Appendix A

Menu Structure

Phone Book (section 10.2)		
Search		
Add new contact		
Edit		
Delete		
Instant Messages (section 10.3)		
Compose		
Inbox		
Outbox		
Erase all		
Configure		
• Receive and display⇒	• Reject	
Information (section 10.4)		
Times		
• Difference from GMT ⇒	• Phone power on ⇒	• Phone connected ⇒
• Phone registered ⇒	• Total talk time	
Records		
• Call log ⇒	• SIP log	
Communications		
• Ethernet circuits ⇒	• Power ⇒	• TFTP Address ⇒
• Configuration file		
Manufacture		
• MAC address ⇒	• Software version ⇒	• Boot code version ⇒
• Hardware version ⇒	• Date of Manufacture	

User Settings (section 10.5)		
LCD Contrast		
Greeting message		
Clear user settings		
• Never ⇒	• on next power on ⇒	• on each power on
Date and Time		
Audio		
• external ring tone ⇒	• internal ring tone ⇒	• internal Call Answer ⇒
• call disconnect ⇒	• second call tone ⇒	• hold reminder tone ⇒
• key click		
Event Timer		
Bluetooth		
• Discover ⇒	• Headsets ⇒	• Microphone ⇒
• Disable ⇒		
Voice Commands		
• Phone Book ⇒	• Hot words ⇒	• Calibrate ⇒
• Erase all ⇒	• Disable	
Analog		
• Block outgoing call ⇒	• Analog is default ⇒	• Digital is default
Regional Options		
• country ⇒	• language ⇒	• number format ⇒
• date and time ⇒	• time format ⇒	• date format
Emergency numbers		
Factory defaults		
Protected Settings (section 10.6)		
Password		
• Enter ⇒	• Log out ⇒	• Change
IP Communications		
• DHCP ⇒	• Phone address ⇒	• Subnet mask ⇒
• Default gateway ⇒	• DNS server ⇒	• Secondary DNS ⇒
• NTP server ⇒	• TFTP server ⇒	• TFTP address ⇒
• DSCP ⇒	• Stun	
SIP Communications		
• Outbound proxy ⇒	• Backup proxy ⇒	• Registrar server ⇒
• RTP start port ⇒	• Receive port ⇒	• Proxy port ⇒
• Registrar port ⇒	• Backup proxy port ⇒	• Page server ⇒
• Transport protocol ⇒	• Invite retrans ⇒	• Non invite retrans ⇒
• Backup proxy reg ⇒	• Proxy password ⇒	• Outgoing SIP Calls ⇒
• Outgoing RTP		

VLAN		
Names and Numbers		
• Device ID ⇒	• Domain ⇒	• Voice mail ⇒
• Park extension ⇒	• Page Extension	
Audio		
• Codec ⇒	• Encryption ⇒	• Distinctive ring ⇒
• Accept URL ⇒	• Sound URL	
Self Test (section 10.7)		
Ping		
Loop Ethernet ports		
Buttons and keys		
LEDs		
LCD		
Audio		
Audio Return		
Bluetooth		

Appendix B

LED Summary

B.1 Call Appearance Buttons

The LEDs on the call appearance buttons can be off or can show red, green, or orange. Figure B-1 shows what the LEDs show for various phases of a call. The figure shows where you can find more details about that state.

Function	LED Color				Details
Idle	—	—	—	—	Section 6.3.1 on page 50
Call appearance reserved	G	—	—	—	Section 9.2.1 on page 99
Call appearance for dialling	G	—	G	—	Section 9.2.1 on page 99
Call proceeding	G	G	G	—	Section 9.3.1 on page 106
Far end busy	G	G	G	R	Section 9.3.3 on page 108
Network busy	G	R	G	R	Section 9.3.4 on page 108
Encryption rejected	G	R	G	R	section 7.2.2.1 on page 56
Call connected	G	G	G	G	Section 9.3.5 on page 109
Call on hold	G	G	—	—	Section 9.5.2 on page 116
Far end disconnected	R	R	R	R	Section 9.6.2 on page 121
Incoming call	R	—	R	—	Section 9.4 on page 111
Conference	O	O	O	O	Section 9.8.1 on page 126
Conference on hold	O	O	—	—	Section 9.8.2 on page 127

Figure B-1 Summary of LEDs on Call Appearance Buttons

In the figure, there are four columns for the LED color. Each column represents the color that the LED will show for a quarter of a second. The pattern repeats after a second. In the figure:

- '—' indicates the LED is off for a quarter second
- 'R' indicates the LED is red for a quarter second
- 'G' indicates the LED is green for a quarter second
- 'O' indicates the LED is orange for a quarter second

For example, when the call is connected, the LED is continuously lit green (green for each quarter second). When the call is on hold, the LED is green for half a second then off for half a second.

The time reference for all LEDs is the same, so that the first quarter second for each LED starts simultaneously. This provides a more uniform display. For example, if the phone receives a call on call appearance 1 it will flash its LED. If another call comes in 250 ms later, the LED on the second call appearance button will flash synchronously with the first LED.

When the phone is starting, or if there is a problem with the data connection, the phone "walks" a pattern on the four call appearances. The patterns are shown in figure B-2.

Function	Pattern	Details
Power on; loading Linux operating system	Walking red left to right	Section 4.3.2 on page 27
Power on; you have pressed a key for one second	Walking red right to left	Section 4.3.4 on page 28
Unable to establish proper connection to network	Walking orange left to right	Section 4.3.5.9 on page 34

Figure B-2 Special Patterns for LEDs on Call Appearance Buttons

B.1.1 Message and Encrypt Button

The LED flashes red for 500 ms and is off for 500 ms when you have voice mail. See section 7.1 on page 55 for details.

The LED is permanently on when the phone is encrypting the speech. See section 7.2.2 on page 56 for details.

The LED flashes green for 250 ms and red for 250 ms when encryption is rejected.

B.1.2 Hook and User Button

The LED is lit continuously red when the phone sends the audio to the headset. See section 9.1.1 on page 97 for details.

The LED is lit continuously green when another user has logged into your phone or when you or another person has logged into an ACD group, and the headset is not in use. See section 7.3 on page 60 for details.

B.1.3 DND and Forward Button

The LED is lit continuously red when the phone will reject all calls. See section 7.4 on page 64 for details.

The LED is lit continuously green when the phone will forward some or all calls. See section 7.5 on page 65 for details.

B.1.4 Memory and Calculator Button

The LED is lit continuously red after you press the Memory button. Enter a two digit number. The phone turns off the LED. See section 9.7.3 on page 122 for details.

The LED is lit continuously green when the phone is in calculator mode. See section 9.9.2 on page 130 for details.

B.1.5 Park and Pickup Button

The LED is lit continuously red after you press the Park or Pickup button. Enter a two digit number. The phone turns off the LED. See section 7.6 on page 66 and section 7.7 on page 68 for details.

B.1.6 Mute and Page Button

The LED on the Mute button flashes red for 500 ms and is off for 500 ms when you are engaged in a call and your speech is suppressed. See section 9.5.1 on page 115 for details.

The LED is lit continuously after you press the Page button and before you select a paging address. The LED flashes red for 250 ms and is off for 250 ms when you are making a paging announcement. See section 7.8 on page 70 for details.

The LED flashes synchronously with the LED on the Speaker key when the menu is active. See section 6.3.3 on page 51 for details.

B.1.7 Speaker Key

The LED on the Speaker key is lit continuously red when the phone is in speaker mode. See section 9.1.1 on page 97 for details.

The LED flashes on for 250 ms and off for 750 ms when the menu is active. See section 6.3.3 on page 51 for details.

Appendix C

Configuration Files

C.1 Introduction

The ZIP4x5 phone obtains its configuration from three possible sources:

- what is saved in the phone's memory
- what is saved in a common configuration file
- what is saved in a specific configuration file

If the Clear User Settings menu command (as described in section 10.5.3) is set to **on each power on**, the phone reads the configuration files each time it resets, either by command or by power on, and saves the contents to memory. This overwrites all user settings with the parameter values defined by the configuration files.

This appendix describes the function, composition, and implementation of ZIP4x5 configuration files.

C.2 Configuration File Types

The ZIP4x5 phone obtains its configuration from two separate files: the common configuration file and the specific configuration file.

C.2.1 Common Configuration File

The common configuration file sets parameters on all phones within an enterprise that are to have the same values. Parameters that are normally set within a common configuration file define the network configuration, SIP server interface characteristics, and other settings that are common among all phones in an enterprise.

The common configuration file is called:

```
ZIP4x5_common.cfg
```

This file must be stored in the root directory of the TFTP server.

C.2.2 Specific Configuration File

The specific configuration file sets parameters for an individual phone within an enterprise. Parameters normally set within a specific configuration file customize ZIP4x5 features for the person using the phone, such as the greeting message, audio characteristics, and LCD options.

The common configuration file identifies the location of the specific configuration files. A phone extracts configuration information from the common file first, then from its specific file. Specific file parameter settings take precedence over settings of the same parameters in the common file.

The name of the specific configuration file is:

```
<MAC address>.cfg
```

For example,

```
0050C2180FD8.cfg
```

is the specific configuration file for a ZIP4x5 phone that has the MAC address 00:50:C2:18:0F:D8.

C.3 Configuration File Format

Common and specific configuration files are similar in format and composition. Most configuration parameters can be set in either file. Configuration files are stored in ASCII format.

C.3.1 File Sections

Each file is separated into sections, with each section containing settings for a functional parameter group. The order of the functional sections within each configuration file has no affect upon the configuration of the phone. The first line in each section contains the name of the functional group, denoted by square brackets. Figure C-1 displays the name of each function heading and the proper format of the headings.

```
[HW_CONFIG]

[VLAN_CONFIG]

[NET_CONFIG]

[SIP_CONFIG]

[AUDIO_INFO]

[GENERAL_INFO]

[BT]

[FW]

[DHCP_SRV]
```

Figure C-1 Configuration File Section Headings

C.3.2 Parameter Entries

All available parameter settings are classified by function, as described in section C.4. Each parameter within a configuration file must be contained within its defined functional section. The order of parameters within each function section does not effect the configuration of the phone. If a parameter is defined in the common file and the specific file, the specific file setting takes precedence. Figure C-2 displays an example of parameter settings in a configuration file.

```
[HW_CONFIG]
lcd_contrast=8
ring_volume=5
speaker_volume=5
headset_volume=5
handset_volume=5

[NET_CONFIG]
use_dhcp=yes
tftp_cfg_dir=./ZIP4x5
```

Figure C-2 Configuration File Example

The name of the parameter and the parameter value must be on the same line. The name of the parameter is not case sensitive; it can be entered in either upper or lower case. However, parameter values are case sensitive. Refer to the parameter tables in section C.4 for more details. Comment lines are denoted with a leading semi-colon (;) and have no effect on the configuration of the phone.

C.4 Configuration Parameters

This section provides tables that list all of the configuration parameters in each functional group. Parameters in each table are listed in alphabetic order. Many parameters correspond to an equivalent menu command; the tables refer to the section describing the menu command for each of these parameters.

C.4.1 Network Configuration

Network configuration parameters define settings required by the phone to communicate with the network. Figure C-3 lists the network configuration parameters.

C.4.1.1 Server Parameter Settings

It is highly recommended that the configuration files explicitly define the settings for these server variables.

use_dhcp: When DHCP is enabled, the DHCP server should dynamically provide an IP address and subnet mask for the phone, IP addresses for the DNS servers, default gateway, NTP server, and TFTP server.

If dhcp is not enabled, or if the DHCP is unable to return addresses for any of these servers, you must specify valid IP addresses for each server or the phone will not properly configure on startup.

Parameter	Description	Description of equivalent menu command
default_gateway	Parameter is IP address of default gateway. Used when use_dhcp = 'no' DHCP does not provide the default gateway (DHCP option 3) Firewall mode=1 to set ISP gateway in fixed IP addr mode Valid setting is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
domain	Parameter is name of the domain in which the phone resides; used for manual configuration when use_dhcp is set to 'no' or DHCP does not return the domain (DHCP option 15). Valid settings are FQDN or IP address in dotted decimal notation. No default value.	none
dscp_setting	Configures DiffServ (layer 3 QoS) setting. All voice packets (RTP) leaving the phone will have the ToS byte in the IP header set to this value. Valid settings range from 0 to 63. Default value is 0.	section 10.6.4 on page 173
ip_addr	Parameter is static address assigned to the ZIP4x5. Used when use_dhcp = 'no' DHCP does not return an address (DHCP option 50) Firewall mode=1 to set LAN address in Fixed IP addr mode. Valid setting is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
ntp_server_addr	Parameter is IP address of NTP server. Used when use_dhcp = 'no' DHCP does not return an address (DHCP option 42) Firewall mode=1 to set LAN address in Fixed IP addr mode. Valid setting is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
primary_dns	Parameter is IP address of primary DNS Server. Used when use_dhcp = 'no' DHCP does not return DNS Server (DHCP option 6) Firewall mode=1 to set ISP dns address in Fixed IP addr mode Valid setting is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
secondary_dns	Parameter is IP address of secondary DNS Server. Used when use_dhcp = 'no' DHCP does not return DNS Server Firewall mode=1 to set ISP dns address in Fixed IP addr mode Valid setting is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166

Figure C-3 Network Configuration Parameters

Parameter	Description	Description of equivalent menu command
subnet_mask	Parameter is Subnet mask that is used for manual configuration for phone when if use_dhcp is set to 'no' or DHCP does not return mask (DHCP option 1). Valid setting is 32 bit mask in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
stun_server	Parameter is IP address of stun server. Valid setting is 32 bit IP address in dotted decimal notation.	
stun_server_port	Parameter is the port number of the stun server. Valid settings range from 1025 to 65535. Default value is 3478.	
stun_sip_binding	Parameter determines contents of source address field in IP header for SIP packets. Valid settings are 0 and 1: 0 - source address field set to LAN address 1 - source address field set to WAN address Default address is 0.	
stun_rtp_binding	Parameter determines contents of source address field in IP header for RTP packets. Valid settings are 0 and 1: 0 - source address field set to LAN address 1 - source address field set to WAN address Default address is 0	
tftp_addr_fixed	Specifies source of TFTP IP address. Valid settings are 'yes' and 'no': 'yes' - TFTP server address is fixed to value of tftp_server_addr 'no' - TFTP server address is not fixed. If tftp_addr_fixed='yes', DHCP cannot be used to configure TFTP server address. Default value is 'no'.	
tftp_cfg_dir	TFTP directory location of the specific configuration file. Parameter value is directory name that is referenced from TFTP root directory. This parameter must be set in the common configuration file. Default value is ZIP4x5.	section 5.2 on page 38
tftp_server_addr	IP address of TFTP server. Parameter used only if use_dhcp is set to 'no' or DHCP does not return a TFTP server (DHCP option 66). Parameter value is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166
use_dhcp	When enabled, phone uses DHCP to configure network settings: IP address, subnet mask, domain name, default gateway, DNS servers, NTP server address, and TFTP server address. Valid settings are 'yes' and 'no': 'yes' - enables DHCP 'no' - disables DHCP Default value is 'yes'.	section 10.6.2 on page 166

Figure C-3 Network Configuration Parameters (Continued)

tftp_cfg_dir: This parameter points to the TFTP server directory that stores the specific configuration file for your phone. This parameter must be set in the common configuration file in order for the phone to read and process its specific configuration file. The default value of ./ZIP4x5 is valid only if your TFTP server contains a directory by that name and if the specific configuration file resides in that directory.

stun_server: The STUN protocol specifies a scheme to determine the public IP address of an IP device. The ZIP4x5 implements STUN as specified in RFC 3489, first to discover if it's behind a NAT/Firewall, then to obtain the public IP address and port number for that NAT/Firewall. If this discovery is successful, the ZIP4x5 then rewrites all outgoing SIP messages (including RTP port number and source IP address) to masquerade as originating from that Public IP address and port. This is required for SIP and RTP to traverse NATs since, without STUN, SIP would send explicit references to the phone's private IP address and port which is not accessible from outside the NAT/Firewall.

STUN requires a STUN server external to the NAT. This would typically be maintained by the local ISP or ITSP. STUN works across most Firewalls and NATs with the exception of a "full cone" NAT, defined as a NAT that rewrites both the IP address and port number of the phone each time it makes a connection to the outside world.

C.4.1.2 Sample Configuration File

Figure C-4 displays the network settings section from a sample configuration file.

```
[NET_CONFIG]
use_dhcp=yes
ip_addr=
subnet_mask=
default_gateway=
primary_dns=
secondary_dns=
domain=zultys.com
ntp_server_addr=
tftp_server_addr=
tftp_cfg_dir=./ZIP4x5
dscp_setting=0
```

Figure C-4 Sample Configuration File – Network Settings

C.4.2 SIP Configuration

SIP parameters allow the ZIP4x5 phone to operate properly in a SIP environment. Figure C-5 lists the SIP configuration parameters.

Parameter	Description	Description of equivalent menu command
auth_password	The proxy password authenticates the ZIP4x5 to proxy servers that require authentication. Default value is 985897.	section 10.6.3 on page 169
backup_proxy_addr	Backup SIP server proxy address value. If primary proxy server fails to operate, ZIP4x5 attempts to switch to backup proxy. Default is null string.	
backup_proxy_port	Backup SIP server proxy port value. Valid settings range from 1025 to 65535. Default value is 5060.	
backup_reg_expires	Specifies time period, in seconds, after which a REGISTRATION expires for the Backup proxy. This value is inserted into the Expires header field. Valid settings are any positive number. Recommended value is 3600. Default value is 3600.	
call_park_extension	Specifies the name or extension of the call park server. Default value is *7.	section 10.6.5 on page 176
device_id	Specifies the user portion of the SIP URI Default value is MAC address of the phone (upper case).	section 10.6.5 on page 176
display_name	Specifies the string that is sent in the display name part of the SIP From: header. Default is NULL string.	section 10.6.2 on page 166
encryption	Specifies the encryption mode. Valid settings range from 0 to 3, as follows: 0 - encryption is on by default when call is placed, but can be turned off 1 - encryption is off by default when call is placed, but can be turned on 2 - encryption is always on and cannot be turned off 3 - encryption is always off and cannot be turned on Default value is 1.	section 10.6.6 on page 178

Figure C-5 SIP Configuration Parameters

Parameter	Description	Description of equivalent menu command
fxo_mode	Specifies the functional mode of the analog phone line. Valid settings are 0, 1, and 2: 0 - outbound calls via analog lines are blocked 1 - FXO is default; call appearance 4 is in analog mode and is selected first for outgoing calls. 2 - SIP is default; call appearance 4 is in analog mode and is selected last for outgoing calls. Default value is 0.	
inb_im_enabled	Enables instant messaging on the phone. Valid settings are yes and no, as follows: yes - enables the phone to send instant messages. no - rejects all incoming instant messages; phone cannot send IM. Default value is yes.	section 10.3.5 on page 142
page_extension	Specifies name or number of the paging server. Default value is *4.	
page_server_addr	Parameter is IP address of the server that sends RTP streams to the phone. Phone ignores RTP streams from other addresses. Failure to specify an address disables paging on the phone. Default value is NULL string.	
phone_sip_port	Specifies the UDP port number that the phone uses to send and receive SIP messages. Valid settings range from 1025 to 65535. Default value is 5060.	section 10.6.2 on page 166 (SIP Receive Port)
proxy_addr	Specifies the IP address of the SIP proxy server that will be used by the phone. Parameter value is 32 bit IP address in dotted decimal notation. Default value is NULL string.	section 10.6.2 on page 166 (SIP Outbound Proxy Server)
proxy_port	Port of the SIP proxy that is used by the phone. Valid settings range from 1025 to 65535. Default value is 5060.	section 10.6.2 on page 166 (SIP Transmit Port)
register_w_backup_proxy	When enabled, phone registers with backup proxy at startup. Valid settings are 'yes' and 'no': 'yes' - enables option 'no' - disables option Default value is 'no'.	

Figure C-5 SIP Configuration Parameters (Continued)

Parameter	Description	Description of equivalent menu command
register_w_proxy	Enables the phone to register with the registrar server if specified; otherwise phone registers with proxy server. Valid settings are 'yes' and 'no': 'yes' - enables option 'no' - disables option Default value is 'yes'.	none
registrar_addr	SIP registrar server address. When this value is set, phone attempts to register with this server instead of proxy. Valid settings are IP address of Domain name. Default value is proxy address value.	
registrar_port	SIP Registrar server port. Valid settings range from 1025 to 65535. Default value is 5060.	
registration_expires	Specifies time period, in seconds, after which a REGISTRATION expires. This value is inserted into the Expires header field. Valid settings are any positive number. Recommended value is 3600. Default value is 3600.	none
rtp_start_port	Specifies the starting port number for RTP/RTCP transmissions. Valid settings range from 1026 to 64528. The starting port must always be an even number. Should not be set to same value as phone_sip_port or proxy_port. Default value is 33000.	section 10.6.2 on page 166
session_expires	Specifies the timeout period that the phone transmits or receives a RE-INVITE that refreshes a session that is still in progress. Valid settings are any positive number. Recommended value is 3600. Default value is 3600.	
sip_invite_retrans	Specifies number of unsuccessful INVITE retransmissions before phone switches to backup proxy. Valid settings range from 1 to 6. Default value is 6.	
sip_non_invite_retrans	Specifies number of unsuccessful retransmissions (other than INVITE) before phone switches to backup proxy. Valid settings range from 1 to 10. Default value is 10.	

Figure C-5 SIP Configuration Parameters (Continued)

Parameter	Description	Description of equivalent menu command
subscription_expires	Specifies time period, in seconds, after which a SUBSCRIBE expires. This value is inserted into the Expires header field. Valid settings are any positive number. Recommended value is 3600. Default value is 3600.	
use_proxy	Enables the sending of SIP requests through the proxy server, which is necessary for normal phone operation. Valid settings are 'yes' and 'no': 'yes' - enables option 'no' - disables option Default value is 'yes'.	
voice_mail_uri	Specifies the name or extension of the voice mail server Default value is voice.mail (default uri is ***86**).	section 10.6.5 on page 176

Figure C-5 SIP Configuration Parameters (Continued)

C.4.2.1 Mandatory Fields

The **proxy_addr** parameter must be set in order for the ZIP4x5 phone to send SIP address through the proxy server. The proxy server receives SIP requests from the phone and forwards them to the next intermediate device in the network. This parameter sets the address of the proxy server for the phone and provides no meaningful default if it is omitted from the configuration files.

C.4.2.2 Sample Configuration File

Figure C-6 displays the SIP settings section from a sample configuration file.

```
[SIP_CONFIG]
phone_sip_port=5060
rtp_start_port=33000
;The Device ID is the user portion of the SIP URI
device_id=West
;The Display Name is sent in SIP messages
display_name=Zultys ZIP4x5
;This must always be set to "yes"
use_proxy=yes
register_w_proxy=yes
proxy_addr=10.1.32.224
proxy_port=5060
voice_mail_uri=258
call_park_extension=259
registration_expires=3600
```

Figure C-6 Sample Configuration File – SIP Settings

C.4.3 Firewall Configuration

Firewall configuration parameters define settings required by the ZIP4x5 to act as a firewall, VPN, and NAT filter.

Parameter	Description	Description of equivalent menu command
auth_algo	Specifies authentication algorithm for data transfer (manual keys) or phase 2 negotiations (AutoKey). Valid settings include hmac_md5, hmac_sha1, des, and 3des	
authkey	Specifies the authorization key. Valid only if ipsec_mode=2. Valid setting must be double-quoted character string or a series of hexadecimal digits preceded by '0x'.	
encrypt_algo	Specifies encryption algorithm for data transfer (manual keys) or phase 2 negotiations (AutoKey). Valid settings include rijndael(AES), des, 3des, blowfish, and twofish.	
encrypt_key	Specifies encryption key. Valid only if ipsec_mode=2. Valid setting must be double-quoted character string or a series of hexadecimal digits preceded by '0x'.	
inbound_spi	Inbound Security Parameter Index. Valid only if ipsec_mode=2. Valid setting is either a decimal number or a hexadecimal number preceded by '0x'	
ipsec_log	This parameter enables the VPN log. Access the VPN log from the web interface. Valid settings are 0 and 1. 0 - VPN log is disabled 1 - VPN log is enabled Default value is 0.	
ipsec_mode	Specifies the key management method. Valid settings are 0, 1, and 2 as follows: 0 - VPN mode is off 1 - VPN mode is on; uses AutoKey IKE 2 - VPN mode is on; uses manual keys	
key_lifetime	Specifies period that key is valid. After the lifetime expires, the key must be renegotiated. Valid settings include X sec, X min, and X hour Default value is 3600 sec.	

Figure C-7 Firewall Configuration Parameters

Parameter	Description	Description of equivalent menu command
lan_filters	Specifies characteristics of data packets that the firewall prohibits from being sent from the LAN to the WAN. Format is filter list of form l_filter_1 | l_filter_2 | ... | l_filter_n, where each l_filter_x is an individual filter. Syntax of each filter is as follows: $l_filter_x = l_name_x\#l_prot_x\#l_addr_x\#l_port_x\#l_active_x$ l_name_x is the name of filter x l_prot_x is the protocol of the data packet targeted by the filter valid entries are tcp, udp, icmp, all l_addr_x is the origin IP address of the targeted data packets address range is specified by address/prefix notation example syntax is 10.10.10.0/24 l_port_x is the origin port of targeted data packets valid for only udp and tcp protocols multiple ports specified by colon – 10:12 for 10 - 12 l_active_x indicates the activity status of the filter 0 is not used; 1 is used	
lan_vid	Establishes the VLAN ID for the local area network. Values range from 1 to 4095. Default value is 1	
mode	Establishes remote networking support including firewall filtering, vpn support, and DHCP server capabilities within the ZIP4x5. Valid settings are 0 and 1, as follows: 0 - all remote networking support features are off 1 - all remote networking support features are on Default value is 0.	
my_ident	Specifies the user IP address. Valid only if p1_mode=aggressive. Valid setting is fully qualified domain name.	
outbound_spi	Outbound Security Parameter Index. Valid only if ipsec_mode=2. Valid setting is either a decimal number or a hexadecimal number preceded by '0x'.	
pf_secrecy	Specifies the method for deriving phase 2 keys. Valid settings are 0 and 1, as follows: 0 - off 1 - perfect forward secrecy When pf_secrecy is set to 1, the ZIP4x5 uses DH Group 2 for all phase 2 negotiations.	
pppoe_idle_timeout	Not support in version 2.0	
pppoe_mode	Establishes PPPoE support within the ZIP4x5. Valid settings are 0 and 1, as follows: 0 - PPPoE support is off 1 - PPPoE support is on Default value is 0	
pppoe_pwd	The user password on the account as specified by the ISP	

Figure C-7 Firewall Configuration Parameters (Continued)

Parameter	Description	Description of equivalent menu command
pppoe_user	The user name on the account as specified by the ISP.	
psk	Specifies the preshared key.	
p1_encrypt_algo	Specifies the phase 1 negotiation authentication algorithm. Valid settings include 3des, des, and blowfish.	
p1_hash_algo	Specifies the phase 1 negotiation hash algorithm. Valid settings include sha1 and md5.	
p1_mode	Specifies the phase 1 mode. Valid settings include main, aggressive, and base.	
remote_lan_net	Specifies the IP address of the remote LAN. Format of address is net/prefix.	
remote_wan_ip	Specifies IP address of remote VPN gateway.	
static_routes	Specifies delimited list of valid routes. Format of route list is $route_1$ | $route_2$ | ... | $route_n$, where each $route_x$ is an individual route. Syntax of each route is as follows: $route_x$ = $address_x$#$subnet_x$#$gateway_x$ $address_x$ is the IP address of the remote network $subnet_x$ is the subnet mask of the remote network $gateway_x$ is the address that must be used to reach the target	
wan_filters	Specifies characteristics of data packets that the firewall allows to be sent from the WAN to the LAN. Format is filter list of form w_filter_1 | w_filter_2 | ... | w_filter_n, where each w_filter_x is an individual filter. Syntax of each filter is as follows: w_filter_x = w_name_x#w_prot_x#w_addr_x#w_port_x#w_active_x w_name_x is the name of filter x w_prot_x is the protocol of the targeted data packets valid entries are tcp, udp, icmp, all w_addr_x is the origin IP of targeted data packets parameter can only specify a single address) format is ip address (10.10.0.0) w_port_x is the origin port of targeted data packets valid for only udp and tcp protocols parameter can only specify a single port w_active_x indicates the activity status of the filter 0 is not used; 1 is used	
wan_ip	Specifies the WAN interface IP address.	
wan_mask	Specifies the WAN interface subnet mask.	
wan_vid	Establishes the VLAN ID for the wide area network. Values range from 1 to 4095. Default value is 2.	

Figure C-7 Firewall Configuration Parameters (Continued)

All audio information parameters are optional. Figure C-8 displays the Firewall settings section from a sample configuration file.

```
[FW]
mode=1
wan_vid=1
lan_vid=2
wan_ip=172.32.10.66
wan_mask=255.255.240.0

;PPPoE
pppoe_mode=1
pppoe_user=PPPoE
pppoe_pwd_1234

;FW/NAT
wan_filters=wanFilter##0.0.0.0/0##1

;VPN
ipsec_mode=1
remote_lan_net=172.16.0.0/16
remote_wan_ip=180.1.0.50
p1_encrypt_algo=3des
p1_hash_algo=sha1
p1_mode=aggressive
psk=JADE
pf_secrecy=0
key_lifetime=1 hour
encrypt_algo=hmac_md5
encrypt_key=0x00
authkey=0x00
inbound_spi=0x00
outbound_spi=0x00
my_ident=user_fqdn "my_addy@SQLab.com
```

Figure C-8 Sample Configuration File – Firewall Settings

C.4.4 Hardware Configuration

Hardware configuration parameters adjust LCD and volume characteristics. Figure C-9 lists the hardware configuration parameters.

Parameter	Description	Description of equivalent menu command
handset_volume	Adjusts the handset volume. Values range from 0 (silent) to 20 (loud). Default value is 10.	none
headset_volume	Adjusts the headset volume. Values range from 0 (silent) to 20 (loud). Default value is 10.	none
lcd_contrast	Adjusts the LCD contrast. Values range from 1 (light) to 20 (dark). Default value is 7.	section 10.5.1 on page 147
ring_volume	Adjusts the ringer volume. Values range from 0 (silent) to 20 (loud). Default value is 10.	none
speaker_volume	Adjusts the speaker volume. Values range from 0 (silent) to 20 (loud). Default value is 10.	none

Figure C-9 Hardware Configuration Parameters

All hardware configuration parameters are optional. Figure C-10 displays the Hardware settings section from a sample configuration file.

```
[HW_CONFIG]
lcd_contrast=8
ring_volume=5
speaker_volume=5
headset_volume=5
handset_volume=5
```

Figure C-10 Sample Configuration File – Hardware Configuration Settings

C.4.5 VLAN Configuration

The configuration of the ZIP4x5 VLAN depends on the network mode setting, as configured by the mode instruction in the Firewall configuration file section. VLAN parameters configure the ZIP4x5 switch to match your network settings.

C.4.5.1 Programming VLANs – Normal Network Mode

When the Firewall mode is set to 0, the ZIP4x5 is in normal network mode and is used as a client device within a LAN. In this mode, you can configure the ZIP4x5 with up to eight VLANs, referred to as A, B, C, D, E, F, G, and H. Each Ethernet circuit can be on a different VLAN. The following restrictions must be considered when configuring the VLANs

- Each VLAN must have a different ID number.
- The Phone circuit must always be excluded from all VLANs except VLAN A.
- Each circuit can be an untagged member (U) of no more than one VLAN.
- If you configure one or more ports as a tagged member of a VLAN, you must configure the CoS setting (cos_setting). This setting is only used by the phone circuit.

Figure C-11 lists the VLAN configuration parameters in Normal Network mode.

Parameter	Description	Description of equivalent menu command
circuits_a	Defines the VLAN inclusion status of the five ZIP4x5 circuits for VLAN A: Phone, P1, P2, P3, and LAN, respectively. Valid settings for each circuit include T (tagged), U (untagged), and E (excluded). Values are case sensitive. Default value is UUUUU.	section 10.6.4 on page 173
circuits_b circuits_c circuits_d circuits_e circuits_f circuits_g circuits_h	Defines inclusion status of the five ZIP4x5 circuits for VLAN B through VLAN H: Phone, P1, P2, P3, and LAN respectively. Valid settings for each digit include T (tagged), U (untagged), and E (excluded); values are case sensitive. Default value is EEEEE for each VLAN setting.	section 10.6.4 on page 173
cos_setting	Configures the Class of Service (CoS) at layer 2 for the phone port. Valid if Phone port is defined as a tagged member of VLAN A. Values range from 0 to 7. Default value is 5.	section 10.6.4 on page 173
mode	Enables VLAN support within the ZIP4x5. Valid settings are 0 and 1, as follows: 0 - VLAN support is off 1 - VLAN support is on Default value is 0.	section 10.6.4 on page 173

Figure C-11 VLAN Configuration Parameters – Normal Network Mode

Parameter	Description	Description of equivalent menu command
vlan_id_a	Specifies the VLAN ID for VLAN A. Values range from 1 to 4094. Default value is 1.	section 10.6.4 on page 173
vlan_id_b vlan_id_c vlan_id_d vlan_id_e vlan_id_f vlan_id_g valn_id_h	Each variable specifies the VLAN ID for the respective VLAN. Valid settings are -1 and the range from 2 to 4094. –1 The specified VLAN is not used. 2 to 4094VLAN ID for the specified VLAN. Default value is –1 for each VLAN setting.	section 10.6.4 on page 173

Figure C-11 VLAN Configuration Parameters – Normal Network Mode (Continued)

C.4.5.2 Programming VLANs – Remote Network Mode

When the Firewall mode is set to 1, the ZIP4x5 is in remote network mode and is used as a router device between a LAN and a WAN. In this mode, you can configure the ZIP4x5 with two VLANs, referred to as A (connects to the LAN) and B (connects to the WAN). The following restrictions must be considered when configuring the VLANs

- Each VLANA and VLAN B must have a different ID number.
- The ID number for VLAN C through VLAN H is -1.
- The tag settings for VLAN A (Phone, P1, P2, P3, LAN) are TUUUE.
- The tag settings for VLAN B (Phone, P1, P2, P3, LAN) are TEEEU.
- The tag settings for VLAN C through VLAN H are (Phone, P1, P2, P3, LAN) are TEEEE.
- If you configure one or more ports as a tagged member of a VLAN, you must configure the CoS setting (cos_setting). This setting is only used by the phone circuit.

Figure C-12 lists the VLAN configuration parameters in Normal Network mode.

Parameter	Description	Description of equivalent menu command
cos_setting	Configures the Class of Service (CoS) at layer 2 for the phone port. Values range from 0 to 7. Default value is 5.	section 10.6.4 on page 173
mode	Enables VLAN support within the ZIP4x5. Valid settings are 0 and 1, as follows: 0 - VLAN support is off 1 - VLAN support is on Default value is 0.	section 10.6.4 on page 173

Figure C-12 VLAN Configuration Parameters – Remote Network Mode

Parameter	Description	Description of equivalent menu command
vlan_id_a	Specifies the VLAN ID for VLAN A, which connects the LAN to the ZIP4x5. Values range from 1 to 4095. Default value is 1.	section 10.6.4 on page 173
vlan_id_b	Specifies the VLAN ID for VLAN B, which connect the WAN to the ZIP4x5. Values range from 1 to 4095. Default value is 2.	section 10.6.4 on page 173

Figure C-12 VLAN Configuration Parameters – Remote Network Mode (Continued)

C.4.5.3 Sample Configuration File

Figure C-13 displays the VLAN settings section from a sample configuration file.

```
[VLAN_CONFIG]
mode=1
vlan_id_a=1
circuits_a=UUUUU
vlan_id_b=-1
circuits_b=EEEEE
vlan_id_c=-1
circuits_c=EEEEE
vlan_id_d=-1
circuits_d=EEEEE
vlan_id_e=-1
circuits_e=EEEEE
vlan_id_f=-1
circuits_f=EEEEE
vlan_id_g=-1
circuits_g=EEEEE
vlan_id_h=-1
circuits_h=EEEEE
cos_setting=5
```

Figure C-13 Sample Configuration File – VLAN Configuration Settings

C.4.6 Audio Information

Audio information parameters configure ring tone styles. Figure C-14 lists the Audio Information configuration parameters.

Parameter	Description	Description of equivalent menu command
accept_url	Allows the phone to access a WAV file at which the INVITE message points. Valid settings are 'yes' and 'no'. Default value is 'no'.	section 10.6.6 on page 178
codec	Specifies speech encoding method. Valid settings are 0, 1, 2, and 3: 0 specifies G.711 μ-law 1 specifies G.711 A-law 2 specifies G.729A 3 specifies G.729AB Default value is 0.	section 10.6.6 on page 178
cust_ring2	Specifies the file that provides the call waiting tone when ring_tone2 is set to 4 (custom). File directory is specified by sound_url. Valid setting is string that represents the file name. Default value is NULL string.	section 10.5.5.1 on page 152
distinctive_ring	Specifies the use of different ring tones for internal and external calls. Valid parameter settings are 'yes' and 'no' as follows: yes - internal and external calls use different ring tones as specified by int_ring_tone and ext_ring_tone, respectively. no - all calls use internal ring tone setting as specified by int_ring_tone. Default value is yes.	section 10.6.6 on page 178
ext_cust_ring	Specifies the file that provides external ring tone when ext_ring_tone is set to 4 (custom). File directory is specified by sound_url. Valid setting is string that represents the name of the file. Default value is NULL string.	section 10.5.5.1 on page 152
ext_ring_tone	Specifies the ring tone for calls received from phones outside of the enterprise. Valid settings range from 0 to 4 as follows: 0 - ring pause 1 - ring ring 2 - short ring 3 - bell bell 4 - sound defined by custom file (see ext_cust_ring) Default value is 0.	section 10.5.5 on page 149
hold_tone	This tone is played once every 30 seconds when you have a call that is on hold. Valid settings range from 0 to 2 as follows: 0 - off 1 - beep 2 - bleep Default value is 0.	section 10.5.5 on page 149

Figure C-14 Audio Information Configuration Parameters

Parameter	Description	Description of equivalent menu command
int_call_answer	Controls the ZIP4x5 auto answer feature for internal calls. Valid settings are 0, 1, and 2: 0 - phone rings normally 1 - phone automatically answers after one ring and routes the caller's voice through the external speaker 2 - phone automatically answers after on ring and routes the caller's voice through the headset Default value is 0.	section 10.5.5 on page 149
int_call_disconnect	Controls the ZIP4x5 behavior after the other party disconnects a phone call. Valid settings are 0, 1, and 2: 0 - phone plays the busy tone until you hang up 1 - phone plays a busy tone twice (five seconds) before disconnecting 2 - phone disconnects without playing any tone Default value is 0.	section 10.5.5 on page 149
int_cust_ring	Specifies the file that provides internal ring tone when int_ring_tone is set to 4 (custom). File directory is specified by sound_url. Valid setting is string that represents the name of the file. Default value is NULL string.	section 10.5.5.1 on page 152
int_ring_tone	Specifies the ring tone for calls received from phones inside the enterprise. Valid settings range from 0 to 4 as follows: 0 - ring pause 1 - ring ring 2 - short ring 3 - bell bell 4 - sound defined by custom file (see int_cust_ring) Default value is 0.	section 10.5.5 on page 149

Figure C-14 Audio Information Configuration Parameters (Continued)

Parameter	Description	Description of equivalent menu command
key_click	Specifies the tone that the phone emits when you press a button or a non numeric key. Valid settings range from 0 to 3 as follows: 0 - off 1 - click 2 - beep 3 - bleep Default value is 0.	section 10.5.5 on page 149
ring_tone2	Specifies the call waiting tone that is played when you are talking on the phone and the phone receives another call. Valid settings range from 0 to 5 as follows: 0 - short high beep 1 - long high beep 2 - short low beep 3 - long low beep 4 - sound defined by custom file (see cust_ring2) 5 - silent Default value is 0.	section 10.5.5 on page 149
sound_url	Specifies the http directory location for files that define custom ring tones. Valid setting is http://<name of directory> Default value is http://www.zultys.com/phone_sounds/	section 10.6.6 on page 178

Figure C-14 Audio Information Configuration Parameters (Continued)

All audio information parameters are optional. Figure C-15 displays the Audio Information settings section from a sample configuration file.

```
[AUDIO_INFO]
ext_ring_tone=0
ext_cust_ring=
int_ring_tone=0
int_cust_ring=
ring_tone2=0
cust_ring2=
key_click=0
codec=0
distinctive_ring=yes
sound_url=
```

Figure C-15 Sample Configuration File – Audio Information Settings

C.4.7 DHCP Server Configuration

Firewall configuration parameters define settings required by the ZIP4x5 to act as a DHCP server.

Parameter	Description	Description of equivalent menu command
mode	Enables the ZIP4x5 to act as a DHCP server. Valid settings are 0 and 1 as follows: 0 - server functions are off. 1 - server functions are on.	
start_ip	Specifies the starting IP address for DHCP scope.	
end_ip	Specifies the ending IP address for DHCP scope.	
o_mask	Specifies the subnet mask for the DHCP scope.	
lease_secs	Specifies the lease duration, in seconds.	
o_router	Specifies the IP address of the default gateway.	
o_dns1	Specifies the IP address of the primary DNS server.	
o_dns2	Specifies the IP address of the secondary DNS server.	
o_dns3	Specifies the IP address of the tertiary DNS server.	
o_domain	Specifies the default domain name	
o_ntp1	Specifies the IP address of the primary NTP server.	
o_ntp2	Specifies the IP address of the secondary NTP server.	
o_ntp3	Specifies the IP address of the tertiary NTP server.	
o_tftp	Specifies the IP address of the TFTP server.	

Figure C-16 Firewall Configuration Parameters

All audio information parameters are optional. Figure C-17 displays the DHCP Server settings section from a sample configuration file.

```
[DHCP_SRV]
mode=1
start_ip=172.16.17.0
end_ip=172.16.31.254
o_mask=255.255.240.0
lease_secs=300
o_router=172.16.16.66
o_dns1=
o_dns2=
o_dns3=
o_domain=
o_ntp1=172.16.16.66
o_ntp1=
o_ntp2=
o_ntp3=
```

Figure C-17 Sample Configuration File – DHCP Server

C.4.8 Bluetooth Configuration

Firewall configuration parameters define settings required by the ZIP4x5 to use Bluetooth accessories.

Parameter	Description	Description of equivalent menu command
mode	Enables the ZIP4x5 to use Bluetooth. Valid settings are 0 and 1, as follows: 0 - Bluetooth is disabled 1 - Bluetooth is enabled Default value is 0.	

Figure C-18 Firewall Configuration Parameters

Bluetooth parameters are optional. Figure C-19 displays the Bluetooth settings section from a sample configuration file.

```
[BT]
mode=1
```

Figure C-19 Sample Configuration File – Bluetooth

C.4.9 General Information

General information parameters configure miscellaneous phone settings. All general information parameters are optional.

Figure C-20 lists the General Information configuration parameters.

Parameter	Description	Description of equivalent menu command
clear_settings	Determines the frequency that settings are cleared when the phone is powered on. Valid settings are 0, 1, and 2: 0 - phone never clears the user settings. Each time the phone powers on, it retains the user settings previously entered. 1 - phone clears the user settings on the next power on. Configuration file provides user settings the next time the phone is powered on, then sets this parameter to 0. 2- phone clears the user settings each time it powers on. Configuration file provides user settings after each clearing. Default value is 2.	section 10.5.3 on page 148
country	Specifies the call progress tones used by the phone, as defined by country variation. Valid settings include Afghanistan, Argentina, Australia, Austria, Bahrain, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordan, Korea, Kuwait, Lebanon, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Oman, Philippines, Qatar, Romania, Russia, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, Syria, Thailand, UAE, UK, USA, and Yemen. Default value is USA.	section 5.4.2 on page 41
date_fmt	Specifies the format for the LCD date display. Valid entry is a text string that uses the date format tags listed below; section C.4.9.2 andsection C.4.9.3 lists the valid format tag combinations. Format tags include: %a - abbreviated weekday name %b - abbreviated month name %c - data and time format defined for country parameter setting %d - day of month as decimal number (01-31), always expressed with two digits %-d - day of month as decimal number (01-31), expressed with one digit when d=0 through 9 %m - month as decimal number (01-12) %y - year without century, as decimal number (00-99) %Y - year with century, as decimal number Example: %a %d %b %Y yields the following: **Mon 05 May 2003** Default is %a %d %b %y (sample default: Sun 04 May 03).	

Figure C-20 General Information Parameters

Parameter	Description	Description of equivalent menu command
date_time_order	Specifies the display order of the date and time on the LCD. Valid settings are 0 and 1: 0 - time is displayed first 1 - date is displayed first Default value is 1.	section 10.5.10 on page 160
delmtr	Specifies the calculator settings for the decimal point and thousands delimiter. Valid settings is a two character string: the first character specifies the decimal point (period or comma) and the second character specifies the thousand delimiter (period, comma, space, or no separation). Section C.4.9.3 lists the valid format tag combinations. Default value is **._** (period, underscore); Example: 2241.57	section 10.5.10 on page 160
display_events	Specifies time in seconds that some error messages and information screens are displayed on the LCD. Valid settings range from 2 to 10. Default value is 2.	
greeting_message	Specifies the message displayed on the top row of the LCD. Message contains up to twenty alphanumeric characters. Default message is ZIP4x5 SIP Phone.	section 10.5.2 on page 147
password	Specifies password required to change the protected settings. Valid passwords contain four to fifteen numeric (0-9) digits. Default password is 985897.	section 10.6.2 on page 166
software_version	Specifies the software version that the phone must use. If the phone is running a different version, it will attempt to load the correct version from the TFTP server.	section 5.4.2 on page 41
time_fmt	Specifies the format for the LCD time display. Valid entry is a text string that uses the time format tags listed below; section C.4.9.1 lists the valid format tag combinations. Format tags include: %H - hour in 24-hour format (00-23) %l - hour in 12-hour format (01-12) %M - minute as decimal number (00-59) %S - second as decimal number (00-59) %f - am/pm indicator for 12-hour clock Enter other characters (such as:) Example: %I:%M%f yields the following: **5:45p** Default: %H:%M (sample default: 15:45).	
timezone	Specifies the timezone location of the phone. Parameter value is the offset from GMT in minutes; valid settings range from -720 to +720. Default value is -480.	

Figure C-20 General Information Parameters (Continued)

C.4.9.1 Programming Restrictions: Time Format

Figure C-21 lists the four time format (time_fmt) tag combinations supported by the ZIP4x5. The phone will not properly update the time and date if an unsupported combination is used:

Desired Time Format	Format String
24 hour format: display hours and minutes	%H:%M
24 hour format: display hours, minutes, and seconds	%H:%M:%S
12 hour format: display hours and minutes	%l:%M%f
12 hour format: display hours, minutes, and seconds	%l:%M:%S%f

Figure C-21 Time Format Strings Supported by the ZIP4x5

C.4.9.2 Programming Restrictions: Date Format

The choice of valid date format (date_fmt) tag combinations depend upon the selected time format string, as described in section C.4.9.1. Figure C-22 lists the valid date formats when you select a time format that does not display seconds. Figure C-23 displays the valid date formats when you select a time format that displays seconds.

Desired Date Format	Format String
Sun 06 Oct 03	%a %d %b %y
10/6/2003	%m/%-d/%Y
10-6-2003	%m-%-d-%Y
10/6/03 Sun	%m/%-d/%Y %a
10-6-03 Sun	%m-%-d-%Y %a
Sun Oct 06 03	%a %b %d %y
03 Oct 06 Sun	%y %d %b %a
03/10/06 Sun	%y/%m/%d %a
03-10-06 Sun	%y-%m-%d %a
2003/10/06	%Y/%m/%d
2003-10-06	%Y-%m-%d

Figure C-22 Date Format Strings Supported when Time Format Does Not Display Seconds

Desired Date Format	Format String
10/6 Sun	%m/%-d %a
10-6 Sun	%m-%-d %a
10/6/03	%m/%-d/%y
10-6-03	%m-%-d-%y
10/06 Sun	%m/%d %a
10-06 Sun	%m-%d %a
02/10/06	%y/%m/%d
02-10-06	%y-%m-%d

Figure C-23 Date Format Strings Supported when Time Format Displays Seconds

Desired Date Format	Format String
Sun 06 Oct (supported only for 24 hour time format)	%a %d %b
Sun Oct 06 (supported only for 24 hour time format)	%a %b %d
Oct 06 Sun (supported only for 24 hour time format)	%b %d %a

Figure C-23 Date Format Strings Supported when Time Format Displays Seconds

C.4.9.3 Programming Restrictions: Delimiter Format

The delimiters format configure the appearance of numbers as used in the calculator. Each delimiter string comprises two characters. The first character specifies the decimal point – either a period (.) or a comma (,). The second character specifies the thousands delimiter; selection option include a comma (,), period (.), a space ( ), or no separation between the characters, which is denoted by an underscore (_).

Figure C-24 lists the six delimeter format (delmtr) tag combinations supported by the ZIP 4x5. The calculator may not function properly if an unsupported combination is used:

Desired Number Format	Delimiter String
1,234.99	"**.,**" (period, comma)
1.234,99	"**,.**" (comma, period)
1 234.99	"**.** " (period, space)
1 234,99	"**,** " (comma, space)
1234.99	"**._**" (period, underscore)
1234,99	"**,_**" (comma, underscore)

Figure C-24 Time Format Strings Supported by the ZIP 4x5

C.4.9.4 Sample Configuration File

Figure C-25 displays the Audio Information settings section from a sample configuration file.

```
[GENERAL_INFO]
software_version=1.0.0
;The message displayed on the LCD in idle mode
greeting_message=ZIP 4x5 SIP Phone
password=985897
time_fmt=%H:%M
date_fmt=%a %d %b %y
date_time_order=0
;This is the offset from GMT, in minutes
timezone=-480
country=USA
language=ENGLISH
delmtr=._
clear_settings=2
```

Figure C-25 Sample Configuration File – General Information Settings

Appendix D

Web Interface Configuration Utility

D.1 Introduction

The Web Interface Configuration Utility provides a method to configure your ZIP4x5 phone by accessing your web browser. This configuration method is convenient for ZIP4x5 users that do not have access to configuration files through a TFTP server. All web interface parameters have equivalent commands that are accessible either through the ZIP4x5 menu (see Chapter 10, starting on page 133) or through configuration file commands (see appendix C, starting on page 197). This appendix describes each Web Interface Configuration Utility panel.

D.1.1 Accessing the Download and Configuration Utility

The utility is accessible through a web browser that accesses the network where your ZIP4x5 resides. Enter the IP address of the ZIP4x5 in the address entry box of your web browser and press the enter key The Home panel, shown in figure D-1, will appear in your browser.

D.1.2 Interface Structure

Each panel is accessed by through a menu structure that begins on the Home panel. Each first level menu is listed on the left side of the Home menu; click on a menu to display the desired panel. Successive panels are accessed by selecting options on each configuration panel.

Each web interface panel has three functional regions. The Menu, located on the left side of the panel, is light green and lists the web interface panels that are accessible from the current panel. The Address bar, located below the Zultys banner, lists the name of the current panel and the web interface path required to display this panel. The data entry section provides information about your ZIP4x5 and data entry boxes for setting parameter values.

All panels with editable parameters provide an update button which must be pressed to download changes to the phone. After changes are saved to the phone's memory, they take effect only after power cycling the phone or performing a reset operation.

D.2 Home panel

The Home panel, shown in figure D-1, provides access to all web interface panels. You can return to the home panel from any other web interface panel by clicking on Home in the address bar.

To access this panel, enter the IP address of your ZIP4x5 in the address entry box of your web browser. To return to the Home panel, select Home in the main menu.

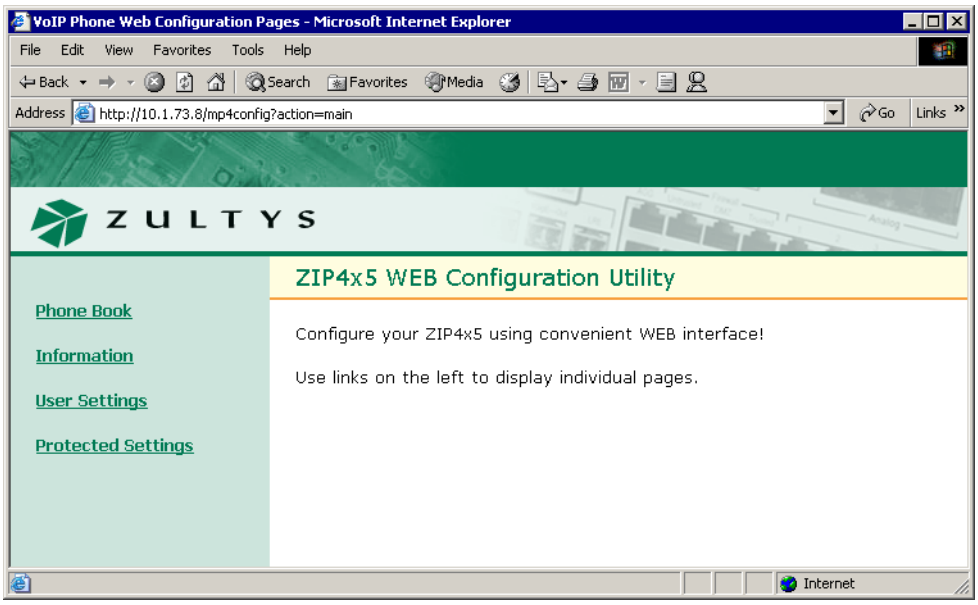

Figure D-1 Home panel

D.3 Phone Book Menu

You can store up to 100 contacts in the ZIP4x5 phone book.

D.3.1 Add Entry panel

The Add Entry panel, shown in figure D-2, allows you to add a contact into an empty phone book memory location. To access the Add Entry panel, select Phone Book | Add Entry from the menu.

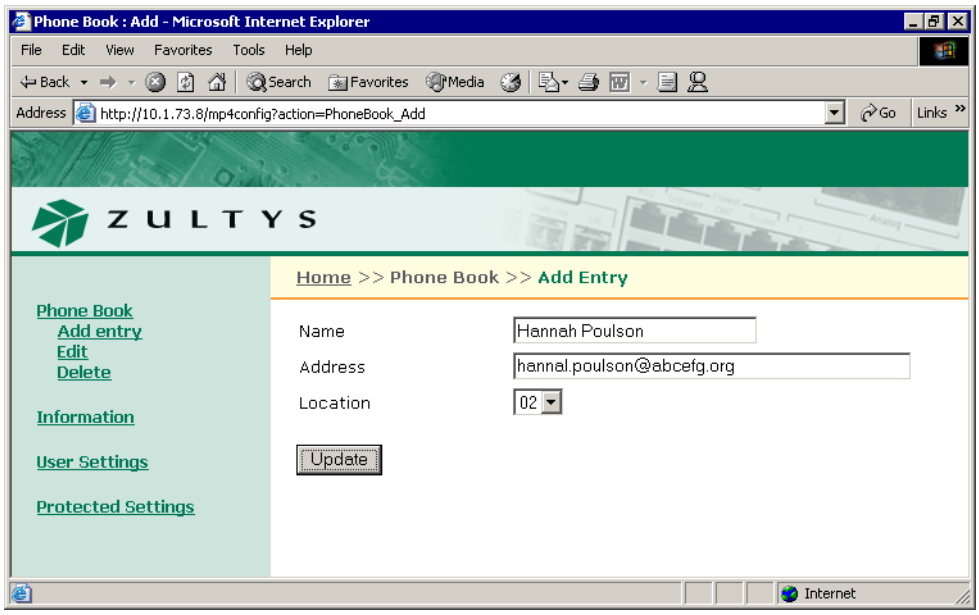

Figure D-2 Phone Book – Add Entry Panel

To add an contact into your phone book,

1. Enter the contact's name in the Name data entry box.
2. Enter the contact's SIP address or phone number in the address data entry box. The ZIP4x5 ignores punctuation characters when dialling phone numbers.
3. Press the **Update** button.

D.3.2 Edit panel

The Edit panel, shown in figure D-3, displays the content of your phone book and allows you to edit any filled memory location. To access the Edit panel, select Phone Book | Edit from the menu.

After editing the contents of the desired phone book locations, press the Update button to save your changes.

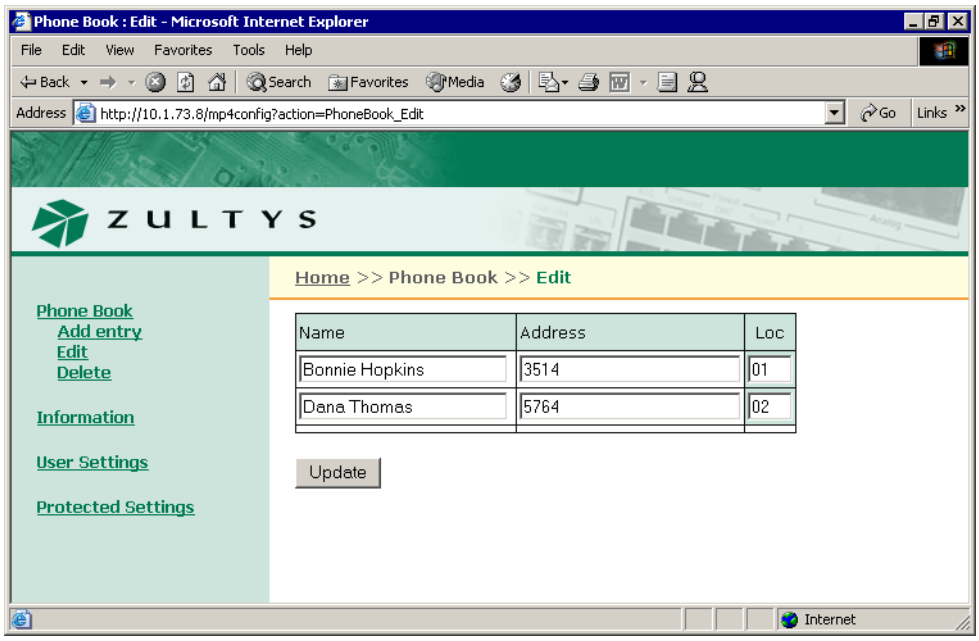

Figure D-3 Phone Book – Edit panel

D.3.3 Delete panel

The Delete panel, as shown in figure D-4, displays the content of your phone book. Place a check mark to the left of any phone book entry that you wish to delete, then press the **Update** button. To access the Delete panel, select Phone Book | Delete from the interface menu.

D.4 Information Menu

The Information Menu allows you to view information about the phone. You cannot change any Information parameter settings.

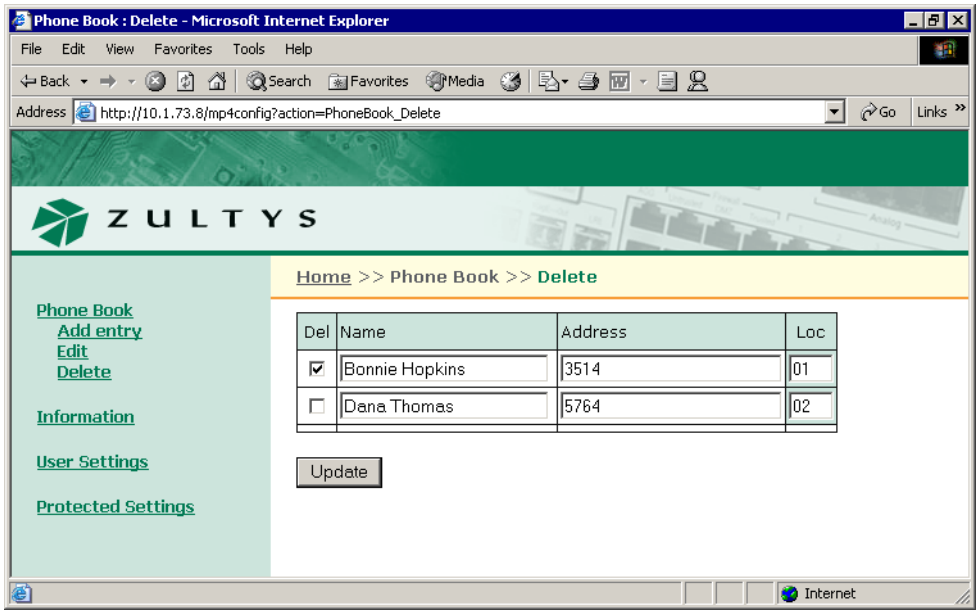

Figure D-4 Phone Book – Delete panel

D.4.1 Times Panel

This panel, as shown in figure D-5, indicates when the phone was initially powered on and the total activity time.

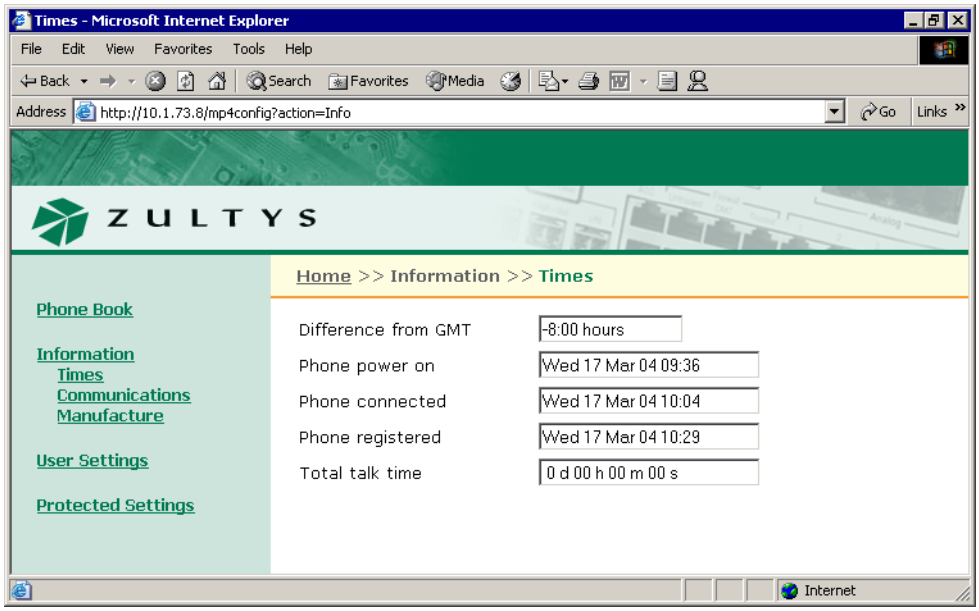

Figure D-5 Information – Times panel

Difference from GMT. This is the value that was either set through the menu (section 10.4.1 on page 142) or was obtained from the configuration file.

Phone Power On. This is when the phone was turned on.

Phone Connected. This is when the phone was connected to the network.

Phone Registered. This is when the phone last registered with the SIP server. The phone registers periodically, typically each hour.

Total Talk Time. This is the summation of time spent on calls that you originated and calls that you received. The time is reset each time the you power cycle the phone.

D.4.2 Communications Panel

The Communications panel, shown in figure D-6, displays circuit, power, and configuration file status, and the TFTP address.

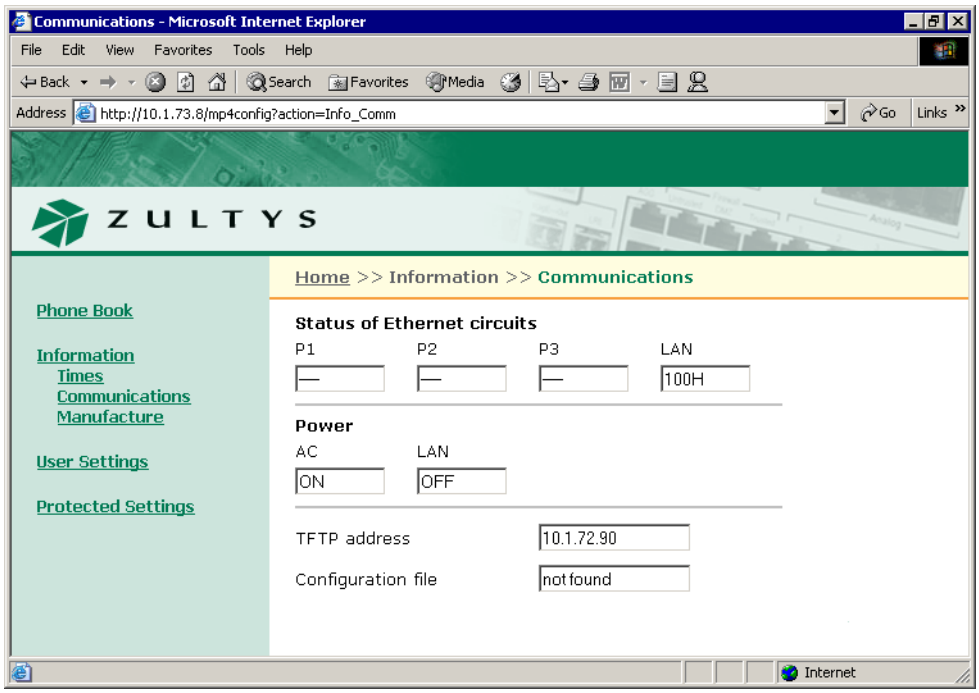

Figure D-6 Information – Communications panel

Status of Ethernet Circuits. This data is updated in real time; the display may change as the phone receives data packets.

Power. The phone updates its power status in real time, as received from the ac adapter and the LAN. If available, you should use the ac adapter regardless of whether your LAN can provide power to the phone.

TFTP Address. This parameter displays the TFTP address., as obtained from the DHCP server configured manually.

Configuration File. This parameter displays the status of the configuration file on the TFTP server.

D.4.3 Manufacture Panel

The manufacture panel, as shown in figure D-7, displays information concerning the manufacture of your ZIP4x5 phone.

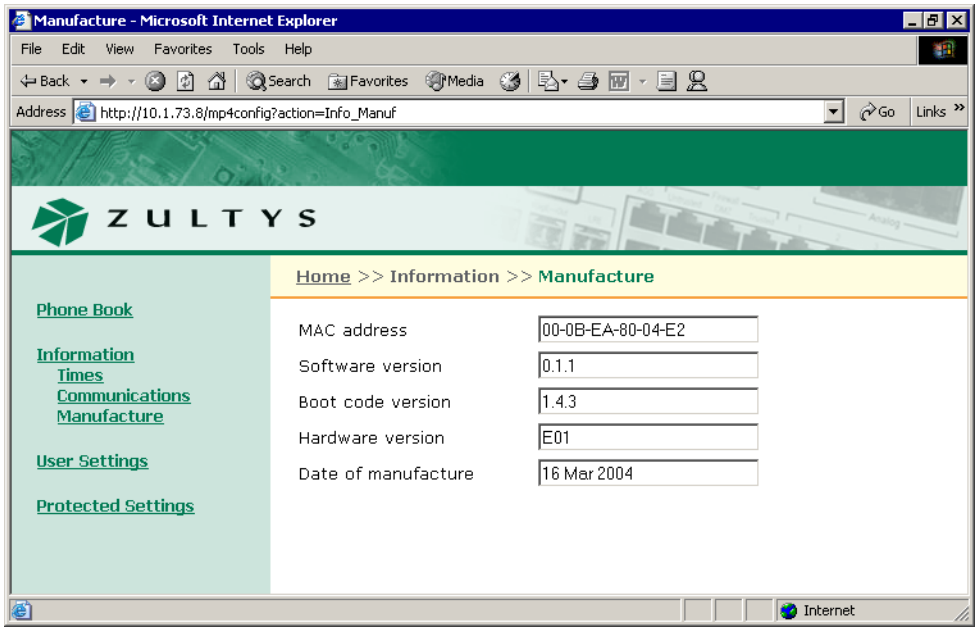

Figure D-7 Information – Manufacture panel

MAC Address. This is hard coded into the phone during manufacture and cannot be modified.

Software version. The software version installed on the phone. Later versions may include more features or better support for existing features.

Boot code version. The boot code version installed on the phone. The boot code resides permanently on the phone.

Hardware version. The hardware version of the phone.

Date of manufacture. The date the phone was manufactured.

D.4.4 Logs Panel

The Logs Panel provides access to three Log screens: Current RTP Status, RTP History, and VPN Log.

D.4.4.1 Current RTP Status

The Current RTP Status Log, as shown in figure D-7, displays the RTP settings for the sessions currently routed through the ZIP4x5.

D.4.4.2 RTP History Log

The RTP History Log, as shown in figure D-8, displays the RTP settings of the most recent 32 sessions that were routed through the ZIP4x5.

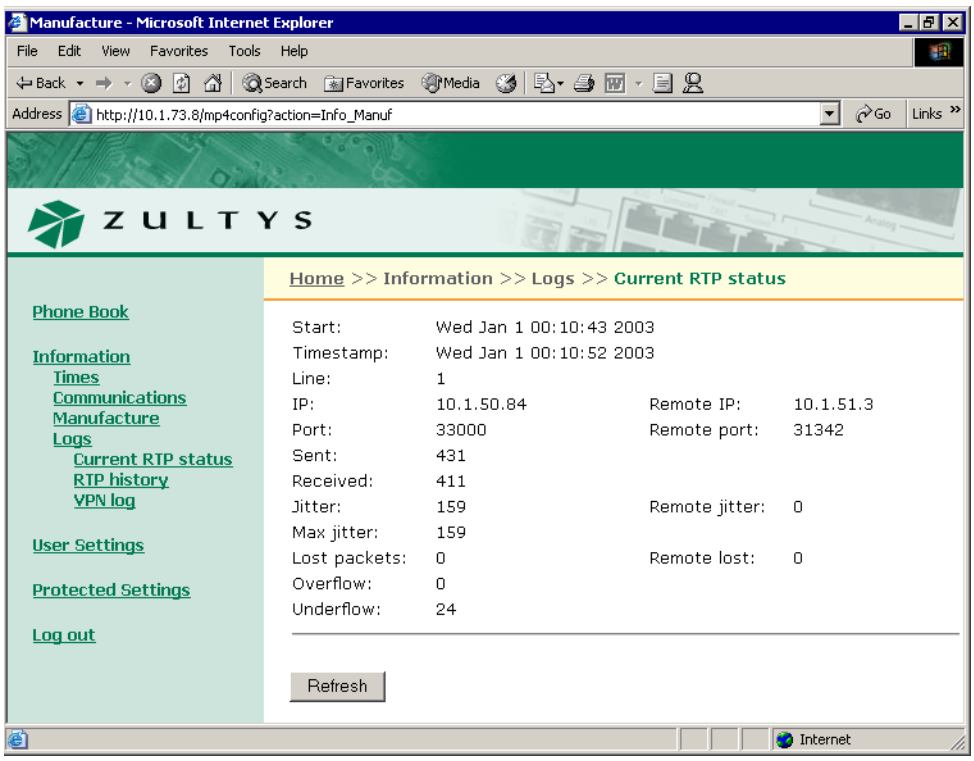

Figure D-8 Current RTP Status Log

D.4.4.3 VPN Log

The VPN Log, as shown in figure D-9, displays the instructions that were executed to establish and maintain your VPN connection.

D.5 User Settings Menu

The Users Settings Menu allows you to tailor the phone to suit your personal preferences.

D.5.1 General panel

The general panel, as shown in figure D-11, provides access to several User Setting parameters. After you adjust the settings, press the Update button to enable your changes.

LCD Contrast panel. The LCD Contrast parameter alters the contrast of the LCD to improve readability. The combo box contains the current LCD contrast value. To change the LCD contrast, select the desired value in the combo box.

Greeting Message. The Greeting Message parameter determines the message on the top row of the LCD when the phone is idle. The combo box contains the current greeting message. To change the greeting message, type the desired message in the text box.

Display Events. The Display Events parameter determines the period that the phone displays status messages. The combo box contains the current value.

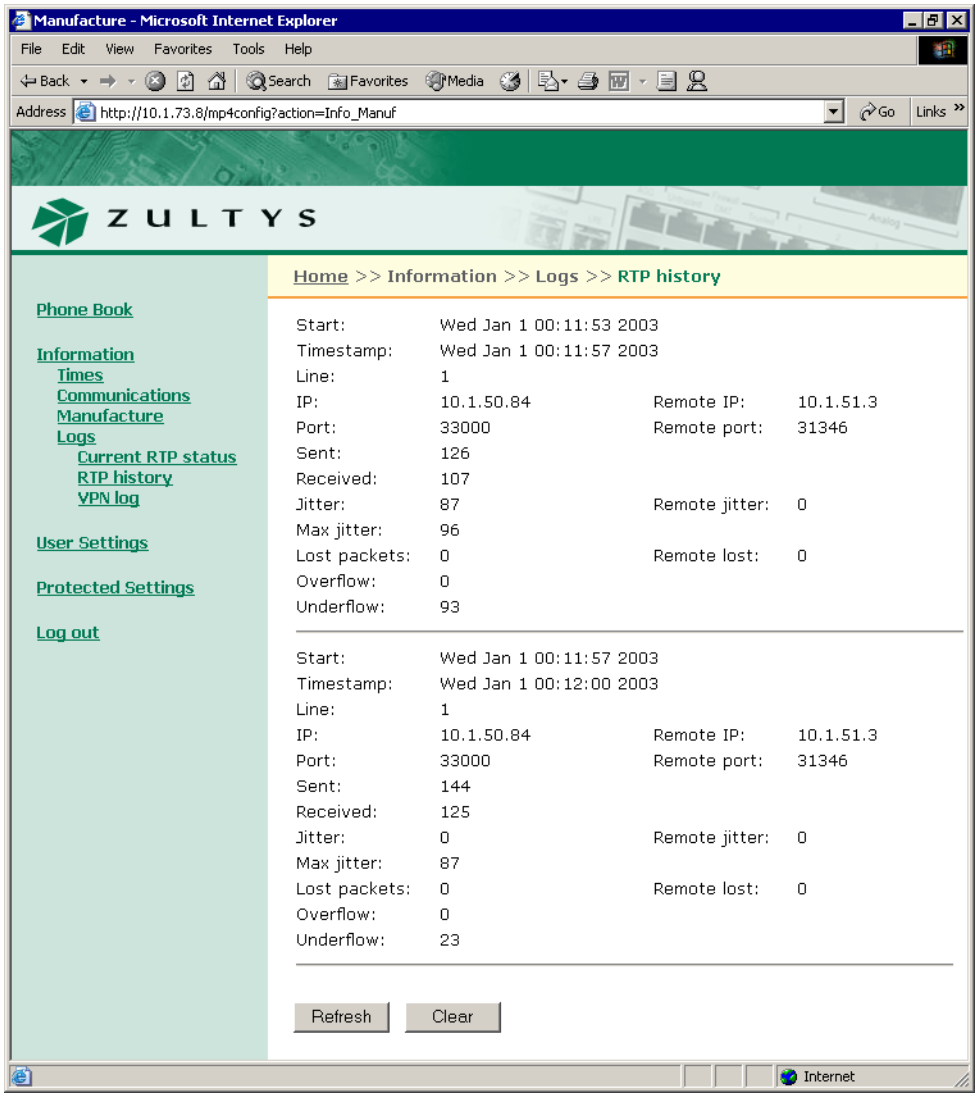

Figure D-9 RTP History Log

Clear User Settings. The Clear User Settings panel determines the settings that the phone uses each time it powers up. The combo box contains the current value.

You should normally set this parameter to **never**; each time the phone powers on, it retains its user settings. If you select **on next power on**, the phone takes its user settings from the configuration file saved on the TFTP site; once the phone obtains these settings, it sets this parameter to never and will not take the settings from the configuration file again. If you select **on each power on**, the phone takes its user settings from the configuration file saved on the TFTP site every time that the phone powers up.

Enable Outgoing Calls on analog line. This parameter sets call appearance 4 to analog mode for making voice calls. To make this call appearance the default when you make a call, set the Hook Control to ***Analog is Default***. To make the lowest available digital call appearance the default when you make a call, set the Hook Control to ***Digital is Default***.

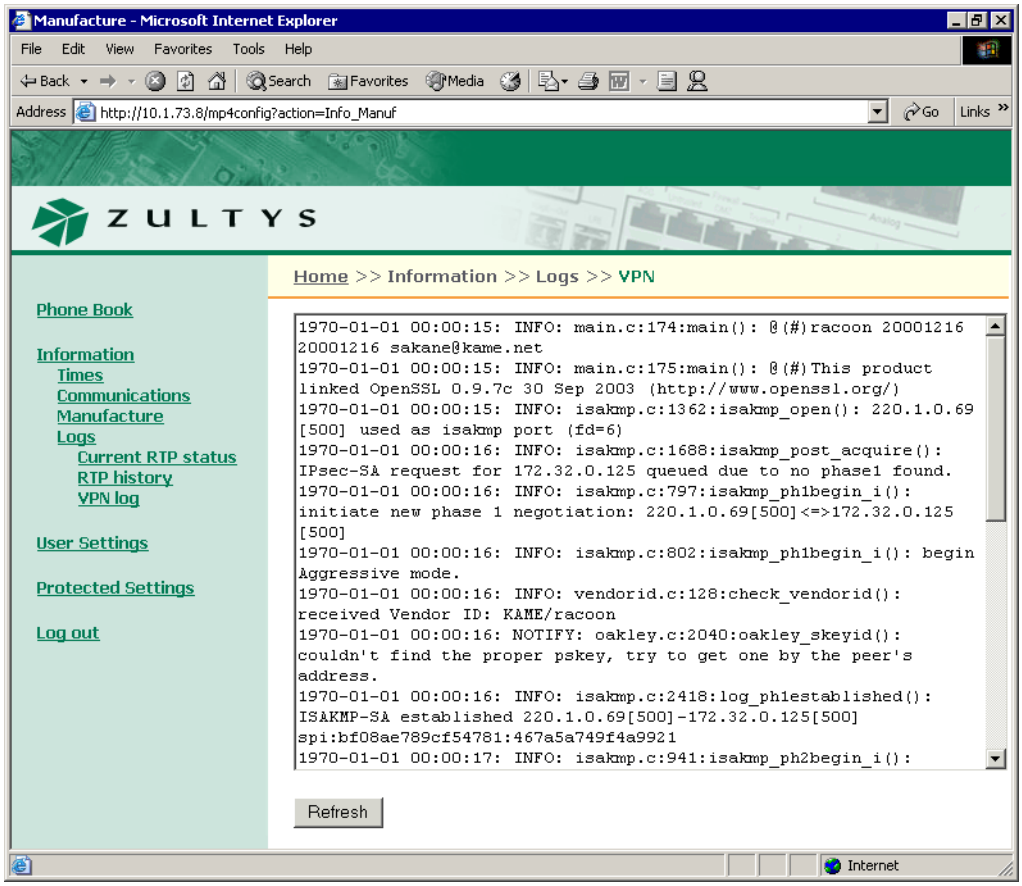

Figure D-10 VPN Log

Enable Bluetooth. Set this parameter to enable your phone to use Bluetooth compatible wireless headsets.

D.5.2 Date and Time

The Date and Time panel, as shown in figure D-12, allows you to adjust the current date and time on the ZIP4x5 and select the offset from GMT. When you access this page, the combo box contains the value of the GMT offset parameter setting. To reset the phone to the GMT offset, select "Yes" and press the Update button.

D.5.3 Audio

This panel, as shown in figure D-13, allows you to configure the ring tones and the sound, if any, that is played when you press a button or key. The Audio panel displays the configuration options for the following parameters:

External ring tone. This parameter determines the tone that the phone plays when you receive a call from outside of your enterprise. When you select custom, you must select the WAV file that provides the custom sound in the adjacent data entry box.

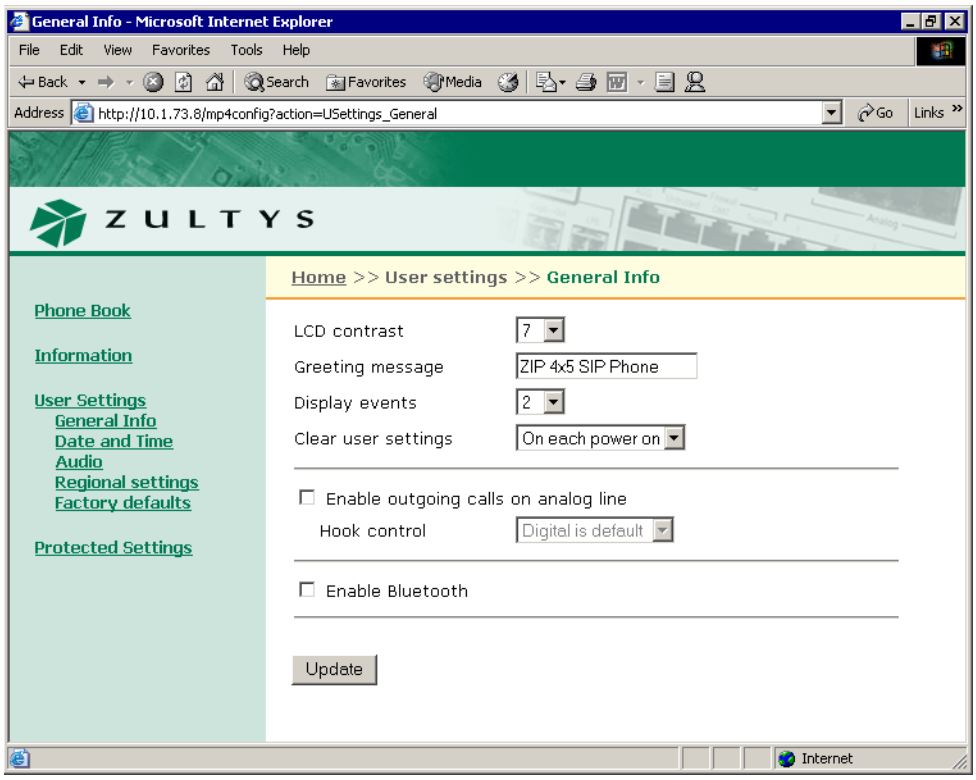

Figure D-11 User Settings – General Info panel

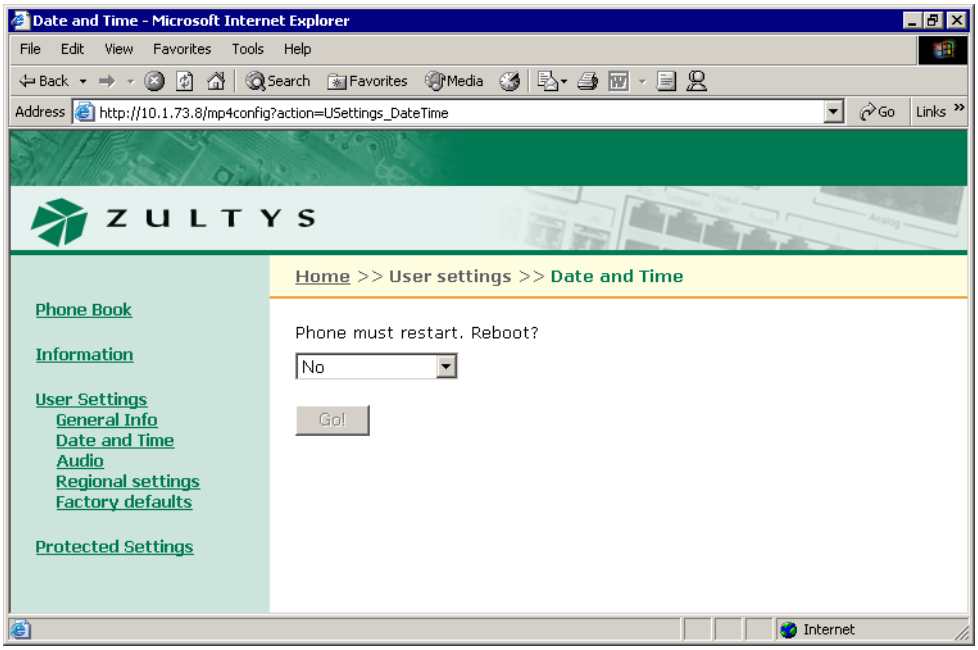

Figure D-12 User Settings – Date and Time panel

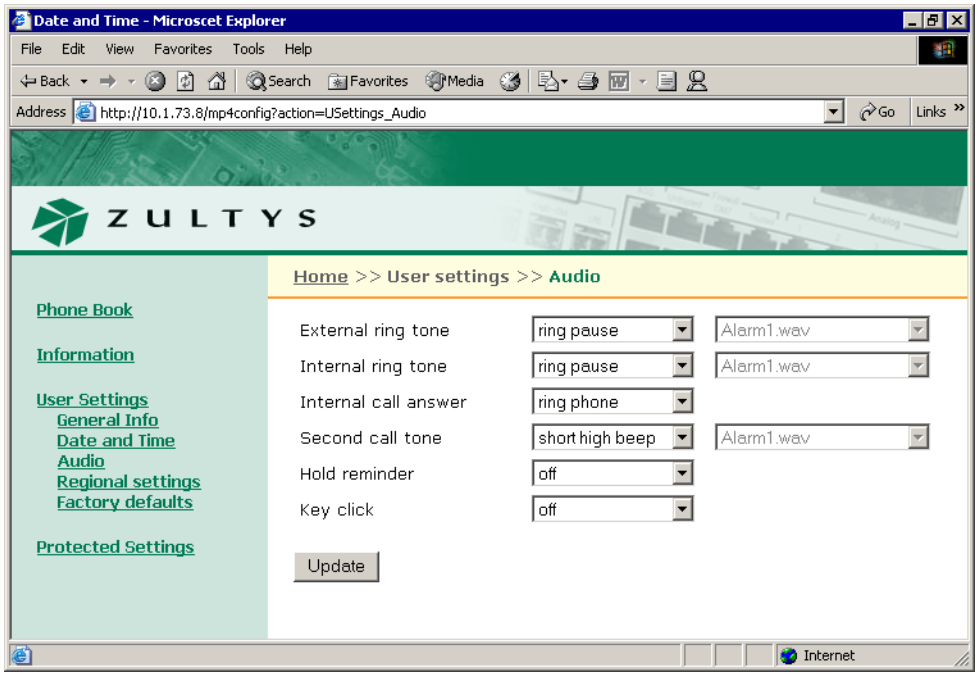

Figure D-13 User Settings – Audio panel

Internal ring tone. This parameter determines the tone that the phone plays when you receive a call from a source internal to your enterprise. When you select custom, you must select the WAV file that provides the custom sound in the adjacent data entry box.

Internal call answer. This parameter determines the phone's behavior when you receive a call from a source internal to your enterprise. You can program the phone to ring normally, automatically answer through the external speaker after one ring, or automatically answer through the headset after one ring.

Second call tone. This parameter determines the sound that the phone plays when you receive a call while you are talking on the phone. When you select custom, you must select the WAV file that provides the custom sound in the adjacent data entry box.

Hold reminder tone. This parameter determines the sound that your phone plays periodically when you have a call on hold.

Key click. This parameter determines the sound that your phone plays when you press a button when the phone is off hook.

D.5.4 Regional Settings

The Regional Settings panel, as shown in figure D-14, sets language, time format, and numerical format parameters for the phone. The Regional Settings panel displays the configuration options for the following parameters:

Country. This selection determines the tones that the phone generates for call progress tones (dial tone, ringback tone, busy tone, and network busy tone (congestion). Select the desired country in the combo box.

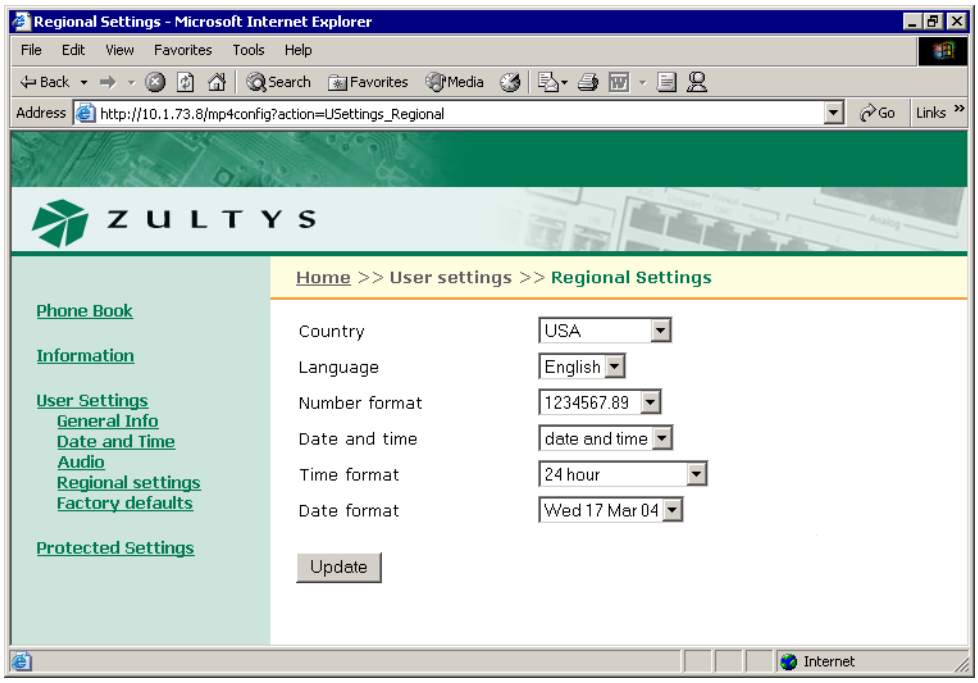

Figure D-14 User Settings – Regional Settings panel

Language. This selection determines the language that the phone uses to display information on the LCD. Select the desired language in the combo box.

Number format. This selection determines the format that the ZIP4x5 uses to display numbers in calculator mode.

Date and time. This selection determines the order that the ZIP4x5 displays the time and the date. Select the desired format in the combo box.

Time format. This selection determines the format that the ZIP4x5 displays the time of day. Select the desired format in the combo box from one of the following options:

Date format. This selection determines the format that the ZIP4x5 displays the current date. The format options depend upon the ***Date and time*** format and the ***Time format*** selections.

D.5.5 Factory Default

The Factory Default panel, as shown in figure D-15, allows you to restore the factory defaults for all configuration settings.

D.6 Protected Settings

Protected Settings panels allow you to alter the communication parameters of the phone. You may need to configure these parameters if your system does not support automatic provisioning.

Each Protected Settings parameter is protected by a password. If you do not login with the correct password, all Protected Settings pages will be read only and the Update button will be disabled.

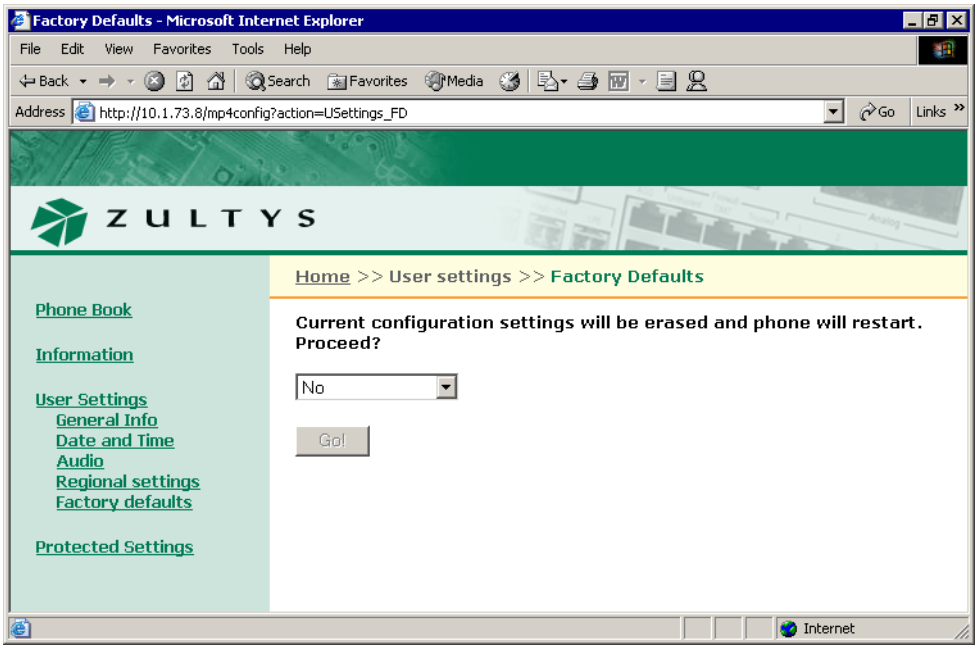

Figure D-15 Protected Settings – Factory Default panel

D.6.1 Password

The Password panel, as shown in figure D-16, accepts the password that allows you to edit the protected settings panel. When the phone is shipped from the factory, its default password is 985897.

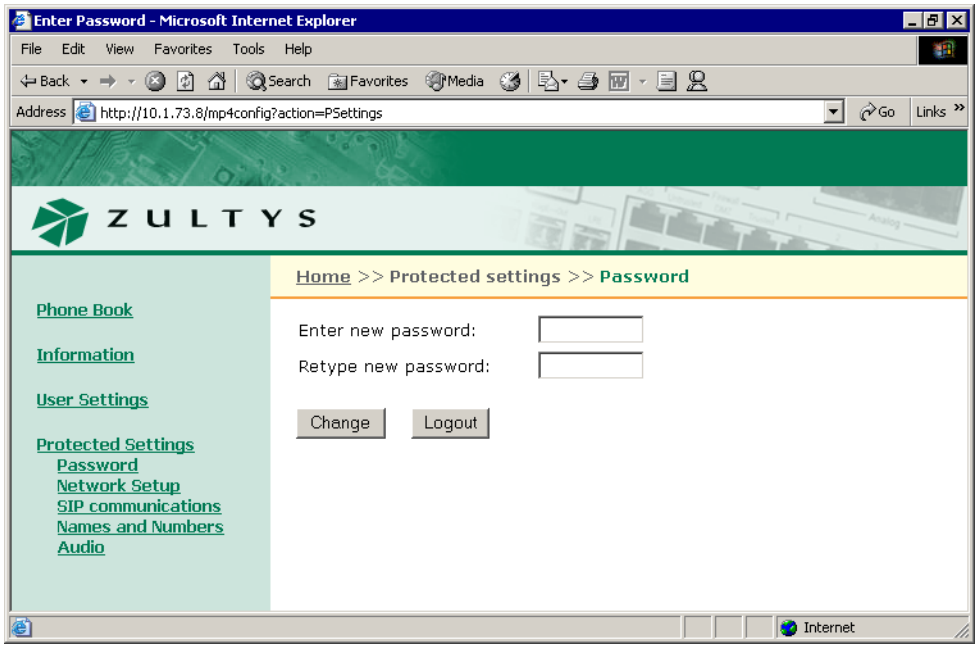

Figure D-16 Protected Settings – Password panel

D.6.2 Network Setup – Normal Network Mode

The Network Setup panel determines the network mode of the phone and provides parameter settings that incorporate the ZIP4x5 into your network. If ***Enable Firewall, NAT, and VPN*** is not selected, as shown in figure D-17, the ZIP4x5 is in Normal Network mode (as described in section 8.2.1.1 on page 75) and the following Network Setup panels require configuring: IP Communications and VLAN.

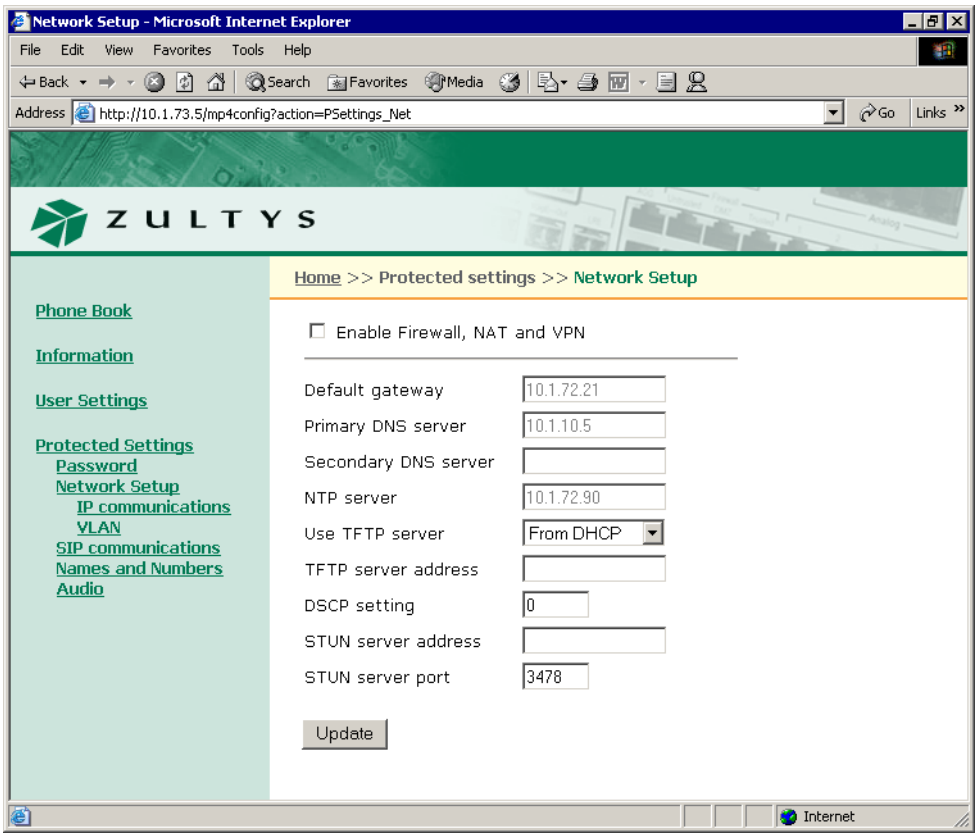

Figure D-17 Network Setup panel – Normal Network Mode

Default Gateway. This parameter is the IP address of the default gateway. The ZIP4x5 uses the address entered in this box if DHCP mode is not enabled (IP communications panel) or DHCP does not return a value for the default gateway.

Primary DNS Server. This parameter is IP address of primary DNS Server. The ZIP4x5 uses the address entered in this box if DHCP mode is not enabled (IP communications panel) or DHCP does not return a value for the primary DNS server.

Secondary DNS Server. This parameter is IP address of secondary DNS Server. The ZIP4x5 uses the address entered in this box if DHCP mode is not enabled (IP communications panel) or DHCP does not return a value for the secondary DNS server.

NTP Server. This parameter is IP address of secondary DNS Server. The ZIP4x5 uses the address entered in this box if DHCP mode is not enabled (IP communications panel) or DHCP does not return a value for the secondary DNS server.

Use TFTP Server. This parameter determines the source of the TFTP server address. When set to From DHCP, the phone obtains the TFTP server address from the DHCP server. When set to Fixed address, the phone uses the TFTP address that you enter in this panel.

TFTP Server Address. When *Use TFTP Server* is set to *Fixed Address*, this parameter provides the TFTP Server address to the ZIP4x5.

DSCP Setting. This parameter configures DiffServ (layer 3 QoS) setting. All voice packets (RTP) leaving the phone will have the ToS byte in the IP header set to this value. Valid settings range from 0 to 63.

STUN Server Setting. This parameter is IP address of the STUN server. Valid setting is 32 bit IP address in dotted decimal notation. Section C.4.1.1 on page 199 describes the STUN protocol.

STUN Server Port. This parameter is the port number of the STUN server. Valid settings range from 1025 to 65535.

D.6.2.1 IP Communications

The IP Communications panel, as shown in figure D-18, displays the parameters needed by the phone to communicate with the network. The IP Communications panel displays the configuration options for the following parameters:

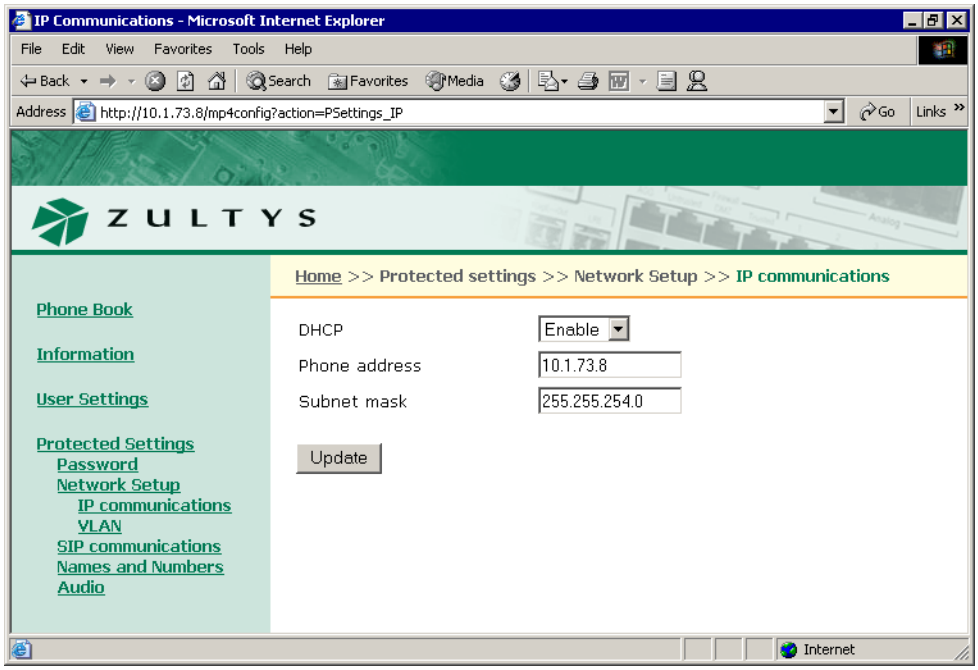

Figure D-18 Protected Settings – IP Communications panel

DHCP. This option allows you to enable or disable DHCP. When DHCP is enabled, the DHCP server should provide the following information:

— IP address for the phone

— domain name

— subnet mask

— address of the default gateway

— IP address of the DNS server

— IP address of the secondary DNS server

— address of the NTP server

— address of the TFTP server

When you disable DHCP, you must enter these parameters manually.

Phone Address. This is the IP address that the phone has obtained dynamically from the DHCP server or a static address that you manually configure.

Subnet Mask. This parameter identifies the subnet mask for the phone. If DHCP is enabled, the phone obtains this parameter from the DHCP server.

D.6.2.2 VLAN

You configure VLANs on the switch that is built into the phone to match your network, optimize performance, and obtain the best speech quality. You must enter the password prior to modifying the VLAN configuration.

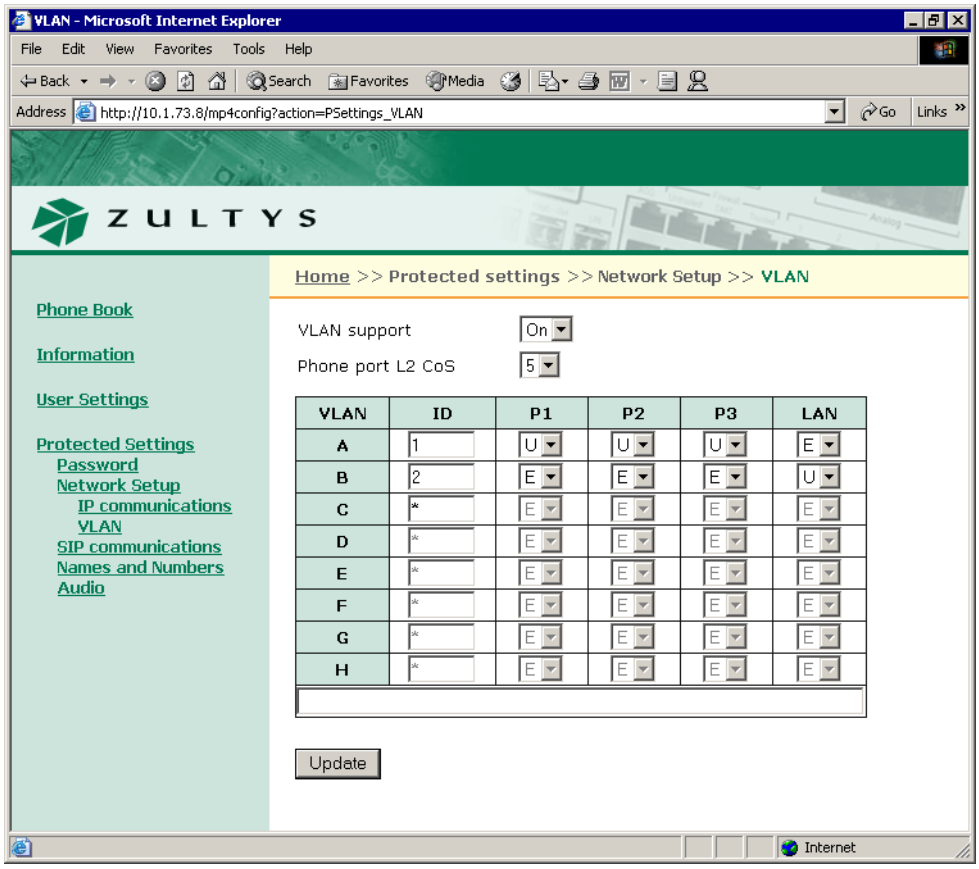

Figure D-19 Protected Settings – VLAN panel

In Normal Network mode, you can configure the ZIP4x5 with up to eight VLANs, referred to as A, B, C, D, E, F, G, and H. Each Ethernet circuit can be on a different VLAN. The following restrictions must be considered when configuring the VLANs through the Web Interface:

- The Phone Circuit is always Tagged (T) on VLAN A.
- Each VLAN must have a different ID number.
- The Phone circuit is always Tagged (T) on VLAN A and is always be excluded (E) from all other VLANs.
- Each circuit can be an untagged member (U) of no more than one VLAN.
- If you configure one or more ports as a tagged (T) member of a VLAN, you must configure the CoS setting (cos_setting). This setting is only used by the phone circuit.

The ***Phone Port L2 CoS*** parameter configures the Class of Service (CoS) at layer 2 for the phone port. Values range from 0 to 7.

D.6.3 Network Setup – Remote Network Mode

The Network Setup panel determines the network mode of the phone and provides parameter settings that incorporate the ZIP4x5 into your network. If ***Enable Firewall, NAT, and VPN*** is selected, as shown in figure D-20, the ZIP4x5 is in Remote Network mode (as described in section 8.2.1.2 on page 75) and the following Network Setup panels require configuring: WAN, LAN, DHCP Server, Static Routes, Firewall, VPN, and VLAN.

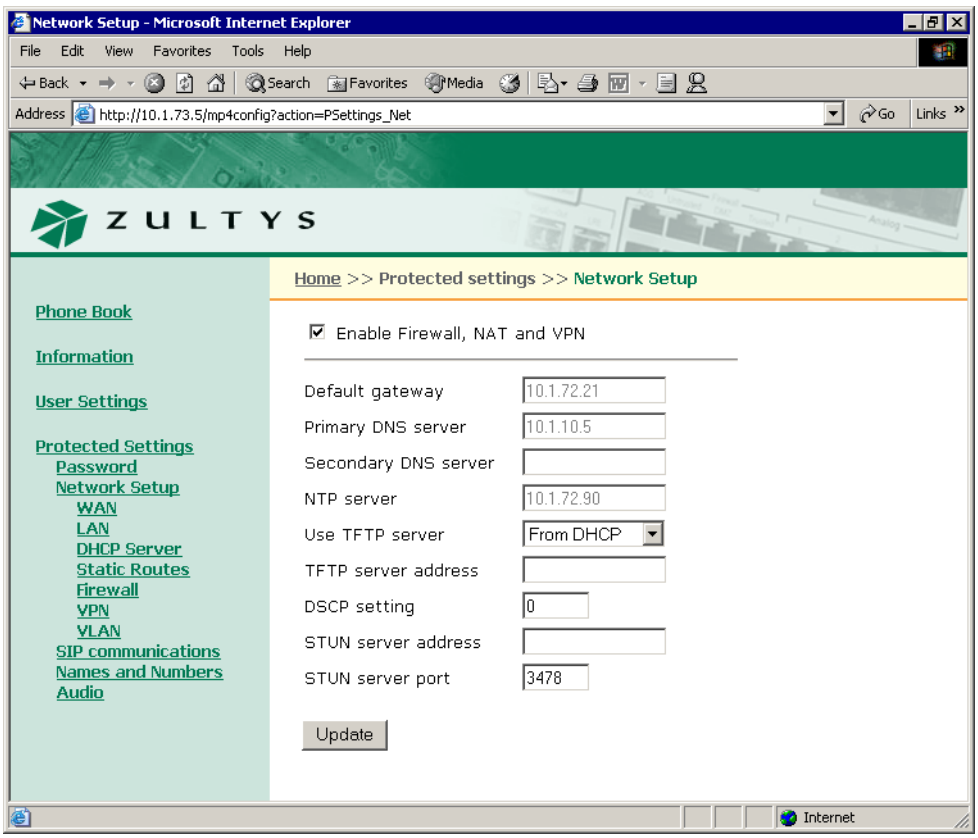

Figure D-20 Network Setup panel - Remote Network Mode

Default Gateway. This parameter is the default gateway IP address. Enter the address provided by the ISP when the phone is in Fixed Address mode, as described in section 8.3.3 on page 80.

Primary DNS Server. This parameter is the primary DNS Server IP address. Enter the address provided by the ISP when the phone is in Fixed Address mode, as described in section 8.3.3 on page 80.

Secondary DNS Server. This parameter is then secondary DNS Server IP address. Enter the address provided by the ISP when the phone is in Fixed Address mode, as described in section 8.3.3 on page 80.

NTP Server. This parameter is the NTP Server IP address. Enter the address provided by the ISP when the phone is in Fixed Address mode, as described in section 8.3.3 on page 80.

Use TFTP Server. This parameter determines the source of the TFTP server address. When set to From DHCP, the phone obtains the TFTP server address from the DHCP server. When set to Fixed address, the phone uses the TFTP address that you enter in this panel.

TFTP Server Address. When *Use TFTP Server* is set to *Fixed Address*, this parameter provides the TFTP Server address to the ZIP4x5.

DSCP Setting. This parameter configures DiffServ (layer 3 QoS) setting. All voice packets (RTP) leaving the phone will have the ToS byte in the IP header set to this value. Valid settings range from 0 to 63.

STUN Server Setting. This parameter is IP address of the STUN server. Valid setting is 32 bit IP address in dotted decimal notation. Section C.4.1.1 on page 199 describes the STUN protocol.

STUN Server Port. This parameter is the port number of the STUN server. Valid settings range from 1025 to 65535.

D.6.3.1 WAN

The WAN panel, as shown in figure D-21, configures the ZIP4x5 to connect with the WAN, such as the internet. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel.

Connection Type. This parameter defines the type of connection between the ZIP4x5 and the WAN. If you have enabled your phone to act as a DHCP server, you cannot set the connection type to DHCP.

WAN IP address. Enter the IP Address of the WAN, as provided by your ISP, in this data entry box when the Connection Type is set to Fixed IP.

Subnet Mask. Enter the subnet mask of the WAN, as provided by your ISP, in this data entry box when the Connection Type is set to Fixed IP.

Idle Timeout. This parameter is not currently used.

User Name. When the Connection Type is set to PPPoE, enter the user name of your ISP account in this data entry box.

User password. When the Connection Type is set to PPPoE, enter the password to your ISP account in this data entry box.

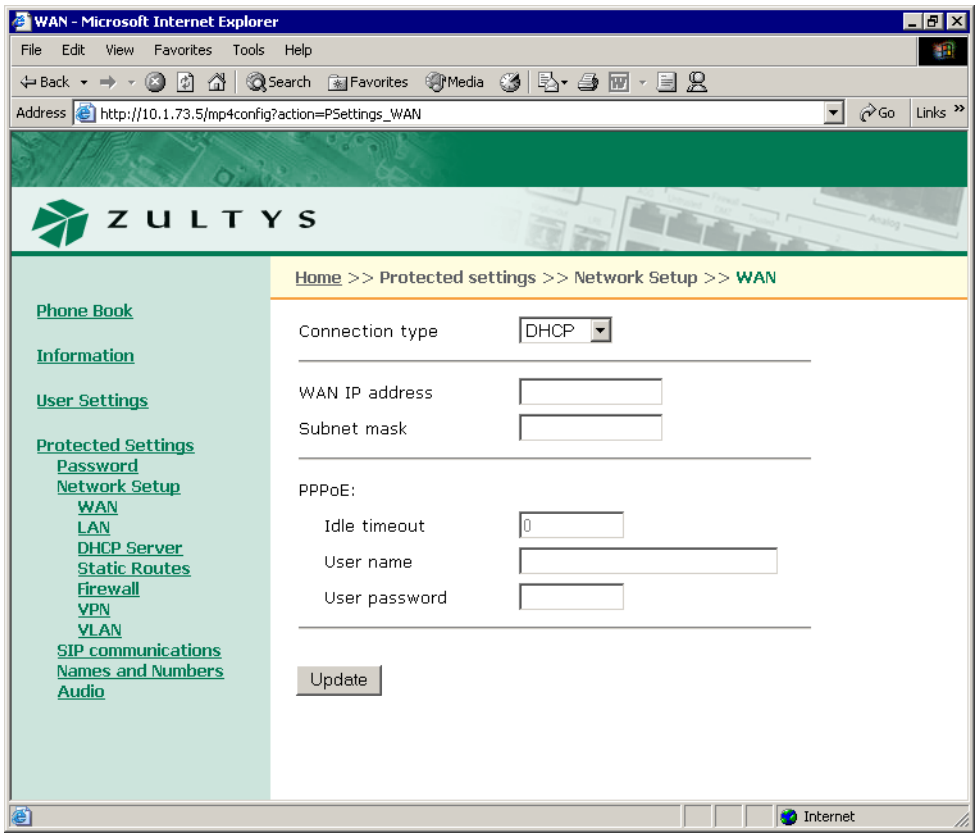

Figure D-21 Protected Settings – WAN panel

D.6.3.2 LAN

The LAN panel, as shown in figure D-22, configures the ZIP4x5 to establish itself as a server for your LAN. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel

IP address. Enter the IP address of the remote LAN that you are connecting to the ZIP4x5 in this data entry box.

Subnet Mask. Enter the subnet mask of the remote LAN that you are connecting to the ZIP4x5 in this data entry box.

D.6.3.3 DHCP Server

The DHCP Server panel, as shown in figure D-23, configures the ZIP4x5 to act as the DHCP server for your LAN. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel

DHCP Server Mode. set this parameter to Enabled to configure the ZIP4x5 as a DHCP server. Setting up the ZIP4x5 as a DHCP server requires that the phone is not configured as a DHCP client in the WAN panel

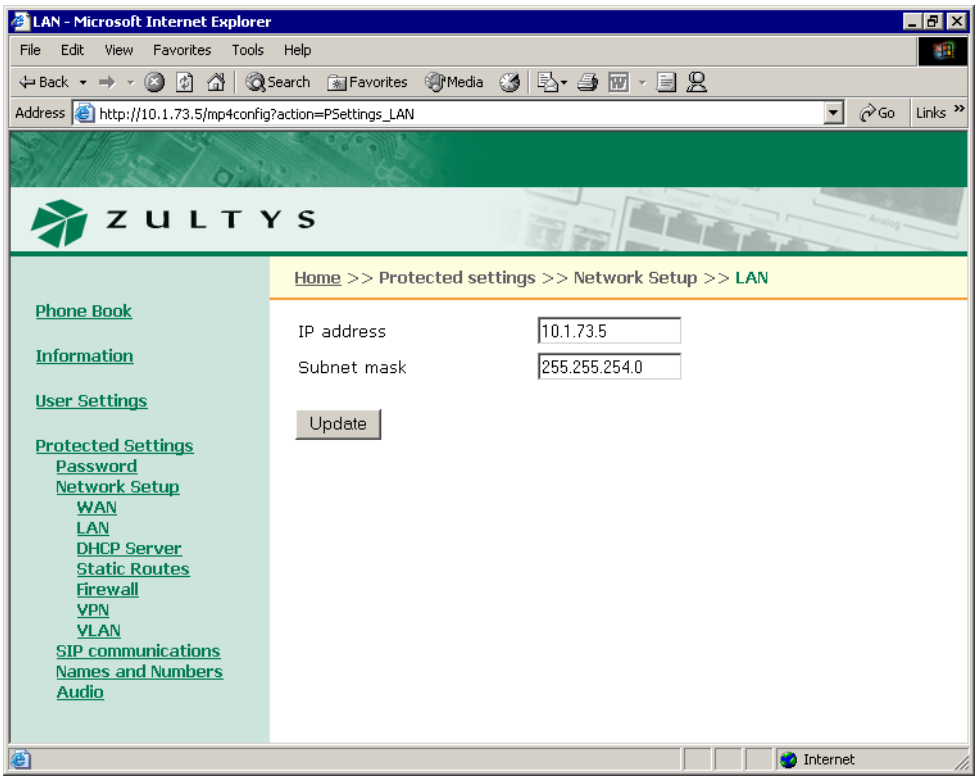

Figure D-22 Protected Settings – LAN panel

Scope. The *Starting IP address*, *Ending IP address*, and *Subnet mask* specifies the list of IP address that the ZIp4x5 assigns to devices that query it as a DHCP server. The IP address range must be within the private address ranges specified by RFC 1918 and listed in section 8.4.2 on page 81.

Lease duration. This specifies the period that client PCs can maintain their dynamic IP address without renewing their lease.

DHCP Options. These data entry boxes configure the IP addresses that the ZIP4x5 returns to its client devices.

D.6.3.4 Static Routes

The Static Routes panel, as shown in figure D-24, configures the static routes that your ZIP4x5 requires to provide access for the LAN to the various servers that are available. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel

Each row specifies one static route:

- **Destination Network:** This parameter is the IP address of the device(s) at the route's end.
- **Subnet Mask:** This parameter is the subnet mask of the device(s) at the route's end.
- **Gateway:** This parameter specifies the IP address of the device that must be accessed to reach the target device.

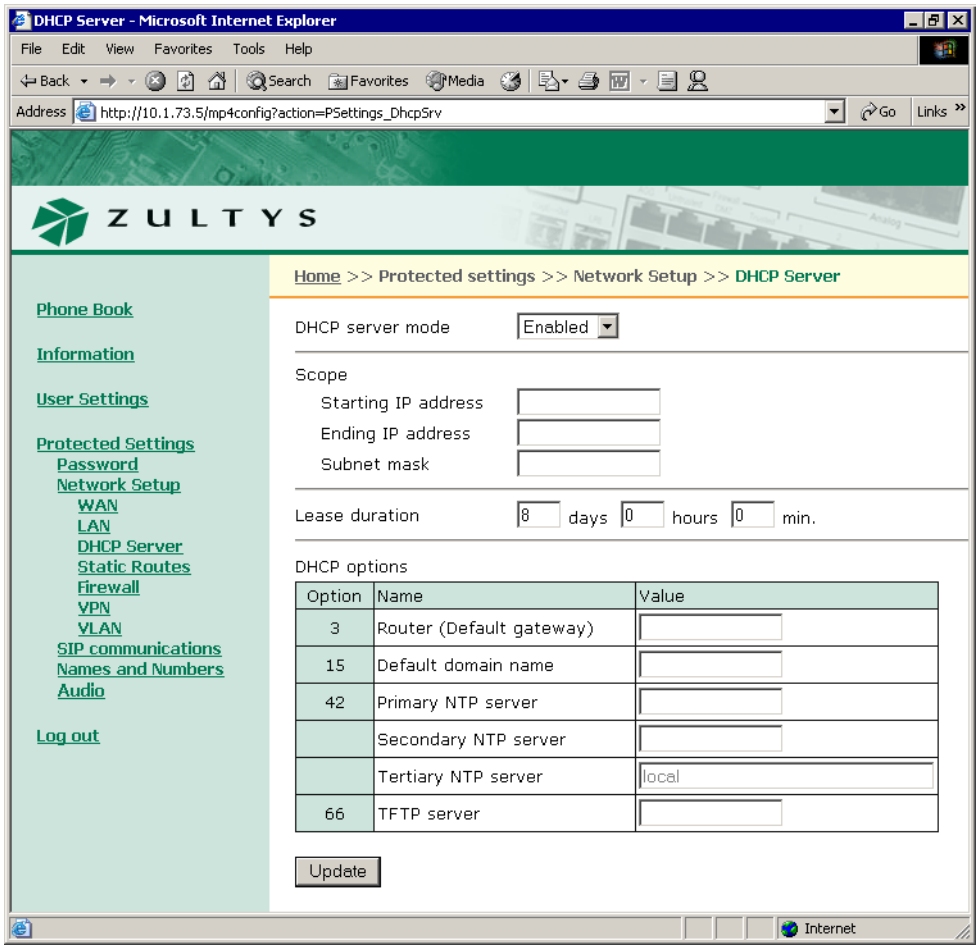

Figure D-23 Protected Settings – DHCP Server

D.6.3.5 Firewall

The Firewall panel, as shown in figure D-25, configures filters that ZIP4x5 will use to restrict packets that are sent between the WAN and the LAN devices. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel.

The ZIP4x5 firewall comprises the following two components:

LAN to WAN filters determine the packets that the firewall prohibits from being sent from the LAN to the WAN. By default, the ZIP4x5 grants full access to the WAN (internet) for packets originating from LAN devices. LAN filters are prioritized such packets are evaluated against them in sequential order. You can also enable or disable individual filters. Each filter statement comprises a set of filters. Each filter is made up of the following components:

- **name:** This parameter is the firewall label.
- **protocol:** This parameter specifies the protocol of the packets that are prohibited from passing through the firewall.
- **address:** This parameter specifies the source IP address of the packets that are prohibited from passing through the firewall.

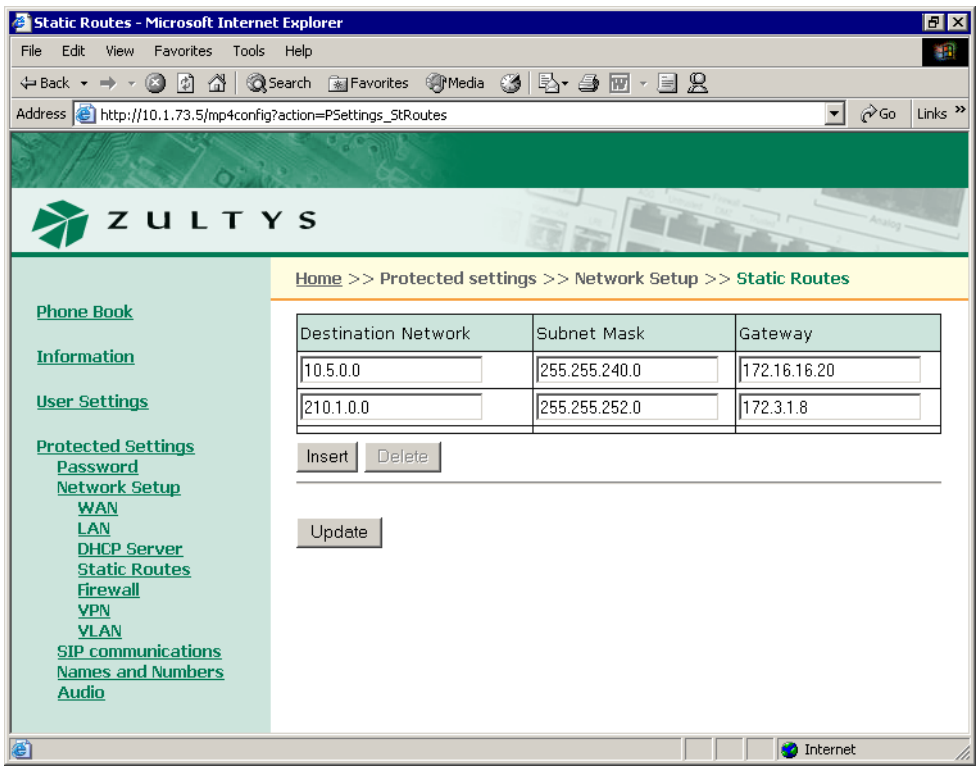

Figure D-24 Protected Settings – Static Routes panel

- **port:** This parameter specifies the port number of the packets that are prohibited from (LAN firewall) passing through the firewall.

WAN to LAN filters determine the packets that the firewall allows to pass from the WAN to the LAN. The firewall also allows packets into the LAN that are direct responses to data originally sent from the LAN. By default, the ZIP4x5 denies access to the LAN for all packets originating from the WAN (internet). Each firewall comprises a set of filters. Firewall filters are prioritized such packets are evaluated against them in sequential order. You can also enable or disable individual filters.Each filter is made up of the following components:

- **name:** This parameter is the firewall label.
- **protocol:** This parameter specifies the protocol of the packets that are allowed to pass through the firewall.
- **address:** This parameter specifies the IP address of the LAN device that will receive the packets that match the protocol and port listed by this filter.
- **port:** This parameter specifies the port number of the packets that are allowed to pass through the firewall.

D.6.3.6 VPN

The VPN panel, as shown in figure D-26, configures the VPN tunnels that the ZIP4x5 will use communicate with a remote site. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel.

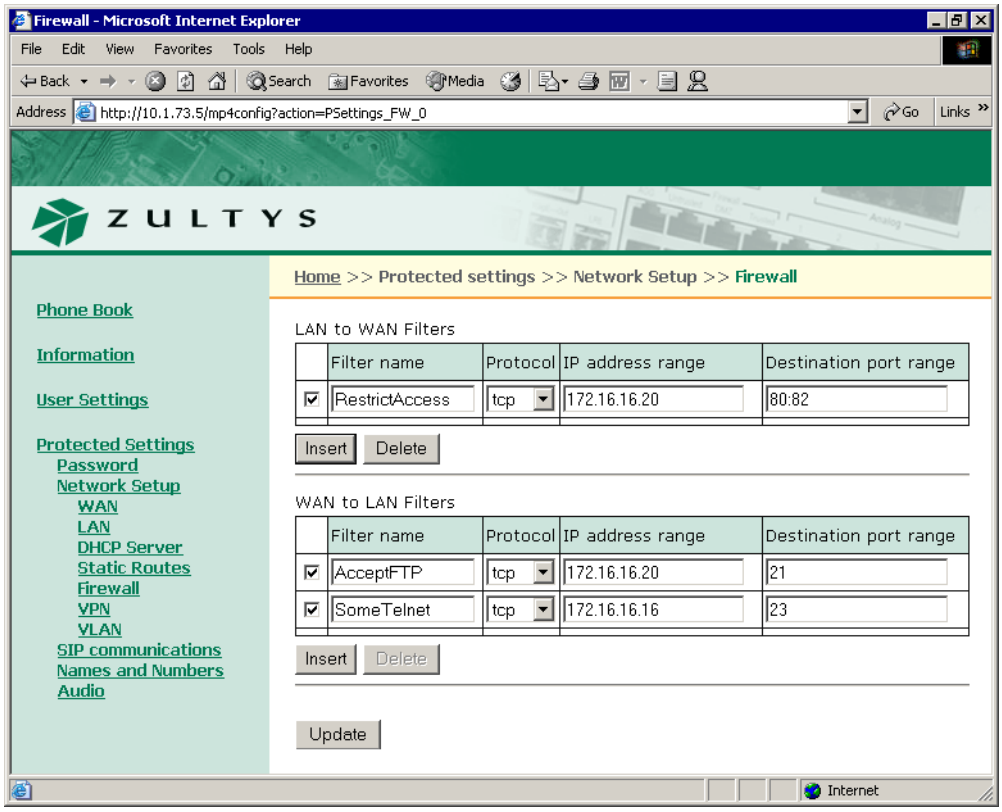

Figure D-25 Protected Settings – Firewall panel

Enabled / Disabled: Select **Enabled** to establish a VPN from your ZIP4x5.

Remote IP network. This command specifies the IP address of the remote LAN. Address format is net/prefix.

Remote IP network gateway. This command specifies the IP address of the remote VPN gateway.

Encryption Algorithm. This command specifies the phase 1 negotiation encryption algorithm. Valid settings include 3des, des, and blowfish.

Hash Algorithm. This command specifies the phase 1 negotiation hash algorithm. Valid settings include sha1 and mds.

Mode. This command specifies the phase 1 mode. Valid settings include main, aggressive, and base.

My Identifier. This parameter specifies the user IP address and is valid only if p1=aggressive. Valid setting is a fully qualified domain name.

Pre-shared key. This parameter specifies the preshared key.

Key Management. This parameter specifies the key management method. Valid settings are Automatic IKE and Manual.

Encryption key. This parameter specifies the encryption key used in manual key mode. Valid setting is either a double-quoted character string or a series of hexadecimal digits preceded by '0x'.

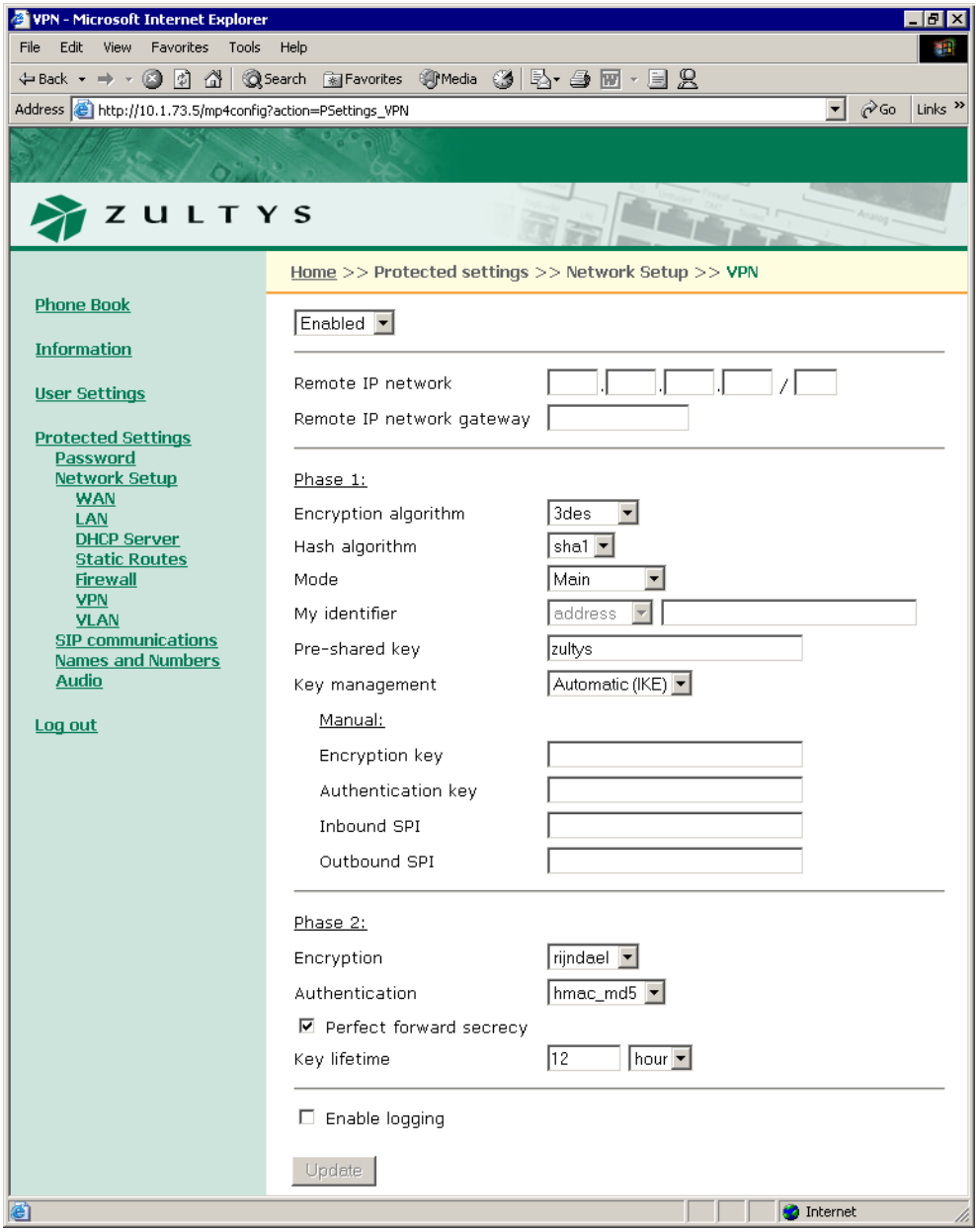

Figure D-26 Protected Settings – VPN panel

Authentication key. This parameter specifies the authorization key when in manual key mode. Valid setting is either a double-quoted character string or a series of hexadecimal digits preceded by '0x'.

Inbound SPI. This specifies the Security Parameter Index, which is a field that identifies the Security Association. It must be exactly 8 hex digits. The inbound SPI at the local end must match the outgoing SPI at the remote end.

Outbound SPI. This specifies the Security Parameter Index, which is a field that identifies the Security Association. It must be exactly 8 hex digits. The inbound SPI at the remote end must match the outbound SPI at the local end.

Encryption. This parameter specifies the encryption algorithm for phase 2 negotiations (AutoKey). Valid settings include aes and 3des.

Authentication. This parameter specifies the authentication algorithm for phase 2 negotiations (AutoKey). Valid settings include md5 and sha1.

Perfect Forward Secrecy. This command specifies the method for deriving phase 2 keys:

— pf_secrecy=0 off

— pf_secrecy=1 perfect forward secrecy is used to derive phase 2 keys.

When pfs is enabled, the ZIP4x5 uses DH Group 2 for all phase 2 negotiations.

Key Lifetime. This command specifies the period that a key remains valid. After the lifetime expires, the key must be renegotiated. Valid settings includes 12 hours, 3600 seconds, and 30 minutes.

Enable Logging. Select this option to activate the VPN logging feature. To view the log, select Information | Logs | VPN Log.

D.6.3.7 VLAN

The VLAN panel, as shown in figure D-27, configures the VLAN ID numbers for the LAN and WAN that are connected to the ZIP4x5. To access this panel, verify that Firewall, NATs, and VPN is enabled on the Network Setup panel.

When the ZIP4x5 is in remote network mode and is used as a router device between a LAN and a WAN, you configure the ZIP4x5 with two VLANs, one of which connects to the LAN and the other connects to the WAN. The following restrictions must be considered when configuring the VLANs

- VLAN support must be enabled when the phone is in Remote Network mode.
- The WAN and LAN VLANs must have different ID numbers.
- The tag settings for VLAN A (Phone, P1, P2, P3, LAN) are TUUUE; this is not configurable.
- The tag settings for VLAN B (Phone, P1, P2, P3, LAN) are TEEEU; this is not configurable.
- The CoS setting (cos_setting) is only used by the phone circuit.

D.6.4 SIP Communications

The SIP Communications panel, as shown in figure D-28, displays the parameters required by the phone to communicate with the SIP proxy and registrar servers. The SIP Communications panel displays the configuration options for the following parameters:

Outbound Proxy. This is the IP address and port number of the server that handles call control for the ZIP4x5.

Backup Proxy. This is the IP address and port number of the backup proxy server. The zip4x5 will attempt to switch to the backup proxy if the primary proxy server fails to operate.

Registrar Server. This is the IP address and port number of the registrar server. When this value is set, the ZIP4x5 attempts to register with this server instead of the proxy.

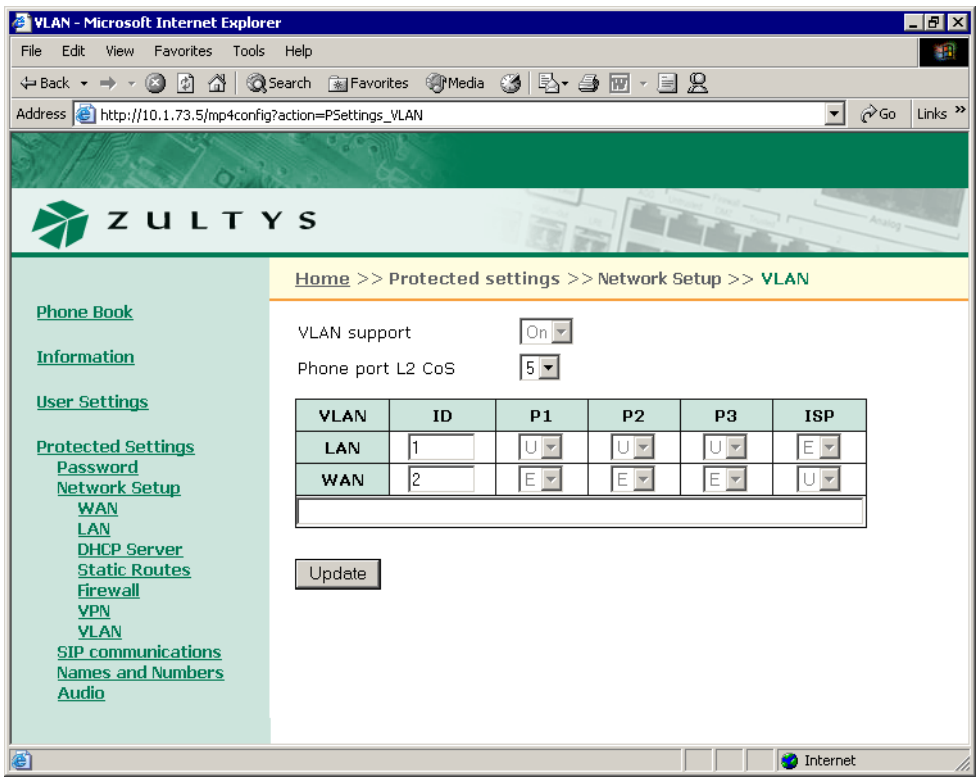

Figure D-27 Protected Settings – VLAN panel for Remote Network mode

Phone SIP Port. This is the TCP or UDP port number the phone uses to send and receive SIP messages. The default value is 5060 and that is used if you leave this field blank.

RTP Start Port. The ZIP4x5 uses consecutively numbered RTP and RTCP port numbers (actually UDP port numbers) for communication. RTP carries media and RTCP carries control information.

The default RTP start port is 1760. In this case, the first call appearance uses port 1760 to receive media and port 1761 to receive RTCP control information. The second call appearance uses ports 1762 and 1763. The highest port in use is 1767. The RTP start port must always be an even number and should not be set to the same value as the Receive Port or the Proxy port.

Page Server. This parameter specifies the IP address of the page server.

Transport Protocol. This determines if the phone uses UDP or TCP to transport the SIP messages. The default is UDP. In the current version of software TCP is not supported.

Invite Retransmissions. This parameter specifies the number of unsuccessful INVITE transmissions before the phone switches to the backup proxy. Valid settings range from 1 to 6.

Non Invite Retransmissions. This parameter specifies the number of unsuccessful retransmissions (other than INVITE) before the phone switches to the backup proxy. Valid settings range from 1 to 10.

Backup Proxy Registration. This parameter determines if the phone registers with the backup proxy at start up. Default value is "No".

Proxy Password. The proxy password authenticates the ZIP 4x5 to proxy servers that require authentication. Default value is blank.

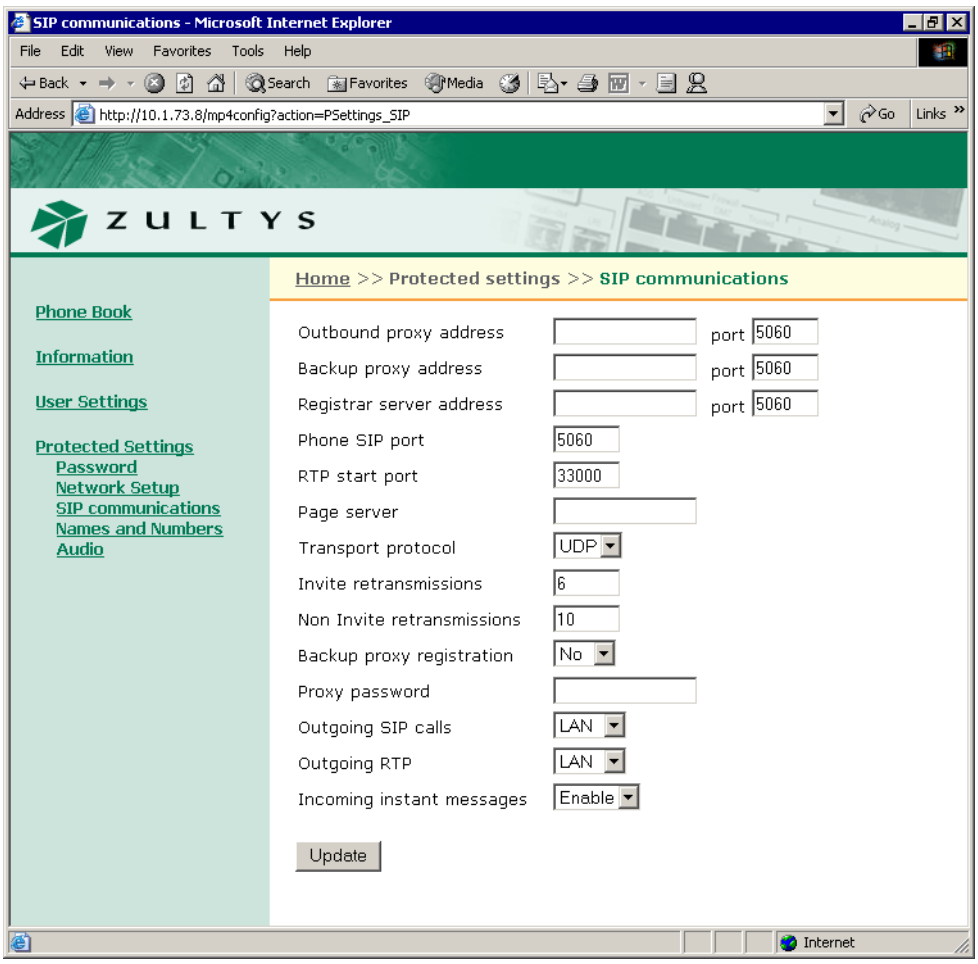

Figure D-28 Protected Settings – SIP Communications panel

Outgoing SIP Calls. When the ZIP4x5 is in Remote Network mode, this parameter determines the IP address that is listed as the source within all SIP packets that are sent through the phone into the WAN.

Outgoing RTP. When the ZIP4x5 is in Remote Network mode, this parameter determines the IP address that is listed as the source within all RTP packets that are sent through the phone into the WAN.

Incoming instant messages. This command configures the ZIP4x5 to accept instant messages.

D.6.5 Names and Numbers

The Names and Numbers panel, as shown in figure D-29, displays the parameters required by the phone to identify itself and other services. The Names and Numbers panel displays the configuration options for the following parameters:

Device ID. This parameter specifies the name which this phone uses to register with the SIP registrar and to subsequently make calls. This parameter is the user portion of the address "user @ domain".

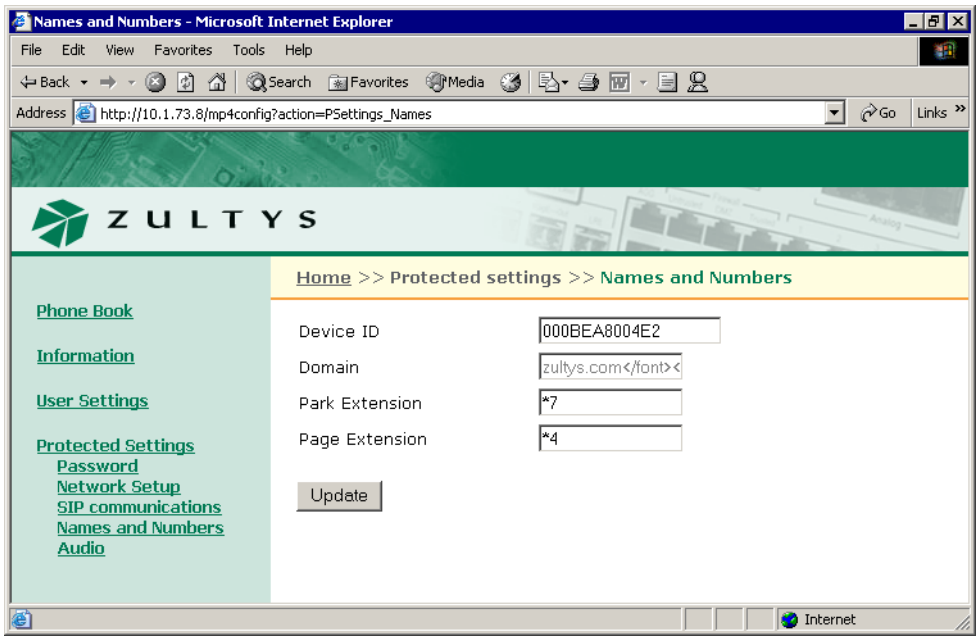

Figure D-29 Protected Settings – Names and Numbers panel

Domain. This parameter specifies the domain name for the enterprise.

Voice Mail. This parameter specifies the name or number for the server that stores voice mail.

Park Extension. This parameter specifies the name or number for the server that handles call park and call pickup.

Page Extension. This parameter specifies the number for the server that handles paging transmissions

D.6.6 Audio

The Audio panel, as shown in figure D-30, controls the way that the ZIP4x5 handles speech and ringing tones. The Names and Numbers panel displays the configuration options for the following parameters:

Codec. This parameter defines this is the way that the phone encodes speech. Normally, you should select G.711-μ law for North America and Japan, and G.711-A law everywhere else. The phone also provides G.729A and G.729AB for networks where bandwidth may be restricted.

Encryption. This parameter determines if encryption must be used by the ZIP4x5. Section 7.2 on page 55 describes encryption and the encryption options provided by this panel.

Distinctive Ring. This parameter allows the user to select a single ring for all incoming calls or different ring tones for internal and external calls.

Accept URL. The SIP message that is used to set up a call (the INVITE message) may contain a pointer to a WAV file. The phone can access this WAV file and play it to announce the incoming call. However, this will increase traffic on your network, delay the announcement of the call, and may contain an undesirable sound or message.

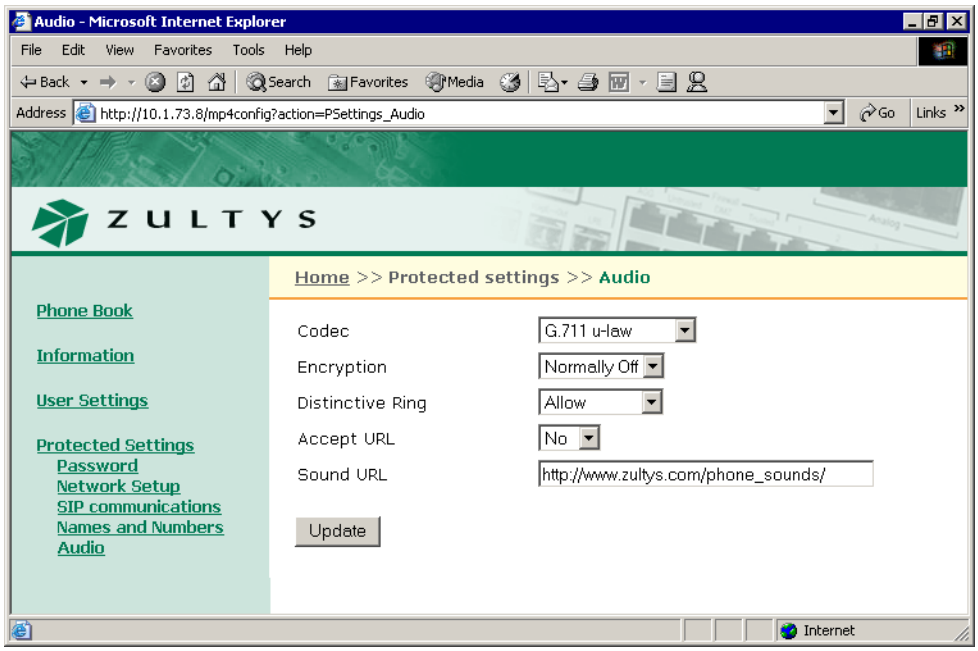

Figure D-30 Protected Settings – Audio panel

If you enable this feature, then when the phone receives a URL to play sound, it repeats the WAV file if it is short and keeps playing it regardless of size if it is long, until the call is answered or terminated.

Sound URL. With this setting you can allow users to play WAV files that are not built into the phone to announce an incoming call. You specify in this menu setting the location of the WAV files and you can have control over the WAV files that are stored in that location. You can therefore ensure that only appropriate files are played to announce the incoming call.

Appendix D

Acronyms

ACD	automatic call distributor
CAS	channel associated signalling
CoS	class of service
DHCP	dynamic host configuration protocol
DND	do not disturb
DNS	domain name service
DTMF	dual tone multi-frequency
FQDN	fully qualified domain name
GMT	Greenwich Mean Time
ICMP	Internet control message protocol
IEEE	Institute of Electrical and Electronic Engineers
IP	Internet protocol
LAN	local area network
MAC	media access control
MDI	media dependent interface
NTP	network time protocol
PBX	private branch exchange
PCM	pulse code modulation
PHB	per hop behavior
PIN	personal information number
PSTN	public switched telephone network
QoS	quality of service
RTCP	real time transport protocol control protocol
RTP	real time transport protocol
SIP	session initiation protocol
SNTP	simple network time protocol
TCP	transmission control protocol
TFTP	thin file transfer protocol
UDP	user datagram protocol
URI	uniform resource identifier
URL	universal reference locator

VLAN virtual local area network

Index

Symbols

#, sending 101
* key 103
μ-law 178

Numerics

1.1 181
2.5 mm socket 25

A

AC adapter 22
ACD log in 62
ACD log out 63
acronyms 255–256
add entry panel 226
aggressive mode, VPN negotiation . 91
A-law 178
always on, encryption 56, 178
analog line
    configuration file parameter . . 204
    menu setting 159
    using 47
answering a call 114
attended transfer 118
audio configuration parameters . . . 215
audio panel 233, 252
audio settings 149
authentication algorithms 90, 91
authorization key 91
autokey IKE 90

B

backup of data 53
backup proxy server 170
base mode, VPN negotiation 91
binary file 42
blind transfer 118
Bluetooth
    configuration file parameters . 219
    menu commands 155–157
boot process 37
busy tone 121
buttons, *see* keypad

C

calculator 120, 130–132
call answered 109
call appearances 47
call duration 109, 110
call forward
    description 65–66
    encrypted call 59
call hold
    conference call 127
    description 116
    encrypted call 59
    see also call park
call park
    description 66
    encrypted call 59
    extension 177
    see also call pickup
call pickup
    conference call 69
    description 68
call summary 109
call transfer
    description 118
    encrypted call 59
call waiting 112
call when using menu 53
caller ID 111
calling 106
    from menu mode 102
    in calculator mode 101, 132
    see also dialling
calling party, display on LCD 111
cascading network 23
caution, definition 7
clear user settings 148
codec 178
common configuration file 197
communications panel 229
compressed display 109
conference calls
    description 126–130
    encrypted 59
    park 68
    pickup 69
configuration file
    comments 199
    common 197
    description 38–41, 197–223
    function sections 198
    parameter entries 199
    specific 198
configuration file parameters
    audio 215
    Bluetooth 219
    DHCP server 218
    firewall 207
    general 220
    hardware 211
    network 199
    SIP 203
    VLAN 212
congestion tone 108
connected call 109
connection time 143
custom tones 152

D

danger, definition 7
data backup 53
date and time
    adjusting 148
    format 161
    setup 34
date and time panel 233
date of manufacture 145
delete panel 227
desk mounting 23
device ID 176
DHCP 31, 199
DHCP client, remote network mode 77
DHCP server, ZIP4x5 as a
    configuration parameters 218
    description 81
    panel 243
dial by name 123
dial tone 99
dialling
    from memory 122
    recent callers 124
    redial 121
    using SIP address 102
    with dial tone 99
    without dial tone 101
    see also calling
Diffie-Hellman group 90, 91
disconnect indicator 121
display name 111
display, LCD 5
distinctive ringing 149, 152, 179
DND 64, 114
DNS 168
do not disturb 64
domain name 176
duration of a call 109, 110

E

edit panel 227
editing a number 104
encryption
    always on 56, 178
    call forward 59
    call hold 59
    call park 59
    call transfer 59
    conference calls 59
    description 55–60
    individual call 56
    never on 56, 178
    normally on or off 56, 178
encryption algorithms 90, 91
encryption key 91
ending a call 120
entering letters and symbols 102
Ethernet
    circuit status 144
    ping 180
    power over 22
    self test 28, 182

Ethernet quick test 28
event timer 155
expanded display 109
external ring tones 149

F

factory default panel 236
far end busy 108
fast busy tone 108
files, binary 42
firewall
  configuration file parameters . 207
  description 84–87
  LAN filters 85
  panel 245
  WAN filters 85
fixed addressing, remote network . . 80
fixed IP address 33
forward
  description 65–66
  encrypted call 59
FTP, *see* TFTP
Func key 48, 102

G

gateway 167
general configuration parameters . . 220
general panel 231
GMT 34, 143
greeting message 147

H

handset
  description 97
  installing 22
hardware configuration parameters 211
hardware version 145
headset
  installing 25
  selecting 97, 98
here I am 60–64
hold, *see* call hold
home panel 225
hook button 98
  see also off hook
  see also on hook
hot key dialling 101

I

idle state 50
important, definition 7
incoming call 51, 111–115
information menu 142–146
installation
  power 22
  wall or desk mounting 23
instant messages
  accessing 55
  indication 55
instant messages menu 139–142
instruction card 5
internal ring tones 149
invalid address 105
invalid number 108
IP address 33, 167
IP communications panel 239
IP settings 166–169
IPsec 90

K

key click 149
key lifetime 91
keypad
  buttons 50
  definition 47
  keys 47
  quick test 28
  self test 183

L

ladder diagram 42
LAN
  connecting 23
  power over 22
LAN configuration, remote 81
LAN filters 85
LAN panel 243
LCD
  contrast 147
  data structure 50
  description 5
  quick test 28
  self test 185
LEDs
  description 5
  quick test 28
  self test 184
  summary 193–195
  walking 28
license agreement, software 12
lines, phone 47
log in 60–64
log out 62

M

MAC address 145
main mode, VPN negotiation 91
making a call 99–106
manual
  acronyms 255–256
  feedback 8
  special paragraph styles 7
  see also instruction card
  see also user's guide
manual keys 91
manufacture details 145
manufacture panel 230
MDI/MDI-X 23
memory 53
  see also phone book
menu
  how to use 51–53
  incoming call 53
  saving data 53
  using 133–187
message LED 55
messages, shown briefly 155
microphone, quick test 30
missed calls 114, 124
mounting
  desk 23
  wall 23
mute 115, 128
MWI 55
MX1200 1

N

names and numbers panel 251
negotiation modes 91
network busy tone 108
network configuration parameters . 199
network setup panel 238, 241
never on, encryption 56, 178
no ring tone 111
normal network mode 75
normally off, encryption 56, 178
normally on, encryption 56, 178
not connected 31
NTP 34
number format 161

O

off hook 97
on hook 97
operator log in 62
operator log out 63

P

page 70
page extension 177
park extension 177
park, *see* call park
password 165
password panel 237
perfect forward secrecy 91
phone book
  description 133–138
  dialling from 123
  empty 123
phone identification 147
phone lines 47
pickup, *see* call pickup
ping 180
point to point protocol 79
power on
  process 26
  time of 143
power status 144
PPPoE 79
pre-release software 13

preshared key 90
protected settings 164–180
provisioning 37, 225
proxy ports 171

Q

quick dial 121–125
quick test 28–31

R

receive ports 171
receiving a call 111–115
receiving equipment
  in case of damage 18
  inspection 17
  procedures 17–20
redial 121
  see also dialling
regional options 160–163
regional settings panel 235
registrar server 171
registration time 143
rejecting an incoming call 114
release numbers 13
remote LAN configuration 81
remote network mode 75
ring tone 111, 179
ring tones 149, 152
ringback 107
RMA, obtaining 18
RTP ports 171

S

saving menu data 53
second call tone 149
security parameter index 92
self test 28–31, 180–187
sending # 101
serial number 145
service, description 9–16
shift functionality 50
shipments
  damaged 18
  inspection 17
  returning to Zultys 18
SIP address, entering 102
SIP communications panel 249
SIP configuration parameters 203
SIP display name 111
SIP failure 111
SIP proxy 170
SIP registration 33
SIP settings 169–173
SIP URI, user portion 111
SNTP, *see* NTP
socket, 2.5 mm 25
software
  license agreement 12
  loading 27
  pre-released 13
  released 13
  subscription 13
  update 41
  update subscription 13
  version 145
  version numbers 13
software, updating 41
speaker
  quick test 30
  using 97
specific configuration file 198
SPI 92
start up process 37
static routes 87
static routes panel 244
STUN
  menu setting 169
STUN server 32, 202
subnet mask 167
subscription, software 13
support
  description 14–16
  see also software subscription
  see also training
switch 4, 23

T

talk time 143
technical support 15
terminating a call 120
TFTP
  configuration file 32
  menu setting 168
TFTP address, menu setting 168
time difference from GMT 34, 143
time offset 143
times panel 228
training 12
transfer, *see* call transfer
tunnel negotiation
  phase 1 90
  Phase 2 91
tunnel negotiation modes 91

U

unattended transfer 118
updating software 41
user button 60–64
user log in 61
user log out 62
user portion of SIP URI 111
user settings 146–163
user's guide 1

V

version numbers 13
virtual private networks
  see VPN
VLAN 173–175
VLAN configuration parameters . . 212
VLAN panel 240, 249
voice activated dialling
  description 125
  menu settings 157
voice mail
  accessing 55
  address 176
  indication 55
volume 49
VPN
  description 89–95
  web interface panel 246

W

walking LEDs 28
wall mounting 23
WAN configuration 77
WAN filters 85
WAN panel 242
warning definition 7
warranty 9–12
web interface utility
  accessing 225
  add entry panel 226
  audio panel 233, 252
  communications panel 229
  date and time panel 233
  delete panel 227
  description 41, 225–236
  DHCP server panel 243
  edit panel 227
  factory default panel 236
  firewall panel 245
  general panel 231
  home panel 225
  information menu 227–230
  IP communications panel 239
  LAN panel 243
  manufacture panel 230
  names and numbers panel . . . 251
  network setup panel 238, 241
  password panel 237
  phone book menu 226–227
  protected settings menu . 236–253
  regional settings panel 235
  SIP communications panel . . . 249
  static routes panel 244
  times panel 228
  user settings menu 231–236
  VLAN panel 240, 249
  VPN panel 246
  WAN panel 242

Z

ZIP4x5
features 2
user's guide 1
web site 1