Integrating Singlewire Software with Algo Communications Solutions

InformaCast and the LPI with the Algo 8180 SIP Auto Alerter
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Overview

Singlewire Software’s applications can integrate into an environment using Algo Communications Solutions products. Each system should be functional on its own before attempting to integrate the two, i.e. you should be able to pick up an IP phone, dial a number to page, and have your voice heard in both solutions independently before attempting the integration.

Required Components

Integrating Singlewire’s applications with Algo’s products has the following requirements:

- Cisco Unified Communications Manager (CUCM)
- Cisco IP phone(s)
- Algo 8180 SIP Audio Alerter(s)
- Singlewire’s InformaCast application
- Singlewire’s LegacyPagingInterface (LPI) application

How It Works

The Algo 8180 SIP Audio Alerter can register to CUCM as a third-party SIP device. The device itself is programmed with a directory number (DN) as its paging extension. When the device receives a call on this number, it outputs the audio of the call through the speaker, thus allowing paging functionality.

When more than one Algo 8180 SIP Audio Alerter is present, the device that receives the telephone call for paging can be set up to multicast the audio back onto the network, and all other Algo devices can be programmed to listen to that multicast audio.

InformaCast, integrated with the CUCM, provides functionality to page, or “broadcast,” through Cisco’s IP phones. When integrated with Singlewire’s LPI, InformaCast can also place phone calls to other systems. The LPI registers to InformaCast as an IP speaker. When the LPI-registered IP speaker is added to an InformaCast recipient group (i.e. a paging zone), InformaCast can send a broadcast (i.e. page), and the LPI dials a telephone number and plays audio.

The following diagram depicts how the systems work with one another.
The flow for paging/broadcasting is:

- A user dials paging extension using an IP phone.
- The call is routed to InformaCast’s DialCast CTI route point in CUCM.
- InformaCast activates the IP phones and LPI-registered IP speaker.
- The LPI dials the Algo device to set up a call.
- InformaCast broadcasts its audio.
- The LPI picks up the audio and sends it across the phone call to the Algo device.
- The Algo device that receives the call plays the audio, and retransmits the audio on a multicast address and port.
- Other Algo devices, programmed to listen to for the multicast address and port, play the audio when they see the traffic.
- The user hangs up the IP phone.
- InformaCast signals the IP phones and LPI-registered IP speaker that the page/broadcast is finished.
- The LPI disconnects the call to the Algo device.
Integration

The steps in this section detail the process of allowing Algo 8180 SIP Audio Alerters to work with CUCM and configuring InformaCast and the LPI to work with the Algo devices.

Configure the CUCM

The Algo devices must be reachable from your IP phones, and the CUCM must be configured to register an Algo device so that it can be dialed from your IP phones as well as the LPI.

Create an End User

An end user must be created to allow digest authentication. This is the user that will be used to call the Algo device.

Note

If your CUCM will synchronize with an LDAP directory, you must first create this user in the LDAP directory. The steps in the following section show creating a user in an environment not synched with an LDAP directory. If your environment is synched with an LDAP directory, your user will already exist. Select it and skip to Step 6 on page 5.

Step 1

Log into your CUCM server. The Cisco Unified CM Administration page appears.
Step 2  Go to User Management | End User. The Find and List Users page appears.
**Step 3**  Click the **Add New** button. The End User Configuration page appears.

**Step 4**  Enter the **DN** of your Algo 8180 SIP Audio Alerter in the **User ID** field.

**Step 5**  Enter a description of the Algo 8180 SIP Audio Alerter in the **Last Name** field, e.g. AlgoSIPDevice.

**Step 6**  Enter a password into the **Digest Credentials** and **Confirm Digest Credentials** fields. This password is currently only tied to this user and can be whatever works best for your environment. Make a note of the password as it will be needed when setting up the Algo device.
Step 7  Click the **Save** button.

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**Create a Phone Security Profile**

You must create a phone security profile that allows digest authentication, which will then be assigned to the Algo device.

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**Step 1**  Go to **System | Security | Phone Security Profile.** The Find and List Phone Security Profiles page appears.

**Step 2**  Click the **Add New** button. The Phone Security Profile Configuration page appears.
Step 3 Select **Third-party SIP Device (Basic)** from the **Phone Security Profile Type** dropdown menu and click the **Next** button. The Phone Security Profile Configuration page refreshes.

Note These steps illustrate a “basic” device, which only allows one line to be assigned, but uses less device license units (DLUs) than an “advanced” third-party SIP device.

Step 4 Enter a name for your profile's configuration in the **Name** field, e.g. Algo SIP Basic Device Security Profile.

Step 5 Optionally, enter a description of your profile configuration in the **Description** field.

Step 6 Select the **Enable Digest Authentication** checkbox.

Step 7 Leave the other fields with their default values.

Step 8 Click the **Save** button.
Add the Algo Device as a Phone

To allow calls to be routed to it, the Algo device must register to the CUCM as a phone.

**Step 1** Go to **Device** | **Phone**. The Find and List Phones page appears.

**Step 2** Click the **Add New** button. The Add a New Phone page appears.
**Step 3**  Select Third-party SIP Device (Basic) from the **Phone Type** dropdown menu and click the **Next** button. The Phone Configuration page appears.

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**Note**

A basic device only allows one line assigned, but uses less DLUs.
**Step 4** Remove the plastic mounting bracket from the back of your Algo device and obtain the device’s MAC address.

**Step 5** Enter the Algo device’s MAC address in the **MAC Address** field on the Phone Configuration page.

**Step 6** Select a device pool from the **Device Pool** dropdown menu that will allow calls from the LPI to be G.711 μLaw.

**Tip** If you already have InformaCast set up and configured, select its device pool.

**Step 7** Select **Third-party SIP Device (Basic)** from the **Phone Button Template** dropdown menu.

**Step 8** Select the profile you just created in “Create a Phone Security Profile” on page 6 from the **Device Security Profile** dropdown menu in the **Protocol Specific Information** area.

**Step 9** Select **Standard SIP Profile** from the **SIP Profile** dropdown menu.

**Step 10** Select the user you created in “Create an End User” on page 3 from the **Digest User** dropdown menu.
Step 11  Click the **Save** button. The Phone Configuration page refreshes.
Step 12  Click the Line [1] - Add a new DN link. The Directory Number Configuration page appears.

Step 13  Enter the DN of your Algo device in the Directory Number field, making sure it matches the username of the end user you created in “Create an End User” on page 3.

Step 14  Click the Save button.
Configure the Algo Devices

The Algo devices can be setup as master or slave. The Algo device that is programmed in the CUCM will be setup as the master, receiving the telephone call and audio. It will then retransmit the audio on a multicast address and port. The slave devices will listen for the audio on this multicast address and port.

Determine the Master Algo Device’s DHCP Address

First, you must determine the master Algo device’s DHCP address.

**Step 1**  Plug the Algo device into a PoE switchport where it can obtain a DHCP IP address.

**Step 2**  Press the **Menu** button on the back of the Algo device until it says, “Press Select to get device information.”

**Step 3**  Press the **Select** button. The device will read aloud its IP address. Make a note of it.

Configure the Master Algo Device

Next, you can configure the master Algo device through a web interface.

**Step 1**  Enter the Algo device’s IP address into a web browser. The Welcome page appears.
**Step 2** Enter the default password of **algo** in the **Password** field and click the **Login** button. The Config page appears.

**Step 3** Enter the hostname of the CUCM in the **SIP Domain/Proxy** field in the **SIP** area.

**Step 4** Enter the DN you assigned to the device in “Create an End User” on page 3 in the **Page Audio Extension** field.

**Step 5** Enter the value of the **Digest Credential** field from CUCM in the **Password** field under the **Page Audio Extension** field on the Algo device's Config page.

**Step 6** Select the **Master** radio button for **Multicast Mode** in the **Features** area.

**Note** You can change the values in the **Multicast Channel IP** and **Multicast Channel Port** fields to suit your network. Make sure it does not overlap with other ranges, such as InformaCast.

**Step 7** Click the **Save Settings** button.
Configure the Slave Algo Device(s)

Once you have your master algo device configured, you can configure your slave Algo devices.

**Step 1** Follow the steps in “Determine the Master Algo Device’s DHCP Address” on page 13.

**Step 2** Follow Steps 1 through 5 in “Configure the Master Algo Device” on page 13.

**Step 3** Select the Slave radio button for Multicast Mode in the Features area.

**Step 4** Ensure that the values in the Multicast Channel IP and Multicast Channel Port fields are the same as those listed for the master Algo device.

**Step 5** Click the Save Settings button.

**Tip** You can modify the other fields on this page to suit your environment, but their settings are outside the scope of this document.

**Step 6** Repeat these steps for each slave Algo device.

Verify Algo Paging with an IP Phone

Before integrating the Singlewire and Algo systems, the Algo system must be functional as a standalone system. You should be able to pick up an IP phone and place a call to the number assigned to the master Algo device. Audio paging using an IP phone through the Algo devices should also be working. Please ensure this is functional before proceeding.

Up to this point, there has been nothing specific to any Singlewire applications. If you need additional assistance with either the CUCM or Algo configurations, please contact Cisco and Algo.

Configure InformaCast and the LPI

Singlewire’s InformaCast and the LPI must be operational before attempting to integrate with the Algo system. For more details on InformaCast and the LPI, including guides and video tutorials, please visit the Singlewire website.

**Caution** Instructions on installing InformaCast and the LPI are outside the scope of this document. It is assumed that InformaCast and the LPI are currently installed and functional in your environment. An intermediate level of familiarity with the administration of both products is also assumed. For detailed steps, please refer to each product’s documentation.
Configure The LPI

First, you must add the Algo device to the LPI.

**Step 1**  
Open and log into the LPI. The Welcome page appears.

**Step 2**  
Click the **Paging Devices** link. The Paging Devices page appears.
Step 3  Click the Page icon ( ) to add a new paging device. The Add Paging Device page appears.

Step 4  Enter a name for your Algo device in the **Device Name** field, e.g. Master Algo.

Step 5  Enter your CUCM’s IP address in the **SIP IP Address** field.

Step 6  Enter the DN for the Algo device in the **SIP User** field. This is the telephone number the LPI should dial to reach the Algo device.

Step 7  Enter 0 in the **Max SIP Response Time** field.

**Note**  For specifics about the rest of the settings on this page, see the “LPI Installation and User Guide.”
Step 8  Click the Add button in the Paging Zones area. InformaCast recognize paging zones as recipients, and your paging zones are what will display when you want to add your Algo device(s) to a broadcast. The Add Paging Device page refreshes.

Step 9  Enter an unique name for this zone in the Zone Name field.

Step 10 Leave the MAC Address field set as suggested by the LPI or enter your own unique value. Singlewire recommends that you use the generated MAC address.

Step 11 Click Add button to add another zone or click the Save button if you are finished configuring your Algo device.
Configure InformaCast

Once you’ve configured the LPI, you can add the device you created within it as a speaker to InformaCast.

**Step 1** Open and log into InformaCast. The InformaCast Welcome page appears.
Step 2  Go to Speakers | Edit IP Speakers. The Edit IP Speakers page appears.
Step 3  Click the **View** button to see a list of undefined speakers. The Edit IP Speakers page refreshes.

![InformaCast](image)

**Note**  Until you add your paging zones to InformaCast (and enter an appropriate, descriptive name for them), their MAC addresses are what initially display on the Edit IP Speakers page.

Step 4  Click the **Add** button next to a paging zone you created in “Configure The LPI” on page 16. The Add IP Speaker page appears.

![InformaCast](image)

Step 5  Enter a name for your speaker in the **IP Speaker Name** field.
Step 6  Enter a description for your speaker in the **Speaker Description** field.

Step 7  Click the **Save** button.

Step 8  Go to **Recipients | Edit Recipient Groups**. The Edit Recipient Groups page appears.

Step 9  Edit an existing recipient group or create a new recipient group that includes the LPI speaker. For more information on creating and editing recipient groups, see the “InformaCast Installation and User Guide” for InformaCast 8.0 or later.
Step 10  Go to Admin | DialCast | Dialing Configurations. The Dialing Configurations page appears.

![InformaCast Interface](image)

Step 11  Click the Add button and add a new dialing configuration that contains the broadcast you want to send out and a recipient group that contains your Algo devices. For more information on dialing configurations, see the “InformaCast Installation and User Guide” for InformaCast 8.0 or later.

Verify Integration

If everything was configured successfully, you should now be able to pick up your IP phone and dial the dialing pattern you created in Step 11 of “Configure InformaCast.” InformaCast will trigger the LPI, which will dial all of the numbers of the Algo devices at the same time and play your selected broadcast across the IP phones and Algo speakers at once.

If this is not successful, please see “Troubleshooting” on page 24.
Troubleshooting

Problem  My Algo device doesn’t appear to boot.
Solution  Make sure the device is plugged into an 802.3af PoE switchport.

Problem  My Algo device does not get an IP address on the right subnet.
Solution  Make sure your switchport has the proper Access VLAN configured and that there are free DHCP addresses in the pool.

Solution  You can also span the switchport and capture the traffic with Wireshark to see the DHCP traffic and verify if the Algo device gets a response from a DHCP server.

Problem  My Algo device doesn’t register with CUCM.
Solution  You have several solutions:
* Make sure the end user you created in “Create an End User” on page 3 matches the directory number of the Algo device.
* Ensure that the digest credential password for the created end user was entered properly into the Algo device’s webpage (described in “Configure the Master Algo Device” on page 13).
* Make sure the created phone security policy has Enable Digest Authentication selected (described in “Create a Phone Security Profile” on page 6).

You can also span the switchport and capture the traffic with Wireshark to see the Algo device attempt to register to CUCM and CUCM’s response, if any.

Problem  I can’t dial the Algo device from an IP phone.
Solution  Ensure the device is registered to the CUCM. Make sure the partition assigned to the Algo device’s directory number exists in the calling search space of the phone you are using to dial the Algo device. If necessary, perform detailed CUCM traces on the CUCM to see why a call cannot be completed.

Problem  The LPI IP speaker doesn’t register to InformaCast.
Solution  Ensure the LPI is configured properly. Please view the “LPI Installation and User Guide” for more information.

Problem  InformaCast plays audio through phones, but I don’t hear any audio the Algo devices.
Solution  Can you dial the Algo directly? If not, the troubleshooting needs to be focused on the Algo system prior to the integration of InformaCast and the LPI. If you can dial the Algo system directly, but you still can’t hear audio when using InformaCast and the LPI, please look at the LPI and InformaCast logs to verify that InformaCast triggered the broadcast to the LPI and the LPI attempted to place the call to the Algo devices. Please see the user guides for InformaCast and the LPI for more details.
**Problem**  Placing calls to the DialCast extension don’t work.

**Solution** Ensure there is a CTI route point configured in CUCM that has the DialCast extension. Ensure the route point is associated to the InformaCast application user in CUCM. Also, ensure that the calling search space and partition assignments allow the phone to reach this extension in CUCM. For more details about troubleshooting DialCast, see the “InformaCast Installation and User Guide” for InformaCast 8.0 or later.

**Problem**  Why would I want to do a Wireshark traffic capture?

**Solution**  Sometimes the best tool for seeing why things are not functioning is to examine the traffic. There are potentially two places where the traffic will need to be captured: at the Algo device and the InformaCast/LPI server.

Capturing traffic at the Algo device will require spanning the switchport to which the Algo device is connected. The details on how to do this are outside the scope of this document. Viewing this traffic will show:

- Registration to the CUCM
- Call setup and teardown
- RTP audio

Capturing traffic on the InformaCast/LPI server can be done by installing Wireshark directly on the server. The details on how to do this are outside the scope of this document, but using Wireshark to perform a traffic capture is documented in the “InformaCast Installation and User Guide” for InformaCast 8.0 or later. Examining this traffic will show:

- LPI IP speaker registration
- InformaCast phone activation and deactivation
- LPI speaker activation and deactivation
- LPI call setup and teardown
- RTP audio