		I n n o v a t i o n **N e t w o r k A p p N o t e**
SShoreTel®	**ascom**	**TPP: 10111** **Date: July, 2013**
**Product: ShoreTel	Ascom IP-DECT**		**System version:** ShoreTel 13.2

Abstract

The Ascom IP-DECT System is a wireless telephony system that utilizes the standard LAN/WAN infrastructure from the ShoreTel IP-PBX to the IP-DECT Base Station/IP-DECT gateway and then a DECT protocol from the Base Station to the Handset. Combining the ShoreTel IP-PBX with an Ascom IP-DECT System, allows our customers the opportunity to utilize their existing wireless infrastructure, ShoreTel's unique distributed call control architecture and Ascom's dedicated DECT voice path.

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Overview

This Application Note details the steps for creating a SIP VoIP-enabled wireless network using Digital Enhanced Cordless Telecommunications (DECT) with connectivity that enables interoperability between the Ascom IP-DECT SIP solutions with ShoreTel's IP-PBX. The specific calling features that were verified to operate correctly include transfer (attended and unattended), hold/return from hold, caller ID operation, call forwarding (unconditional, on busy/no answer and clear), pickup groups, call pickup, bridged appearances, and voicemail Message Waiting Indicator (MWI).

Ascom Overview and Contact

Sales support for the Ascom IP-DECT Solution can be obtained through the following:

For local US/Canada:

- **Phone:** 1-877-71ASCOM or 1-877-712-7266

- **Internet:** http://www.ascom.us/us-en/index-us/products-solutions/sales-us.htm (for your Regional Sales Director)

- **Email:** techsupport@ascomwireless.com (for Technical support)

For international customer:

- **Internet:** www.ascom.com/ws and select your country of interest, to find local sales and support contact information.

Ascom Product Information

Ascom IP-DECT Base Stations and IP-DECT Gateway

IPBS1   IPBS2   IP-DECT Gateway (IPBL)

Ascom DECT handsets

d41   d62   d81

Architecture Overview

The network diagram shown below illustrates the testing environment used for compliance testing. The network consists of: a ShoreTel Shore Ware Director, a ShoreTel Personal Call Manager, three different models of ShoreTel IP telephones (IP110, IP230, and IP560), three different Ascom DECT handsets (d41, d62 and d81), one non wireless non IP telephone, two Ascom IP-DECT Base Stations/IP-DECT Gateway (Master, Standby Master) and a wireless network infrastructure providing network services such as DHCP, and TFTP.
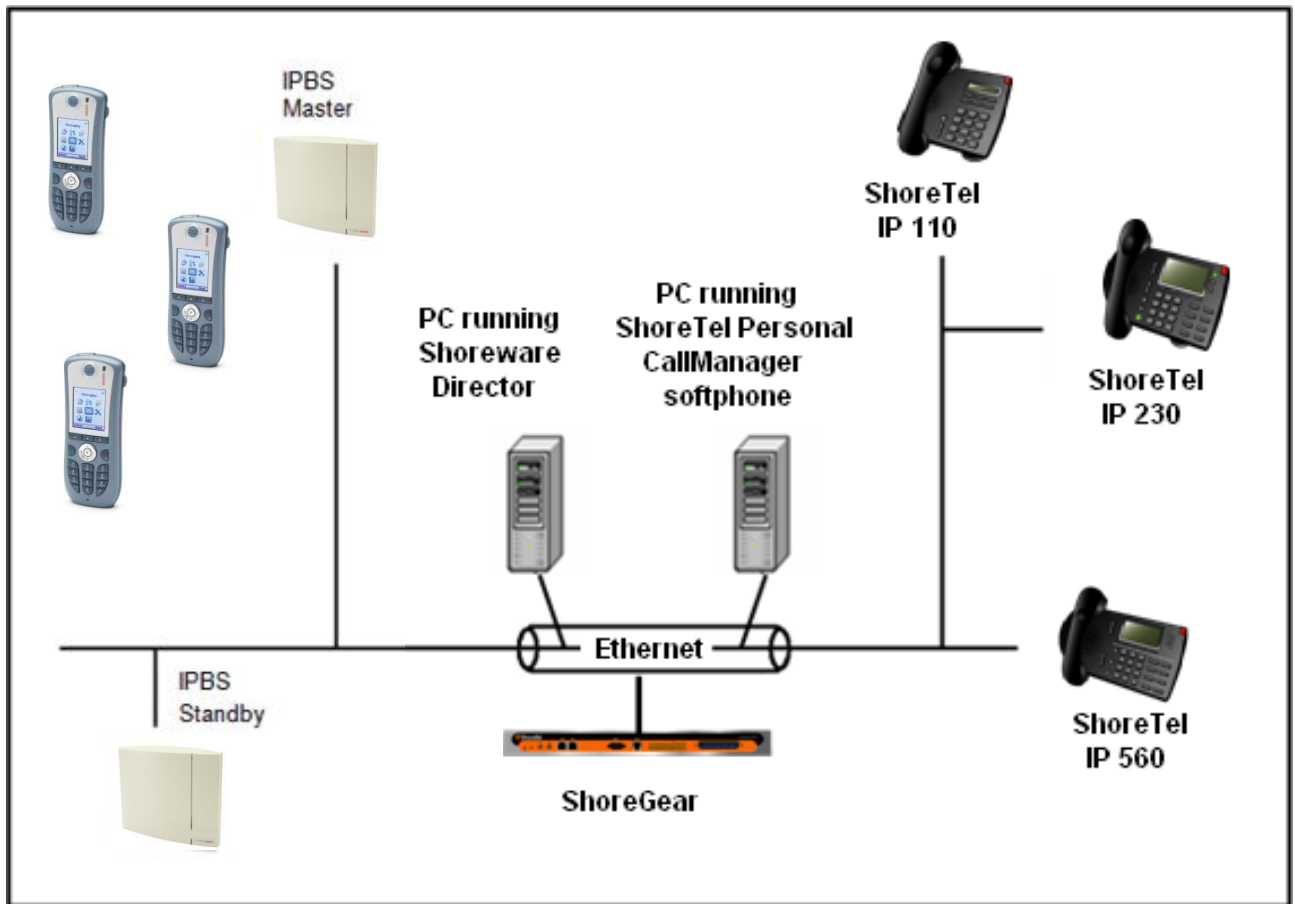
Requirements, Certification and Limitations

The following is required in order to configure the IP-DECT system:

• PC

• 10/100base-T Ethernet connection

Web Browser Requirements:

To use the interface properly, the web browser has to meet the following requirements:

• HTTP 1.1 protocol

• HTML 4.0 protocol

• XML/XSL Version 1.0

The GUI has been tested with Internet Explorer 8.x, but can also be operated with other browsers in compliance with the requirements above.

Note: Deployment of Ascom IP DECT handsets require ShoreTel SIP Phone License(s) (one per Ascom IP DECT handset) as well as the either the Extension & Mailbox License OR the Extension Only License

Version Support

The DECT handset software versions does not directly affect the SIP signaling interoperability towards the ShoreTel PBX since the IP-DECT infrastructure is working as a proxy between DECT and SIP. Thus any Ascom DECT handset and software version should work under normal operating conditions. For the ShoreTel IP-DECT SIP interoperability testing the following version were used:

		Ascom IP-DECT Base Station (IPBS1 & 2)	Ascom IP-DECT gateway (IPBL)	Ascom d41/ d62 /d81 Handsets
		6.1.2	6.1.2	4.1.6
ShoreTel Release	13.2 Build 18.42.1304.0 (or above)	✓	✓	✓

Certification Testing Results Summary

Table 1: Basic Test Cases

ID	Name	Description	Results
1.1	Device initialization with static IP address	Verify successful startup and initialization of the device up to a READY/IDLE state using a static IP address	Pass
1.2	Device reset – idle (for static configurations)	Verify successful re-initialization of device after power loss while device is idle	Pass
1.3	Device initialization with DHCP	Verify successful startup and initialization of the device up to a READY/IDLE state using DHCP	Pass
1.4	Device reset – idle (for dynamic configurations)	Verify successful re-initialization of device after power loss while device is idle	Pass
1.5	Verify Diffserv Code Point support	Verify the ability to set Diffserv Code Point from SIP DUT (device under test)	Not Tested
1.6	Verify Date and Time Update support	Verify setting of Date and Time Update on SIP DUT	Pass
1.7	Place call	Verify successful call placement with normal dialing to a variety of terminating phones	Pass
1.8	Receive call	Verify successful call placement with normal dialing to a variety of terminating phones	Pass
1.9	CODEC support (DUT to ShoreTel Phone)	Verify successful call connection and audio path using all supported CODECs (G.711-Ulaw and G.729)	Pass
1.10	CODEC support (DUT to SIP reference)	Verify successful call connection and audio path using all supported CODECs (G.711-Ulaw and G.729)	Pass
1.11	CODEC negotiation	Verify successful negotiation between devices configured with different default CODECs (G.711-Ulaw and G.729)	Pass
1.12	Hold DUT to SIP reference	Verify successful hold and resume of connected call	Pass
1.13	Hold DUT to ShoreTel	Verify successful hold and resume of connected call	Pass
1.14	Forward	Verify successful forwarding of incoming calls	Pass *
1.15	Forward from SIP DUT	Verify successful forwarding of incoming calls	Pass *
1.16	Dual-tone multi-frequency (DTMF) transmission	Verify successful transmission of in-band and out-of-band digits (RFC2833) for calls placed to and from the DUT with a variety of other devices	Pass RFC2833 only

Table 2: Extended Feature Test Cases

ID	Name	Description	Notes
2.1	Call waiting	Verify appropriate notification and successful connection of incoming call while busy with another party	Pass
2.2	Park	Verify successful park and retrieval of connected call	Pass
2.3	Transfer – blind	Verify successful blind transfer of connected call	Pass
2.4	Transfer – monitored	Verify successful monitored transfer of connected call	Pass
2.5	Conference – ad hoc	Verify successful ad hoc conference of three parties	Pass
2.6	Caller ID	Verify that Caller ID name and number is sent and received from SIP endpoint device	Pass **
2.7	911	Verify dialing "911" on DUT could connect with "911" services	Not Tested
2.8	Auto Attendant Menu	Verify that calls are properly terminated on the ShoreTel Auto Attendant menu and that you can transfer to the desired extension.	Pass
2.9	Auto Attendant Menu "Dial by Name"	Verify that calls are properly terminated on the ShoreTel Auto Attendant menu and that you can transfer to the desired extension using the "Dial by Name" feature.	Pass
2.10	Auto Attendant Menu checking Voice Mail mailbox	Verify that calls are properly terminated on the ShoreTel Auto Attendant menu and that you can transfer to the Voice Mail Login Extension.	Pass
2.11	Initiate call to a Hunt Group	Initiate a call from DUT and verify that calls route to the proper Hunt Group and are answered by an available hunt group member with audio in both directions using G.729 and G.711 codecs.	Pass
2.12	Initiate call to a Workgroup	Initiate a call from DUT and verify that calls route to the proper Workgroup and are answered successfully by an available workgroup agent with audio in both directions using G.729 and G.711 codecs.	Pass
2.13	Hunt Group Member	Verify that incoming calls to a hunt group can be answered properly when DUT is a member of the hunt group.	Pass
2.14	Workgroup Agent	Verify that incoming calls to a workgroup can be answered properly when DUT is an agent of the workgroup.	Pass
2.15	Call Forward – "FindMe"	Verify that calls are forwarded to DUT's "FindMe" destination.	Pass
2.16	ShoreTel Converged Conferencing Server	Verify that calls are properly forwarded to the ShoreTel Converged Conferencing Server and it properly accepts the access code and you're able to participate in the conference bridge.	Pass
2.17	Bridged Call Appearance (BCA) extension	Verify that calls are properly presented to all of the phones that have BCA configured and that the call can be answered, placed on-hold and then transferred.	Pass

*) Call forwarding was configured from Shoretel GUI (Web Client). Local Call Forward not possible as ShoreTel does not allow 3rd party devices to redirect calls.

**) Caller will see only called party's number and not name.   Called party will display the callers name. This applies to internal calls.

Remarks

- Call forwarding has to be done via the ShoreTel user interface.
- Display information. Caller will see only called party's number.
  If A calls B. B will see A's name but A will see only B's number.

Configuration Overview

This document describes the major steps needed to configure the ShoreTel system and the Ascom IP DECT handset and base station for interoperability.

ShoreTel Configuration

This section describes the ShoreTel system configuration to support the Ascom. The section is divided into general system settings and individual user configuration needed to support the Ascom IP DECT handsets.

ShoreTel System Settings - General

The first settings to address within the ShoreTel system are the general system settings. These configurations include the call control, the switch and the site settings. If these items have already been configured on the system, skip this section and go on to the "ShoreTel System Settings – Individual Users" section below.

Call Control Settings

The Call Control Options within ShoreWare Director may need to be reconfigured. To configure these settings for the ShoreTel system, log into ShoreWare Director and select　"**Administration**"　"**Call Control**"　and then　"**Options**"　(**Figure 2**).
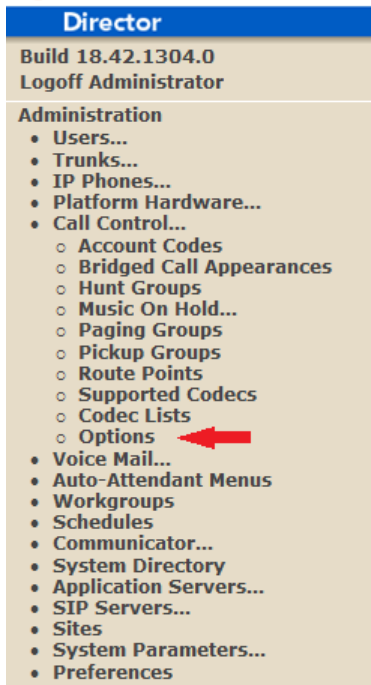
Figure 2 – Administration Call Control/Options

The "Call Control/Options" screen will then appear (**Figure 3**).
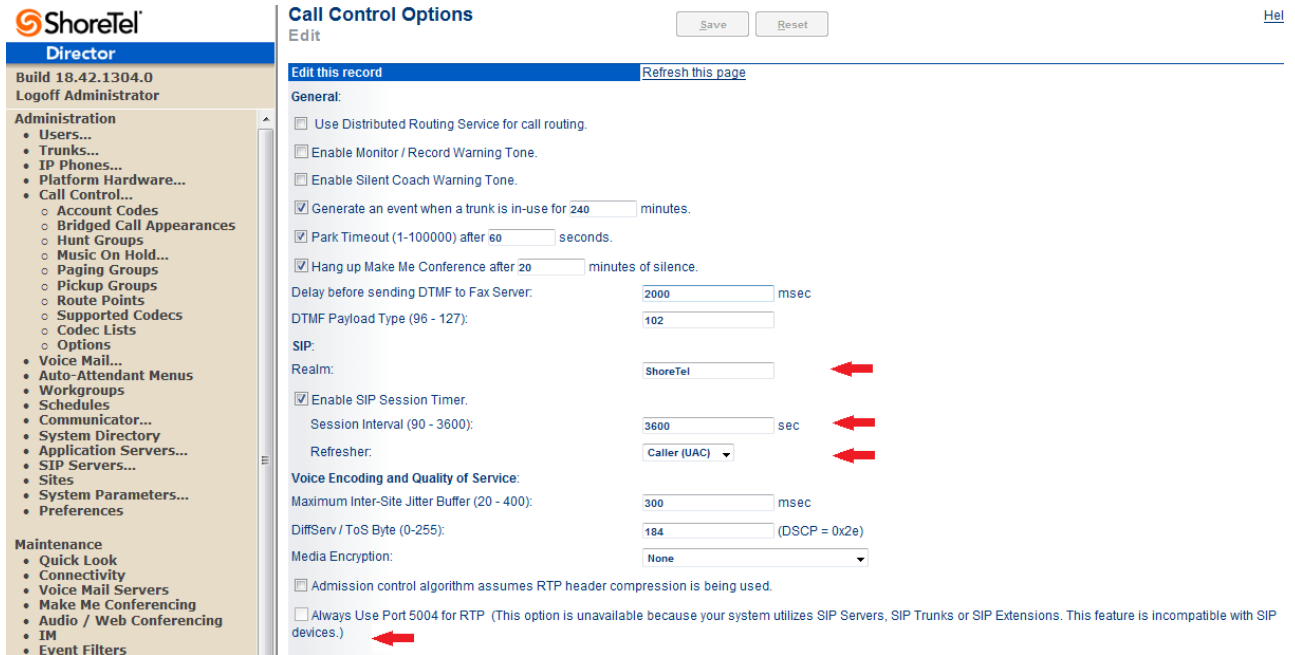
Figure 3 – Call Control/Options Screen

- If this is an upgrade from previous ShoreTel versions, you may see a parameter named "Always Use Port 5004 for RTP." If so, you will need to disable this parameter by un-checking the box and saving the setting. When enabled, SIP extension configuration will fail. It is also important to note that this "one time" setting requires a system restart (all servers first, then ShoreGear switches followed by IP Phones) to take effect. Once the server has been restarted, this configuration parameter will no longer be visible, or may be grayed out. The default for new installations is disabled, thus the parameter is not visible (as shown in **Figure 3**).

- Realm: The realm is used in authenticating all SIP devices. It is typically a description of the computer or system being accessed. Changing this value will require reboot of switches serving as SIP extensions. It is not necessary to modify this parameter to get the Ascom IP DECT handsets functional.

- SIP session interval: Session interval value indicates the session (call) "keep alive" period. There is no need to modify the default value of "3600" seconds.

- SIP session refresher: The refresher setting decides if user agent client or user agent server refreshes the session. Again, there is no need to modify the default value of "Caller (UAC)." This allows the Ascom IP DECT handset to be in control of the session timer refresh.

Switch Settings

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When allocating Ports for SIP extensions, these changes are modified by selecting "**Administration**", "**Platform Hardware/Voice Switches/Primary…**", then "**Primary**" in ShoreWare Director (**Figure 4**).

Figure 4 – Administration/Switches

This action brings up the "Switches" screen. From the "Switches" screen, simply select the name of the switch to configure. The "Edit ShoreGear …Switch" screen will be displayed. Within the "Edit ShoreGear …Switch" screen, define one of the "Port Type" settings from the available ports to "100 SIP Proxy" (**Figure 5**), then save the change.

Note: If your installation requires more than 100 SIP extensions configure the "Port Type" as "100 SIP Proxy" as necessary (i.e. two ports configured for "100 SIP Proxy" will provide 200 SIP extensions).

Figure 5 – Edit Switches

If the ShoreGear switch that you have selected has "built-in" capacity (i.e., ShoreGear 50/90/220T1/E1, etc.) for IP phones and SIP trunks, you can also remove 5 ports from the total number available to provide the "100 SIP Proxy" configuration necessary (**Figure 6**).

Note: Every 5 ports you remove from the total available will result in "100 SIP Proxy" ports being made available.

One dedicated ShoreGear 120 switch can act as a proxy for the entire site and support up to 2400 SIP phones.

Figure 6 – ShoreGear Switch Built-in Capacity

Sites Settings

The next settings to address are the administration of sites. These settings are modified under the ShoreWare Director by selecting "**Administration**" then "**Sites**" (**Figure 7**).

Figure 7 – Administration/Sites

This selection brings up the "Sites" screen. Within the "Sites" screen, select the name of the site to configure. The "Edit Site" screen will then appear. Scroll down to the "**SIP Proxy**" parameters (**Figure 8**).
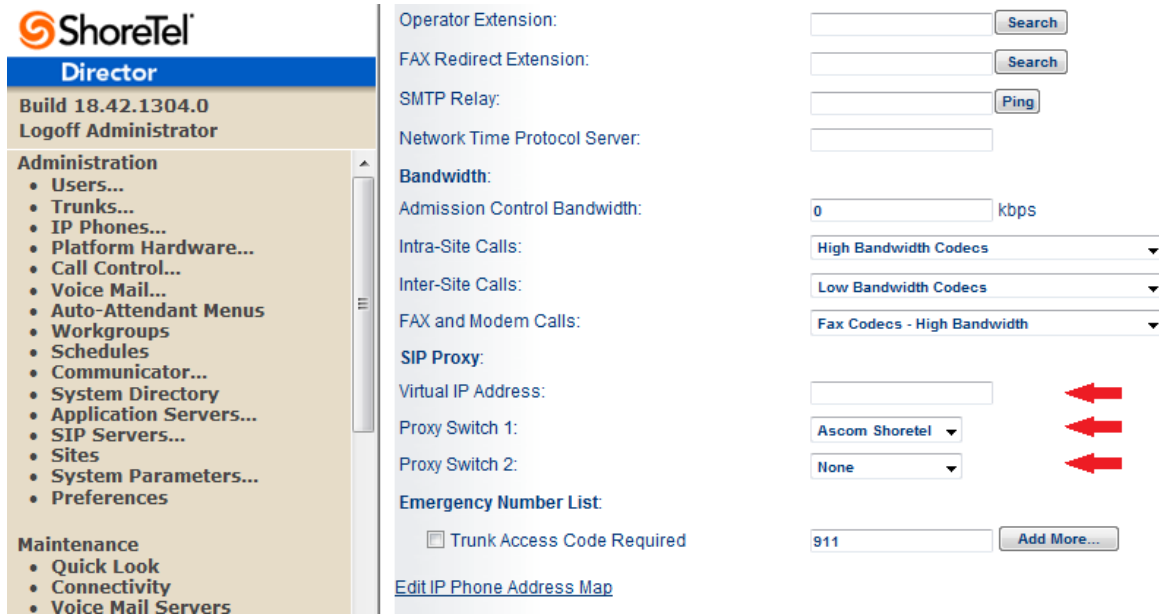
Figure 8 – Site Screen SIP Proxies

The "Virtual IP Address" parameter is a new configuration parameter beginning with ShoreTel 8. This "Virtual IP Address" is an IP address that can be moved to a different switch during a failure. For each site that supports SIP extensions, one "Virtual IP Address" is defined that will act as the SIP Proxy for the site. This IP address must be unique and static.

The ShoreTel server will assign this "Virtual IP Address" to the ShoreGear that is configured as SIP proxy for the site. Two ShoreGear switches can be configured as SIP proxy servers for redundancy and reliability purposes. If the primary proxy server goes down, the other proxy switch will take over the "Virtual IP Address." Due to this "Virtual IP Address" mechanism, SIP phones will not know if the proxy switch goes off-line.

Note: If you choose not to define a "Virtual IP Address," you can only define one proxy switch, and there is no redundancy or failover capabilities. The switches available in the "Proxy Switch 1 / 2" will only be shown if proxy resources have been enabled on the switch.

The Admission Control Bandwidth defines the bandwidth available to and from the site. This is important as SIP endpoints may be counted against the site bandwidth. See the ShoreTel Planning and Installation Guide for more information about this.

Beginning with ShoreTel 8.1, we now add 11 CODECs by default. These CODECs can be grouped as "Codec Lists" and defined in the sites page for "Inter-site" and "Intra-site" calls. See ShoreTel's Administration Guide for more information. The default settings will work properly with the IP DECT handsets.

Creating SIP Extension

You need to create a user extension for the IP DECT handset. This is accomplished from ShoreWare Director by selecting "**Administration**" followed by "**Users⋯**" then "**Individual Users**" This action will bring up the "Individual Users" screen at the top of the page. To the right of "**Add new user at site:**" select the site you wish to create the user in (from the drop down menu), and select "**Go**" (**Figure 9**).

Figure 9 – Individual Users Settings

This action brings up the "Users" "Edit Users" screen (**Figure 10**).

Figure 10 – Adding/Editing Users

Define the "**First Name**" and "**Last Name**" as you deem appropriate. ShoreWare Director will auto-assign the next available "**Number**" (i.e. extension), but you can modify it to any available extension. Define the "**License Type**" as needed, in this example we chose "Extension and Mailbox" although it's not necessary to have a mailbox, and "Professional"for "**Access License**". Define the proper "**User Group**" and set the "**Primary Phone Port**" to "Any IP Phone.", the Primary Phone Port will automatically update once the Ascom IP DECT handset registers to the ShoreTel system.

Note: If you configured the "License Type" for "Extension-Only," you cannot select "Any IP Phone" but instead must set the "Home Port" for the "SoftSwitch" selection. Save your changes, thenscroll down to the "**SIP Password:**" section (**Figure 11**).
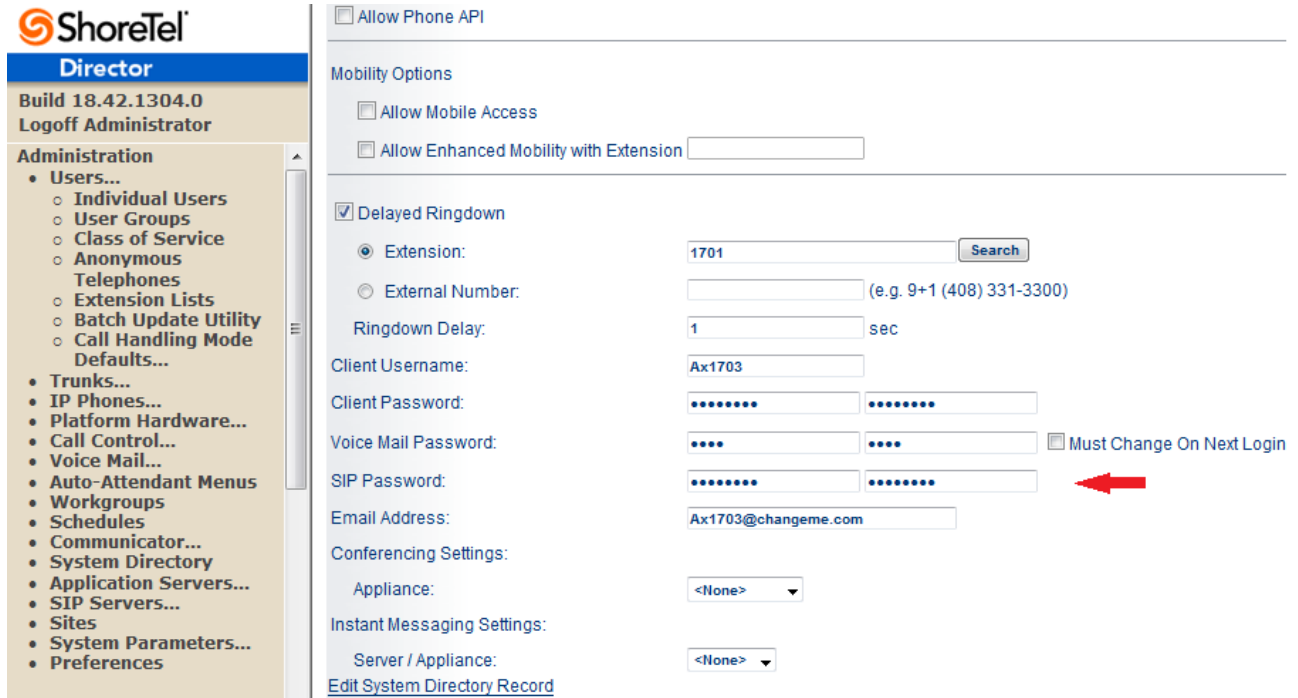
Figure 11 – Individual User SIP Settings

There is no default "**SIP Password**" it is masked with the appearance that there is, but don't be confused to think that there's a default password. You can modify it to any value you wish, but be certain to note what you changed it to, as you will need it when configuring the Ascom IP DECT handset parameters.

 "**Save**" your changes.

SIP Profiles

ShoreWare Director's "**IP Phones…**" section contains a "**SIP Profiles**" option. ShoreTel 12.1 comes standard with a "_System" and "_ShorePhoneIP8000" SIP profiles (they cannot be deleted - only disabled). By default, the Ascom IP DECT handsets utilize the "_System" profile. In order to optimize the functionality, you will need to add a custom profile. This is accomplished from ShoreWare Director by selecting "**Administration**" followed by "**IP Phones**" then "**SIP Profiles**" This action brings up the "SIP Profiles" screen. At the top of the page, below the "SIP Profiles List", select the "**New…**" radio button, as shown in **Figure 12**.

Figure 12 – SIP Profiles

This action brings up the "Edit SIP Profile" screen, Figure 13.

Figure 13 – Edit SIP Profile

Define a "**Name:**" for the entry, and be sure to define an appropriate name. For the "**User Agent:**" option, enter "Ascom IP-DECT" (without quotes); the "**Priority:**" defaults to 100, no change is required. Enable the profile by checking (enabling) the "**Enable**" option. In the "**Custom Parameters:**" options, add the following entries:

OptionsPing=1
MWI=subscribe
FakeDeclineAsRedirect=486
XferFailureNotSupported=1
AddGracePeriod=90
DelayUnregister=15

"**Save** " the changes.

Note: Please do not disable any of the default SIP profiles. In case there are issues with the custom profile defined, disabling the system profiles may cause the Ascom IP DECT handsets to not be added to the ShoreTel system. Refer to the ShoreTel's Planning and Installation Guide for more information.

IP address Phone Map

If you plan on adding Ascom IP DECT handsets at a differenct site, you will need to create an "IP Address Phone Map".Create an "IP Address Phone Map". You can do so via ShoreWare Director, navigating to the "**Administration**" , followed by "**IP Phones…**" , then "**IP Address Phone Map**" screen, then adding an entry for the desired site, with the IP address range of the Ascom IP DECT handsets. For more information on creating sites and adding switches, please refer to the ShoreTel Planning and Installation Guide.

This completes all of the ShoreTel configuration parameters necessary to install the Ascom IP DECT handsets.
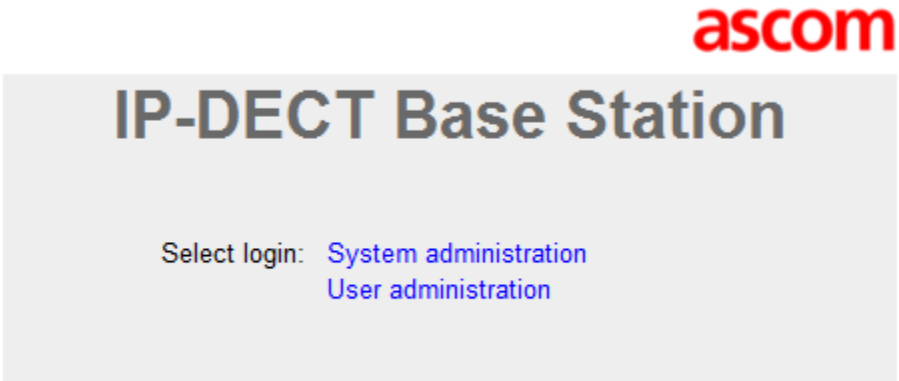
Ascom Configuration

The following steps detail the configuration process for the Ascom.

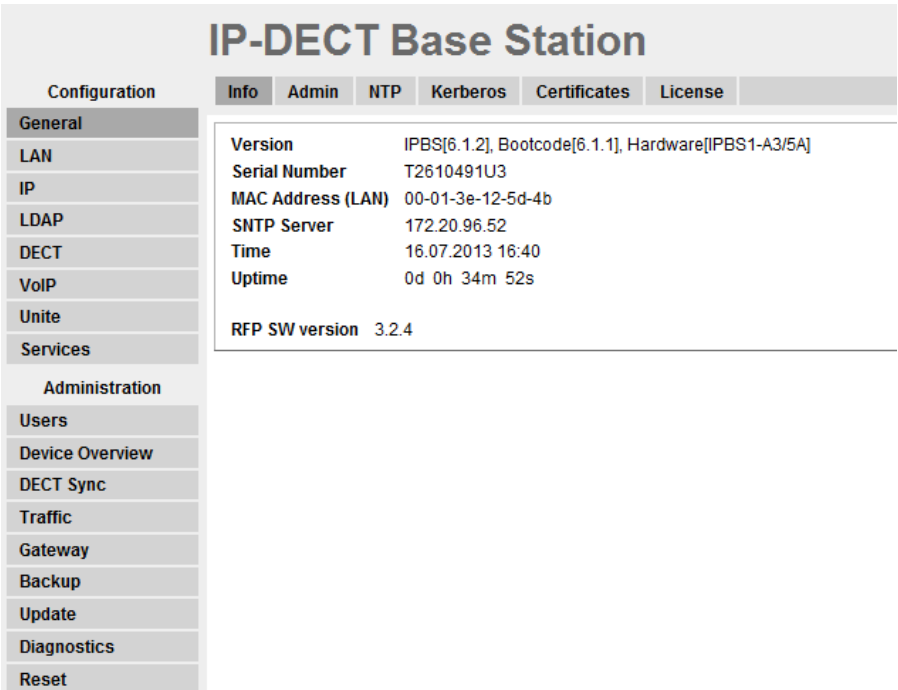## Configure the Master IP-DECT Base Station or the IP-DECT Gateway

The Ascom IP-DECT Base Stations /IP_DECT Gateway can be configured in a Master/Standby Master scenario to provide redundancy or to extend the radius of coverage.
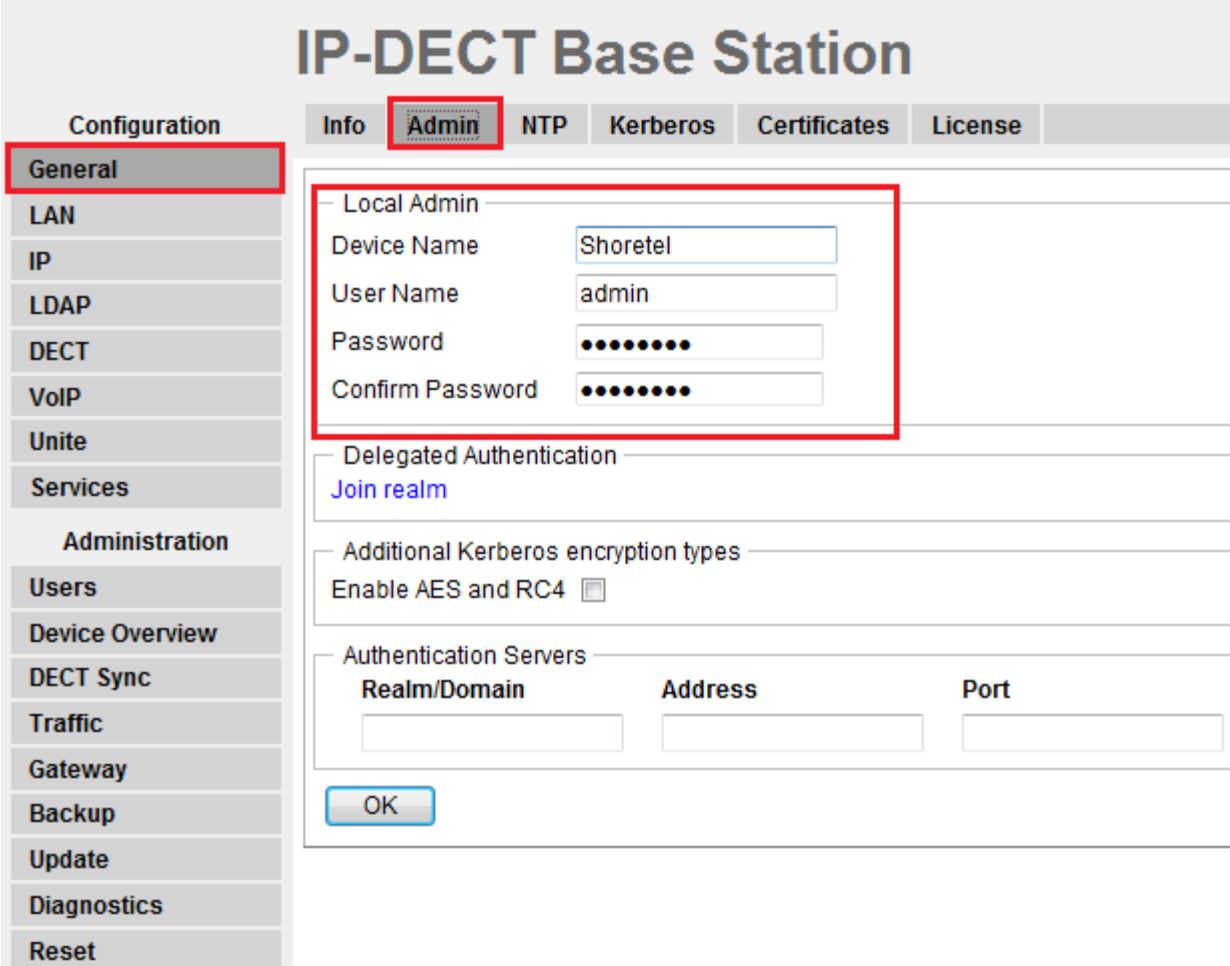
The following configuration steps detail the configuration process used to configure an Ascom IP-DECT Base Station in Master mode with one Standby Master base station but the same steps are applicable also for the IP-DECT Gateway.
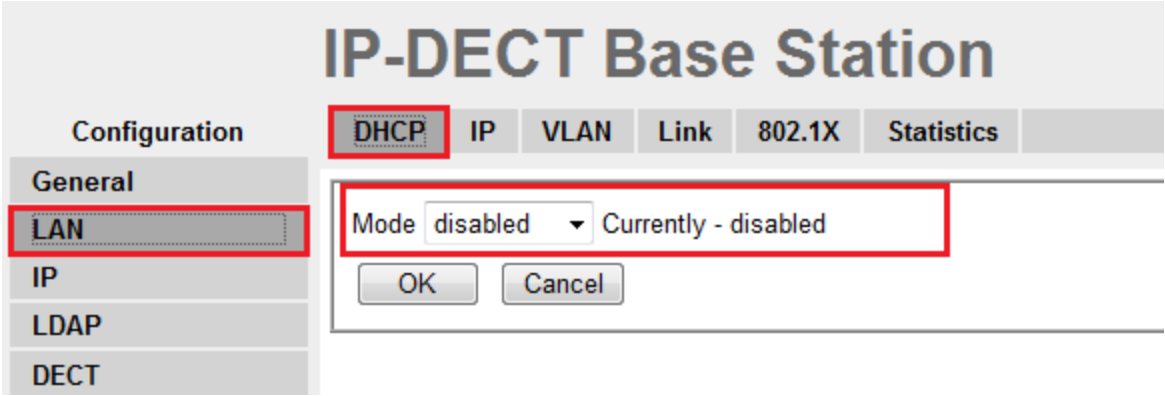
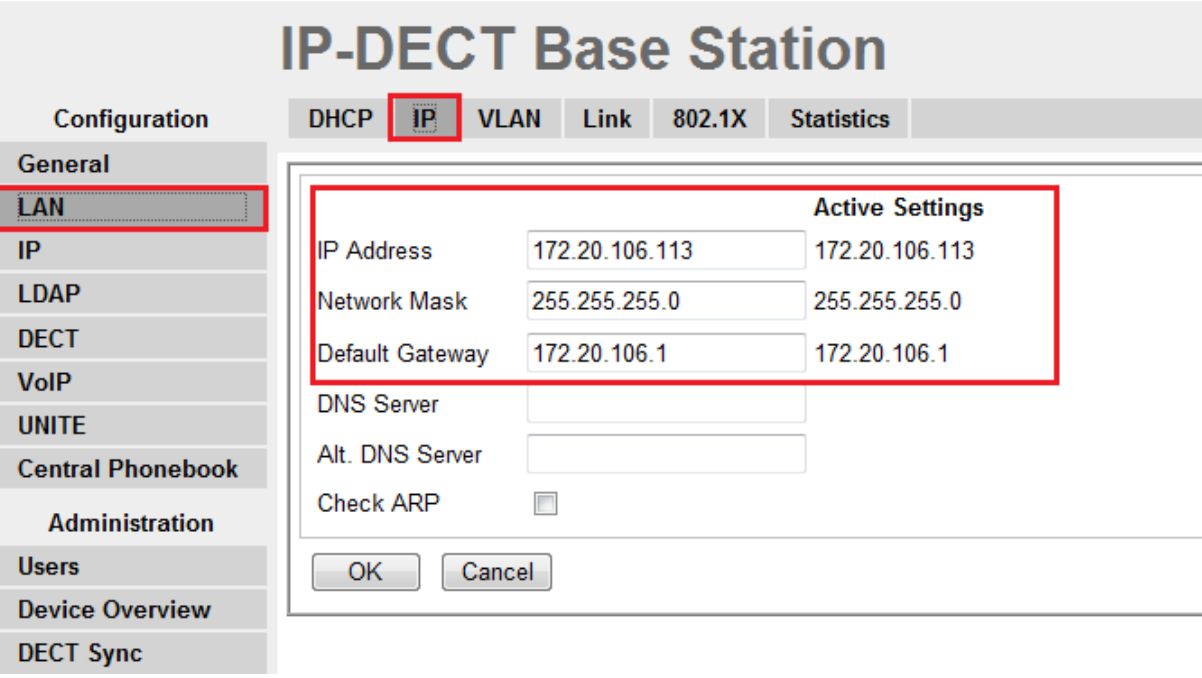| Step	Description
1	Launch a web browser. Place http://ipbs-xx-xx-xx (where xx-xx-xx is the last half of the Ascom IP-DECT Base Station's MAC address) in the web browser's URL. For example if an IPBS has MAC: 00-01-3F-00-C7-B9 the user would put http://ipbs-00-C7-B9 into the URL. The user will be presented with a start up screen. Select the **System administration** link to login

Next you will be presented with a login screen. Enter the appropriate login information and then click **OK**. The default **User name** is **admin** and the default **Password** is **changeme**.
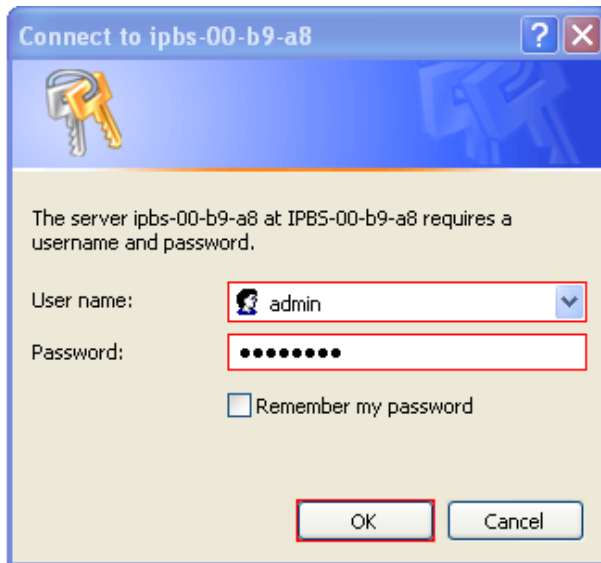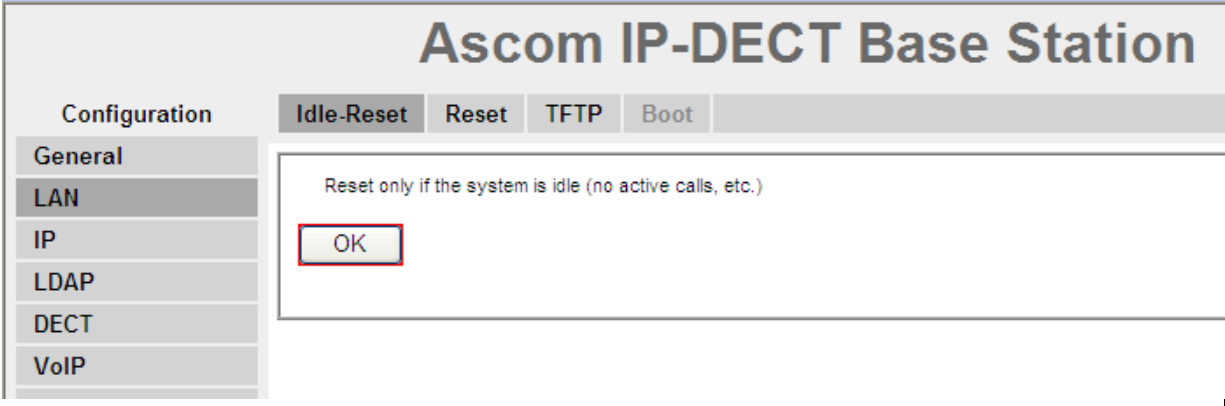

Step	Description
2	The user is presented with the **General Info** frame where the system information for the Ascom IP-DECT Base Station is displayed.

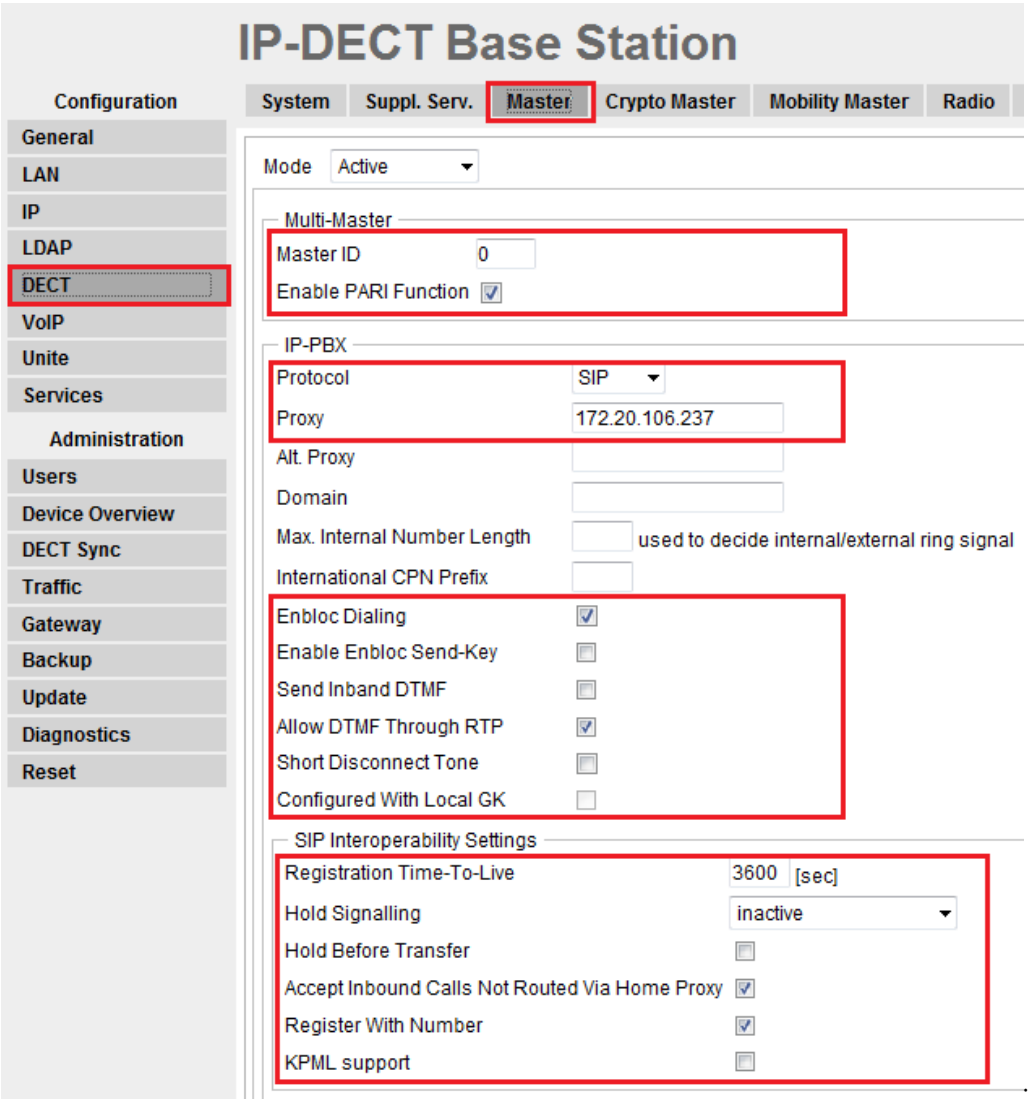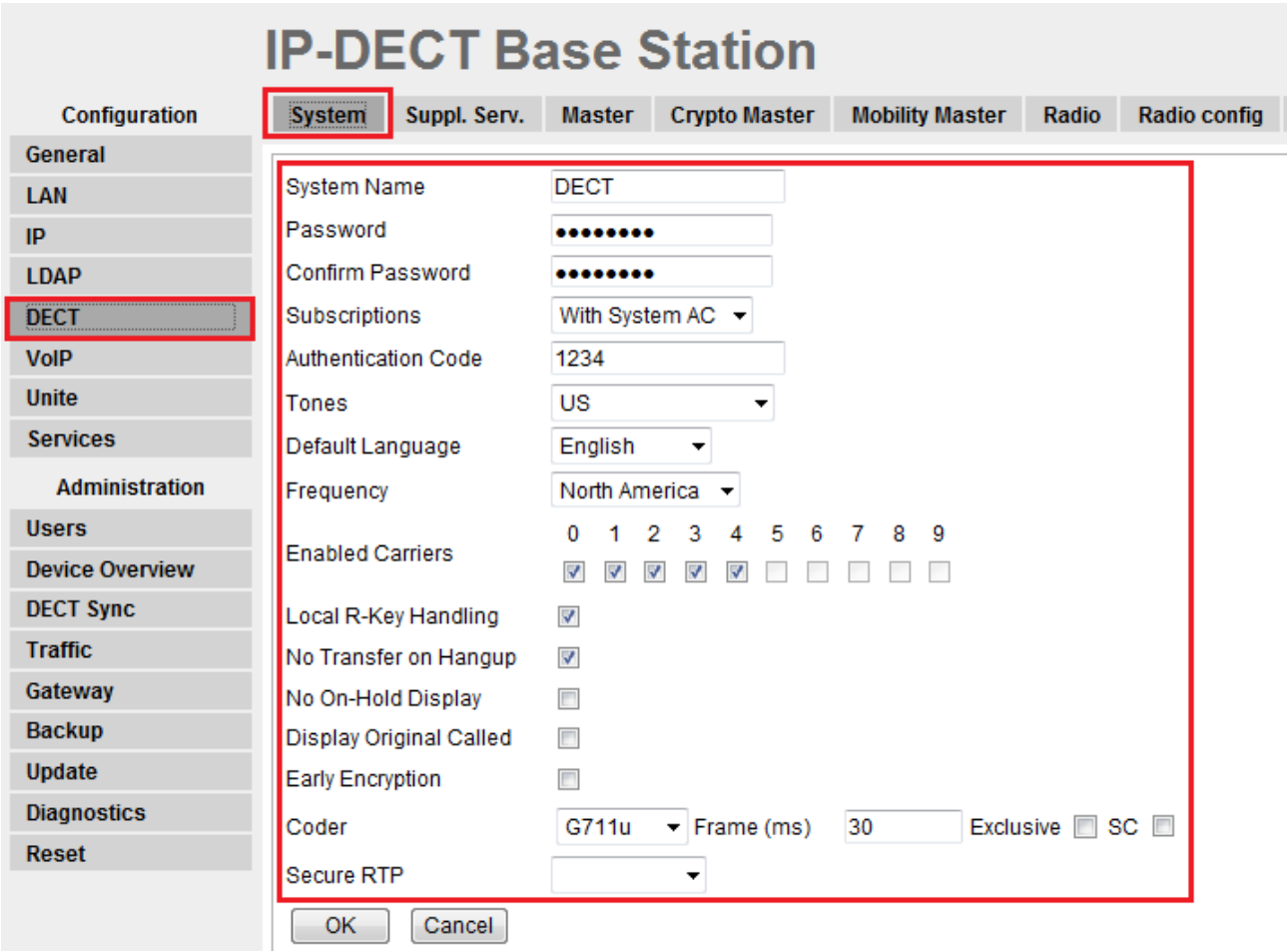| Step	Description
3	To navigate the web interface on the Ascom IP-DECT Base Station the user will navigate through a series of frames which lead to forms and web pages for configuration or to display information. The user flow is a two-click process where a category and then an option are clicked. Categories are found below **Configuration**, which is displayed in the top left portion of the frame, and options are found to the right. Navigate to the **General Admin** frame by clicking **General** and then clicking **Admin**. Configure the **Device Name** field and then click **OK**. The **Device Name** can be any descriptive name that identifies this Ascom IP-DECT Base Station. In the sample network the name "ShoreTel Master" was chosen. The **User Name** and **Password** fields should be left at their default values.

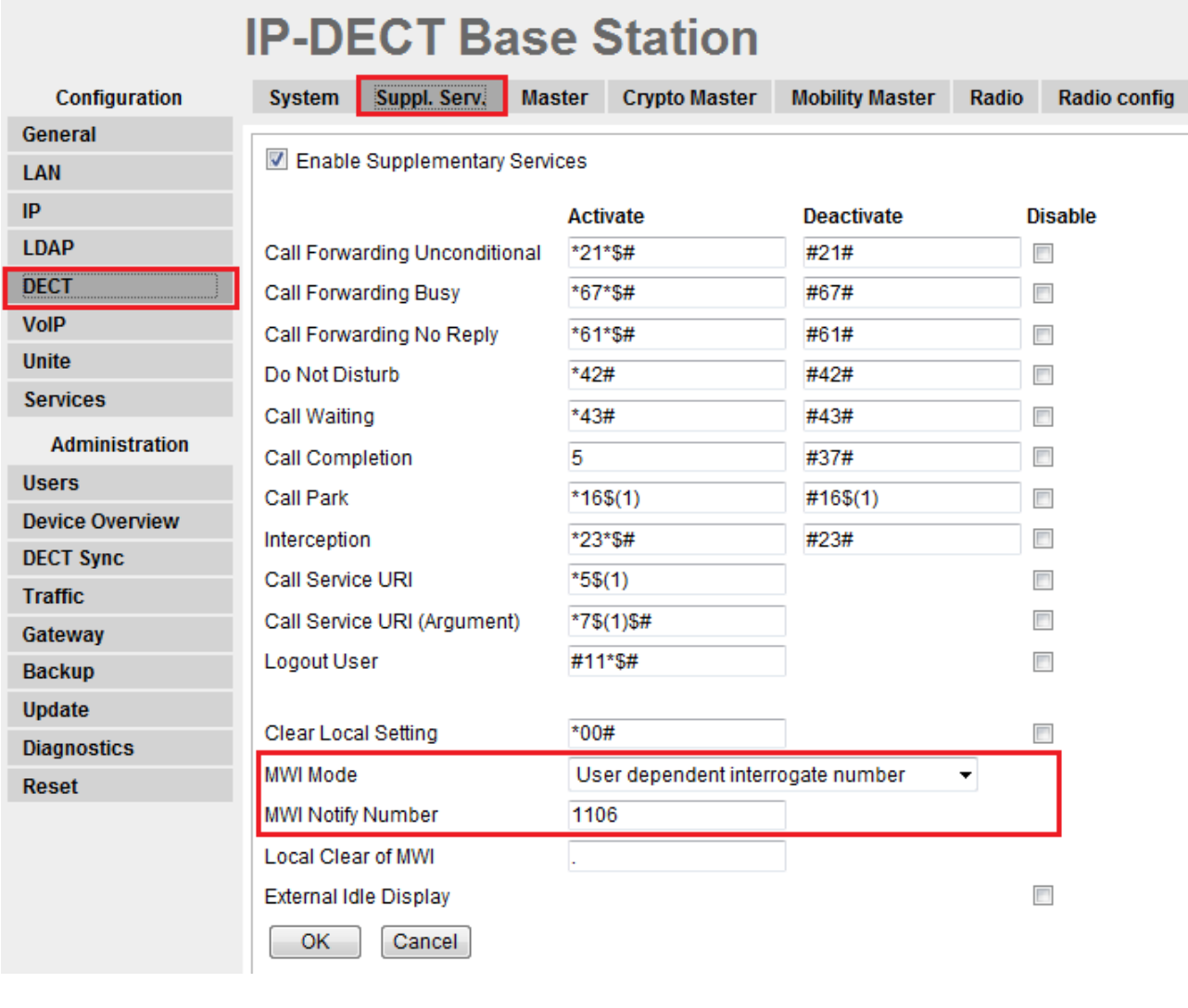| Step	Description
4	Navigate to the **LAN DHCP** frame by first clicking **LAN** and then clicking **DHCP**. Using the drop-down list, set **Mode** to "Off" and then click **OK**. This will present the user with the clickable red text which reads "reset required". Click **reset required**.
5	Navigate to the **LAN IP** frame by first clicking **LAN** and then clicking **IP**. Configure the fields displayed below and then click **OK**. Set **IP Address** to the designated static address on your network. Set **Network Mask** and **Default Gateway** to the proper values of your network.

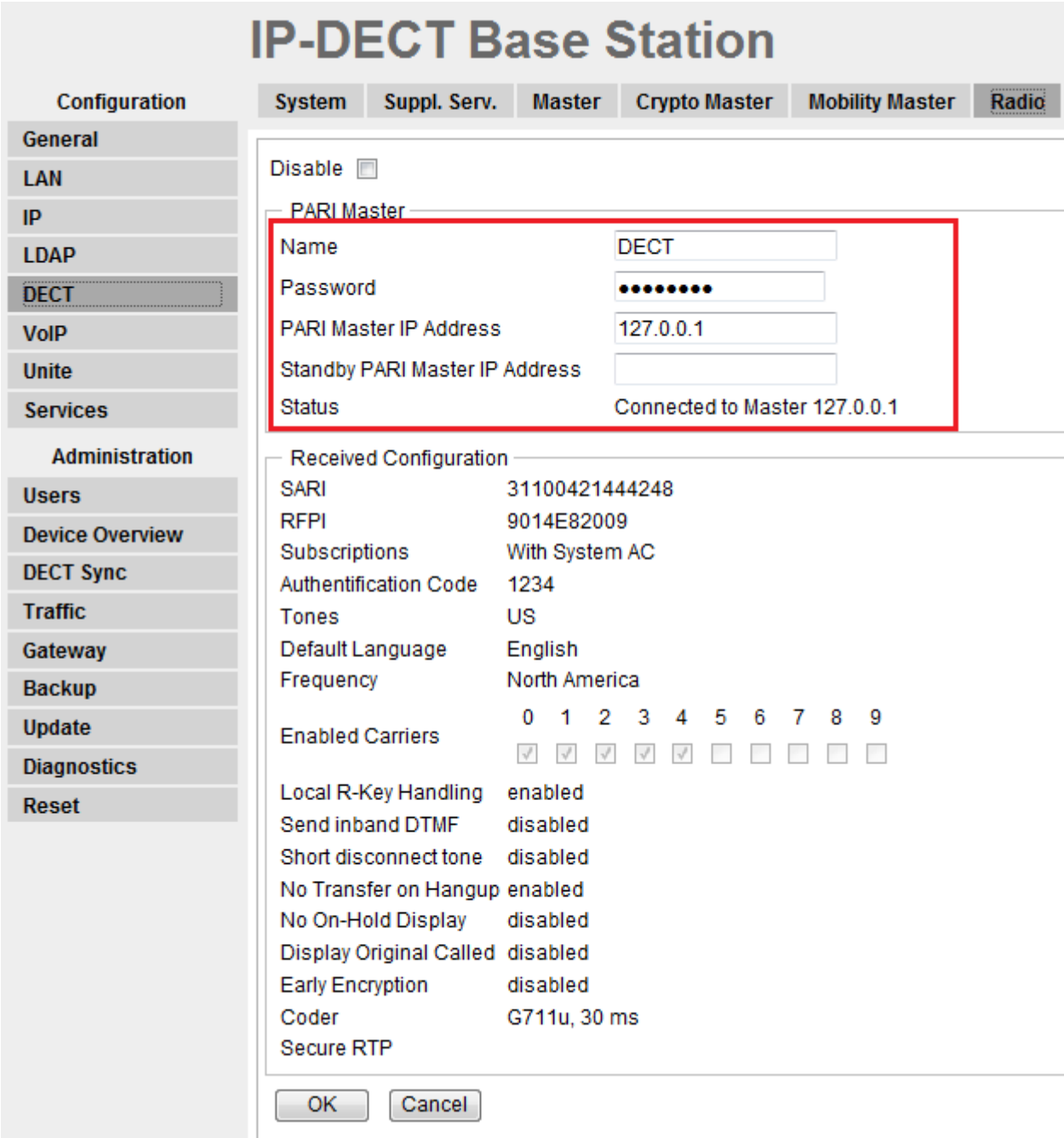| Step	Description
6	The user is presented with the reset confirmation dialogue. Click **OK** to initiate the system reset. Many of the other changes made to the system during the configuration process require a reboot. Repeat this process whenever a reset is required.

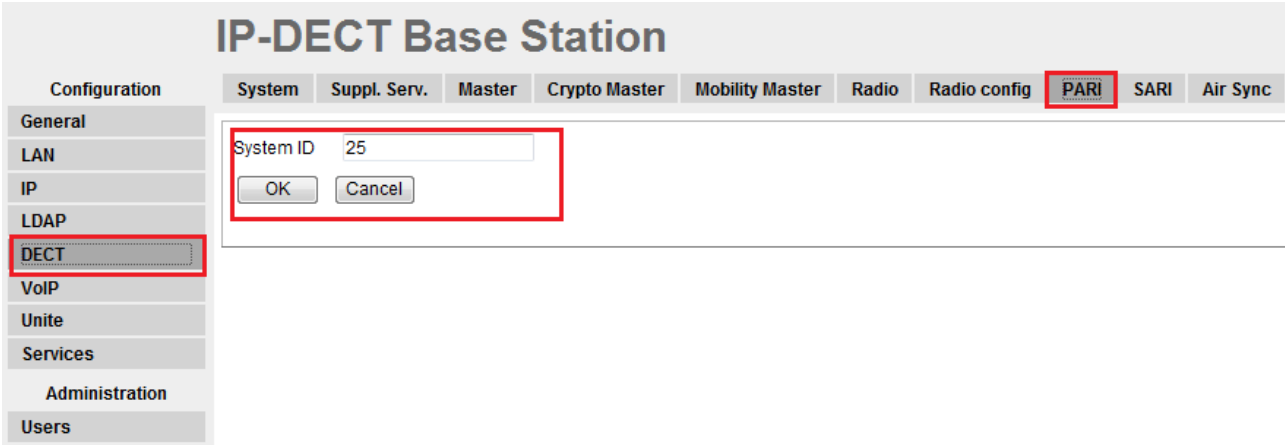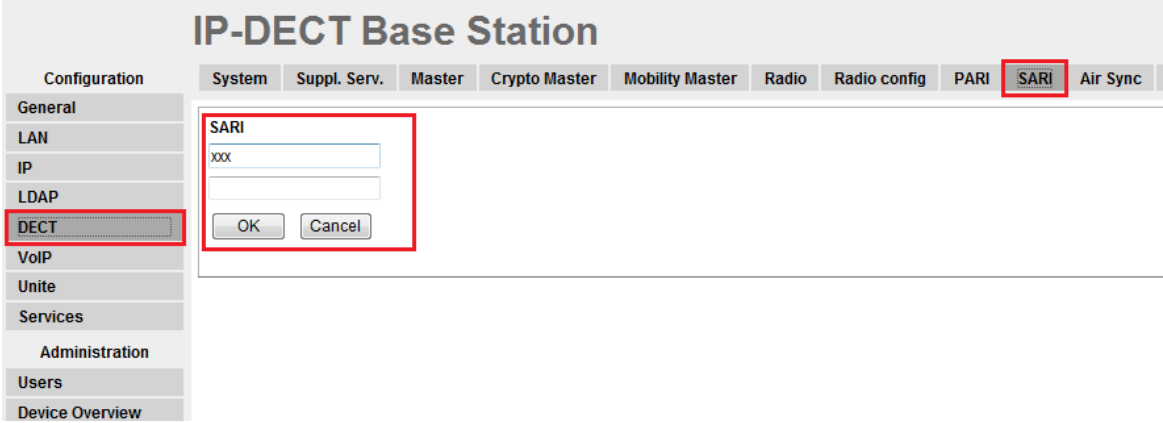| Step	Description
7	Please refer to the Ascom documentation for information how to configure the LDAP server/replicator in systems where a Standby Master is used.

Step	Description
8	Navigate to the DECT Master frame by clicking DECT and then clicking Master. Use the drop-down list for **Mode** and select "Active". You will see the following display screen telling you to configure the admin password on the DECT/System page. Click OK. Click on the **Reset required!** link and then the following OK button, to rest the system. Make sure you check the **Enable Pari function** box. Use the **IP-PBX**, **Protocol** drop-down list to set the protocol to "SIP". The **IP-PBX Proxy** is set to the IP address of the ShoreGear Switch that you enabled SIP Proxy ports. The **Max. Internal number length** should be set to the length of your internal extension lenght. Checking the **Enbloc Dialing** box will allow for post dialing. You should also enable (check) the following parameters: **Allow DTMF through RTP, Accept inbound calls not routed via home proxy** and **Register with number.** We also recommend that you configure **Registration time-to-live** to a value of 3600. Click **OK** when finished. **IP-DECT Base Station** **Configuration** General LAN IP LDAP **DECT** VoIP Unite Services **Administration** Users Device Overview DECT Sync Traffic Gateway Backup Update Diagnostics Reset System Suppl. Serv. **Master** Crypto Master Mobility Master Radio Mode Active Multi-Master Master ID 0 Enable PARI Function ☑ IP-PBX Protocol SIP Proxy 172.20.106.237 Alt. Proxy Domain Max. Internal Number Length used to decide internal/external ring signal International CPN Prefix Enbloc Dialing ☑ Enable Enbloc Send-Key ☐ Send Inband DTMF ☐ Allow DTMF Through RTP ☑ Short Disconnect Tone ☐ Configured With Local GK ☐ SIP Interoperability Settings Registration Time-To-Live 3600 [sec] Hold Signalling inactive Hold Before Transfer ☐ Accept Inbound Calls Not Routed Via Home Proxy ☑ Register With Number ☑ KPML support ☐

Step	Description
9	Navigate to the **DECT System** frame by clicking **DECT** and then clicking **System**. Configure the fields displayed below and then click **OK**. **System Name** is the **Device Name** used in **Step 3**. **Password** is the **Password** used in **Step 3**. The box below **Password** is to confirm the password and the value configured for **Password** field must be entered here. **Subscriptions** can be set to "With User AC", "With System AC", or "Disable". In the sample configuration "With System AC" was used. This enables the system to use the **Authentication Code** when challenging DECT handsets during registration. The **Authentication Code** is a numerical code that every DECT handset will need to use to subscribe to this system, in our example we set the access code to "1234". Use the drop-down list for **Tones** and select "US". Use the drop-down list for **Default Language** and select "English". Use the drop-down list for **Frequency** and select "North America". By default carriers **0,1,2,3** and **4** will be checked. The **Enable Carriers** check boxes enable the DECT handsets to use different channels or frequencies when transmitting. Use the drop-down list for **Coder** and select "G711u" and set **Frame (ms)** to 30. **IP-DECT Base Station** Configuration System Suppl. Serv. Master Crypto Master Mobility Master Radio Radio config General LAN IP LDAP DECT VoIP Unite Services Administration Users Device Overview DECT Sync Traffic Gateway Backup Update Diagnostics Reset System Name: DECT Password: •••••••• Confirm Password: •••••••• Subscriptions: With System AC Authentication Code: 1234 Tones: US Default Language: English Frequency: North America Enabled Carriers: 0 1 2 3 4 5 6 7 8 9 (0,1,2,3,4 checked) Local R-Key Handling: ✓ No Transfer on Hangup: ✓ No On-Hold Display: ☐ Display Original Called: ☐ Early Encryption: ☐ Coder: G711u Frame (ms): 30 Exclusive ☐ SC ☐ Secure RTP: OK Cancel

Step	Description
10	Navigate to the **DECT Suppl. Serv.** frame by clicking **DECT** and then clicking **Suppl. Serv.**. Check the **Enable Supplementary Services** check box. Enter the extension used for Voice Mail in the **MWI notify No.** field. Click **OK** when finished.

IP-DECT Base Station

Configuration | System | Suppl. Serv. | Master | Crypto Master | Mobility Master | Radio | Radio config

General
LAN
IP
LDAP
DECT
VoIP
Unite
Services

Administration
Users
Device Overview
DECT Sync
Traffic
Gateway
Backup
Update
Diagnostics
Reset

☑ Enable Supplementary Services

	Activate	Deactivate	Disable
Call Forwarding Unconditional	*21*$#	#21#	☐
Call Forwarding Busy	*67*$#	#67#	☐
Call Forwarding No Reply	*61*$#	#61#	☐
Do Not Disturb	*42#	#42#	☐
Call Waiting	*43#	#43#	☐
Call Completion	5	#37#	☐
Call Park	*16$(1)	#16$(1)	☐
Interception	*23*$#	#23#	☐
Call Service URI	*5$(1)		☐
Call Service URI (Argument)	*7(1)#		☐
Logout User	#11*$#		☐
Clear Local Setting	*00#		☐
MWI Mode	User dependent interrogate number ▼		
MWI Notify Number	1106		
Local Clear of MWI	.		
External Idle Display			☐

OK   Cancel

Step	Description
11	Navigate to the **DECT Radio** frame by clicking **DECT** and then clicking **Radio**. Configure the fields displayed below. Click **OK** and reset the system. **Pari Master IP Address** can be either the loopback IP address (127.0.0.1) or the IP address assigned to the Ascom IP-DECT Master Base Station. **Standby Pari Master IP Address** is the IP address of the Ascom IP-DECT Standby Master Base Station.

Step	Description
12	Navigate to the **DECT PARI** frame by clicking **DECT** and then clicking **PARI**. **PARI** is a user-defined system value and must range from 1-35. Enter any number from 1-35. Click **OK** and reset the system.

Step	Description
13	Navigate to the **DECT SARI** frame by clicking **DECT** and then clicking **SARI**. **SARI** is an Ascom provided activation code which is needed for the system to function. Contact Ascom to obtain a **SARI**. Enter the **SARI** value and then click **OK**.
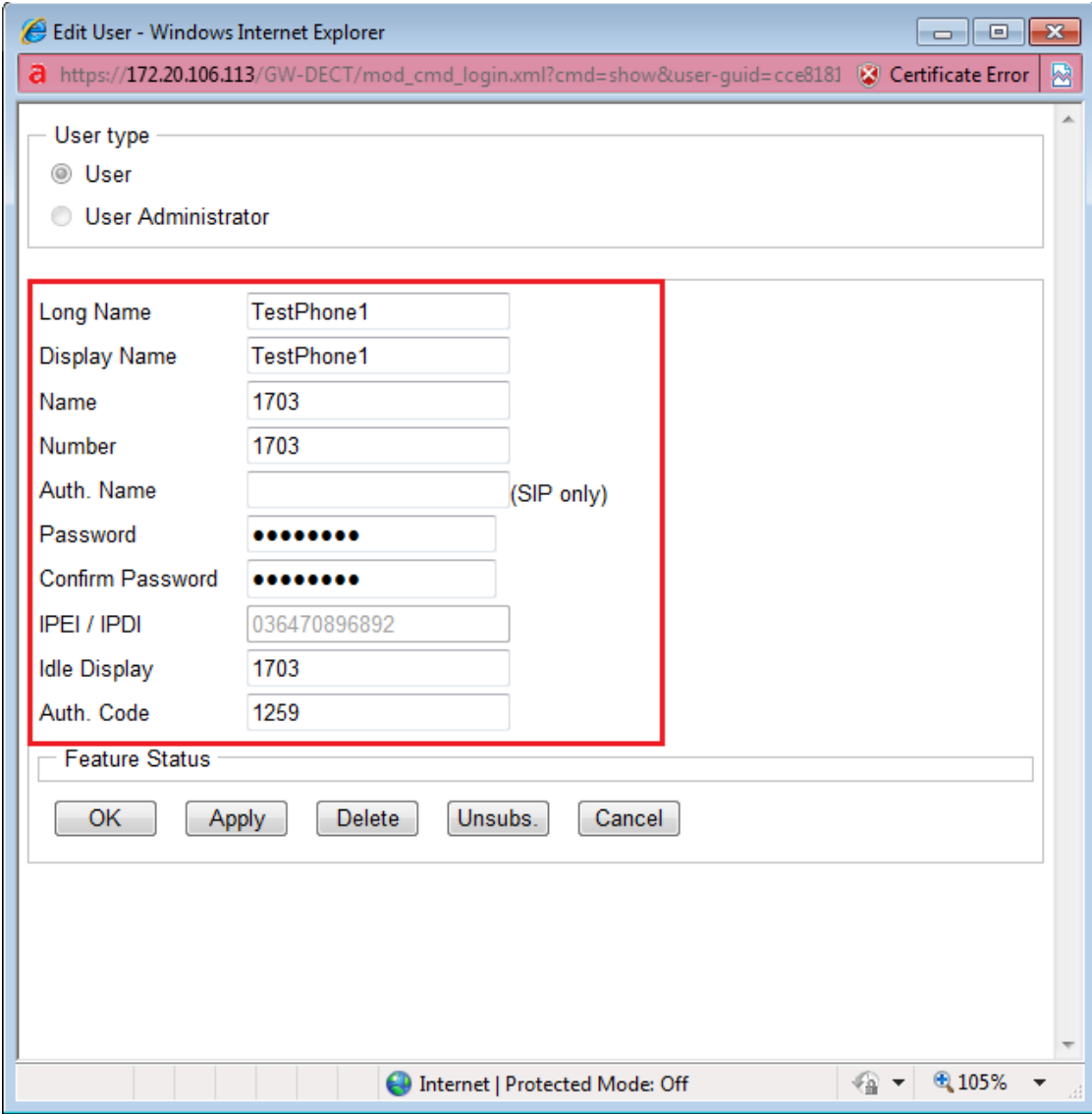
14	Navigate to the **Users** frame by clicking **Users** and then clicking **Users**. Click **new** to provision a new user account. The **PARK** code is displayed. This value is needed when programming Ascom DECT handsets. The **PARK** code is similar to an SSID in an 802.11 wireless environment.

IP-DECT Base Station

Configuration	Users	Anonymous
General		
LAN	**PARK** 31100421444248	
IP	**PARK 3rd pty** 2110024720	
LDAP	**Master Id** 0	
DECT		show
VoIP		new
Unite		import
Services		export
Administration		
Users		
Device Overview		
DECT Sync		
Traffic		
Gateway		
Backup		
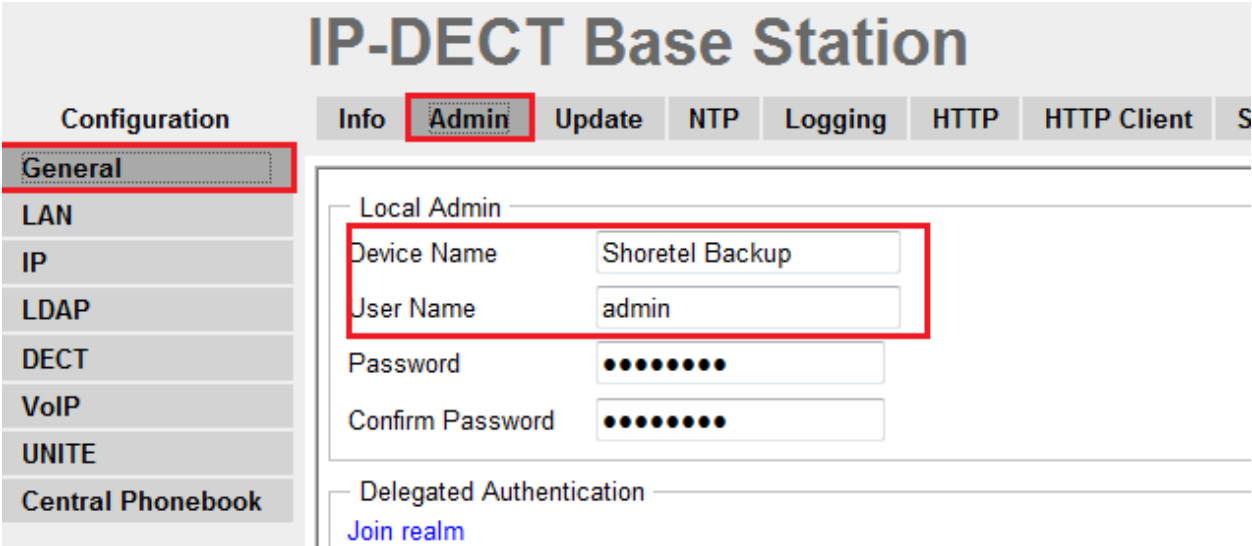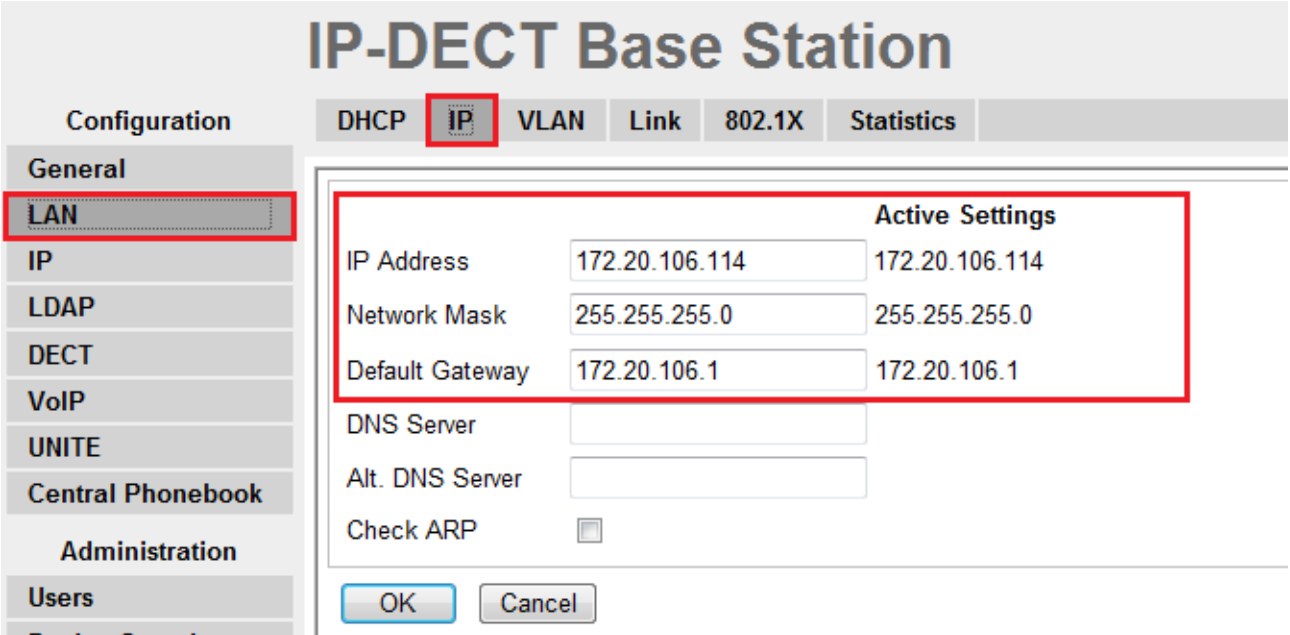
Step	Description
15	The user is presented with the **Edit User** web page. **Long Name** and **Name** can be any descriptive name that identifies this user. The **Number** field is the extension assigned to this user. The **Password** field is the password used to register with the ShoreTel IP-PBX. The box below **Password** is to confirm the password and the value entered for the **Password** field must be entered here. **Display Text** is the text string that will be displayed on the LCD screen of the Ascom DECT Handset. For additional information regarding IPEI, Auth Code and how to register the handset towards the base station please refer to Ascoms installation manual.

Configure the Ascom IP-DECT Base Station

Configuring a Standby Master Ascom IP-DECT Base Station is very similar to the configuration process for configuring a Master system. The following steps detail the configuration process used to configure an Ascom IP-DECT Base Station in Standby Master mode.
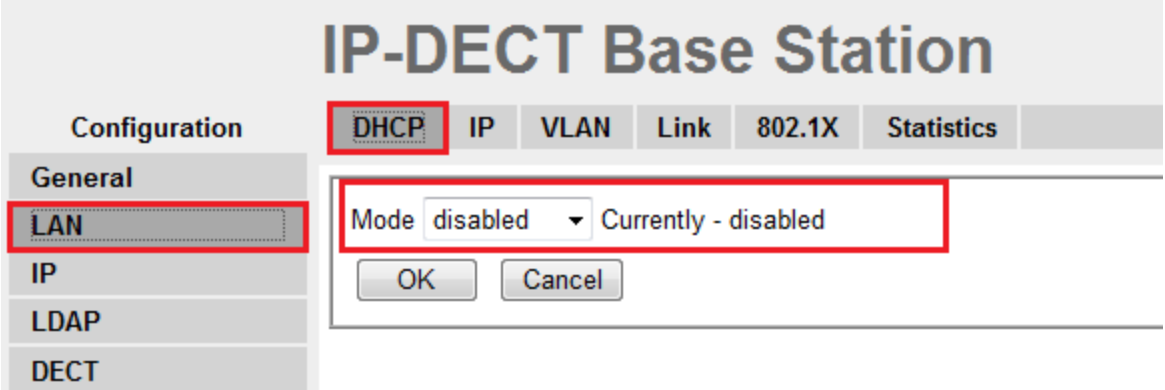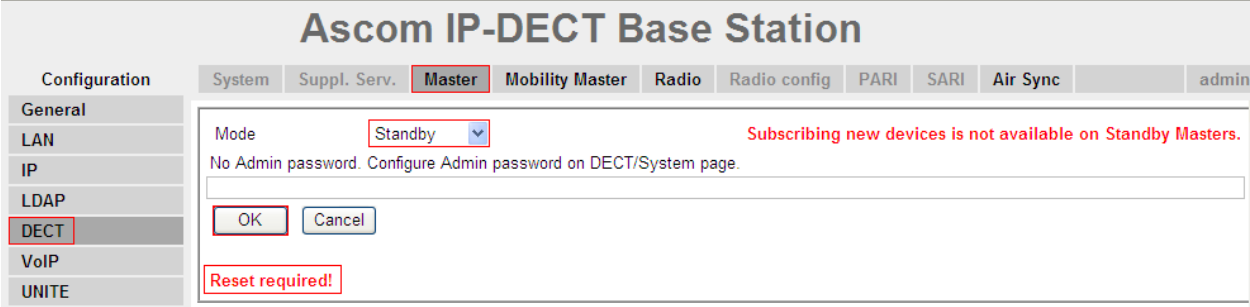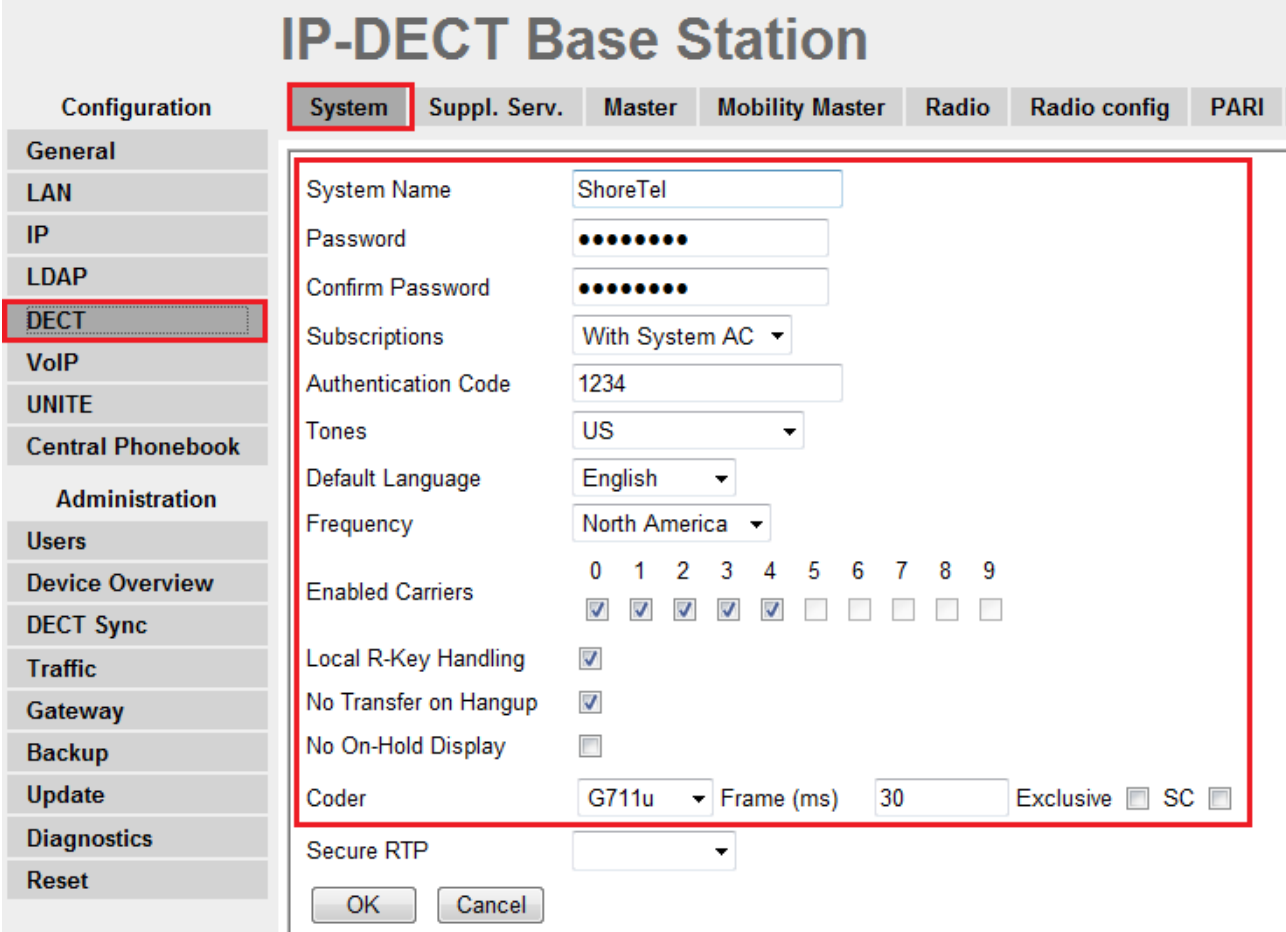
A third mode exists for the Ascom IP-DECT Station called Slave. This mode is used for Ascom IP-DECT systems whose coverage requires the use of more than two IP-DECT Base Stations. An Ascom IP-DECT Slave Base Station configuration was not tested as part of this solution
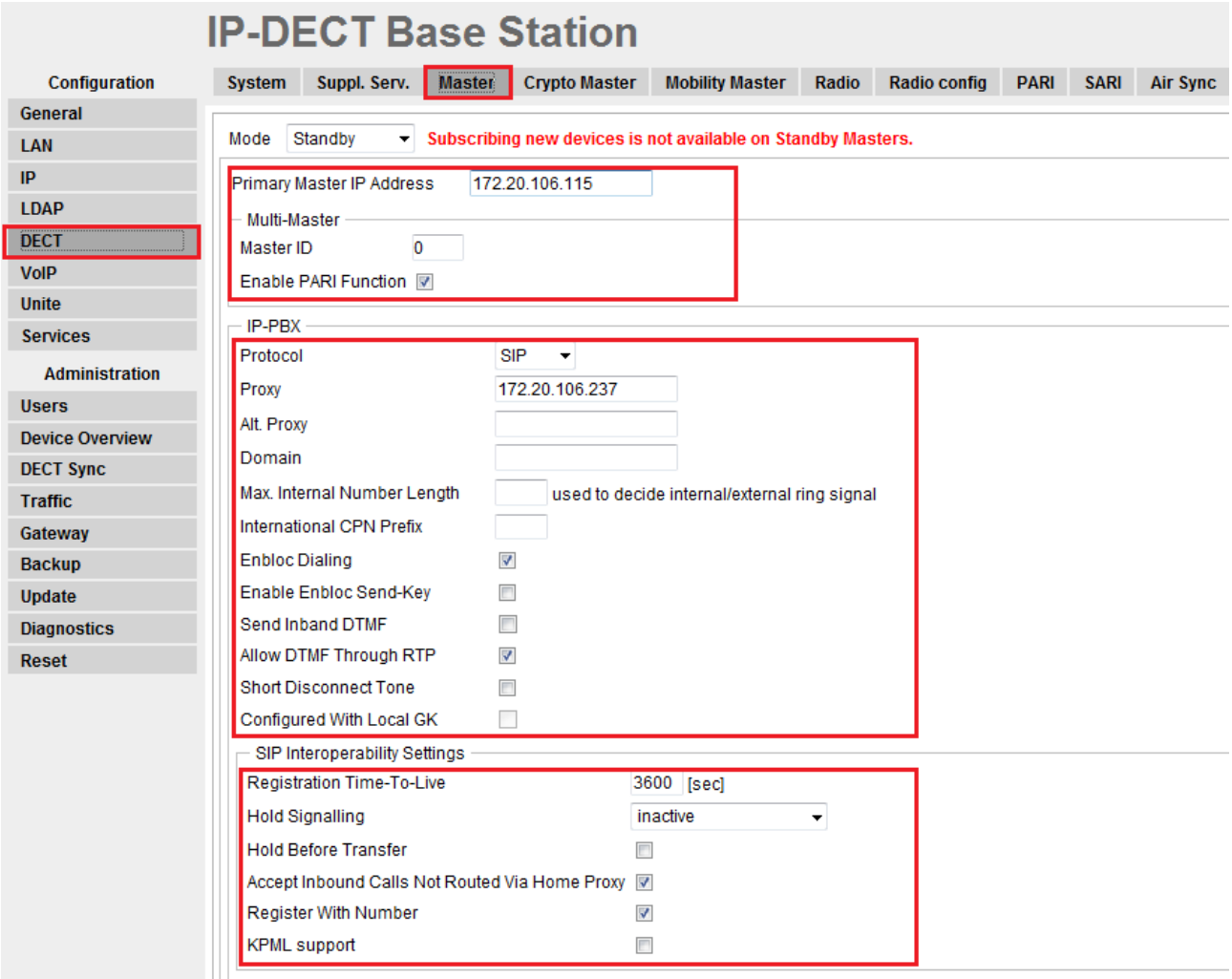
Step	Description
1	Using a web browser open up a connection to the Standby Master Ascom IP-DECT Base Station (refer to **Section 4.1 Step 1**). A login is required in order to access the system. Navigate to the **General Admin** frame by clicking **General** and then clicking **Admin**. Configure the **Device Name** field and then click **OK**. The **Device Name** can be any descriptive name that identifies this particular Ascom IP-DECT Base Station. In the sample network the name "ShoreTel Backup" was used. The **User Name** and **Password** fields should be left at their default values.
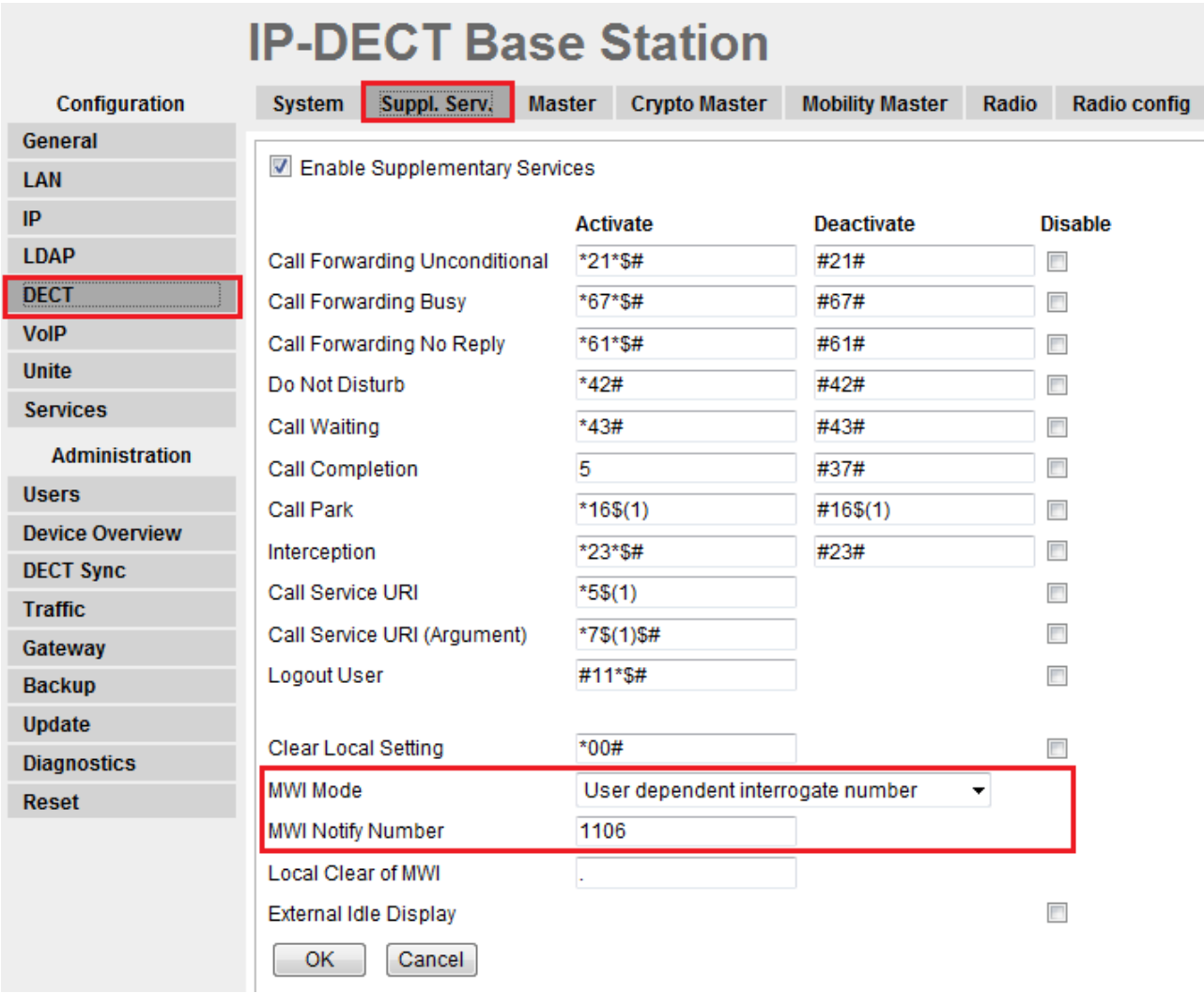
Step	Description
2	Navigate to the **LAN IP** frame by first clicking **LAN** and then clicking **IP**. Configure the fields displayed below and then click **OK**. Set **IP Address** to the designated static address on your network. Set **Network Mask** and **Default Gateway** to the proper values of your network. ![IP-DECT Base Station configuration screen showing LAN IP settings with IP Address 172.20.106.114, Network Mask 255.255.255.0, Default Gateway 172.20.106.1]
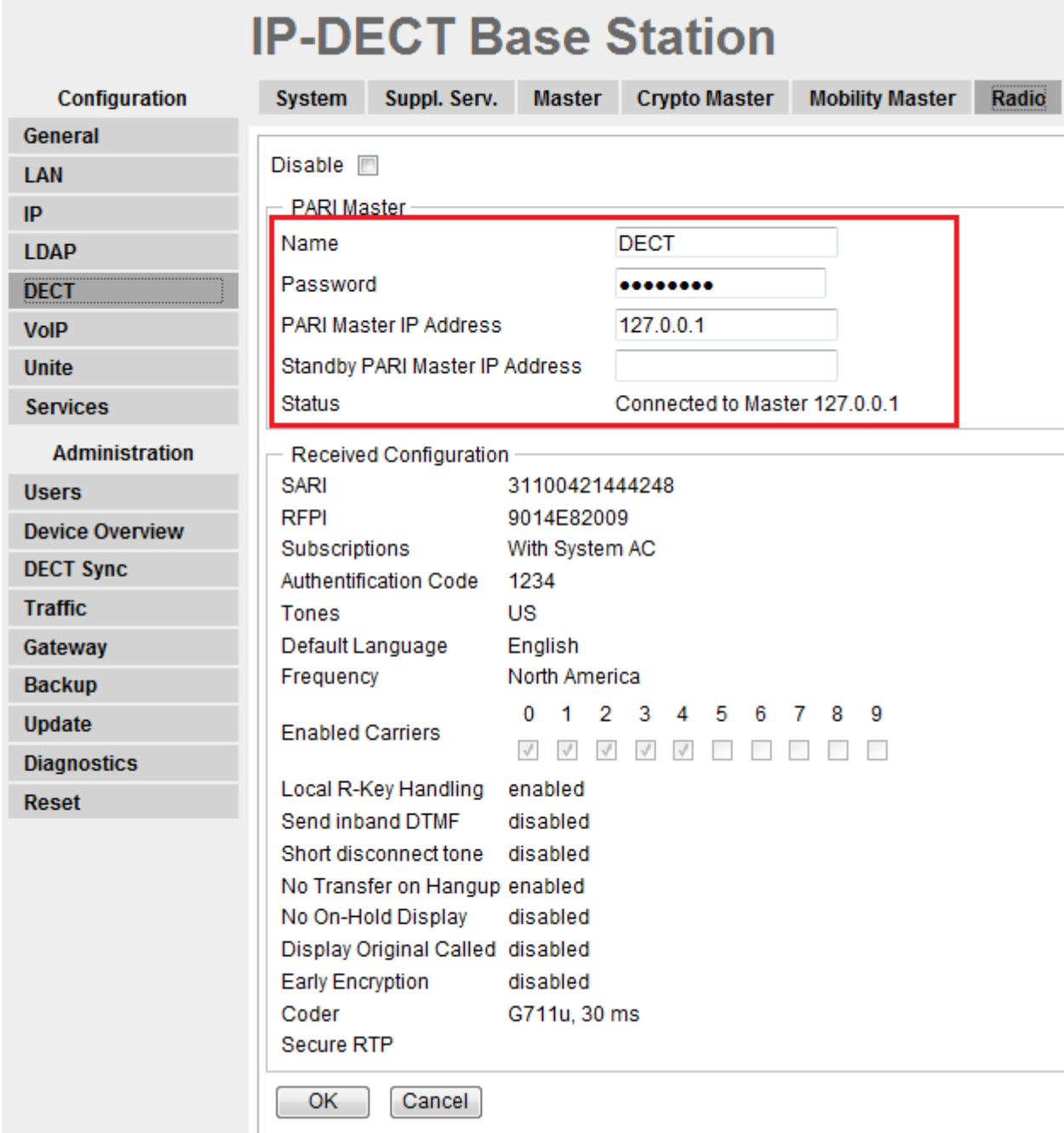
Step	Description
3	Navigate to the **LAN DHCP** frame by first clicking **LAN** and then clicking **DHCP**. Using the drop-down list, set **Mode** to "Off" and then click **OK**. This will present the user with the clickable red text which reads "reset required". Click **reset required**. **IP-DECT Base Station** Configuration DHCP IP VLAN Link 802.1X Statistics General LAN IP Mode disabled ▼ Currently - disabled LDAP OK Cancel DECT

Step	Description
4	After the IPBS has completed its reset, navigate to the **DECT Master frame by clicking DECT** and then clicking **Master.** Use the drop-down list for **Mode** and select "Standby". You will see the following display screen. Click **OK** and reset the system.

Step	Description
5	Navigate to the **DECT System** frame by clicking **DECT** and then clicking **System**. Configure the fields displayed below. Click **OK** and reset the system. The **System Name** and **Password** fields are the **Device Name** and **Password** fields used on the Ascom IP-DECT Master Base Station

Step	Description
6	Navigate back to the DECT Master frame by clicking DECT and then clicking Master. Configure the fields displayed below. Click **OK** and reset the system. The **Primary Master IP Address** is the IP address of the Master Base Station. Make sure you check the **Enable Pari function** box. Use the **IP-PBX Protocol** drop-down list to set the protocol to "SIP". The **IP-PBX Proxy** is set to the IP address of the ShoreTel IP-PBX. The **Max. Internal number length** should be set to the length of your internal extension numbers. Checking the **Enbloc Dialing** box will allow for post dialing.

Step	Description
7	Navigate to the **DECT Suppl. Serv.** frame by clicking **DECT** and then clicking **Suppl. Serv.**. Check the **Enable Supplementary Services** check box. Enter the extension used for Voice Mail in the **Message Center No.** field. Click **OK.**

Step	Description
8	Navigate to the **DECT Radio** frame by clicking **DECT** and then clicking **Radio**. Configure the fields displayed below. Click **OK** and reset the system. **Name** is the name of the Ascom IP-DECT Master Base Station. **Password** is the password of the Ascom IP-DECT Master Base Station. **Pari Master IP Address** is the IP address of the Ascom IP-DECT Master Base Station. **Standby Pari Master IP Address** can be either the actual IP Address assigned to the Ascom IP-DECT Standby Master Base Station or the loopback IP Address of "127.0.0.1". **IP-DECT Base Station** Configuration: System · Suppl. Serv. · Master · Crypto Master · Mobility Master · **Radio** General, LAN, IP, LDAP, DECT, VoIP, Unite, Services Administration: Users, Device Overview, DECT Sync, Traffic, Gateway, Backup, Update, Diagnostics, Reset Disable ☐ PARI Master Name — DECT Password — ●●●●●●●● PARI Master IP Address — 127.0.0.1 Standby PARI Master IP Address — Status — Connected to Master 127.0.0.1 Received Configuration SARI — 31100421444248 RFPI — 9014E82009 Subscriptions — With System AC Authentification Code — 1234 Tones — US Default Language — English Frequency — North America Enabled Carriers — 0 1 2 3 4 5 6 7 8 9 : ☑ ☑ ☑ ☑ ☑ ☐ ☐ ☐ ☐ ☐ Local R-Key Handling — enabled Send inband DTMF — disabled Short disconnect tone — disabled No Transfer on Hangup — enabled No On-Hold Display — disabled Display Original Called — disabled Early Encryption — disabled Coder — G711u, 30 ms Secure RTP — OK Cancel

Step	Description
9	Please refer to the Ascom documentation for information how to configure LDAP server/replicator in case a standby master is used.

Ascom DECT Handset Configuration

Refer to the following documents to obtain information on the procedures for subscribing and registering the Ascom DECT Handsets to the Ascom IP-DECT Base Station.

- User Manual Ascom d41 DECT Handset, Document number TD 92582EN

- User Manual Ascom d62 DECT Handset, Document number TD 92477GB.

- User Manual Ascom d81 DECT Handset, Document number TD 92644GB

Ascom Troubleshooting

Ascom DECT Handset Registration Verification

The following steps can be used to ascertain the registration state of the Ascom DECT Handsets that the Ascom IP-DECT Base Station is configured to support.

From a web browser open up a connection to the Ascom IP-DECT Master Base Station. Navigate to the Users frame by clicking Users then clicking Users and then clicking show. A Registration state of "Pending" indicates that an Ascom DECT Handset has not registered to the Ascom IP-DECT Base Station and a registration is requested by that particular extension. A Registration state of "Subscribed" indicates that an Ascom DECT Handset has connected to the Ascom IP-DECT Base Station and is requested by that particular extension. A Registration state that displays the IP Address of the ShoreTel IP-PBX indicates the extension has successfully registered to both the Ascom IP-DECT Base Station and ShoreTel IP-PBX.

Ascom DECT Handset Function Verification

The following steps can be used to verify proper operation of the Ascom DECT Handsets.

- Place calls from the Ascom DECT Handsets and verify two-way audio.

- Place a call to the Ascom DECT Handsets, allow the call to be directed to voicemail, leave a voicemail message and verify the MWI message is received.

- Using each Ascom DECT Handset that received a voicemail, connect to the voicemail system to retrieve the voicemail and verify the MWI clears.

- Place calls to the Ascom DECT Handsets and exercise calling features such as transfer and hold.

Ascom Technical Support

For local US/Canada support:

- **Phone:** 1-877-71ASCOM or 1-877-712-7266

- **Email:** techsupport@ascomwireless.com (for Technical support)

For world wide support:

- **Phone:** 46 31 55 9450

- **Email:** support@ascom.se (for Technical support)

For international customer:

- **Internet:** www.ascom.com/ws and select your country of interest, to find local sales and support contact information.

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