

MEDIA OVER IP SYSTEM
B-900-MOIP-4K-CTRL
B-900-MOIP-4K-TX
B-900-MOIP-4K-RX

BINARY

NETWORKING GUIDE



INTRODUCTION

This guide 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. Also, you will find the simple 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. SnapAV does not recommend a particular switch as an alternative to Araknis. In setups where MoIP transmitters and MoIP 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.

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 will vary 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
- IGMP Snooping Fast Leave
 - Also known as Instant Leave or Immediate Leave
- 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

Note: It is highly recommended that the above features be **applied to all network switches** on the same LAN as MoIP as a best practice. This is not required; however, highly recommended.

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. 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:

1. Number of sources (MoIP Transmitters)
2. Number of displays (MoIP Receivers)
3. MoIP Controller
4. LAN connection to main network for OvrC (if applicable)

Power

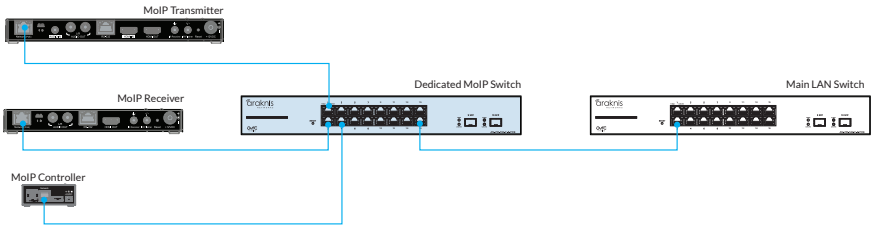
The MoIP Transmitters and MoIP Receivers can be powered by **Power-over-Ethernet (PoE)** or a separate **12V power supply (not included)**. The separate power supply is available only as a replacement part only. TX and RX will each utilize no more than 7.5 watt of power. Snap AV recommends using PoE to power the MoIP TX and RX units. The MoIP Controller is NOT powered by PoE and requires the use of the included 12V power supply.

MoIP System Network Setups

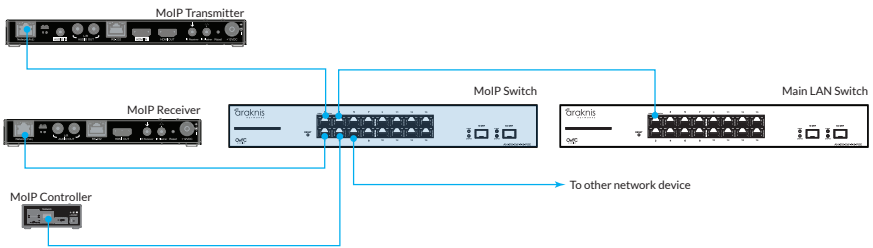
Single switch MoIP network configurations are supported by Araknis 210 PoE and 310 PoE Series switches. Integrators familiar with the above requirements and the configuration of stackable and cascaded switches with multi-gigabit uplinks will be able to create very large MoIP deployments.

Single Switch

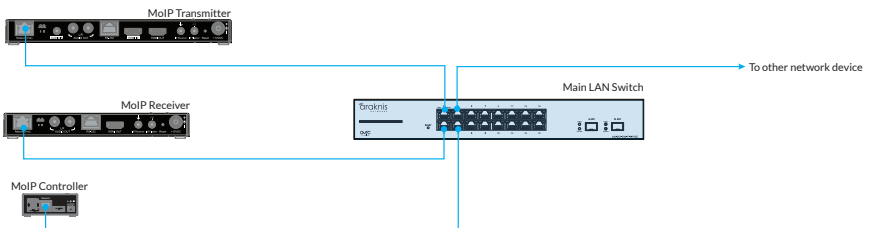
Dedicated MoIP Switch (RECOMMENDED)



Shared MoIP Switch



MoIP on Main LAN Switch



Multiple Switches

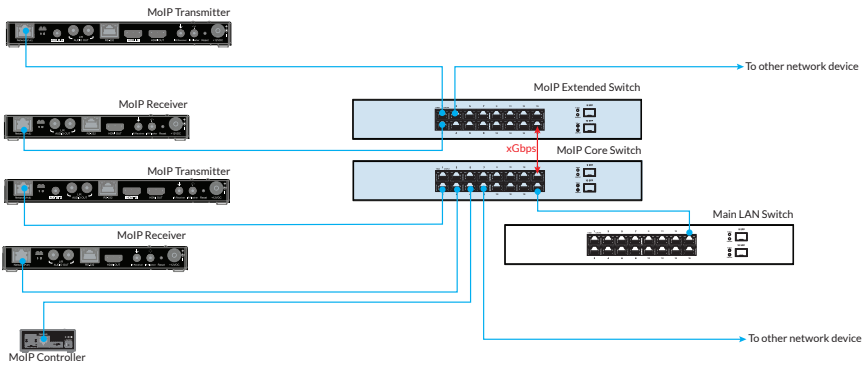
Please refer to your network switch manufacturers' documentation to enable the critical features for optimal performance in multiple switch MoIP network configurations.

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 will be the link between switches. MoIP Receivers

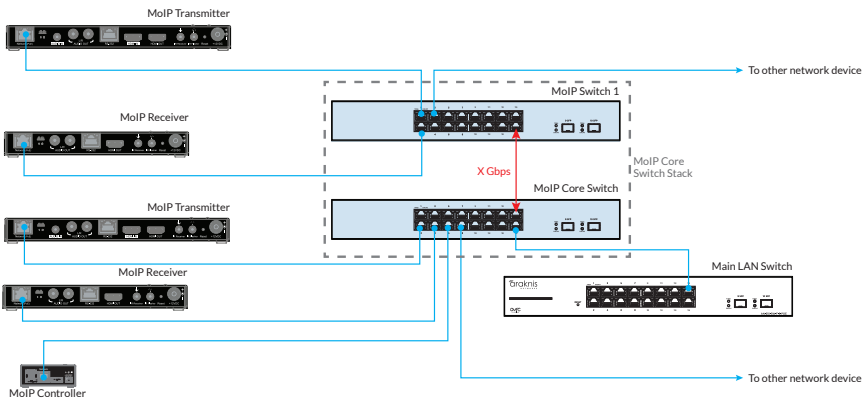
have no impact on available bandwidth. The bandwidth requirements of other devices on the network should also be considered.

Each MoIP Transmitter will consume 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 will give 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



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 will reboot the switch and reset 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 which are araknis / araknis. The Default IP address is 192.168.20.254.

2. Enable IGMP Snooping

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

1. Status: **Enabled**
2. Version: **V2**
3. Report Suppression: **Enabled**
4. Unregistered IPMC Forward Action: **Drop**
5. IGMP Snooping Status: **Enabled**
6. Fast Leave: **Enabled**
7. Querier State: **Enabled**
8. Querier Version: **V2**
9. Router Settings > Router Ports Auto-Learned: **Enabled**

Click **Apply** to save these settings

The screenshot shows the Araknis web interface for IGMP Snooping configuration. The top status bar indicates 'CLOUD SERVICE: Connected', 'System Time: 2018-05-25 08:58:09', and 'System Uptime: 2d 11:39:10'. The sidebar menu on the left is expanded to 'ADVANCED' > 'MULTICAST' > 'IGMP SNOOPING'. The main configuration area is titled 'IGMP SNOOPING' and contains the following sections:

- Settings:** Status is **Enabled**, Version is **V2**, Report Suppression is **Enabled**, and Unregistered IPMC Forward Action is **Drop**.
- VLAN Settings:** A table with columns for 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, and Oper Last Member Query Interval. The first row shows VLAN 1 with Querier State **Enabled**, Querier Version **v2**, Querier Status **Non-Querier**, Querier IP **192.168.0.204**, Robustness **2**, Interval **125**, Oper Interval **125**, Max Response Interval **10**, Oper Max Response Interval **10**, Last Member Query Counter **2**, Oper Last Member Query Counter **2**, Last Member Query Interval **1**, and Oper Last Member Query Interval **1**.
- Router Settings:** A table with columns for VLAN ID, Router Ports Auto-Learned, Dynamic Port List, Static Port List, and Forbidden Port List. The first row shows VLAN 1 with Router Ports Auto-Learned **Enabled** and Dynamic Port List **4**.
- URC Settings:** A table with columns for URC State and Member Ports. The first row shows URC State **Disabled** and Member Ports **1**.

The 'Apply' button is visible at the bottom right of the configuration area.

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.

ADDITIONAL SUPPORT INFORMATION

- Each transmitter and receiver can be connected to the MoIP switch with up to 328ft / 100m of category cable.
- CAT5e cabling is sufficient to support the MoIP system; however, with all networking installs utilizing shielded CAT5e, CAT6, CAT6A or CAT7 is recommended to minimize potential for interference from environmental factors.
- Each category cable should be terminated to the T-568B specification. TIA/EIA Standard 568-B (Gold Pins Facing Up)

TIA/EIA Standard 568-B (Gold Pins Facing Up)

Pin 1	White/Orange	Pin 5	White/Blue
Pin 2	Orange	Pin 6	Green
Pin 3	White/Green	Pin 7	White/Brown
Pin 4	Blue	Pin 8	Brown



Two (2) Year Limited Warranty

This Binary product has a Two-Year Limited Warranty. This warranty includes parts and labor repairs on all components found to be defective in material or workmanship under normal conditions of use. This warranty shall not apply to products that have been abused, modified or disassembled. Products to be repaired under this warranty must be returned to a designated service center with an assigned return authorization number (RA). Contact technical support for an RA number.

SUPPORT

Need Help? Contact Tech Support!

If you need further clarification, please call tech support at **866.838.5052**, or email **support@snapav.com**. For other information, instructional videos, support documentation, or ideas, visit our website and view your item's product page at **www.snapav.com**.

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