Spectrum Enterprise SIP Trunking Service
Allworx 6x Firmware 7.3.9.5
IP PBX Configuration Guide

About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Time Warner Cable Business Class. All references to Time Warner Cable Business Class, TWCBC or TWC should be read as Spectrum Enterprise.

Thank you,

Spectrum Enterprise

Document Purpose and Target Audience

This document will serve as a reference guide to configure the Allworx 6x IP PBX to interoperate with Time Warner Cable (TWC) SIP Trunk Service.

This guide is not intended to be a replacement of the PBX manufacture's user or configuration guide. It is intended to provide additional guidance on configuring the PBX in preparation to receive voice service from the SIP Trunk. It provides detailed instructions and best practices for a successful installation with TWC SIP Trunks.

There are many options for establishing and maintaining service using the Allworx 6x series. This guide focuses on the minimum configurations essential for successful interoperability with Time Warner Cable Business Class SIP Trunks.

This configuration guide is based on:

Customer Premise Equipment:

Model	Allworx 6x
Firmware	7.3.9.5

TWC Network Equipment:

ESG	InnoMedia ESBC 9378-4B

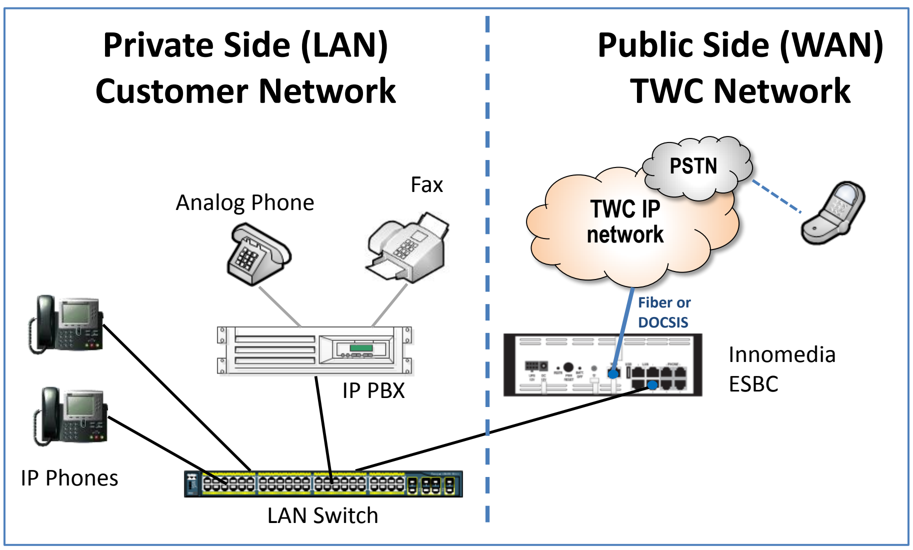
SIP Trunk Components

The Time Warner Cable Business Class (TWCBC) SIP Trunks product is an IP-based, voice only trunk that uses Session Initiation Protocol (SIP) to connect an IP PBX to the PSTN. The IP PBX uses SIP to exchange signaling information with the service provider and to deliver and receive voice in IP packets.

The IP PBX is connected to the TWC Enterprise SIP Gateway (ESG), which provides network access for voice traffic. The customer is responsible for the LAN infrastructure and configuration, including the physical connection to the LAN port 2 on the ESG.

The ESG is the demarcation point to the TWC network. The ESG is connected to a dedicated router for SIP Trunks delivered over a fiber connection or to a cable modem when delivered over a DOCSIS connection.

SIP Trunk components located on the customer premise, including connections to the TWC network, are illustrated below.



All TWC SIP Trunk calls are routed over Time Warner Cable's IP network and are not routed over the public internet.

Getting Started

You will need to have the TWC "**SIP Trunk Questionnaire**" and "**Business Class (BC) SIP Trunks: Customer Cut Sheet**" in order to configure your IP PBX for TWC Business Class SIP Trunk service.

Confirm that your **IP PBX model number and software versions** recorded on the **Customer Cut Sheet** match those associated with your current equipment. If they do not, be sure to alert your TWC sales engineer or TWC project manager as this can impact how TWC designs your service configuration.

Example* from *Customer Cut Sheet for Cisco UC 560:

SERVICE INFORMATION	
PRODUCT	Business Class SIP TRUNK
IP-PBX MAKE	Cisco
IP-PBX MODEL	UC560
IP-PBX SOFTWARE VERSION	15.1(4)

While configuring your IP PBX for BC SIP Trunk service, you will need to know your Lead Telephone Number and the IP address of your IP PBX.

The **Lead Number** is confirmed on the **Customer Cut Sheet** as seen below:

Trunk Groups				
TWC TRUNK Group ID	DID Range	Lead Number	Inbound Call Blocking	Outbound Call Blocking

The **IP Address** of the IP PBX was recorded on the **SIP Trunk Questionnaire**, Section 5. Signaling and Media as shown below:

5- Signaling and Media		
IP Address for PBX or SBC To setup LAN configuration for signaling of voice traffic to the ESG	IP: xxx.xxx.xxx.xxx	
	Subnet: 255.255.xxx.xxx	

This document is intended as an aid to help configure a customer's IP PBX for interoperability with TWCBC SIP Trunk Service.

Allworx 6x Configurations

The instructions provided in this section are intended to configure the Allworx 6x IP-PBX to connect to the ESG. It is not intended for advanced functionality setups.

Direct Inward Dialing Blocks

1. Enter your Starting Phone Number in your Dialing Block (Lead Telephone Number)
2. Enter Total number of Phone Numbers in the DID Block
3. Choose the DID Routing Plan to use for this Block of numbers, or if none, then "make new Routing Plan
4. Click Update for changes to take effect and a new Routing Plan to be created.

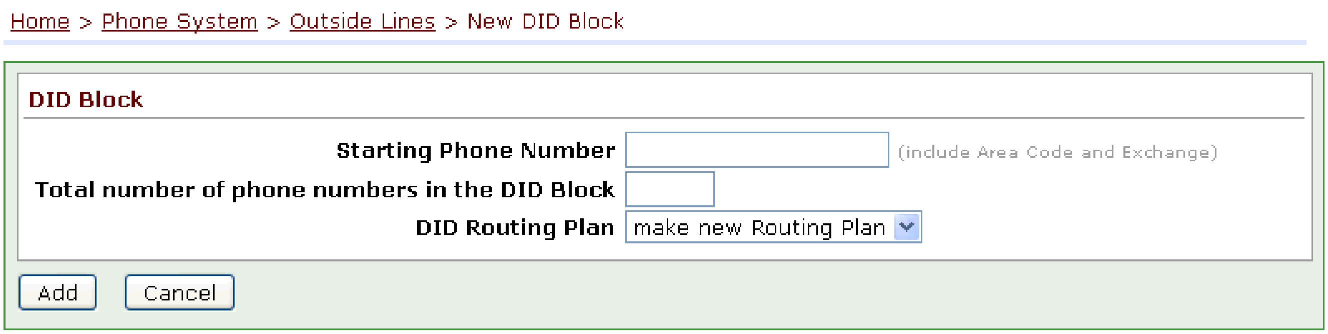


Figure 1

Direct Inward Dial Routing Plans

- Navigate to Home > Phone System > Outside lines > DID Routing Plan
- Add/Modify the Routing Plan Information to send numbers not mapped to an Extension to be sent to the Operator/ or desired extension of your choice

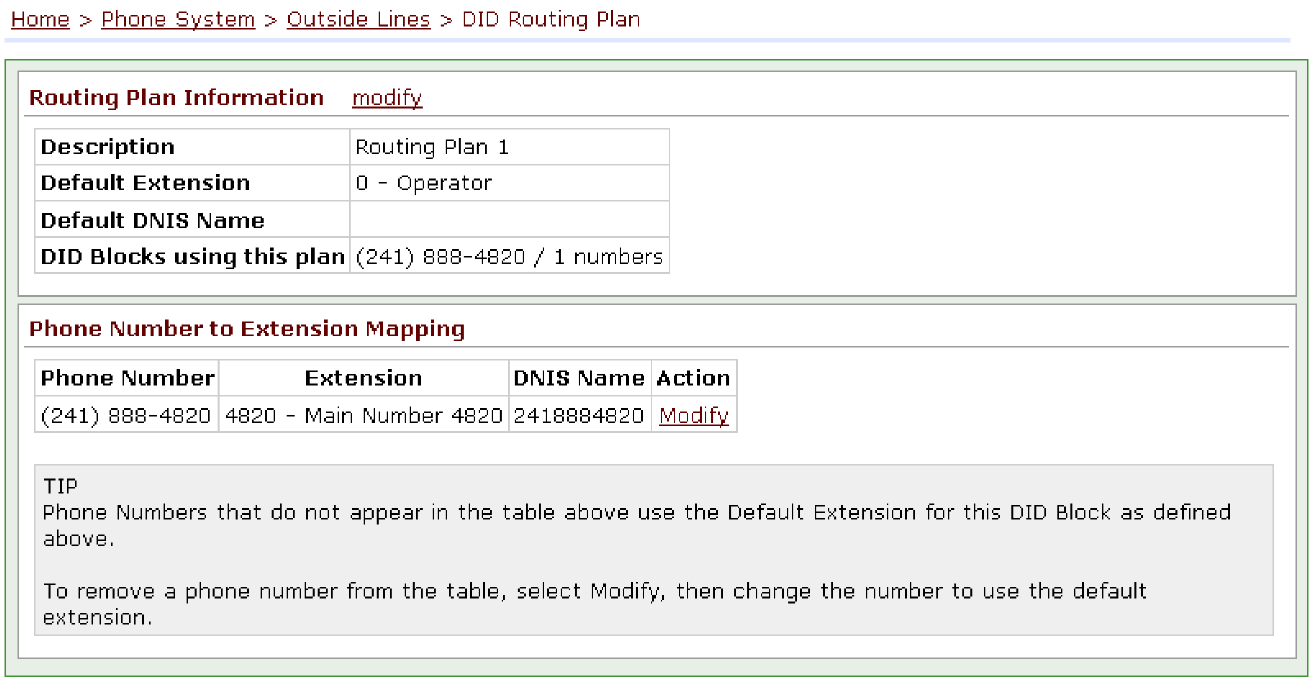


Figure 2

- To send a DID to a specific Extension, click “add number to table” in the Phone Number to Extension Mapping box. If all DID’s have been assigned an extension, you will no longer have the option to click on “add number to table”

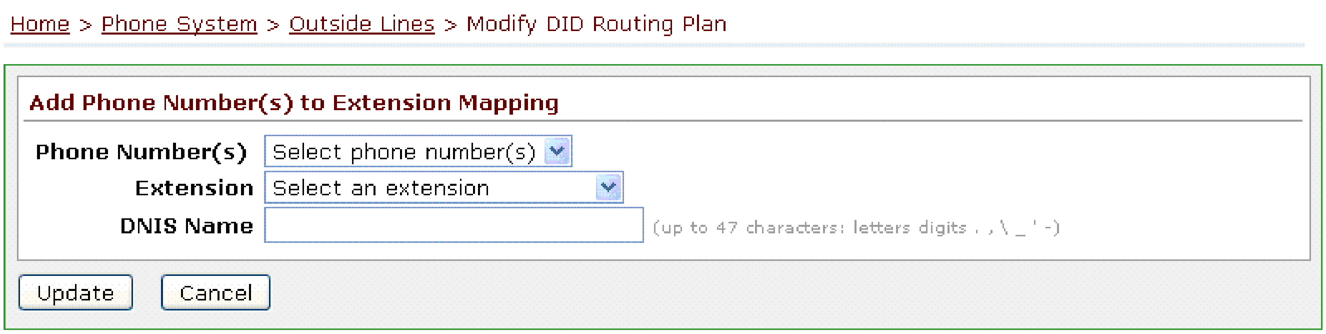


Figure 3

- Select phone number
- Select the extension you want the phone number to be sent to.
- Enter the Number or Name you want to associate to this number.

SIP Trunk Setting

Figure 4

1. Navigate to Phone System > Outside Lines > SIP Gateway
2. Click "add new SIP Gateway"
3. Enter a Description
4. Enter a value for the "Number of Line Appearances" - If you have a total of 5 SIP lines, then you should not enter a number higher than 5.

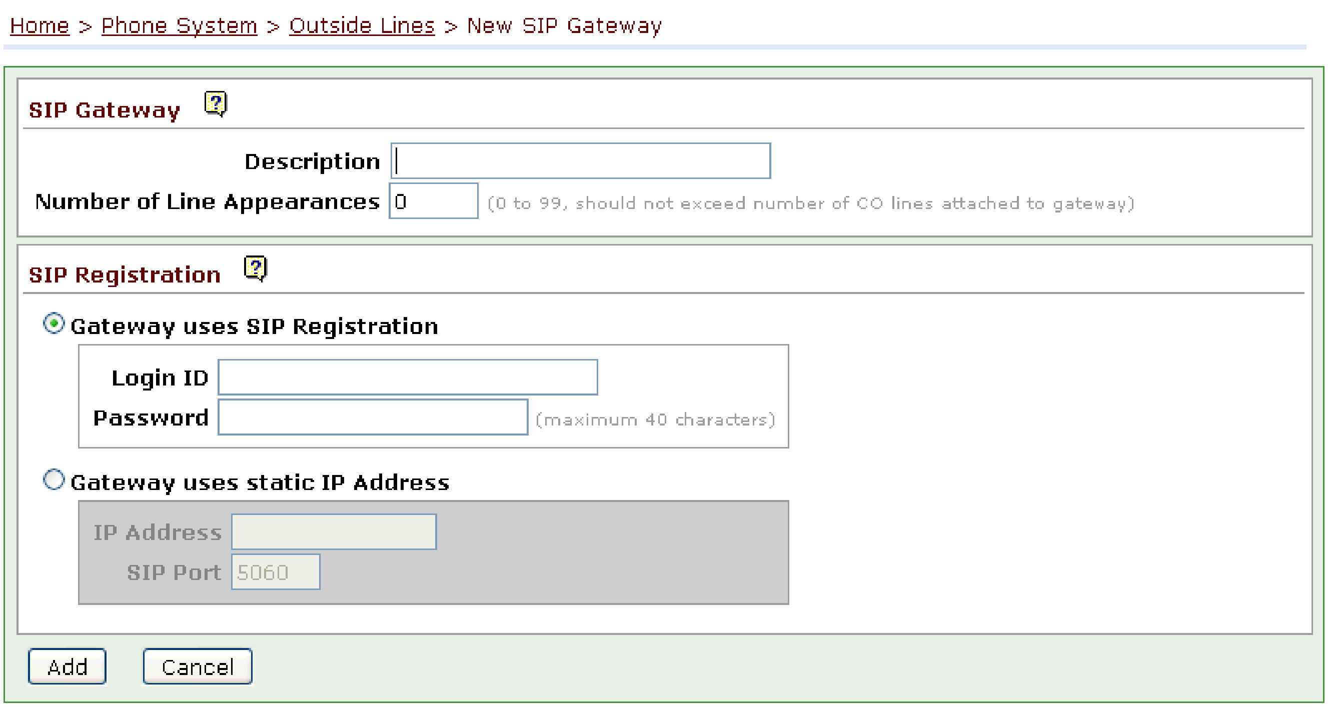


Figure 5

5. Choose "Gateway uses static IP Address" , and then enter the IP Address of the ESG LAN port
6. Click "Add" to create the new Gateway
7. Now Modify the gateway

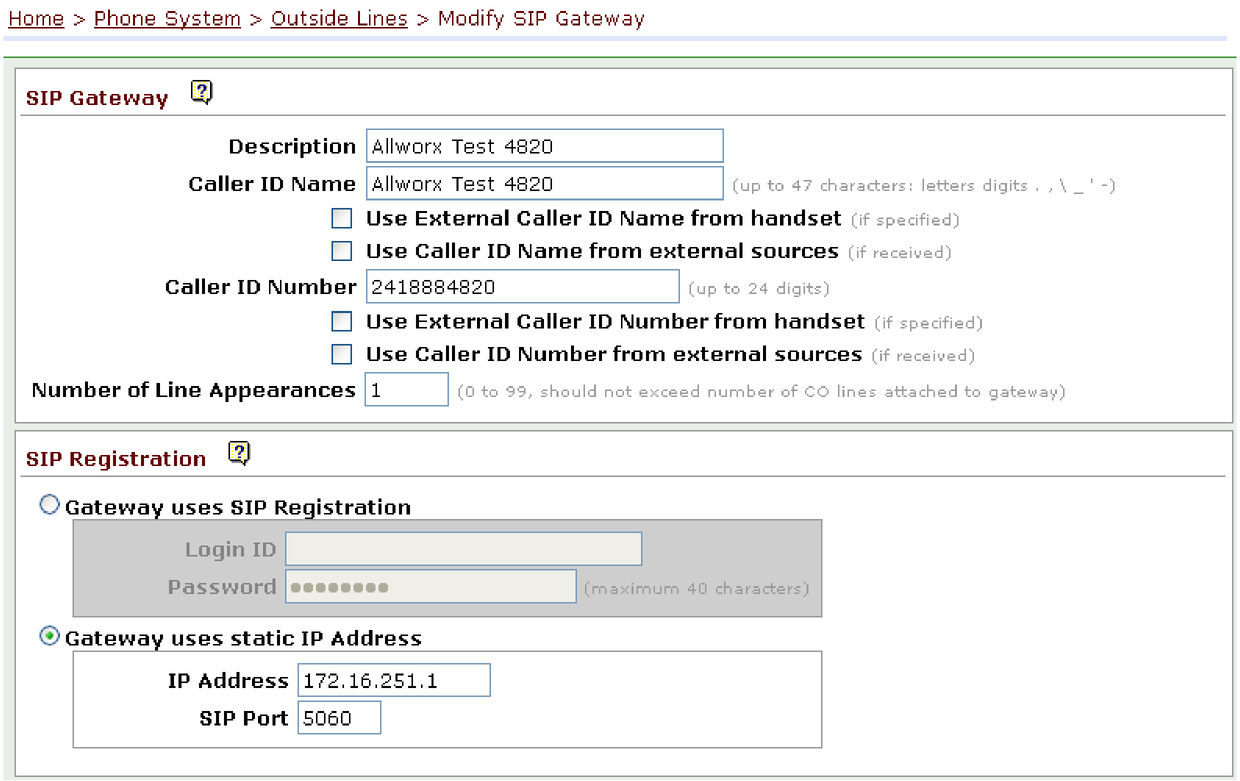


Figure 6

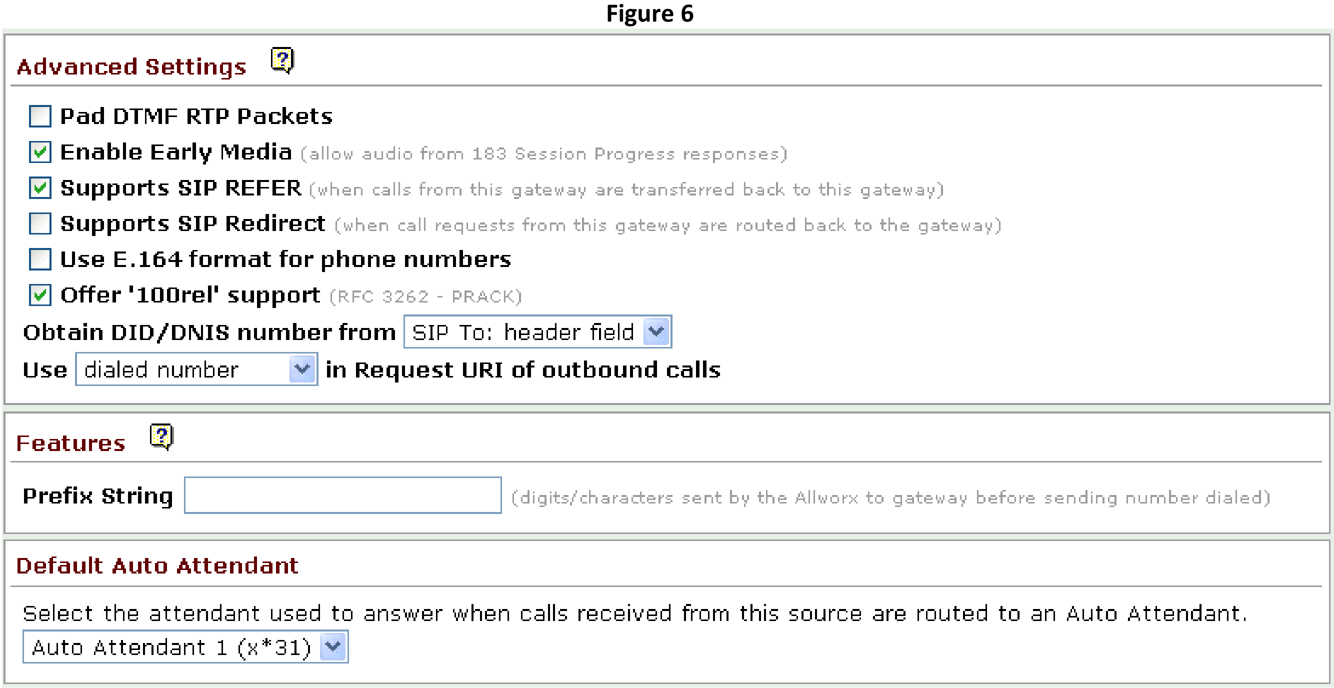


Figure 7

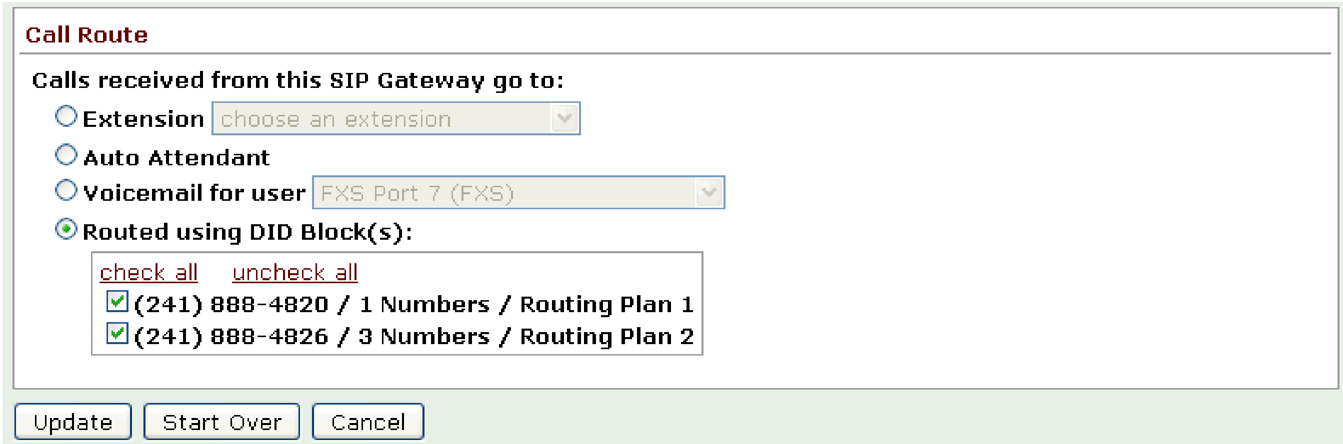


Figure 8

8. Enter your Desired Caller ID Name – something like your company name for example.
9. Enter your Caller ID Number – Lead Telephone Number.
10. Ensure "Gateway uses Static IP Address" is clicked and the correct IP is entered
11. Setup the Call Route – Choose "Routed using DID Block(s)" - choose the Routing plan(s) you want it to use.

SIP Proxy

1. For each DID, you will need to create a SIP Proxy
2. Navigate to Phone System > Outside Lines > SIP Proxies

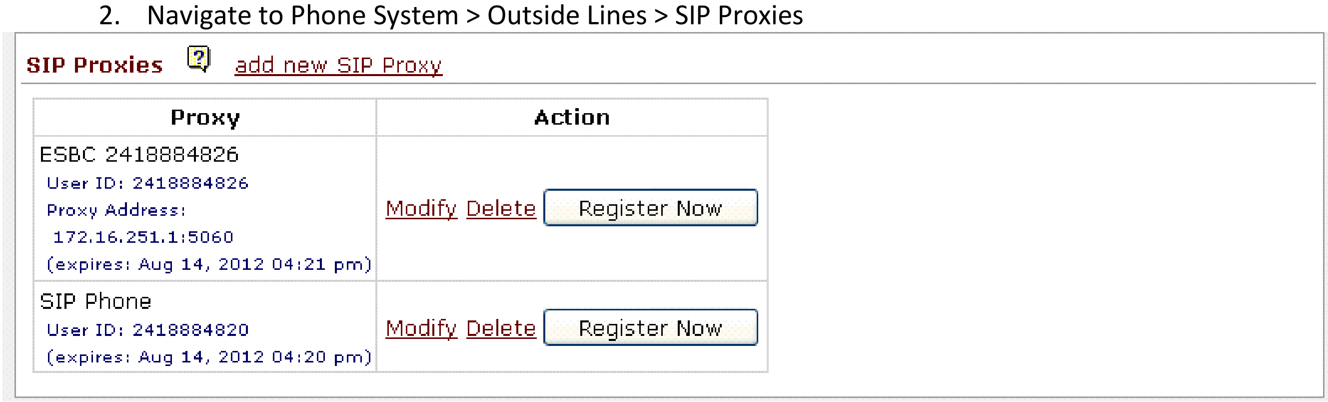


Figure 9. Allworx 6X SIP Trunk Settings

3. Click "add new SIP Proxy" to add a new proxy for each DID number

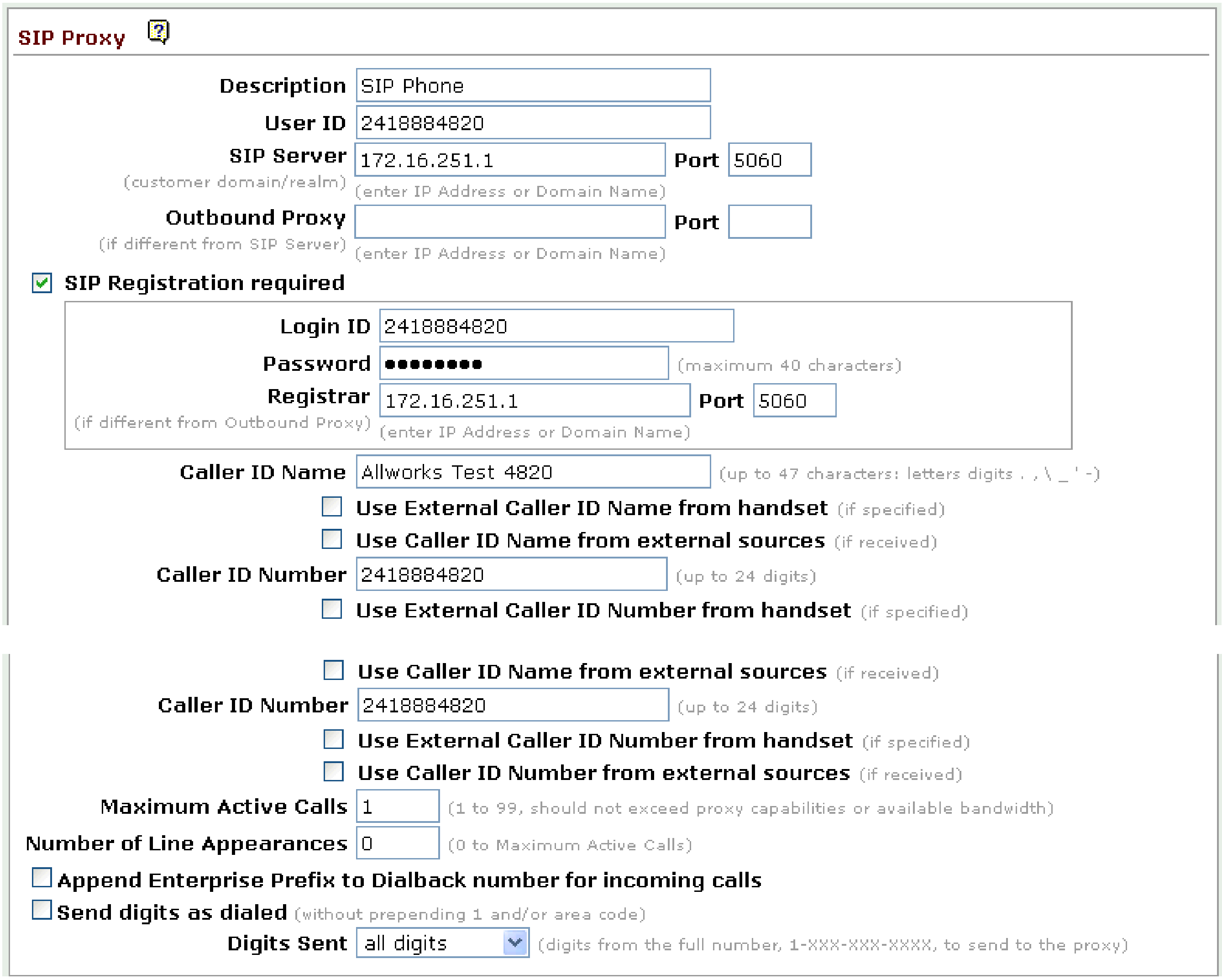

SIP Proxy
Description
SIP Phone
User ID
2418884820
SIP Server
(customer domain/realm)
172.16.251.1
Port
5060
(enter IP Address or Domain Name)
Outbound Proxy
(if different from SIP Server)
Port
(enter IP Address or Domain Name)
SIP Registration required
Login ID
2418884820
Password
(maximum 40 characters)
Registrar
(if different from Outbound Proxy)
172.16.251.1
Port
5060
(enter IP Address or Domain Name)
Caller ID Name
Allworks Test 4820
(up to 47 characters: letters digits . , \ _ ' -)
Use External Caller ID Name from handset (if specified)
Use Caller ID Name from external sources (if received)
Caller ID Number
2418884820
(up to 24 digits)
Use External Caller ID Number from handset (if specified)
Use Caller ID Name from external sources (if received)
Caller ID Number
2418884820
(up to 24 digits)
Use External Caller ID Number from handset (if specified)
Use Caller ID Number from external sources (if received)
Maximum Active Calls
1
(1 to 99, should not exceed proxy capabilities or available bandwidth)
Number of Line Appearances
0
(0 to Maximum Active Calls)
Append Enterprise Prefix to Dialback number for incoming calls
Send digits as dialed (without prepending 1 and/or area code)
Digits Sent
all digits
(digits from the full number, 1-XXX-XXX-XXXX, to send to the proxy)

Figure 10

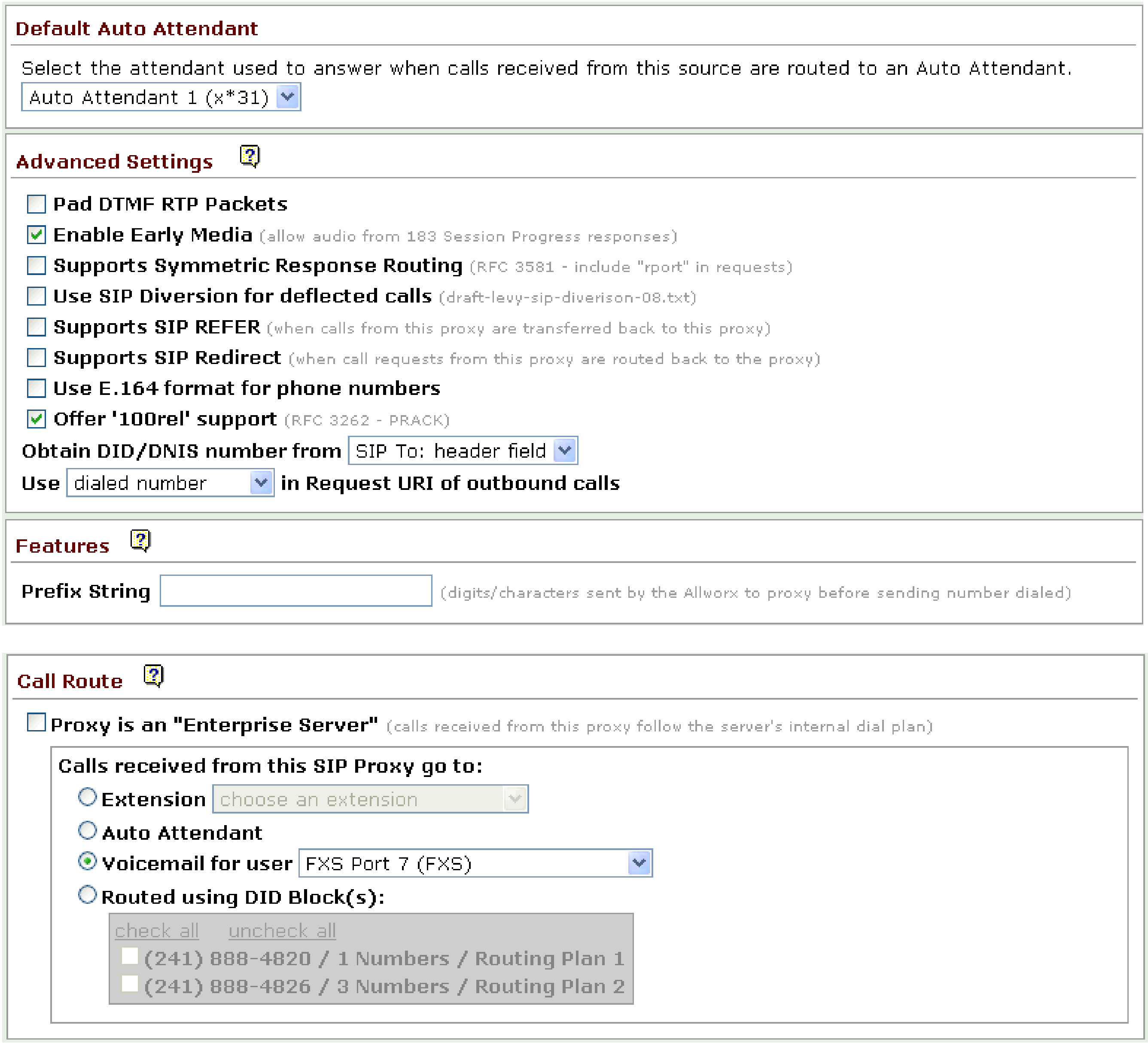


Figure 11

4. Enter a Description for this SIP Proxy
5. Enter the UserID – the Phone Number in most cases
6. Enter the SIP Server – IP address of the ESG LAN port
7. Check “SIP Registration required” if not using Static Registration on the ESG PBX Profile Settings.
8. If using SIP Registration, complete the Login ID (ESBC User ID), password (ESG User Password), and Registrar (ESBC Lan IP) fields.
9. Enter a Caller ID Name and Caller ID Number
10. Enter the desired Call Route –Route using DID Block(s) or the specific Extension

Configuring Outbound Routing

1. Ensure you are using North American Numbering Plan Administration (NANPA)
2. Modify the External Dialing rules for dialing out from your Area Code so the correct Service Group is used, correct dialing string is passed on.

External Dialing Rules

North American Numbering Plan Administration (NANPA)	enabled	Modify

Area Code	Exchange	Number Dialed	Service Group	Action
240		9+240-xxx-nnnn 9+1+240-xxx-nnnn	All CO Lines & SIP Gateways	
Home 241		9+241-xxx-nnnn 9+1+241-xxx-nnnn	All CO Lines & SIP Gateways	Modify
all others		9+1+aaa-xxx-nnnn	All CO Lines & SIP Gateways	

aaa - area code xxx - exchange nnnn - number

Type	Number Dialed	Service Group	Action
Emergency	9+911	see Dialing Privileges Group for source of call	
Phone Services (211,311,411,511,611,711,811)	9+n11	All Trunk Devices	
Operator	9+0	All Trunk Devices	
Long Distance Services	9+1010...	All CO Lines & SIP Gateways	Modify
International Calls	9+011...	All Trunk Devices	
Public SIP Directory	1+nnnn (4 digits)	All SIP Proxies	
PIN Code	78+nnnnn (5 digits)	All CO Lines	
Outside Line Seizure	9#	All Trunk Devices	

Emergency Call Email Notifications are not enabled. Modify

Figure 12

3. Enter your Home Area Code and choose the service group to dial out from.

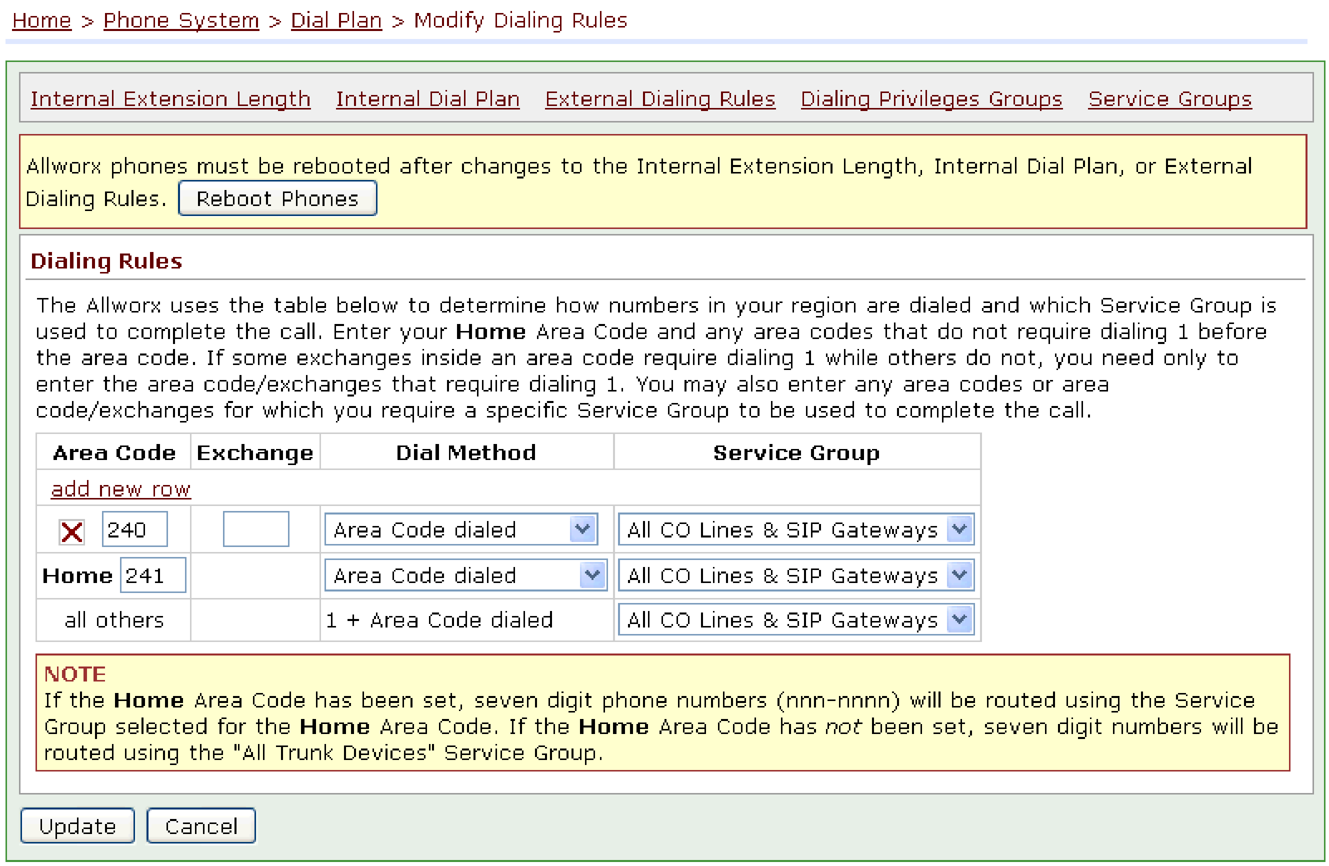


Figure 13

4. Ensure you have an Internal Dial Plan with an External Call Access number, normally this is a 9 + External Number. If not modify the Internal Dial Plan so you have one.

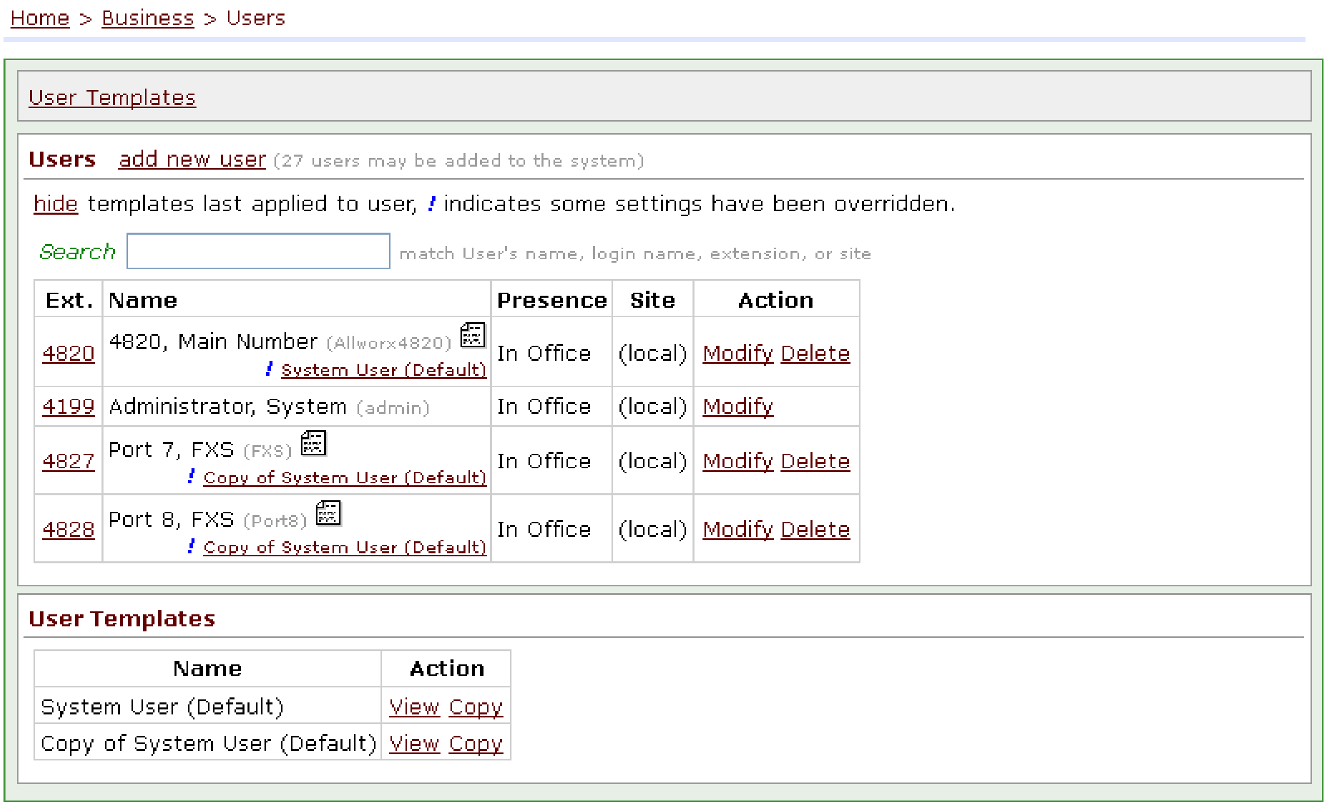
Internal Dial Plan modify view the Phone Functions Reference Card

Plan	
4xxx 5xxx	User and System Extensions
0	Operator
9 + external number	External Call access (follows External Dialing Rules below)
1 + enterprise number	Enterprise calling
2nnn	Internal station access (reserved for system)
350-399 34nnn	Speed dial numbers
6 + user extension	Message Center
700 call park 701-709 call retrieve 7xxxx call pickup 78 + pin code	Call Functions (park/pickup/audit pin code)
8 + user extension	Leave a voicemail for extension
*03 door relay *08 conference center *2n do not disturb *3n auto attendants *4nn call queues *950-*999 call retrieve *5xxxx call forwarding *6n paging	PBX Functions

Figure 14. Allworx 6X SIP Trunk Line Dialing Rule Settings

Add Users and Extensions

1. Navigate to Home > Business > Users



Ext.	Name	Presence	Site	Action
4820	4820, Main Number (Allworx4820) ! System User (Default)	In Office	(local)	Modify Delete
4199	Administrator, System (admin)	In Office	(local)	Modify
4827	Port 7, FXS (FXS) ! Copy of System User (Default)	In Office	(local)	Modify Delete
4828	Port 8, FXS (Port8) ! Copy of System User (Default)	In Office	(local)	Modify Delete

User Templates

Name	Action
System User (Default)	View Copy
Copy of System User (Default)	View Copy

Figure 15 Add Users and Extensions to Allworx

2. Click “add new user”

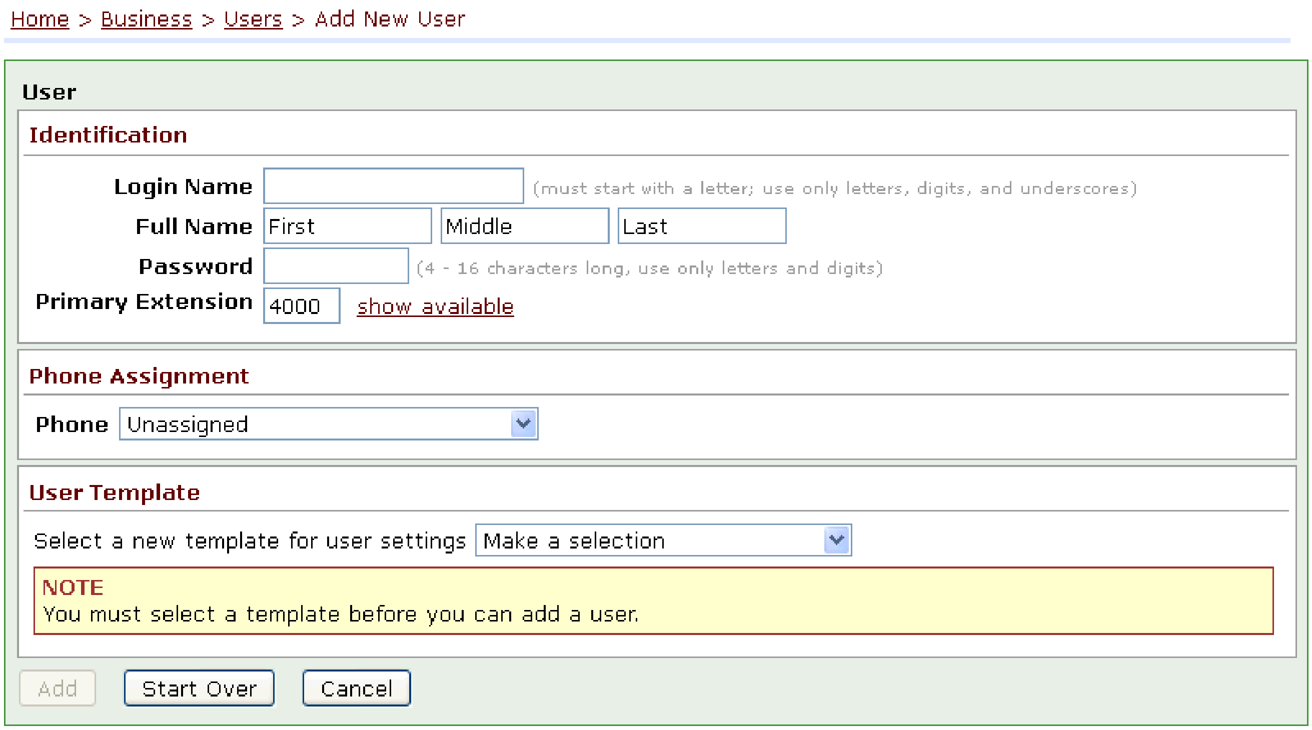


Figure 16

3. Enter Login Name
4. Enter First and Last name
5. enter a minimum 4 character password
6. Enter a Primary Extension – I would use the last 4 digits of the DID number if possible, so it is easy to follow.
7. If you have plugged in a SIP Phone, and it has been recognized, you can assign it to this user, choose from the pull down menu.
8. Choose a User Template, the default user should be fine.
9. Click "add" at bottom of screen. Note that when you choose the Template, you will get more options, and Defaults should be fine, unless you want to make changes.

FXS/Analog Handset and SIP Handsets

FXS Handset

1. Navigate to Home > Phone System > Handsets

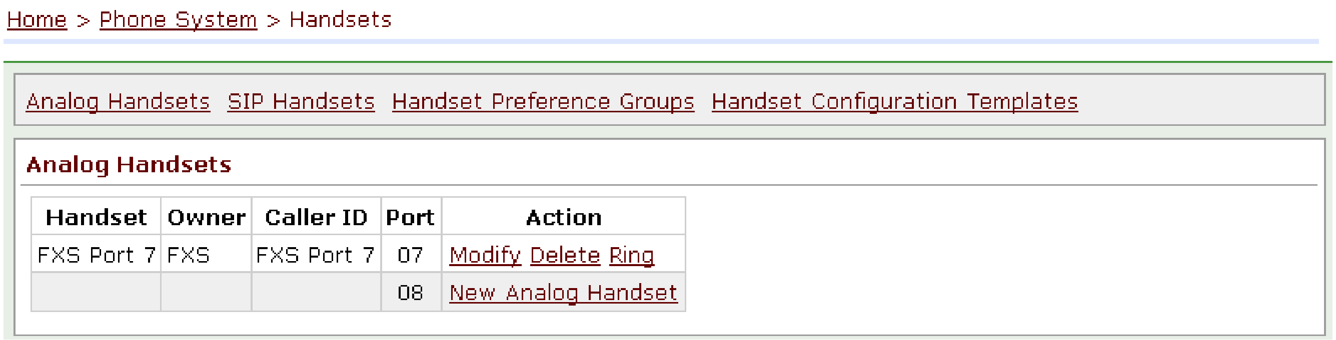


Figure 17

1. Click on "New Analog Handset"

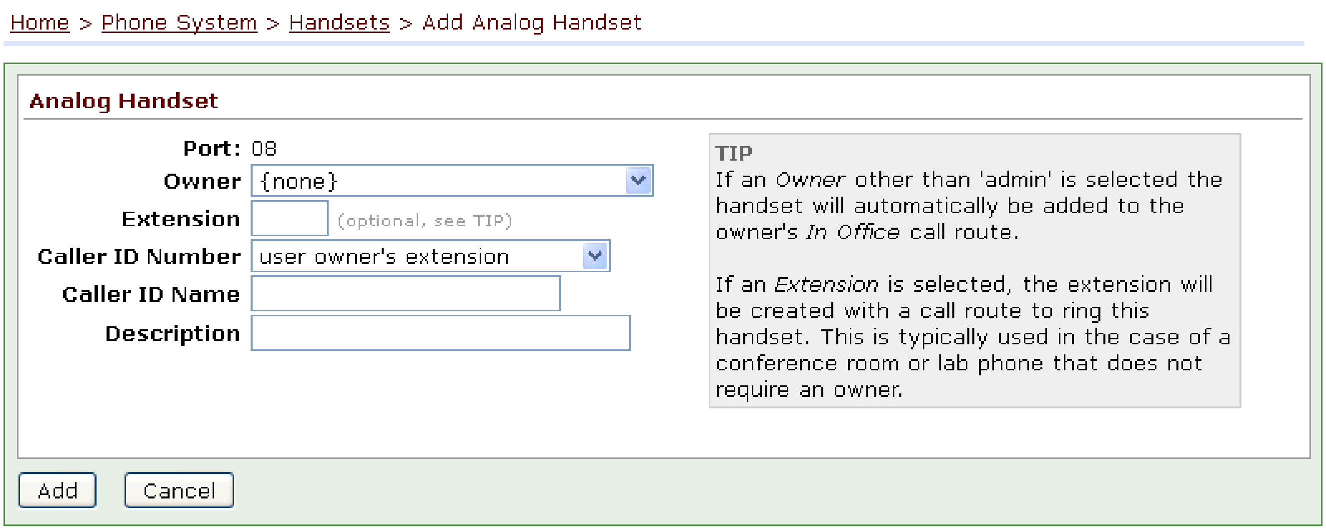


Figure 18

2. Choose an Owner from the pull down menu from one of the users you created earlier.
3. Choose a Caller ID Number from the pull down menu for the same owner. This should populate the Caller ID Name and Description as well.
4. Click "Add" to assign this information to your FXS port

SIP Handset

1. Navigate to Home > Phone System > Handsets

SIP Handsets add new SIP handset Reboot Allworx Phones

Handset	Line	Owner	Caller ID	Identification	Action
Allworx 9212 PBX Station (Default) MAC: 00-0A-DD-85-1D-6E 192.168.2.7:5060				View Configuration Add Call Appearance	Reboot Replace
Main Number 4820	1	Allworx4820	Main Number 4820	User ID: 2100 Login ID: 5100 (expires: Aug 15, 2012 06:11 pm)	Modify Delete Ring
Allworx 9212 PBX Station (Default) MAC: 00-0A-DD-82-4E-A8				View Configuration Add Call Appearance	Reboot Replace
IP 4827	1	FXS	IP 4827	User ID: 2102 Login ID: 5102 (not registered)	Modify Delete Ring

Figure 19

2. Click “add new SIP handset”

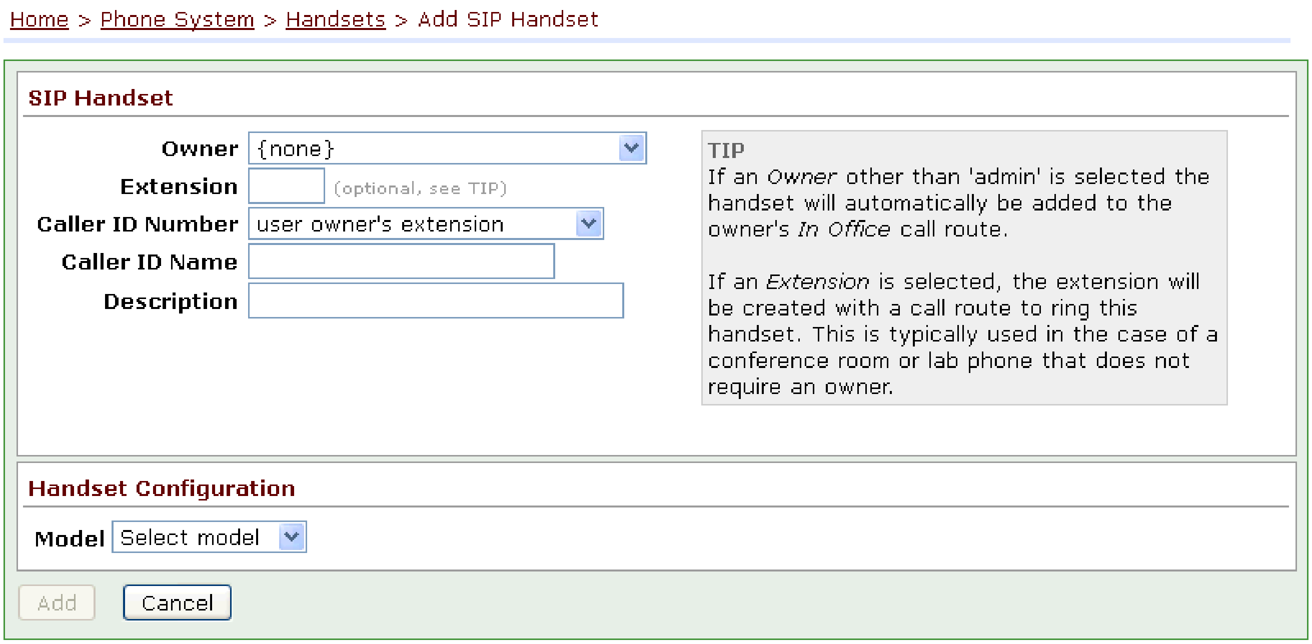


Figure 20

3. Choose the Owner from the Owner’s pull down list
4. Choose Caller ID Number from the pull down list of the Owner you choose. _This will cause the Caller ID Name and Description to be filled in.
5. Choose the Model of your SIP Phone. When you choose the model, it will cause 3 additional items to be filled out

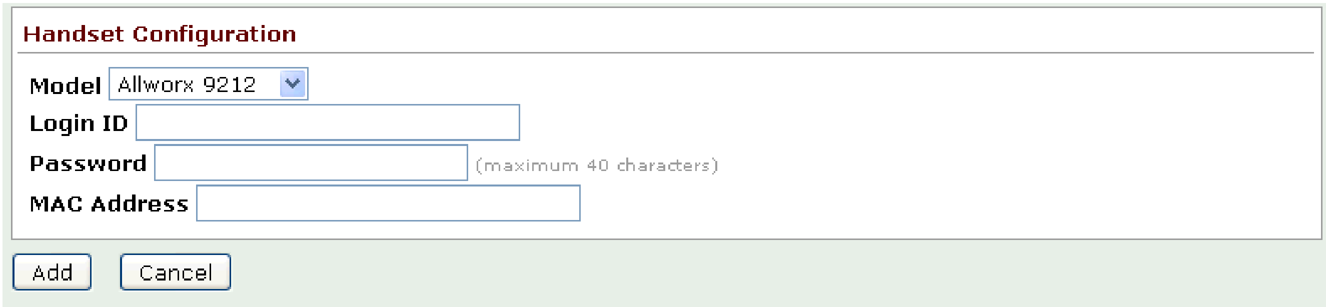


Figure 21

6. Enter a Login ID for this phone
7. Enter a Password for the phone
8. Enter the MAC Address of this phone.
9. Click "Add" to add this handset.

Allworx Configuration File

Export creates an external copy of a configuration backup such that it can be imported later into this or another Allworx 6X device.

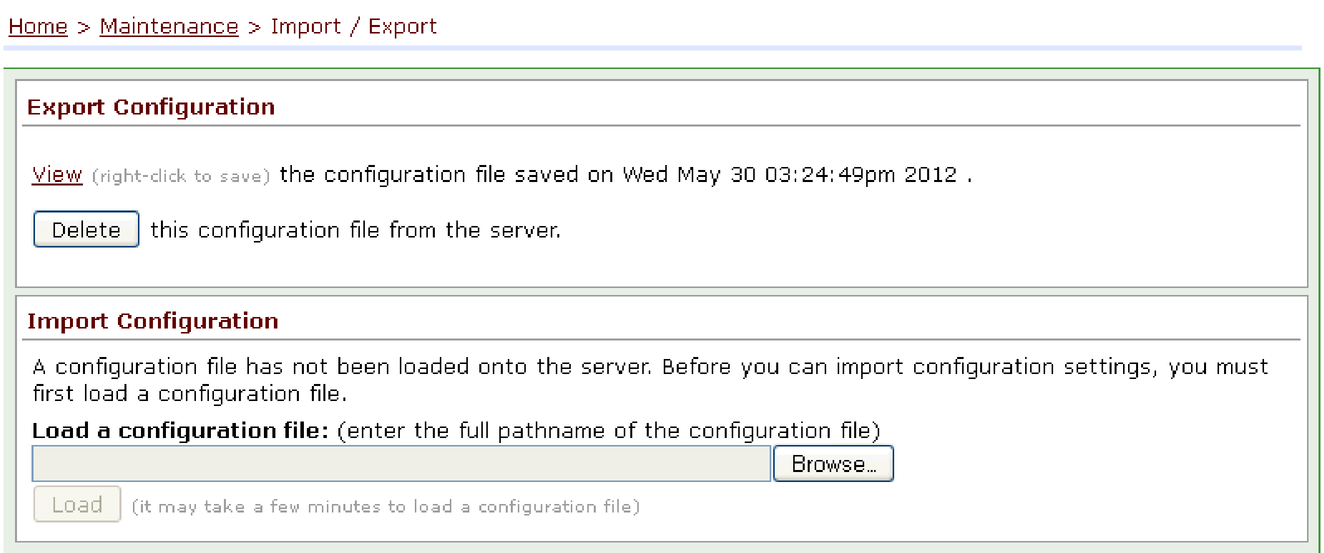


Figure 22

Appendix

TWC Turn-up Testing Procedure

To ensure proper service between the IP PBX and the TWC network, test calls from the IP PBX will be made. Typically, the following call types will be used (call testing varies depending on service configuration)

1. Outbound/Inbound call to a local number
2. Outbound/Inbound call to a long distance number
3. Calls to 411 and 611
4. Outbound calls to a blocked number to verify call blocking settings
5. Other calls based on customer request , e.g. FAX testing using T.38 or calls to an auto-attendant to verify DTMF

Questions

If you have questions, please contact your Time Warner Cable Business Class Account Executive.