Controller

1 Gbps

Multiple Switches

Please refer to your network switch manufacturers' documentation to enable the critical features for optimal performance in multiple switch MoIP network configurations.

Bandwidth considerations are critically important. The maximum number of MoIP transmitters which can be supported by a given network topology is limited by the lowest bandwidth link in the network. Typically, this is the link between switches. MoIP receivers

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have no impact on available bandwidth. The bandwidth requirements of other devices on the network should also be considered.

Each MoIP transmitter consumes 250-850 Mbps (4K) or 150-750 Mbps (1080p) of the available bandwidth. The lowest bandwidth link limitation applies no matter to which switch in the multiple switch setup the transmitter is connected. To calculate the required bandwidth needed to support the desired number of MoIP transmitters, multiply the number of MoIP transmitters by 0.85. This gives you the bandwidth in Gbps. For example, 10 MoIP transmitters would require 8.5 Gbps. In the diagrams below, **X Gbps** indicates a multiple gigabit connection between switches. The throughput of this uplink must accommodate, for this example, 8.5 Gbps for the MoIP system to operate optimally.

Cascaded Switches
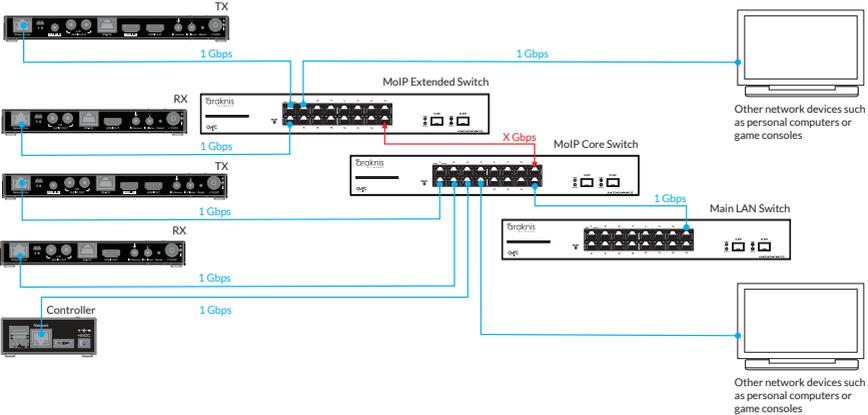
Stacked Switches
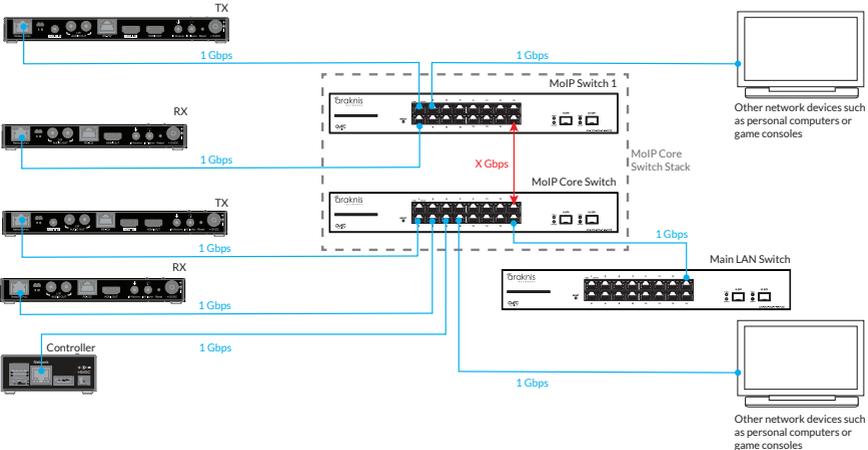
Network Troubleshooting

It should be noted that for challenging network setups where complete isolation of a MoIP system is desired, the controller supports this functionality. A USB-to-Ethernet adapter with an ASIX 88179, ASIX 88178A, RealTek 8153, or RealTek 8152 chipset is required.

Install this adapter before the MoIP controller is booted (or plug it in and restart). The USB adapter should run from the USB port on the MoIP controller to the main LAN. The network port on the MoIP controller should run to the dedicated MoIP switch or switches.

After the controller is booted visit the network settings page of the controller for isolation enablement and selection of DHCP or Static configuration.

Note: The MoIP controller's firmware must be up to date for this configuration.

ARAKNIS 210/310 PoE SERIES CONFIGURATION

1. Configure Network Switch

Steps below use an Araknis 210 PoE or 310 PoE Series switch as an example

1. Factory default the **MoIP switch** to be used for all MoIP components (not necessary for new switches). Press and hold the reset button for 10—15 seconds until the Status LED flashes once. This restarts the switch and resets it to factory settings.

2. Connect the dedicated MoIP switch directly to your **Main LAN switch**. (The Main LAN switch is the main network switch into which all other switches and network devices are connected. The Main LAN switch is the only switch connected to the router. A dedicated MoIP switch is preferred but not required. See 'Network Guide' for more information.)

3. Access the local of the **MoIP Switch**.

Note: Default login in credentials for an Araknis switch are araknis / araknis. The default IP address is 192.168.20.254, if it was not assigned a DHCP IP address.

2. Enable IGMP Snooping

Choose **ADVANCED > MULTICAST > IGMP SNOOPING**, then check options as follows:

3. Status: **Enabled**

4. Version: **V2**

5. Report Suppression: **Enabled**

6. Unregistered IPMC Forward Action: **Drop**

7. IGMP Snooping Status: **Enabled**

8. Fast Leave: **Disabled**

9. Querier State: **Enabled**

10. Querier Version: **V2**

11. Router Settings > Router Ports Auto-Learned: **Enabled**

Click **Apply** to save these settings

araknis NETWORKS

CLOUD SERVICE: Connected | System Time: 2020-10-29 17:09:27 | System Uptime: 0d 07:43:23

IGMP SNOOPING

STATUS
SYSTEM
PORTS

SETTINGS
SYSTEM
PORTS
POE
VLANS
LINK AGGREGATION
ACCESS MANAGEMENT

MAINTENANCE
PING TEST
TRACE ROUTE
FILE MANAGEMENT
RESTART DEVICE
LOG OUT

ADVANCED
PORT STATISTICS
RUNNING CONFIG
▷ NEIGHBORS
▲ MULTICAST
  ▸ IGMP SNOOPING
  MLD SNOOPING
▷ STP
▷ VLANS
▷ SECURITY
▷ RMON
▷ QOS
▷ SNMP
LACP
LOG

Search

Settings

Status	● Enabled ○ Disabled
Version	● v2 ○ v3
Report Suppression	● Enabled ○ Disabled
Unregistered IPMC Forward Action	○ Flood ● Drop

VLAN Settings

VLAN ID	IGMP Snooping Status	Fast Leave
1	Enabled	Disabled

Querier Settings

VLAN ID	Querier State	Querier Version	Querier Status	Querier IP	Robustness	Interval	Oper Interval	Max Response Interval	Oper Max Response Interval	Last Member Query Counter	Oper Last Member Query Counter	Last Member Query Interval	Oper Last Member Query Interval
1	Enable	v2	Non-Querier	---	2	125	125	10	10	2	2	1	1

Group List

VLAN ID	Group IP Address	Member Ports

Router Settings

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

URC Settings

URC State	Member Ports	VLAN
Disabled	1	1

3. Verify Jumbo Frame

Choose **SETTINGS > PORTS**, then verify **Jumbo Frame** is set to greater than 8,000 Bytes. The default value is 9216 the maximum is acceptable.

4. Set up the MoIP Controller

Connect the controller to the MoIP Switch and use the external power supply to connect it to an AC outlet. Then, claim the **MoIP controller** on OvrC and access the local UI.

IMPORTANT: This is **REQUIRED** for firmware maintenance.

1. Document the MoIP Controller MAC Address and Service Tag on the box or on the bottom of the device

2. Log into OvrC and go to **Customer** > **Devices**, click **+ Device**.

Home

House ● | MORE ❯ ●

◎ DASHBOARD | ⌨ DEVICES | ⚙ SITE SETTINGS | ◎ CLIENT SERVICES | 🖹 NOTES

Search devices... | ⊕ ADD DEVICE | ↻ SCAN

3. Manually enter MAC Address and Service Tag to claim the device.

‹ **Add Devices**
Add and claim devices to this customer location

CUSTOMER LOCATION
Home   House

Please enter the **MAC address** of an installed device

MAC ADDRESS

ex: 95:16:AB:1C:2D:43 | FIND

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5. **Access Local UI using Remote Access**.

    1. Log in to the MoIP Controller (default username/password is binary / binary). You are prompted to change the username and password upon first login. The user name and password can be changed under the **Configure> Account Management**.

    2. It is **recommended to apply a static IP address**. Navigate to the **Configure >IP Settings** and click **Enable**. Apply a static address to the MoIP controller on the same ip address range. Click **Save** to apply.

6. **Update the MoIP Controller Firmware**

    Available firmware updates are visible in the **Device List** for that location in OvrC. Follow steps provided in OvrC to complete.

    | | | MoIP Controller | 192.168.0.24 | Binary D4:6A:91: | | | | |
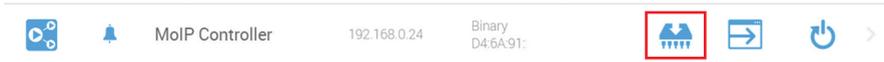
7. **Power off the MoIP Switch, then Connect Devices**

    1. Connect sources via HDMI to the MoIP transmitters.

    2. Connect displays or A/V receivers via HDMI to the MoIP receivers.

    3. The transmitter and receiver are PoE powered (no power supply is included).

    4. The controller must be powered by the included external power supply.

8. **Powering Up the System**

    1. Turn on all displays, sources and other related A/V equipment.

    2. Verify the MoIP Controller is also powered up.

    3. Apply power to the MoIP Switch. This supplies power on all connected MoIP devices.

9. Discover MoIP Transmitters and MoIP Receivers

Access the local UI of the MoIP controller and click **Discover** to identify all transmitters and receivers on the system.

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

If the assigned transmitter and receiver numbers do not fit an existing pre-written program, numbers can be re-assigned via the configuration tab of the UI.

10. Update TX and RX Firmware

Once discovered, the controller automatically pushes firmware updates to the transmitters and receivers (if necessary).

IMPORTANT: Do not remove any devices or restart until all have completed update status.

11. Identify Receiver-Display and Transmitter-Source Pairs (Recommended)

1. Click the **i** under each device to name each transmitter. Use the screen capture from each source to help identify each transmitter.

Transmitters
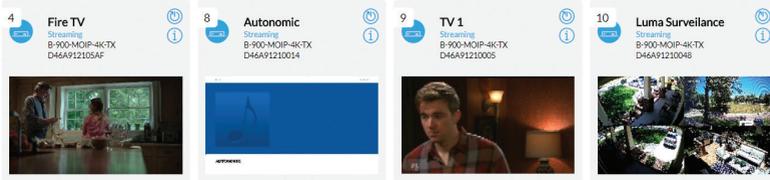
2. Record the Transmitter number, MAC address and connected source for use during control system integration.

3. Activate **Identify Mode** via the MoIP controller UI. Each display connected to a receiver displays the MAC address for the receiver connected to that display.

4. Name each receiver based on the MAC address.

5. Record the Receiver number, MAC address, and connected display type/location for use during control system integration.

Note: In **Test** mode, 4K content does not show on a 1080p TV or via 1.4 HDCP connection. Downscaling can be configured to fix this by clicking **i** next to each receiver.

12. Configure the MoIP Transmitters

MoIP Video Transmitters

1. The audio EDID between the MoIP transmitter and the source can be fixed to 2 Channel Stereo or 5.1 Multichannel. By default, the device is shipped with this set to Pass-through. Pass-through allows all multi-channel high audio resolution formats including DTS-X, Dolby ATMOS, DTS HD Master Audio, and Dolby True HD.

2. If a device connected to a MoIP receiver has limited audio capabilities, configure the MoIP Transmitters to limit the audio EDID presented to the source to the most common format (5.1 or 2ch). Below are three examples:

   a. If the MoIP transmitter Audio EDID is set to 2 Channel Stereo, all MoIP Receivers receive the 2 channel stereo audio from the HDMI source.

   b. If all the TVs in the system can process 5.1 Dolby Digital and DTS 5.1, but only the home theater AVR can process Dolby ATMOS, configure the MoIP Transmitter Audio EDID to 5.1 Multichannel mode.

   c. If one or more MoIP transmitters are dedicated to the home theater, then those MoIP Transmitter Audio EDID settings should be configured for Pass-through.

   d. When using a transmitter with downmixing (B-900-MOIP-4K-TX-2AC), you can configure audio latency (up to 250 milliseconds.) Audio latency can be adjusted while streaming content. All other settings must be saved before they take effect.
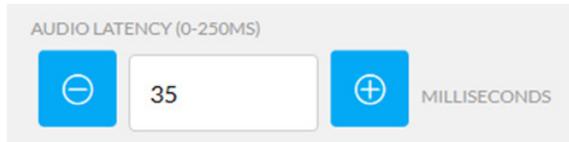
Note: Disabling power saving settings on connected sources helps maintain accessibility to the video stream.

Binary MoIP

DETAILS   CONFIGURE   SYSTEM LOG

Transmitter Details

TRANSMITTER NAME

Roku

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A91218C5B	B-900-MOIP-4K-TX	v1.0.18	Streaming

⟳ REFRESH

Video Details

VIDEO RESOLUTION	HDCP VERSION	FRAMERATE	SCAN MODE	COLOR DEPTH	PIXEL RATE	SIGNAL TYPE
[1280]X[720]	2.2	[60]	Progressive	24	74175KHz	HDMI 16:9

AUDIO EDID

Pass-Through ▼

Pass-Through
Force 2-Channel
5.1 Multi Channel

REMOVE   CANCEL   SAVE

Binary MoIP

DETAILS   CONFIGURE   SYSTEM LOG

Transmitter Details

TRANSMITTER NAME

TX-D46A91218D0E

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A91218D0E	B-900-MOIP-4K-TX-2AC	v2.0.27	No Source

⟳ REFRESH

IR RECEIVER 12V   SERIAL MODE

⬜◻   DCE DTE

Video Details

VIDEO RESOLUTION	HDCP VERSION	FRAMERATE	SCAN MODE	COLOR DEPTH	PIXEL RATE	SIGNAL TYPE

AUDIO EDID

Pass-Through ▼

Pass-Through
Force 2-Channel
5.1 Multi Channel

AUDIO LATENCY (0-250MS) ⓘ

⊖ 100 ⊕ MILLISECONDS

REMOVE   CANCEL   SAVE

21

MoIP Audio Transmitters

1. 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. There are possible limitations on the ability for devices to receive audio, such as a receiving device using HDMI with its own limitations unknown to the MoIP system. It is important to test the performance of the link to ensure that audio is passing through.

    A MoIP Audio transmitter communicating to a MoIP Audio receiver has no restrictions. Using this pairing, the transmitter should be set to 24/192. A MoIP Video RX over HDMI also supports 24/192. However, if using the analog outputs of the MoIP Video RX to distribute audio, you must set the MoIP Audio transmitter to a maximum Sampling Frequency of 96 kHz.

2. The **Maximum Input Level** is adjustable on the MoIP Audio transmitter 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, then setting the Maximum Input Level on the MoIP Audio transmitter to 1 Vrms provides the best system performance. If the source device is capable of outputting more than 1 Volt RMS, then the Maximum Input Level of the MoIP Audio transmitter must be set to 2 Vrms, or clipping may occur. The default setting is 2 Vrms.

3. **Audio Latency** – MoIP Audio transmitters provide up to 250 milliseconds of audio delay adjustment. If the audio signal from the source needs to be delayed at every location, make the adjustment on the transmitter. The MoIP Audio receiver also contains delay capabilities to adjust the delay for a specific zone. The default value is 0.

Binary MoIP

UPDATE   REBOOT

DETAILS   CONFIGURE   SYSTEM LOG

Transmitter Details

TRANSMITTER NAME

TX Audio 1

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A9121BC14	B-900-MOIP-A-TX	0.2.5	Streaming

AUDIO RESOLUTION | SAMPLE FREQUENCY | MAXIMUM INPUT LEVEL ⓘ

24-bit | 48 kHz | 2 Vrms

AUDIO LATENCY (0-250MS)

⊖ 5 ⊕ MILLISECONDS

REMOVE   CANCEL   SAVE

13. Configure the MoIP Receivers

MoIP Video Receivers

1. For displays that only support 1080p and/or HDCP 1.4, set the corresponding receiver to match this requirement to allow video to pass. 4K video input into transmitters does not show on 1080p and/or HDCP 1.4 displays.

2. Set each receiver to **Passthrough** for the displays that support 4K HDR to allow the HDR metadata to pass, resulting in 4K HDR 30Hz.

3. Set each receiver to 2160p 30Hz to displays that are 4K, but don't support HDR.

4. If desired, choose drop down for **Rotation** between 90, 180, or 270 degrees. 180 degrees is the most common for the top row of video walls where TVs are hung upside down, so bezel logos are right-side up.

5. When using a receiver with a downmixing feature (B-900-MOIP-4K-RX-2AC), you can configure downmixing mode (Auto, 2CH, or Bypass) and audio latency (up to 250 milliseconds).

Note:

- The video output resolution can be set to 2160p (4K) at 30Hz or 25Hz or 1080p (2K) at 60Hz or 50Hz.

- When the MoIP RX is set to 2160p 30Hz, instead of Pass-Through, the receiver always outputs 4K 30Hz 4:4:4 8 bit color and 4K HDR is limited to 8-bit color only. However, the display shows content as 4K HDR and output higher brightness and contrast.

Binary MoIP

DETAILS   CONFIGURE   SYSTEM LOG

Receiver Details

RECEIVER NAME

Living

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A91210ACA	B-900-MOIP-4K-RX	v1.0.11	Streaming

MAX VIDEO RESOLUTION

Pass-Through
Full HD 1080p60
Full HD 1080p50
Ultra HD 2160p30
Ultra HD 2160p25

HDCP

Pass-Through
2.2
1.4

ROTATION

No Rotation
180 Degrees
90 Degrees
270 Degrees

Video Details

VIDEO RESOLUTION	HDCP VERSION	FRAMERATE	SCAN MODE	COLOR DEPTH	PIXEL RATE	SIGNAL TYPE
[1920]X[1080]	N/A	[60]	Progressive	24	148351KHz	HDMI 16:9

REMOVE   CANCEL   SAVE

Binary MoIP

DETAILS   CONFIGURE   SYSTEM LOG

Receiver Details

RECEIVER NAME

Outside v2

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A91218D5C	B-900-MOIP-4K-RX-2AC	v2.0.27	Streaming

MAX VIDEO RESOLUTION

Pass-Through ▼

Pass-Through
Full HD 1080p60
Full HD 1080p50
Ultra HD 2160p30
Ultra HD 2160p25

HDCP ⓘ

Pass-Through ▼

Pass-Through
2.2
1.4

ROTATION

No Rotation ▼

No Rotation
180 Degrees
90 Degrees
270 Degrees

...ODE   DTE   T...   EOUT (0-60 SECONDS)   ONE   15   X

Video Details

VIDEO RESOLUTION	HDCP VERSION	FRAMERATE	SCAN MODE	COLOR DEPTH	PIXEL RATE	SIGNAL TYPE
[1280]X[720]	1.x	[60]	Progressive	24	74175KHz	HDMI 16:9

HDMI AUDIO

AUTO   2CH   BYPASS

AUDIO LATENCY (0-250MS) ⓘ

⊖   112   ⊕   MILLISECONDS

REMOVE   CANCEL   SAVE

MoIP Audio Receivers

1. The **Maximum Output Level** of the MoIP Audio receiver is adjustable to either 1 Volt or 2 Volts RMS. The proper setting is dependent on the amplifier or switcher/preamplifier that the receiver is connected to and the maximum voltage level that the line level input is capable of. Default value is 2 Vrms.

2. The **Output Volume** of the MoIP Audio receiver is adjustable for use with an amplifier without an adjustable volume level. For use with an audio system with its own volume control, it is recommended to leave this setting at the default value, 100%.

3. **Audio Latency** – The MoIP Audio receiver provides for up to 250 milliseconds of audio delay adjustment. If the audio signal from the source needs to be delayed in a specific location, it is best to make the adjustment here, on the receiver. The MoIP Audio transmitter also contains delay capabilities to adjust the delay for a specific source globally. The default value is 0.

Binary MoIP

UPDATE   REBOOT

DETAILS   CONFIGURE   SYSTEM LOG

Receiver Details

RECEIVER NAME
Audio Receiver 2

General Information

MAC ADDRESS	MODEL	FIRMWARE VERSION	STATUS
D46A9121BC0B	B-900-MOIP-A-RX	0.2.7	Streaming

Audio Details

AUDIO RESOLUTION	SAMPLE FREQUENCY
24-Bit	48 kHz

MAXIMUM OUTPUT LEVEL ⓘ
2 Vrms

OUTPUT VOLUME
100%

AUDIO LATENCY (0-250MS)
⊖ 7 ⊕ MILLISECONDS

REMOVE   CANCEL   SAVE

Create a Video Wall

A video wall can be created with receivers currently discovered by the MoIP controller. After creating the wall, it's added to the **Receiver** list alongside the existing receivers. 4x4, 3x3 and 2x2 video walls can be created out of 16, 9 and 4 receivers. Each receiver can only be a member of a single video wall group.

Binary MoIP

UPDATE   REBOOT

DETAILS   CONFIGURE   SYSTEM LOG

Video Wall Settings

Video Wall Details

Video Wall Name

ex. LivingRoom VideoWall

Display Type

2x2   3x3   4x4

Receiver Screen Placement

Position	Receiver
P1	Select Receiver ▼
P2	Select Receiver ▼
P3	Select Receiver ▼
P4	Select Receiver ▼

P1 P2
P3 P4

Bezel Adjustments

Enable

OUTER WIDTH

OUTER HEIGHT   SCREEN HEIGHT

BEZEL CORRECTION GUIDE
(IN MILLIMETERS)

SCREEN WIDTH

TV Outer Dimensions

0   0

WIDTH (mm)   HEIGHT (mm)

TV Screen Dimensions

0   0

WIDTH (mm)   HEIGHT (mm)

DELETE   CANCEL   SAVE

To create a video wall:

1. Name the video wall (required)
2. Select the video wall size (2x2, 3x3, 4x4) by clicking the matching size
3. Based on your installation, assign a given receiver to each position "PX" of the video wall.
4. Measure the display screen dimensions as indicated to adjust out the video that falls behind each TV bezel
5. Click **Enable** to adjust the bezel
6. Enter the dimensions
7. Click **Save**

The updated video wall receivers are now available and can integrate with a control system as another output like all other receivers. Additional control system steps may be required to properly switch control for a video wall.

Set up Control System

Integrating MoIP with your chosen control system is very similar to the steps to integrate a matrix switcher. The Binary team has developed custom drivers and worked with control system manufacturers to certify.

The following control system drivers, models and documentation are available:

Control4   CRESTRON   ELAN   URC Control the Experience.

Please refer to individual driver support documents for specific features and capabilities.

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

- Basic switching control: An IP control system is required to control the system 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 end points directly to the devices to be controlled. RS-232 commands sent over IP and are generated at each end point. To integrate, 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 establish on the **IR Links Settings** page on the MoIP controller local user interface (UI). These routes create virtual wires simplifying the integration process. To integrate these static 2-way IR routes with the control system, link control system 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 via the control system driver and supports Stand-by and Power On commands. Details of this are provided in specific driver documentation. CEC compatibility varies between display manufacturers and should be tested for each install to ensure maximum reliability. Other control options may be required for your specific application.

- Audio De-embedding: The L/R stereo audio outputs on the transmitter and receiver, when stereo content is present, extracts this audio for convenient input into multi-room audio distribution systems. No control system integration is necessary.

End User App

- Visit Configure -> Client Control App Settings via the controller UI to enable client control outside of a control system. Thi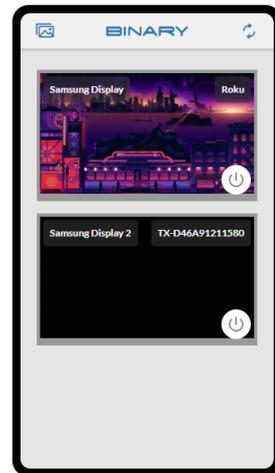s allows clients to easily change input sources for each video display from their tablet or mobile device. Configure scenes to create common display templates (i.e. Fight Night, etc.) across a location.

- A DHCP reservation or static IP address is recommended when using this feature.

- Simply visit http://<system static IP>/control on the client device and choose "Save to Home Screen" after visiting the URL. This makes the page behave like a native mobile application on iOS and Android.

- Select a Display and available transmitter content appears to scroll through, on the bottom of the screen.

- Choose the picture icon in the top left to name a scene.

- Chose the refresh icon on the top right to refresh available displays, sources, and screen shot content on each.

Two (2) Year Limited Warranty

Find details of this product's 2-Year Limited Warranty at snapav.com/warranty, or request a paper copy from Customer Service at (866) 424-4489. Find other legal resources, such as regulatory notices and patent information, at **snapav.com/legal**.

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