Avaya Solution & Interoperability Test Lab

Application Note for Configuring the Ascom wireless i75 VoWiFi Handset with an Avaya Aura™ Telephony Infrastructure 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 an Avaya Aura™ telephony infrastructure consisting of Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Aura™ Communication Manager Messaging 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 Aura™ telephony infrastructure.

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 Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging, Avaya Communication Manager Messaging 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 verified the integration between Ascom wireless i75 VoWiFi SIP Handsets and an Avaya Aura™ telephony infrastructure. The compliance testing focused on verifying interoperability of the Ascom wireless i75 VoWiFi Handset with Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging. Additional testing verified proper operation between the Ascom wireless i75 VoWiFi Handset with Avaya 9600 Series SIP & H.323 IP Telephones, and the Avaya 2410 Digital Telephone. Voicemail and MWI using Avaya Modular Messaging and Avaya Communication Manager Messaging was tested and 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 representations 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.

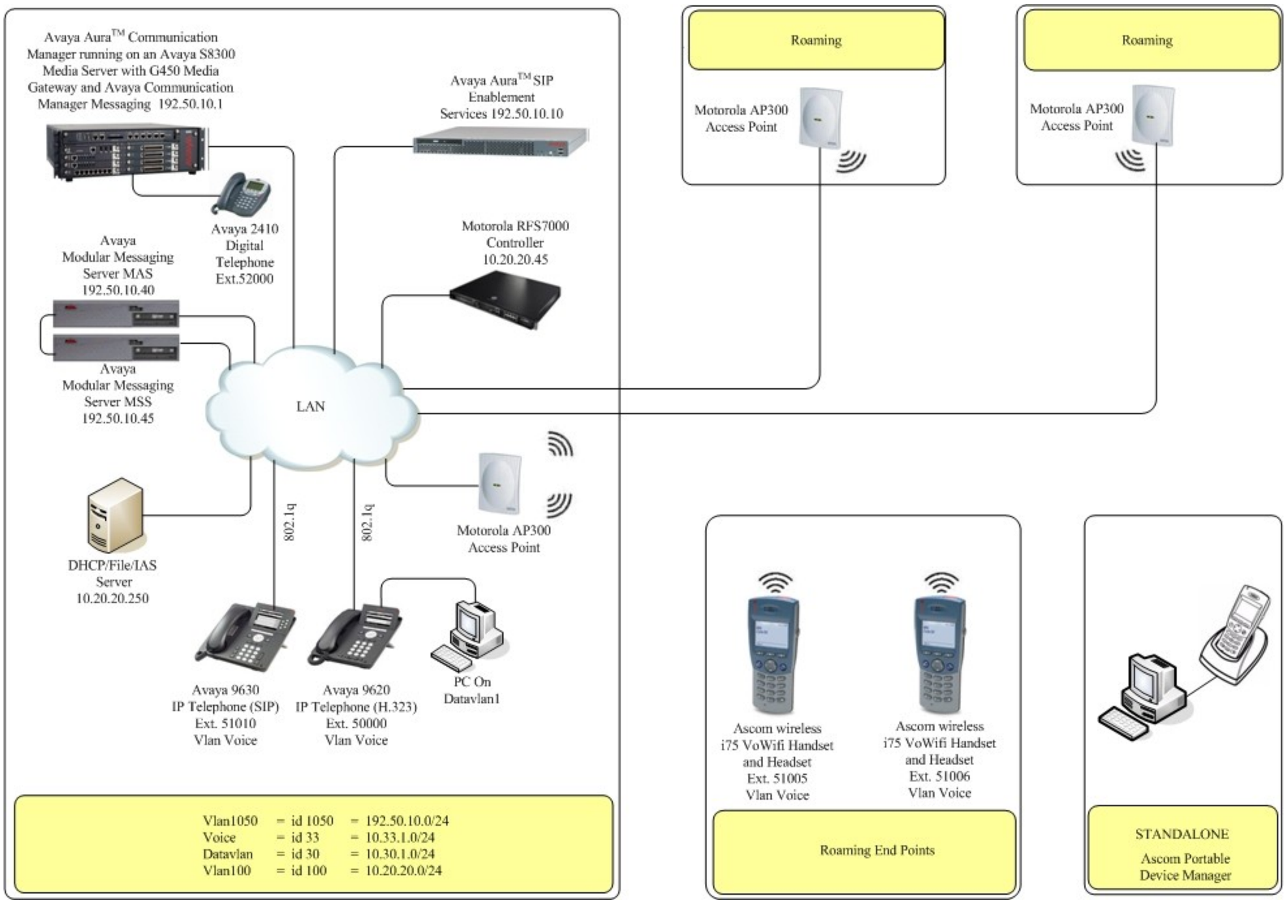
1.2. Support

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 Aura™ Communication Manager running on an Avaya S8300 Server with an Avaya G450 Media Gateway, and Avaya S8500 server running Avaya Aura™ SIP Enablement Services, one Avaya Modular Messaging Application Server, one Avaya Modular Messaging Storage Server, one Avaya 9630 IP Telephone (SIP), one Avaya 9620 IP Telephone (H.323), one Avaya 2420 Digital Telephone, two Ascom wireless i75 VoWiFi SIP Handsets and one Ascom Device Manger (WinPDM). The wireless network consists of one Motorola RFS7000 controller and three Motorola AP300 access points.



Avaya Aura™ Communication Manager running on an Avaya S8300 Media Server with G450 Media Gateway and Avaya Communication Manager Messaging 192.50.10.1
Avaya Aura™ SIP Enablement Services 192.50.10.10
Avaya 2410 Digital Telephone Ext.52000
Motorola RFS7000 Controller 10.20.20.45
Avaya Modular Messaging Server MAS 192.50.10.40
Avaya Modular Messaging Server MSS 192.50.10.45
LAN
DHCP/File/IAS Server 10.20.20.250
802.1q
802.1q
Motorola AP300 Access Point
Avaya 9630 IP Telephone (SIP) Ext. 51010 Vlan Voice
Avaya 9620 IP Telephone (H.323) Ext. 50000 Vlan Voice
PC On Datavlan1
Vlan1050 = id 1050 = 192.50.10.0/24
Voice = id 33 = 10.33.1.0/24
Datavlan = id 30 = 10.30.1.0/24
Vlan100 = id 100 = 10.20.20.0/24
Roaming
Motorola AP300 Access Point
Roaming
Motorola AP300 Access Point
Ascom wireless i75 VoWifi Handset and Headset Ext. 51005 Vlan Voice
Ascom wireless i75 VoWifi Handset and Headset Ext. 51006 Vlan Voice
Roaming End Points
STANDALONE
Ascom Portable Device Manager

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 S8300 Server running Avaya Aura™ Communication Manager	Avaya Aura™ Communication Manager 5.2
Avaya G450 Media Gateway (Corporate Site)	
MGP	28.22.0
MM712 DCP Media Module	HW9
Avaya Aura™ SIP Enablement Services (SES)	
Avaya Aura™ SIP Enabled Services (SES) Server	5.2 SP2
Avaya Messaging (Voice Mail) Products	
Avaya Modular Messaging - Messaging Application Server (MAS)	5.0
Avaya Modular Messaging - Message Storage Server (MSS)	5.0
Avaya Communication Manager Messaging (CMM)	5.2.1-13.0
Avaya Telephony Sets	
Avaya 9600 Series IP Telephones	Avaya one-X Deskphone Edition 3.0.1
Avaya 9600 Series IP Telephones	Avaya one-X Deskphone SIP 2.4
Avaya 2410 Digital Telephone	5.0
Ascom Products	
Ascom wireless i75 VoWiFi Handset	1.6.23 (SIP)
Ascom Device Manger (WinPDM)	3.3.5
Motorola Products	
Motorola RFS7000 controller	1.2.0.0-040R
Motorola AP300 Access Point	01.00-2100r
MS Products	
Microsoft Windows 2003 Server	Microsoft Windows 2003 Server

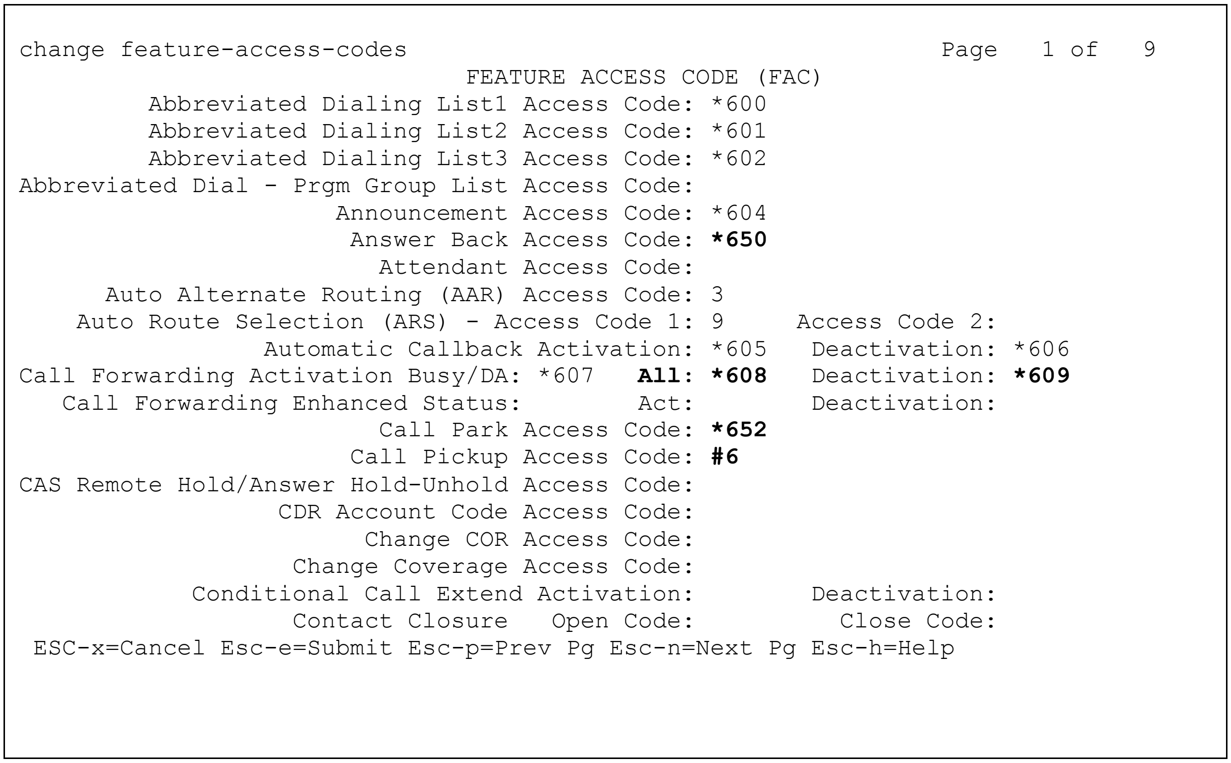
4. Configure Avaya Aura™ Communication Manager

This section describes the steps required for Avaya Aura™ Communication Manager to support the configuration shown in **Figure 1**. The assumption is that the appropriate license and authentication files have been installed on the servers and that login and password credentials are available. It is assumed the Avaya Aura™ Communication Manager and Avaya Aura™ SIP Enabled Services are configured. Refer to **[1]**, **[2]**, and **[3]** for more information.

Each Ascom wireless i75 VoWiFi SIP Handset configured in the sample network in **Figure 1** was administered as stations on Communication Manager with the Off-PBX stations option set. For information on how to administer these types of stations refer to **[1]**, **[2]**, and **[3]**.

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>1.</td><td>

To enable the features used for testing (Call Park, Call Park Answerback, Call Forwarding and Call Pickup) administer the configuration for Feature-Access-Codes (FAC) on Communication Manager. From the SAT (System Administration Terminal) interface on Communication Manager, use the "**change feature-access-codes**" command to configure the following parameters on Page 1 and Submit the changes.

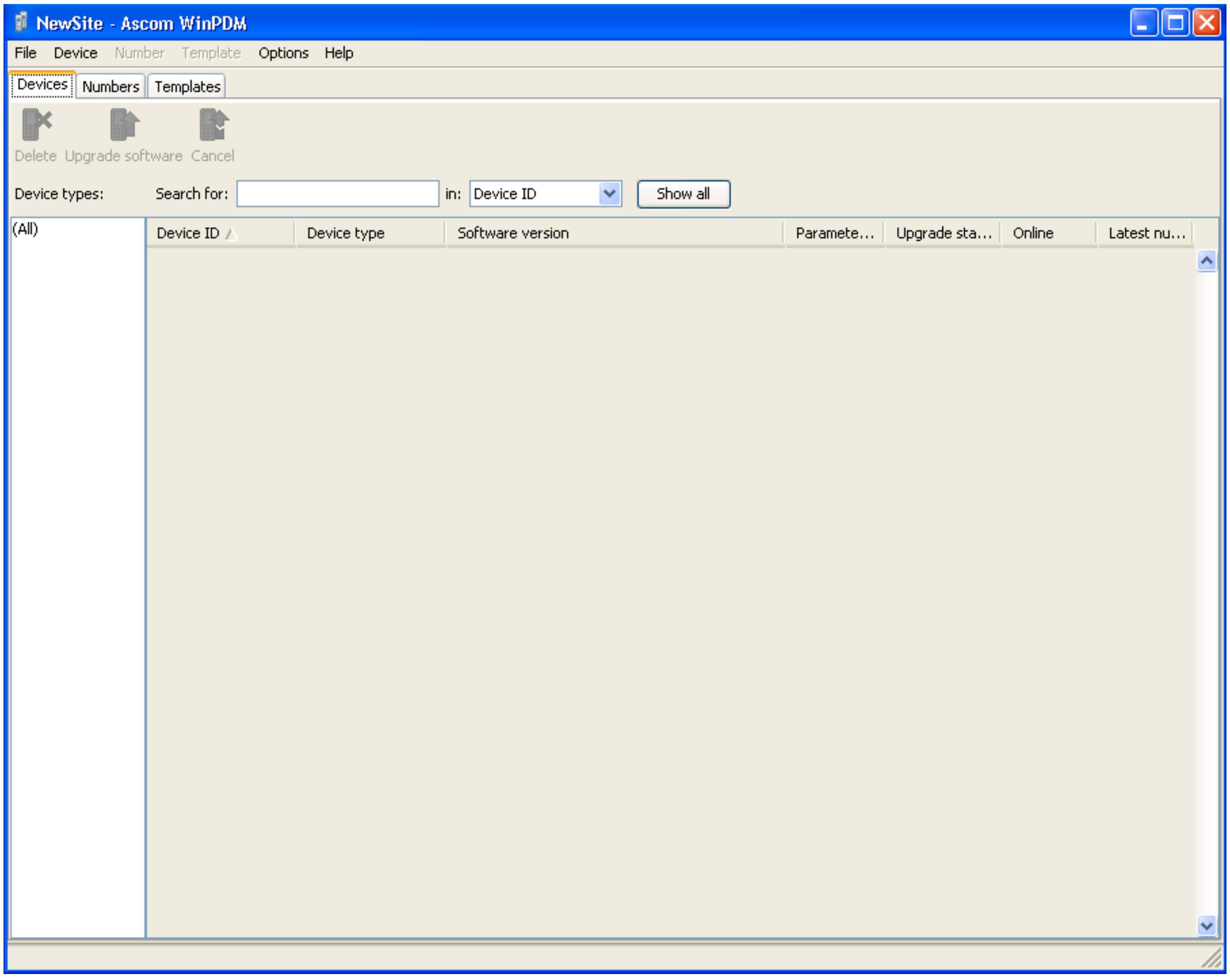


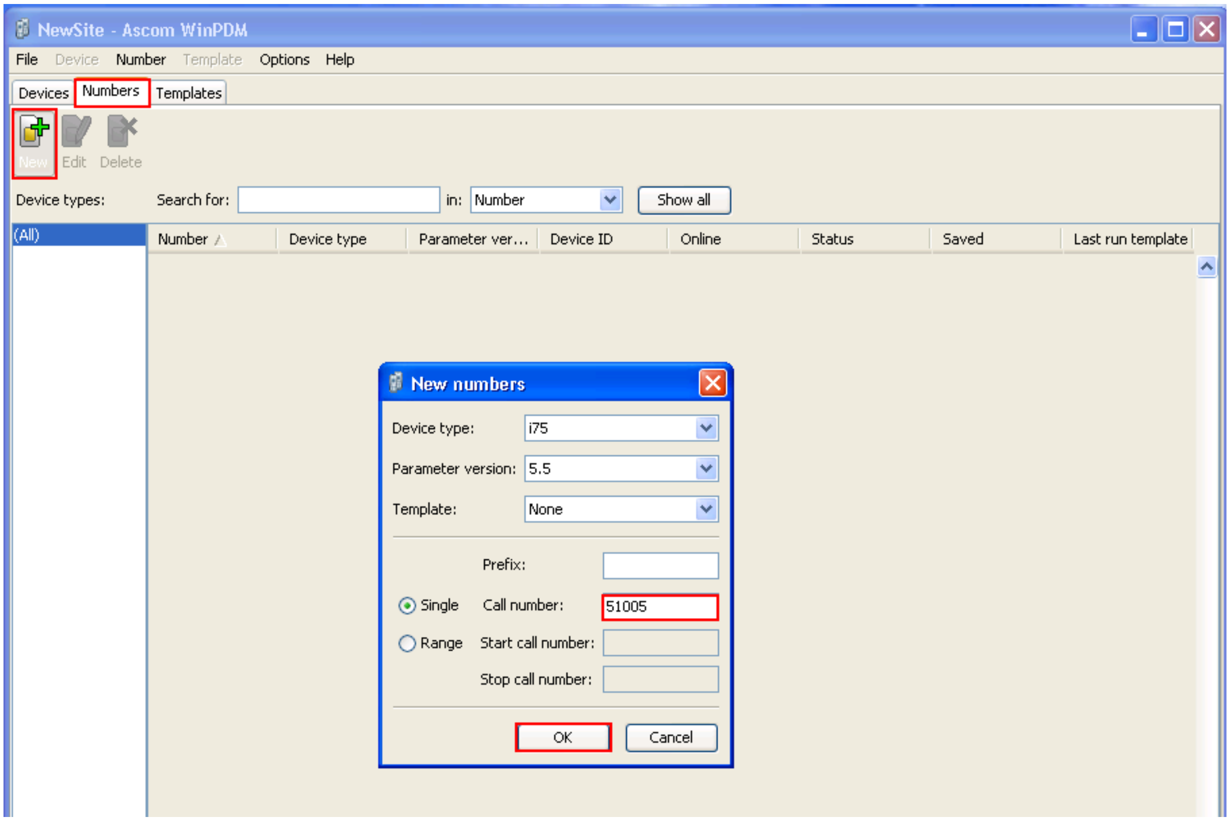
```
change feature-access-codes                                     Page   1 of   9
                               FEATURE ACCESS CODE (FAC)
         Abbreviated Dialing List1 Access Code: *600
         Abbreviated Dialing List2 Access Code: *601
         Abbreviated Dialing List3 Access Code: *602
Abbreviated Dial - Prgm Group List Access Code:
                      Announcement Access Code: *604
                       Answer Back Access Code: *650
                         Attendant Access Code:
      Auto Alternate Routing (AAR) Access Code: 3
    Auto Route Selection (ARS) - Access Code 1: 9     Access Code 2:
                 Automatic Callback Activation: *605   Deactivation: *606
Call Forwarding Activation Busy/DA: *607   All: *608   Deactivation: *609
   Call Forwarding Enhanced Status:        Act:        Deactivation:
                         Call Park Access Code: *652
                       Call Pickup Access Code: #6
CAS Remote Hold/Answer Hold-Unhold Access Code:
                  CDR Account Code Access Code:
                        Change COR Access Code:
                   Change Coverage Access Code:
            Conditional Call Extend Activation:        Deactivation:
                   Contact Closure   Open Code:          Close Code:
 ESC-x=Cancel Esc-e=Submit Esc-p=Prev Pg Esc-n=Next Pg Esc-h=Help
```

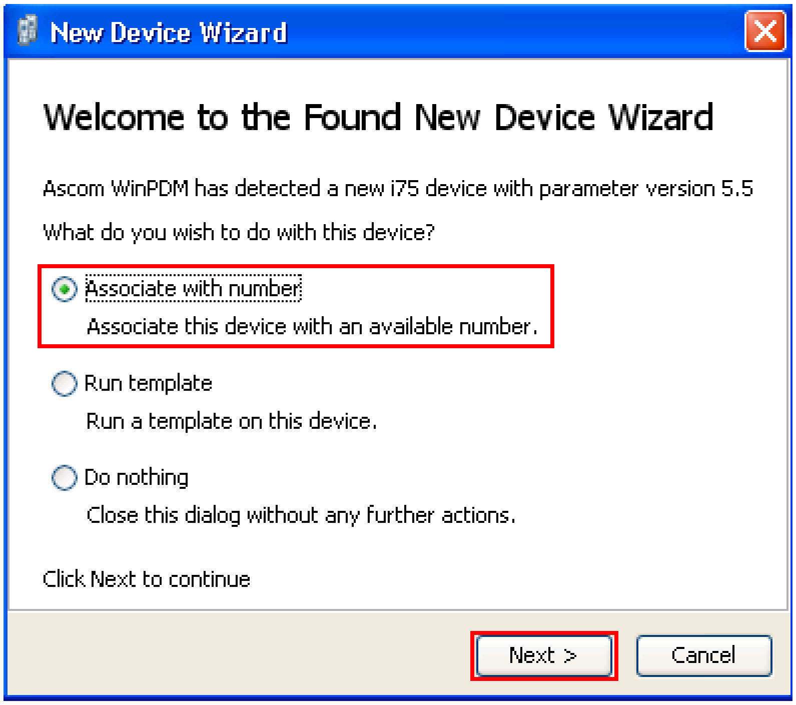
</td></tr>
</table>

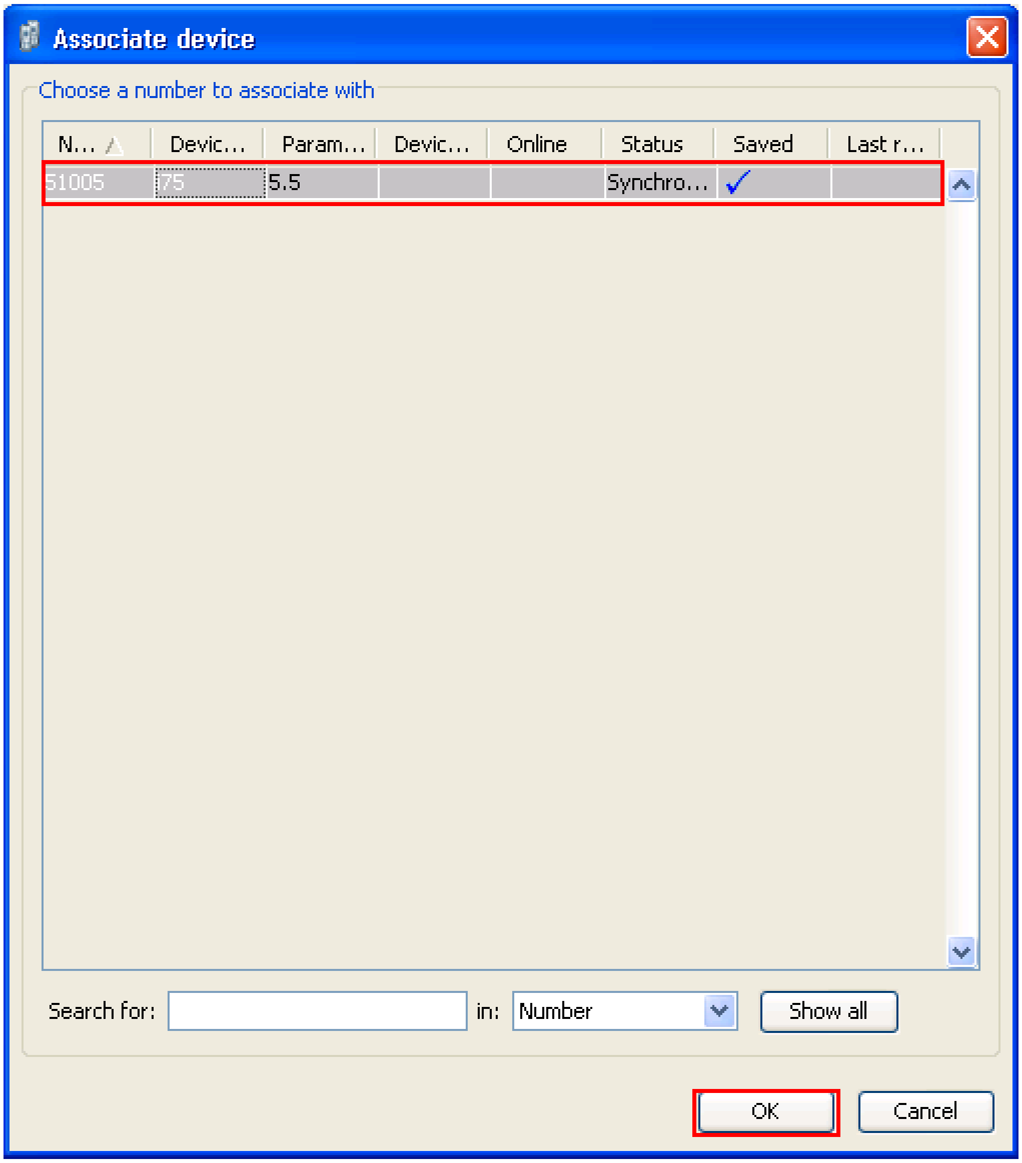
5. Configure the Ascom wireless i75 VoWiFi Handset

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, [8] and [9]**.

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, [8] and [9]** 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.  NewSite - Ascom WinPDM File Device Number Template Options Help Devices Numbers Templates Delete Upgrade software Cancel Device types: Search for: in: Device ID Show all (All) Device ID Device type Software version Paramete... Upgrade sta... Online Latest nu...

Step	Description
2.	Create the extension profiles on the Ascom WinPDM. For this example extension 51005 will be used. From the Ascom WinPDM window, click **Numbers → New**. The **New numbers** dialogue window appears, Set the following options: • **Call number = 51005** Click **OK** to continue.  New numbers Device type: i75 Parameter version: 5.5 Template: None Prefix: ● Single Call number: 51005 ○ Range Start call number: Stop call number: NewSite - Ascom WinPDM File Device Number Template Options Help Devices Numbers Templates New Edit Delete Device types: Search for: in: Number Show all (All) Number Device type Parameter ver... Device ID Online Status Saved Last run template OK Cancel
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.**  Welcome to the Found New Device Wizard Ascom WinPDM has detected a new i75 device with parameter version 5.5 What do you wish to do with this device? ● Associate with number Associate this device with an available number. ○ Run template Run a template on this device. ○ Do nothing Close this dialog without any further actions. Click Next to continue

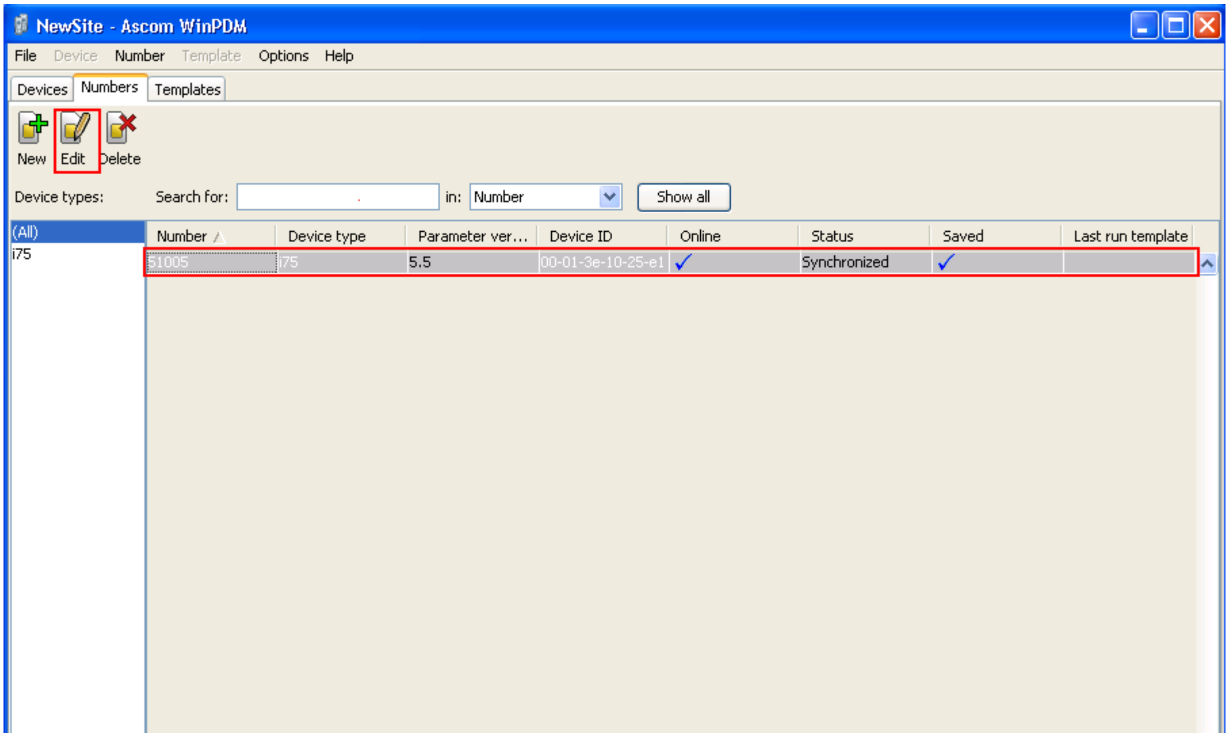
Step	Description
5.	The **Associate device** dialogue window appears, select the extension that the Ascom wireless i75 Handset is associating to and select **OK**. 

Associate device

Choose a number to associate with

N...	Devic...	Param...	Devic...	Online	Status	Saved	Last r...
51005	i75	5.5			Synchro...	✓	

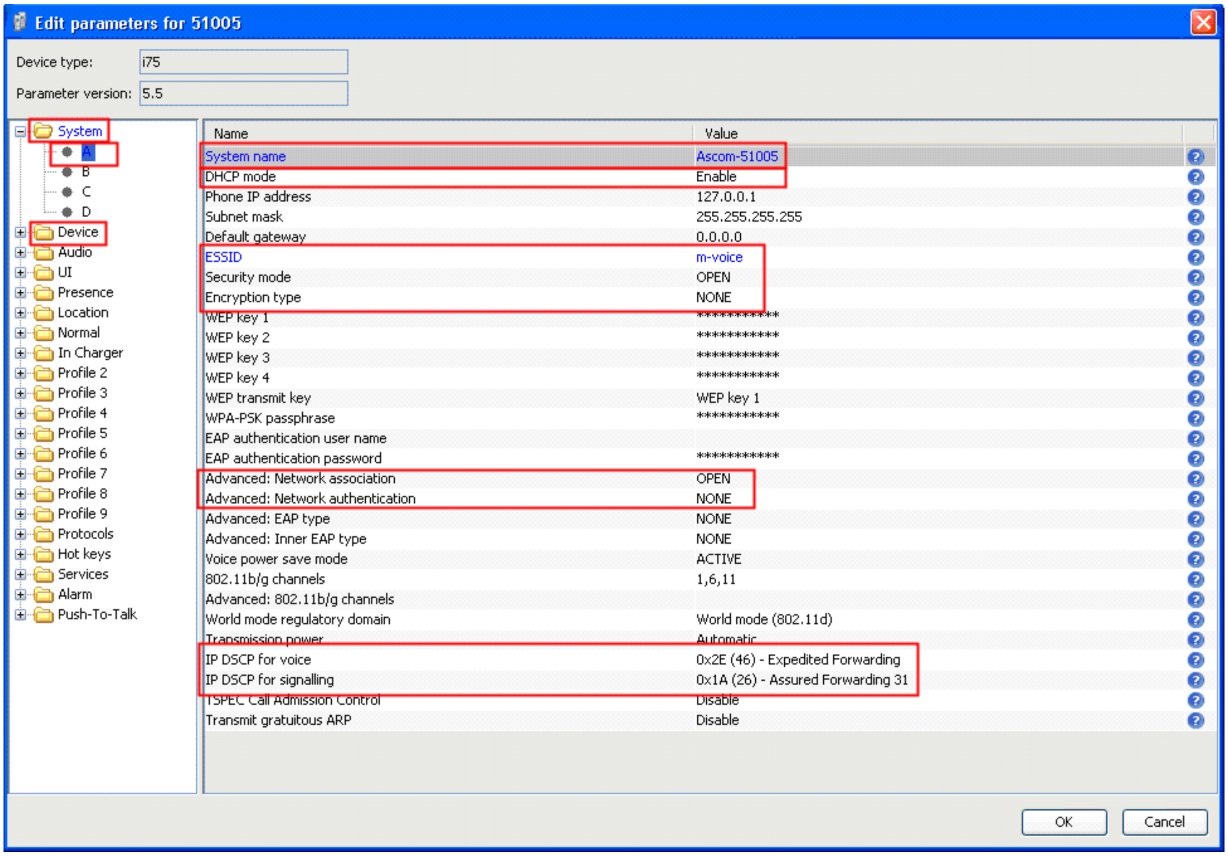
Search for: in: Number

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

Number	Device type	Parameter ver…	Device ID	Online	Status	Saved	Last run template
51005	i75	5.5	00-01-3e-10-25-e1	✓	Synchronized	✓	

Step	Description
7.	The **Edit parameters for 51005** 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 **Section 9, [8] and [9]**.

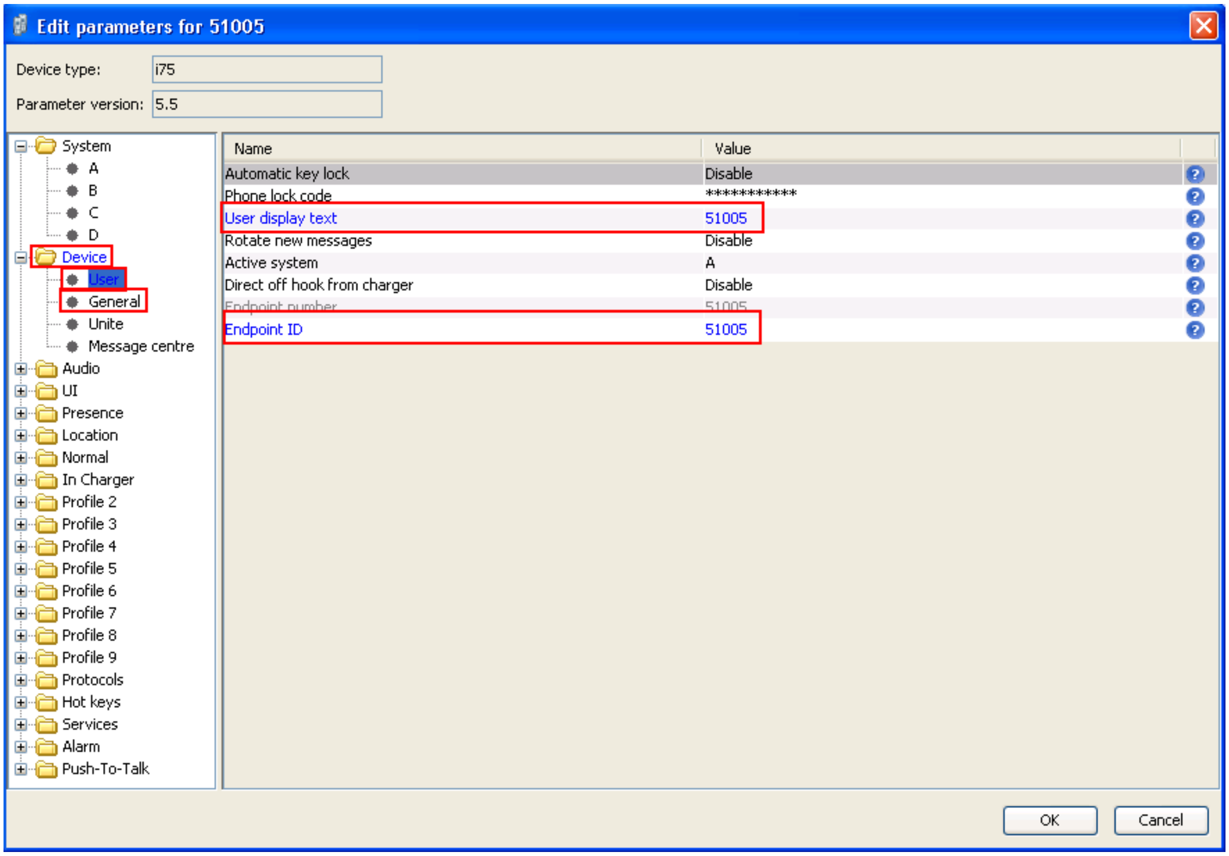
System Name	**"Ascom-51001"**
DHCP mode	**"Enable"**
ESSID	**"m-voice"**
Security mode	**"Open"**
Encryption type	**"NONE"**
Advanced Network association	**"OPEN"**
Advanced Network authentication	**"NONE"**
IP DSCP for voice	**"0x2E (46) – Expedited Forwarding"**
IP DSCP for signaling	**"0x1A (26) – Assured Forwarding 31"**



Device type: i75

Parameter version: 5.5

Name	Value
System name	Ascom-51005
DHCP mode	Enable
Phone IP address	127.0.0.1
Subnet mask	255.255.255.255
Default gateway	0.0.0.0
ESSID	m-voice
Security mode	OPEN
Encryption type	NONE
WEP key 1	***********
WEP key 2	***********
WEP key 3	***********
WEP key 4	***********
WEP transmit key	WEP key 1
WPA-PSK passphrase	***********
EAP authentication user name	
EAP authentication password	***********
Advanced: Network association	OPEN
Advanced: Network authentication	NONE
Advanced: EAP type	NONE
Advanced: Inner EAP type	NONE
Voice power save mode	ACTIVE
802.11b/g channels	1,6,11
Advanced: 802.11b/g channels	
World mode regulatory domain	World mode (802.11d)
Transmission power	Automatic
IP DSCP for voice	0x2E (46) - Expedited Forwarding
IP DSCP for signalling	0x1A (26) - Assured Forwarding 31
TSPEC Call Admission Control	Disable
Transmit gratuitous ARP	Disable

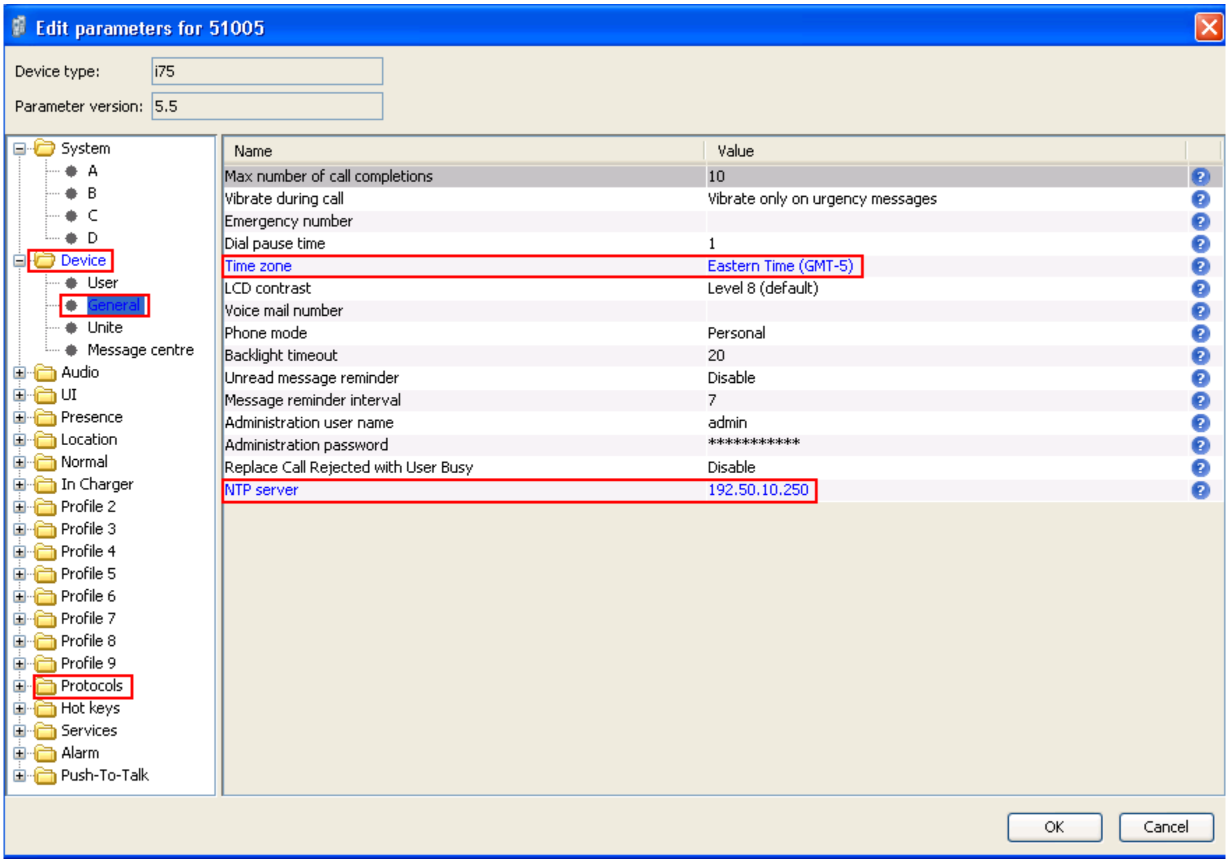
Step	Description
8.	Navigate to the **USER** configuration page by clicking **DEVICE** and then **USER**. Verify and Configure the parameters that are listed below, click **General** to continue. **User display text** "51005" **Endpoint ID** "51005" 

Edit parameters for 51005

Device type: i75

Parameter version: 5.5

Name	Value
Automatic key lock	Disable
Phone lock code	***********
User display text	51005
Rotate new messages	Disable
Active system	A
Direct off hook from charger	Disable
Endpoint number	51005
Endpoint ID	51005

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

Edit parameters for 51005

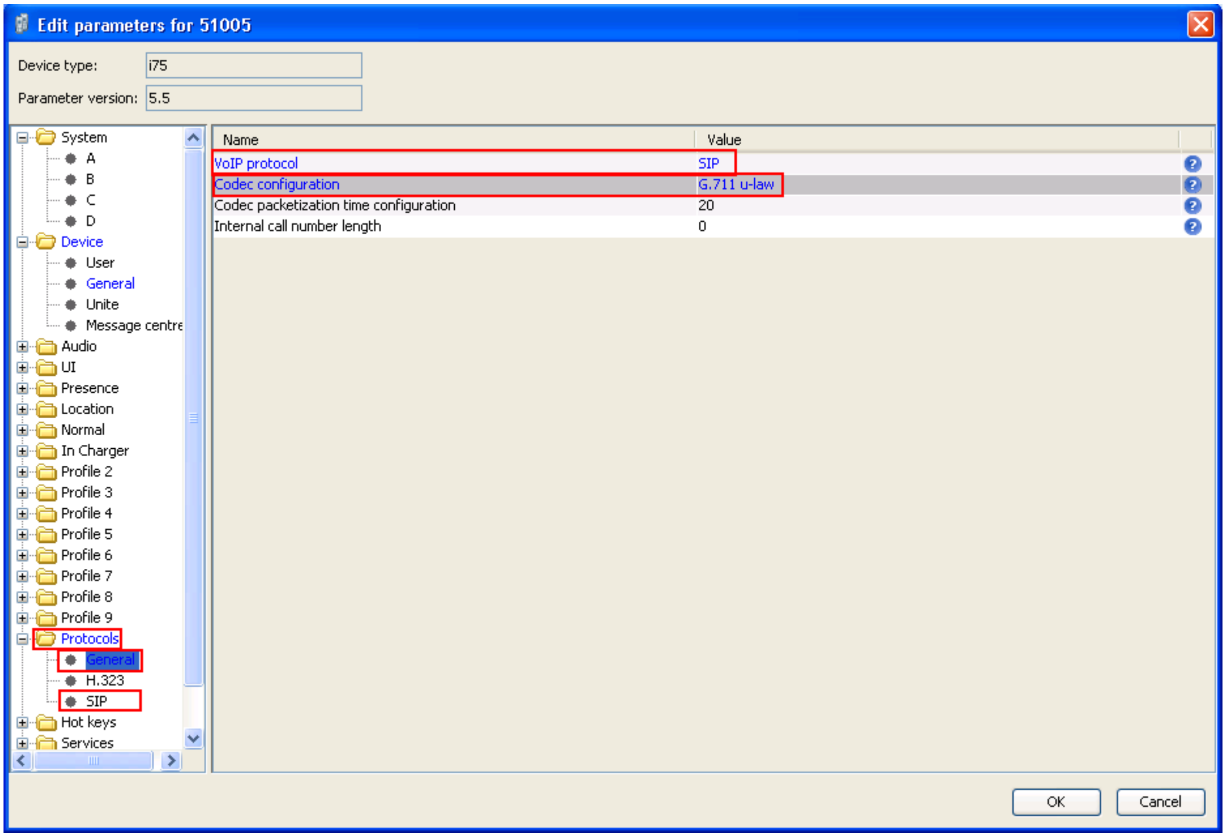
Device type: i75

Parameter version: 5.5

Name	Value
Max number of call completions	10
Vibrate during call	Vibrate only on urgency messages
Emergency number	
Dial pause time	1
Time zone	Eastern Time (GMT-5)
LCD contrast	Level 8 (default)
Voice mail number	
Phone mode	Personal
Backlight timeout	20
Unread message reminder	Disable
Message reminder interval	7
Administration user name	admin
Administration password	***********
Replace Call Rejected with User Busy	Disable
NTP server	192.50.10.250

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>10.</td><td>
Click <b>GENERAL</b>. Verify and configure the parameters that are listed below. Ensure that the codec chosen matches whatever is used on Communication Manager. Click <b>SIP</b> to continue.

<b>VoIP protocol</b> “SIP”
<b>Codec configuration</b> “G.711 u-law”

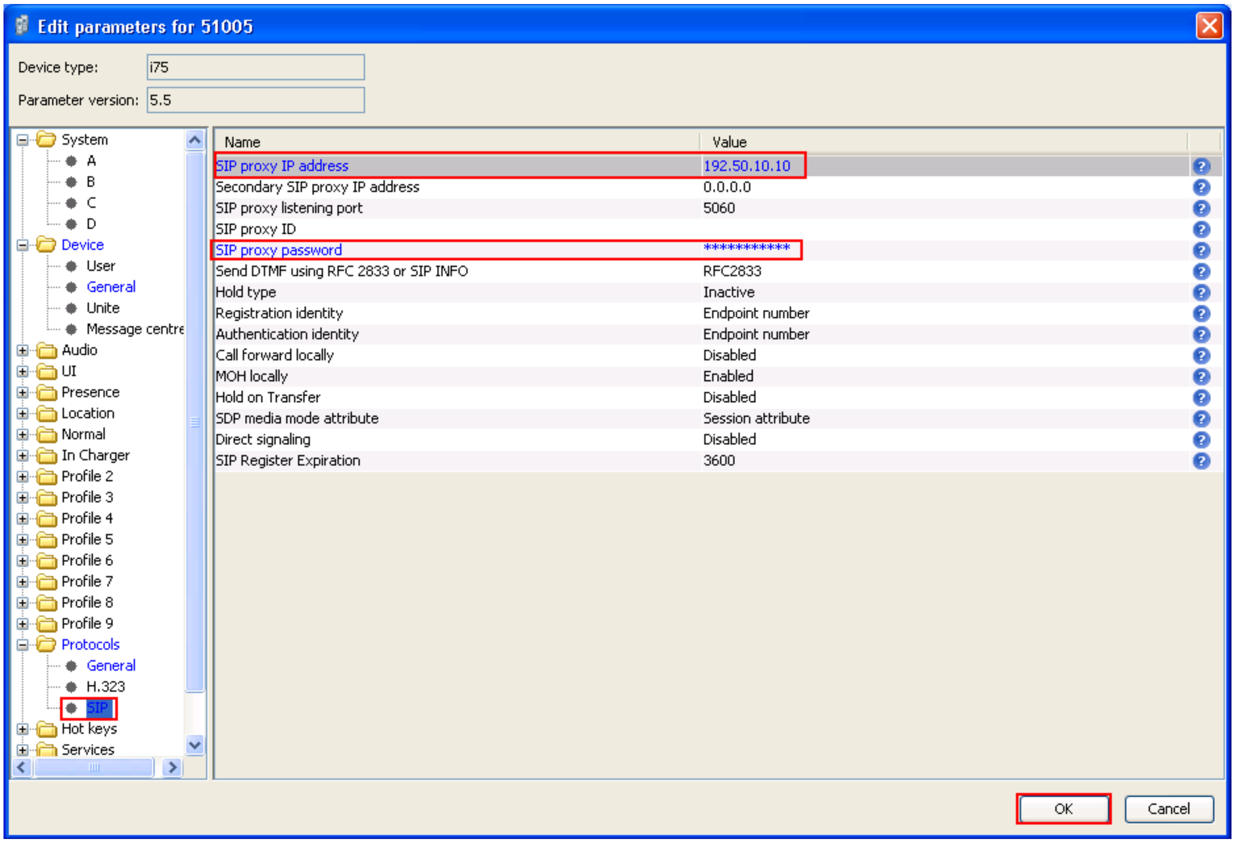


Edit parameters for 51005
Device type: i75
Parameter version: 5.5
<table>
<tr><th>Name</th><th>Value</th></tr>
<tr><td>VoIP protocol</td><td>SIP</td></tr>
<tr><td>Codec configuration</td><td>G.711 u-law</td></tr>
<tr><td>Codec packetization time configuration</td><td>20</td></tr>
<tr><td>Internal call number length</td><td>0</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>11.</td><td>Verify and Configure the parameters that are listed below. Ensure that the codec chosen matches whatever is used on Communication Manager Branch.

The <b>SIP proxy password</b> field must match the user password configured on SES. Once the information has been configured, the WinPDM reports the information as ****. After clicking <b>OK</b>, pick up the i75 handset from the WinPDM in order to reboot the handset and activate the new configuration.

<b>SIP proxy IP address</b> “192.50.10.10”
<b>SIP proxy password</b> “123456”



Device type: i75
Parameter version: 5.5
<table>
<tr><th>Name</th><th>Value</th></tr>
<tr><td>SIP proxy IP address</td><td>192.50.10.10</td></tr>
<tr><td>Secondary SIP proxy IP address</td><td>0.0.0.0</td></tr>
<tr><td>SIP proxy listening port</td><td>5060</td></tr>
<tr><td>SIP proxy ID</td><td></td></tr>
<tr><td>SIP proxy password</td><td>************</td></tr>
<tr><td>Send DTMF using RFC 2833 or SIP INFO</td><td>RFC2833</td></tr>
<tr><td>Hold type</td><td>Inactive</td></tr>
<tr><td>Registration identity</td><td>Endpoint number</td></tr>
<tr><td>Authentication identity</td><td>Endpoint number</td></tr>
<tr><td>Call forward locally</td><td>Disabled</td></tr>
<tr><td>MOH locally</td><td>Enabled</td></tr>
<tr><td>Hold on Transfer</td><td>Disabled</td></tr>
<tr><td>SDP media mode attribute</td><td>Session attribute</td></tr>
<tr><td>Direct signaling</td><td>Disabled</td></tr>
<tr><td>SIP Register Expiration</td><td>3600</td></tr>
</table></td></tr>
<tr><td>12.</td><td>Repeat <b>Steps 1 – 11</b> for each Ascom wireless i75 VoWiFi Handset being provisioned, but modify the appropriate extension fields to avoid duplication.</td></tr>
</table>

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 Aura™ SIP Enablement Services.
- Verify Message Waiting Indicator and message retrieval from Avaya Modular Messaging Server & Avaya Communication Manager Messaging
- VoIP calls between Ascom and Avaya Digital Telephones, Avaya SIP and Avaya H.323 IP Telephones.
- Inter-office calls using SIP, G.711 codec, shuffling, conferencing, voicemail, DTMF and sending low priority data traffic over the LAN.
- 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 Aura™ Communication Manager and Avaya Aura™ SIP Enablement Services. 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 and codecs, G.711MU were used for testing. Telephone calls were verified to operate correctly with the media path direct between the telephones (shuffling enabled) and with the media path centralized through Avaya Aura™ Communication Manager (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, multiple call appearances, caller ID operation, call forwarding unconditional, call forwarding on busy, call forwarding clear, pick groups, call pickup, bridged appearance alerting, voicemail using Avaya Modular Messaging & Avaya Communication Manager Messaging, MWI, 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 an Avaya Aura™ telephony infrastructure using Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging. All feature functionality test cases described in **Section 6.1** passed.

9. Additional References

Avaya documentation was obtained from http://support.avaya.com.

[1] *Administering Avaya Aura™ Communication Manager,* May 2009 , Issue 5.0, Document Number 03-300509..

[2] *Administering Avaya Aura™ SIP Enablement Services*, May 2009, Issue 2.1, Document 03-602508.

[3] *Avaya Aura™ SIP Enablement Services (SES) Implementation Guide*, May 2009, Issue 6, Document 16-300140.

[4] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide Release 3.0,* Document Number 16-300698.

[5] *Avaya one-X Deskphone SIP for 9600 Series IP Telephones Administrator Guide, Release 2.0,* Document Number 16-601944.

[6] *Modular Messaging, Release 5.0 with the Avaya MSS Messaging Application Server (MAS) Administration Guide,* January 2009.

[7] *Avaya Communication Manager Messaging Application Release* 5.1 *Administering. Communication Manager Servers to Work with IA 770*, June 2008.

The Ascom wireless documentation was obtained from http://www.Ascom wireless.com.

[8] *Installation and Operation Manual – Device Manager (WinPDM)*, *Windows version*, December 2006, Version C, Document Number TD 92325GB

[9] *User Manual Ascom i75 VoWiFi Handset,* September 2006, Version B, Document Number TD 92319GB

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.