



**Application Notes for configuring Axis Communications AB
AXIS C2005 Network Ceiling Speaker with Avaya IP Office
Server Edition and 500v2 Expansion 10.1 – Issue 1.0**

Abstract

These Application Notes describe the configuration steps for provisioning the AXIS C2005 Network Ceiling Speaker from Axis Communications AB to interoperate with Avaya IP Office Server Edition and 500v2 Expansion.

Readers should pay particular attention to the scope of testing as outlined in **Section 2.1**, as well as 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 for provisioning the AXIS C2005 Network Ceiling Speaker from Axis Communications AB to interoperate with Avaya IP Office Server Edition and 500v2 Expansion.

AXIS C2005 Network Ceiling Speaker is an indoor loudspeaker that provides clear, long-range speech for remote speaking. The loudspeaker can play a pre-recorded audio file when it is manually or automatically triggered in response to an alarm event.

The unit supports Session Initiation Protocol (SIP) for easy integration with Avaya IP Office and the AXIS C2005 Network Ceiling Speaker makes announcements possible from anywhere with network connectivity. It easily integrates with video management software (VMS) that support two-way audio and with Voice over IP (VoIP) telephony systems that use SIP (Session Initiation Protocol).

2. General Test Approach and Test Results

The interoperability compliance testing evaluates the ability of the AXIS C2005 Network Ceiling Speaker (Axis Speaker) to receive calls from Avaya Digital, H.323 and SIP desk phones as well as mobile/PSTN endpoints. The speaker is registered to IP Office as a SIP endpoint.

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's formal testing and Declaration of Conformity is provided only on the headsets/Smartphones that carry the Avaya brand or logo. Avaya may conduct testing of non-Avaya headset/handset to determine interoperability with Avaya phones. However, Avaya does not conduct the testing of non-Avaya headsets/Smartphones for: Acoustic Pressure, Safety, Hearing Aid Compliance, EMC regulations, or any other tests to ensure conformity with safety, audio quality, long-term reliability or any regulation requirements. As a result, Avaya makes no representations whether a particular non-Avaya headset will work with Avaya's telephones or with a different generation of the same Avaya telephone.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya products. 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 these Application Notes, the interface between Avaya systems and the Network Ceiling Speaker did not include use of any specific encryption features as requested by Axis Communications.

2.1. Interoperability Compliance Testing

The compliance testing included the test scenarios shown below. Note that when applicable, all tests were performed with Avaya SIP phones, H.323 phones Digital phones, and PSTN endpoints.

- Registration of speaker.
- Invalid usernames/passwords for registration.
- Basic calls.
- Codec support.
- Serviceability testing.

2.2. Test Results

All test cases passed successfully with no issues or observations.

2.3. Support

Support from Avaya is available by visiting the website <http://support.avaya.com> and a list of product documentation can be found in **Section 9** of these Application Notes. Technical support for the AXIS C2005 Network Ceiling Speaker product can be obtained as follows:

Axis Communications AB

Tel: +46 46 272 18 00

Fax: +46 46 13 61 30

<http://www.axis.com/global/en/learning-and-support>

3. Reference Configuration

Figure 1 shows the network topology during compliance testing, an AXIS C2005 Network Ceiling Speaker from Axis Communications AB with Avaya IP Office server Edition and 500v2 Expansion.

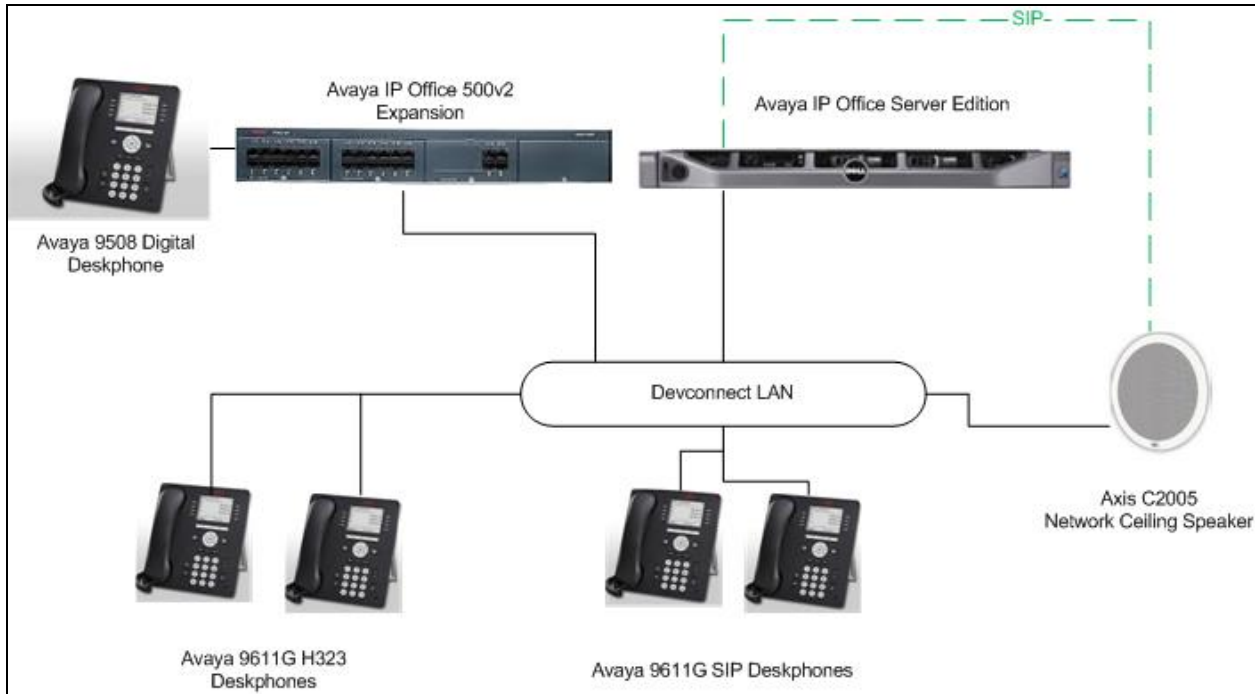


Figure 1: Connection of Axis Communications AB AXIS C2005 Network Ceiling Speaker with Avaya IP Office Server Edition and 500v2 Expansion.

4. Equipment and Software Validated

The following equipment and software was used for the compliance test.

Equipment/Software	Version/Release
Avaya IP Office Server Edition running on a virtual platform	R10.1.0.0.0 Build 237
Avaya IP Office 500 V2	R10.1.0.0.0 Build 237
Avaya IP Office Manager	R10.1.0.0.0 Build 237
Avaya 9608 Deskphone	H.323 Release 6.6401
Avaya 1120e Deskphone	SIP R04.04.23.00
Avaya 1616-I Deskphone	H323 1.390A
Avaya 9408 Digital Deskphone	V2.0
Axis Communications AB AXIS C2005 Ceiling Speaker	Firmware Version 1.65.032

Note: Testing was performed with IP Office Server Edition .Testing also applies to an IP Office 500 V2 standalone system.

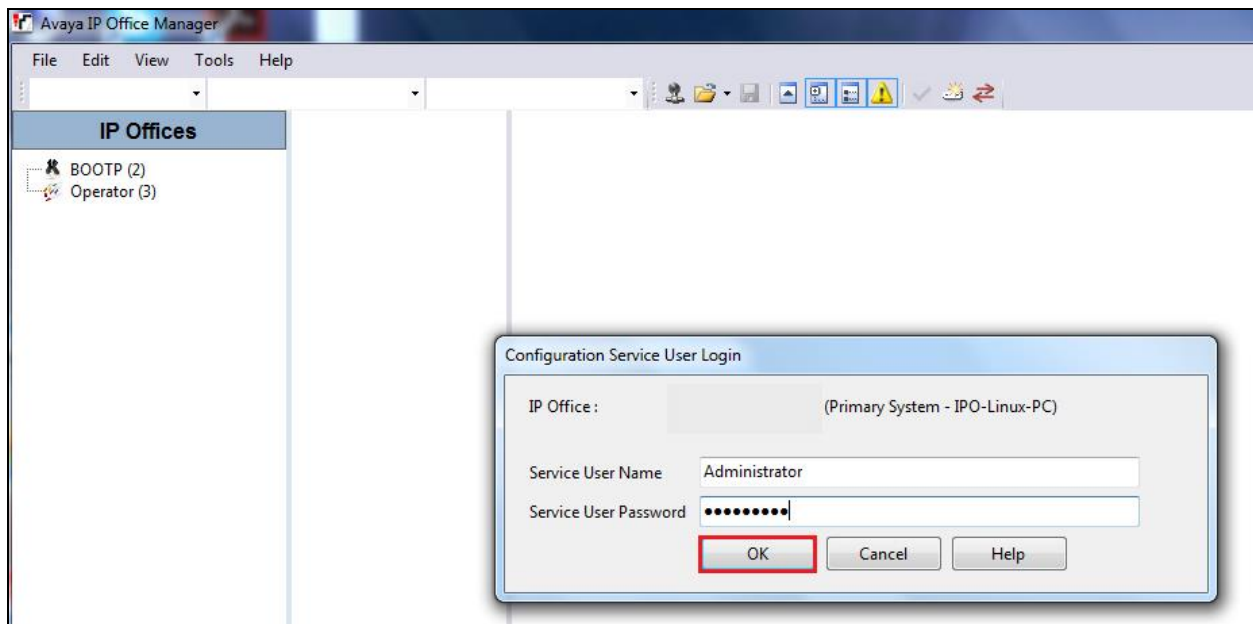
5. Configure Avaya IP Office

Configuration and verification operations on Avaya IP Office illustrated in this section were all performed using Avaya IP Office Manager. The information provided in this section describes the configuration of Avaya IP Office for this solution. It is implied a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration operations described in this section can be summarized as follows:

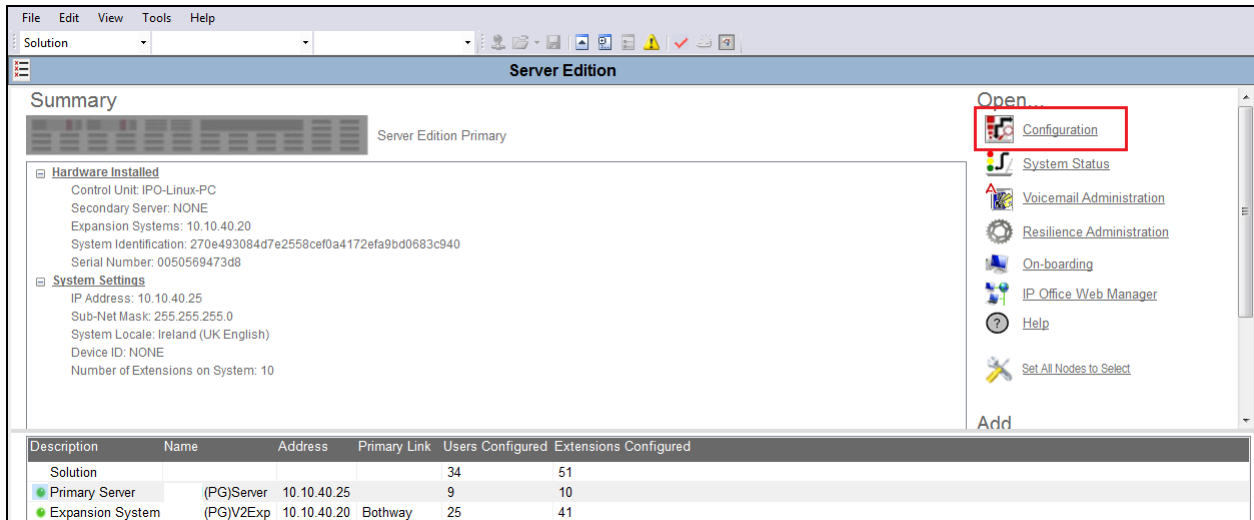
- Launch Avaya IP Office Manager.
- Display LAN Configuration.
- Configure New SIP User.
- Save Configuration.

5.1. Launch Avaya IP Office Manager

From the Avaya IP Office Manager PC, go to **Start** → **Programs** → **IP Office** → **Manager** to launch the Manager application or use the shortcut on the desktop (not shown). A login window will automatically appear, using the appropriate credentials click **OK** to log in.

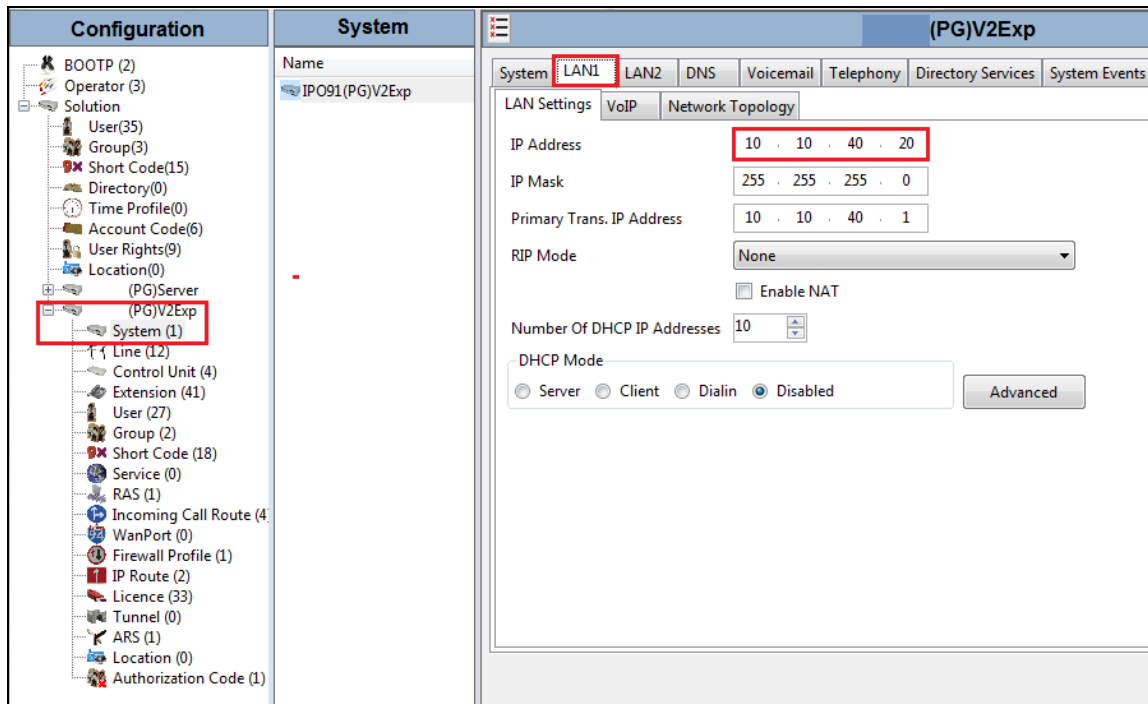


Click on **Configuration** to open the configuration GUI for both the Server Edition system and the expansion system.

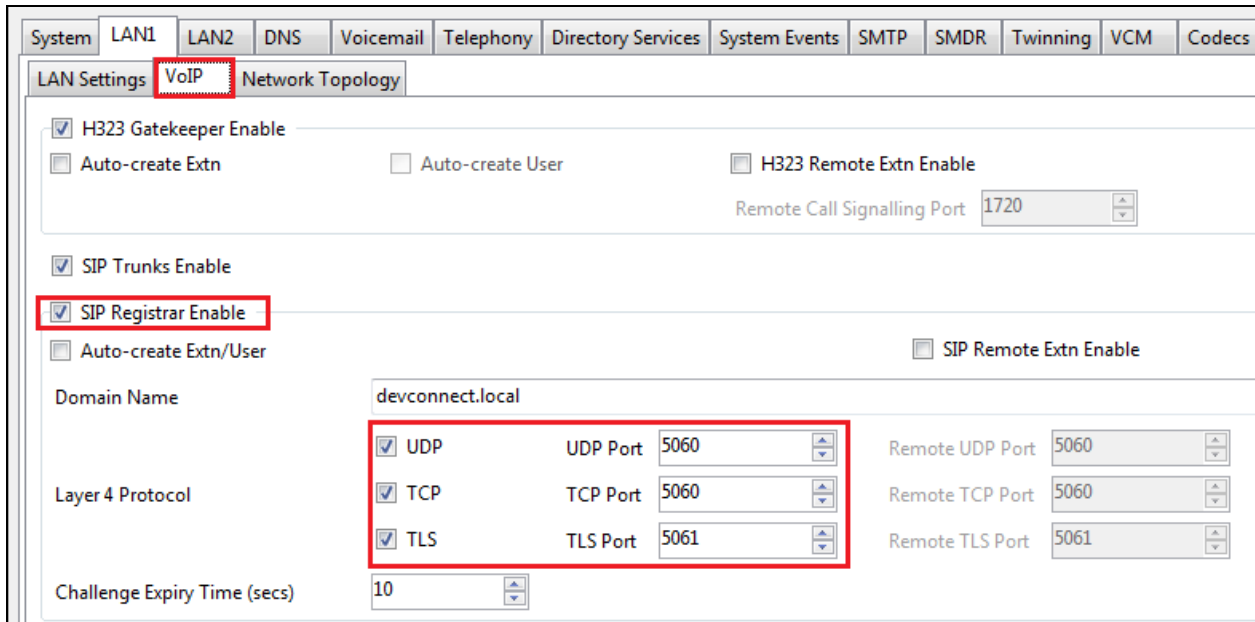


5.2. Display LAN Configuration

Once logged in, navigate to **System** in the left window and this will display the IP Office system properties in the main window. Select the **LAN1** tab in the main window and within that tab select the **LAN Settings** tab. This displays the **IP Address** information for the Axis speaker to register to in **Section 5.3**.

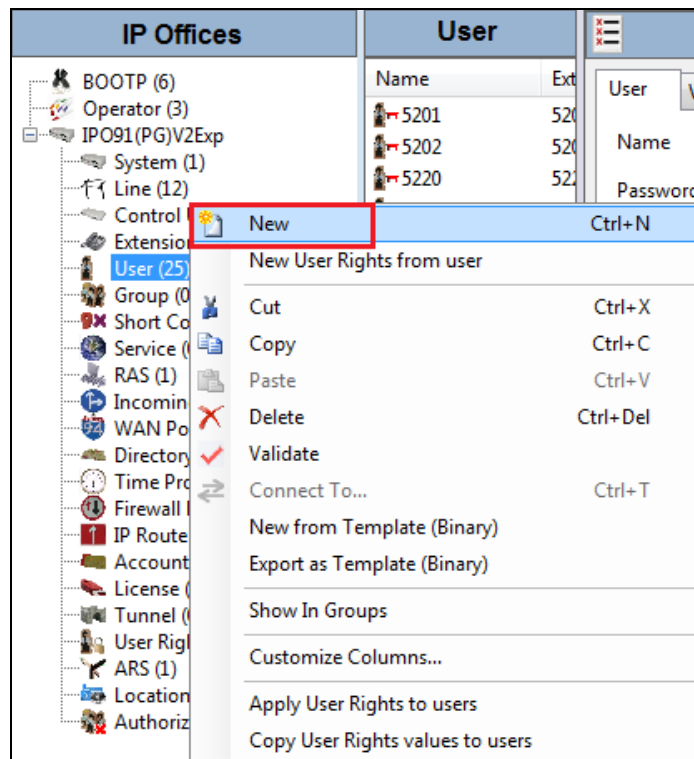


Selecting the **VoIP** tab displays the **Domain Name** and the **UDP, TCP and TLS Port** details used in the configuration of the Axis speaker in **Section 5.3**



5.3. Configure New SIP User

From the left window right click on **Users** and select **New** as shown below, this will allow a new user to be added to IP Office, this new user will be a SIP user.



Within the **User** tab at the top of the screen, enter a suitable **Name** and **Password** for the user. Add the **Extension** number as shown below.

The screenshot shows a web-based configuration interface with a top navigation bar containing several tabs: 'User', 'Voicemail', 'DND', 'ShortCodes', 'Source Numbers', 'Telephony', 'Forwarding', 'Dial In', 'Voice Recording', and 'Button Programming'. The 'User' tab is highlighted with a red box. Below the tabs is a form with the following fields and options:

Name	Axis
Password	••••
Confirm Password	••••
Conference PIN	
Confirm Conference PIN	
Account Status	Enabled
Full Name	Axis
Extension	5290
Email Address	
Locale	
Priority	5
System Phone Rights	None
ACCS Agent Type	None
Profile	Basic User

Below the Profile dropdown, there are five checkboxes:

- Receptionist
- Enable Softphone
- Enable one-X Portal Services
- Enable one-X TeleCommuter
- Enable Remote Worker

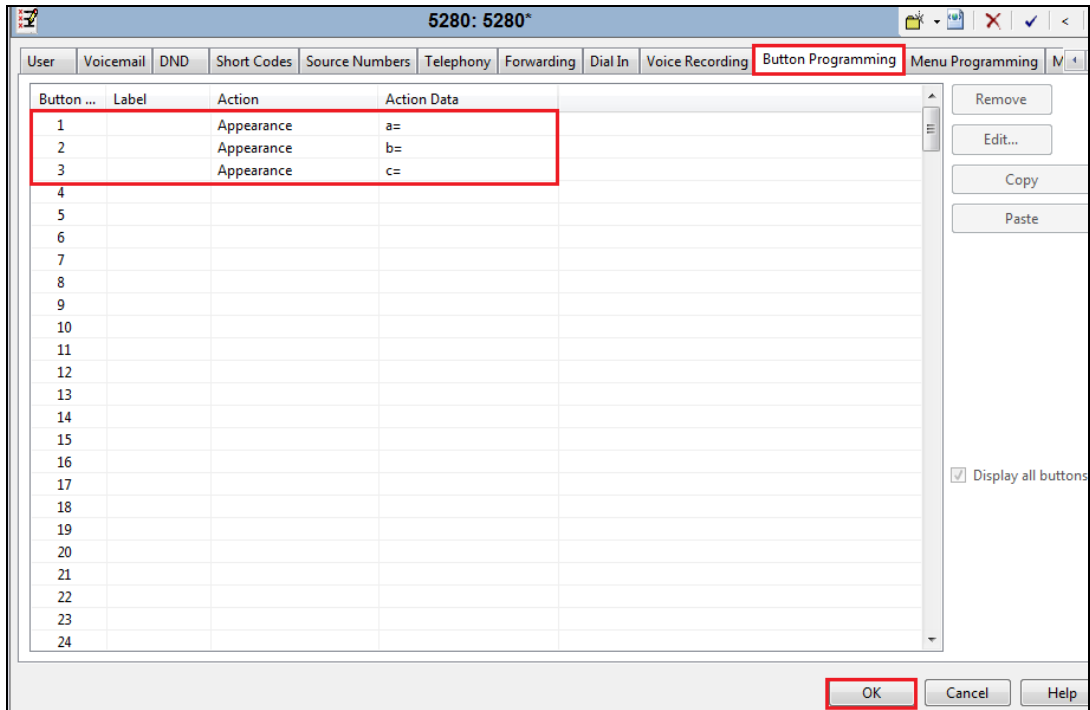
Navigate to the **Supervisor Settings** tab, enter the **Login Code** for the SIP user and note that this password will be required for the Axis speaker configuration in **Section 6.3**. Click on **OK** to save the configuration.

The screenshot shows a software window with a menu bar at the top containing: User, Voicemail, DND, ShortCodes, Source Numbers, **Telephony**, Forwarding, Dial In, Voice Recording, Button Programming, and Menu Programmin. Below the menu bar is a sub-menu bar with: Call Settings, **Supervisor Settings**, Multi-line Options, Call Log, and TUI. The main area contains the following fields and options:

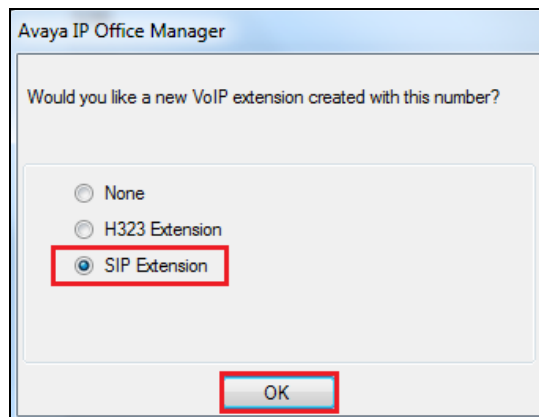
- Login Code: [.....]
- Confirm Login Code: [.....]
- Login Idle Period (secs): [.....]
- Monitor Group: [<None>]
- Coverage Group: [<None>]
- Status on No-Answer: [Logged On (No change)]
- Reset Longest Idle Time: [All Calls]
- Force Login:
- Force Account Code:
- Force Authorization Code:
- Incoming Call Bar:
- Outgoing Call Bar:
- Inhibit Off-Switch Forward/Transfer:
- Can Intrude:
- Cannot be Intruded:
- Can Trace Calls:
- Deny Auto Intercom Calls:

At the bottom right, there are three buttons: **OK**, Cancel, and Help.

Navigate to **Button Programming** and the three call appearance buttons should already be programmed, click on **OK**. If not create the appearance buttons (not shown) and click on **OK**.



On the subsequent screen, ensure that **SIP Extension** is selected and click on **OK** to create the SIP extension along with the new user.



5.4. Save Configuration

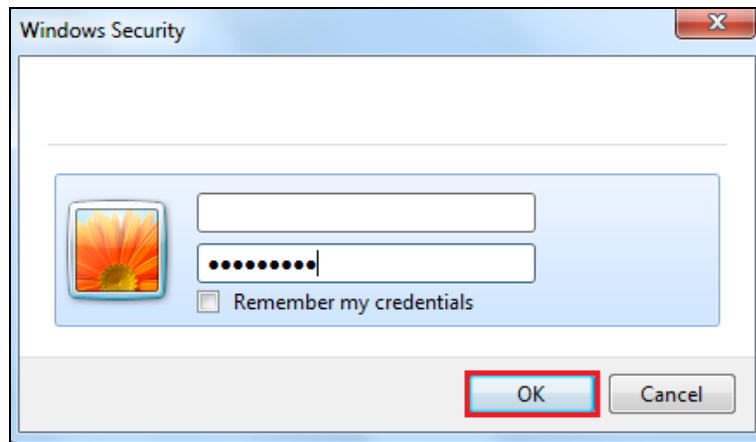
Once all the users and extensions have been created click on the **Save** icon at the top of the screen, which will bring up a new window and click on **OK** to save the new configuration (not shown).

6. Configure AXIS C2005 Network Ceiling Speaker

The configuration of the Axis speaker uses a web interface.

Note: The speaker obtains its IP address using DHCP and this was the way in which an IP address was given to the device during compliance testing.

Open a web session to the IP address of the Axis speaker, enter the proper credentials and click on **OK**.



Please refer to Axis Communications documentation listed in **Section 9** of these Application Notes for further information about the Axis speaker configuration. The following sections cover specific settings concerning SIP and the connection to IP Office.

6.1. Audio Settings

Although the audio settings are not relevant to the SIP connection with IP Office it is important as it governs the volume from the speaker and so it is shown below how to adjust this under **Audio** → **Audio Settings**.



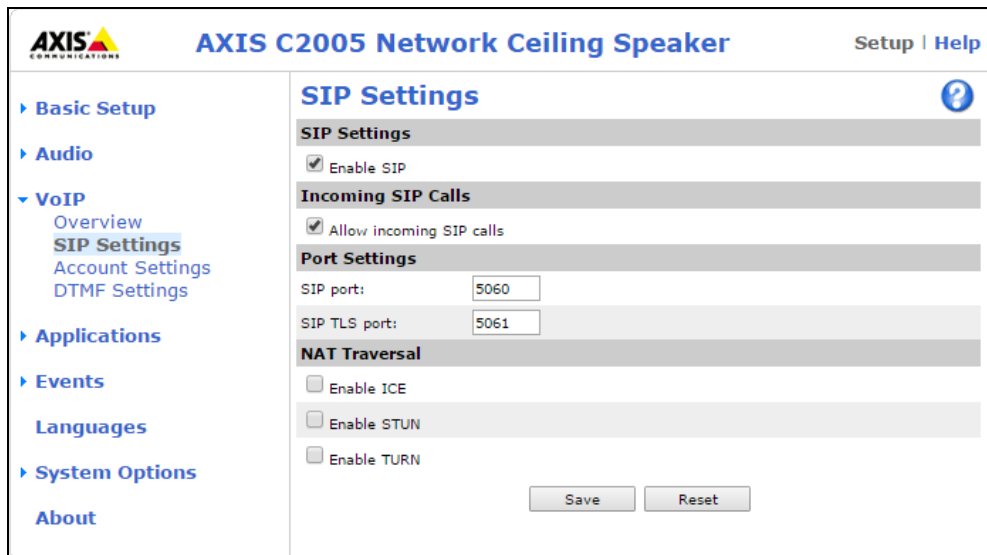
The screenshot shows the web interface for the AXIS C2005 Network Ceiling Speaker. The page title is "AXIS C2005 Network Ceiling Speaker" with "Setup | Help" in the top right. The left sidebar contains a navigation menu with the following items: Basic Setup, Audio (with sub-items: Audio Overview, Audio Settings, Audio Clips), VoIP, Applications, Events, Languages, System Options, and About. The main content area is titled "Audio Settings" and contains the following sections:

- Auto Speaker Test**: A "Test" button with a status message: "Status: The Auto Speaker Test must be calibrated before use."
- Calibrate Auto Speaker Test**: A "Calibrate" button with a status message: "Status: The Auto Speaker Test must be calibrated before use."
- Audio Channels**: "Audio mode:" set to "Simplex - Speaker only" with a dropdown arrow.
- Audio Output**: "Output gain:" with a slider control and a speaker icon showing "-10 dB".

At the bottom of the main content area are "Save" and "Reset" buttons.

6.2. Configure SIP Settings

Click on **VoIP** → **SIP Settings** in the left window, in the main window ensure that **Enable SIP** is ticked under **SIP Settings** and **Allow incoming SIP calls** under **Incoming SIP Calls**. Under **Port Settings** select the SIP ports that are to be used and click on **Save** once all is configured correctly.



The screenshot shows the web interface for the AXIS C2005 Network Ceiling Speaker, specifically the "SIP Settings" page. The page title is "AXIS C2005 Network Ceiling Speaker" with "Setup | Help" in the top right. The left sidebar contains a navigation menu with the following items: Basic Setup, Audio, VoIP (with sub-items: Overview, SIP Settings, Account Settings, DTMF Settings), Applications, Events, Languages, System Options, and About. The main content area is titled "SIP Settings" and contains the following sections:

- SIP Settings**: A checked checkbox for "Enable SIP".
- Incoming SIP Calls**: A checked checkbox for "Allow incoming SIP calls".
- Port Settings**: "SIP port:" set to "5060" and "SIP TLS port:" set to "5061".
- NAT Traversal**: Three unchecked checkboxes for "Enable ICE", "Enable STUN", and "Enable TURN".

At the bottom of the main content area are "Save" and "Reset" buttons.

6.3. Configure Account

Click on **Account Settings** under **VoIP** in the left window. Click on the **Add** button in the main window.

The screenshot shows the web interface for the AXIS C2005 Network Ceiling Speaker. The page title is "AXIS C2005 Network Ceiling Speaker" with "Setup | Help" in the top right. The left sidebar contains a navigation menu with categories: Basic Setup, Audio, VoIP (expanded), Applications, Events, Languages, System Options, and About. Under the VoIP section, the sub-items are Overview, SIP Settings, Account Settings (highlighted), and DTMF Settings. The main content area is titled "Account Settings" and features a table with the following headers: Name, SIP address, Transport, Default, and Reg. status. Below the table are three buttons: "Add...", "Modify...", and "Remove". The "Add..." button is highlighted with a red rectangular box. Below the buttons is a section titled "Test SIP Call" with the instruction "Make a test call from the selected SIP account to the specified SIP address." This section includes a text input field with the placeholder "Enter SIP address: sip(s):extension@domain" and a "Test call" button.

Enter the following details under the **General** tab:

- **Name:** Enter a suitable name for the SIP account.
- **User ID:** Enter the SIP user number configured in **Section 4.3**
- **Password:** Enter the password for the SIP user created in **Section 4.3**.
- **Caller ID:** This should be the extension number created in **Section 4.3**.
- **Domain Name:** The IP Office SIP domain.
- **Registrar address:** The IP address of the IP Office
- **Transport mode** This can be **UDP**, **TCP** or **TLS**. TLS was not tested as no 3rd Party Certificates were exchanged.

Click on **OK** to save the configuration.

Add Account ?

Account Information

Name:

Default account (Note that only one account can be the default account.)

Account Credentials

User ID:

Use User ID as Authentication ID

Authentication ID:

Password:

Caller ID:

SIP Server Settings

Domain name:

Registrar address:

Transport Settings

Enable SIPs

Transport mode:

Allow port update messages through MWI

Proxy Settings

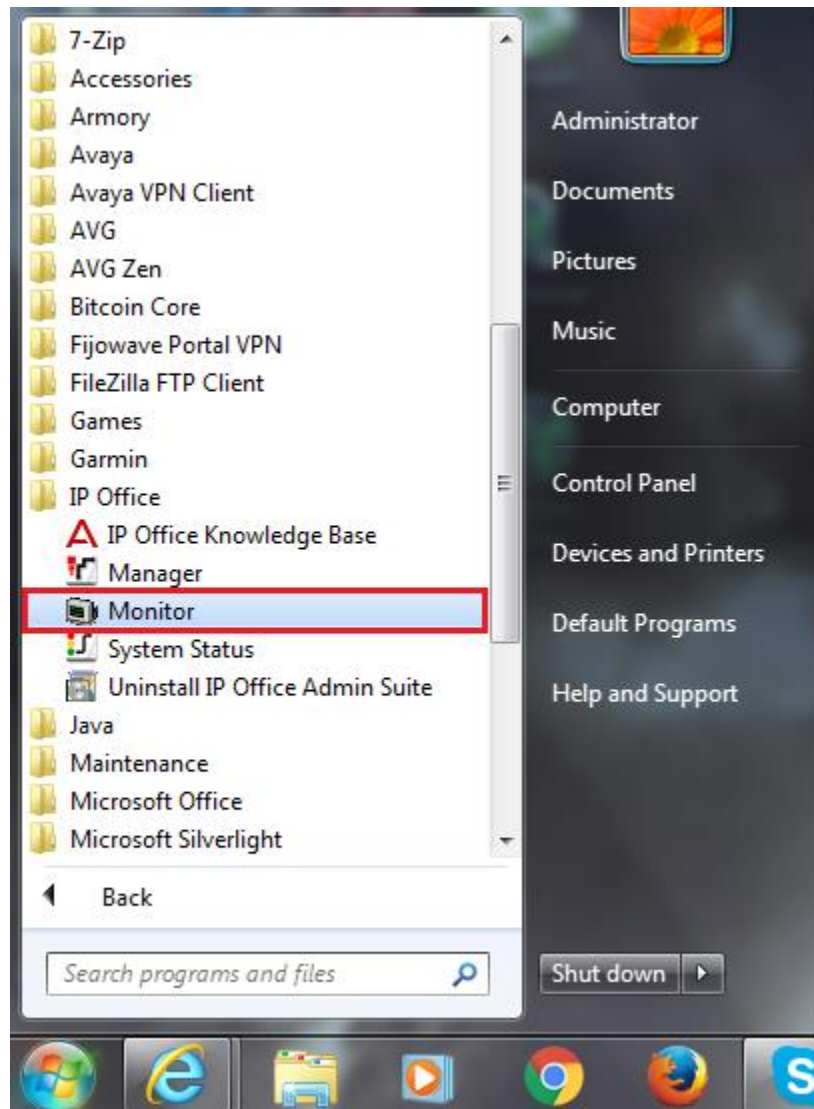
Address	Username
---------	----------

7. Verification Steps

Making a call to the Axis speaker and hearing voice is the ultimate verification that the product works and is connected and configured correctly. The steps below can also be taken to ensure that the Axis speaker is registered correctly with IP Office and some monitoring tips to see that this is the case.

7.1. Verify Registration from Avaya IP Office

Open IP Office **Monitor** as shown below.



Once connected to the desired IP Office, information on SIP calls and registrations will be shown (as long as the correct filter is applied for SIP messaging (not shown)). Below is an example of a message being displayed when a call is made from IP Office **Digital Ext 5201** to the speaker extension **5290**.

```
File Edit View Filters Status Help
[Icons]
601342945mS SIP Call Tx: phone
INVITE sip:5290@10.10.40.205;transport=TCP;ob SIP/2.0
Via: SIP/2.0/TCP 10.10.40.20:5060;rport;branch=z9hG4bK97d2d6273dad5e12d4683d2614b4bcb0
From: "Digital Ext 5201" <sip:5201@devconnect.local>;tag=12901157f4ba6193
To: <sip:5290@devconnect.local;transport=TCP;ob>
Call-ID: 27db75a754b7b1b4204ac844bdd459b0
CSeq: 1788984493 INVITE
Contact: "Digital Ext 5201" <sip:5201@10.10.40.20:5060;transport=tcp>
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,OPTIONS,BYE,INFO,REFER,NOTIFY,SUBSCRIBE,REGISTER,PUBLISH,UPDATE
Supported: timer,100rel
User-Agent: IP Office 9.1.6.0 build 153
P-Asserted-Identity: "Digital Ext 5201" <sip:5201@10.10.40.20:5060>
Content-Type: application/sdp
Content-Length: 320

v=0
o=UserA 670962484 1343193693 IN IP4 10.10.40.20
s=Session SDP
c=IN IP4 10.10.40.20
t=0 0
m=audio 49152 RTP/AVP 4 9 0 8 18 101
a=rtpmap:4 G723/8000
a=rtpmap:9 G722/8000
a=rtpmap:0 PCMU/8000
a=rtpmap:8 PCMA/8000
a=rtpmap:18 G729/8000
a=fmtp:18 annex=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-15
601342945mS SIP Tx: TCP 10.10.40.20:5060 -> 10.10.40.205:39202
INVITE sip:5290@10.10.40.205;transport=TCP;ob SIP/2.0
Via: SIP/2.0/TCP 10.10.40.20:5060;rport;branch=z9hG4bK97d2d6273dad5e12d4683d2614b4bcb0
From: "Digital Ext 5201" <sip:5201@devconnect.local>;tag=12901157f4ba6193
To: <sip:5290@devconnect.local;transport=TCP;ob>
Call-ID: 27db75a754b7b1b4204ac844bdd459b0
CSeq: 1788984493 INVITE
Contact: "Digital Ext 5201" <sip:5201@10.10.40.20:5060;transport=tcp>
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,OPTIONS,BYE,INFO,REFER,NOTIFY,SUBSCRIBE,REGISTER,PUBLISH,UPDATE
Supported: timer,100rel
User-Agent: IP Office 9.1.6.0 build 153
P-Asserted-Identity: "Digital Ext 5201" <sip:5201@10.10.40.20:5060>
Content-Type: application/sdp
```

7.2. Verify Registration from AXIS C2005 Network Ceiling Speaker

Log in to the speaker as per **Section 5** Navigate to **VoIP** → **Account Settings** in the left window and the registration information is displayed in the main window as shown below. The green lights show a successful registration of **5290**. Test call can be made from each account to a specific phone number using the **Test SIP Call** at the bottom of the screen.

The screenshot displays the web interface for the AXIS C2005 Network Ceiling Speaker. The page title is "AXIS C2005 Network Ceiling Speaker" with "Setup | Help" in the top right. The left navigation menu includes: Basic Setup, Audio, VoIP (with sub-items: Overview, SIP Settings, Account Settings, DTMF Settings), Events, Languages, System Options, and About. The main content area is titled "Account Settings" and features a table with the following data:

Name	SIP address	Transport	Default	Reg. status
500V2 Ext (5290)	<sip:5290@devconnect.local>	TCP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Below the table are buttons for "Add...", "Modify...", and "Remove". A "Test SIP Call" section follows, with the instruction: "Make a test call from the selected SIP account to the specified SIP address." Below this is a text input field containing "Enter SIP address: sip(s):extension@domain" and a "Test call" button.

In the event of an issue with a call to the Axis speaker there are logs that can be accessed that show some further information on where the issue may lie. Navigate to **System Options** → **Support** → **Logs & Reports** in the left window and from the main window select **View Server Report** under the **Reports** section also the System Log is available as shown below.

The screenshot displays the web interface for the AXIS C2005 Network Ceiling Speaker. The top header includes the AXIS logo, the product name "AXIS C2005 Network Ceiling Speaker", and links for "Setup" and "Help". A left-hand navigation menu lists various settings categories, with "System Options" expanded to show "Logs & Reports" as the active selection. The main content area is titled "Logs & Reports" and contains a help icon, a note about loading times, and two sections: "Logs" and "Reports".

Logs & Reports ?

The log files and reports may prove useful when troubleshooting a problem or when contacting the Axis support web.

Note: Depending on your connection, these pages may take a while to load.

Logs

- System Log** System log information.
- Access Log** Access log information.

Reports

- View Server Report** Important information about the server's status.
- Download Server Report** Include snapshot from Live View
- Parameter List** The unit's parameters and their current settings.
- Connection List** Connection list information.
- Crash Report** Detailed information about the server's internal status. This report may contain sensitive information. It may take several minutes to download this report, please wait for the download to finish.

For more information, please read Axis [Privacy statement](#).

8. Conclusion

These Application Notes describe the configuration steps for provisioning the AXIS C2005 Network Ceiling Speaker from Axis Communications AB to interoperate with Avaya IP Office Server Edition and 500v2 Expansion. Please refer to **Section 2.2** for test results and observations.

9. Additional References

This section references documentation relevant to these Application Notes. The Avaya product documentation is available at <http://support.avaya.com> where the following documents can be obtained.

Product documentation for Avaya products may be found at <http://support.avaya.com>.

- [1]. *Avaya IP Office R10 Manager 10.1, Document Number 15-601011*
- [2]. *Avaya IP Office R10 Doc library*

Technical information for the AXIS C2005 Network Ceiling Speaker can be obtained from:

Axis Communications AB

Tel: +46 46 272 18 00

Fax: +46 46 13 61 30

<http://www.axis.com/global/en/learning-and-support>

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