ShoreTel IP Phone 930D Base Station and Repeater User Guide

May 2013

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Contents

Before You Start

This preface contains the following topics:

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- Related Documents on page 6

About This Book

This book is intended for those who install, administer, or use the ShoreTel IP Phone 930D. It describes the features of the base station unit and the repeater unit. This document should be used in conjunction with the *ShoreTel IP Phone 930D Planning and Installation Guide.*

Organization

This document is divided into the following chapters:

- Chapter 1, Using the Base Unit on page 7, describes how to install and use the base station.
- Chapter 2, Using the Repeater Unit on page 13, describes how to install and use the repeater.
- Chapter 3, Troubleshooting on page 21, describes how to troubleshoot issues with the components.

Conventions

The following typographical marking conventions are used in this document.

Marking	Meaning
Bold	Names of interface objects, such as buttons and menus.
Blue	Cross references with hyperlinks. Click the blue text to go to the indicated section. All chapters have a list of section links on the first page. **Note:** Table of Contents entries are also links, but they are not shown in blue.

Related Documents

The following documents are also available:

- *ShoreTel IP Phone 930D Planning and Installation Guide*
- *ShoreTel IP Phone 930D Handset User Guide*

CHAPTER

1

Using the Base Unit

This chapter describes how to set up and use the IP930D base unit and contains these main topics:
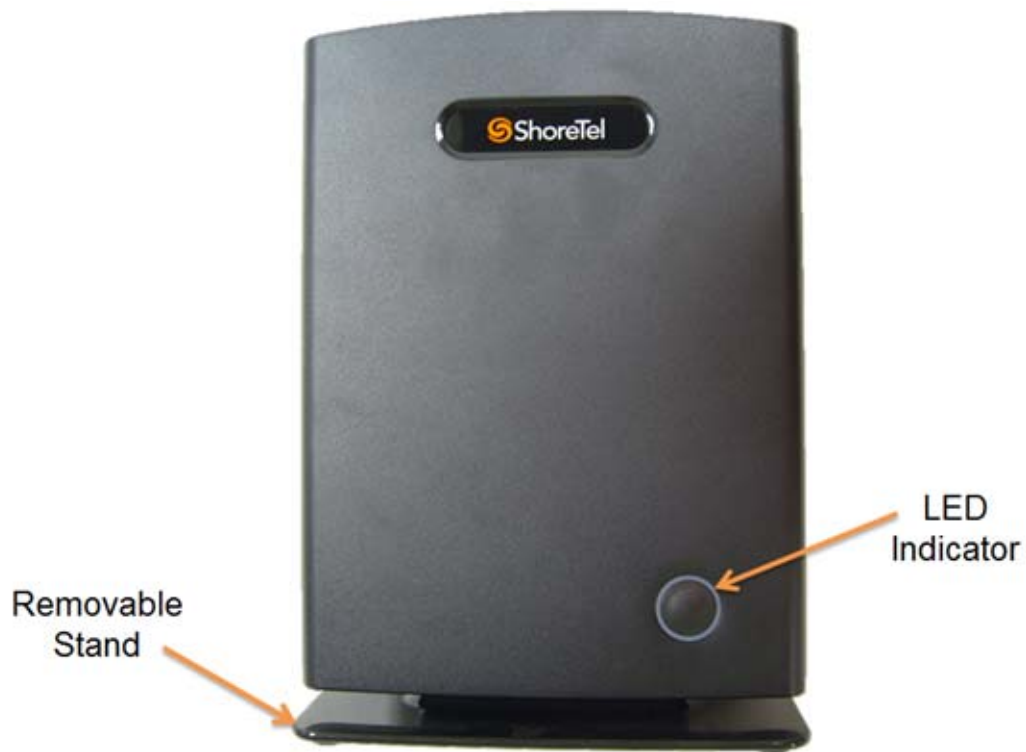
Unpacking the Box

Make sure that all of these items are included in the base unit package:

- 1 x IP930D base

- 1 x base charging stand

- 1 x printed Safety, Warranty, and Regulatory Information sheet

- 2 x wall mounting screws and anchors

Base Overview

The illustrations below show the front view and back view of the IP930D base.

Front View

Rear View
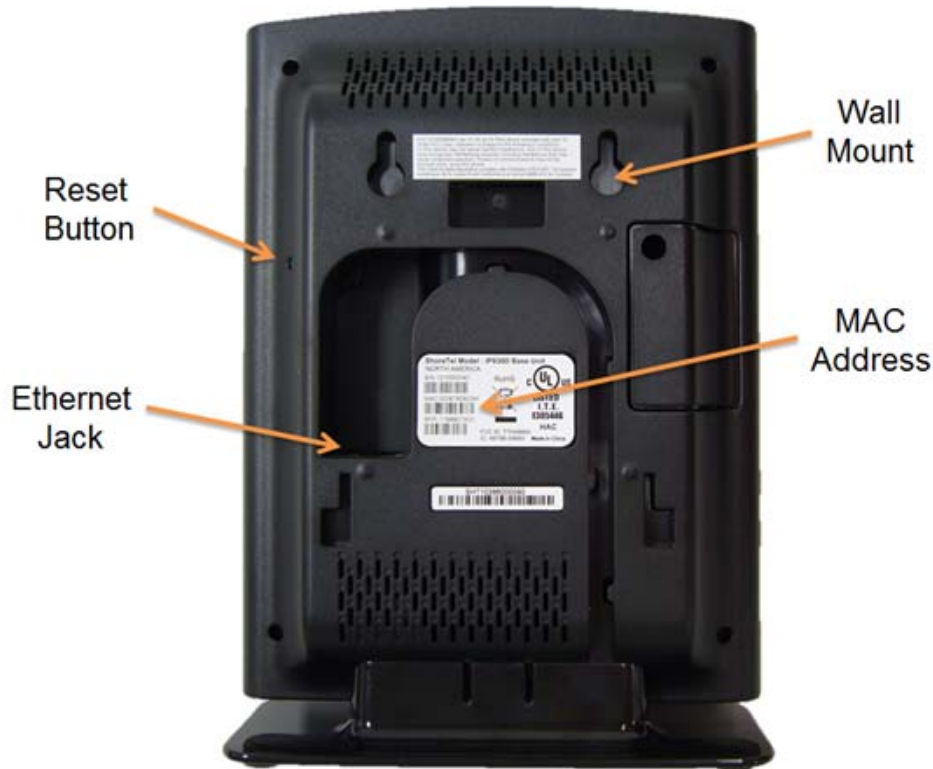
Understanding Base Basics

Bases are the gateway between the IP network and IP930D handsets.

■ Bases are powered by a Power-over-Ethernet (PoE) connection.

■ Bases can be used in stand-alone- or multicell-mode.

■ If more than four handsets are needed in a system, the multicell mode is required to synchronize bases and maximize performance.

■ Each base can support up to four IP930D handsets.

■ Bases come in two versions: A version for North America, and a second for Europe, Australia, and New Zealand.

■ The IP930D handset detects the frequencies used by the base and adapts automatically.

For more information, see the *ShoreTel IP Phone 930D Planning and Installation Guide*.

Readying the Base for Use

1. Prepare the configuration files for the base and upload them to the FTP server. See the *ShoreTel IP Phone 930D Planning and Installation Guide* for instructions on how to prepare these files.

2. If the base will be wall mounted, remove the base stand from the bottom of the base by pressing the area shown and pulling downward.

3. Plug the Ethernet cable downward into the jack and route the cable through the cable guide so the cable exits near the bottom of the base.

⚠ **WARNING!**

Do not unplug the Ethernet cable until the LED indicator stops fast flashing red (500 mS on/500 mS off); unplugging the cable while the LED indicator is fast flashing red can permanently damage the base.

When the Ethernet cable is attached, the base powers up and downloads configuration files from the specified FTP server, after which the base can be managed using ShoreTel IP930D Manager.

Note

Option 156 must be enabled and the ftpserver parameter set so that the base can locate and load the required configuration files. Refer to the *ShoreTel IP Phone 930D Planning and Installation Guide* for more information.

The first time the base is plugged in, the process can take up to 10 minutes. The base LED indicator will stop flashing red or green when the process is complete.

Installing the Base

To mount the base on a wall, use the provided screws, or use bolts with a 6-10 mm head and a shaft that is less than 4 mm in diameter. Install screws or bolts with centers separated by 60 mm.

Here are some guidelines for installing bases:

- Bases should be mounted as high on a wall as possible and away from large metal objects or building structures that can block their signal.

- Do not mount bases near electrical appliances such as microwave ovens or other radio frequency sensitive or generating equipment such as computers.

- Bases must be mounted with at least one meter of separation between devices.

- All bases must all be installed on the same subnet.

For more guidance on where to locate bases when installing your system, see the *ShoreTel IP Phone 930D Planning and Installation Guide*.

Resetting the Base to Factory Defaults

To return a base to its factory defaults, follow this procedure:

1. Plug in the base and wait until the LED indicator starts flashing green.

2. Press and then hold the reset button on the back of the base for at least 10 seconds, or until the LED indicator turns off.

   The base restarts using its factory defaults.

WARNING!

Never unplug a base or perform any type of reset on a base whose LED indicator is fast flashing red (500 mS on/500 mS off); doing so can permanently damage the base. A fast red flash means that firmware in the unit is being upgraded.

Monitoring a Base with the LED Indicator

The base has an LED indicator on the front that can be used to monitor the base's status. Additional information on the base status is available using ShoreTel IP930D Manager.

LED State	Description
Off	No power.
Two red flashes followed by flashing green (1 sec on/1 sec off)	Base is starting.
Winking green (800 mS on/200 mS off)	Base has started running but has not yet synchronized to a master (multicell only).
Solid green	Unit is operating normally and is synchronized to a master.
Winking red (800 mS on/200 mS off)	No Ethernet.
Fast flashing red (500 mS on/500 mS off)	Unit is upgrading firmware. (Do not remove power.)
Flashing red/green (1 S red/1 S green)	Registration enabled.
Solid red	Critical error.

CHAPTER

2

Using the Repeater Unit

This chapter describes how to set up and use the IP930D repeater unit and contains these main topics:

Unpacking the Box

Make sure that all of these items are included in your repeater package:

- 1 x IP930D repeater

- 1 x AC adapter with plug adapters

- 1 x printed Safety, Warranty, and Regulatory Information sheet
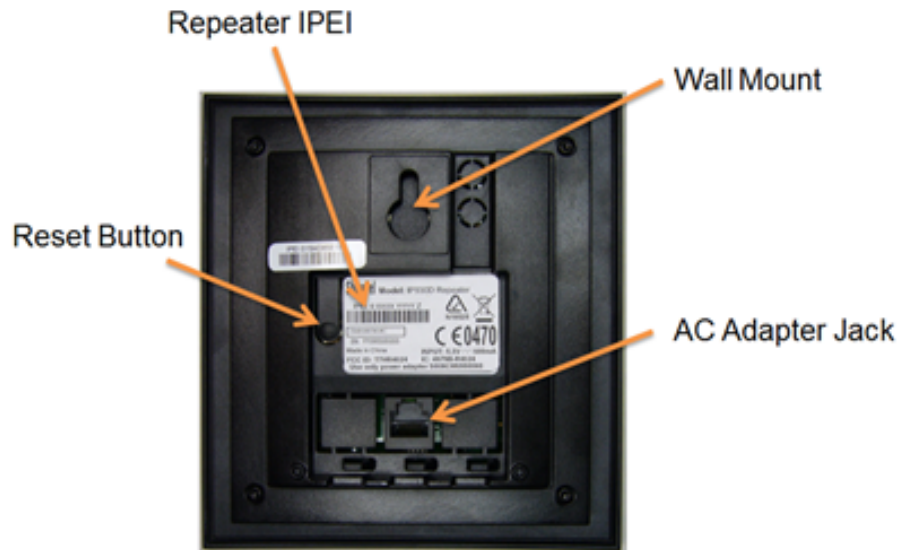
- 1 x wall mounting screw and anchor

Repeater Overview

The illustrations below show the front view and back view of the IP930D repeater.

Front View

LED Indicator
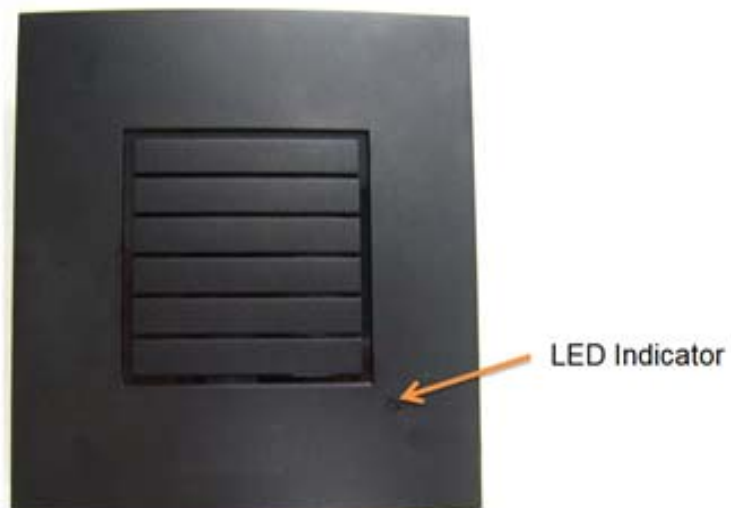
Rear View

Repeater Basics

Repeaters are used to extend the operating range of IP930D handsets beyond the coverage area of the base station. To deliver optimal service, IP930D handsets will automatically connect to the base or repeater with the strongest signal.

■   Before the repeater is installed, it must be registered to a base station.

■   Up to four repeaters can be registered to a base station.

■   Up to three repeaters can be daisy chained to provide coverage (but doing so may introduce delays and Y-branches are not supported).

■   Repeaters can be used to extend coverage in all directions, including vertically (to cover several floors in a building).

■   If repeaters are positioned correctly, the mobile handset will automatically switch from cell to cell with no noticeable interruption. Correct positioning means overlapping the coverage area of the base station or other repeaters.

Powering the Repeater

Repeaters require one of these for power:

- A non-switched AC outlet (100-240V 50/60hz) within 2 meters of the repeater.

- A PoE wire adapter and Linksys POES5 5-volt PoE splitter for use with a powered Ethernet connection.

Connecting the AC Adapter

Follow these steps:

1. Choose the AC power plug that matches the AC outlet in your country or region.

2. Insert the AC power plug into the AC adapter; slide until it locks in place.

3. Plug the AC adapter cable into the modular adapter jack on the rear of the repeater.

If the location where you would like to install in the repeater does not have a nearby AC outlet, use a PoE wire adapter instead of AC power. See Using a PoE Wire Adapter to Power the Repeater on page 17.

WARNING!

Do not use extension cables to lengthen the AC adapter cable; doing so can cause the repeater to malfunction.

Using a PoE Wire Adapter to Power the Repeater

If you need to position the repeater in a location that does not provide a nearby AC outlet, you can use a PoE wire adapter and a Linksys POES5 5-volt PoE splitter with a powered Ethernet connection to power the repeater. Use the Linksys splitter to provide power only; do not use the Ethernet cable provided by the splitter. See the illustration below.

Splitter Ethernet
cable (do not use)

PoE wire adapter

Linksys splitter

Repeater

Powered Ethernet cable plugs in here
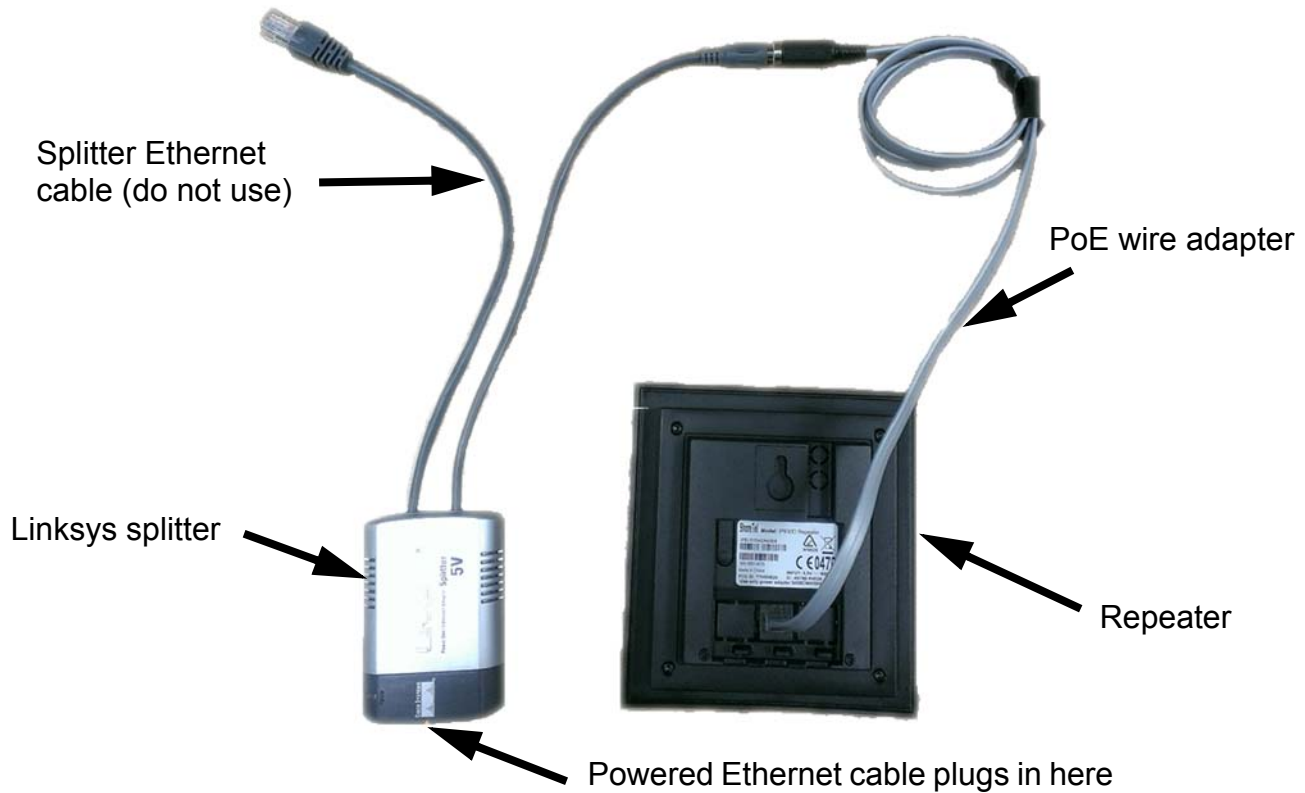
Registering a Repeater to a Base

Refer to the *ShoreTel IP Phone 930D Planning and Installation Guide* for additional information.

1. Configure the bases in your system to permit repeaters to register, and to assign synchronization relationships for each repeater.

2. From the Base Security page in ShoreTel IP930D Manager, enable registration on the base with which you would like to register. Enable registration on only one base at a time; otherwise, the repeater may attempt to register with the wrong base and delay the registration process.

3. Provide power to the repeater by using AC power, or use a PoE wire adapter and splitter (see Using a PoE Wire Adapter to Power the Repeater on page 17). Power the repeater in a location that is near to the base to ensure a good signal.

4. Check that the LED indicator on the front of the repeater begins double-flashing green. If this is not the case, press and hold the reset button on the back of the repeater until the LED indicator turns red and then release the button. The LED indicator begins double-flashing green.

5. Within one minute, the LED indicator turns steady green, indicating that the repeater has registered with the base.

Repeat the above process for all of the repeaters you wish to register with this base. Be sure to disable registration from ShoreTel IP930D Manager before proceeding to the next base.

Installing the Repeater

Here are some guidelines for installing repeaters:

- Repeaters should be mounted as high on a wall as possible and away from large metal objects or building structures that can block their signal.

- Repeaters must be located within six feet of an AC outlet; otherwise, use a PoE wire adapter and splitter for power. See Using a PoE Wire Adapter to Power the Repeater on page 17.

- Repeaters must be located close enough to the base or repeater to which they are synchronized to provide a signal level between about -65 and -75 dBm. (A value of -70 dBm or better is recommended).

- Do not mount repeaters near electrical appliances or other radio frequency generating equipment, such as microwaves or computers.

- Repeaters must be mounted with at least one meter of separation between devices.

- Do not use an AC outlet that can be switched off.

- Do not use a cable extender to lengthen the AC adapter's cable; doing so may cause the repeater to malfunction.

- A single screw or bolt (provided) with a 6-10 mm head and a shaft that is less than 4 mm in diameter can be used to mount the unit on the wall.

For information more information, see the *ShoreTel IP Phone 930D Planning and Installation Guide*.

Restoring a Repeater to Factory Defaults

While the repeater is powered, press and hold the reset button on the back of the unit for 3 seconds or until the repeater's LED indicator turns red.

The repeater restarts in a factory default state.

Monitoring a Repeater with the LED Indicator

The repeater has an LED indicator on the front that can be used to monitor the repeater's performance. Additional information on the repeater status is available using ShoreTel IP930D Manager.

LED State	Description
Off	No power.
Slow flashing green (400 mS on/250 mS off)	Searching for fixed part (base or repeater).
Double flashing green (900 mS on/200 mS off/200 mS on/200 mS off repeated)	Searching for fixed part in registration mode or performing registration procedures.
Steady green (occasional red flashes)	Repeater is synchronized to its master and operating properly. Red flashes indicate traffic is passing through the repeater.
Alternating red/green flashing (200 mS red/ 200 mS green)	Repeater is in recovery mode and cannot find base or RPN allocation error.
Steady red	Critical error.

CHAPTER

3

Troubleshooting

This chapter contains the following topics:

Troubleshooting for the Base Station

Problem: The LED indicator on the base is fast flashing red (500 mS on/500 mS off) and does not show steady green after the Ethernet cable is plugged in.

Solution: The LED indicator on the base fast flashes red during firmware upgrades, which may occur when the base is first powered on. The upgrade can take up to 10 minutes to complete.

> **WARNING!**
>
> **Never unplug a base while the LED indicator is fast flashing red or the base may be permanently damaged.**

Problem: The LED indicator on the base is flashing green (1 second on/1 second off) and does not show steady green after the Ethernet cable is plugged in.

Solution: The base is unable to obtain an IP address from a DHCP server. Check that a DHCP server is available by plugging a laptop or other device into the Ethernet cable.

Problem: The LED indicator on the base is winking green (800 mS on/200 mS off) and never becomes steady green.

Solution: The base is having difficulty synchronizing with other bases. In some cases this can take up to 10 minutes. If the issue extends longer, it may indicate that the base cannot find a free DECT channel to use to communicate with other bases. Check for interfering DECT or other RF devices near the base.

Another cause may be an error in the configuration files for this base. Re-check the configuration files for the base, following the guidelines provided in the *ShoreTel IP Phone 930D Planning and Installation Guide*.

Problem: The LED indicator on the base is winking red (800 mS on/200 mS off).

Solution: The base does not detect an Ethernet connection. Check the connection between the base and the Ethernet switch.

Problem: The LED indicator on the base is solid red

Solution: This indicates a critical error. Try power cycling the base: Unplug the Ethernet connection to the base to remove power for a few seconds, then reconnect. If the issue is not resolved, the base has encountered a non-recoverable error and needs to be replaced.

Troubleshooting for the Repeater

Problem: The LED indicator on the repeater is slow flashing green (400 mS on/250 mS off) and never becomes steady green after installation.

Solution: The repeater is having trouble connecting to either the base to which it is registered or to the repeater from which it receives synchronization.

First try power cycling the repeater to resolve the issue.

If the issue is not resolved, follow the procedure below (Accessing Site Survey Mode on page 24) to access site survey mode on the handset. Then check that the signal level from the hosting base or repeater is between -65 and -75 dBm when measured near the repeater with the flashing green LED. (A value of -70 dBm or better is recommended.) If the signal level is outside of this range, the repeater needs to be relocated to synchronize properly.

Problem: The LED indicator on the repeater is alternating red and green flashing.

Solution: The repeater is in the recovery mode and cannot find a base or cannot allocate an RPN.

Load the project file for the installation into the ShoreTel IP930D Configuration Tool and check the following:

- Check for typographical errors in the IPEI values for each repeater.

- Check that the synchronization source for every repeater is correct.

- Check that every repeater is associated with the correct base.

You can check each of these items by selecting a repeater and viewing properties in the right-hand pane of the Configuration Tool. Alternatively, you can print the installation summary to check these items. See the *ShoreTel IP Phone 930D Planning and Installation Guide* for assistance.

The symptom (LED indicator flashing red/green) may also indicate that the repeater cannot find a free DECT channel to use to communicate with the hosting base or repeater. Check for interfering DECT devices or other RF devices near the repeater and hosting base.

Problem: There are no AC outlets near where the repeater should be located.

Solution: Use a PoE wire adapter instead of AC power. See Using a PoE Wire Adapter to Power the Repeater on page 17 for more information.

WARNING!

Do not use extension cables to lengthen the AC adapter cable; doing so can cause the repeater to malfunction.

Problem: A beep is heard about every 3 seconds when on a call.

Solution: Debug mode on a repeater has been accidently activated. Follow these steps:

1. While on a call, access the site survey mode on the beeping handset. See Accessing Site Survey Mode on page 24 for the procedure.

2. In this mode, detect the RPN of the repeater that is in debug mode (it will be the left-most RPN on the site survey screen).

3. In the Manage Bases page of ShoreTel IP930D Manager, obtain the IPEI for the repeater that you identified by RPN in the previous step.

4. Find the matching repeater by looking at the IPEI on the hardware label.

When there are no active calls on this repeater (the status LED is steady green without red flashes), press the reset button on the repeater for more than 20 seconds to turn off the beeping.

Accessing Site Survey Mode

1. Press and hold the **Menu** button on the IP930D handset for more than 3 seconds.

    The Settings menu appears.

2. Enter ***service*** (or ***7378423***).

3. Turn on the site survey mode from the menu.

    An overlay displays the RPN of the base or repeater the handset is connected to (left-most) and any other base or repeaters it can see. Also shown is the RSSI (received signal strength indicator) for the base or repeater to which the handset is connected.

    Note

    The RPN is a unique identifier assigned to each base and repeater in the system. RPN assignments are included in the Installation Summary generated by the ShoreTel IP930D Configuration Tool during installation.

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4. Press **End/Power** to exit the Settings menu.