

Algo & Multicast Paging

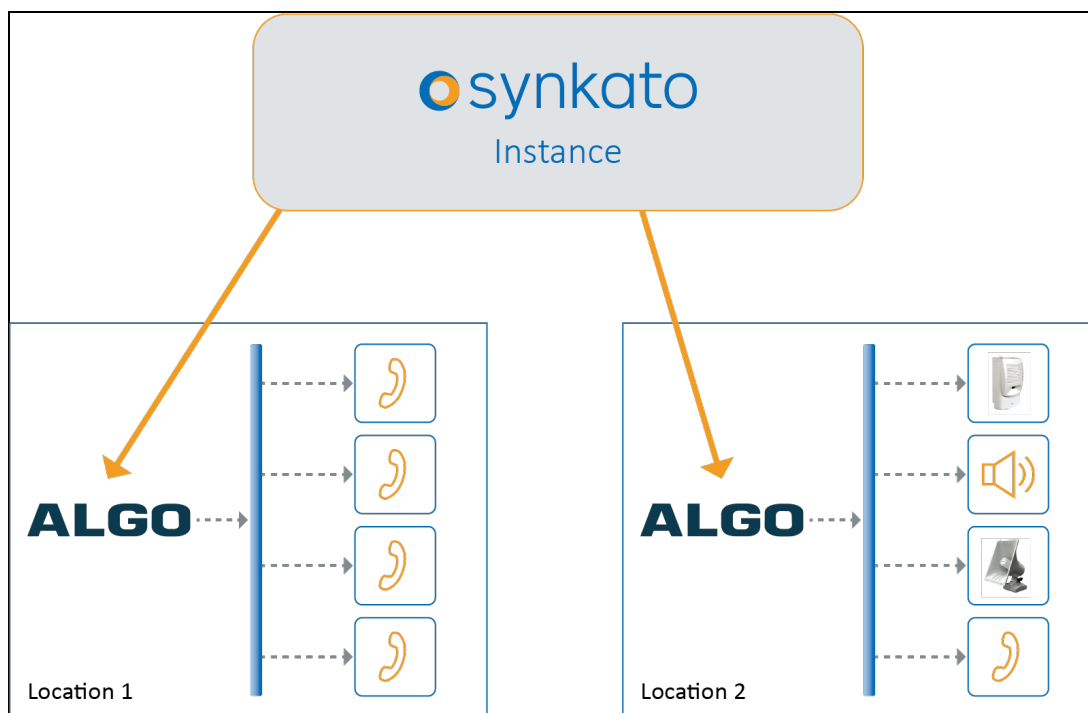
Last Modified on 12/31/2020 10:57 am EST

What is Multicast?

Multicast facilitates bandwidth savings while paging a larger number of stations at one location. Multicast works with the [Algo 8301 Relay Device](#) to accomplish paging en masse via one datastream. Recipients can subscribe to multicast streams as desired.

For example, 30 endpoints in an office location each require a page. The bandwidth to connect with all 30 endpoints at once is taxing on the system (90Kbps x 30 = 2.7Mbps). A multicast configuration reduces bandwidth expenditure and also connects to all endpoints at the exact same time. Audio may experience a slight difference in delivery timing to the endpoint, but each endpoint receives the audio at the exact same time.

Multicast Overview



Multicast configuration as shown above:

- 90Kbps total
- 1 stream input per location
- Total of 90Kbps WAN & 160 Kbps LAN utilized per page, regardless of paged devices
- G722 is used for audio

Requirements

Provided below are the basic requirements for deploying a multicast solution for Synkato.

Synkato Instance

- One or more generic User License
- One or more Generic Extension(s)

End User Devices

Devices must be supported by Synkato:

- Yealink T4x with firmware 82.0.0 or higher
- Yealink T2x with firmware 44.83.0 or higher
- Polycom VVX 3xx, 4xx, 5xx, 6xx with firmware 5.4.0 or higher

Relay Device

- Algo 8301 with firmware 1.7 or higher.

Relay Parameters

Define one relay to support up to 10 virtual paging zones per location. A location is a distinct IP layer 3 segment with a distinct 224.x.x.x subnet. Advanced networks may implement multicast routing schemes, although little bandwidth advantages are provided.

At least one generic extension license per paging zone per location must be available.

Example:

Zone: All Stations All Locations = 2 licenses

Zone: Location 1 = 1 license

Zone: Location 2 = 1 license

Zone: Horn @ Location 2 + Stations @ Location 1 = 2 licenses

6 licenses total for 6 generic extensions.

Algo Audio Devices

The following Algo products are optional for receiving paging audio:

- 8180 Wall Speaker
- 8186 Horn

Configure Synkato for Multicast

Create Generic Extension(s)

Create at [least one generic extension in](#) Synkato to serve as the point where the relay device registers to Synkato. Each Location and Paging Zone require one generic extension.

Virtual Paging Zones

[Build one or more Virtual Paging Zones in](#) Synkato. These zones may include one or many endpoints including Multicast Relays. Add a multicast relay device to a Virtual Paging Zone to add the devices subscribed to the

multicast stream at that location.

Note: Do not include devices individually that are subscribed to a multicast stream associated to a Real Paging Zone (defined within a specific device), as this causes the endpoint to receive both the direct stream and the multicast stream needlessly and may not operate as intended. Generally, this is a good way to group Real Paging Zones across multiple locations.

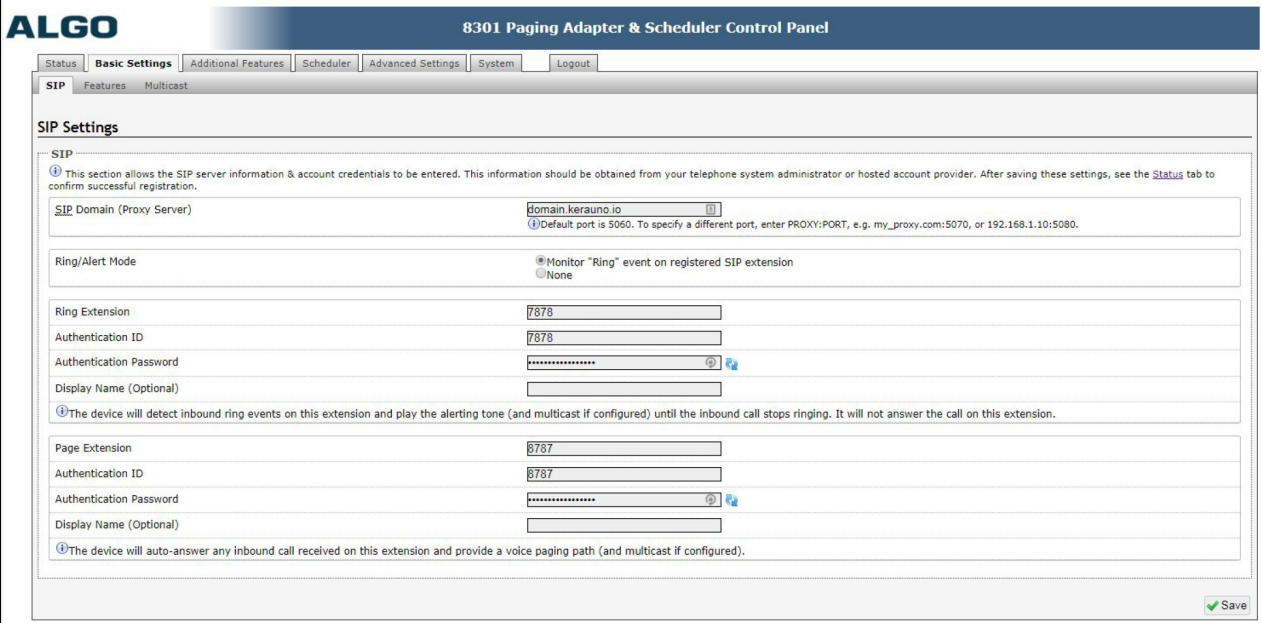
Device Configuration

Algo 8301 Relay

This device acts as the Master Relay for a location. Each location is similar in configuration with the registered extensions associated to the various Zones being the significant difference.

Each location is pointed to the same Synkato instance and has a default page extension with an optional ring extension for all locations. The authentication information has been retrieved from Synkato in the generic extension.

Basic SIP Settings:



The screenshot shows the '8301 Paging Adapter & Scheduler Control Panel' with the 'SIP Settings' tab selected. The interface includes a navigation bar with tabs for 'Status', 'Basic Settings', 'Additional Features', 'Scheduler', 'Advanced Settings', 'System', and 'Logout'. Below the navigation bar, there are sub-tabs for 'SIP', 'Features', and 'Multicast'. The 'SIP Settings' section contains the following fields and options:

- SIP Domain (Proxy Server):** domain.kerauno.io (Default port is 5060. To specify a different port, enter PROXY:PORT, e.g. my_proxy.com:5070, or 192.168.1.10:5080.)
- Ring/Alert Mode:** Monitor "Ring" event on registered SIP extension, None
- Ring Extension:** 7878
- Authentication ID:** 7878
- Authentication Password:** [Redacted]
- Display Name (Optional):** [Empty]
- Page Extension:** 8787
- Authentication ID:** 8787
- Authentication Password:** [Redacted]
- Display Name (Optional):** [Empty]

There are two informational notes: one for the Ring Extension stating that the device will detect inbound ring events and play an alerting tone until the call stops ringing, and another for the Page Extension stating that the device will auto-answer any inbound call and provide a voice paging path.

A 'Save' button is located at the bottom right of the settings area.

When the relay is behind a network firewall or NAT, additional information may be required. Set the STUN Server and outbound proxy domain and disable TLS and SDP SRTP Offer.

Advanced SIP Settings:

ALGO 8301 Paging Adapter & Scheduler Control Panel

Status Basic Settings Additional Features Scheduler **Advanced Settings** System Logout

Network Admin Users Time Provisioning File Manager Advanced Audio **Advanced SIP** Advanced Multicast

Advanced SIP Settings

General

SIP Transportation

 ① Select Auto to check DNS NAPTR record, then try UDP/TCP.
 ② In TLS mode, if the SIP Server requires endpoints to be authenticated, a PEM file containing both a device certificate and a private key needs to be installed on the Algo device. Use the "Advanced Settings > File Manager" tab to upload a certificate file renamed to 'sipclient.pem' in the 'certs' folder.
 ③ To force the Algo device to authenticate the SIP server, a certificate obtained from the SIP server needs to be installed. Use the "Advanced Settings > File Manager" tab to upload a certificate file renamed to 'siptrusted.pem' in the 'certs' folder.

SDP SRTP Offer

SIP Outbound Support (RFC 5626) Enabled Disabled
 ① Enable this option to support best networking practices according to RFC 5626. This option should generally be enabled if the Algo device is being registered with a hosted server or if TLS is being used for SIP Transportation.

Outbound Proxy

Register Period (seconds)

NAT

Media NAT None ICE STUN

STUN Server

Server Redundancy

Server Redundancy Feature (Multiple SIP Server Support) Enabled Disabled

Interoperability

Keep-Alive Method None Double CRLF
 ① This setting will enable sending periodic CRLF messages for both UDP and TCP connections.

Use Outgoing TLS port in SIP headers Enabled Disabled
 ① Use ephemeral port number from outgoing SIP TLS connection instead of listening port number in SIP Contact and Via headers. This is useful to connect the device to some local SIP servers, like Asterisk or FreeSWITCH.

Do Not Reuse Authorization Headers Enabled Disabled
 ① When enabled, all SIP authorization information from the last successful request will not be reused in the next request.

Save

Set Algo as the master device. Enable the relay to send multicast using both Regular RTP and Polycom Proprietary protocols. Enable Basic and expanded Zones to allow for multiple zones and extension mapping. Use a Single Group for Polycom since Extensions will be mapped to zones. Set the default zone for both Polycom and Regular to Zone/Group 1.

Basic Multicast Settings:

ALGO 8301 Paging Adapter & Scheduler Control Panel

Status **Basic Settings** Additional Features Scheduler Advanced Settings System Logout

SIP Features **Multicast**

Multicast Settings

Multicast Mode

Multicast Mode None Master/Sender Slave/Receiver
 ① Multicast Zone Definitions can be found in "Advanced Settings > Advanced Multicast".

Multicast Type Regular (RTP)
 Polycom Group Page
 Polycom Push-to-Talk
 Regular RTP + Polycom Group Page
 Regular RTP + Polycom Push-to-Talk
 ① Regular mode uses RTP audio packets compatible with all Algo SIP endpoints, and most multicast-enabled phones.
 ② Both "RTP + Polycom" multicast types will enable local speaker playback for all groups and zones.

Number of Zones Basic Zones Only Basic and Expanded Zones

Polycom Group Paging/Push-to-Talk

Polycom Zone
① Enter the same Multicast IP Address & Port number as configured on the Polycom phones.

Polycom Group Selection Mode DTMF Selectable Group Single Group

Polycom Default Channel

Master/Sender Zone Settings

Zone Selection Mode DTMF Selectable Zone Single Zone
 ① For additional capabilities allowing unique SIP extensions per zone, see "Additional Features > More Page Extensions".

Master Single Zone
① If "DTMF Selectable Zone" is selected above, then this single zone setting will not apply to Paging (since the zone can now be dynamically selected per call using DTMF), but it will still apply to the Ring Extension and Relay triggered events, including the analog audio input.

Save

Next add more extensions. Each Zone that you would like to utilize for the location should have its own matching extension. Remember that a distinct location must have its own set of Generic Extensions defined in Synkato. In this example we have three more extensions in addition to the default extensions earlier.

These are related to the Generic Extensions defined in Synkato. The Zone will match the Polycom Group as well as the Zones that are mapped to Multicast IPs.

Page Extensions:

The screenshot shows the ALGO 8301 Paging Adapter & Scheduler Control Panel. The 'More Page Extensions' section is active, displaying configuration options for various paging zones. The page includes a navigation menu at the top with tabs for Status, Basic Settings, Additional Features, Scheduler, Advanced Settings, System, and Logout. Below the navigation, there are sub-tabs for Input/Output, Emergency Alerts, More Page Extensions, and More Ring Extensions. The 'More Page Extensions' section contains a descriptive paragraph and three informational notes. The main configuration area is titled 'Basic Extensions' and includes several sections: 'Priority Call Page Extension (Polycom Group 9)', 'All Call Page Extension (Polycom Group 8)', 'Zone 1 Page Extension' through 'Zone 6 Page Extension', and 'Music Page Extension (Polycom Group 7)'. Each section has fields for Extension, Authentication ID, Authentication Password, and Display Name (Optional), along with radio buttons for Enabled/Disabled. The 'Priority Call Page Extension' has an extension of 2222 and a display name of 'Priority Page'. The 'All Call Page Extension' has an extension of 1111 and a display name of 'Page All'. The 'Zone 6 Page Extension' has an extension of 8911 and a display name of 'Emergency Page'. The 'Music Page Extension' is currently disabled.

Map the Zones to the Multicast IP Addresses and Ports on the Advanced Multicast page. These are referenced later in the Yealink/Regular RTP configuration.

Verify that the Audio Output CODEC is set to G.722 and the Packetization Time is set to 20ms. These must match on the receiving devices as well; as a mismatch causes the audio to be distorted or not heard.

Advanced Multicast:

✓ Saved
Setting changes have been saved and will be applied on the next call.

Advanced Multicast Settings

④ Current multicast mode: Master
Multicast mode can be set in "Basic Settings > Multicast"

Master Settings

Master Output Codec	G.722 ▼
Master Output Packetization Time (milliseconds)	20 ▼

RTP Control Protocol (RTCP)

RTCP Port Selection

Disabled Next Higher Port Multiplexed on Same Port

④ Select the port on which packets will be sent or received.
If using the 'Next Higher Port' option, ensure that the default multicast zone definitions are modified such that zones are only assigned to even-numbered ports, leaving the next higher odd-numbered ports free for RTCP packets.

Basic Zone Definition

Zone	IP Address and Port	Page Tone
Priority Call (DTMF:9)	224.0.2.60:50000	buzzer.wav ▼
All Call (DTMF:0/8)	224.0.2.60:50001	page-notif.wav ▼
Zone 1 (DTMF:1)	224.0.2.60:50002	chime.wav ▼
Zone 2 (DTMF:2)	224.0.2.60:50003	<Use Default Page Tone> ▼
Zone 3 (DTMF:3)	224.0.2.60:50004	<Use Default Page Tone> ▼
Zone 4 (DTMF:4)	224.0.2.60:50005	<Use Default Page Tone> ▼
Zone 5 (DTMF:5)	224.0.2.60:50006	<Use Default Page Tone> ▼
Zone 6 (DTMF:6)	224.0.2.60:50007	tone-1kHz-max.wav ▼
Music (DTMF:7)	224.0.2.60:50008	<Use Default Page Tone> ▼

Configure Devices

Yealink Multicast IP:

Yealink T46S English(English) Log Out

Local Directory

Remote Phone Book

Phone Call Info

LDAP

Multicast IP

Setting

Multicast Listening

Paging Barge:

Ignore DND:

Paging Priority Active:

IP Address	Listening Address	Label	Channel	Priority
1 IP Address	<input type="text" value="224.0.2.60:50002"/>	<input type="text" value="Default Zone 1"/>	<input type="text" value="0"/>	1
2 IP Address	<input type="text" value="224.0.2.60:50003"/>	<input type="text" value="Zone 2"/>	<input type="text" value="0"/>	2
3 IP Address	<input type="text" value="224.0.2.60:50004"/>	<input type="text" value="Zone 3"/>	<input type="text" value="0"/>	3
4 IP Address	<input type="text" value="224.0.2.60:50005"/>	<input type="text" value="Zone 4"/>	<input type="text" value="0"/>	4
5 IP Address	<input type="text" value="224.0.2.60:50006"/>	<input type="text" value="Zone 5"/>	<input type="text" value="0"/>	5
6 IP Address	<input type="text" value="224.0.2.60:50007"/>	<input type="text" value="Emergency Page"/>	<input type="text" value="0"/>	6
7 IP Address	<input type="text" value="224.0.2.60:50008"/>	<input type="text" value="Music Zone"/>	<input type="text" value="0"/>	7
8 IP Address	<input type="text" value="224.0.2.60:50001"/>	<input type="text" value="All Page"/>	<input type="text" value="0"/>	8
9 IP Address	<input type="text" value="224.0.2.60:50000"/>	<input type="text" value="Priority Page"/>	<input type="text" value="0"/>	9
10 IP Address	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>	10

Paging List

Index	Paging Address	Label	Channel
1	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
2	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
3	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
4	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
5	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
6	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
7	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
8	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
9	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>
10	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>

NOTE

Multicast Paging
 Multicast paging allows IP phones to send/receive Real-time Transport Protocol (RTP) streams to/from the pre-configured multicast address(es) without involving SIP signaling. Up to 10 listening multicast addresses can be specified on the IP phone.

You can click here to get more guides.

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Polycom Group Page:

Polycom VVX 310

Home Simple Setup Preferences Settings Diagnostics Utilities

You are here: Settings > Paging/PTT Configuration

VIEWS

- Microbrowser
- Logging
- Applications
- Audio Codec Priority
- Audio Codec Profiles
- Provisioning Server
- Syslog
- Paging/PTT Configuration**
- SIP
- Lines
- Power Saving
- Change Password
- Phone Lock

Paging/PTT Configuration

Settings

Multicast IP Address: 224.0.1.116

Port: 5001

Emergency Volume (db): -10

Call Waiting: Enable Disable

Compatibility: Enable Disable

Group Paging Configuration

Group Paging: Enable Disable

Group Type	Group No.	Available	Send	Subscribe	Label
Default Group	Group 8	Yes	Yes	Yes	All Page
Priority Group	Group 9	Yes	Yes	Yes	Priority Page
Emergency Group	Group 6	Yes	Yes	Yes	Emergency Page

Accept While Busy: Enable Disable

Sender ID: _____

Payload Size (ms): 20

Codec: G.722

Added Timeout (s): 0

Continuation Timeout (s): 60

Configure Groups

PTT Mode Configuration

Polycom Page Groups:

Group No.	Available	Send	Subscribe	Label
1	Yes	Yes	Yes	Default Zone 1
2	Yes	Yes	Yes	Zone 2
3	Yes	Yes	No	Zone 3
4	Yes	Yes	No	Zone 4
5	Yes	Yes	No	Zone 5
6	Yes	Yes	Yes	Emergency Page
7	Yes	Yes	Yes	Music
8	Yes	Yes	Yes	All Page
9	Yes	Yes	Yes	Priority Page
10	Yes	Yes	No	
11	Yes	Yes	No	
12	Yes	Yes	No	

Cancel Save

Match Algo to Yealink and Polycom Devices

Map the Algo zones in both Yealink and Polycom devices as follows:

- Algo Zone 1 =**
- Yealink 1 IP Address
 - Polycom Default Zone 1

Advanced Multicast Settings

Current multicast mode: Master
Multicast mode can be set in "Basic Settings > Multicast"

Master Settings

Master Output Codec: G.722

Master Output Packetization Time (milliseconds): 20

RTP Control Protocol (RTCP)

RTCP Port Selection: Disabled

Basic Zone Definition

Zone	IP Address and Port	Page Tone
Priority Call (DTMF:9)	224.0.2.60:50000	buzzer.wav
All Call (DTMF:0/8)	224.0.2.60:50001	page-notif.wav
Zone 1 (DTMF:1)	224.0.2.60:50002	chime.wav
Zone 2 (DTMF:2)	224.0.2.60:50003	<<Use Default Page Tone>
Zone 3 (DTMF:3)	224.0.2.60:50004	<<Use Default Page Tone>
Zone 4 (DTMF:4)	224.0.2.60:50005	<<Use Default Page Tone>
Zone 5 (DTMF:5)	224.0.2.60:50006	<<Use Default Page Tone>
Zone 6 (DTMF:6)	224.0.2.60:50007	tone-1kHz-max.wav
Music (DTMF:7)	224.0.2.60:50008	<<Use Default Page Tone>

Yealink 1465

Status Account Network **Deskey** Features Settings

Local Directory

Remote Phone Book

Phone Call Info

LDAP

Multicast IP

Setting

Multicast Listening

Paging Barge: 6

Ignore DND: Disabled

Paging Priority Active: Enabled

IP Address	Listening Address	Label	Channel	Priority
1 IP Address	224.0.2.60:50002	Default Zone 1	0	1
2 IP Address	224.0.2.60:50003	Zone 2	0	2
3 IP Address	224.0.2.60:50004	Zone 3	0	3
4 IP Address	224.0.2.60:50005	Zone 4	0	4
5 IP Address	224.0.2.60:50006	Zone 5	0	5
6 IP Address	224.0.2.60:50007	Emergency Page	0	6
7 IP Address	224.0.2.60:50008	Music Zone	0	7
8 IP Address	224.0.2.60:50001	All Page	0	8
9 IP Address	224.0.2.60:50000	Priority Page	0	9
10 IP Address			0	10

Groups Configuration

Group No.	Available	Send	Subscribe	Label
1	Yes	Yes	Yes	Default Zone 1
2	Yes	Yes	Yes	Zone 2
3	Yes	Yes	No	Zone 3
4	Yes	Yes	No	Zone 4
5	Yes	Yes	No	Zone 5
6	Yes	Yes	Yes	Emergency Page
7	Yes	Yes	Yes	Music
8	Yes	Yes	Yes	All Page
9	Yes	Yes	Yes	Priority Page

Test the Multicast & Algo Solution

Once generic extensions are defined and changes are applied in Synkato, Algo may register to Synkato. This will show on the Algo Status page. In Synkato in the **Users & Devices** section, the generic extensions created for Algo reflect as **Registered**.

In order to verify the basic operation of any single zone the generic extension associated to the location and zone may be dialed. It is useful to have a couple of endpoints in different zones within hearing distance. When dialing a generic extension/zone, an initial tone should be heard and then whatever is said after that. The initial tone should be heard on all endpoints simultaneously and the audio should be distortion free. If using a speakerphone to initiate the page and the destination endpoints are within hearing distance, you may hear a normal amount of audio feedback.

When testing multiple Algo relays configured for different locations on the same network, the same Multicast IPs are being used and therefore may not test properly. As a work around, create a temporary VLAN or use a test Ethernet switch and place each Algo relay on its own VLAN/Switch.

If you do not hear audio from the endpoints, verify endpoint configuration using the same Groups, Multicast IPs, and Ports. Also verify that the correct CODEC is being used.

If additional assistance is required, please contact Synkato.