Avaya Solution & Interoperability Test Lab

Application Note for Configuring the Ascom wireless i75 VoWiFi Handset with Avaya IP Office in a Converged Voice over IP and Data Network - Issue 1.0

Abstract

These Application Notes describe a solution for supporting wireless interoperability between the Ascom wireless i75 VoWiFi Handsets with Avaya IP Office in a converged Voice over IP and Data Network. Emphasis of the testing was placed on verifying good voice quality of calls with Ascom wireless SIP handsets registered to the Avaya IP Office.

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

Implementing wireless telephony requires interoperability between the wireless telephony products and the telephony infrastructure. As IP telephony evolves, potential implementers of this technology look for flexibility and choice when deciding on which particular technology to implement. Regardless of the technology chosen the telephony infrastructure needs to be flexible enough to support solutions using all available technologies.

These Application Notes describe the configuration process necessary to provide interoperability between Avaya IP Office and Ascom wireless i75 VoWiFi SIP Handsets in a Converged Voice over IP and Data Network.

1.1. Interoperability Compliance Testing

Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab. Compliance testing focused on verifying interoperability of the Ascom wireless i75 VoWiFi Handset with Avaya IP Office. Additional testing verified proper operation between the Ascom wireless i75 VoWiFi Handset with Avaya 9600, 1600, 5600 Series H.323 IP Telephones and the Avaya 2410 Digital Telephone. Voicemail and MWI using Voicemail Pro were verified to operate correctly. Network level tests included verifying roaming from access point to access point and validating Quality of Service for voice calls in a converged voice and data network configuration.

Avaya's formal testing and Declaration of Conformity is provided only on the headsets/handsets 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/handsets 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 or scalability. As a result, Avaya makes no representation whether a particular non-Avaya headset will work with Avaya's telephones or with a different generation of the same Avaya telephone.

Since there is no industry standard for handset interfaces, different manufacturers utilize different handset/headset interfaces with their telephones. Therefore, any claim made by a headset vendor that its product is compatible with Avaya telephones does not equate to a guarantee that the headset will provide adequate safety protection or audio quality.

1.2. Support

Technical support for the Ascom wireless i75 VoWiFi handset can be obtained through your local Ascom supplier.

Ascom global technical support:
Phone: +46 31 559450
Email: support@ascom.se

2. Reference Configuration

The network diagram shown in **Figure 1** illustrates the testing environment used for compliance testing. The network consists of an Avaya IP Office, one Avaya 9620 IP Telephone (H.323), one Avaya 1616 IP Telephone (H.323), one Avaya 5610SW IP Telephone (H.323), one Ascom Device Manager (WinPDM) and two Ascom wireless i75 VoWiFi SIP Handsets, one server running Avaya IP Office Manager and Voicemail Pro and one server providing network services such as DHCP, TFTP and HTTP..

The wireless network consists of one Motorola RFS4000 controller and three Motorola AP300 access points.

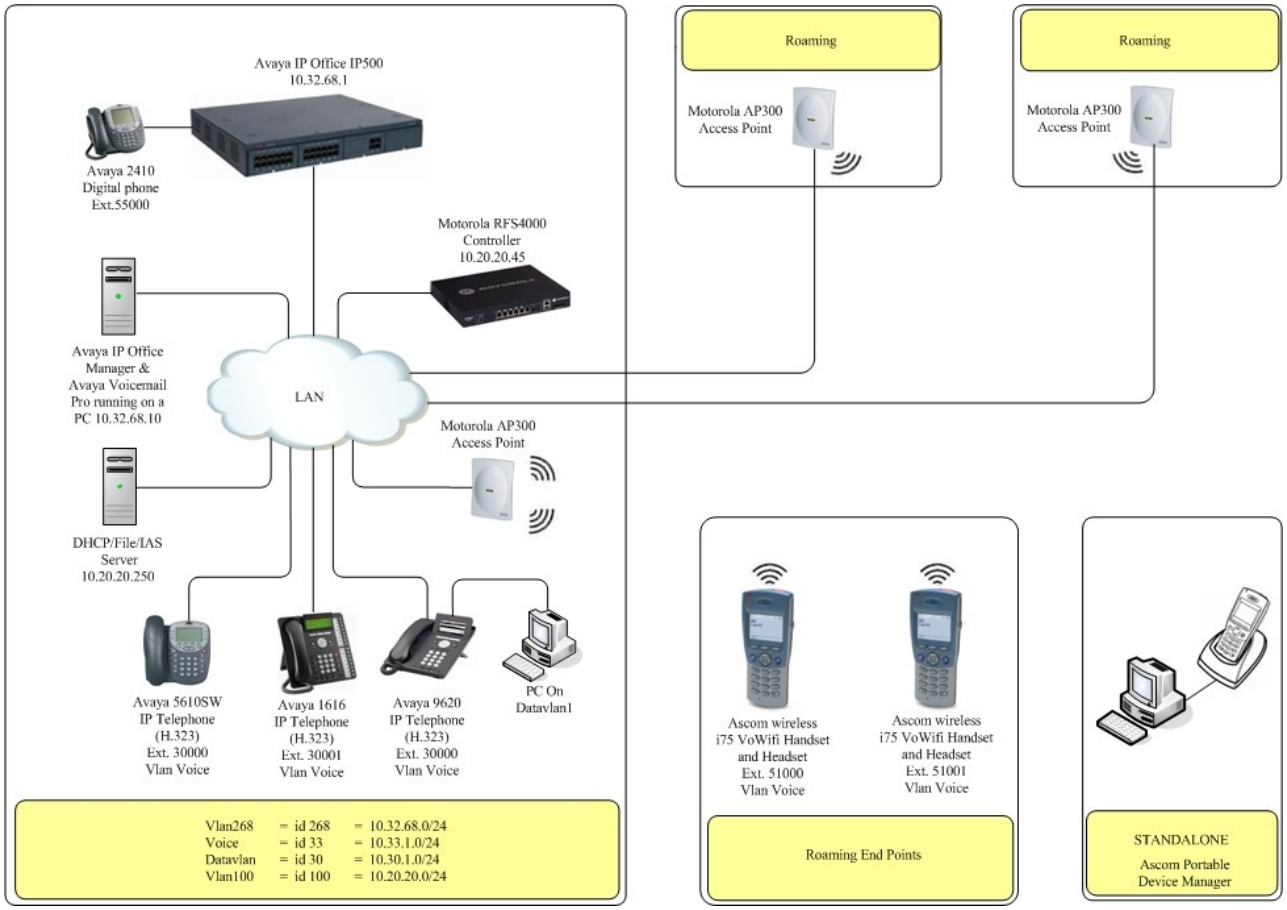


Figure 1: Network Diagram

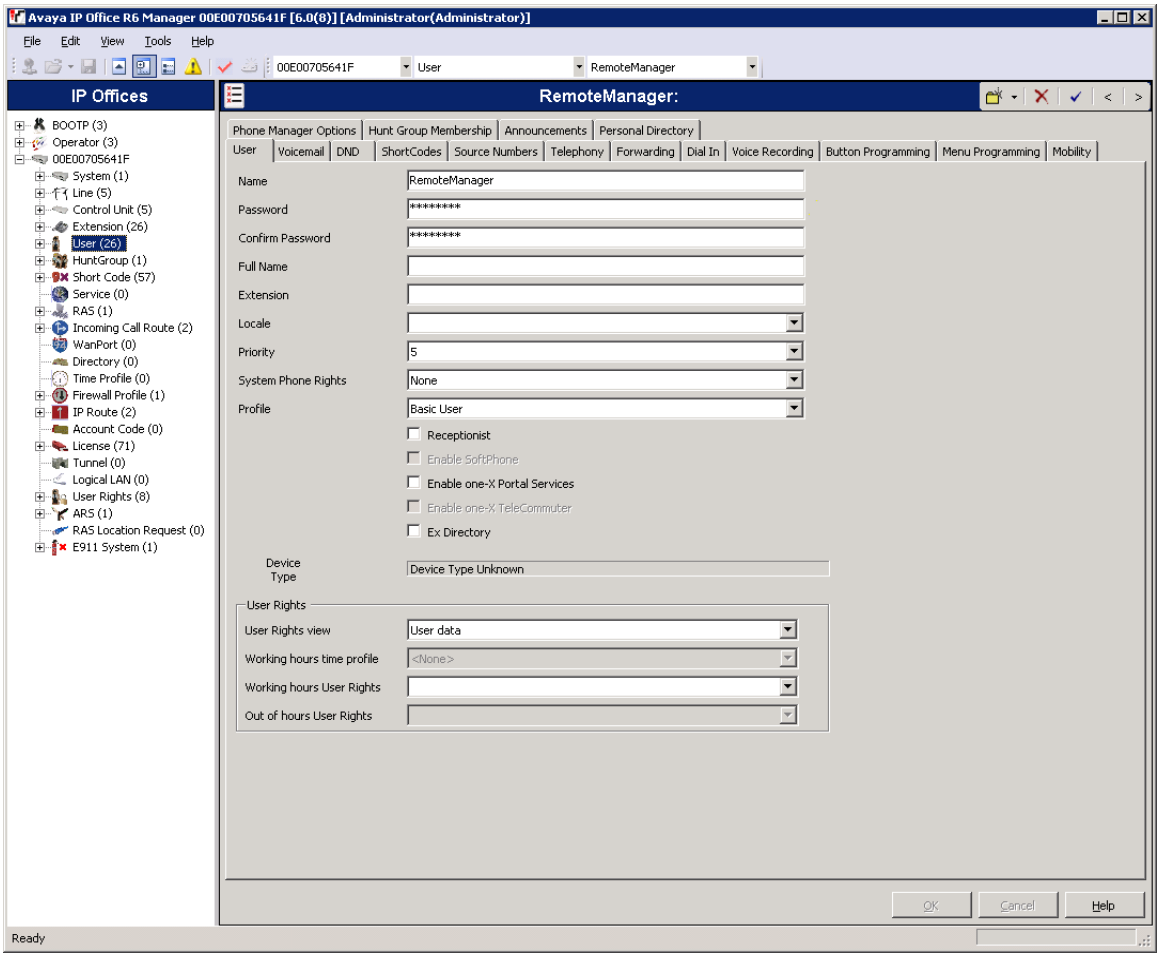
3. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya PBX Products	
Avaya IP Office (IP500)	6.0 (8)
Avaya IP Office Manager	8.0 (8)
Avaya Messaging (Voice Mail) Products	
Avaya Voicemail Pro	6.0 (22)
Avaya Telephony Sets	
Avaya 1600 Series IP Telephones	Avaya one-X Deskphone Value Edition 1.020
Avaya 5600 Series IP Telephones	8.016
Avaya 9600 Series IP Telephones	S3.110b
Avaya 2420 Digital Telephone	6.0
Ascom Products	
Ascom wireless i75 VoWiFi Handset	1.7.7 (SIP)
Ascom Device Manager (WinPDM)	3.5.4
Motorola Products	
Motorola RFS4000 controller	4.1.0.0-042R
Motorola AP300 Access Point	4.1.0.0-042R
MS Products	
PC	Microsoft Windows 2003 Server (File/DHCP Service)

4. Avaya IP Office Configuration

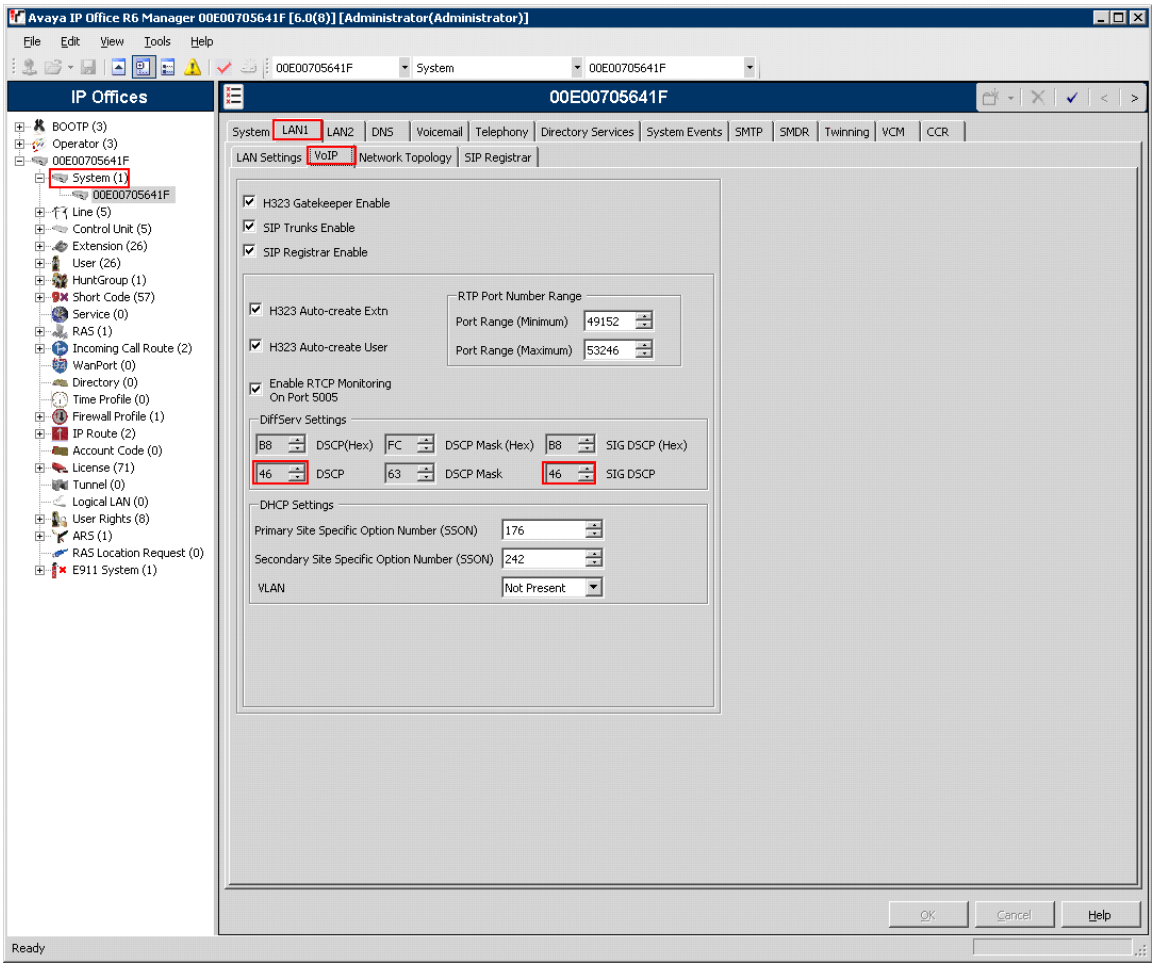
This section was included to verify that Avaya IP Office was configured correctly. Except where stated, the parameters in all steps are the default settings and are supplied for reference. For all other provisioning information such as provisioning of the trunks, call coverage, extensions, and voice mail, please refer to the Avaya IP Office product documentation in **Section 9.**

Step	Description
1.	Avaya IP Office is configured via the Avaya IP Office Manager program. Log into the Avaya IP Office Manager PC and select **Start → Programs → IP Office → Manager** to launch the Avaya IP Office Manager application. Select **File → Open** to search for IP Offices in the network. Click on appropriate Avaya IP Office. Click **OK** and log into the Avaya IP Office Manager application using the appropriate credentials.
2.	The main IP Office Manager window appears. The following steps refer to the Configuration Tree which is in the left pane of the window and under the heading **IP Offices**. 

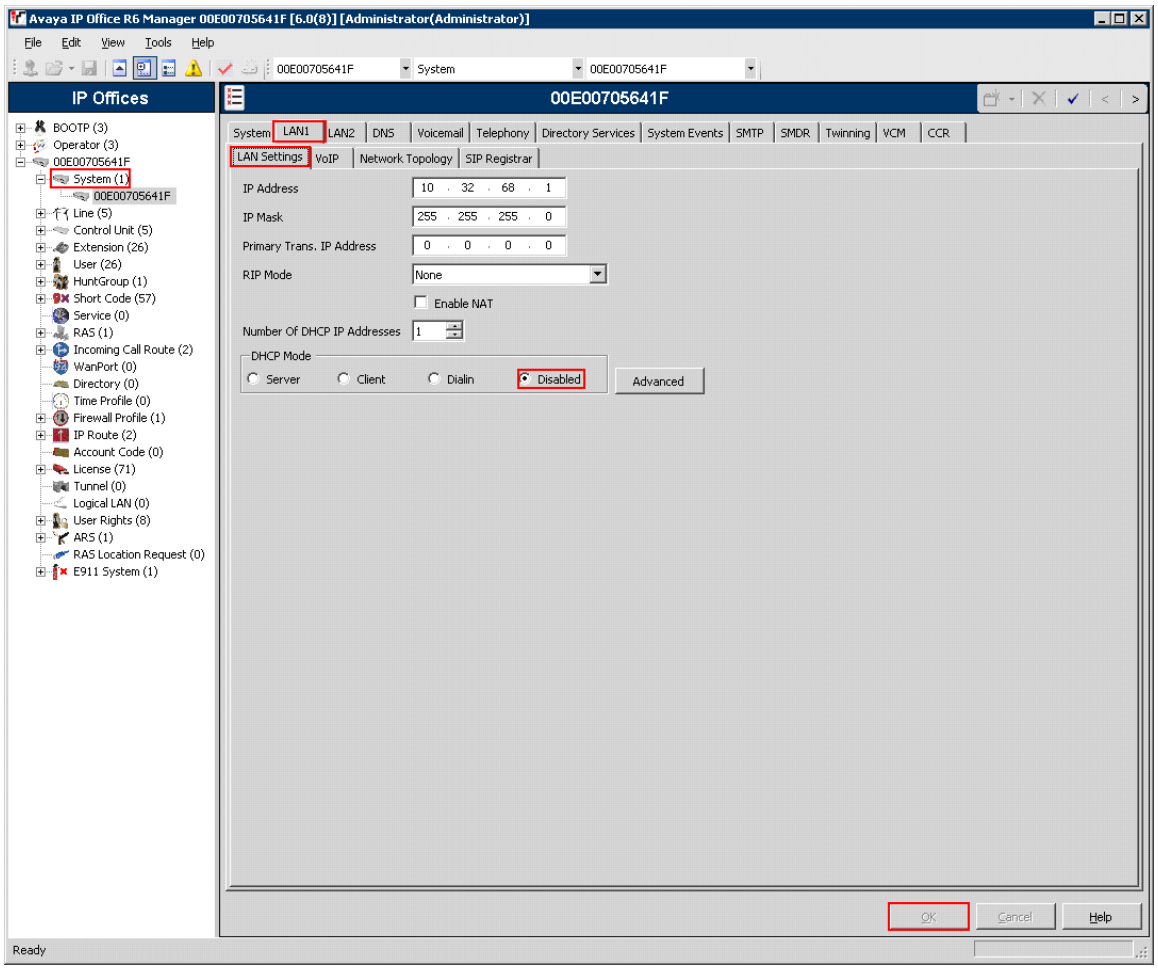
3. Verify VoIP information.
The Avaya IP Telephones will get Differentiated Services information from the Avaya IP Office. In the Manager window, from the Configuration Tree, click **System → LAN1 → VoIP**. Verify that the **DiffServ Settings** for **DSCP** and **SIG DSCP** are both set to **46**. If they are not **46**, change them and then click **OK** to continue.

Notes:

- Alternative QoS settings are required in an U-APSD-enabled WLAN environment. Please contact Ascom for further details.
- 00E00705641F is the MAC address of this specific IP Office and will be different for all IP Offices.

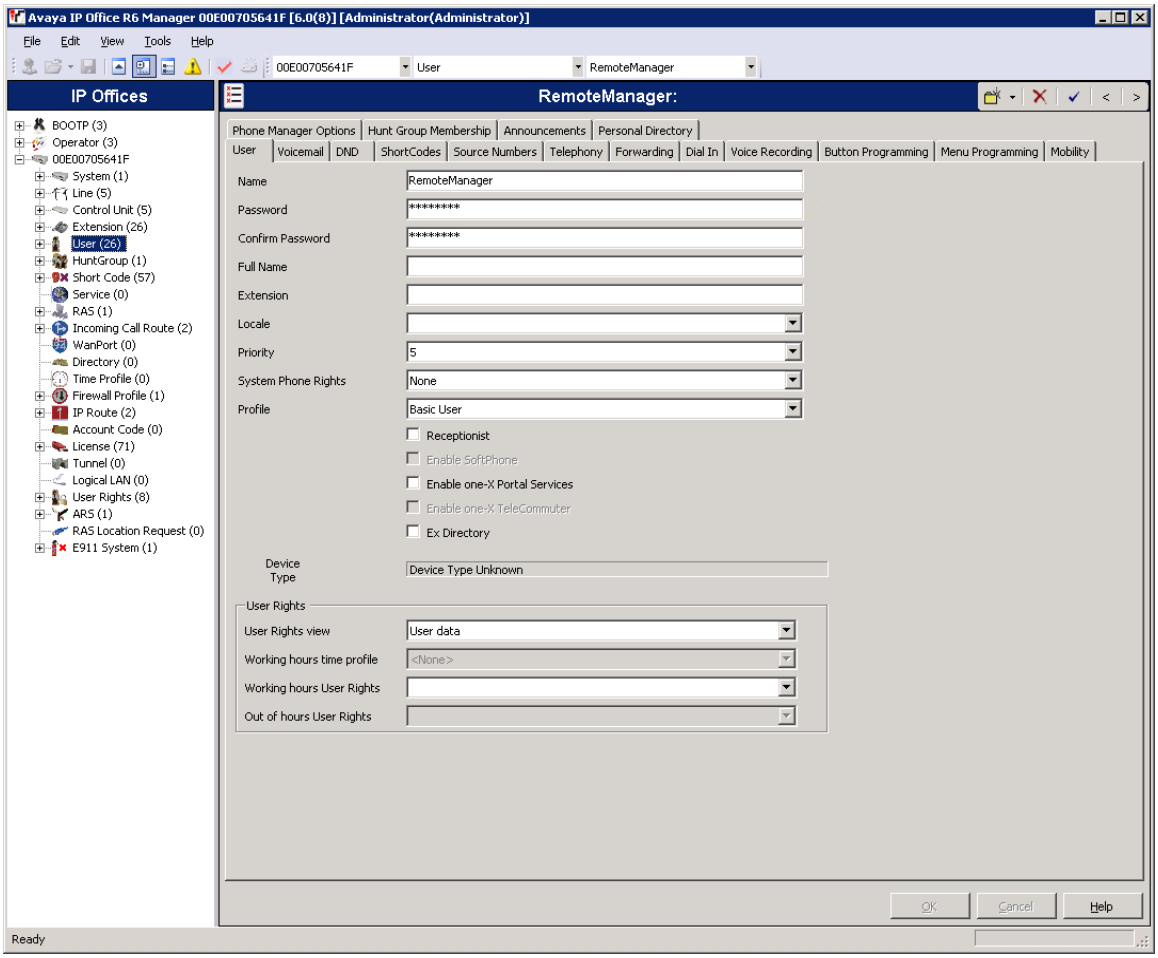


4. Disable DHCP server on Avaya IP Office.
From the Configuration Tree, click **System → LAN1 → LAN Settings**. Set the **DHCP Mode** to **Disabled**. Click **OK** to continue.

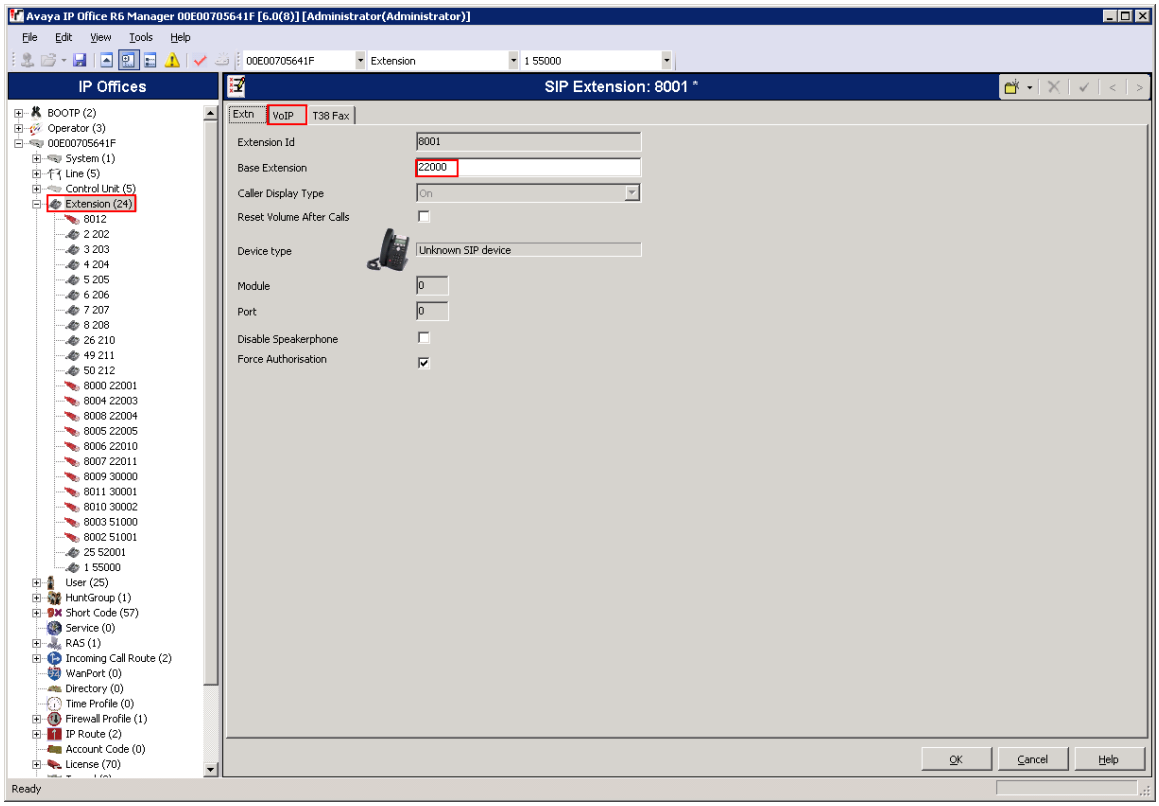


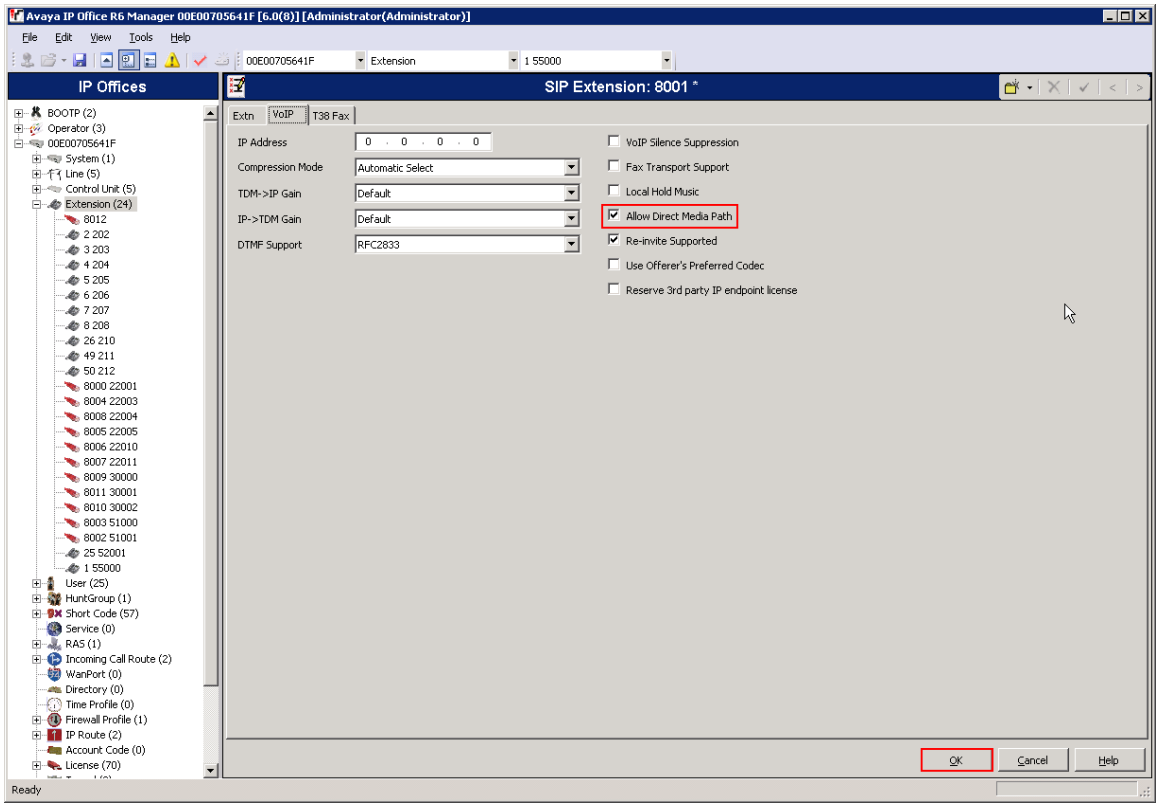
4.1. SIP Extension Configuration

This section was included to show basic SIP Extension configuration. Except where stated, the parameters in all steps are the default settings and are supplied for reference. For all other provisioning information such as provisioning of the trunks, call coverage and voice mail, please refer to the Avaya IP Office product documentation in **Section 9.**

Step	Description
1.	Avaya IP Office is configured via the Avaya IP Office Manager program. Log into the Avaya IP Office Manager PC and select **Start → Programs → IP Office → Manager** to launch the Avaya IP Office Manager application. Select **File → Open** to search for IP Offices in the network. Click on appropriate Avaya IP Office. Click **OK** and log into the Avaya IP Office Manager application using the appropriate credentials.
2.	The main IP Office Manager window appears. The following steps refer to the Configuration Tree which is in the left pane of the window and under the heading **IP Offices**. 

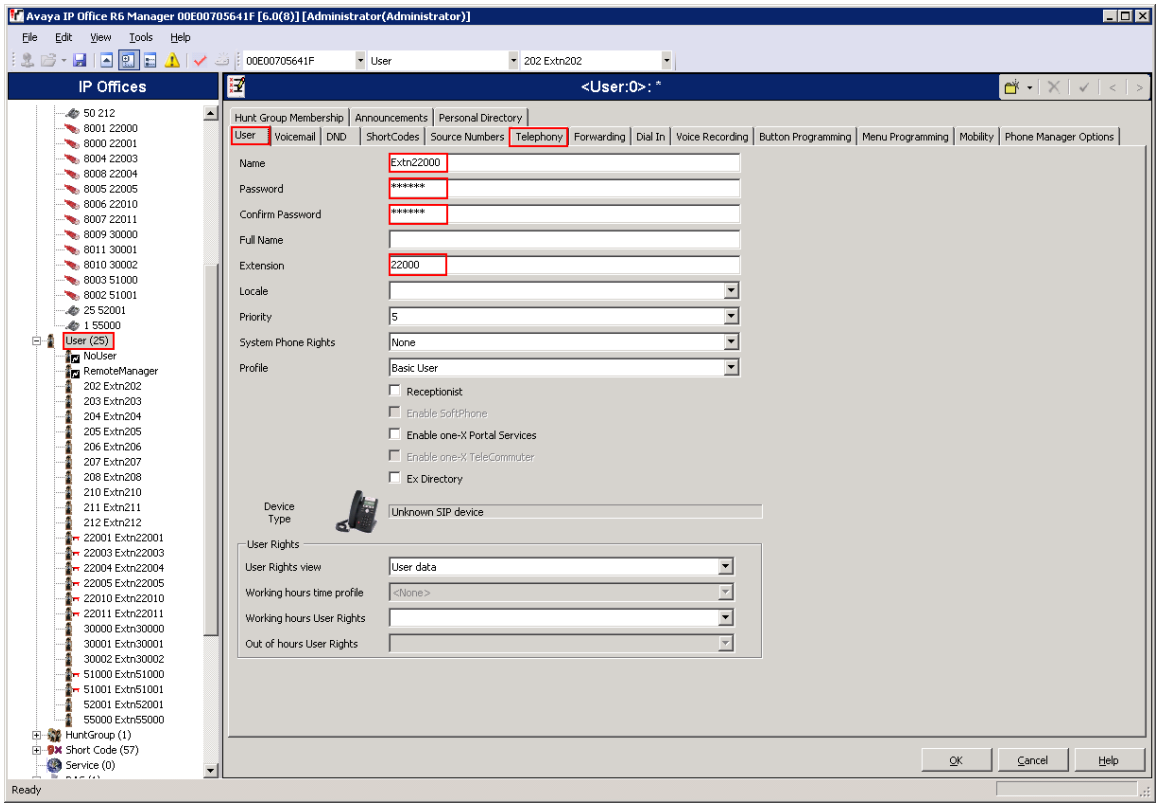
3. Create SIP Extension.
From the Configuration Tree, right mouse click on **Extension → New → SIP Extension**. Enter a unique extension, click **VoIP** to continue.

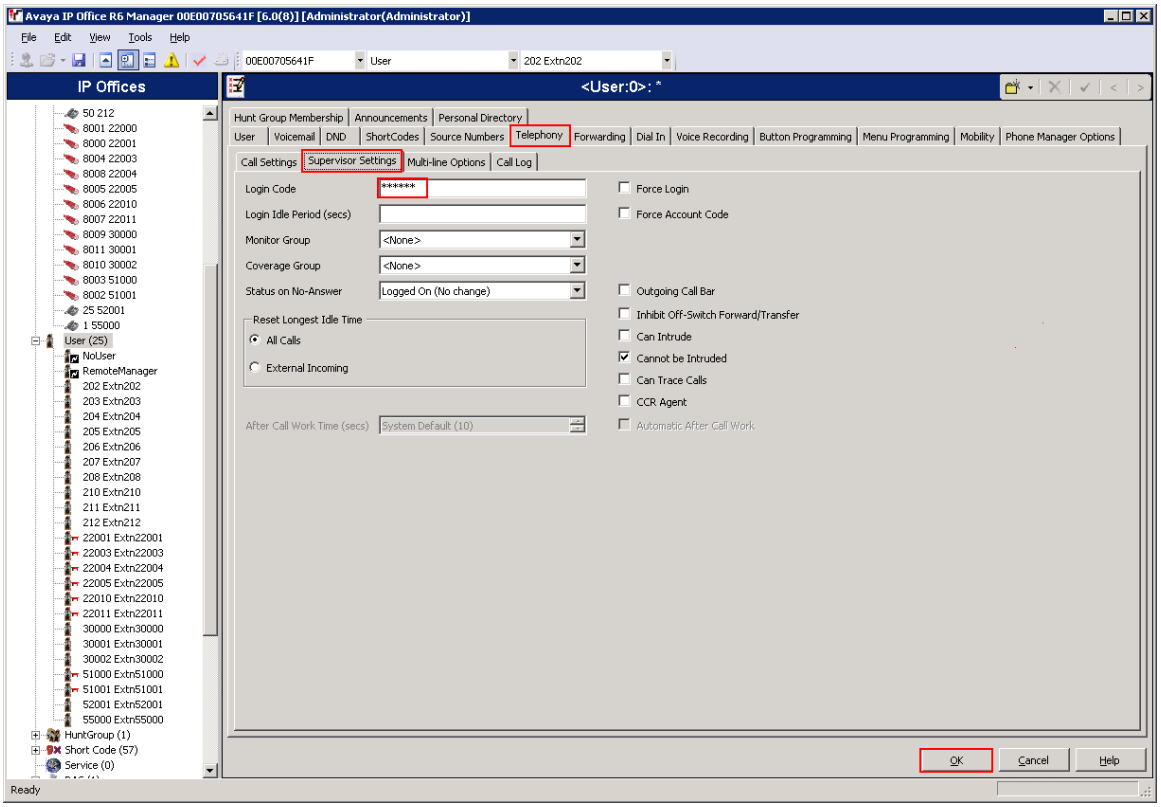


4.	Verify Direct Media Path. Verify that **Allow Direct Media Path** is checked. Click **OK** to continue. 

5. Create User:

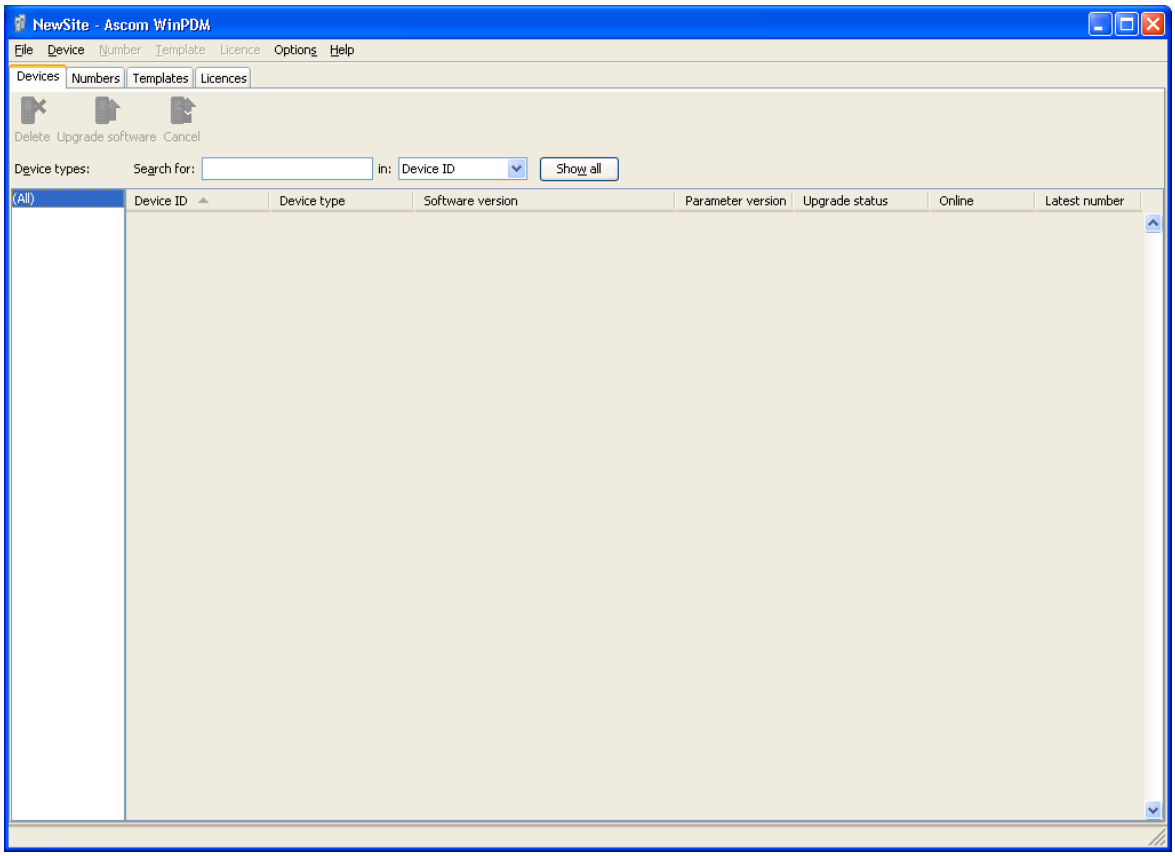
From the Configuration Tree, right mouse click on **User → New**. Enter the extension that was created in **Step 3** and precede it with **Extn**, for example, Extn22000. Enter a **Password** and **Confirm Password** value, enter the extension that was created in **Step 3**. Click **Telephony** to continue.

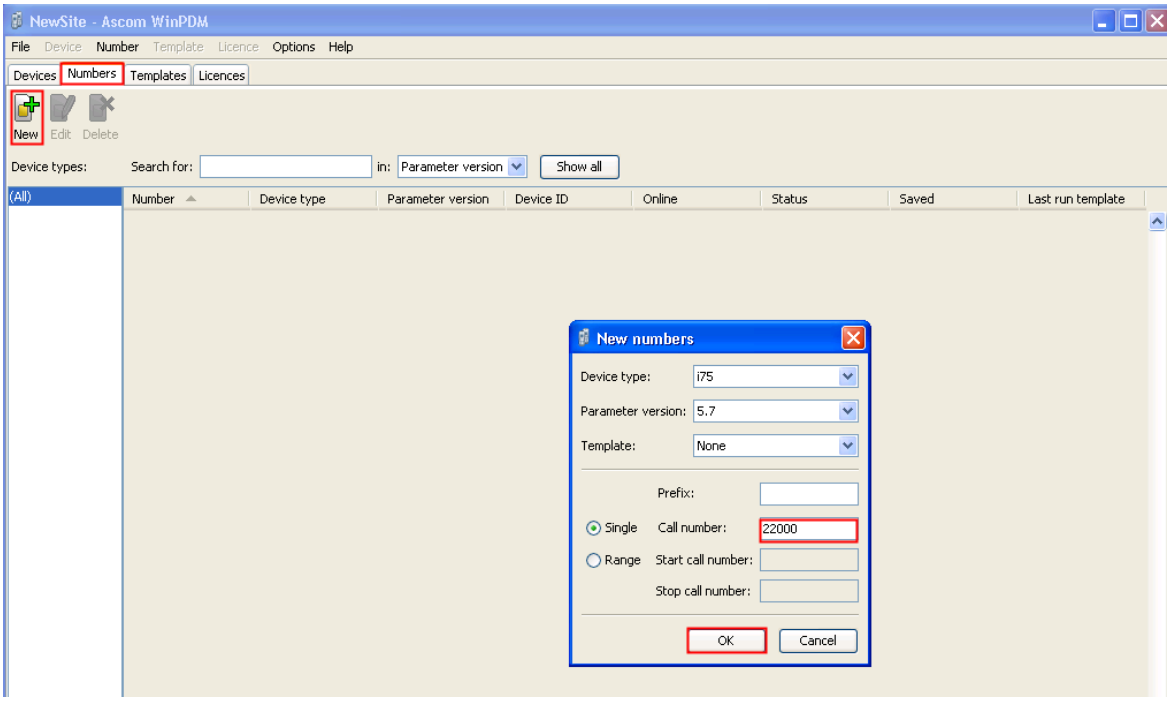


6.	Click **Supervisor Setting**, Enter a **Login Code**, 123456 was used for compliance testing. The Login Code is used by the Ascom IP-DECT Handset to log into the IP Office, it will be configured in **Section 5.1**, **Step 11.** Click **OK** to continue. The changes must be saved before they will take effect, click to the  icon to save the configuration. 
7.	Repeat **Steps 3 through 6** for additional Extensions.

5. Configure the Ascom wireless i75 VoWiFi Handset

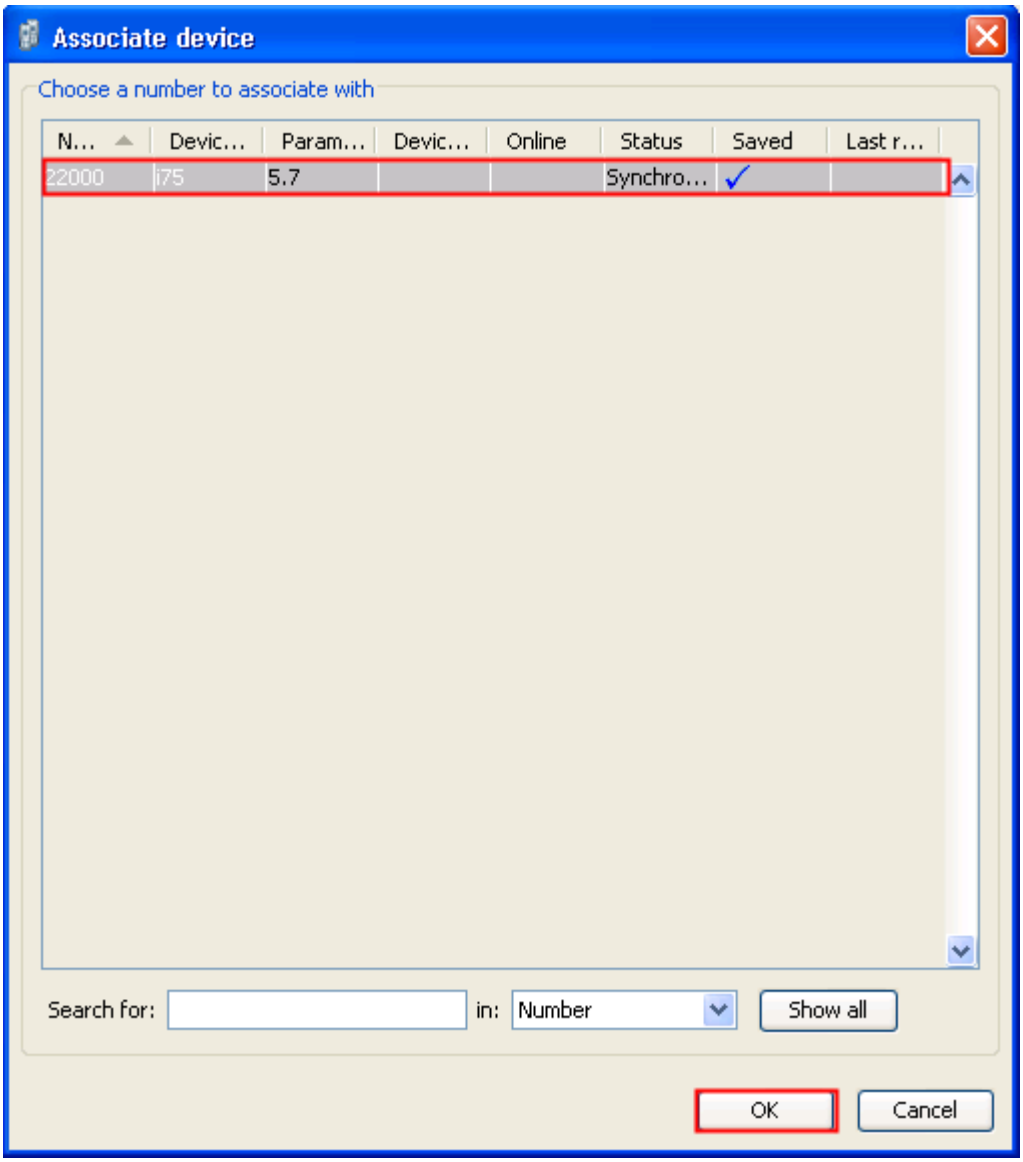
The following steps detail the configuration process for the Ascom wireless i75 VoWiFi Handset using the Ascom Device Manger (WinPDM) Windows-based application. For complete details on all the supported features on the Ascom wireless i75 VoWiFi Handset refer to **Section 9, [6].**

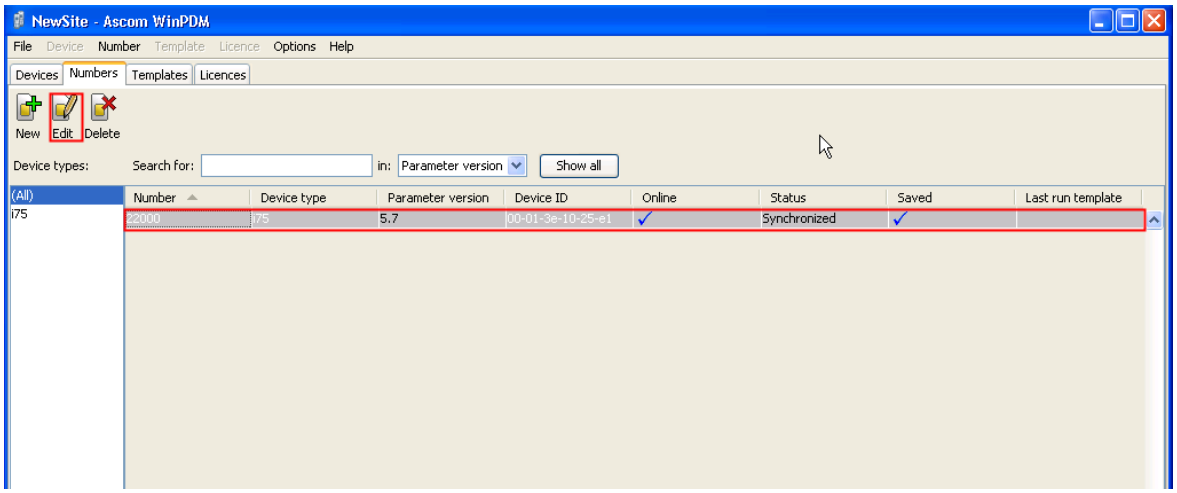
Step	Description
1.	Launch the WinPDM application from the computer that has the application installed and has the WinPDM physically attached via a USB cable. Before the user is presented with the following screen a login is required. See **Section 9, [6]** for administration and configuration information on the WinPDM. After the user has logged on to the WinPDM the following screen is displayed which shows the devices found in the database. Since no devices have been plugged into the WinPDM, none are shown at this time. 

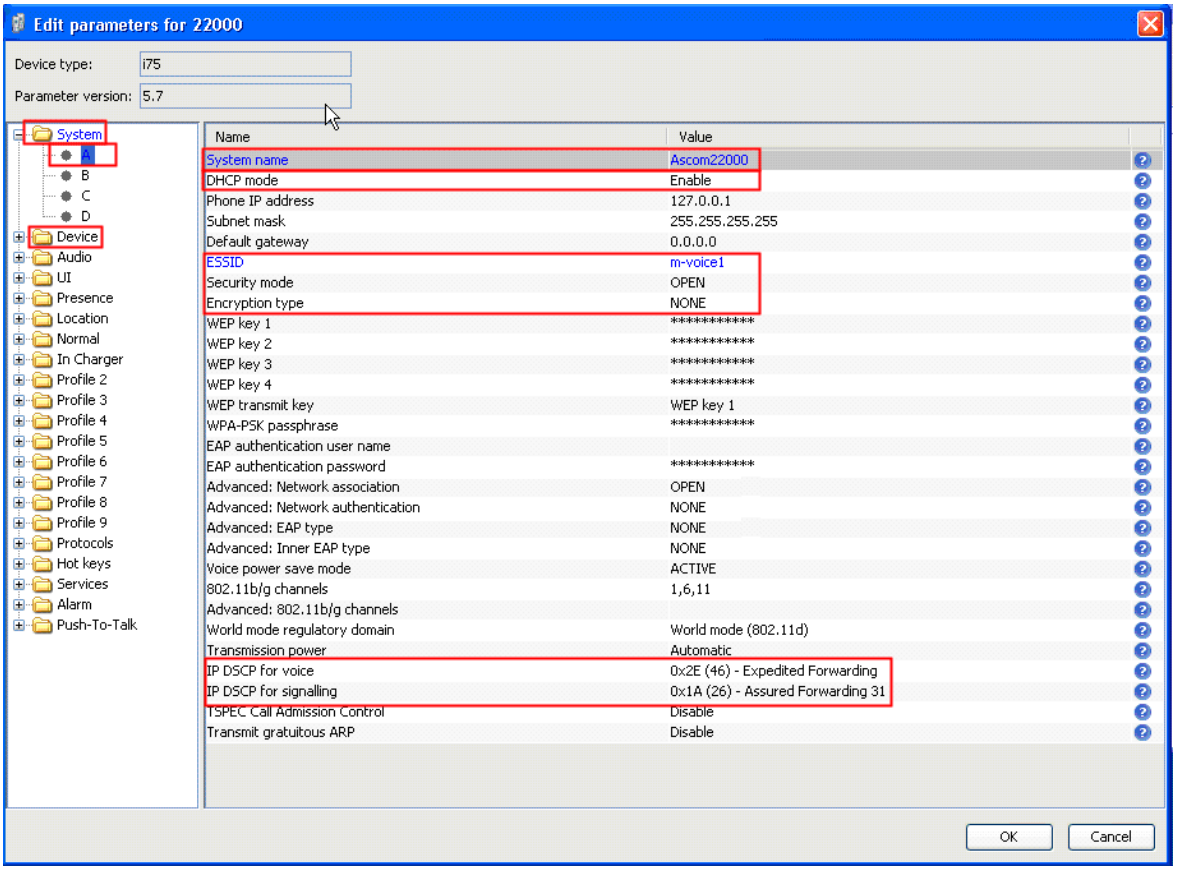
Step	Description
2.	Create the extension profiles on the Ascom WinPDM. For this example extension 22000 will be used. From the Ascom WinPDM window, click **Numbers → New**. The **New numbers** dialogue window appears, Set the following options: • **Call number = 22000** Click **OK** to continue. 
3.	Repeat Step 2 for all Ascom i75 handsets as shown in **Figure 1**.

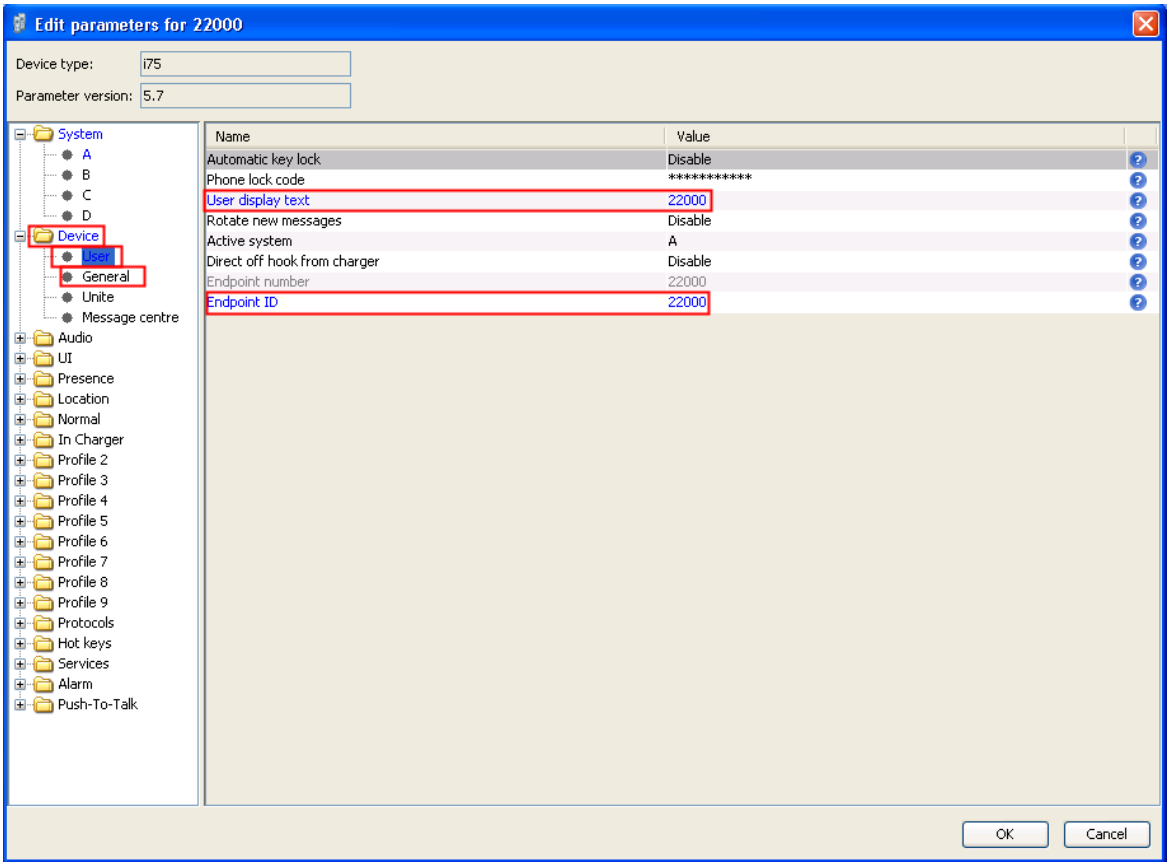
Step	Description
4.	Place an Ascom wireless i75 Handset into the WinPDM, Once an Ascom wireless i75 Handset is placed into the cradle, the WinPDM recognizes the telephone. Click the radio button labeled **Associate with number** and then click **Next.** 

Step	Description
5.	The **Associate device** dialogue window appears. Select the extension that the Ascom wireless i75 Handset is associating to and select **OK**.

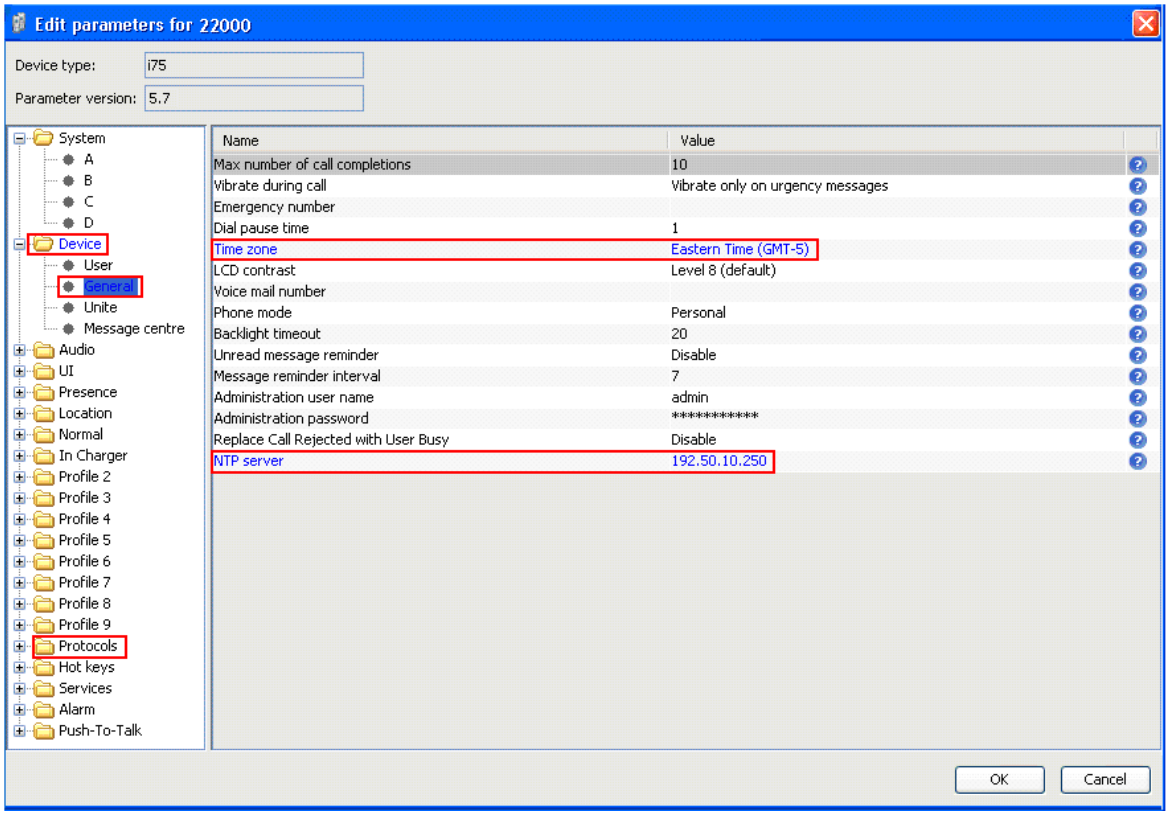


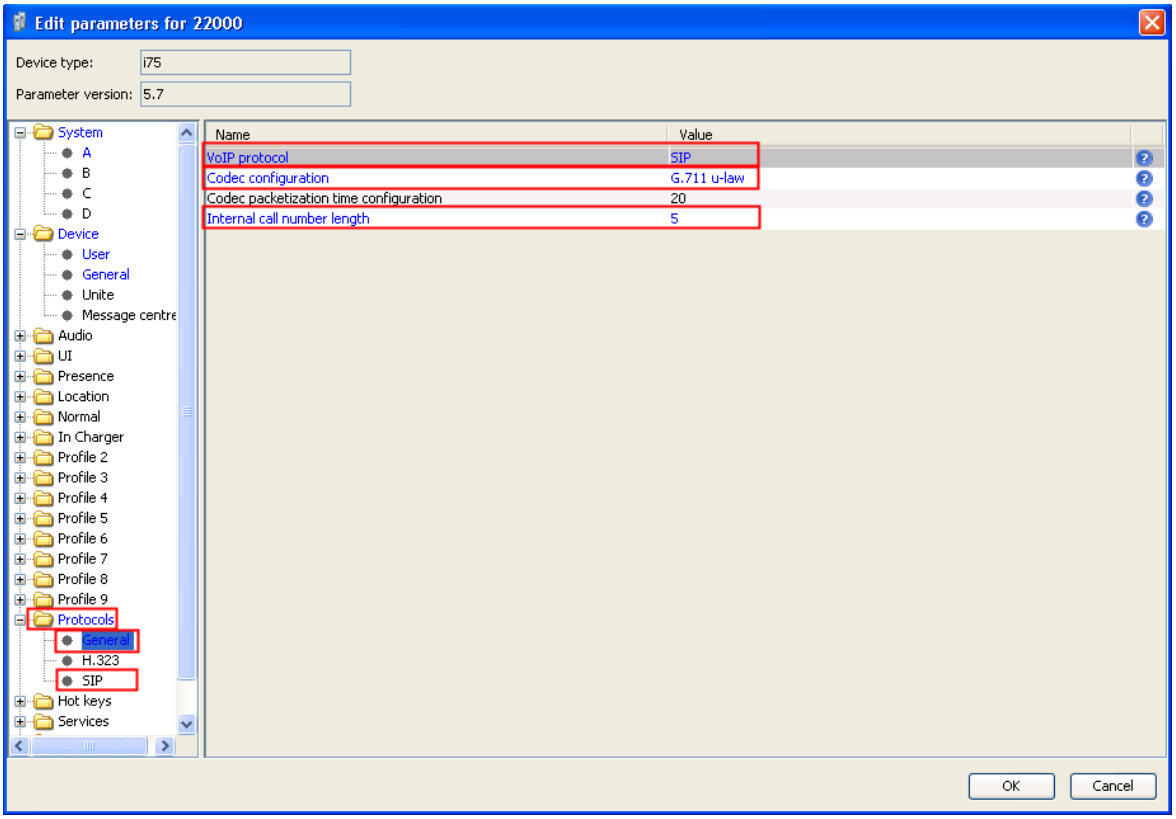
Step	Description
6.	After entering **OK**, the new extension is created. Highlight the extension and select **Edit** tab. 

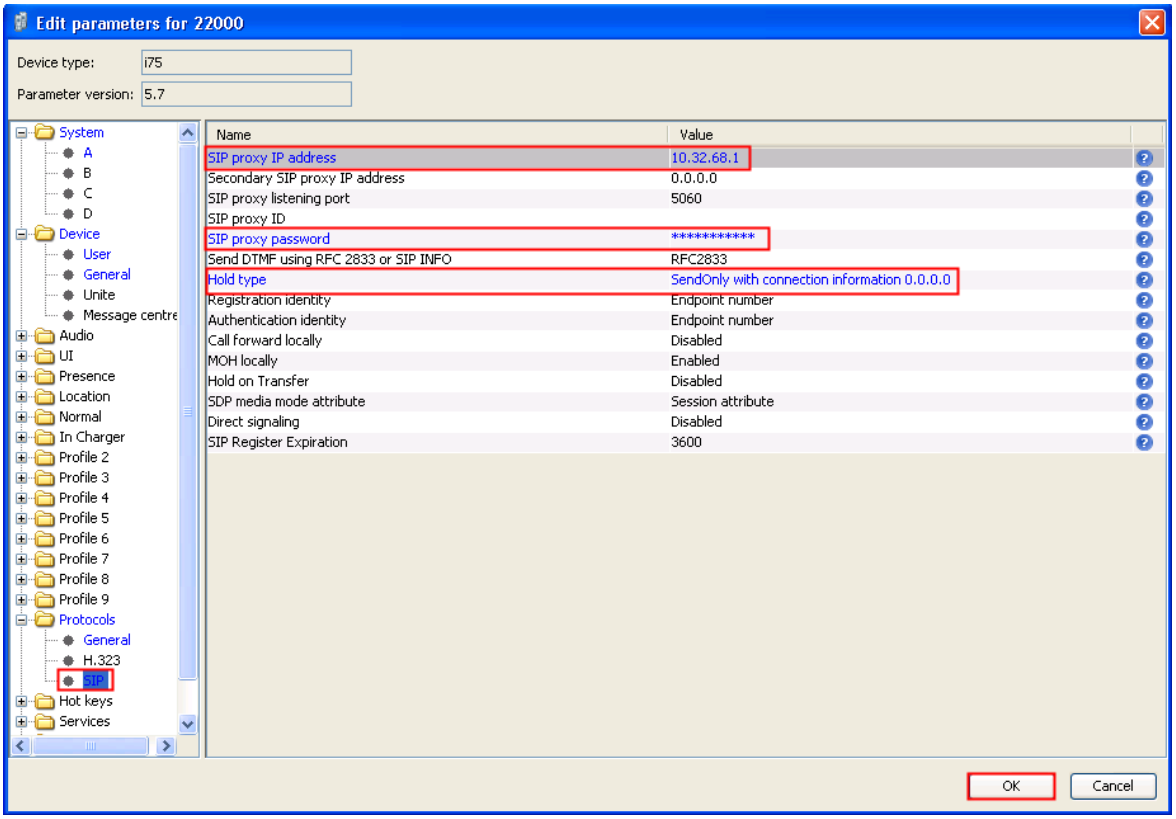
Step	Description
7.	The **Edit parameters for 22000** dialogue window appears. Navigate to the System A configuration page by clicking **SYSTEM** and then **A**. Verify and Configure the parameters that are listed below, click **Device → User** to continue. Two security schemas were tested: None/Open, and WPA2-AES-CCMP. Only OPEN will be shown in this document. For complete details on how to configure these parameters using the WinPDM refer to **[6]**. **System Name** **"Ascom22000"** **DHCP mode** **"Enable"** **ESSID** **"m-voice1"** **Security mode** **"OPEN"** **Encryption type** **"NONE"** **IP DSCP for voice** **"0x2E (46) – Expedited Forwarding"** **IP DSCP for signaling** **"0x1A (26) – Assured Forwarding 31"** 

Step	Description
8.	Verify and Configure the parameters that are listed below, click **General** to continue. **User display text "22000"** **Endpoint ID "22000"** 

Step	Description
9.	Ensure that the **Time zone** and **NTP server** values are set. Click **Protocols** to continue.



Step	Description
10.	Click **GENERAL**. Verify and Configure the parameters that are listed below. Ensure that the codec chosen matches whatever is used on Avaya IP Office. Click **SIP** to continue. **VoIP protocol "SIP"** **Codec configuration "G.711 u-law"** **Internal Call number length "5"** 

Step	Description
11.	Navigate to the **SIP** configuration page by clicking **PROTOCOLS** and then **SIP**. Verify and configure the parameters that are listed below. The **SIP proxy password** field must match the user password configured on IP Office. Once the information has been configured, the WinPDM reports the information as ****. After clicking **OK**, pick up the i75 handset from the WinPDM in order to reboot the handset and activate the new configuration. **SIP proxy IP address** "10.32.68.1" **SIP proxy password** "123456" **Hold type "**SendOnly with connection information 0.0.0.0**"** 
12.	Repeat **Steps 1 – 11** for each Ascom wireless i75 VoWiFi Handset being provisioned, but modify the appropriate extension fields to avoid duplication.

6. General Test Approach and Test Results

6.1. General Test Approach

All feature functionality test cases were performed manually. The general test approach entailed verifying the following:

- Registration, re-registration of Ascom i75 VoWiFi Portable Handsets with Avaya IP Office.
- Verify Message Waiting Indicator and message retrieval with Avaya Voicemail Pro.
- VoIP calls between Ascom and Avaya Digital Telephones, Avaya H.323 IP Telephones.
- Inter-office calls using SIP, G.711U-law and G.729a codec, shuffling (between i75's), conferencing, voicemail, DTMF.
- Wireless Roaming, Wireless Security, Wireless Authentication and Wireless Quality of Service.
- Verifying that QoS directed the voice signaling and voice media to the higher priority queue based on WMM QoS.

6.2. Test Results

The Ascom wireless i75 VoWiFi Handset passed all test cases. Ascom wireless i75 VoWiFi Handsets were verified to successfully register with Avaya IP Office. The compliance testing also focused on verifying WMM Quality of Service for voice traffic while low priority wireless background traffic was competing for bandwidth. The Ascom wireless i75 VoWiFi Handset was verified to roam successfully between access points while maintaining voice calls. Multiple security schemas, OPEN and WPA2-AES-CCMP were used for testing. Telephone calls using codec's G.711U-law and G.729a were verified to operate correctly with the media path direct between the Ascom wireless i75 VoWiFi Handset (shuffling enabled) and with the media path centralized through Avaya IP Office (shuffling disabled). Calls were maintained for durations over one minute without degradation to voice quality. The telephony features verified to operate correctly included attended/unattended transfer, conference call participation, conference call add/drop, call waiting, caller ID operation, call forwarding unconditional, call forwarding clear, call park, call pickup, Twinning/bridged, voicemail using Avaya Voicemail Pro, Message Waiting Indicator (MWI) and message retrieval, hold and return from hold.

7. Verification Steps

The following steps can be used to verify proper operation of the Ascom wireless i75 VoWiFi Handset.

- Ensure that the **ESSID** value of the wireless network matches the **ESSID** field value configured in **Section 5 Step 7** on the Ascom wireless i75 VoWiFi Handset.
- Ensure that the **VoIP Protocol** and **Codec configuration** field values are set correctly, see **Section 5**, **Step 10**.
- Ensure that the **SIP proxy IP address** and **SIP proxy password** field values are set correctly, see **Section 5**, **Step 11**.
- Ensure that the Ascom wireless i75 VoWiFi Handset was removed from the Device Manager after completing the configuration to apply the changes and reboot the handset.
- Place calls from the Ascom wireless i75 VoWiFi Handset and verify two-way audio.
- Place a call to the Ascom wireless i75 VoWiFi Handset, allow the call to be directed to voicemail, leave a voicemail message and verify the MWI message is received.
- Using the Ascom wireless i75 VoWiFi Handset that received the voicemail, connect to the voicemail system to retrieve the voicemail and verify the MWI message clears.
- Place calls to the Ascom wireless i75 VoWiFi Handset and exercise calling features such as transfer, conference and hold.

8. Conclusion

These Application Notes illustrate the procedures necessary for configuring the Ascom wireless i75 VoWiFi Handset with Avaya IP Office. All feature functionality test cases described in **Section 6.1** passed.

9. Additional References

The documents referenced below were used for additional support and configuration information.

This section references documentation relevant to these Application Notes. In general, Avaya product documentation is available at http://support.avaya.com

1. IP Office 6.0 Installation Manual, Issue 21f, March 1 2010, Document Number 15-601042
   http://support.avaya.com/css/P8/documents/100073460

2. IP Office Release 6.0 Manager 8.0, Issue 24h, February 20, 2010
   Document Number 15-601011
   http://support.avaya.com/elmodocs2/ip_office/R4.2/Newissuesept08/eng/manager_en.pdf

3. IP Office Release 6.0 System Status Application, Issue 05a, February 12, 2010
   Document Number 15-601758
   http://support.avaya.com/css/P8/documents/100073300

4. IP Office Release 6.0 Voicemail Pro, Issue 22b, January 16, 2010
   http://support.avaya.com/css/P8/documents/100073435

5. IP Office System Monitor, Issue 02b, November 28, 2008
   Document Number 15-601019
   http://support.avaya.com/css/P8/documents/100073350

Ascom product documentation.

6. Ascom product documentation can be found at http://www.Ascomwireless.com

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.