Algo IP System Overview & Use Cases: Voice Paging / Public Address (PA), Bell Scheduling, Emergency Alerting & Entrance Security Intercom in K-12 & Higher Education

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Introduction

K12 schools, colleges and universities require open standard network-based technology for building and campus communications to integrate with hosted / cloud or premise-based VoIP telephone systems. Leveraging the UC environment allows maximum flexibility for any telephone or device to efficiently initiate day-to-day public address announcements. In addition, managing bell scheduling, providing notification for emergency alerting and supporting visitor communication at secure entrance doors, gates and other access points, are other common application requirements.

Algo IP endpoints are 3rd party SIP compliant. These devices eliminate the limitations of an ATA or FXS port, and provide convenient web-based network management and supervision. All the endpoints are multicast scalable,

and can be deployed to cover any size building or campus. Common central provisioning protocols are supported, as well as secure SIP using TLS and SRTP.

The Algo product portfolio includes a variety of Wideband HD Voice talkback speakers (wall / ceiling / horn), paging adapters, strobe lights and push buttons. These endpoints support applications for voice paging and emergency alerting, as well as bell scheduling for automating tones and announcements. Algo doorphone / intercoms are audio and video capable for visitor communication and secure entry using any telephone or device.

Algo products meet the National Electrical Manufacturers Association (NEMA) standard, ANSI/NEMA SB 40-2015 *Communications Systems for Life Safety in Schools*. This standard covers the application, installation, location, performance, and maintenance of school emergency communications systems and their components.

Algo products are also UL/CSA, FCC and CE certified.

Algo IP Endpoint Portfolio

IP Speakers & Strobes – voice paging, emergency alerting & loud ringing

- Classroom

  8190 SIP Speaker-Clock

  8190S SIP Speaker-Clock with Visual Alerter

8190/8190S

- Classroom, kitchen, staff room:

  8180 SIP Audio Alerter

- Classroom, hallway, cafeteria, library, office, common area:

  8188 SIP Ceiling Speaker

  8189 SIP Surface Mount Speaker
  (music capable speakers)

8188   *8189*

- Gymnasium, workshop, playground:

  8186 SIP Horn Speaker
  (outdoor rated)

- Visual alerting for emergency notification and telephone ringing:

  8128 SIP Strobe Light (clear)
  (amber, blue and red lens covers are available)

  8138 SIP Multi-Color Strobe Light
  (amber, blue, red, green)

IP Paging Adapters & Bell Scheduler – integrate legacy analog amplifier, bells & music

- Bridge to a single analog amplifier with single zone:

  8301 Paging Adapter
  (Bell Scheduler and 3.5mm music input)

- Bridge to a single analog amplifier with multiple zones:

  8373 Zone Paging Adapter
  (3 zone)

IP Doorphones / Intercoms – entrance doors, gates & access points

- Audio only with door control relay:

    8028 SIP Doorphone

    8201 SIP PoE Intercom*

- Audio – video with door control relay:

    8036 SIP Multimedia Intercom*

    8039 SIP Video Intercom*

8036   *8039*

*Note: 8061 IP Relay Controller available for door control on 8201, 8036 & 8039 models

Algo IP Endpoint Monitoring & Supervision

8300 Controller

Benefits of an Algo IP System Solution

Features	Benefits
Web Configuration & Central Provisioning	ROI: 1. Less time to deploy, provision and troubleshoot reduces IT staff resources and outside contractor labor costs. 2. Where legacy analog paging systems can be time-consuming and costly to re-configure page zones, web-based management of IP devices means no re-wiring of speakers to meet the regular changes that can occur in schools. **Note:** Supported protocols include: auto-provisioning (i.e., TFTP, FTP, HTTP, HTTPS), TLS & SRTP (secure SIP signalling and media), SIP over TCP, DNS SRV Record, and CDP/LLDP automatic VLAN assignment.
Network Supervision	Algo 8300 Controller or SNMP support to monitor endpoint registration and minimize fault conditions.
G.722 Wideband Support	Higher intelligibility and greater clarity of voice page announcements. Algo IP speakers meet STI-PA requirements of NEMA SB40 and other regulations for speech intelligibility.
Ambient Noise Monitoring	Automatic volume control using built-in speaker microphone measures background noise to better address areas in a school such as hallways and cafeteria where ambient noise levels can vary greatly throughout the day. This ensures better reliability of the speaker to delivery page and emergency announcements at appropriate volume levels.
Multiple Extension Registration Options	Multiple Page, Emergency Alert and Ring extensions are available to register in Algo IP speakers, IP strobe lights and 8301 paging adapter, allowing for multi-functional use of the endpoints for voice paging, loud or visual ringing and emergency/safety/security notification and alerting.
Multicast & Page Zones	1. Using the IP network, simultaneously broadcast to any number of Algo audible / visual endpoints and supported IP telephones. 2. No limit to scale of solution over LAN/WAN to cover any size room, building or campus. 3. Minimized SIP licensing to generally only one endpoint, which is configured to Send a multicast. No registration is required for any devices configured to Receive a multicast. 4. No paging server or PC-based software required. Multicast capability within the Algo endpoint. Simplified hardware requirements and BOM. 5. Multicast support for a choice of protocols including RTP, Polycom Group Page, InformaCast and SA-Announce, allowing for simultaneous broadcast to Algo speakers, paging adapters, strobe lights and supported IP telephones. 6. Simple web configuration to group any number of endpoints (speakers, strobes, paging adapters and supported IP telephones) into page zones. 7. Small to large page zones easily accommodated, allowing for paging to specific speakers (e.g. classroom), if desired.
Talkback Speakers	Built-in speaker microphone supports talkback during a voice page call, e.g. classroom. Note: Talkback not available on a multicast Receiver speaker.
Firmware Upgrade	Easily upgrade an Algo endpoint via the network. A minimal touch appliance which saves time to manage and reduces system operating costs.
Consolidated Single Source Solution	Speakers, paging adapters, strobe lights, push buttons, clocks and doorphone/intercoms can be deployed in any number as part of one UC integrated system.
Flexible Deployment	The endpoints are capable of being deployed individually without extra hardware, allowing for maximum flexibility to stage production of devices over time to meet budgetary requirements.
Improved Workflows, Efficiencies & Safety/Security	Any combination of endpoints can meet day-to-day public address announcements, notification and emergency communication of safety and security alerts, and visitor communication at entrance doors, gates and access points.
PoE	Convenience of integrated power via network switch (48V, IEEE 802.3af, Class 0). No separate amplifier required for IP speakers.
Network Wiring	One wiring infrastructure (CAT5/6) for easier system management.
SIP & Regulatory Compliance	Open standard protocol. 3rd party SIP compliant endpoints are supported on most VoIP platforms (cloud / hosted or premise-based). Algo products are UL/CSA, FCC and CE certified.

Algo Use Cases

The 8301 Paging Adapter and Scheduler is generally used as the multicast Sender in most deployments. It is best practice to secure the endpoint as the multicast Sender in a closet away from traffic areas.

SIP registration options referenced in the Use Cases refer to the following extension types. Multiples of each extension are generally available:

Page – an auto-answer extension for making a voice announcement / public address (PA). (50 extensions)

Emergency Alert – an extension which plays a WAV file when called for safety / security / emergency alerting. The WAV file is a custom pre-recorded announcement / tone uploaded to device memory (1GB). The WAV file will play for a duration configured or the file can play in a continuous loop. For continuous loop, a Call to Cancel extension is registered on the endpoint. Only one cancelling extension is required for any of the Emergency Alert extensions registered. (10 extensions)

Ring – an extension which plays a WAV file ring tone when called. This extension is used for telephone ring alerting (e.g., loud ringing / night bell, visual ring alert). Default ring tones are available in device memory or customer may upload custom files. The WAV file will only play for the duration of the ring event. The Algo endpoint is generally paired with a telephone using a ring group. When the telephone is answered the Algo device will stop activating. (10 extensions)

Use Case #1A - Legacy Analog: Voice Paging & Emergency Alerting (SIP Registration)

* SIP registration options for Page (50), Emergency Alert (10) and Ring (10) extensions. 1GB memory to store pre-recorded announcements / tones.
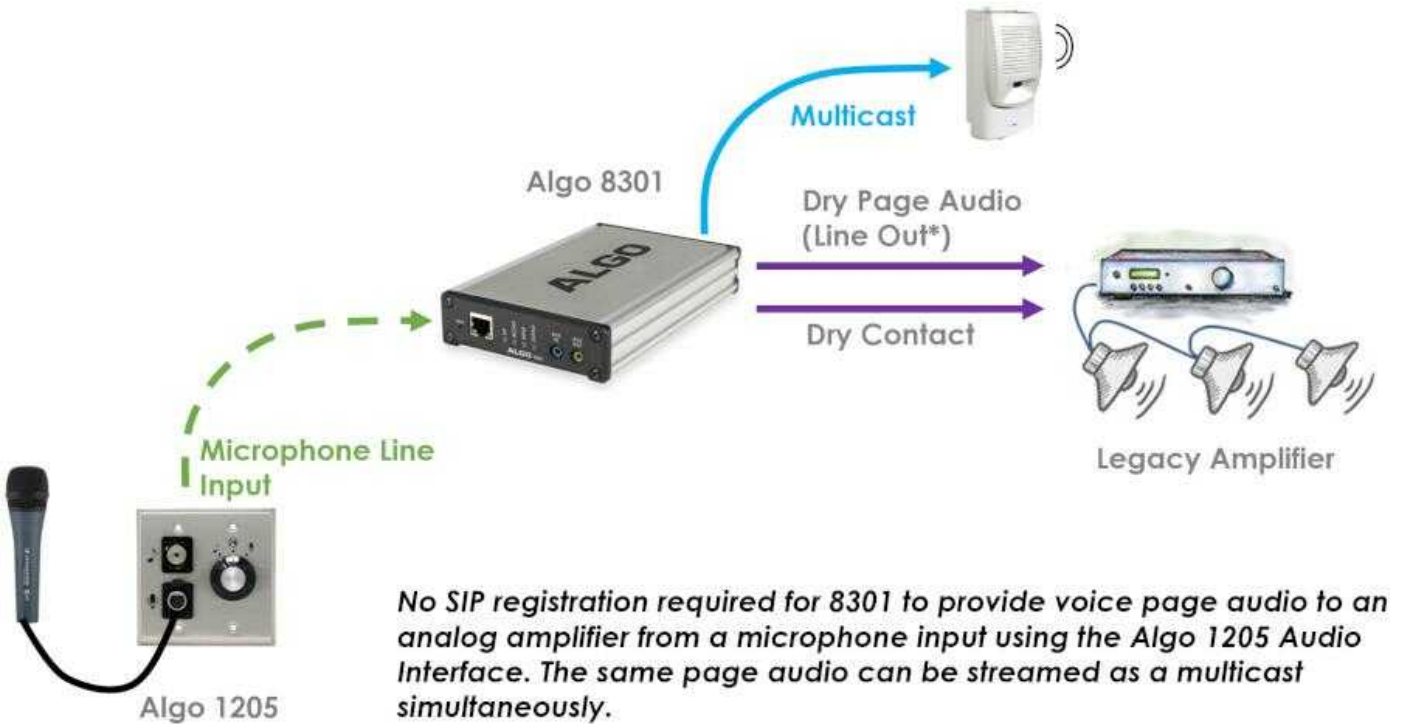
** The Algo 8301 Line Output is configurable to support an input impedance range of 600 Ohm – 10 kOhm. The 8301 output is isolated and balanced to prevent hum or noise.
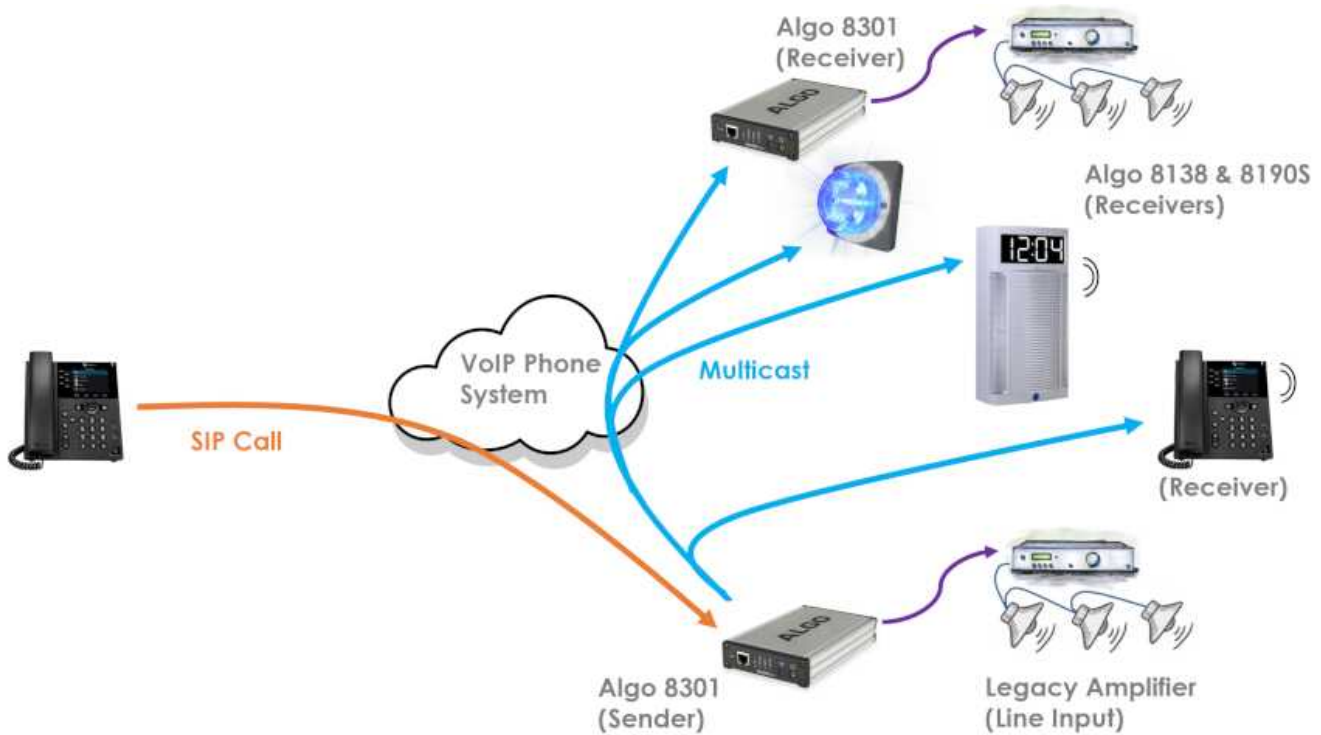
Use Case #1B - Legacy Analog: Multicast Voice Paging (No SIP Registration)

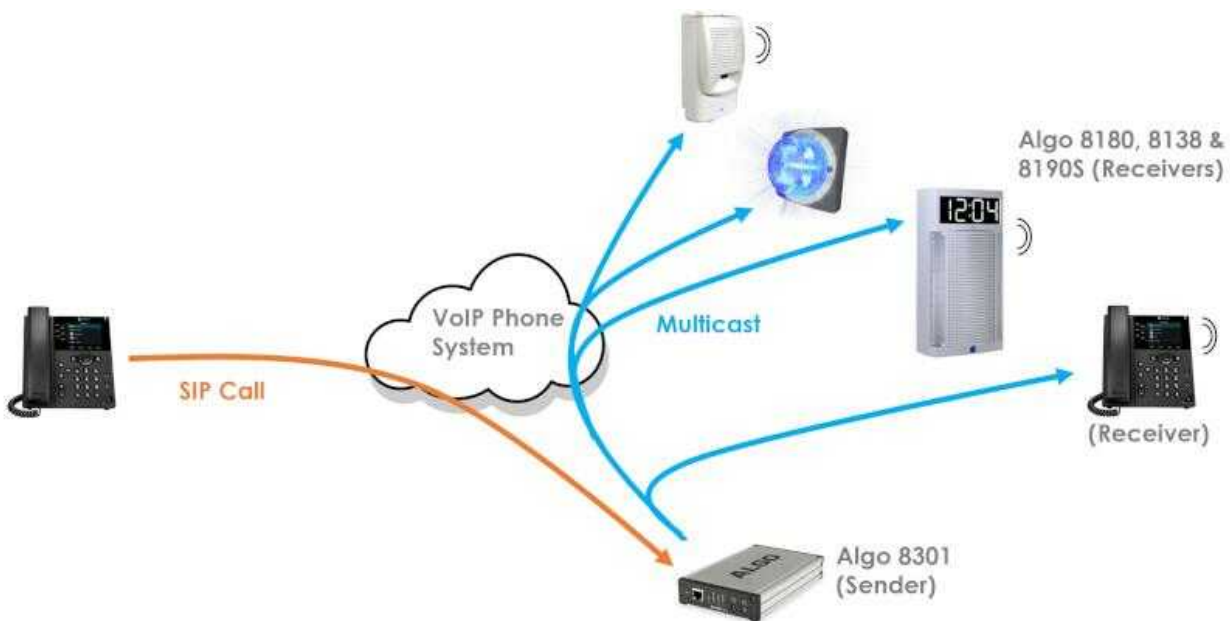### *Use Case #1C - Legacy Analog: Paging Using a Microphone (No SIP Registration)*

Use Case #2 - Hybrid (Analog & IP): Voice Paging & Emergency Alerting

A call can be made to the Algo 8301 on Page, Emergency Alert or Ring extensions, which simultaneously launches a multicast to any number of Algo IP endpoint speakers, paging adapters and strobe lights, as well as multicast supported IP telephones. Multicast configured Receivers require no SIP registration.
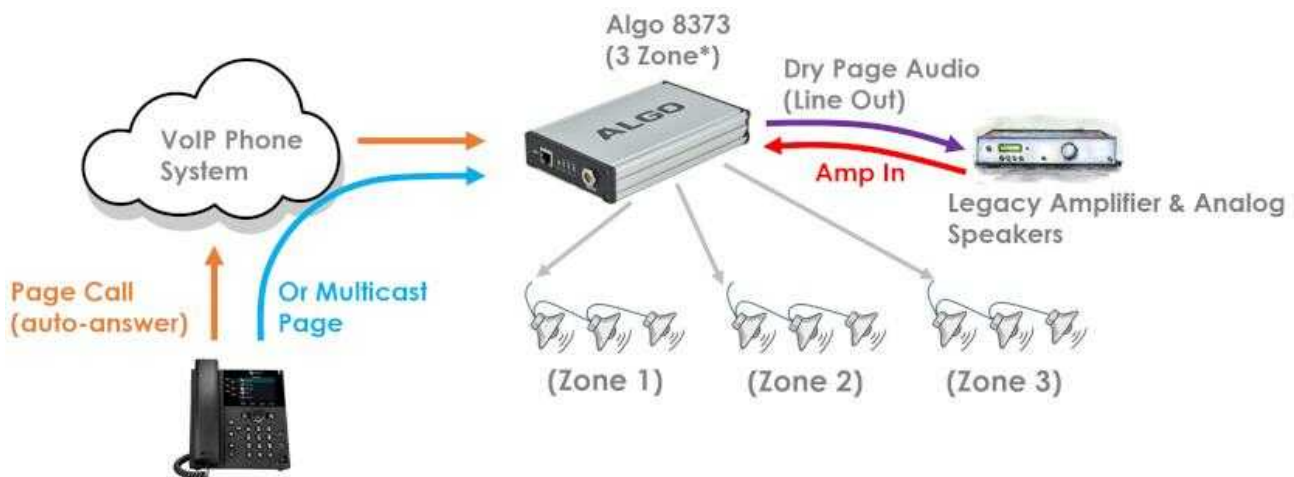
Use Case #3 - IP: Voice Paging & Emergency Alerting

Using multicast zones, endpoints can be included/excluded depending on the type of extension called (Page, Emergency Alert, Ring). For example, the 8138 strobe and 8190S speaker are multi-color alerting devices which can be configured to light for an emergency alert event and not for voice paging, if desired. A color can be aligned to a specific emergency alert for enhanced situational awareness (e.g. Amber – Shelter, Blue – Medical, Green – Evacuate, Red – Lockdown, RGB (White) – All Clear).
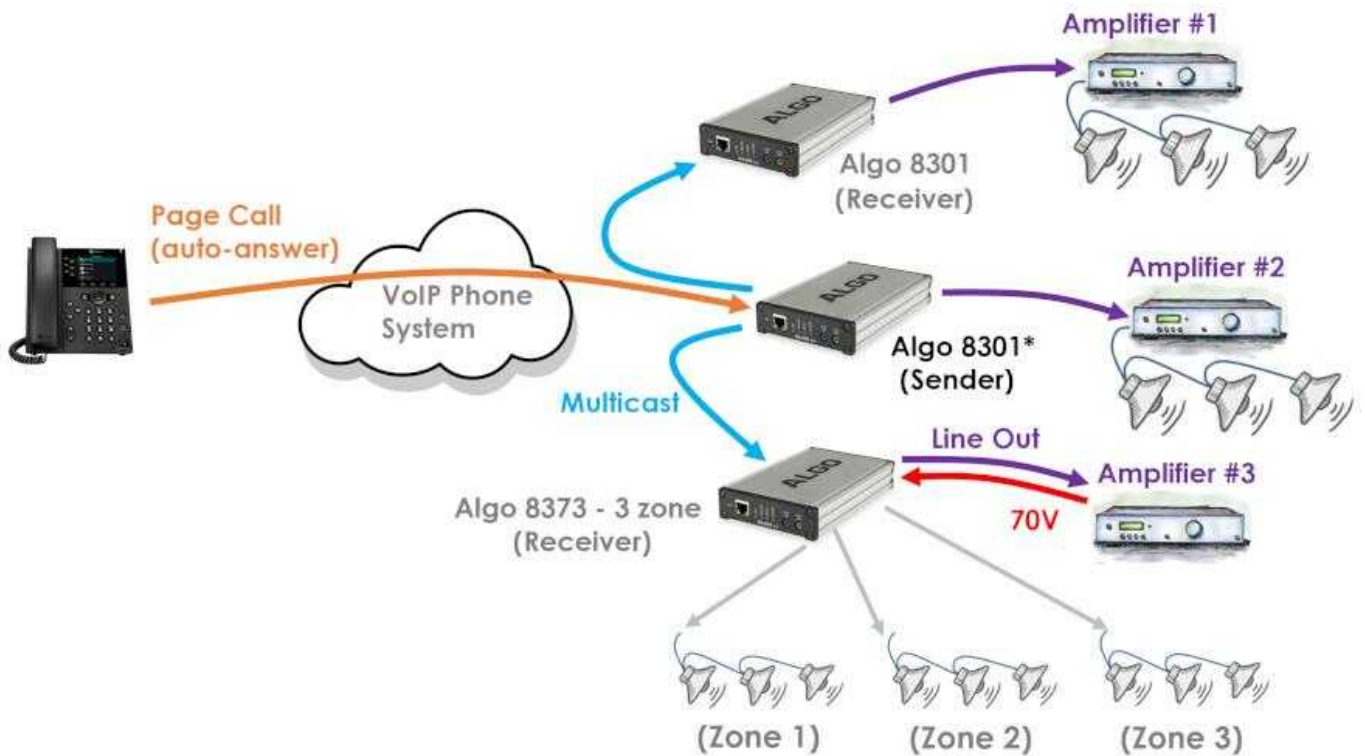
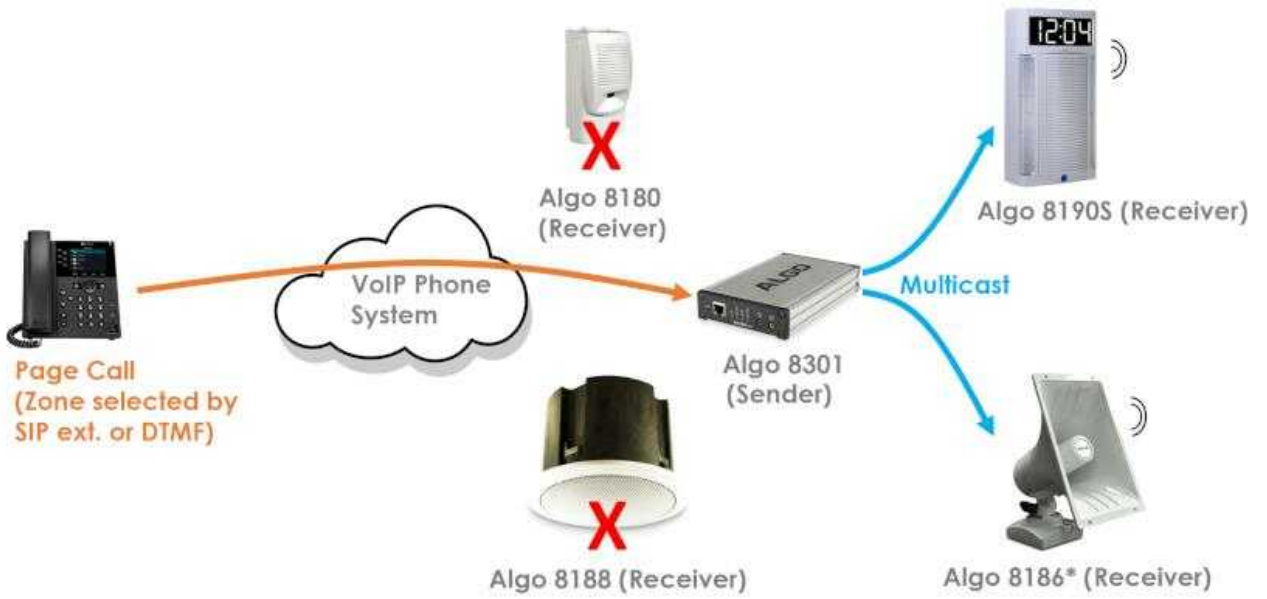## Use Case #4A – Legacy Analog Zone Paging (One Amplifier)

* Zones may be selected via SIP extension, DTMF or multicast zone. Additional 8373 adapters can be used in a multicast configuration to support more zones if necessary. Where multiple amplifiers are deployed as individual zones, use separate 8301 adapters configured in a multicast. No Emergency Alert or Ring extensions are available in 8373, however, the 8301 can be use to multicast such audio to the 8373.

Use Case #4B – Legacy Analog Zone Paging (Multiple Amplifiers)

* Multicast zone selection by SIP extension (50 Page) or by DTMF. Multicast can be directed to a specific adapter(s) and/or zone output of 8373 (e.g. All Call).
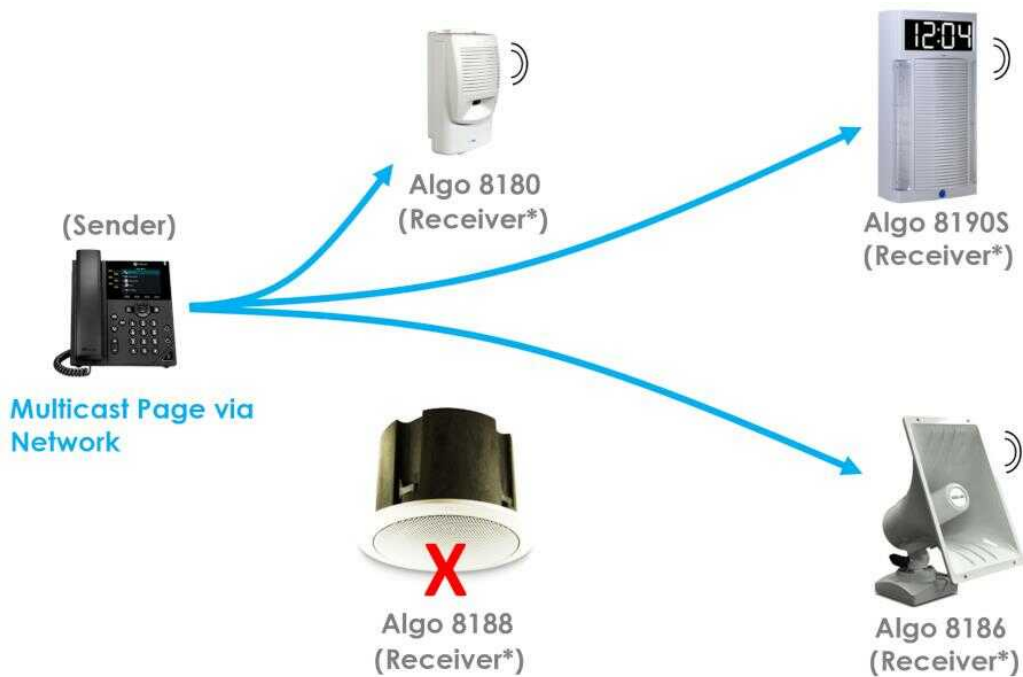
Use Case #5A - IP Zone Paging (SIP Extension or DTMF Selection)

Multicast page zones are defined by IP address and port on the network switch – not wiring to the IP speakers.

* Speakers configured in a multicast for zone paging can also be individually registered with their own extension for room paging &/or loud ringing.
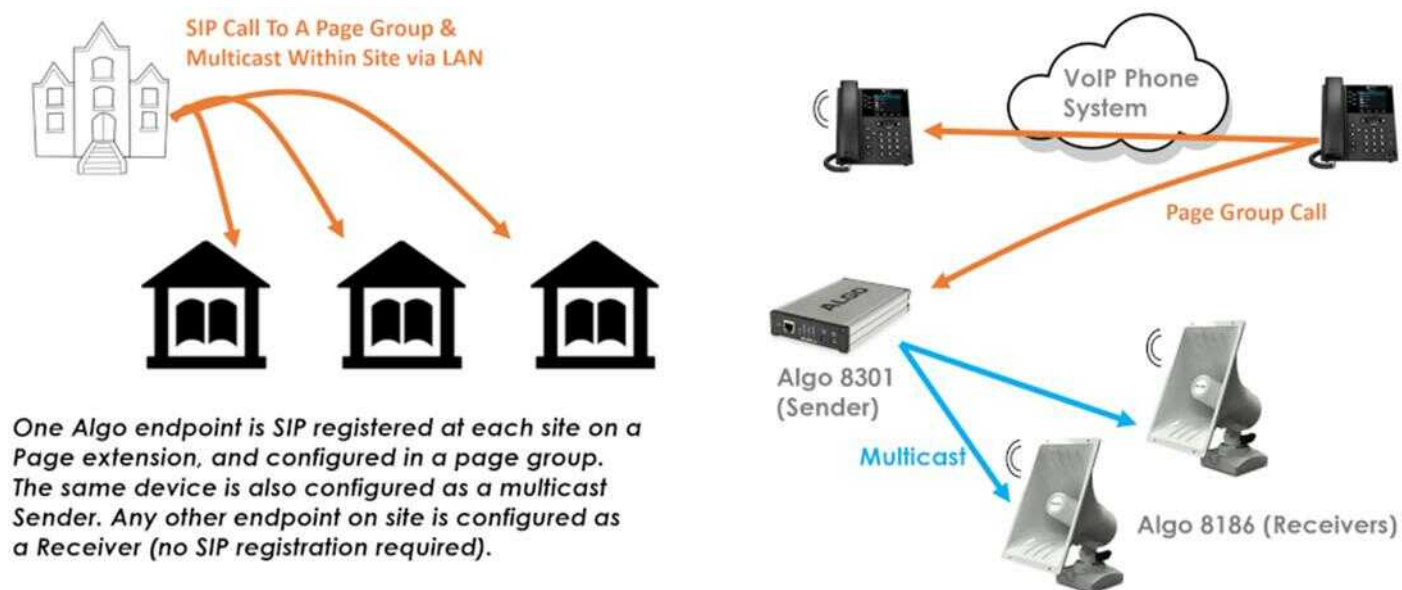
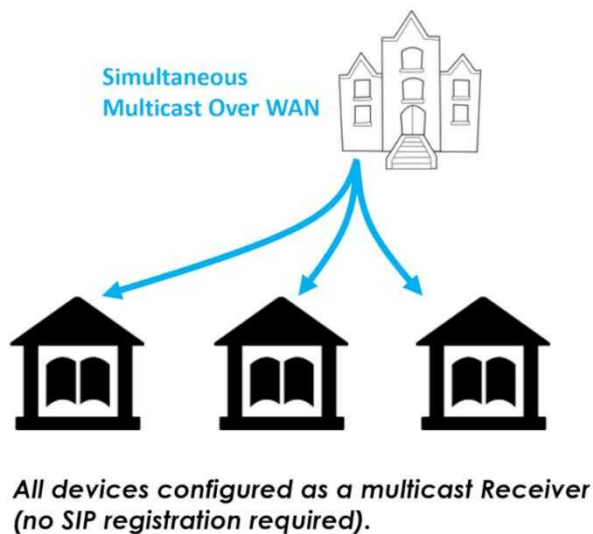## Use Case #5B - IP Zone Paging (Multicast – No SIP Registration)

IP multicast address and port on the network switch defines the page zone.

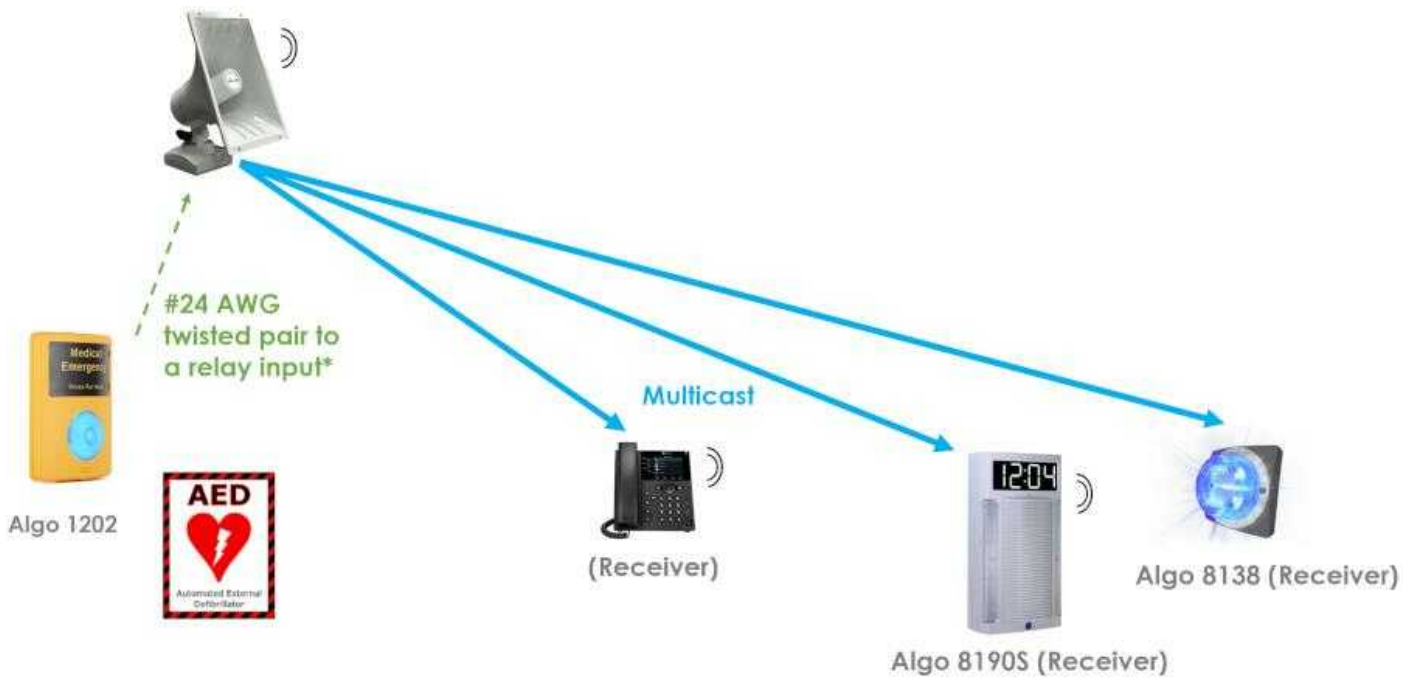*Endpoints receiving a multicast require no SIP registration.

Use Case #6A - Multi-Site Paging (Multicast Within a Site via LAN Using a Page Group)

SIP Call To A Page Group &
Multicast Within Site via LAN

VoIP Phone System

Page Group Call

Algo 8301 (Sender)

Multicast

Algo 8186 (Receivers)

One Algo endpoint is SIP registered at each site on a Page extension, and configured in a page group. The same device is also configured as a multicast Sender. Any other endpoint on site is configured as a Receiver (no SIP registration required).

Use Case #6B - Multi-Site Paging (Multicast via WAN)

Simultaneous Multicast Over WAN

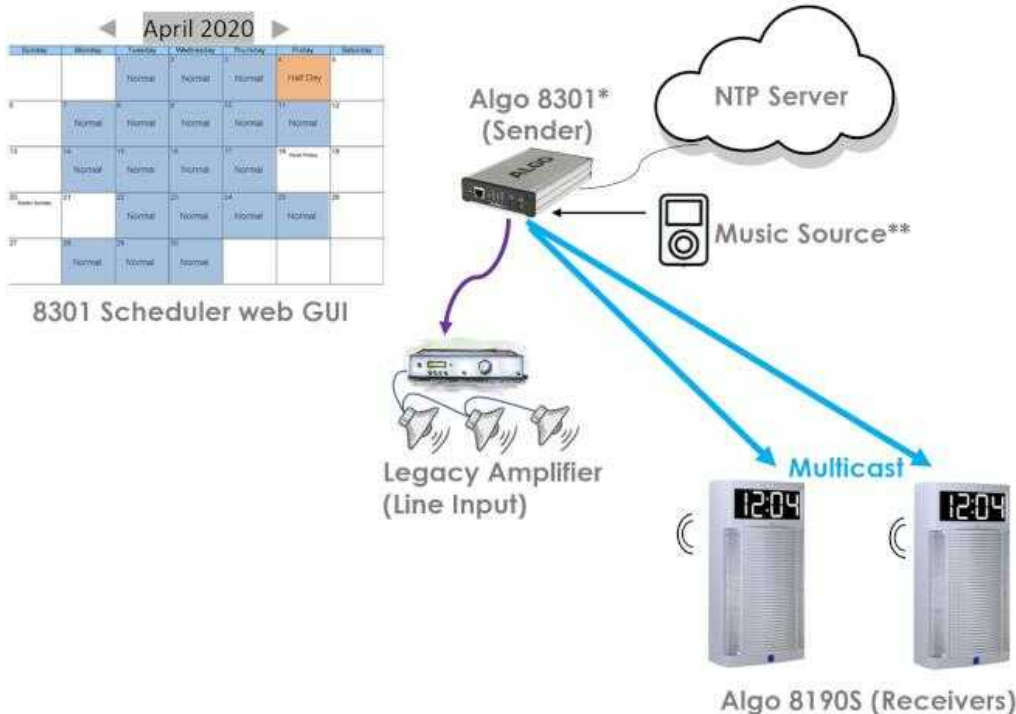All devices configured as a multicast Receiver (no SIP registration required).

Use Case #7 - Emergency Alerting: Push Button

Multicast a pre-recorded WAV file announcement &/or tone upon a button press. 1GB device memory. The relay input can also be configured for playing a discrete alert to a target extension, or the endpoint speaker can be configured to make a call to a target extension and permit a two-way voice call via its microphone.

Use Case #8 - Bell Scheduler & Music

* 8301 uses the NTP server for time/date, which can be synchronized with IP clocks. 1GB device memory to store WAV files for scheduled events.

** A 3.5mm Aux Input is available on the 8301 to play music. Music can be configured as a lower priority vs. paging, emergency alerting and scheduled tones/announcements.

Use Case #9A – Ring Alerting: Audible (Loud Ringing / Night Bell)

SIP Call
(Ring Group)

Algo 8180 *

Algo 8186 *

Registering the Ring ext. will permit a WAV file ring tone to be played when the speaker is called. Any Algo IP speaker or 8301 supports loud ringing / night bell, however, the 8180 wall mount or 8186 horn speakers are the most popular. Easily combine a speaker with an Algo IP strobe light using a relay or multicast.
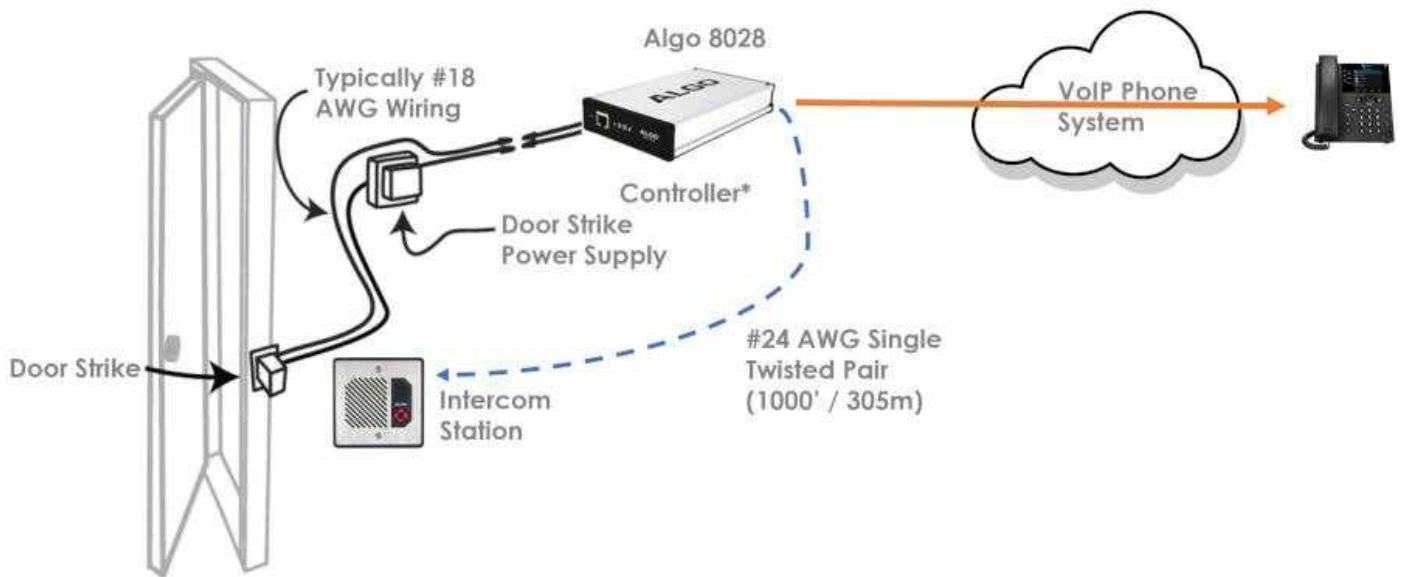
Use Case #9B – Ring Alerting: Visual

SIP Call
(Ring Group)

Algo 8128 *

Algo 8138
(multi-color)

Registering the Ring ext. will permit the strobe to flash a specific pattern/intensity when the endpoint is called. Easily combine a strobe light with an Algo IP speaker using a relay or multicast.
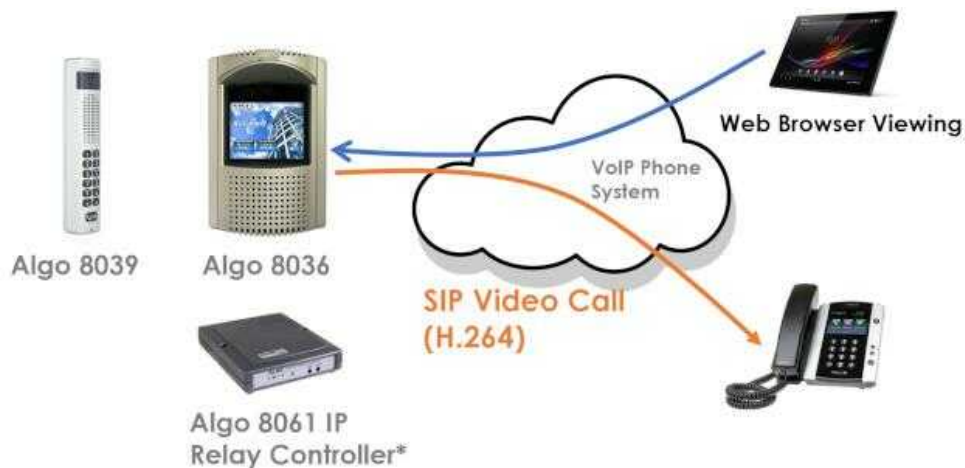
Use Case #10 – Visitor Communication & Entry: Audio Intercom

8028 can be configured to dial a single extension or hunt group for visitor communication when the call button on the intercom station is pressed. The intercom can also be called directly and the endpoint will auto-answer.

* The Controller in the 8028 kit provides a Normally Open (NO) or Normally Closed (NC) relay to integrate with a door / gate locking mechanism or access control panel. A momentary open code entered via the telephone keypad during the intercom call will activate the relay for visitor access.

Use Case #11 - Visitor Communication & Entry: Audio - Video Intercom

* When paired with an Algo intercom, the Normally Open (NO) or Normally Closed (NC) relay from the 8061 can integrate with a door / gate locking mechanism or access control panel. A momentary open code entered via the telephone keypad during the call or using intercom touch screen (8036) or keypad (8039), will activate the relay for visitor access. No SIP registration is required for the 8061, only the 8036 or 8039 intercom.

Use Case #12 - Algo IP Endpoint Supervision

The 8300 Controller provides network supervision and monitoring of Algo IP endpoints, which helps to ensure higher system reliability.

Additional Resources

- Links to this document: Online
- Algo IP Paging vs. Analog
- Algo SIP Endpoint Brochure
- Algo Use Cases
- Algo 8373 vs. 8301 Paging Adapters
- Compatible VoIP Phone Systems
- IP Speaker Ambient Noise Compensation
- IP Speaker Coverage Guideline
- Multicast Guide
- Network Device Locator
- Paging Adapter Amplifier Integration Guide
- Provisioning Guide
- SIP Registration Guide
- TLS Certificates & Mutual Authentication
- Tone Conversion and Upload Guide
- YouTube Channel

Ordering Guide

Description – Paging & Alerting	Product Code
SIP Audio Alerter	8180
SIP Horn Speaker	8186
SIP Ceiling Speaker	8188
Ceiling Speaker T-Bar Bracket	8188TBR
Ceiling Speaker T-Bar 2'x2' Panel – White	8188T2X2
Hydrophobic Membrane Screen for 8188 & 8189 Speakers	8188MEM
SIP Surface Mount Speaker	8189
SIP Speaker-Clock	8190
SIP Speaker-Clock & Visual Alerter	8190S
SIP Strobe Light (clear)	8128
Strobe Light Lens Cover (amber)	X128A
Strobe Light Lens Cover (blue)	X128B
Strobe Light Lens Cover (red)	X128R
SIP Multi-Color Strobe Light	8138
Controller	8300
Paging Adapter & Scheduler	8301
Zone Paging Adapter	8373
Audio Cable for 8301/8373: Output XLR-Mini Female to XLR Male (optional)	2504
Audio Cable for 8301: Input XLR-Mini Male to XLR Female (optional)	2505
Call Button	1202
Call Switch	1203
Volume Control	1204

Audio Interface	1205
Algo InformaCast IP Endpoints	**Product Code**
IP Wall Speaker	8180-IC
IP Horn Speaker	8186-IC
IP Ceiling Speaker	8188-IC
IP Surface Mount Speaker	8189-IC
IP Speaker-Clock	8190-IC
IP Speaker-Clock & Visual Alerter	8190S-IC
IP Strobe Light (clear)	8128-IC
IP Multi-Color Strobe Light	8138-IC
IP Paging Adapter	8301-IC
Description – Doorphones / Intercoms	**Product Code**
SIP Doorphone (controller + intercom)	8028
SIP Multimedia Intercom (video)	8036
SIP Video Mullion Intercom	8039
SIP Relay Controller	8061
SIP PoE Intercom	8201