

9.4.4 Rejecting the Call or Not Answering

9.4.4.1 Rejecting Calls

You can reject a call by pressing the DND button. Once you have pressed the DND button, the function remains active. See section 7.4 on page 64 for more details.

If the phone is receiving multiple calls when you press DND, the phone rejects *all* of the incoming calls. If you want to talk to one of the people who is calling you, answer that call before you press DND.

9.4.4.2 Not Answering Calls

If you do not answer the call, the phone behavior depends upon the system to which it is connected. Your system may route a call voice mail or it may disconnect the caller.

9.4.4.3 Missed Calls

When the phone next returns to the idle state it shows the number of call you have missed or that your ZIP4x5 rejected, for example:

```
Sales support
3 missed calls
Fri 12 Mar 04 08:17
```

If you have configured the phone to unconditionally forward all calls, none of the calls that the phone receives is counted as being missed.

To view a list of the calls that you have missed and to dial the caller, follow the procedure described in section 9.7.5 on page 124.

The phone may reject a call because of encryption policies as described in section 7.2.2.2 on page 57.

9.4.5 Answering the Call

9.4.5.1 No Existing Conversation

If the phone is idle when you receive a new call, do one of the following to answer the call:

1. Press the call button that represents the call you want to answer. The phone selects the speaker mode and answers the call.
2. Take the phone off hook.¹ The phone answers the call that is displayed on the LCD if the display is in expanded mode, or the call that is on the first row of the LCD if the display is in compressed mode.

The phone lights the LED for the call appearance continuously green. The display is identical to that shown when you make a call as described in section 9.3.5 on page 109.

1. See section 9.1.2 on page 98 for a definition of off hook.

Important If you press the call appearance button of a new call while you have an existing conversation, you will drop the first call unless you press Hold beforehand.

9.4.5.2 Existing Conversation

If you are talking with one or more people when you receive a new call, do one of the following to answer the call:

1. Press the call button that represents the call you want to answer. The phone terminates the existing call and answers the new call.
2. Press the Hold key then press the call button that represents the call you want to answer. The phone puts the existing call on hold and answers the new call.

9.4.6 Receiving a Call While Accessing the Menu

If you are accessing the menu and the phone receives a call, it substitutes the menu that was displayed with the notification of the incoming call as shown in section 6.3.2 on page 51. When the call terminates the phone resumes access to the menu exactly as it was prior to the call. The phone automatically exits the menu function 60 s after the end of the call if you do not press any keys or buttons.

9.5 During a Call

During a call, you can transfer or hold the current conversation. You can create or answer a new call and you can create a conference call.¹ You can use the calculator as described in section 9.9 on page 130. You can switch between using the headset, handset, or speaker as described in section 9.1.1 on page 97.

If you press one of the keys 0 to 9, *, or # while the call is active (LED on the call appearance button is lit continuously green), the phone sends a message for that key and plays a DTMF tone in the earpiece or speaker simultaneously.²

9.5.1 Mute

If you want to hear the person with whom you are speaking, but do not want him or her to hear you, press the Mute button. The phone disconnects the microphone input and flashes the LED on the Mute button red for 500 ms and off for 500 ms. The ZIP 4x5 does not change the display. To resume a 2-way conversation, press the Mute button again.

When you have pressed the Mute button so that the LED is flashing, you have muted the entire phone, not just the current conversation. If you place the muted call on hold, and select another call, the mute function remains active and the person on the other call will not be able to hear you. If you terminate the call with the Mute function still active, the Mute function remains active until you disable it.³

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1. If the SIP Server becomes unreachable during an active call, pressing a button that requires a response from the SIP server (such as Hold, Park, or Transfer) will terminate the call.
 2. The message is sent in the RTP payload according to RFC 2833.
 3. If you cycle the power on the phone, the phone disables the Mute function.

When you mute the phone and press the digit keys, the phone plays the DTMF digit into the audio path you have selected and sends the digit to the switch. You might use this feature to communicate with an IVR system.

9.5.2 Hold

9.5.2.1 Description

The Hold function allows you to maintain the state of a call but suspend the conversation. The person cannot hear you and you cannot hear the other person.¹

When you place a call on hold, you must retrieve the call from your same phone to resume the conversation. If you want to retrieve the conversation from a different phone, use the Park function as described in section 7.6 on page 66.

9.5.2.2 Placing a Call on Hold

If you want to put the conversation on hold, press the Hold key. The LED on the call appearance button flashes green for 500 ms and off for 500 ms.

The phone is silent. Although you still have the phone off hook, the phone does not provide you with a dial tone and does not automatically reserve a call appearance.²

You can place the phone on hook. The call that is on hold remains on hold. When you take the phone off hook, the phone does not provide you with a dial tone and does not automatically reserve a call appearance.

9.5.2.3 Expanded Display

If the phone is in the expanded display mode when you put a call on hold and the phone is not receiving an incoming call, the phone changes the display to:

```
1. Hold
4083280450
                                00:00:29
```

or

```
1. Hold
Lancelot Capability
Brown                                00:00:29
```

The display shows the time period that the conversation *has been on hold* in hours, minutes, and seconds.

-
1. When you put a conference call on hold, the other people do not hear any music, as described in section 9.8.2 on page 127.
 2. If the other phone terminates the call while on hold, the ZIP4x5 will remain silent. The Hold button will quit flashing to indicate that the session is terminated.

If you want to display the date and time, use the Up or Down buttons.¹ The display changes to:

```
1. Hold    2. Idle
3. Idle    4. Idle
Tue 10 Feb 04 13:24
```

The display shows the state of each call appearance as described in section 9.3.5.2 on page 109. You can toggle the phone to the compressed display mode by pressing the Enter button.

9.5.2.4 Compressed Display

If the phone is in the compressed display mode when you put a call on hold and the phone is not receiving an incoming call, the display changes to:

```
1. 4083280450 00:29
Tue 10 Feb 04 13:24
```

or:

```
1. Lancelot C 00:29
Tue 10 Feb 04 13:24
```

On the top row, the phone displays:

- the call appearance for this call (1 to 4)
- the number you called (or the SIP address of the person you called) or the name of the person if the name exists in the phone book and you made the call
- a timer that flashes and indicates the time period that the conversation *has been on hold* in minutes and seconds

The phone displays the current time and date just as it does in the idle state.

You can toggle the phone to the expanded display mode by pressing the Enter button.

9.5.2.5 Making a New Call After Placing a Call on Hold

The phone does not select a new call appearance nor does it provide you with dial tone when you have a call on hold. To make a new call, do one of the following:

1. Go off hook if you do not currently have the phone off hook.
2. Select a call appearance then dial the name or number.
3. Dial the name or number then select a call appearance.

1. Do not press the Func key or Menu button before pressing the Up and Down buttons.

Important If you press a call appearance button without first pressing Hold, you will terminate the current call.

9.5.2.6 Answering a Call After Placing a Call on Hold

If you receive an incoming call while you are talking with a person on another call appearance, you can put the first call on hold. You then need to press the call appearance button to answer the incoming call.

If you placed a call on hold, then went on hook, you need only to go off hook to answer the incoming call.

Important If you press a call appearance button without first pressing Hold, you will terminate the current call.

9.5.2.7 To Resume the Conversation

To resume talking with the person on hold, do one of the following:

1. If you have only one call on hold (only one call appearance button is flashing green and off):
 - a. optionally take the phone off hook
 - b. press the Hold key or press the call appearance button
2. If you have more than one conversation on hold:
 - a. use the Up and Down buttons to identify which caller is on which call appearance¹
 - b. optionally take the phone off hook
 - c. do one of the following:
 - press the call appearance button indicating the person with whom you want to speak
 - press the Hold key to resume the conversation with the conversation that you most recently placed on hold

If the phone was on hook when you selected the call that you wanted to resume, the phone activates the speaker mode.

The phone makes the LED on the call appearance button solid green again and changes the display to that described in section 9.3.5 on page 109. The phone displays the call duration again, which the phone incrementally changed during the time that you had the call on hold.

9.5.3 Transferring a Call

You can transfer a call you made to, or a call you answered from, another person inside or outside of the enterprise. You can choose to speak to the person to whom you are transferring the call (referred to as an “attended transfer”), or to not speak with the person (referred to as an “unattended transfer” or “blind transfer”). You cannot transfer a conference call.²

1. See section 9.4.3 on page 112 for details.

2. You can, however, park a conference as described in section 7.6.3 on page 68.

To transfer a call, do the following:

1. Ensure that you have at least one free call appearance. You cannot transfer a call if you currently have four calls.
2. Ensure that the call you want to transfer is the active call (that is, you are currently in communication with the person).
3. Press the Transfer key.
4. The phone places the active call on hold, and indicates this by flashing the LED on the call appearance button green.
5. The phone reserves a call appearance and provides you with a dial tone.
6. Make the call as described in section 9.2.1 on page 99.
7. The phone updates the display to indicate which call is being transferred. For example, suppose you were talking on call 1 when you received a call on appearance 2. You answered it and used call appearance 3 to transfer the call. The display might look like:

```
1. Hold
Lancelot Capability
Brown                0:46
```

Press Down:

```
2. Transfer
Lord Blenheim
                                0:12
```

Press Down:

```
3. Calling
Oxford Stone Masons
                                0:08
```

Press Down:

```
1. Hold    2. Trns
3. Call    4. Idle
Tue 10 Feb 04 13:24
```

The abbreviations are explained in section 9.3.5.2 on page 109. You can toggle the phone to the compressed display mode by pressing the Enter button.

8. If you do not want to talk to the person to whom you are transferring the call, place the phone on hook or press the Transfer key again. The phone turns off the LEDs on the call appearance buttons as the transfer is completed.
9. If you want to talk to the person to whom you are transferring the call:
 - a. Wait until the person answers. Depending on the current settings for the user, the call may be redirected to the person's voice mail.

- b. The phone changes the summary display to:

```
1. Hold    2. Trns
3. Cnct    4. Idle
Tue 10 Feb 04 13:24
```

- c. If you want to proceed to transfer the call, place the phone on hook or press the Transfer key again.
- d. If you do not want to transfer the call, press the call appearance button for the person who is on hold pending the transfer. The phone releases the call you just made.

9.5.4 Transferred by the Other Party

When a call appearance on the ZIP4x5 is transferred to a different party, the call information for the initial party (the party that transferred your call), instead of the party that received your call, remains on the LCD.

9.5.5 Using the Calculator

You can use the calculator while you have one or more conversations active. If the phone had been in calculator mode prior to making a call, the phone toggles out of this mode for the duration of the call and toggles back to calculator mode at the end of the call.

See section 9.9.9 on page 132 for information on making calls while in calculator mode and section 9.2.4 on page 101 for details how to dial in this mode.

9.6 Ending a Call

9.6.1 You Terminate the Call

Do one of the following:

1. Go on hook.¹ The phone ends the call, makes the handset, headset, and speaker quiet, and turns off the LED for the call appearance.
2. Press the call button that is lit continuously green.² The phone ends the call, makes the handset, headset, and speaker quiet, and turns off the LED for the call appearance.
3. Press a call button other than the one that is lit continuously green. The phone ends the call.

If the LED on that call appearance button was off (indicating the call appearance was inactive), the phone will provide you with dial tone and you can make another call.

If the LED on that call appearance button was indicating there was an incoming call, you will answer the call.

If the LED on that call appearance button was indicating there was a call on hold or a conference call on hold you can resume the conversation with the other person or people.

1. See section 9.1.3 on page 98 for a definition of on hook.

2. The phone lights the LED continuously green to indicate which call is currently active.

9.6.2 Other Party Terminates the Call

When the person that you are talking with goes on hook, your ZIP4x5 phone is immediately aware of this. The phone turns the call appearance LED solid red to indicate that the far end has disconnected. The phone changes the display to show that the call is disconnected, for example:

```
1. Disconnected
Lancelot Capability
Brown           1:23
```

The timer stops incrementing and shows you the duration of the call that has just ended. The phone plays busy tone until you put the phone on hook.

9.7 Quick Ways to Dial a Number

9.7.1 Introduction

You can dial any of 32 names or numbers that you have recently dialed. See section 9.7.2 on page 121.

You can dial a name or number that you have stored in the phone book by specifying the location in the memory. See section 9.7.3 on page 122.

You can dial a name or number that you have stored in the phone book by selecting the name of the person. See section 9.7.4 on page 123.

You can dial any of 32 names or numbers of people who have recently called you. See section 9.7.5 on page 124.

9.7.2 Redial

9.7.2.1 Last Name or Number Dialed

To dial the name or number that you most recently dialed, press the Redial key twice.

You can substitute entering a number by redialling it instead of entering it from the keypad for any of the call methods outlined in section 9.2.1 on page 99. The phone plays the DTMF digit for #.

If you have not reserved a call appearance, the phone enables speaker mode and silently dials the number.

9.7.2.2 List of Recent Names or Numbers Dialed

If you press the Redial key once, the phone allows you to select from the most recent 32 calls that you have made. The screen displays the name or number that you dialed, and the date and time that you made the call. It shows the most recent call as call 01, and the oldest call as call 32. For example:

```
Redial 01
Zultys Technologies
Fri 12 Mar 04 19:47
```

Press the Up and Down buttons to move through the list of names or numbers. Press the Enter button or the Redial key to select the number.

You can substitute entering a number by selecting it from the list of recently dialed names or numbers for any of the call methods outlined in section 9.2.1 on page 99. The phone plays the DTMF digit for #.

If you have not reserved a call appearance, the phone enables speaker mode and silently dials the number.

To exit the feature without selecting a name or number from the list, press the Esc button.

9.7.3 Dialling by Memory Location in the Phone Book

9.7.3.1 Description

You can save 99 phone numbers in the phone and associate a name with each number. The phone has one additional number that is reserved for calling the voice mail, as described in section 7.1 on page 55.

To enter and edit numbers, use the menu as described in section 10.2 on page 133.

9.7.3.2 Memory Locations 1 to 5

To dial a number or address in the phone book at memory locations 1, 2, 3, 4, or 5, press the button M01, M02, M03, M04, or M05.

The phone plays the DTMF digit for # and silently dials the number. If you have not reserved a call appearance, the phone enables speaker mode.

9.7.3.3 Any Memory Location

To dial a number or address in the phone book at any memory location, press the Mem button. The ZIP4x5 lights the LED on the button red. Enter the two digit number (00 to 99) of the memory location. You do not need to press the Enter button or #.¹

The phone turns off the LED, plays the DTMF digit for #, and silently dials the number. If you have not reserved a call appearance, the phone enables speaker mode.

1. The voice mail is location 00 and may or may not be active. See section 7.1 on page 55 for details.

If you do not enter two digits within 60 seconds, or if you press the Esc button, the phone turns off the LED, and restores the display to the idle condition.

9.7.3.4 Other Uses for the Memory

You can substitute entering a number from the memory instead of from the keypad for any of the call methods outlined in section 9.2.1 on page 99. The phone plays the DTMF digit for #.

You can also specify a destination from the memory as a number for forwarding calls. This is described in section 7.5.5 on page 66.

9.7.3.5 Invalid Location

If you try to dial from a memory location that is empty, the phone displays:

```
Error!
Phone book location
34 is empty.
```

The phone holds this display for two seconds, or until you press a key, lift the handset, or replace the handset.

9.7.4 Dialling by Name

If you have no active calls, you can quickly dial by the name of a person or entity by pressing the Down button.¹ The phone shows you the entries in your phone book listed alphabetically. If an entry in the phone book does not have a name, the display shows the address.

To use this feature, do the following:

1. Press the Down button.

The display changes to show the first, second, and last entries in the phone book. The arrow is on the middle row and points to the first entry:

```
last_entry
➔first_entry
second entry
```

For example:

```
Zultys Technologies
➔Apple Computer
Blenheim Palace
```

2. Do one of the following:
 - a. Use the Up and Down buttons to select the name. The arrow remains in the middle row.

1. Do not press the Menu button or the Func key first.

3. If you were dialling following receipt of dial tone, press the Enter button or the # key.
The phone plays the DTMF digit for the # key and the call proceeds as described in section 9.2.1 on page 99.
4. If you were dialling without receipt of dial tone, do one of the following:
 - a. Go off hook.
 - b. Press the Enter button.
 - c. Press a call appearance button.

The phone silently dials the number or address and the call proceeds as described in section 9.2.2 on page 101.

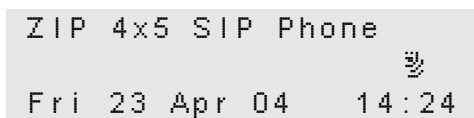
To exit the feature without selecting a name or number from the list, press the Esc button.

9.7.6 Voice Activated Dialling

The ZIP4x5 can dial selected contacts in your phone book and access voice mail through voice commands. To activate voice commands on your phone, select Menu | User Settings | Voice Commands | Enable, then press the enter button. The menu will display the full Voice Activated Commands menu as described in section 10.5.8 on page 157. Voice Command menu options include directions for training and calibrating your ZIP4x5 for voice activated dialling.

9.7.6.1 Configuring Voice Activated Dialling

Before you can perform any voice commands, you must enable voice activated dialling on the ZIP4x5 and train the phone to recognize your voice as you speak the commands. When voice activated dialling is enabled, the ZIP4x5 shows the voice icon on the right side of the display:



A flashing Voice Command icon indicates that you have not trained the phone with enough commands or contacts to use voice activated dialling. Section 10.5.8 on page 157 describes the menu commands that enable voice activated dialling and trains your phone. If the icon is not flashing, your phone is capable of performing voice activated dialling.

Before you train the phone, or after moving into a different noise environment, you should calibrate the ZIP4x5 to ignore local background noise. Section 10.5.8 on page 157 also describe the calibration procedure.

9.7.6.2 Dialling a Contact

To dial a contact using voice activated commands:

1. Take the phone off hook. You should hear a normal dial tone.
2. Speak the words "Dial Number".
The dial tone will stop and you will hear a single beep.
3. Speak the name of the contact that you wish to dial.

The phone will repeat the name of the contact.

4. If the phone repeats the name of the proper contact, say "Yes". The phone will then dial that number. If the phone does not repeat the name of the proper contact, say "No" and restart the process.

9.8 Conference Calls

The ZIP4x5 allows you to hold a conversation with two, three, or four other people simultaneously. When you have a conversation with more than one person this is called a conference. This is a feature that is supported on the ZIP4x5 so the function will operate on any phone system that can support multiple call appearances to the phone. You can have only a single conference call active at a time.

You can join people into the conference call that you have called or who have called you. You can drop individuals from and add individuals to the conference at any time.

9.8.1 Initiating a Conference Call

This section describes the simplest means to initiate a conference call. Section 9.8.5 on page 128 describes other means to add people to a conference call.

1. Make or answer the first call as you would normally do so.
2. Press the Conf key.

The phone selects another call appearance and provides you with dial tone.

The phone changes the LED on the first call appearance to be lit continuously orange.

3. Dial the third person for the conference.

The phone joins all calls into a single conference.

4. The phone changes the colors of the LEDs on the call appearance buttons to be all continuous orange.
5. If the phone is in the expanded display mode, the phone changes the display to:

```
1. Conf with 2, 3
4083280450
00:00:29
```

or

```
2. Conf with 1, 3
Lancelot Capability
Brown 00:00:45
```

The phone displays:

- the call appearance number
- an indication that the person is in a conference and which other call appearances are in the same conference

- the name or number of the person on the call appearance
 - how long the call has been on this call appearance (not the duration of the conference call)
6. Press the Up or Down buttons to scroll through the list of people on the conference call.
 7. You can toggle the phone to the compressed display mode by pressing the Enter button.
 8. If the phone is in the compressed display mode the display changes to:

```
1. 4083280450 00:29
2. Lancelot C 00:45
Wed 26 Jun 02 11:34
```

The phone displays the name or number of the person on the conference call together with how long the call has been on the call appearance.

The phone displays the current time and date just as it does in the idle state.

9. Press the Up or Down buttons to scroll through the list of people on the conference call.
10. You can toggle the phone to the expanded display mode by pressing the Enter button.

9.8.2 Placing a Conference Call on Hold

To place the conference on hold, press the Hold key. The LEDs on each of the call appearance buttons flash orange for half a second and off for half a second. The other people on the conference call can carry on with the conversation without you. The people on the conference call cannot hear you and you cannot hear the other people.

The phone does not select a new call appearance and does not provide you with a dial tone.

If you want to place the conference call on hold and resume the call from a different phone, use the park feature as described in section 7.6 on page 66.

9.8.3 Resuming a Conference Call

When the conference call is on hold, and you want to resume conversation with the conference, do one of the following:

1. Press any of the call appearance buttons that has its LED flashing orange.
 - a. If the phone has no other calls active other than the existing calls that are part of the conference, the conference resumes as it was prior to your placing it on hold.
 - b. If the phone has other calls proceeding or active, the phone terminates those calls.
 - c. If the phone has other calls on hold, the phone keeps those calls on hold.
2. Press the Conf key.
 - a. If the phone has no other calls active other than the existing calls that are part of the conference, the conference resumes as it was prior to your placing it on hold.
 - b. If the phone has other calls proceeding, active, or on hold, the phone joins all calls into the conference.

9.8.4 Muting a Conference Call

When you press the Mute button, the other people on the conference call can continue with their conversation uninterrupted. You can hear the conversation but the other people on the conference cannot hear you.

The phone flashes the LED on the Mute button red for 500 ms and off for 500 ms. The phone does not change the display.

To allow the other people on the conference call to hear you, press the Mute button again.

9.8.5 Adding Another Person to the Conference

9.8.5.1 Outgoing

To make an outgoing call do one of the following:

1. If you want the other people on the conference call to hear you make the call:
 - a. Press the Conf key.
 - b. The phone selects the lowest numbered call appearance that is inactive.¹
 - c. The phone plays dial tone that can be heard by the other participants in the conference call.
 - d. The phone flashes the LED on the call appearance button green to indicate it has reserved the call appearance.
 - e. Dial a name or number using the keypad, by specifying a memory location, or by selecting a recent number either called or received. The other participants in the conference can hear the DTMF digits as you dial them.
 - f. As the call proceeds, the phone changes the LED on the call appearance button as described in section 9.2 on page 99. The other participants in the conference call can hear the call progress tones.
 - g. Once the called party answers, he or she is immediately in the conference call and all participants can hear the conversation. The phone changes the LED of the call appearance button to continuous orange.
2. If you do not want the other people on the conference call to hear you make the call, or you want to speak privately to the person prior to him or her joining the conference call:
 - a. Press the Hold key.
 - b. The phone puts the conference on hold and flashes the LEDs on the call appearance buttons for each of the calls in the conference orange.
 - c. Make a new call by one of the methods described in section 9.2 on page 99.
 - d. When the called party answers, the phone turns the call appearance LED to continuous green. You can have a conversation with the person without any of the members of the conference call.
 - e. If you do not want the person that you have called to join the conference call:

1. If the phone does not have an inactive call appearance, pressing the Conference key has no effect.

- Press the call appearance button that is lit continuously green. That terminates the call.
 - Press any of the call appearance buttons that is flashing orange to resume the conference call without the person you just called.
- f. If you want the person you just called to join the conference call, press the Conf key. The phone lights the LED on the call appearance button to be continuously orange.

9.8.5.2 Incoming

To answer an incoming call do one of the following:

1. If you want the other people on the conference call to hear you answer the call:
 - a. Press the Conf key.
 - b. The phone immediately joins the calling party to the conference call.
 - c. The phone changes the LED of the call appearance button to continuous orange.
2. If you do not want the other people on the conference call to hear you answer the call, or you want to speak privately to the person prior to him or her joining the conference call:
 - a. Press the Hold key.
 - b. The phone puts the conference on hold.
 - c. Press the call appearance button that indicates there is an incoming call.
 - d. The phone changes that call appearance button to be solid green and you can talk with the calling party.
 - e. If you do not want the person that has called to join the conference call:
 - Press the call appearance button that is lit continuously green. That terminates the call.
 - Press the Hold key. The phone puts the call on hold and flashes the LED on the call appearance button green.
 - Press any of the call appearance buttons that is flashing orange to resume the conference call without the person you just called.
 - f. If you want the person you just called to join the conference call, press the Conf key. The phone lights the LED on the call appearance button to be continuously orange.

9.8.6 Terminating a Conference Call

9.8.6.1 Ending the Entire Conference

To end a conference call, ensure the conference call is active, then go on hook. The phone terminates the calls on each of the call appearances and turns the LEDs on those buttons off.

9.8.6.2 Individuals Dropping from the Conference

As individuals leave the conference call, the call appearance that person was occupying on your phone will become free. The phone turns off the LED on the call appearance button.

9.8.6.3 Dropping Individuals

To end an individual call that is part of a conference, ensure the conference call is active, then press the call appearance button of the call that you want to terminate. The phone terminates the call on that call appearance and turns the LED on that button off.

You can use the Up and Down buttons to identify which person is on which call appearance as described in section 9.4.3 on page 112.

9.8.6.4 Ceasing to be Part of the Conference

If you no longer want to take part in the conference but want the other participants to continue to talk to one another, place the conference on hold as described in section 9.8.2 on page 127.

Your phone continues to mix the audio signals for the conference call and it continues to use the call appearances on your phone. As the participants in the call leave the conference, the call appearances used by the individuals will once again become free and the phone will turn off the LEDs on those call appearance buttons.

9.9 Calculator

9.9.1 Functions

The calculator can perform simple additions, subtractions, multiplications, and divisions with a precision (number of significant digits) of 12 digits. You can easily put the phone into calculator mode and restore it to phone mode. Alternatively, you can keep the ZIP4x5 normally in calculator mode; the ZIP4x5 will switch between calculator mode and call mode intelligently depending upon what you are doing.

9.9.2 Keys

To put the ZIP4x5 into calculator mode, press Calc.¹ The phone displays the word **Calculator** on the top row and keeps it there until you press a numeric key or exit calculator mode. The phone turns on the LED on the calculator button continuous green.

Use the keys labelled 0 to 9 for numerals, the * key for the decimal point, and the Redial (+), Conf (—), Trans (X), and Hold (÷) keys to indicate the arithmetic function. Press the Speaker (=) key to obtain the result of the calculation.

9.9.3 Display

As you type, the display shows the calculation and the result:

```
2.048
x 192
= 393.216
```

1. See section 6.2.1.2 on page 48 on how to access this.

The software puts each number on a separate line, preceded by the arithmetic operator. If you enter multiple arithmetic functions, the software scrolls the numbers off the top of the display. You can scroll the display by using the Up and Down buttons.

As you perform multiple calculations, the ZIP4x5 remembers what you typed so that you can scroll back. The phone remembers and can display 32 lines.

9.9.4 Order of Operations

If you use multiple operators, the calculator performs multiplications and divisions first then additions and subtractions. Therefore:

$$2 + 3 \times 4 = 14$$

and:

$$2 \times 3 + 4 \times 5 = 26$$

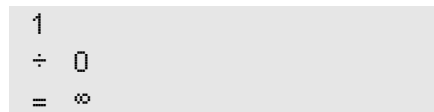
A calculator that displays a single number might evaluate the calculations as 20 and 50 respectively. If you want the calculator to make a calculation with each operator, use the = key to force the calculation, as in the following example:

$$1 + 2 \div 3 = 1.666667$$

$$1 + 2 = 3 \div 3 = 1$$

9.9.5 Divide by Zero

If you divide a number by zero, the phone displays the symbol for infinity. For example:



```

1
÷ 0
= ∞

```

9.9.6 Editing

You can edit your entries by using the volume keys in a similar manner to that described in section 9.2.7 on page 104. When you edit your entry, you can change the arithmetic operator. Use the Up and Down buttons to move between the lines.

After you have made the changes, it is not necessary for you to return the cursor to the last position. You can press the = button to see the result. The software displays the last line and the result of the equation.

9.9.7 Clearing

You can clear the current entry by pressing the # key. The small 'C' on that key indicates *Clear*. If you most recently entered a number, the phone clears the entire number. If you most recently entered an arithmetic operator, the phone clears the operator. As you continue to press the Clear key, the phone deletes numbers or arithmetic operators that you have entered.

You can clear all numbers and arithmetic operators that you have entered by pressing the Func key. The small letters 'AC' on that key indicate *All Clear*.

9.9.8 Exiting

You exit the calculator mode by pressing the Calc button. To select Calc, you press the Func key followed by the Mem | Calc button. When you press the Func key, the phone clears all data in the calculator. When you next enter calculator mode, the display is clear.

9.9.9 Making and Answering a Call While in Calculator Mode

You can make a call while in calculator mode. As soon as you start to do so, the phone automatically toggles from calculator mode to phone mode. It turns off the LED on the calculator button. Making a call when in calculator mode is described in detail in section 9.2.4 on page 101.

If the phone receives an incoming call, it immediately toggles from calculator mode to phone mode. The phone turns off the LED on the calculator button and displays information about the call. Receiving a call is described in section 9.4 on page 111.

When the phone is not in calculator mode, the five function keys (Redial, Conference, Transfer, Hold, and Speaker) do not function as arithmetic keys. You can, for example, easily put a conversation on hold (without dividing their phone number!).

When you terminate the call, the ZIP4x5 returns to the calculator mode provided all of the LEDs on the call appearance buttons are off; that is, there is no call activity.

You can put the ZIP4x5 into calculator mode during a conversation or while you have conversations on hold by pressing Calc again. The ZIP4x5 turns on the LED on the calculator button and displays the calculator screen as it was prior to a call.

Important In this mode you cannot access the functions for Redial, Conference, Transfer, Hold, and Speaker. If you need to access these functions, exit the calculator mode first.

The Menu

10.1 Introduction

When you press the Menu button, the phone displays:

```
Menu
➤Phone book
  Instant Messages
  Information
  User Settings
  Protected Settings
  Self Test
```

This example shows seven rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are:

Phone Book. Store and recall numbers that you want to dial. See section 10.2 on page 133.

Instant Messages. Exchange instant messages with other ZIP4x5 users. See section 10.3 on page 139.

Information. View data about the phone, the way it is connected, and the calls you have made. See section 10.4 on page 142.

User Settings. Customize the phone to suit your needs. See section 10.5 on page 146.

Protected Settings. Adjust the communications settings so that the phone works within your network. See section 10.6 on page 164.

Self Test. Test the functionality of your phone and its connections to your network. See section 10.7 on page 180.

Details on navigating through the menu are described in section 6.3.3 on page 51. See appendix A, starting on page 189 for a complete summary of the menu structure.

10.2 Menu | Phone Book

You can store 100 contacts in the phone book at memory locations referred to as 00 to 99. Location 00 is reserved for accessing the voice mail as described in section 10.6.5 on page 176. The administrator configures address 00. You need a password to change that number.

When you select Menu | Phone Book the display shows:

```
Phone Book
➔Search
  Add new contact
  Edit
  Delete
```

This example shows five rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are:

Search. Find a name or number in the phone book. See section 10.2.1 on page 134.

Add new contact. Put a new entry in the phone book. See section 10.2.2 on page 135.

Edit. Change the information for a contact. See section 10.2.3 on page 137.

Delete. Remove a contact from memory. See section 10.2.4 on page 138.

10.2.1 Search

To search for a contact, do the following:

1. Select Menu | Phone Book | Search.
2. The display shows:

```
Search      Func: abc
➔
```

The phone automatically places the keypad in character mode and shows Func:abc on the top row.

3. Specify the name of the person whose address you are trying to find using the character mode as described in section 9.2.6 on page 102.

Enter no characters or the first few letters of the name of the contact.

4. Press the Enter button.

The phone displays the first contact in your address book that matches the characters you have typed or the contact that is next alphabetically to the characters you have typed.¹ The phone ignores upper and lower case characters to perform the match.

For example, if you typed L and pressed the Enter button, the ZIP4x5 might display:

```
Ken Livingston
➔Lancelot Capability
Lord Nelson
```

1. If you typed no characters, the ZIP4x5 displays all of the contacts in your phone book and points to the one that is closest to the start of the alphabet.

The phone looks at the contact's name to find a match. If you have not entered a name for the contact, the phone displays the address (SIP URI or number). The SIP URIs are sorted within the alphabetical list. Numbers are at the end of the list.

5. If the contact is not the one you wanted:
 - a. Use the Up and Down buttons or the Up and Down keys to scroll through the list of names.
 - b. Press the keys again to select the first letter for a different contact.
6. To dial a contact, press the Enter button, press a call appearance button, or go off hook. The phone exits the menu function.
7. To exit the search function, press the Esc button.¹

10.2.2 Add New Contact

To add a new contact to the phone book, do the following:

1. Select Menu | Phone Book | Add new contact.
2. The display shows:

```
Name          Func:abc
#
```

The phone automatically places the keypad in character mode and shows Func:abc on the top row.

3. Type the name of the contact using the character mode as described in section 9.2.6 on page 102. The maximum length of the name can be 19 characters. After you have typed the 19th character the cursor remains on the last character. If you try to add more characters, the phone plays the DTMF digit for the # key and replaces the last character in the string with the last typed character.
4. Press the Enter button.

You can press the Enter button without entering a name for the contact.
5. The display shows:

```
Address
#
```

Enter a name or number for the contact.²

1. Even though Func:abc is active, if you press the Esc button, the phone does not interpret this as if you are trying to dial memory location number two (M02).

2. The phone prompts you for an *address* to indicate that either a name or a SIP URI is acceptable.

6. If you want to enter a number, you can enter a simple string of digits such as:

```
Address
➔1485
```

You should not append a # character to the end of the phone string.

You can enter punctuation characters, for example:

```
Address
➔9-(408)328-0450
```

The phone stores the characters that you enter, but when you dial, the phone sends only the digits to the phone system.

Remember to precede the number with the access code for an outside line if the administrator of the system has configured the dial plan to require it.

7. If you want to save a SIP address instead of the number, press the Func key to access letters and enter the address of the contact using the character mode as described in section 9.2.6 on page 102.

```
Address      Func:abc
➔lancelot.capability
```

If the address is greater than 19 characters, the display scrolls to show just 19 characters:

```
Address      Func:abc
➔ot.capability.brown
```

The maximum length of the SIP URI can be 64 characters. After you have typed the 64th character the cursor remains on the last character. If you try to add more characters, the phone plays the DTMF digit for the # key and replaces the last character in the SIP URI with the last typed character.

You do not need to precede the address with the word SIP and a colon character. The ZIP4x5 automatically includes these for you in the outgoing message. If you want to type the characters, you can do so:

```
Address      Func:abc
➔SIP:lancelot.ca■
```

8. When you have finished entering the address (SIP URI or number), press the Enter button. You can enter a name and save it into memory without entering an address or a number, but you cannot dial that contact.

9. The display shows:

```
Location
➔07
  11
```

The phone shows a list of unused memory locations, and points to the lowest location that is free.

10. Use the Up and Down buttons or the Up and Down keys to select a memory location and press the Enter button.
11. The display changes to:

```
Saved                07
Lancelot Capability
+44-(123)9872 8645
```

The phone shows:

- a. the memory location on the top row
 - b. the name on the second row, or if there is no name, a blank line
 - c. the first 20 digits of the phone number or SIP URI on the bottom row, if there is a number or SIP URI¹
12. To dial the contact, press a call appearance button or go off hook.
The phone exits the menu function.
13. To display the phone book menu, press the Esc button. To exit the menu function without calling the contact, press the Menu button.

10.2.3 Edit

To edit the information you have saved about a contact, do the following:

1. Select Menu | Phone Book | Edit.
2. The display shows:

```
Edit                Func:abc
➔lanc
```

The phone automatically places the keypad in character mode and shows Func:abc on the top row.

3. Find the name of the contact as you would if you were searching for a contact as described in section 10.2.1 on page 134.

1. The phone system must understand the '+' symbol as is shown in this example. Not all phone systems may do so.

4. Edit the name, and address of the contact as you would do if you were entering a new contact as described in section 10.2.2 on page 135.

The phone places the cursor at the end of the name, address, or number. Edit it as described in section 9.2.7 on page 104.

If you did not earlier enter a name or an address, the phone still allows you to edit these so that you can complete them if required. When you press the Enter button, the phone gives you the opportunity to complete blank fields.

You can edit a contact to assign a different memory location. The location you assign must be currently unused.

5. When you have completed editing the information, the phone indicates it has saved the information and you can dial the contact or exit the function.

10.2.4 Delete

To delete the information you have saved about a contact, do the following:

1. Select Menu | Phone Book | Delete.
2. The display shows:

```
Delete      Func:abc
➔lanc
```

The phone automatically places the keypad in character mode and shows Func:abc on the top row.

3. Find the name of the contact as you would if you were searching for a contact as described in section 10.2.1 on page 134.
4. Press the Enter button when you have located the contact you want to delete.
5. The phone displays:

```
Lancelot Capability
Brown
Delete?  ➔No   Yes
```

6. Use the Up and Down buttons or the Up and Down keys to select Yes.
If you do not want to delete this entry, select No, or press the Esc button.
7. Press the Enter button to delete the information.

The phone removes the entry from its memory and displays the main menu for the phone book.

10.3 Menu | Instant Messages

You can exchange instant messages with other SIP devices connected to the same SIP server that connects to your ZIP4x5. The ZIP4x5 can send messages of 1000 characters in length and receive messages of up to 3600 characters.

When you select Menu | Instant Message, the LCD displays options for accessing ZIP4x5 Instant Message functions:

```
Instant Messages
➔Compose
Inbox <4 msgs>
Outbox <3 msgs>
Erase all
Configure
```

This example shows six rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

10.3.1 Compose

When you select Compose in the Instant Message menu, the LCD displays the lines for specifying the recipient and content of your instant message:

```
New message Func:abc
To :➔
Text:
```

To create and send an instant message:

1. Specify the recipient of your message on the **To** line, using one of the following methods
 - enter the recipient's extension
 - enter the recipient's address from the keypad, using the method described in section 9.2.6 on page 102 for entering an alphanumeric address.
 - access the address book by pressing the Mem button, then select the recipient from the list.
2. Press the Down button to move the cursor to the Text line.
3. Enter the message content, using the method described in section 9.2.6 on page 102 for entering an alphanumeric message.¹
4. Press the Enter button. The ZIP4x5 confirms your intent before sending the message.

1. Some unicode characters (such as μ , $^\circ$, § , ¥) may be interpreted differently by other IM programs, such as Windows Messenger.

10.3.2 Inbox

Instant messages received by the ZIP4x5 are placed in the inbox. The LED on the Msg button flashes orange for 500 ms and off for 500 ms when the inbox contains unopened instant messages. The Inbox line of the Instant Message display lists the number of messages that remain in the Inbox; the Instant Message display shown in section 10.3 on page 139 shows an inbox that contains four messages. Messages remain in the inbox until you delete them.

To access the instant message inbox:

1. Select Inbox from the Instant Messages menu. You can also access the inbox by pressing the Msg button if the LED on that button is flashing orange. The LCD displays the list of instant messages in your inbox, as shown below.

```
➔✉ 2520@sample.com
✉ 2496@sample.com
✉ 2514@sample.com
```

The open envelope symbol on the first line indicates that the instant message sent from the extension listed on the line was previously opened. The closed envelope symbol on the bottom two lines indicates that those messages are new and have not been opened.

2. To open a message, use the up and down buttons to position the arrow next to the desired message, then press the enter key.

```
Wed Feb 25 16:50:26
Are you finished with
the report yet?
➔Delete Reply
```

The example display requires four rows; in practice, the display can show only three rows at once. Press the Up and Down buttons to scroll through the message.

The top line of the message display is the header that lists the day and time that the inbox received the message. The bottom line is a response menu for the message. The instant message is displayed between the header line and the response line.

3. To close the message, perform one of the following actions:
 - Select *Delete* in the Response line and press the enter key. The resulting display asks you to confirm the deletion of the message. Select Yes to delete the message and return to the inbox. Select No to return to the message.

```
Delete Message
➔Yes
No
```

- Select *Reply* in the Response line and press the enter key. The resulting display is the compose menu, with the address of the sender of the original message entered on the To line. Type a message in the text line and press the enter key. The next display confirms your intent to send the message. Select Yes to send the message and return to the inbox; select No to discard your message and return to the inbox. In each case, the inbox message is not altered.

- Press the Esc key to exit the message and return to the inbox.

10.3.3 Outbox

Instant messages that are sent from the ZIP4x5 are placed in the outbox. Messages remain in the outbox until you delete them. The outbox line of the Instant Message display lists the number of messages that remain in the outbox; the Instant Message display shown in section 10.3 on page 139 indicates that the outbox contains three messages.

To access the instant message outbox:

1. Select **Outbox** from the Instant Message menu. The LCD displays the list of instant messages in your outbox, as shown below.

```
➔2498@10.1.38.251
 2502@10.1.38.251
 2508@10.1.38.251
```

2. To open a message, use the up and down buttons to position the arrow next to the desired message, then press the enter key.

```
Fri Feb 26 09:14:04
I finished the report
this morning.
➔Delete Resend
```

The example display requires four rows; in practice, the display can show only three rows at once. Press the Up and Down buttons to scroll through the message.

The top line of the message display is the header that lists the day and time that the message was sent. The bottom line is a response menu for the message. The instant message is displayed between the header line and the response line.

3. To close the message, perform one of the following actions:
 - Select **Delete** in the Response line and press the enter key. The resulting display asks you to confirm the deletion of the message. Select Yes to delete the message and return to the inbox. Select No to return to the message.

```
Delete Message
➔Yes
No
```

- Select **Resend** in the Response line and press the enter key. The resulting display is the compose menu, with the address of the sender of the original message entered on the To line and the original message entered on the text line. Press the enter key to send the message. The next display confirms your intent to send the message. Select Yes to send the message and return to the inbox; select No to discard your message and return to the inbox. In each case, the inbox message is not altered.
- Press the Esc key to exit the message and return to the inbox.

10.3.4 Erase all

Select the **Erase All** option to remove all messages from the ZIP4x5 inbox and outbox.

10.3.5 Configure

Selecting the **Configure** option displays a menu that programs the ZIP4x5 to receive instant messages.

```
IM | Configure
➔Receive and display
  Reject
```

To configure the ZIP4x5 to receive instant messages, select **Receive and Display**.

To disable the ZIP4x5 from receiving instant messages, select **Reject**.

10.4 Menu | Information

This allows you to view data about the phone. You cannot change any part of the configuration in this menu item. When you select Menu | Information the display shows:

```
Information
➔Times
  Records
  Communications
  Manufacture
```

This example shows five rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are:

Times. View the time difference from GMT and how long the phone has been connected. See section 10.4.1 on page 142.

Records. View the record of the calls to and from the phone and the protocol messages to and from the phone. See section 10.4.2 on page 143.

Communications. View data about how the phone is connected. See section 10.4.3 on page 144.

Manufacture. View data about the hardware and software versions of the phone. See section 10.4.4 on page 145.

10.4.1 Times

When you select Menu | Information | Times, the ZIP4x5 shows the following displays. You can only view this information. Use the Up and Down buttons or the Up and Down keys to scroll through the various screens. The display on your phone may be different from the screens shown below.

Time Difference from GMT. This is the value that was entered manually or obtained from the configuration file:

```
Information | Times
➔Difference from GMT
-8:00 hours
```

Phone Power On. This is when the phone was turned on. The date and time is shown in the format that you have selected in section 10.5.10 on page 160:

```
Information | Times
➔Phone power on
Sun 29 Feb 04 08:44
```

Phone Connected. This is when the phone was connected to the network. The date and time is shown in the format that you have selected in section 10.5.10 on page 160:

```
Information | Times
➔Phone connected
Sun 29 Feb 04 08:45
```

Phone Registered. This is when the phone last registered with the SIP server. The phone registers periodically, typically each hour. The date and time is shown in the format that you have selected in section 10.5.10 on page 160:

```
Information | Times
➔Phone registered
Sun 29 Feb 04 10:37
```

Total Talk Time. This is the total time that the phone has been in the active call state since power on. It is the summation of time spent on calls that you originated and calls that you received. The time is reset each time the power is cycled on the phone. The time is shown in days, hours, minutes, and seconds:

```
Information | Times
➔Total talk time
12 d 07 h 39 m 02 s
```

10.4.2 Records

When you select Menu | Information | Records, the ZIP4x5 shows the following displays. You can only view this information. Use the Up and Down buttons or the Up and Down keys to scroll through the various screens. The display on your phone may be different from the screens shown below.

Call Log. This shows a listing of the calls you have made or received. This feature is not supported in version 2.0.

SIP Log. This shows a listing of the protocol messages sent from or received by your phone. This feature is not supported in version 2.0.

10.4.3 Communications

When you select Menu | Information | Communications, the ZIP4x5 shows the following displays. You can only view this information. Use the Up and Down buttons or the Up and Down keys to scroll through the various screens. The display on your phone may be different from the screens shown below.

Status of Ethernet Circuits. This data is updated in real time, so that as the phone receives communication the display may change.

```
Information | Comms
➔P 1  P 2  P 3  LAN
   100F  ----  10H 100F
```

- a. P1, P2, and P3 signify the three switched ports on the back of the phone.
- b. LAN signifies the port that you connect to the switch.
- c. — signifies there is no connection.
- d. 10 signifies there is connection at 10 Mb/s.
- e. 100 signifies there is connection at 100 Mb/s.
- f. H signifies half duplex.
- g. F signifies full duplex.

When you display this first screen, the LEDs on the four call buttons display the status of the Ethernet circuits.¹

- a. The LED is solid green to indicate that there is a connection.
- b. The LED flashes orange every quarter second to indicate there is activity.

You interpret the LEDs as follows:

- a. LED on Call 1 indicates the status of the circuit P1.
- b. LED on Call 2 indicates the status of the circuit P2.
- c. LED on Call 3 indicates the status of the circuit P3.
- d. LED on Call 4 indicates the status of the circuit LAN.

Power. The phone shows if it has power from the ac adapter and power from the LAN,² updated in real time. You should use the ac adapter if you have one, regardless whether the phone can be powered from the LAN.

```
Information | Comms
➔Power
  AC = on;  LAN = off
```

1. Do not confuse the use of the LEDs in this mode with the four call appearances. The call appearances all take place over the circuit labelled LAN.
 2. The power over the LAN is also referred to as power over Ethernet, PoE.

TFTP Address. This is what has been configured manually or obtained by DHCP. If the DHCP server did not specify the TFTP address, the phone indicates this:

```
Information | Comms
➔TFTP Address
 192.168.1.100
```

```
Information | Comms
➔TFTP Address
not found
```

Configuration File. Once the phone obtains the address of the TFTP server, it tries to retrieve its configuration file from the TFTP server. It reports whether the file was read correctly or not:

```
Information | Comms
➔Configuration file
OK
```

```
Information | Comms
➔Configuration file
not found
```

10.4.4 Manufacture

When you select Menu | Information | Manufacture, the ZIP4x5 shows the following displays. You can only view this information. Use the Up and Down buttons or the Up and Down keys to scroll through the various screens. The display on your phone may be different from the screens shown below.

MAC Address. This is hard coded into the phone during manufacture and cannot be modified.¹

```
Information | Manfr
➔MAC address
00-0B-EA-80-04-D7
```

Versions. You can update the software version. Later versions may include more features or better support for existing features. The boot code permanently resides on the phone and you cannot modify it. You may need to provide the hardware version and date of manufacture if you need support on the phone. The versions on your phone may be different from those shown in the following examples.

```
Information | Manfr
➔Software version
1.0.0
```

1. The MAC address uniquely identifies your phone. The MAC address is printed on a label on the base of the phone as a bar code with text.


```
Information | Manfr
➔Boot code version
  1.4.4
```

```
Information | Manfr
➔Hardware version
  E01
```

```
Information | Manfr
➔Date of Manufacture
  01 Apr 2004
```

See section 5.4.5 on page 45 for how to update the software.

10.5 Menu | User Settings

This menu selection allows you to tailor the phone to suit your personal preferences. When you select Menu | User Settings the display shows:

```
User Settings
➔LCD Contrast
  Greeting message
  Clear user settings
  Date and time
  Audio
  Event Timer
  Bluetooth
  Voice Commands
  Analog
  Regional options
  Emergency numbers
  Factory Defaults
```

This example shows thirteen rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are:

LCD Contrast. Improve readability of the display. See section 10.5.1 on page 147.

Greeting Message. Change the display in the idle state. See section 10.5.2 on page 147.

Clear user settings. Reset the settings to those created by the system administrator. See section 10.5.3 on page 148.

Date and Time. Set the current date and time and the offset from GMT. See section 10.5.4 on page 148.

Audio. Select the ring tones. See section 10.5.5 on page 149.

Event Timer. Determine the length of time that the phone should display messages. See section 10.5.6 on page 155.

Bluetooth. Detect Bluetooth headsets and pair them with your phone. See section 10.5.7 on page 155.

Voice Commands. Train the ZIP4x5 to accept your voice activated dialling commands. See section 10.5.8 on page 157.

Analog. Determine the usage parameters of the analog phone line. See section 10.5.9 on page 159.

Regional Options. Select the country, language, and how you want the date and time presented. See section 10.5.10 on page 160.

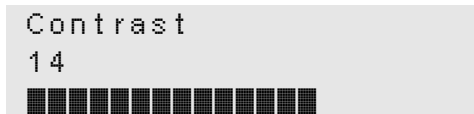
Emergency numbers. Program the ZIP4x5 to always use the analog phone line to call selected emergency numbers. See section 10.5.11 on page 163.

Factory Defaults. Restores all phone parameters to their original factory settings. See section 10.5.12 on page 164.

Important If you have been assigned the phone, and want to ensure that the changes you make to the settings remain after you power up the phone, select **Never** under the menu *Clear user settings*, described in section 10.5.3 on page 148.

10.5.1 LCD Contrast

You alter the contrast to improve readability. The readability is affected by the ambient light, the room temperature, and the angle at which you view the display. To change the contrast, select Menu | Settings | Contrast. The display changes to:



Use the Up and Down buttons to change the contrast. The display gets darker as the number increases. There are 20 steps, numbered 1 to 20. The bar on the bottom of the display is a graphical representation of the setting.

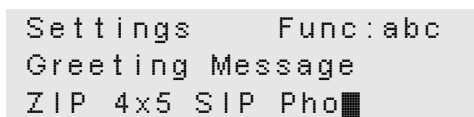
10.5.2 Greeting Message

This allows you to display a message on the top row of the phone when the phone is idle (see section 6.3.1 on page 50). When shipped from the factory, the greeting message is set to



To change the greeting message:

1. Select Menu | Settings | Greeting Message.
2. The display changes to:



3. The phone displays the current greeting message so you can edit it. Use the method described in section 9.2.6 on page 102 to edit and change an alphanumeric message.

The phone has already enabled alphanumeric mode for this purpose.

4. Press the Enter button when done, or the Esc button to cancel.

10.5.3 Clear User Settings

This determines what settings the phone will use each time it powers up. When you select this, the phone displays:

```
Clear user settings
◆never
  on next power on
  on each power on
```

This example shows four rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

Ordinarily, you will keep the selection to **never**. Each time the phone powers on, it retains the user settings that you have entered.

If you select **on next power on**, the phone takes its user settings from the configuration file saved on the TFTP site. This is the configuration selected by the system administrator.¹ Once the phone has taken the settings from the configuration file, it sets this entry to **never**, and will not take the settings from the configuration file again.

This is very useful if a telephone is being transferred to a different person or if the person is changing locations. The administrator can maintain the default setting (within the administration UI) and change this parameter on the phone to **on next power on**. The next time the phone boots up it will take the default configuration. This will eliminate any undesirable settings and the user of the phone can now configure his or her own preferences.

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. This is useful if the phone is in a common area and users may change the settings from those desired by the system administrator.

10.5.4 Date and Time

This allows you to adjust the current date and time on the ZIP4x5 and select the offset from GMT. By default, the phone should use NTP and obtain its time automatically. If you find that the date or time is incorrect, contact the administrator of your network.

The phone relies on having an accurate time for its operation. Therefore, if you need to adjust the phone, you need to reboot the phone. To make the changes:

1. Select Menu | Settings | Date and Time.

1. See section 5.1 on page 37 for a description of the mechanism by which this takes place.

- The display changes to:

```
Phone must restart.
Continue?
➤No      Yes
```

- Use the Up and Down buttons or the Up and Down keys to select Yes and press the Enter button.

The phone restarts and shows the display described in section 4.3.3 on page 27. The phone operates from that point forward. The phone will overwrite configuration parameters with data received from the DHCP server and TFTP server but will not destroy user settings such as phone lists.

- Press the Esc button, or select No and press the Enter button, if you do not want to change the date and time.

10.5.5 Audio

This allows you to configure the ring tones and what sound if any is played when you press a button or key. You select the country where you live separately (see section 10.5.10 on page 160). That selection determines the sounds you hear for other call progress tones.

To configure the audio properties, do the following:

- Select Menu | User Settings | Audio.
- The display changes to:

```
Set | Audio
➤external ring tone
  internal ring tone
  internal call answr
  call disconnect
  second call tone
  hold reminder tone
  key click
```

This example shows eight rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

If the administrator has selected (see section 10.6.6 on page 178) that only a single tone should be played for internal or external calls, the phone instead displays in lieu of rows two and three:

```
➤ring tone
```

3. Press the Enter button, the display shows:

```
External ring tone
➤ring pause
ring ring
short ring
bell bell
custom
```

This example shows six rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

When you move to a different selection, the phone plays the particular sound. The volume keys control the volume and do not select between the items in the list.

See section 10.5.5.1 on page 152 for how to access the custom audio features.

4. If you make a selection other than custom, the phone changes the display to that shown in step 2.
5. Select "internal ring tone" and press the Enter button, the display shows:

```
Internal ring tone
ring pause
➤ring ring
short ring
bell bell
custom
```

This example shows six rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

When you move to a different selection, the phone plays the particular sound. The volume keys control the volume and do not select between the items in the list.

See section 10.5.5.1 on page 152 for how to access the custom audio features.

6. If you make a selection other than custom, the phone changes the display to that shown in step 2.
7. Select "internal call answer" and press the Enter button. The display shows:

```
Internal Call Answer
➤ring phone
auto answer speaker
auto answer hook
```

This example shows four rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

Select **Ring Phone** to program the phone to plays the internal ring tone until you take the phone off hook or a system call handling routine sends the call to an operator or your voice mail.

Select **Auto Answer Speaker** to program the phone to ring once, then automatically go off hook and route the caller's voice through your external speaker. You can then speak to the calling party.

Select **Auto Answer Hook** to program the phone to ring once, then automatically go off hook and route the caller's voice through your headset. You can then speak to the calling party.

8. Select "call disconnect" and press the Enter button; the displays shows:

```
Call disconnect
➔busy tone
  busy tone timeout
  silent
```

This example shows four rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

Select **busy tone** to program the phone to play a busy tone after the other party disconnects from a phone call

Select **busy tone timeout** to program the phone to play a busy tone for five seconds after the other party disconnects from a phone call

Select **silent** to program the phone to remain quiet after the other party disconnects from a phone call.

9. Select "second call tone" and press the Enter button, the display shows:

```
Second call tone
➔short high beep
  long high beep
  short low beep
  long low beep
  custom
  silent
```

This is the tone that is played to you when you are talking on the phone and the phone receives an incoming call (call waiting). The phone does not play the standard ring tone but instead announces the call with the tone you select here.

This example shows seven rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. Also, with each choice, the phone plays the particular sound. The volume keys control the volume and do not select between the items in the list.

See section 10.5.5.1 on page 152 for how to access the custom audio features.

10. If you make a selection other than custom, the phone changes the display to that shown in step 2.

11. Press "hold reminder" and press the Enter button. The display shows:

```
Hold reminder
➔off
  beep
  bleep
```

This example shows four rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. Also, with each choice, the phone plays the particular sound.

This tone is played once every 30 seconds when you have a call that is on hold.

12. Select "key click" and press the Enter button, the display shows:

```
Key click
➔off
  click
  beep
  bleep
```

This example shows five rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. Also, with each choice, the phone plays the particular sound.

This tone is played when you press a button or when you press a non numeric key. It is also played when you press a numeric key and are not necessarily dialling a number.

13. When you have made your selection, press the Enter button. The phone changes the display to that shown in step 2.

10.5.5.1 Custom Audio

This section describes how you can select a custom tone to indicate an incoming call from an internal number or an external number or indicate a second call (while you are on a call).

In this section, the first line of the display of the screen images shows:

```
External ring tone
```

However, if you are selecting a custom tone for the internal calls, the screens will instead show:

```
Internal ring tone
```

If you are selecting a custom tone to indicate a second call, the screens will instead show:

```
Second call tone
```

For details on how to access these functions see step 3 (for external ring tone), step 5 (for internal ring tone), or step 9 (for second call tone) of section 10.5.5 on page 149.

1. When you select custom, the display shows:

```
External ring tone
Retrieving list
■■■■■■■■ 01:17
```

The phone shows a new bar every second and maintains the total time on the right of the third row of the display. Every 10 s the phone clears the bars and then starts to show them one by one again.¹

2. After the phone has found all the custom tones available, it lists them and displays:

```
External ring tone
➔sound1
  sound2
```

3. Use Up and Down or the volume keys to scroll between the choices. Press the Enter button to select a sound or the Esc button to return to the previous menu.
4. When you select a file, the phone retrieves it from the server and the display shows:

```
External ring tone
Downloading file
■■■■ 00:34
```

The phone shows a new bar every second and maintains the total time on the right of the third row of the display. Every 10 s the phone clears the bars and then starts to show them one by one again.²

5. When the phone has downloaded the file, the phone plays the file and displays:

```
External ring tone
bell bell
➔custom
```

6. Press the Enter button to keep this selection. The phone changes the display to that shown in step 2 on page 149. Press the Esc button if you want to select a different file. The phone displays that shown in step 2 on page 153 so you can select a different file.³
7. If the phone encounters errors while accessing the HTTP server or retrieving the file, it will display one of the following messages.

1. The length of time taken to access the server depends on the number of sound files stored on the server and the activity on your network. This could be anywhere from a few seconds to a few minutes.

2. The length of time taken to download the file depends on the size of the file and the activity on your network. This could be anywhere from a few seconds to a few minutes.

3. The phone assumes that the list of files has not changed and therefore shows you the same list of files that it earlier retrieved. If you wait for more than 30 seconds, the phone will once again retrieve the list of files and will display that shown in step 1 instead.

- a. The ZIP4x5 displays this message if the connection to the HTTP server fails:

```
External ring tone  
Error: Connection  
failure
```

- b. The ZIP4x5 displays this message if the HTTP server does not exist or does not respond:

```
External ring tone  
Retrieving list  
Error: time-out
```

- c. The ZIP4x5 displays this message if the HTTP server denies access:¹

```
External ring tone  
Retrieving list  
Error: unauthorized
```

- d. The ZIP4x5 displays this message if the HTTP server forbids access:²

```
External ring tone  
Retrieving list  
Error: forbidden
```

- e. The ZIP4x5 displays this message if there is an error with the HTTP server:³

```
External ring tone  
Retrieving list  
Error: bad server
```

- f. The ZIP4x5 displays this message if the specified directory on the HTTP server is empty:

```
External ring tone  
Retrieving list  
Error: no files
```

- g. The ZIP4x5 displays this message if the downloaded WAV file is of the wrong format:⁴

```
External ring tone  
Downloaded file  
Error: wrong format
```

1. This is HTTP error 401 (unauthorized).

2. This is HTTP error 403 (forbidden).

3. This is one of the HTTP errors 500 (internal server error), 501 (not implemented), 502 (bad gateway), or 503 (service unavailable).

4. The WAV files that are saved on the HTTP server must be encoded as described in section 10.6.6 on page 178.

10.5.6 Event Timer

The phone displays messages about the status of a call or a problem. Some of these messages are displayed only temporarily. With this setting, you determine for how long the phone should show the message.

1. Select Menu | User Settings | Event Timer.

The display changes to:

```
Event Timer
seconds (2..10)
➔3
```

2. Use the keypad to enter a number between 2 and 10. This represents the time in seconds for which the event will be displayed. The default value is three seconds.
3. Press the Enter button.

10.5.7 Bluetooth

The Bluetooth menu configures the ZIP4x5 to recognize and interact with your Bluetooth wireless headset. The configuration process require the following steps:

- Enabling Bluetooth mode
 - Detecting available Bluetooth headsets
 - Pairing the headset that you will use with the ZIP4x5
 - Adjusting the microphone sensitivity
1. To enable Bluetooth mode on the ZIP4x5, select Menu | User Settings | Bluetooth from the main menu. If the phone is not in Bluetooth mode, the display changes to:

```
Bluetooth
➔enable
```

Select enable and press the enter button.

2. When Bluetooth is enabled, the phone displays the Bluetooth menu:

```
Bluetooth
➔Discover
Headsets
Microphone
Disable
```

This example shows five rows, though in practice the display can show only three rows at once.

Use the up and down buttons to adjust the sensitivity.

7. To disable Bluetooth on your phone, select Disable from the Bluetooth menu, then press the Enter button. The menu will display a Bluetooth Disabled message to indicate that the phone is no longer in Bluetooth mode.

10.5.8 Voice Commands

The Voice Commands menu configures the ZIP4x5 to recognize and interact with your Bluetooth wireless headset. The configuration process require the following steps:

- enabling Voice Commands
- calibrating the phone to ignore background noise
- training the phone to recognize your voice commands

To use voice command dialling, you must train the phone to recognize the command “Dial Number” and at least one contact.

You can use the handset, headset, or Bluetooth wireless headset when performing voice commands. The external speaker-microphone does not support voice commands.

The following procedure configures your phone to recognize your voice commands:

1. To enable voice activated dialling on the ZIP4x5, select Menu | User Settings | Voice Commands from the main menu. If Voice Activated Dialling was not previously enabled on your phone, the display changes to:

```
Voice Commands
➔enable
```

Select enable and press the enter button.

2. When Voice Activated Dialling is enabled, the phone displays the Voice Command menu:

```
Voice Commands
➔Phone Book
  Hot Words
  Calibrate
  Erase All
  Disable
```

This example shows six rows, though in practice the display can show only three rows at once.

- Before training the phone to recognize your voice, you should calibrate the ZIP4x5 to ignore the local background noise. To calibrate the ZIP4x5, select Calibrate and then press the enter button. The phone will ask you to go off hook, speak loudly for a short period, then remain silent for a period. The phone displays a menu similar to the following after you complete the calibration process:

```
Calibration Finished
BOS Level: 1000
Gain Level: 4.2db
```

You should repeat the calibration process for each ZIP4x5 microphone that you will use, including the handset, headset, and Bluetooth headset. Although calibration is not necessary to execute voice activated dialling, it will improve the phone's speech recognition ability, especially in noisy environments. You can calibrate the phone at any time; you should calibrate the phone prior to training it and when you move the phone into a different noise environment.

- To train the ZIP4x5 to recognize your contacts by voice, select Phone Book, then press the Enter button. The menu displays a portion of your phone book.

```
*James Little
➔ Kelvin Mason
  Zeke Miller
```

You can program the phone to recognize ten of your contacts through voice commands. An asterisk next to a person's name indicates that you can initiate a call to that person by speaking his or her name.

- Select an individual with the up or down buttons and press the Enter button. If the phone is programmed to recognize the person's name, the menu displays:

```
James Little
➔Play
  Record
```

If the phone is not programmed to recognize the person's name, it will only list Record as an option. To listen to the playback of the person's name, select Play and press the enter button.

- Select Record and press the enter button. The menu displays a "Please go off hook" request. After you go off hook, the menu displays:

```
Recording #1 of 4
Speak Now
■■■■■
```

- Speak the name of contact into your handset or headset microphone. After you finish speaking, the menu displays:

```
Recording #1 of 4
OK
<Enter> to continue
```

Press the Enter button. The phone will ask you to speak the name of your contact a total of four times. After the fourth iteration, the menu displays the phone book again, as in step 4. You can either repeat the process for another contact or press the Esc button to return to the Voice Commands menu.

8. Select Hot Words from the Voice Commands menu to program the ZIP4x5 to recognize your commands. The menu displays:

```
Hot Words
 *Dial Number
 ➔ Yes
   No
```

This example shows four rows, though in practice the display can show only three rows at once. To use voice commands, you must program the phone for each Hot Word; an asterisk next to a hot word indicates that the Phone is programmed for that command.

9. Select a Hot Word with the cursor and press the Enter button:

```
Word: Yes
 ➔ Record
```

If the ZIP4x5 is programmed to recognize this command, the menu will provide an option to playback the recording of the command.

10. To train the phone to recognize this word, select Record and press the Enter button. The process of training the phone to recognize this command is identical to the process of train the phone to recognize your contact, as described in step 6 and step 7. Repeat this process for all hot words.
11. To remove all voice training, select Erase All from the Voice Command menu and press the Enter button. This command is useful when training a phone that was previously used by another person.
12. To disable voice activated dialling, select Disable from the Voice Command menu and press the Enter button. All the training information that is entered into the phone remains intact after you disable voice activated dialling.

10.5.9 Analog

To configure the ZIP4x5 for making analog calls, do the following:

1. Select Menu | User Settings | Analog. The display changes to:

```
Analog
 ➔ Block outgoing call
   Analog is default
   Digital is default
```

This example shows four rows, though in practice the display can show only three rows at once.

To prohibit the ZIP4x5 from making any calls through the analog line, select *Block outgoing call*. Any calls that you initiate from the phone will be through an ethernet line; the only time the phone will use the analog line is for incoming calls.

To program Call Appearance 4 for outgoing analog calls and designate the analog line as the default for outgoing calls, select *Analog is default*, then press the enter button.

To program Call Appearance 4 for outgoing analog calls and designate the digital lines as the default for outgoing calls, select *Digital is default*, then press the enter button.

10.5.10 Regional Options

To configure the regional options, do the following:

1. Select Menu | User Settings | Regional Options.

The display changes to:

```
Set | Regional Optn
➔country
  language
  number format
  date and time
  time format
  date format
```

This example shows seven rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

2. Press the Enter button. The phone displays the country settings menu:

```
Settings | Country
  UK
  ➔USA
```

To select a country, scroll through the list of countries with the Up and Down buttons. Available country 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.

This selection determines the tones that the phone generates for call progress tones (dial tone, ringback tone, busy tone, and network busy tone (congestion)). It does not determine the tone used for alert (ringing), which informs you of an incoming call.¹

The selection is also used to narrow your choices of time zones.

3. Select the country, press the Enter button, press the Down button and press the Enter button again.

1. See section 10.5.5 on page 149 for details on how to select different ring tones.

The display changes to:

```
Settings | Language
➔English
```

With this version of the software, only English is supported.

4. Press the Enter button, press the Down button and press the Enter button again.

The display changes to:

```
Settings | Numbers
➔. decimal , 1000
. decimal 1000
, decimal . 1000
, decimal sp 1000
, decimal 1000
```

The selections allow you to choose how you want numbers displayed by selecting the characters used for the decimal point and the delimiter for thousands. For example, the selections would show a number as:

- a. 12,345.6789
- b. 12345.6789
- c. 12.345,6789
- d. 12 345,6789
- e. 12345,6789

The phone uses this format only when you use the calculator.

5. Choose the format that you want, press the Enter button, press the Down button and press the Enter button again.

The display changes to:

```
Settings | Date Time
➔date time
time date
```

This determines whether the phone shows the date before or after the time, for example:

```
09:30 Sun 07 Mar 04
Sun 07 Mar 04 09:30
```

6. Select the format you want and press the Enter button.¹ Press the down button and press the enter button to select time format.

1. If you want to change the date and time, see section 10.5.4 on page 148.

The display changes to:

```
Settings | Time Frmt
➔24 hour
 24 hour + seconds
 12 hour
 12 hour + seconds
```

In 24 hour format the phone always uses two digits for the hour. For example

```
09:30
```

In 12 hour format the phone uses one or two digits for the hour and appends an 'a' or 'p' at the end after the minutes. For example

```
9:30a
```

When you display the seconds it appears, for example, as:

```
09:30:27
9:30:27a
```

7. Select the format you want and press the Enter button. Press the down button, then press the enter button to select date format.
8. The display changes so that you can select the format for the date. The choices depend whether you have selected to display seconds or not.

If you have chosen to not display seconds, the choices are:

```
Settings | Date Frmt
➔Thu 16 Mar 04
 03/18/2004
 03-18-2004
 03/18/04 Thu
 03-18-04 Thu
 Thu Mar 18 04
 04 Mar 18 Thu
 04/03/18 Thu
 04-03-18 Thu
 2004/03/18
 2004-03-18
```

This example shows 12 rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

If you have chosen to display the seconds in 12 hour format, the choices are:

```
Settings | Date Frmt
➔03-5 Fri
 03/5 Fri
 03/5/02
 03-5-02
 03/05 Fri
 03-05 Fri
 04/03/05
 04-03-05
```

If you have chosen to display the seconds in 24 hour format, the choices are:

```
Settings | Date Frmt
➔03-5 Fri
 03/5 Fri
 03/5/04
 03-5-04
 03/05 Fri
 03-05 Fri
 04/03/05
 04-03-05
 Fri 05 Mar
 Fri Mar 05
 Mar 05 Fri
```

9. Select the one you want and press the Enter button.
10. Press the menu button to exit the menu function.

10.5.11 Emergency Numbers

This option defines phone numbers that the ZIP4x5 will always call over the analog PSTN line. Dialling any emergency number overrides the Block Outgoing Call setting in the Analog menu, as described in section 10.5.9 on page 159. You can designate up to three phone numbers as emergency numbers.

To configure the ZIP4x5 emergency numbers:

1. Select Emergency Numbers from the User Settings menu:

```
Emergency
➔911
 <Enter to edit>
 <Enter to edit>
 Erase All
```

This example shows five rows, though in practice the display can show only three rows at once.

The menu displays the emergency numbers that you have configured, along with an Erase All option that deletes the numbers. Each unused emergency number slot displays the “<Enter to Edit>” message.

2. To edit an emergency number, select a number or emergency number slot and press the Enter button. The menu displays:

```
Emergency Number
➔Edit
Delete
```

To remove the number from the list of emergency numbers, select Delete and press the Enter button. This option is not available for unused emergency number slots

To edit the emergency number, select Edit and press the Enter button. Type the new emergency number next to the arrow and press the Enter button.

10.5.12 Factory Defaults

Select the Factory Defaults option from the User Settings panel to reset the phone parameters to their original, factory installed values.

10.6 Menu | Protected Settings

This allows 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 of the parameters in this menu is protected by a password that you need to enter to make changes to the settings. If you do not know the password, you can view but not alter the parameters. The menu name *Protected Settings* indicates that you need a password to modify the settings.

When you select Menu | Protected Settings the display shows:

```
Protected Settings
➔Password
IP Communications
SIP Communications
VLAN
Names and numbers
Audio
```

This example shows seven rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are:

Password. Enter and change the password, and log out of password mode. See section 10.6.1 on page 165.

IP Communications. Configure IP addresses and related parameters. See section 10.6.2 on page 166.

VLAN. Configure the VLANs for the various Ethernet ports. See section 10.6.4 on page 173.

Names and Numbers. Enter the names and phone numbers associated with the phone. See section 10.6.5 on page 176.

Audio. Configure the sounds that the phone can play. See section 10.6.6 on page 178.

10.6.1 Password

When the phone is shipped from the factory, it has the default password:

```
985897
```

This corresponds to the word “zultys.” When you select Menu | Protected Settings | Password the display shows:

```
PSettings | Password
➔Enter password
*****
```

You enter the password followed by the Enter button. The ZIP4x5 displays the star characters shown above as you enter the password. You need to enter the correct password to be able to change any of the protected settings described in the remainder of this section 10.6.

If you enter the password incorrectly, the screen remains, prompting you to enter the password again.

If you enter the password correctly, the display changes to:

```
PSettings | Password
➔Log out
Change
```

You should log out once you have made changes to the phone configuration to prevent other people from modifying the parameters. The phone will log you out automatically if you have not made any changes to the configuration for ten minutes or if you turn the power off.

To change the password, select Change. The display shows:

```
PSettings | Password
➔Enter new password
*****
```

When you press the Enter button, the display changes to:

```
PSettings | Password
➔Repeat new password
*****
```

If you enter the password the same each time, the ZIP4x5 displays the upper level. Otherwise, the ZIP4x5 prompts you to enter the new password again. The password can be only numeric (you can use the digits 0 to 9, the # character and the * character) and can be from 4 to 15 characters. If you try to add a sixteenth character, the phone plays the DTMF digit for the # key and replaces the last character in the string with the last typed character.

The Administrator can change the password from the configuration file that is saved on the TFTP server. If the Administrator chose to do so, the ZIP4x5 restores the password to that saved in its configuration file the next time it powers up.¹

10.6.2 IP Communications

When you select Menu | Protected Settings | IP Communications, the display shows the parameters needed by the phone to communicate with the network. Each of these parameters is locked and you cannot change any of them unless you have previously entered the password. If you have entered the password, you can modify any of the parameters.

The first screen shows:

```
PSettings | IP
➔DHCP
  Phone address
  Subnet mask
  Default gateway
  DNS server
  Secondary DNS
  NTP server
  TFTP server
  TFTP address
  DSCP
  Stun
```

This example shows twelve rows, though in practice the display can show only three rows at once. Use the Up and Down buttons or the Up and Down keys to scroll through the various settings. Press the Enter button to select a parameter.

Type the new value using the keypad. Most parameters require an IP address. To enter the period (full stop), use the * key. You can enter some parameters by entering an FQDN. To enter this, follow the procedure described in section 9.2.6 on page 102.

Press the Enter button (to save changes) or the Esc button (to discard changes) to exit the screen. The selections are as follows:

DHCP. This allows you to enable or disable DHCP.

```
PSettings | IP
➔Enable DHCP
  Disable DHCP
```

1. Automatic provisioning is described in section 5.1 on page 37.

When you enable DHCP, the DHCP server should provide the following information:

- IP address for the phone
- domain name
- subnet mask
- address of the default gateway (you can specify this as an IP address or an FQDN)
- IP address of the DNS server
- IP address of the secondary DNS server
- address of the NTP server (you can specify this as an IP address or an FQDN)
- address of the TFTP server (you can specify this as an IP address or an FQDN)

If you enable DHCP you should not ordinarily modify these parameters on the ZIP4x5. If the server does not provide all of these parameters, or if you want to make a change to one of the parameters, you can set it from the appropriate screen.¹

When you disable DHCP, you must enter these parameters manually.²

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

```
PSettings | IP
Address of phone
➔192.168.0.6
```

Subnet Mask. This identifies the subnet mask for the phone.

```
PSettings | IP
Subnet mask
➔255.255.254.0
```

Default Gateway. This is the IP address for the gateway on the same subnet on which the phone resides.

```
PSettings | IP
Default gateway
➔10.1.30.1
```

1. In the version of software available as of the time of writing, you need to reboot the phone for any changes to the IP parameters to take effect. If the phone reads data from the DHCP server during the boot up process, it will overwrite whatever parameter you have modified if the server provides that parameter. The phone will not overwrite parameters that are absent in the data that it receives from the DHCP server.
2. For each of the parameters that you enter from the keypad, you can enter only an IP address and cannot enter an FQDN.

DNS Server. This is the IP address for the server that provides address resolution (DN to IP address) for the phone.

```
PSettings | IP
DNS server
➔10.1.10.1
```

Secondary DNS Server. This is the IP address for the alternative server that provides address resolution (DN to IP address) for the phone.

```
PSettings | IP
Secondary DNS server
➔10.1.10.10
```

NTP Server. This is the IP address for the server that provides date and time information for the phone. If you leave this field blank, or if your DHCP server does not provide an address for the SNTP server, the ZIP4x5 uses the address of the SIP Outbound Proxy to access the SNTP server.

```
PSettings | IP
NTP server
➔10.1.10.194
```

TFTP Server. This parameter indicates the source of the IP address for the TFTP that provides the configuration files to the ZIP4x5.

```
PSettings | IP
From DHCP
➔Fixed Address
```

TFTP Address. This is the IP address for the file server that provides configuration information for the phone.

```
PSettings | IP
TFTP server
➔10.1.10.20
```

The TFTP server should contain a configuration file that provides the following information:¹

- address of the SIP outbound proxy server (you can specify this as an FQDN or an IP address)
- address of the SIP registrar server (you can specify this as an FQDN or an IP address)
- address of the voice mail server (you can specify this as an FQDN or an IP address)
- RTP start port
- SIP receive port
- SIP transmit port

1. For more information about how the phone uses the TFTP server, see section 5.1 on page 37.

- SIP transport protocol

If you use the ZIP4x5 with the a system that does not creates the configuration file with all these parameters, you must configure these parameters manually.

DSCP. The next setting is the DSCP (layer 3 QoS) setting.¹ The phone displays:

```
Phone port DSCP
➔0
(0~63. VoIP 46)
```

Type a number for the DSCP setting and press the Enter button. The phone will not accept a number that is greater than 63. All voice packets (RTP) leaving the phone's microprocessor will have this value in the ToS byte of the IP header (see figure 1-3 on page 4).

The default value is 0, which corresponds to best effort. If you use differentiated services in your network, you should set the value to 46 (101110 binary) which corresponds to the expedited forwarding per hop behavior (PHB).

Stun. This setting allows you to specify the Stun server IP address and port number. Select Stun from the IP Communications menu to display the following panel:

```
PSettings | Stun
➔Stun server
Stun server port
```

Select Stun server and press the Enter button to enter the IP address of the Stun server:

```
PSettings | IP
Stun Server
➔
```

Select Stun server port and press the Enter button to enter the port number of the Stun server:

```
PSettings | IP
Stun server port
```

10.6.3 SIP Communications

When you select Menu | Protected Settings | SIP Communications, the display shows the parameters needed by the phone to communicate with the SIP proxy and registrar servers.²

Each of these parameters is locked and you cannot change any of them unless you have previously entered the password. If you have entered the password, you can modify any of the parameters.

1. RFC 2597 and RFC 2598 define the various code points and per-hop behavior (PHBs). RFC 2474 and RFC 2475 define differentiated services.
2. SIP phones sessions are conducted by exchanging a a series of SIP messages with the SIP server. The ZIP4x5 will not respond to any SIP message that has a damaged contact field.

The first screen shows:

```
PSettings | SIP
➔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
```

This example shows seventeen rows, though in practice the display can show only three rows at once. Use the Up and Down buttons or the Up and Down keys to scroll through the various settings. Press the Enter button to select a parameter.

Type the new value using the keypad. Most parameters require an IP address. To enter the period (full stop), use the * key. You can enter some parameters by entering an FQDN. To enter this, follow the procedure described in section 9.2.6 on page 102.

Press the Enter button (to save changes) or the Esc button (to discard changes) to exit the screen. The selections are as follows:

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

```
PSettings | SIP
Outbound proxy
➔10.1.30.194
```

Backup Proxy Server. This is the IP address of the backup proxy server. The ZIP4x5 will attempt to switch to the backup proxy if the primary proxy server fails to operate.

```
PSettings | SIP
Backup proxy
➔10.1.31.196
```

Registrar Server. This is the IP address of the registrar server. When this value is set, the ZIP 4x5 attempts to register with this server instead of the proxy.

```
PSettings | SIP
Registrar server
➔10.1.30.194
```

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. 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.

```
PSettings | SIP
RTP start port
➔1760
```

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

```
PSettings | SIP
Receive port
➔5060
```

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

```
PSettings | SIP
Proxy port
➔5060
```

Registrar Port. This parameter specifies the SIP Registrar server port. The default value is 5060 and that is used if you leave this field blank.

```
PSettings | SIP
Registrar port
➔5060
```

Backup Proxy Port. This parameter specifies the TCP or UDP port number of the backup proxy. The default value of 5060 is used if you leave this field blank.

```
PSettings | SIP
Backup proxy port
➔5060
```

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

```
PSettings | SIP
Page server
➔10.1.31.193
```

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.

```
PSettings | SIP
Transport protocol
➔UDP
```

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

```
PSettings | SIP
Invite retrans
➔6
```

Non Invite Retransmission. 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.

```
PSettings | SIP
Non invite retrans
➔10
```

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

```
Register with
backup proxy?
➔No      Yes
```

Proxy Password. The proxy password authenticates the ZIP4x5 to proxy servers that require authentication. Default value is blank.

```
PSettings | SIP
Proxy password
➔
```

Outgoing SIP Calls. When the ZIP4x5 is configured as a router, this parameter determines the IP address that is listed as the source within all SIP packets that originate from the phone. See section 8.3 on page 77 (WAN address) and section 8.4.1 on page 81 (LAN address)

```
PSettings | SIP
➔LAN
  WAN
```

Outgoing RTP. When the ZIP4x5 is configured as a router, this parameter determines the IP address that is listed as the source within all RTP packets that originate from the phone. See section 8.3 on page 77 (WAN address) and section 8.4.1 on page 81 (LAN address)

```
PSettings | SIP
➔LAN
  WAN
```

10.6.4 VLAN

The VLAN menu is used for editing VLAN configuration settings when the phone is in normal network mode. It is recommended that you do not alter these settings when the phone is in remote network mode.

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.

You can have one to eight VLANs on the ZIP4x5. These are referred to as A, B, C, D, E, F, G, and H. For each VLAN, you can specify the VLAN ID from 0 to 4094.¹

Each Ethernet circuit can be on different VLANs. The phone itself is considered to connect to a separate Ethernet circuit on the switch, as shown in figure 1-3 on page 4.

To configure the VLANs, do the following:

1. If you have not already done so, enter the password as described in section 10.6.1 on page 165 so that you have rights to make the changes.
2. Select VLAN from the menu (Menu | Protected Settings | VLAN).

The display shows:

```
VLAN support
➔Off      On
```

Select On to enable VLAN support within the ZIP4x5.

1. You should not normally use VLAN ID of 0. You may not obtain the results you expect if you do so.

3. Press the enter button. The display shows:

```
VLAN definition
A: 1
(0 to 4094)
```

Type a number from 0 to 4094. Use the left and right keys to edit the number as described in section 9.2.7 on page 104. The default value is 1.

4. Press the Down button or the Enter button. The phone changes the display to:

```
VLAN definition
B: * not used *
(0 to 4094; * = no)
```

Type a number from 0 to 4094 or press *. When you press * the phone clears the number and indicates that this VLAN definition is not used. This is the default value.

5. Press the Enter button. If you have defined a second VLAN (that is, you entered a VLAN ID for the definition of B), the phone prompts you to define a third VLAN (C), and so on.
6. As soon as you define no more VLANs (or you define eight VLANs which is the maximum number), the phone displays:

```
VLAN A
P1 U
P2 U
```

7. The phone shows a table.
 - a. You can change the data in the cells of the table.
 - b. The column headings of the table show the VLANs that you have defined. In the example above only the first VLAN (A) was defined.
 - c. The row headings of the table shows four circuits: P1, P2, P3, and LAN. The phone circuit for VLAN A is always untagged and is not displayed.
8. In the second and third rows, the phone displays whether the phone and Ethernet circuit P1 are included in the VLAN or not. The phone shows:
 - a. U if the circuit is included in the VLAN but untagged
 - b. T if the circuit is included in the VLAN and tagged
 - c. E if the circuit is excluded from the VLAN
9. The phone places the cursor in the first cell of the table (representing the setting for the first VLAN for the phone).
10. To change the setting, press:
 - a. 1 for U
 - b. 2 for T
 - c. 3 for E

11. The phone moves the cursor to the next position. If you have defined a single VLAN (as shown in the example above) the phone places the cursor under the configuration for the port P1.
12. Continue to select the configuration for the other ports. Use the Up and Down buttons or the left and right keys to scroll between the selectable entries.
13. The phone scrolls the display to be:

```
VLAN A
P2 U
P3 U
```

14. Press the Enter button when you have finished entering all the data in the table.
15. An example of a more complex table might be:

```
VLAN A B C
P1   U T E
P2   E T E
P3   T E U
LAN  T T T
```

This example shows five rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the rows.

The phone defaults to having all ports members of VLAN A. P1, P2, P3, and LAN are untagged members of the VLAN and the VLAN ID is 1.

When you create another VLAN, the phone defaults to excluding all ports from the other VLAN. You must then select those ports that will be tagged or untagged members of the newly created VLAN.

The phone port (Phn) is always excluded from all VLANs except the first (VLAN A), which is untagged. The phone port is not displayed by the menu.

No port can be an untagged member (U) of more than one VLAN. If you set a port to be an untagged member of one VLAN and then set it to be an untagged member of a different VLAN, the phone changes the initial setting to be excluded from the VLAN.

16. Configure the CoS setting (IEEE 802.1p). The phone displays:

```
Phone port L2 CoS
➔5
(0 to 7. Default 5)
```

Type a number for the setting – the phone will accept an input from the keys 0 to 7. This setting is used only by the phone port on the switch. Press the Enter button.

The phone does not display this if you have not configured the Phn port to be a tagged member of VLAN A.

10.6.5 Names and Numbers

When you select Menu | Protected Settings | Names and Numbers, the display shows:

```
PSettings | Names
➔Device ID
  Domain
  Voice Mail
  Park Extension
  Page Extension
```

This example shows six rows, though in practice the display can show only three rows at once. Use the Up and Down buttons or the Up and Down keys to scroll through the various settings. Press the Enter button to select a parameter.

The selections are as follows. Any of the parameters can be alphanumeric. To enter an alphanumeric parameter, follow the procedure described in section 9.2.6 on page 102.

Device ID. Specify 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

When the phone is shipped from the factory, this parameter is blank. The phone then uses the MAC address. If you want to use a different name, type it in the field. To restore the device ID to be the value of the MAC address, delete the text in the field.

```
PSettings
Device ID
➔
```

Domain Name. Specify the domain name for the enterprise. This has no default value and you must therefore complete this parameter. The phone can obtain this information from the DHCP server. This is always specified as an FQDN, so the phone automatically enables character entry mode.

```
PSettings Func:abc
Domain name
➔Zultys.com
```

Voice Mail. Specify the name or number for the server that stores voice mail. The name or number of the voice mail is saved at memory location 00. You can dial it by pressing the Msg button or pressing Memory 00.¹ When the ZIP4x5 needs to access the voice mail, it sends the call to:

<voice mail number>@<SIP outbound proxy server>

For example:

5500@10.1.30.194

You can enter a name for the address of the voice mail. Therefore, any of the following is valid:

1. See section 9.7.3 on page 122 for how to dial from a memory location. See section 7.1 on page 55 for how to access the voice mail using the Message button.

voice.mail@10.1.30.194
 voice.mail@SIP.Zultys.com
 5500@SIP.Zultys.com

This parameter has the default value of

voice.mail

If this value is acceptable, you do not need to modify it. The phone can obtain this information from the configuration file pulled from the TFTP server.

```
PSettings Func:abc
Voice mail
➔voice.mail
```

```
PSettings
Voice mail
➔5500
```

Park Extension. Specify the name or number for the server that handles call park and call pickup.¹ When the phone parks a call, it transfers the call to the park server which returns the two digit park ID. When the user picks up a parked call, the phone makes a call to the park server with the additional two digits appended.

When you press the Park or Pickup button, the phone sends the call to:

<park extension>@<SIP outbound proxy server>

For example:

5501@10.1.30.194

```
PSettings
Park Extension
➔5501
```

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

```
PSettings
Page Extension
➔*4
```

1. Call park and call pickup are described in section 7.6 on page 66 and section 7.7 on page 68.

10.6.6 Audio

This selection allows you to control the way speech and ringing tones are handled on the ZIP4x5. The phone is supplied with four standard tones to announce ringing that most businesses will find acceptable. The phone can play any WAV file as a ringing tone. Using these settings you determine what choices the users of the phone will have to change the ringing tones for the phone.

To configure the audio properties, do the following:

1. If you have not already done so, enter the password as described in section 10.6.1 on page 165 so that you have rights to make the changes.
2. Select Menu | Protected Settings | Audio.
3. The display changes to:

```
PSettings | Audio
+codec
  encryption
  distinctive ring
  accept URL
  sound URL
```

This example shows six rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices.

4. Press the Enter button to select one of the parameters described below.

Codec. This is the way the speech is encoded. Normally, you should select G.711 μ law for North America and Japan, and G.711 A law everywhere else. The G.729 codecs should be used in situations where available bandwidth may be a concern.

```
Audio | Codec
+G.711  $\mu$  law
  G.711 A law
  G.729A
  G.729AB
```

Encryption. This allows you to select whether encryption must be used in the enterprise or not. This selection modifies the way encryption is engaged as described in section 7.2 on page 55.

If you want to allow the user the option to select encryption as he or she sees fit, choose **normally on** or **normally off**. In the one case the phone usually attempts to establish a secure connection and in the other case the phone usually attempts to establish an insecure connection. Final control is left to the user.

If you want all calls in your enterprise to be encrypted and do not want a user to disable encryption, choose **always on**.

If you never want to allow users to encrypt a conversation, choose **never on**.

```
Audio | Encryption
➔normally on
  normally off
  always on
  never on
```

Important If you select **always on** and the phone system does not support encryption, users can make calls from one phone to another but cannot make calls to the PSTN, receive calls from the PSTN, hear music on hold, or receive voice mail.

Danger If you select **always on** and the phone system does not support encryption, users cannot dial emergency services from the phone.

Distinctive Ring. This allows the user of the phone to select a single ring tone for all received calls, or separate ring tones for internal and external calls.

```
Distinctive ring
➔allow
  do not allow
```

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.

```
Accept URL
➔no
  yes
```

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.

```
Sound URL   Func:abc
http://intranet/MIS/
phone_sounds
```

When a user selects a WAV file from that location, the phone stores it in its memory. Therefore, there is no increase in network traffic with each incoming call and no delay in announcing the call to the user.

For a ring tone, the phone stores only the first 128 KB of any WAV file (approximately 16.4 s of sound). When it plays the WAV file, it repeats it until the call is answered or terminated. For a second call tone, the phone stores only the first 8 KB of any WAV file (approximately 1 s of sound). The phone plays this only once when a call is received.

To specify a location, type it in using the method described in section 9.2.6 on page 102. The phone automatically puts the keypad in character mode for this purpose and displays Func:abc on the top row. The phone displays only 40 characters of the path. If you type more than 40 characters the phone scrolls the entire path name. When the phone first displays the path, it shows only the first 40 characters.

The ZIP4x5 will allow users access only to the first 256 files in the directory. Therefore, you should not store more than this. Each of the files in the directory must be encoded as 8 bit μ -law (PCM).

If you do not want to allow users access to this feature, clear the string completely.

10.7 Menu | Self Test

10.7.1 Purpose

This menu selection allows you to test the phone and the network to which it is connected. The phone will not allow you to make or receive calls when you are conducting any of the self tests. When you select Menu | Self Test the display shows:

```
Self Test
➔Ping
  Loop Ethernet ports
  Buttons and keys
  LEDs
  LCD
  Audio
  Audio Return
```

This example shows eight rows, though in practice the display can show only three rows at once. As you press Up and Down, the display scrolls through the list of choices. The selections are shown in the following sections.

10.7.2 Ping

This causes the phone to send an ICMP echo request message to an IP device, and the phone expects an ICMP echo reply to be returned. The display shows:

```
Ping
➔
```

Enter an FQDN or an IP address. Enter an IP address using the keypad and use the * key to enter a period (full stop), for example:

```
Ping
*10.1.31.12
```

Enter an FQDN using the method described in section 9.2.6 on page 102, for example:

```
Ping      Func:abc
*sip.zultys.com
```

Press the Enter button when you have typed the device address or FQDN. The phone first resolves an FQDN. While it is resolving the address, the phone displays:

```
Ping
Resolving...
sip.zultys.com
```

If the DNS supplies an address quickly, you may not see this screen. If the DNS cannot resolve the name, the phone displays:

```
Ping
Unknown host
sip.zltys.com
```

Press the Menu, Esc, or Enter buttons to exit this state.

If you typed an IP address, or an FDQN that was resolved, the ZIP4x5 sends up to 99 messages to the host, each one second apart. Each message has 24 bytes of optional data (so the total message length is 32 bytes) and the phone increments the sequence numbers starting with 0 after power on and continuing to increment the numbers until 64K. The phone displays:

```
Ping: 10.1.40.25
01: reply < 10 ms
Min000;Avg000;Max000
```

```
Ping: 203.47.73.194
01: reply = 691 ms
Min000;Avg000;Max000
```

On the top row the phone displays the IP address of the host (which may be resolved from what you typed). On the second row, the phone displays the number of the message (1 to 99), whether it received a reply or not and the round trip delay. The phone calculates the round trip delay by storing the time at which it sent the message in the data portion of the ICMP message. The phone resolves this time to 10 ms.

On the bottom row, the phone displays the minimum, average, and maximum times of the round trip delay, each in ms. This is resolved to 1 ms.

The maximum time that the phone waits for a response is 990 ms. If it receives a response after that time, it ignores it. After this time-out, the phone displays:

```
Ping: 10.1.40.25
17: time-out
Min000;Avg456;Max673
```

The phone does not count this time to calculate the minimum, average, or maximum times.

The phone continues to send messages. When it receives a response to a message it updates the second and third rows of the display. The ZIP4x5 continues in this way until it has sent 99 messages or until you press the Esc button to stop the process. When you stop the process, the phone waits the time-out period for any reply that it might be expecting. The phone displays:

```
Ping: 10.1.40.25
Sent 56. Received 49
Min047;Avg481;Max673
```

The phone shows the number of echo request messages that it sent and the number of echo reply messages that it received (before it timed out).

Press Menu, Esc, or Enter to exit this test. If you press Menu, the phone exits the menu system. If you press Enter or Esc, the phone displays the Self Test menu shown in section 10.7.1 on page 180.

10.7.3 Loop Ethernet Ports

This allows you to test the four Ethernet circuits on the phone. To conduct this test, you must power the ZIP4x5 from an ac adapter.¹ When you select this, the display shows:

```
Test | Ethernet
Connect P1 to P2, P3
to LAN. Press Enter
```

Using two CAT5 cables, connect:²

- Ethernet port P1 to Ethernet port P2
- Ethernet port P3 to Ethernet port LAN

Press the Enter button when you have done so. The phone displays:

```
Test | Ethernet
P1-P2      P3-LAN
000 000    000 000
```

1. See section 4.2.2.2 on page 22 for details of how to connect an ac adapter.
2. The cables you use can be straight or cross wired. See section 4.2.4.1 on page 23 for details.

The phone sends data packets from P1 to P2, from P2 to P1, from P3 to LAN, and LAN to P3. It sends up to 999 packets out of each circuit, or until you press the Esc button to stop the process. It receives the packets and checks for errors. If it receives a packet with no errors it shows this on the bottom row. If it fails to receive a packet within 25 ms or if the packet has errors, it does not count this in the totals on the bottom row.

The bottom row shows how many packets each circuit has received. If there are no errors, the counts will all be the same. If you let the test run for the maximum number of 999 packets, each value should be 999.

Press Menu, Esc, or Enter to exit this test. If you press Menu, the phone exits the menu system. If you press Enter or Esc, the phone displays the Self Test menu shown in section 10.7.1 on page 180.

Caution Remove all cables from the back of the ZIP4x5 before proceeding. You must not connect the phone to your network with a loop on the Ethernet ports of the phone.

10.7.4 Buttons and Keys

This allows you to test the buttons, keys, handset switch, and headset switch on the phone. When you select this, the display shows:

```
Test | Buttons, Keys
Press each in turn.
Wait to exit.
```

The phone waits 10 s for you to press a button or key. If you do not press a button or key in 10 s, the phone exits this menu selection. Once you press a button or key, the display changes to:

```
■          ===
Wait to exit.
```

The top row represents the state of the buttons, handset switch, and headset switch. The second row represents the state of the keys. As you press a button or key, or change the status of a switch, the phone puts the cursor character on the display. Each position on the display is dedicated to one button, key, or switch.

There are 17 spaces on the top row – one for each of the 15 buttons and one each for the hook switch and headset switch. The mapping of the buttons to the positions on the display is left to right, top to bottom. These are represented by the first 15 positions on the top row.

The 19th position on the top row represents the headset switch. Either insert and remove or remove and insert the headset for the phone to detect a transition.

The 20th position (right most) on the top row represents the handset switch. Either lift and replace or replace and lift the handset for the phone to detect a transition.

There are 20 places on the bottom row – one for each key. The mapping of the buttons to the positions on the display is left to right, top to bottom.

- green on Call 2
- red on Call 3
- green on Call 3
- red on Call 4
- green on Call 4
- red on Mute
- red on Speaker

The phone holds each LED lit for one second, so the test takes 20 s. The test repeats until you press Menu, Esc, or Enter. If you press Enter or Esc, the phone displays the Self Test menu shown in section 10.7.1 on page 180, and flashes the Mute and Speaker LEDs again.

If you press Menu, the phone exits the menu system and turns off all of the LEDs.

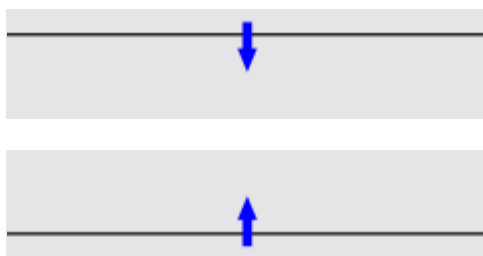
10.7.6 LCD

The phone displays several graphical patterns followed by the Zultys logo. The first display is:



The phone shows a vertical line that moves from left to right. It then moves the line back from right to left.

The next display is:



The phone shows a horizontal line that moves from top to bottom. It then moves the line back from bottom to top.

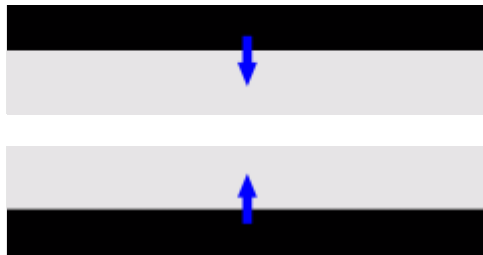
The next display is:





The phone shows a vertical filled area that moves from left to right. It then clears the display and moves the filled area from right to left.

The next display is:



The phone shows a horizontal filled area that moves from top to bottom. It then clears the display and moves the filled area from bottom to top.

Each transition takes one to two seconds, so the test time for the transitional screens is about 15 s.

Finally the phone fills the display with the Zultys logo:



The phone transitions the contrast from its current value, to the maximum value, then to the minimum value, and back to the original value. This test takes ten seconds.

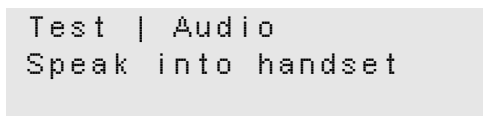
The ZIP4x5 then repeats the test of the LCD by showing the vertical line.

Press Menu, Esc, or Enter to exit this test. If you press Menu, the phone exits the menu system. If you press Enter or Esc, the phone displays the Self Test menu shown in section 10.7.1 on page 180. The phone restores the contrast setting in effect prior to your running the test.

10.7.7 Audio

This allows you to test the audio paths (microphones and speakers) on the phone. The phone prompts you to speak into a microphone, then replays what you spoke. This test is a subjective test, but if you use external test equipment to generate and receive the sounds, you can perform a quantitative test.

The phone first displays:



After two seconds, the phone plays a double beep into the handset. The phone then detects when you start to speak. If you do not speak for 10 s, the phone proceeds to test the headset.

After you start to speak, the phone records the next 10 s of your speech. It shows a progress on the third row of the display. In the following example, the phone has recorded 7.5 s of speech:

```
Test | Audio
Speak into handset
████████████████████
```

When the phone has recorded for 10 s, it plays a double beep into the handset. The phone is silent for one second and then plays a tone that sweeps from 300 Hz to 3 kHz in three seconds.

The phone is silent for 500 ms then it replays the audio that it recorded to the headset.

The phone then displays

```
Test | Audio
Speak into headset
```

The cycle repeats but with the headset instead of the handset. If you do not have a headset connected, the phone will time-out after 10 s and test the speaker.

Lastly, the phone displays

```
Test | Audio
Speak into base unit
```

Speak into the microphone used for speaker mode for this test.

Press Menu, Esc, or Enter at any time to exit this test. If you press Menu, the phone exits the menu system. If you press Enter or Esc, or if the test has completely finished, the phone displays the Self Test menu shown in section 10.7.1 on page 180.

10.7.8 Audio Return

This test is not supported in version 1.1.

