Introduction

K12 schools, colleges and universities require open standard network-based technology for building and campus communications to integrate with all Cisco Unified Communications Manager platforms. Leveraging the UC environment allows maximum flexibility for any telephone or device to efficiently initiate day-to-day public address announcements, manage bell scheduling, provide notification for emergency alerting, and support visitor communication at secure entrance doors, gates and other access points.

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 TLS and SRTP.
The Algo product portfolio includes a variety of Wideband HD Voice 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 IP Endpoint Portfolio**

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

- Classroom

  8190 SIP Classroom Speaker-Clock

  8190S SIP Classroom Speaker-Clock with Visual Alerter

- 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)

- Gymnasium, workshop, playground:

  8186 SIP Horn Speaker
  (outdoor rated)
• Visual alerting for emergency notification and telephone ringing:

**8128 SIP Strobe Light** (clear, amber, blue, red)
(outdoor rated)

**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*

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

Endpoint Monitoring & Supervision

8300 Controller

Benefits of an Algo IP System Solution

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| 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           | SNMP support to monitor endpoint registration and minimize fault conditions; **Algo 8300 Controller**                                      |
| 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 Ring (10), Emergency Alert (10) and Page (50) extensions are available to register in the 8180G2/8186/8188/8189 speakers and the 8301 Paging Adapter, allowing for multi-functional use of the endpoints for voice paging, loud 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: Talk back not available on a multicast Receiver speaker.

### Firmware Upgradeable

- Easily upgrade endpoint via the network. Minimal touch appliance.

### Consolidated Single Source Solution

- Speakers, paging adapters, strobe lights, push buttons 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, etc.

### 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

- Open standard protocol. 3rd party SIP compliant endpoints are supported on all Cisco Unified Communications Manager platforms.
Use Cases

*Use Case #1 - Legacy Analog: Paging & Emergency Alerting*

- **Algo 8301 Paging Adapter** (SIP registered; multiple extensions available*; 1GB memory)
- **8301 Line Out** (isolated & balanced; Wideband HD Voice)
- **PoE Switch**
- **CUCM**
- **Analogue Amplifier & Speakers**

* Call to a Page ext. (auto-answer)
* Call to Emergency Alert ext. (plays a WAV file, e.g. Lockdown announcement**)

* 50 Page ext. & 10 Emergency Alert ext. in 8180G2, 8186, 8188, 8189 & 8301. 10 Ring ext. are also available for telephone loud ringing/night bell.

** Emergency alerts can be configured to play once or in a continuous loop where a canceling ext. stops the alert.
Use Case #2 - Hybrid (Analog & IP): Paging & Emergency Alerting

* All Algo IP speakers, paging adapters and strobe lights can Send or Receive a multicast. The endpoints can be configured for a multicast in any number and combination.
Use Case #3 - IP: Paging & Emergency Alerting

* Using multicast zones, endpoints can be included/excluded depending on the type of page announcement or alert. In the example above the 8128 strobe and visual alert in the 8190S speaker is only included in the multicast for alerting and not for paging. Four discrete LEDs including amber, blue, green & red (+ white using RGB) are available in the 8190S to align a color with an alert event (e.g. Amber – Shelter, Blue – Medical, Green – Evacuate, Red – Lockdown, White – All Clear).
Use Case #4 - InformaCast Paging & Emergency Alerting

*Note: An InformaCast license is required per endpoint. The 8180G2, 8186, 8188, 8189 & 8301 are supported devices using this license. As an alternative, registering an Algo endpoint as a Legacy Paging Device (LPD) via SIP does not require an InformaCast license.
Use Case #5 - Legacy Analog Zone Paging

*Multiple 8373 adapters can be used in a multicast configuration to support more zones. Where multiple amplifiers are deployed as individual zones, use separate 8301 adapters configured in a multicast. No alert/ring extensions are available in 8373, however, any other IP speaker or 8301 can be used to multicast such alerts.*
Use Case #6 - IP Zone Paging

Select page zone by SIP ext. (50) or by DTMF

SIP registered to Page ext.

Simultaneous Multicast *

* Speakers configured in a multicast for zone paging can also be individually registered with their own extension for classroom paging.
**Use Case #7 - Page Group & Multicast**

SIP registered to Page ext. in a Page Group

Simultaneous Multicast *

**Use Case #8 - Multi-Site Paging**

SIP call to a page group & simultaneously multicast within each site

Simultaneous multicast over WAN

*Consult network administrator for best option available & configuration assistance.*
Use Case #9 - Emergency Alerting: Push Button

Twisted pair wiring to a relay input*

Simultaneous multicast a WAV file stored in device memory (1GB)

* The relay input is available on 8180G2, 8186, 8188, 8189, 8190 and 8301 endpoints. The relay can also be configured for playing a discrete alert WAV file 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 #10 - Bell Scheduler & Music

* 8301 uses the NTP server for time/date, which can be synchronized with IP clocks. 1GB device memory.

** A 3.5mm Music 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 #11 – Visitor Communication & Entry: Audio Intercom**

Configure intercom to call a hunt group or individual extension

Algo 8028 (audio) *

* The 8028 kit includes door station, controller and 24V power supply. A built-in Normally Open (NO) or Normally Closed (NC) relay can integrate with any door/gate locking mechanism or access control panel. A key press code from the telephone can activate the relay during an intercom call.

**Use Case #12 - Visitor Communication & Entry: Audio/Video Intercom**

Algo 8036 (video) *

Web Browser Viewing

SIP + H.264 video

* The 8036 touch screen is configurable via a web interface to display any text / images. Multiple call options can be also configured as a scroll list or icon based menu. Video can be viewed via a video phone, soft client or web browser. For door/gate control, the 8061 module is required to provide a NO/NC relay.
Use Case #13 Example School System Deployment

Additional Resources

- Links to this document: PDF, Word
- Compatible VoIP Phone Systems
- Algo IP Paging System Overview
- Algo IP Paging vs. Analog
- Video: 8186 SIP Horn Speaker
- What is the difference between the Algo 8373 and 8301 Paging Adapters?
- Product Links & Specifications:
  - 8180 SIP Audio Alerter
  - 8186 SIP Horn Speaker
  - 8188 SIP Ceiling Speaker
  - 8189 SIP Surface Mount Speaker
  - 8190 SIP Classroom Speaker-Clock
  - 8128 SIP Strobe Light
  - 8300 Controller
  - 8301 Paging Adapter & Scheduler
  - 8373 Zone Paging Adapter (3)
  - 1202 Call Button
  - 1203 Call Switch
- Multicast Guide
- Network Device Locator
- Paging Adapter Amplifier Guide
- Provisioning Guide
- SIP Registration Guide
- Speaker Coverage Guideline
- Tone Conversion and Upload Guide
### Order Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Product Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP Audio Alerter (wall mount)</td>
<td>8180</td>
</tr>
<tr>
<td>InformaCast Wall Mount Speaker</td>
<td>8180-IC</td>
</tr>
<tr>
<td>SIP Horn Speaker (outdoor rated)</td>
<td>8186</td>
</tr>
<tr>
<td>InformaCast Horn Speaker</td>
<td>8186-IC</td>
</tr>
<tr>
<td>SIP Ceiling Speaker</td>
<td>8188</td>
</tr>
<tr>
<td>InformaCast Ceiling Speaker</td>
<td>8188-IC</td>
</tr>
<tr>
<td>Optional T-Bar Bracket for Ceiling Speaker</td>
<td>8188TBR</td>
</tr>
<tr>
<td>Optional 2'x2' T-Bar Panel for Ceiling Speaker (white)</td>
<td>8188T2X2</td>
</tr>
<tr>
<td>Hydrophobic Membrane Screen for 8188 &amp; 8189 Speakers</td>
<td>8188MEM</td>
</tr>
<tr>
<td>SIP Surface Mount Ceiling Speaker</td>
<td>8189</td>
</tr>
<tr>
<td>InformaCast Surface Mount Ceiling Speaker</td>
<td>8189-IC</td>
</tr>
<tr>
<td>SIP Classroom Speaker-Clock</td>
<td>8190</td>
</tr>
<tr>
<td>SIP Classroom Speaker-Clock with Visual Alerter</td>
<td>8190S</td>
</tr>
<tr>
<td>SIP Strobe Light (clear)</td>
<td>8128</td>
</tr>
<tr>
<td>Strobe Light Lens Cover (amber)</td>
<td>X128A</td>
</tr>
<tr>
<td>Strobe Light Lens Cover (blue)</td>
<td>x128B</td>
</tr>
<tr>
<td>Strobe Light Lens Cover (red)</td>
<td>x128R</td>
</tr>
<tr>
<td>Controller</td>
<td>8300</td>
</tr>
<tr>
<td>Paging Adapter &amp; Scheduler</td>
<td>8301</td>
</tr>
<tr>
<td>Zone Paging Adapter (3)</td>
<td>8373</td>
</tr>
<tr>
<td>Optional Audio Cable for 8301: Output XLR-Mini Female to XLR Male</td>
<td>2504</td>
</tr>
<tr>
<td>Optional Audio Cable for 8301: Input XLR-Mini Male to XLR Female</td>
<td>2505</td>
</tr>
<tr>
<td>Call Button</td>
<td>1202</td>
</tr>
<tr>
<td>Call Switch</td>
<td>1203</td>
</tr>
</tbody>
</table>