



Avaya Solution & Interoperability Test Lab

Application Notes for Algo 8190S SIP Classroom Speaker Version 3.1.3 and with Avaya IP Office Server Edition Release 11- Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Algo 8190S SIP Classroom Speaker to interoperate with Avaya IP Office Server Edition. Algo 8190S SIP Classroom Speaker is a SIP-based device that can register with Avaya IP Office as a SIP endpoint for public address (PA) voice paging, ringing and emergency alerting.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required for the Algo8190S SIP Classroom Speaker to interoperate with Avaya IP Office Server Edition. The Algo 8190S SIP Classroom Speaker is a SIP-based device that can register with IP Office for public address (PA) voice paging, ringing and emergency alerting.

The Algo 8190S SIP Classroom Speaker supports multiple SIP extensions which behave differently – RING,PAGE and EMERGENCY ALERT. One or multiple may be used depending on the application. If the RING extension is called the 8190S will not answer. Instead, it will flash a light pattern and play a tone until the inbound call stops ringing. Typically the RING extension is programmed as part of a hunt group so that it receives a ring signal simultaneously with one or more devices. The simultaneous ringing at the desk phone and the Algo 8190S SIP Classroom Speaker is accomplished via the Mobile internal twinning feature.

If the PAGE extension is called, the Algo 8190S SIP Classroom Speaker will auto-answer and allow paging over its internal speaker. When the 8190S answers it will play a configurable tone to the caller so they know when they can begin speaking.

In the compliance testing, Avaya IP Office Server Edition system consists of Avaya IP Office Primary Linux running on Virtualized Environment and a 500V2 Expansion.

2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were manually placed to the loud ringing and voice paging extensions, with call controls such as hold/resume, unattended, attended transfer and conference performed from the caller.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in this DevConnect Application Note included the enablement of supported encryption capabilities in the Avaya products only (private network side). Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with this Application Note, the interface between Avaya systems and the Algo 8190S did not include use of any specific encryption features as requested by Algo.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The loud ringing feature testing included registration, internal and external caller, interactions with the voice paging extension, and interactions with desk phone features such as coverage, call forwarding, and do not disturb. The voice paging feature testing included registration, media shuffling, internal and external caller, interactions with the loud ringing extension, and interactions with caller actions such as drop, hold/reconnect, blind/attended transfer, and blind/attended conference.

The serviceability testing focused on verifying the ability of the 8190S SIP Classroom Speaker to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet cable to the device.

2.2. Test Results

The objectives outlined in **Section 2.1** were verified. All test cases passed.

2.3. Support

Technical support on Algo 8190S SIP Classroom Speaker can be obtained through the following:

- Phone: + 1 604 454 3792
- Web: <http://www.algosolutions.com/support/support.html>
- Email: support@algosolutions.com

3. Reference Configuration

Figure 1 illustrates the test configuration used during the compliance testing between the Avaya IP Office and 8190S SIP Classroom Speaker. The 8190S SIP Classroom Speaker communicates with IP Office through Avaya switch with Power over Ethernet (PoE) and registered with Avaya IP Office as SIP endpoint. The SIP trunk was also configured to connect from IP Office to SIP Service Provider for test cases off-net via PSTN.

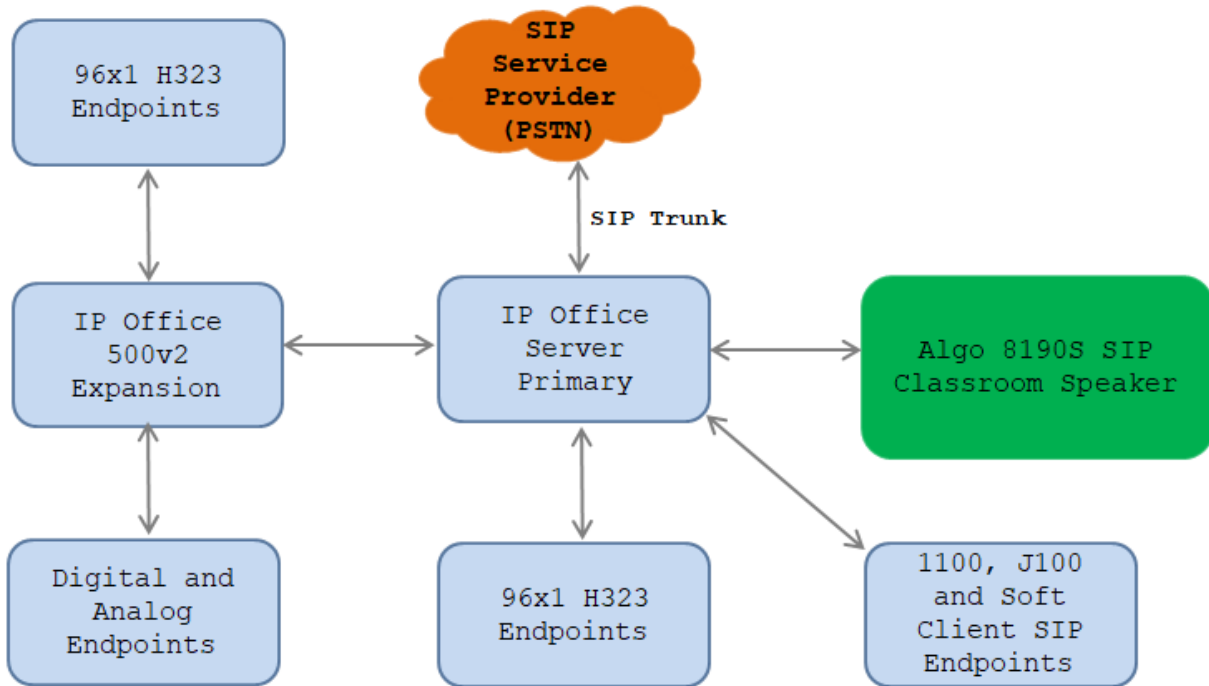


Figure 1: Test Configuration Diagram

The following table indicates the IP addresses that were assigned to the systems in the test configuration diagram:

Description	IP Address
IP Office Primary Server Edition	10.33.1.110
IP Office 500V2 Expansion	10.33.1.55
Avaya SIP and H323 Endpoint	10.33.5.30-10.33.5.36
Algo 8190S SIP Classroom Speaker	172.16.199.10

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment/Software	Release/Version
Avaya	
Avaya IP Office Primary Server Edition running on Virtual Environment	11.0.4.1.0 Build 11
Avaya IP Office 500v2 Expansion	11.0.4.1.0 Build 11
Avaya IP Office DIG DCPx16 V2	11.0.4.1.0 Build 11
Avaya IP Office Manager	11.0.4.1.0 Build 11
Avaya 96x1 Series IP Deskphones (H.323)	Version 6.6604
Avaya 1140E IP Deskphones (SIP)	SIP1140e Ver. 04.04.23.00
Avaya IX Workplace for Windows	3.7.4.22.1
Avaya J129 SIP Deskphone	4.0.3.1
Algo 8190S SIP Classroom Speaker	3.1.3

Note: Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500v2 and also when deployed with all configurations of IP Office Server Edition.

5. Configure Avaya IP Office

This section provides the procedures for configuring Avaya IP Office. The procedures include the following areas:

- Verify IP Office license
- Obtain LAN IP address
- Administer SIP registrar
- Administer SIP extensions
- Administer SIP users
- Administer Internal Twinning

5.1. Verify IP Office License

From a PC running the Avaya IP Office Manager application, select **Start → Programs → IP Office → Manager** to launch the Manager application. Select the proper IP Office system, and log in using the appropriate credentials.

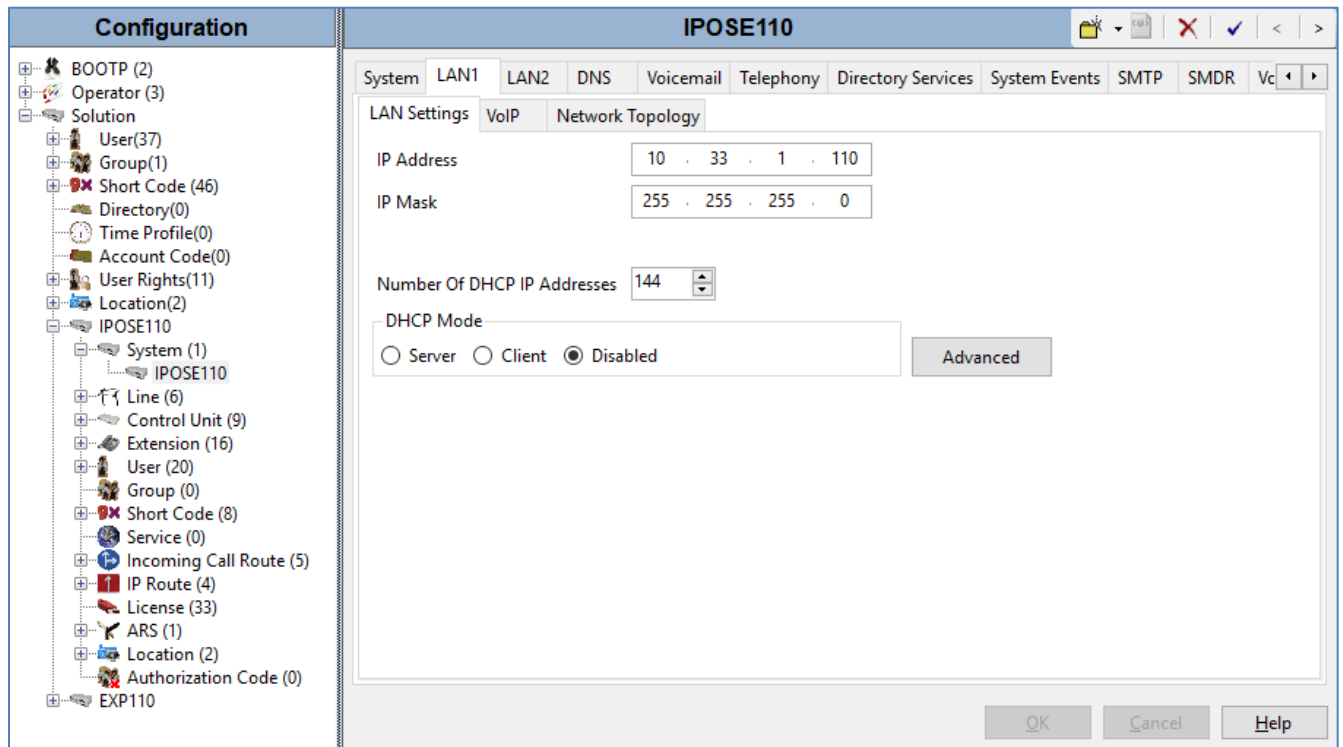
The **Avaya IP Office Manager** screen is displayed. From the configuration tree in the left pane, select **License**, the list of license displayed in the right panel. Verify that the **3rd Party IP Endpoints** status is “Valid”.

The screenshot shows the Avaya IP Office Manager interface. On the left is a configuration tree with 'License' selected. The main area displays a table of licenses under the 'Remote Server' tab. The table has columns for Feature, Instances, Status, Expiration Date, and Source. The '3rd Party IP Endpoints' row is highlighted in blue, showing a status of 'Valid'. Other rows include Power User, Avaya IP endpoints, IP500 Voice Networking Channels, SIP Trunk Channels, IP500 Universal PRI, CTI Link Pro, Wave User, Centralized Endpoints, Essential Edition, R8+ Preferred Edition (VM Pro), Server Edition, UMS Web Services, WebLM Model, WebLM Model 9.1, Avaya Mac Softphone, SM Trunk Channels, Web Collaboration, and Avaya Contact Center Select.

Feature	Instances	Status	Expiration Date	Source
Power User	384	Valid	Never	PLDS Nodal
Avaya IP endpoints	384	Valid	Never	PLDS Nodal
IP500 Voice Networking Channels	32	Obsolete	Never	PLDS Nodal
SIP Trunk Channels	512	Valid	Never	PLDS Nodal
IP500 Universal PRI (Additional cha...	100	Obsolete	Never	PLDS Nodal
CTI Link Pro	5	Valid	Never	PLDS Nodal
Wave User	16	Obsolete	Never	PLDS Nodal
3rd Party IP Endpoints	384	Valid	Never	PLDS Nodal
Centralized Endpoints	100	Obsolete	Never	PLDS Nodal
Essential Edition	5	Obsolete	Never	PLDS Nodal
R8+ Preferred Edition (VM Pro)	5	Obsolete	Never	PLDS Nodal
Server Edition	5	Valid	Never	PLDS Nodal
UMS Web Services	100	Valid	Never	PLDS Nodal
WebLM Model	1	Obsolete	Never	PLDS Nodal
WebLM Model 9.1	1	Obsolete	Never	PLDS Nodal
Avaya Mac Softphone	100	Valid	Never	PLDS Nodal
SM Trunk Channels	128	Valid	Never	PLDS Nodal
Web Collaboration	64	Valid	Never	PLDS Nodal
Avaya Contact Center Select	5	Valid	Never	PLDS Nodal

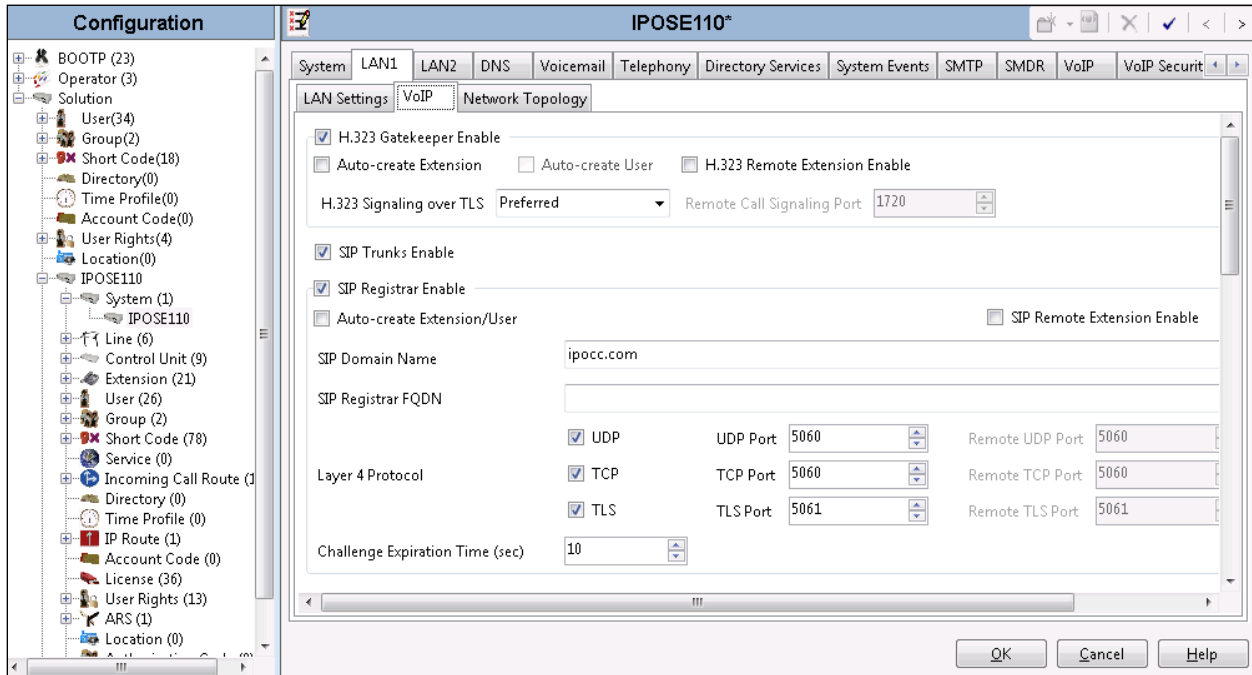
5.2. Obtain LAN IP Address

From the configuration tree in the left pane, select System to display the **IPOSE110** screen in the right pane. Select the LAN1 tab, followed by the LAN Settings sub-tab in the right pane. Make a note of the IP Address, which will be used later to configure the Algo 8190S endpoint. Note that IP Office can support SIP extensions on the LAN1 and/or LAN2 interfaces, and the compliance testing used the LAN1 interface.



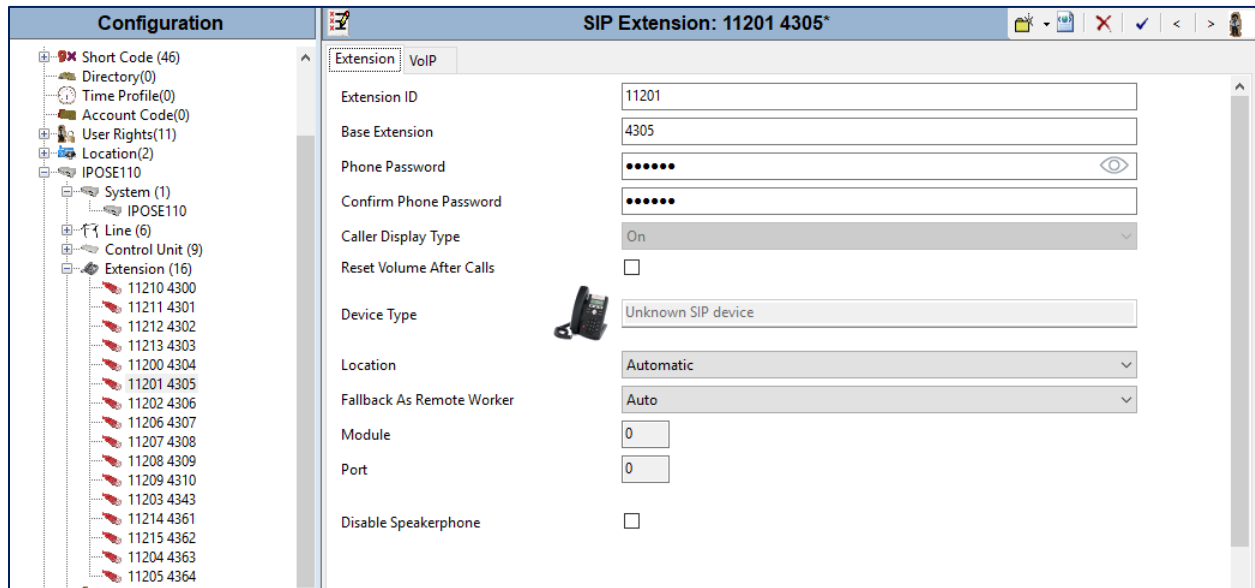
5.3. Administer SIP Registrar

Select the **VoIP** sub-tab. Make certain that **SIP Registrar Enable** is checked, as shown below. Enter a valid sip domain name for SIP endpoints to use for registration with IP Office. In the compliance testing, the sip domain name **ipocc.com** was used so the SIP endpoints used the sip domain name for registration.

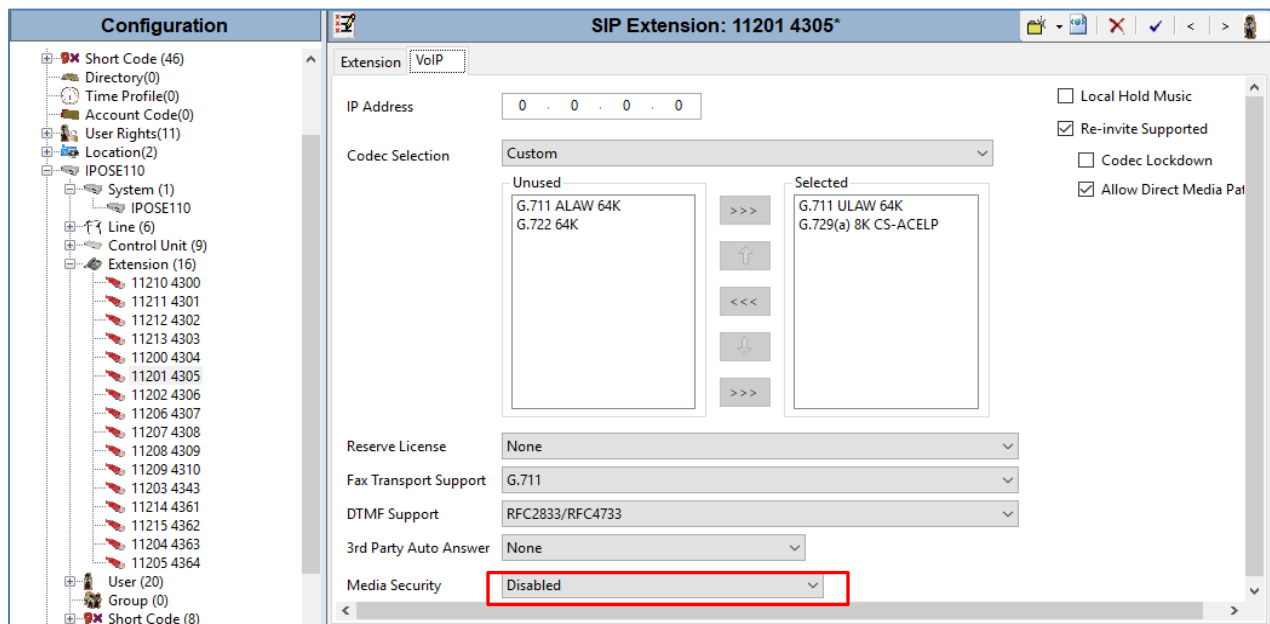


5.4. Administer SIP Extensions

From the configuration tree in the left pane, right-click on **Extension** and select **New → SIP Extension** from the pop-up list to add a new SIP extension. For **Base Extension**, enter the SIP door extension “**4305**”, enter password in the **Phone Password** and **Confirm Phone Password** fields and retain the default values in the remaining fields.



Select the **VoIP** tab, select **Disabled** in the **Media Security** field and retain other fields at default values. Repeat this section to add additional SIP extensions as desired.



5.5. Administer SIP User

From the configuration tree in the left pane; right-click on **User** tab and select **New** from the pop-up list. Enter desired values for **Name**. For **Extension**, enter the **4305** extension from **Section 5.4**. Remember these values as they will be needed to register Algo 8190S to IP Office. Enter desired values for **Password** and **Confirm Password**.

The screenshot shows the IP Office configuration interface for user 4305: 4305. The left pane displays the configuration tree with 'User (20)' expanded and '4305 4305' selected. The main pane shows the 'User' configuration form with the following fields and values:

Field	Value
Name	4305
Password	••••••
Confirm Password	••••••
Unique Identity	
Conference PIN	
Confirm Audio Conference PIN	
Account Status	Enabled
Full Name	SIP 4305
Extension	4305
Email Address	
Locale	
Priority	5
System Phone Rights	None
ACCS Agent Type	None

Select the **Telephony** tab, followed by the **Supervisor Settings** sub-tab, and enter a desired **Login Code**. This **Login Code** is needed to register the Algo 8190S to IP Office. Note: if the **Phone Password** in the **Extension** tab in **Section 5.4** is configured, the password in the **Phone Password** must be used for the registration, in case the **Phone Password** is left blank then the code in the **Login Code** is used for the registration. The difference between **Phone Password** and **Login Code** is that the **Phone Password** can combine letter and number while **Login Code** only allows number.

The screenshot shows the IP Office configuration interface for user 4309: 4309. The left pane displays the configuration tree with 'User (26)' expanded and '4309 4309' selected. The main pane shows the 'Telephony' configuration form with the 'Supervisor Settings' sub-tab active. The following fields and values are visible:

Field	Value
Login Code	••••••
Confirm Login Code	••••••
Login Idle Period (sec)	
Monitor Group	<None>
Coverage Group	<None>
Status on No-Answer	Logged On (No change)
IPOCC Agent Type	<None>
Privacy Override Group	<None>
Reset Longest Idle Time	All Calls (selected)
Force Login	<input type="checkbox"/>
Force Account Code	<input type="checkbox"/>
Force Authorization Code	<input type="checkbox"/>
Incoming Call Bar	<input type="checkbox"/>
Outgoing Call Bar	<input type="checkbox"/>
Inhibit Off-Switch Forward/Transfer	<input type="checkbox"/>
Can Intrude	<input type="checkbox"/>
Cannot Be Intruded	<input checked="" type="checkbox"/>
Can Trace Calls	<input type="checkbox"/>
Deny Auto Intercom Calls	<input type="checkbox"/>

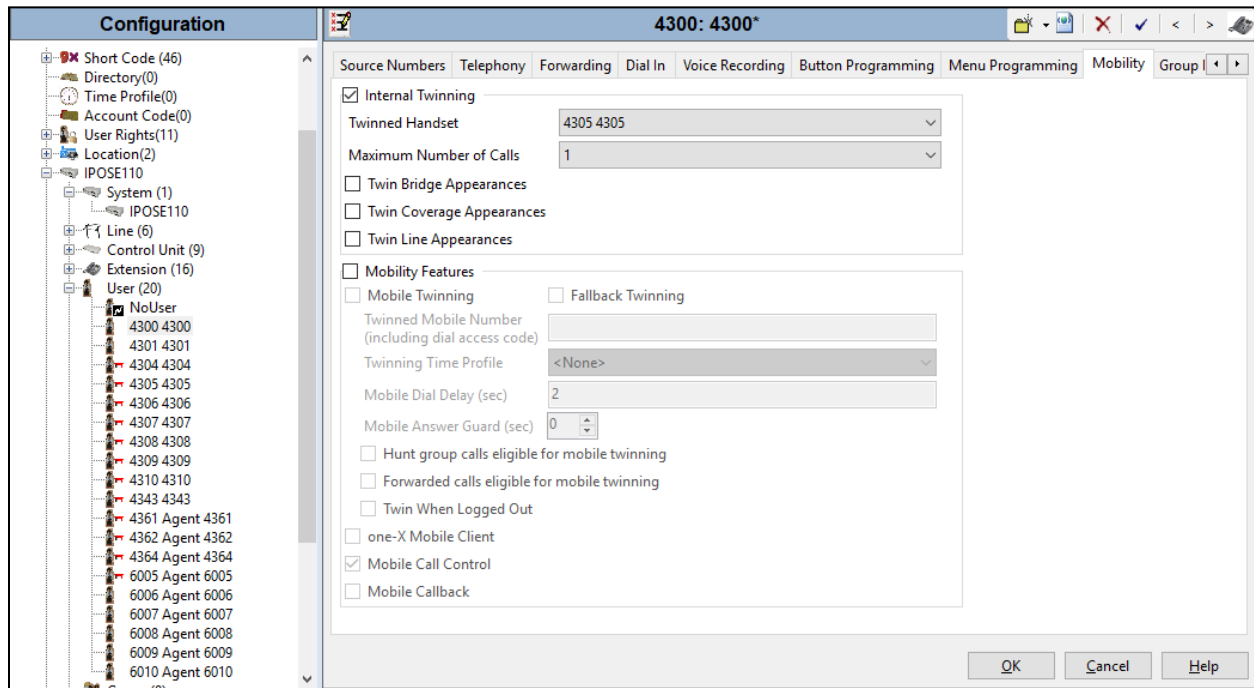
5.6. Administer Internal Twinning

From the configuration tree in the left pane, select the desk phone user that will be associated with the loud ringing user. In this case, desk phone user “4300”.

The screenshot displays a configuration interface for a user named "4300". The left pane shows a configuration tree with the following structure:

- Configuration
 - Short Code (46)
 - Directory(0)
 - Time Profile(0)
 - Account Code(0)
 - User Rights(11)
 - Location(2)
 - IPOSE110
 - System (1)
 - IPOSE110
 - Line (6)
 - Control Unit (9)
 - Extension (16)
 - User (20)
 - NoUser
 - 4300 4300**
 - 4301 4301
 - 4304 4304
 - 4305 4305
 - 4306 4306
 - 4307 4307
 - 4308 4308
 - 4309 4309
 - 4310 4310
 - 4343 4343
 - 4361 Agent 4361
 - 4362 Agent 4362
 - 4364 Agent 4364
 - 6005 Agent 6005
 - 6006 Agent 6006
 - 6007 Agent 6007

Select the **Mobility** tab, and check **Internal Twinning**. In the **Twinned Handset** field, select the loud ringing user from **Section 5.5**. Retain the default values in the remaining fields. Note that with the Internal Twinning configuration, the Algo 8190S loud extension 4305 will be acting like secondary extension of the extension 4300 which is configured as primary and direct call to the secondary will always get busy. This is design intend of Internal Twining feature in IP Office. In order to place direct call to the Algo 8190S endpoint's loud ringing extension, do not configure it twinned with a deskphone.

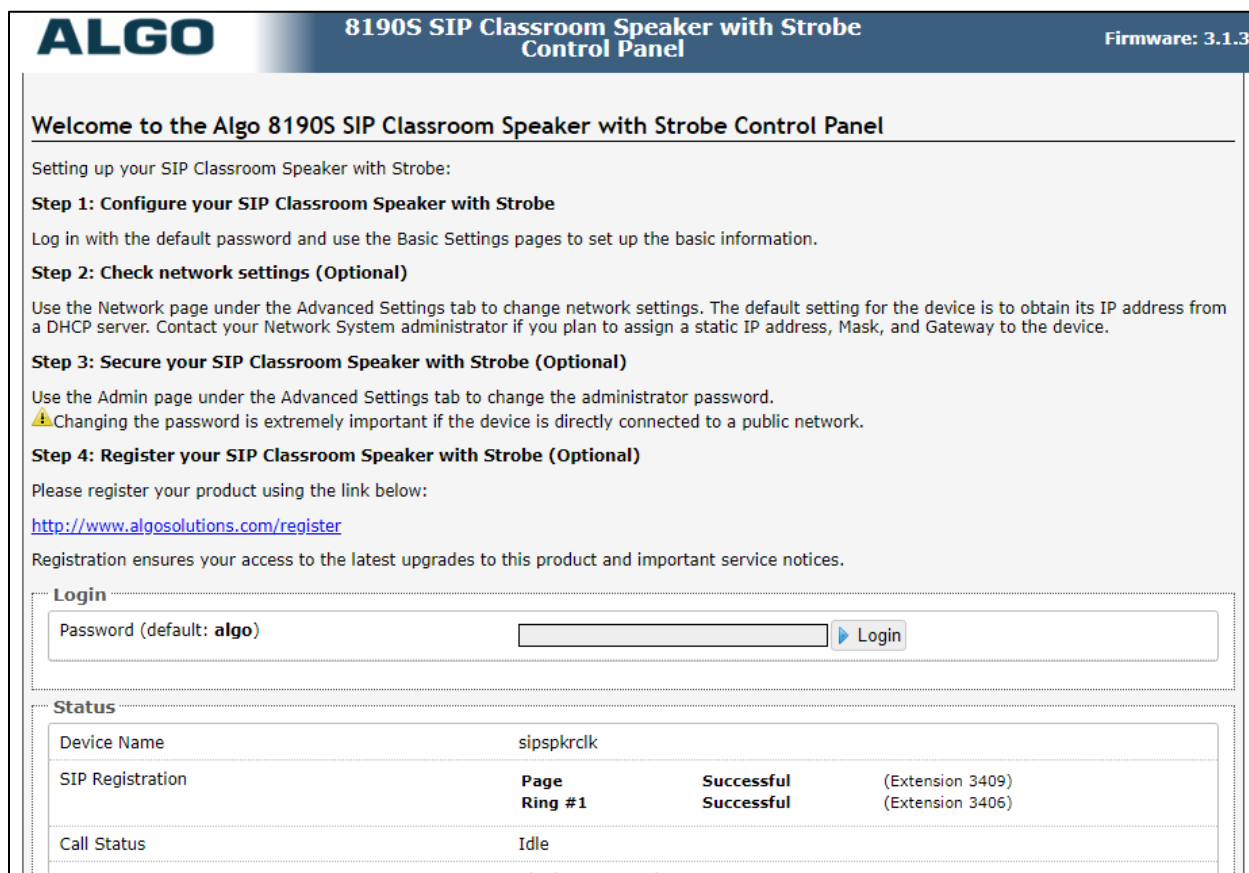


6. Configure Algo 8190S SIP Classroom Speaker

This section provides the procedures for configuring Algo 8190S Classroom Speaker. The

6.1. Launch Web Interface

Access the 8190S SIP Classroom Speaker web-based interface by using the URL “http://ip-address” in an Internet browser window, where “ip-address” is the IP address of the 8190S SIP Classroom Speaker. The **Welcome to 8190S SIP Classroom Speaker with Strobe Control Panel** screen is displayed, as shown below. Log in using the appropriate credentials.



ALGO 8190S SIP Classroom Speaker with Strobe Control Panel Firmware: 3.1.3

Welcome to the Algo 8190S SIP Classroom Speaker with Strobe Control Panel

Setting up your SIP Classroom Speaker with Strobe:

Step 1: Configure your SIP Classroom Speaker with Strobe
Log in with the default password and use the Basic Settings pages to set up the basic information.

Step 2: Check network settings (Optional)
Use the Network page under the Advanced Settings tab to change network settings. The default setting for the device is to obtain its IP address from a DHCP server. Contact your Network System administrator if you plan to assign a static IP address, Mask, and Gateway to the device.

Step 3: Secure your SIP Classroom Speaker with Strobe (Optional)
Use the Admin page under the Advanced Settings tab to change the administrator password.
⚠ Changing the password is extremely important if the device is directly connected to a public network.

Step 4: Register your SIP Classroom Speaker with Strobe (Optional)
Please register your product using the link below:
<http://www.algosolutions.com/register>
Registration ensures your access to the latest upgrades to this product and important service notices.

Login

Password (default: algo)

Status

Device Name	sipsprcklk		
SIP Registration	Page Ring #1	Successful Successful	(Extension 3409) (Extension 3406)
Call Status	Idle		

6.2. Administer Algo 8190S

Select **Basic Settings** → **SIP** from the top menu, to display the screen below. Configure the **SIP Account** section toward the bottom of the screen as desired to match the configuration. Enter the following values for the specified fields, and retain the default values in the remaining fields.

- **SIP Domain (Proxy Server):** Enter the SIP domain name as configured in **Section 5.2**.
- **Ring/Alert Mode:** Select the **Monitor** “Ring” event on registered SIP extension.
- **Ring/Alert Extension:** Enter the SIP user extension as configured in **Section 5.4**.

- **Authentication ID:** Enter the SIP user name as configured in **Section 5.5**.
- **Authentication password:** Enter the SIP password extension from **Section 5.4** or the SIP user login code from **Section 5.5**.
- Enter the Authentication Extension and ID and password for the Page extension.

ALGO
8190S SIP Classroom Speaker with Strobe
Control Panel
Firmware: 3.1.3

Status
Basic Settings
Additional Features
Advanced Settings
System
Logout

SIP
Features
Clock
Strobe
Multicast

SIP Settings

SIP

ⓘ This section allows the SIP server information & account credentials to be entered. This information should be obtained from your telephone system administrator or hosted account provider. After saving these settings, see the [Status](#) tab to confirm successful registration.

SIP Domain (Proxy Server)	ipocc.com	<i> ⓘ Default port is 5060. To specify a different port, enter PROXY:PORT, e.g. my_proxy.com:5070, or 192.168.1.10:5080.</i>
Ring/Alert Mode	<input checked="" type="radio"/> Monitor "Ring" event on registered SIP extension <input type="radio"/> None	
Ring/Alert Extension	4305	
Authentication ID	4305	
Authentication Password	
Display Name (Optional)	Ring 8190	
<i> ⓘ The device will detect inbound ring events on this extension and play the alerting tone until the inbound call stops ringing. It will not answer the call on this extension.</i>		
Base/Page Extension	4306	
Authentication ID	4306	
Authentication Password	
Display Name (Optional)	Page 8190	

Navigate to **Advanced Settings** → **Advanced SIP**. The **Advanced SIP** page is displayed, enter the LAN1 IP address of IP Office Primary in the **Outbound Proxy** and keep other values at default.

Click on **Save** button to save the configuration.

ALGO 8190S SIP Classroom Speaker with Strobe Control Panel Firmware: 3.1.3

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

Network Admin Time Provisioning Advanced Audio **Advanced SIP** Advanced Multicast

Advanced SIP Settings

General

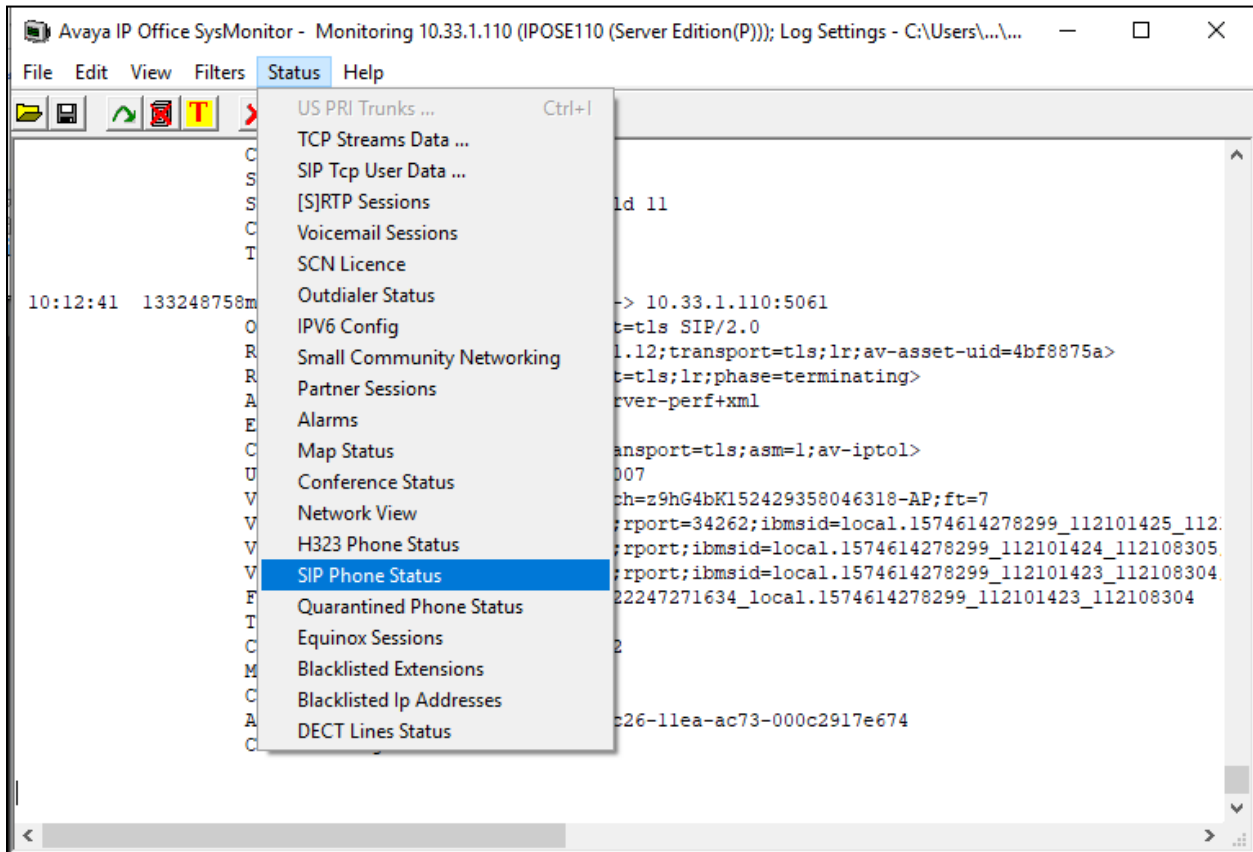
SIP Transportation	Auto	<p>Select Auto to check DNS NAPTR record, then try UDP/TCP.</p> <p>In TLS mode, if the SIP Server requires endpoints to be authenticated, a PEM file containing both a device certificate and a private key needs to be installed on the Algo device. Use the "System > File Manager" tab to upload a certificate file renamed to 'sipclient.pem' in the 'certs' folder.</p>
SIPS Scheme	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	
Validate Server Certificate	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	<p>Validate the SIP server against common certificate authorities. To validate against additional certificates, use the "System > File Manager" tab to upload a Base64 encoded X.509 certificate file in .pem, .cer, or .crt format to the 'certs/trusted' folder.</p>
Force Secure TLS Version	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	<p>Enable this option to require TLS connections to use TLSv1.2.</p>
SDP SRTP Offer	Disabled	
SIP Outbound Support (RFC 5626)	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	<p>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.</p>
Outbound Proxy	10.33.1.110	
Register Period (seconds)	3600	

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya IP Office and Algo 8190S SIP Classroom Speaker.

7.1. Verify Avaya IP Office

From a PC running the Avaya IP Office Monitor application, select **Start → Programs → IP Office → System Monitor** to launch the application. The **Avaya IP Office SysMonitor** screen is displayed, as shown below. Select **Status → SIP Phone Status** from the top menu.



The **SIPPhoneStatus** screen is displayed and select the **Registered** radio button in the **Display Options** area it displays all SIP users currently register to IP Office. Verify that there are two extensions for the Algo 8190S ring and page in the list.

SIPPhoneStatus

Total Configured: 10 Waiting 1 secs for update

Total Registered: 6 Registered Status: [Progress Bar]

Extn Num	User Num	Phone Type	Security	Behind...	IP Address	Priva...	Transport	User Agent	Licensed	SIP Optic
4304	4304	SIP	disable		172.16.199.100		UDP	Panasonic-KX-TGP600/10.008 (4c36...	3rd Party IP	RU
4305	4305	SIP	disable		172.16.199.10		UDP	Algo-8190S/3.1.3	3rd Party IP	R
4306	4306	SIP	disable		172.16.199.10		UDP	Algo-8190S/3.1.3	3rd Party IP	R
4343	4343	AVAYA_A...	best effort		10.33.1.57		TLS	Avaya Nebraska Contact Center 7.0...	Avaya IP	R
4309	4309	1140E_SIP	best effort		192.168.199.6		TCP	Avaya IP Phone 1140E (SIP1140e.04...	Avaya IP	RU
4310	4310	J129 SIP	best effort		192.168.199.7		TLS	Avaya J129 IP Phone 4.0.3.1.4 a478...	Avaya IP	RU

Display Options: Show All Registered UnRegistered Page 1 Save Page Reset Phones Reregister Phones Cancel

7.2. Verify Algo 8190S SIP Classroom Speaker

From the Algo 8190S Classroom Speaker web-based interface, select **Status** from the top menu. Verify that **SIP Registration** displays “Successful” in the **SIP Registration** as shown below.

ALGO 8190S SIP Classroom Speaker with Strobe Control Panel Firmware: 3.1.3

Device Status

Welcome to the Algo 8190S SIP Classroom Speaker with Strobe Control Panel

Setting up your SIP Classroom Speaker with Strobe:

Step 1: Configure your SIP Classroom Speaker with Strobe
Log in with the default password and use the Basic Settings pages to set up the basic information.

Step 2: Check network settings (Optional)
Use the Network page under the Advanced Settings tab to change network settings. The default setting for the device is to obtain its IP address from a DHCP server. Contact your Network System administrator if you plan to assign a static IP address, Mask, and Gateway to the device.

Step 3: Secure your SIP Classroom Speaker with Strobe (Optional)
Use the Admin page under the Advanced Settings tab to change the administrator password.
⚠ Changing the password is extremely important if the device is directly connected to a public network.

Step 4: Register your SIP Classroom Speaker with Strobe (Optional)
Please register your product using the link below:
<http://www.algosolutions.com/register>
Registration ensures your access to the latest upgrades to this product and important service notices.

Status

Device Name	sipskrclk		
SIP Registration	Page	Successful	(Extension 4306)
	Ring #1	Successful	(Extension 4305)
Call Status	Idle		

The following tests were conducted to verify the solution between the Algo 8190S and Avaya IP Office.

- Verify that the incoming call to the twinning extension on the IP Office rings the 8190S and the 8190S stops ringing if the twinning extension answers the call
- Verify that the incoming call to the 8190S Page is automatically answered with clear audio path
- Verify that the telephone that places the incoming call to the 8190S can do conference, transfer, mute, un-mute and provide busy tone if it is on another call
- Verify that the solution works with different Avaya clients (e.g. digital, analog, IP etc).
- Verify that 8190S goes into an idle state when the call is completed
- Verify that the 8190S re-registers without issues if the Ethernet cable is unplugged and plugged back in

8. Conclusion

These Application Notes describe the procedures required to configure Algo 8190S SIP Classroom Speaker to interoperate with Avaya IP Office Server Edition using as SIP 3rd endpoint. All of the executed test cases have passed and met the objectives outlined in **Section 2.1**.

9. Additional References

This section references the documentation relevant to these Application Notes. Product documentation for Avaya IP Office, including the following, is available at:

<http://support.avaya.com/>

- [1] *Avaya IP Office Platform Solution Description*, Release 11.0, August 2019.
- [2] *Avaya IP Office Platform Feature Description*, Release 11.0, August 2019.
- [3] *IP Office Platform 11.0 Deploying Avaya IP Office Essential Edition*, Document Number 15-601042, Issue 3, 20 August 2019.
- [4] *Administering Avaya IP Office Platform with Manager*, Release 11.0, August 2019.
- [5] *IP Office Platform 10.1 Using Avaya IP Office Platform System Status*, Document 15-601758, Issue 1, August 2019.
- [6] *IP Office Platform 11.0 Using IP Office System Monitor*, Document 15-601019, Issue 09b, August 2019.

Additional Avaya IP Office documentation can be found at:

<http://marketingtools.avaya.com/knowledgebase/>

Product documentation for the Algo 8190S SIP Classroom Speaker products may be found at:

<http://www.algosolutions.com/products/speakers/8190.html>

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