LINKSYS®

A Division of Cisco Systems, Inc.

VONAGE
THE BROADBAND PHONE COMPANY

Phone Adapter
with 2 Ports for Voice-over-IP

WIRED

Installation and Troubleshooting Guide

Model No. **PAP2**

CISCO SYSTEMS

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WARNING: This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

How to Use this Guide

Your guide to the Phone Adapter has been designed to make understanding networking with the Phone Adapter easier than ever. Look for the following items when reading this User Guide:

This exclamation point means there is a caution or warning and is something that could damage your property or Phone Adapter.

This question mark provides you with a reminder about something you might need to do while using the Phone Adapter.

This checkmark means there is a note of interest and is something you should pay special attention to while using the Phone Adapter.

In addition to these symbols, there are definitions for technical terms that are presented like this:

Also, each figure (diagram, screenshot, or other image) is provided with a figure number and description, like this:

word: definition.

Figure numbers and descriptions can also be found in the "List of Figures" section.

Figure 0-1: Sample Figure Description

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Chapter 1: Introduction

Welcome

Thank you for choosing the Linksys Phone Adapter with 2 Ports for Voice-over-IP. This Phone Adapter will allow you to make phone or fax calls using the your broadband connection.

How does the Phone Adapter do this? The Phone Adapter connects your phones or fax machines to your network router or gateway, so telephone service is delivered through your cable or DSL Internet connection. Each of the Phone Adapter's two telephone jacks operates independently, with separate phone service and phone numbers, so you can have up to two Vonage phone lines per Adapter.

But what does all of this mean? Networks are useful tools for sharing Internet access and computer resources. With the Phone Adapter, your phones or fax machines can share your high-speed Internet connection and take advantage of it. You will be able to make phone calls using the account you set up with Vonage, even while you're surfing the Internet. So, networks not only are useful in homes and offices, but also can be fun.

Use the instructions in the Quick Installation or this Installation and Troubleshooting Guide to help you connect the Phone Adapter after you have set up an account with Vonage. These instructions should be all you need to get the most out of the Phone Adapter.

NOTE: For information about your Internet phone service, refer to the User Guide, which is included in the welcome kit.

What's in this Guide?

This guide covers the steps for installing the Phone Adapter.

- Chapter 1: Introduction
  This chapter describes the Phone Adapter's applications and this Installation and Troubleshooting Guide.

- Chapter 2: Getting to Know the Phone Adapter
  This chapter describes the physical features of the Phone Adapter.

- Chapter 3: Connecting the Phone Adapter
  This chapter explains how to connect the Phone Adapter to your network and phones (or fax machines).

- Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu
  This chapter explains how to configure the Phone Adapter's network settings.

- Appendix A: Troubleshooting
  This appendix describes some potential problems and solutions, as well as frequently asked questions, regarding use of the Phone Adapter.

- Appendix B: Windows Help
  This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.

- Appendix C: Glossary
  This appendix gives a brief glossary of terms frequently used in networking.

- Appendix D: Specifications
  This appendix provides the technical specifications for the Phone Adapter.

- Appendix E: Warranty Information
  This appendix supplies the warranty information for the Phone Adapter.

- Appendix F: Regulatory Information
  This appendix supplies the regulatory information regarding the Phone Adapter.

- Appendix G: Contact Information
  This appendix provides contact information for a variety of Linksys resources, including Technical Support, as well as Vonage.

Chapter 2: Getting to Know the Phone Adapter

Back Panel Ports

The Phone Adapter's ports are located on the back panel.

Figure 2-1: Back Panel

PHONE 1 Port   For your primary Vonage Internet phone line, the **PHONE 1** port allows you to connect your telephone to the Phone Adapter using an RJ-11 telephone cable (not included).

PHONE 2 Port   If you add a second Vonage line, then use the **PHONE 2** port. It allows you to connect a second telephone (or fax machine) to the Phone Adapter using an RJ-11 telephone cable (not included).

ETHERNET Port   The **ETHERNET** port allows you to connect the Phone Adapter to your router or gateway using a Category 5 (or better) Ethernet network cable.

POWER Port   The **POWER** port is where you will connect the included power adapter.

NOTE: These Phone ports do not carry any voltage.

The Front Panel

The Phone Adapter's LEDs are located on the front panel.

Figure 2-2: Front Panel

PHONE 1 LED   Blue. The **PHONE 1** LED is solidly lit when a telephone or fax machine has a registered connection to Vonage through the PHONE 1 port. (The connection is registered if your Internet phone service account is active.) It flashes when the phone is being used or an incoming call has been detected.

PHONE 2 LED   Blue. The **PHONE 2** LED is solidly lit when a telephone or fax machine has a registered connection to Vonage through the PHONE 2 port. It flashes when the phone is being used or an incoming call has been detected.

ETHERNET LED   Blue. The **ETHERNET** LED lights up when the Phone Adapter is connected to your network through the Ethernet port. It flashes when there is data being sent or received.

Power LED   Blue/Red. The **Power** LED lights up when the Phone Adapter is powered on and ready. It flashes when the Phone Adapter is booting up, undergoing a self-test, or performing a firmware upgrade. The LED lights up red when the Phone Adapter has failed its self-test or is malfunctioning. Refer to "Appendix A: Troubleshooting" for more information.

Chapter 3: Connecting the Phone Adapter

Overview

This chapter gives instructions on how to connect the Phone Adapter to your network and telephones or fax machines. Shown below is a connection diagram displaying a typical setup.

| Internet | Cable/DSL Modem | Router | Phone Adapter | Telephone |
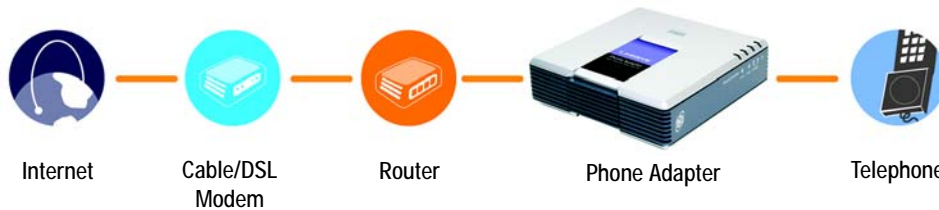
Figure 3-1: Connect the Phone Adapter to Your Network and Telephone

This chapter also describes the Phone Adapter's placement options. You can place it flat on a surface, attach the Phone Adapter's base so it can stand in place, or mount the Phone Adapter on a wall.

Instructions for Connecting the Phone Adapter

If you already have an account set up with Vonage, then proceed to step 1.

If you do not have an account, visit www.vonage.com to activate the Phone Adapter. After you have set up an account, then proceed to step 1.

IMPORTANT: The Phone Adapter includes a ringer (ring signal generator), which is a source of hazardous voltage. When the ringer is activated by an incoming call, do not touch the Phone port wires, the wires of a cable connected to either of the Phone ports, or the internal circuitry of the Phone Adapter.

IMPORTANT: Do not connect either of the Phone ports to a telephone wall jack. Make sure you only connect a telephone or fax machine to either of the Phone ports. Otherwise, the Phone Adapter or the telephone wiring in your home or office may be damaged.

1. Using a telephone cable, connect your telephone to the PHONE 1 port of the Phone Adapter.

2. If you have a second Vonage line on your account, then connect another telephone or a fax machine to the PHONE 2 port of the Phone Adapter.

3. Connect the included Ethernet network cable to the ETHERNET port of the Phone Adapter.

    Connect the other end to the one of the Ethernet ports on your router or gateway.

4. Connect the included power adapter to the POWER port on the back panel of the Phone Adapter.

    Connect the other end to a standard electrical outlet.

5. The Power, Ethernet, and Phone LEDs will be solidly lit when the Phone Adapter is ready for use.

6. Follow the instructions provided by Vonage.

    If you need to manually configure the Phone Adapter's network settings, you can use the telephone; for instructions, proceed to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu."

The installation of the Phone Adapter is complete. Now you can pick up your phone and make calls.

NOTE: Vonage supports 7-, 10-, and 11-digit dialing. Use 7-, 10-, or 11-digit dialing for calls within the same area code as your Vonage phone number. Use 10- or 11-digit dialing for calls outside of your area code.

Proceed to the next section, "Placement Options," if you want to attach the Phone Adapter's base.

Figure 3-2: Connect the Telephone Cable

Figure 3-3: Connect the Ethernet Network Cable

Figure 3-4: Connect the Power

Placement Options

There are three ways to place the Phone Adapter. The first way is to place the Phone Adapter horizontally on a surface. The second way is to stand the Phone Adapter vertically on a surface. The third way is to mount the Phone Adapter on a wall. The second and third options are explained in further detail below.

Stand Option

1. Remove the plate from the Phone Adapter's bottom panel.

2. Line up the pegs of the Phone Adapter's base with the mounting holes of the Phone Adapter's bottom panel.

3. Insert the Phone Adapter's base into the Phone Adapter's bottom panel. Push the base in until it fits snugly.

4. Place the Phone Adapter in an appropriate location.

Congratulations! The installation of the Phone Adapter is complete.

If you need to change any of the Phone Adapter's network settings, proceed to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu."

Figure 3-5: Attaching the Phone Adapter's Base

Figure 3-6: Phone Adapter Standing on Base

Wall-Mount Option

The Phone Adapter has two wall-mount slots on its back panel. The distance between the two slots is 58 mm (2.28 inches).

1. Determine where you want to mount the Phone Adapter.

2. Drill two holes into the wall. Make sure the holes are 58 mm (2.28 inches) apart.

3. Insert a screw into each hole, and leave 5 mm (0.2 inches) of its head exposed.

4. Maneuver the Phone Adapter so the wall-mount slots line up with the two screws.

5. Place the wall-mount slots over the screws and slide the Phone Adapter down until the screws fit snugly into the wall-mount slots.

Congratulations! The installation of the Phone Adapter is complete.

If you need to change any of the Phone Adapter's network settings, proceed to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu."
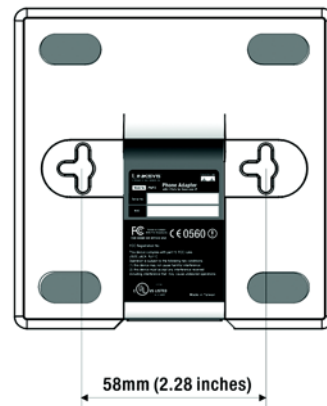

Figure 3-7: Measurement between Wall-Mount Slots

Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu

Overview

Chapter 4 explains how you can use the Interactive Voice Response Menu to configure the Phone Adapter's network settings. You may need to change these settings depending on the specifics of your local network setup. Use the phone's keypad to enter your commands and select choices, and the Phone Adapter will respond with voice responses.

NOTE: If you need to change the settings for your Vonage Internet phone service, then visit www.vonage.com to access your online account.

Accessing the Interactive Voice Response Menu

1. Use a telephone connected to the PHONE 1 or PHONE 2 port of the Phone Adapter.

2. Press **** (in other words, press the star key four times).

3. You will hear, "Configuration menu. Please enter option followed by the # (pound) key or hang up to exit."

    Refer to the following table that lists actions, commands, menu choices, and descriptions. After you select an option, press the # (pound) key. To exit the menu, hang up the telephone.

Using the Interactive Voice Response Menu

While entering a value, such as an IP address, you may exit without entering any changes. Press the * (star) key twice within half a second. Otherwise, the * will be treated as a decimal point or dot.

After entering a value, such as an IP address, press the **#** (pound) key to indicate you have finished your selection. To save the new setting, press **1**. To review the new setting, press **2**. To re-enter the new setting, press **3**. To cancel your entry and return to the main menu, press ***** (star).

For example, to enter the IP address *191.168.1.105* by keypad, press these keys: **191*168*1*105**. Press the **#** (pound) key to indicate that you have finished entering the IP address, and then press **1** to save the IP address. To cancel your entry and return to the main menu, press ***** (star).

If the menu is inactive for more than one minute, the Phone Adapter will time out. You will need to re-enter the menu by pressing ********.

The settings you have saved will take effect after you have hung up the telephone. The Phone Adapter may reboot at this time.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Enter Interactive Voice Response Menu	****		Use this command to enter the Interactive Voice Response Menu. Do not press any other keys until you hear, "Configuration menu. Please enter option followed by the # (pound) key or hang up to exit."

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Check DHCP	**100**		Use this command to find out if DHCP has been enabled or disabled. If enabled, the Phone Adapter will be automatically assigned an IP address by your network router or gateway. If disabled, then the Phone Adapter will use a static IP address.
Enable/Disable DHCP	**101**	Enter **1** to enable Enter **0** to disable	Enable or disable the Phone Adapter's DHCP feature. If your network router or gateway assigns IP addresses, then enter **1**. Otherwise, enter **0**.
Check IP Address	**110**		You will hear the current IP address of the Phone Adapter.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Set Static IP Address	111	Enter the IP address using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	To set a static IP address, the DHCP feature must be disabled. If the DHCP feature is enabled, then you will hear, "Invalid Option," if you try to set a static IP address.
Check Network Mask (or Subnet Mask)	120		You will hear the current network mask of the Phone Adapter.
Set Network Mask (or Subnet Mask)	121	Enter the network mask using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	To set the network mask, the DHCP feature must be disabled. If the DHCP feature is enabled, then you will hear, "Invalid Option," if you try to set the network mask.
Check Static Gateway IP Address	130		You will hear the current gateway IP address of the Phone Adapter.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Set Static Gateway IP Address	131	Enter the IP address using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	To set a static gateway IP address, the DHCP feature must be disabled. If the DHCP feature is enabled, then you will hear, "Invalid Option," if you try to set a static gateway IP address.
Check MAC Address	140		You will hear the MAC address of the Phone Adapter in hexadecimal string format.
Check Firmware Version	150		You will hear the version number of the firmware currently installed on the Phone Adapter.
Manual Reboot	732668		After you hear, "Option successful," hang up the phone. The Phone Adapter will automatically reboot.

Configuring the Settings for Your Internet Phone Service

If you want to change the settings for your Internet phone service, visit www.vonage.com and make configuration changes online. For more information, refer to the instructions provided by Vonage.

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Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu
Configuring the Settings for Your Internet Phone Service

Appendix A: Troubleshooting

This appendix provides solutions to problems that may occur during the installation and operation of the Phone Adapter. Read the description below to solve your problems. If you can't find an answer here, check the Vonage website at *www.vonage.com* or the Linksys website at *www.linksys.com*.

Common Problems and Solutions

1. **I don't hear a dial tone, and the PHONE1 (or PHONE2) LED is not lit.**
   Go through this checklist until your problem is solved:
   • Make sure the telephone is plugged into the appropriate port, PHONE 1 or PHONE 2. (You should use the Phone 2 port only if you have more than one Vonage phone line.)
   • Make sure the ETHERNET LED on the front panel of the Phone Adapter is lit. If it is not lit, then check your router and network connection to the Internet.
   • Pick up the telephone. Press **80#**. Hang up the telephone. Wait approximately 30 seconds. Then pick up the telephone; you should now have a dial tone.
   • Follow these instructions to reboot your cable or DSL modem, Phone Adapter, and router:
     1. Power off your cable or DSL modem by unplugging its power adapter.
     2. Power off the router by unplugging its power adapter.
     3. Power off the Phone Adapter by unplugging its power adapter.
     4. Wait two minutes, and then power on your cable or DSL modem by plugging its power adapter into an electrical outlet.
     5. Wait two minutes, and then power on the router by plugging its power adapter into an electrical outlet.
     6. Wait five minutes, and then power on the Phone Adapter by plugging its power adapter into an electrical outlet.

7. Reboot one of your networked computers, and check to see if you have an active Internet connection.

8. Pick up the telephone. You should now have a dial tone.

• Set up port forwarding on your router. You must specify that four port ranges be forwarded to the IP address of the Phone Adapter. These four port ranges are as follows: 5060-5061 (UDP), 53-53 (UDP), 69-69 (UDP), and 10000-20000 (UDP).

Before you set up port forwarding on your router, change two of the Phone Adapter's settings using its Interactive Voice Response Menu. First, disable its DHCP feature, and then assign a static IP address to the Phone Adapter. Refer to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu" for instructions.

If you have a non-Linksys router, refer to its documentation for instructions.

If you have a Linksys router, then follow these instructions:

1. On one of your networked computers, open your web browser.

2. Access the Router's Web-based Utility by going to **http://192.168.1.1** or the IP address of the Router.

3. A login screen will appear. Leave the *User Name* field blank. Enter the Router's password (the default is **admin**) in the *Password* field. Then click the **OK** button.

4. Click the **Applications & Gaming** tab, and then click the **Port Range Forwarding** tab.

5. For each port range you must specify, enter a different name in the *Application* field. Then enter the number or range of external port(s) used by the Phone Adapter.

6. Select the protocol you will be using, **UDP**.

7. Enter the IP address of the Phone Adapter. For example, if the Phone Adapter's IP address is 192.168.1.100, you would enter 100 in the field provided.

8. Repeat steps 5-7 until you have entered all four port ranges for the Phone Adapter.

Application	Start and End	Protocol	IP Address	Enable
Internet phone 1	5060 to 5061	UDP	(IP address of Phone Adapter)	X
Internet phone 2	53 to 53	UDP	(IP address of Phone Adapter)	X
Internet phone 3	69 to 69	UDP	(IP address of Phone Adapter)	X
Internet phone 4	10000 to 20000	UDP	(IP address of Phone Adapter)	X

9. Check the **Enable** option for the port services you want to use.
10. When you have completed the configuration, click the **Save Settings** button.

2. *When I make a telephone call, the call doesn't go through*; *instead, I hear a fast busy signal.*
   Go through this checklist until your problem is solved:
   • Vonage supports 7-, 10-, and 11-digit dialing. Use 7-, 10-, or 11-digit dialing for calls within the same area code as your Vonage phone number. Use 10- or 11-digit dialing for calls outside of your area code.
   • Follow these instructions to reboot your cable or DSL modem, Phone Adapter, and router:
     1. Power off your cable or DSL modem by unplugging its power adapter.
     2. Power off the router by unplugging its power adapter.
     3. Power off the Phone Adapter by unplugging its power adapter.

4. Wait two minutes, and then power on your cable or DSL modem by plugging its power adapter into an electrical outlet.
5. Wait two minutes, and then power on the router by plugging its power adapter into an electrical outlet.
6. Wait five minutes, and then power on the Phone Adapter by plugging its power adapter into an electrical outlet.
7. Reboot one of your networked computers, and check to see if you have an active Internet connection.
8. Pick up the telephone. You should now have a dial tone.

• Set up port forwarding on your router. You must specify that four port ranges be forwarded to the IP address of the Phone Adapter. These four port ranges are as follows: 5060-5061 (UDP), 53-53 (UDP), 69-69 (UDP), and 10000-20000 (UDP).

Before you set up port forwarding on your router, change two of the Phone Adapter's settings using its Interactive Voice Response Menu. First, disable its DHCP feature, and then assign a static IP address to the Phone Adapter. Refer to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu" for instructions.

If you have a non-Linksys router, refer to its documentation for instructions.

If you have a Linksys router, then follow these instructions:
1. On one of your networked computers, open your web browser.
2. Access the Router's Web-based Utility by going to **http://192.168.1.1** or the IP address of the Router.
3. A login screen will appear. Leave the *User Name* field blank. Enter the Router's password (the default is **admin**) in the *Password* field. Then click the **OK** button.
4. Click the **Applications & Gaming** tab, and then click the **Port Range Forwarding** tab.

5. For each port range you must specify, enter a different name in the *Application* field. Then enter the number or range of external port(s) used by the Phone Adapter.
6. Select the protocol you will be using, **UDP**.
7. Enter the IP address of the Phone Adapter. For example, if the Phone Adapter's IP address is 192.168.1.100, you would enter 100 in the field provided.
8. Repeat steps 5-7 until you have entered all four port ranges for the Phone Adapter.

Application	Start and End	Protocol	IP Address	Enable
Internet phone 1	5060 to 5061	UDP	(IP address of Phone Adapter)	X
Internet phone 2	53 to 53	UDP	(IP address of Phone Adapter)	X
Internet phone 3	69 to 69	UDP	(IP address of Phone Adapter)	X
Internet phone 4	10000 to 20000	UDP	(IP address of Phone Adapter)	X

9. Check the **Enable** option for the port services you want to use.
10. When you have completed the configuration, click the **Save Settings** button.

3. ***When I'm on a telephone call, words are dropped intermittently.***
   Go through this checklist until your problem is solved:
   • Are you using a wireless router and cordless phone? If so, the router and cordless phone may be using the same frequency and interfere with each other. Move the cordless phone farther away from the router.
   • There may be heavy network activity, particularly if you are running a server or using a file sharing program. Try to limit network or Internet activity during any Internet telephone call. For example, if you are running a file sharing program, files may be uploaded in the background even though you are not downloading any files, so make sure you exit the program before you make an Internet phone call.
   • There may not be enough bandwidth available for your call. You can test your bandwidth at http://www.pcpitstop.com/internet/Bandwidth.asp. If necessary, you can lower your service's default codec setting, which is **High (90k)**. First, access your service account at www.vonage.com. Then lower the codec setting to **Med (50k)** or **Low (30k)**. For more information, visit www.vonage.com.

4. ***My telephone does not ring, and my calls automatically go to voicemail.***
   Go through this checklist until your problem is solved:
   • Make sure the telephone is plugged into the appropriate port, PHONE 1 or PHONE 2. (You should use the Phone 2 port only if you have more than one Vonage phone line.)
   • Make sure the ringer volume on your telephone is set to an audible level.
   • Follow these instructions to reboot your cable or DSL modem, Phone Adapter, and router:
      1. Power off your cable or DSL modem by unplugging its power adapter.
      2. Power off the router by unplugging its power adapter.
      3. Power off the Phone Adapter by unplugging its power adapter.
      4. Wait two minutes, and then power on your cable or DSL modem by plugging its power adapter into an electrical outlet.
      5. Wait two minutes, and then power on the router by plugging its power adapter into an electrical outlet.

6.   Wait five minutes, and then power on the Phone Adapter by plugging its power adapter into an electrical outlet.
7.   Reboot one of your networked computers, and check to see if you have an active Internet connection.

• Set up port forwarding on your router. You must specify that four port ranges be forwarded to the IP address of the Phone Adapter. These four port ranges are as follows: 5060-5061 (UDP), 53-53 (UDP), 69-69 (UDP), and 10000-20000 (UDP).

Before you set up port forwarding on your router, change two of the Phone Adapter's settings using its Interactive Voice Response Menu. First, disable its DHCP feature, and then assign a static IP address to the Phone Adapter. Refer to "Chapter 4: Using the Phone Adapter's Interactive Voice Response Menu" for instructions.

If you have a non-Linksys router, refer to its documentation for instructions.

If you have a Linksys router, then follow these instructions:
1.   On one of your networked computers, open your web browser.
2.   Access the Router's Web-based Utility by going to **http://192.168.1.1** or the IP address of the Router.
3.   A login screen will appear. Leave the *User Name* field blank. Enter the Router's password (the default is **admin**) in the *Password* field. Then click the **OK** button.
4.   Click the **Applications & Gaming** tab, and then click the **Port Range Forwarding** tab.
5.   For each port range you must specify, enter a different name in the *Application* field. Then enter the number or range of external port(s) used by the Phone Adapter.
6.   Select the protocol you will be using, **UDP**.
7.   Enter the IP address of the Phone Adapter. For example, if the Phone Adapter's IP address is 192.168.1.100, you would enter 100 in the field provided.

8. Repeat steps 5-7 until you have entered all four port ranges for the Phone Adapter.

Application	Start and End	Protocol	IP Address	Enable
Internet phone 1	5060 to 5061	UDP	(IP address of Phone Adapter)	X
Internet phone 2	53 to 53	UDP	(IP address of Phone Adapter)	X
Internet phone 3	69 to 69	UDP	(IP address of Phone Adapter)	X
Internet phone 4	10000 to 20000	UDP	(IP address of Phone Adapter)	X

9. Check the **Enable** option for the port services you want to use.
10. When you have completed the configuration, click the **Save Settings** button.

5. *The Power LED does not light up or lights up red.*
   Go through this checklist until your problem is solved:
   • Unplug the power adapter from the Phone Adapter. Wait five seconds. Then plug the power adapter into the Phone Adapter again.
   • You may be using the wrong power adapter. Make sure the power adapter you are using is the one included with the Phone Adapter.

6. **The ETHERNET LED does not light up.**

Go through this checklist until your problem is solved:

- Check the cable connecting the Phone Adapter to your router.
- Make sure your network has an active Internet connection. If it does not, follow these instructions to reboot your cable or DSL modem, Phone Adapter, and router:

  1. Power off your cable or DSL modem by unplugging its power adapter.
  2. Power off the router by unplugging its power adapter.
  3. Power off the Phone Adapter by unplugging its power adapter.
  4. Wait two minutes, and then power on your cable or DSL modem by plugging its power adapter into an electrical outlet.
  5. Wait two minutes, and then power on the router by plugging its power adapter into an electrical outlet.
  6. Wait five minutes, and then power on the Phone Adapter by plugging its power adapter into an electrical outlet.
  7. Reboot one of your networked computers, and check to see if you have an active Internet connection.

Frequently Asked Questions

How do I make a phone call?

Pick up the phone and dial. Use 7-, 10-, or 11-digit dialing for calls within the same area code as your Vonage phone number. Use 10- or 11-digit dialing for calls outside of your area code.

Can I make calls if my Internet connection is down?

No. Your high-speed Internet connection must be active when you make Internet phone or fax calls.

Can I make calls while I'm browsing the Internet?

Yes. You can make Internet phone or fax calls while browsing the Internet. However, your web browsing may affect the quality of your telephone call, depending on the amount of upstream data traffic passing through your Internet connection.

Can I receive calls while my network is down?

You cannot directly receive calls while your network is down. However, Vonage can forward calls to a different telephone number, such as a cellular phone number, if you activate a feature called Network Availability Number. You can configure this feature through your service account at www.vonage.com.

Appendix B: Windows Help

Almost all Linksys products require Microsoft Windows. Windows is the most used operating system in the world and comes with many features that help make networking easier. These features can be accessed through Windows Help and are described in this appendix.

TCP/IP

Before a computer can communicate with a network router, TCP/IP must be enabled. TCP/IP is a set of instructions, or protocol, all PCs follow to communicate over a network. This is true for wireless networks as well. Your PCs will not be able to utilize wireless networking without having TCP/IP enabled. Windows Help provides complete instructions on enabling TCP/IP.

Shared Resources

If you wish to share printers, folder, or files over your network, Windows Help provides complete instructions on utilizing shared resources.

Network Neighborhood/My Network Places

Other PCs on your network will appear under Network Neighborhood or My Network Places (depending upon the version of Windows you're running). Windows Help provides complete instructions on adding PCs to your network.

Appendix C: Glossary

Adapter - A device that adds network functionality to your PC.

Backbone - The part of a network that connects most of the systems and networks together, and handles the most data.

Bandwidth - The transmission capacity of a given device or network.

Bit - A binary digit.

Boot - To start a device and cause it to start executing instructions.

Bridge - A device that connects different networks.

Broadband - An always-on, fast Internet connection.

Browser - An application program that provides a way to look at and interact with all the information on the World Wide Web.

Buffer - A shared or assigned memory area that is used to support and coordinate different computing and networking activities so one isn't held up by the other.

Byte - A unit of data that is usually eight bits long

Cable Modem - A device that connects a computer to the cable television network, which in turn connects to the Internet.

CSMA/CA (**C**arrier **S**ense **M**ultiple **A**ccess/**C**ollision **A**voidance) - A method of data transfer that is used to prevent data collisions.

CTS (**C**lear **T**o **S**end) - A signal sent by a wireless device, signifying that it is ready to receive data.

Daisy Chain - A method used to connect devices in a series, one after the other.

Database - A collection of data that is organized so that its contents can easily be accessed, managed, and updated.

DDNS (**D**ynamic **D**omain **N**ame **S**ystem) - Allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.

Default Gateway - A device that forwards Internet traffic from your local area network.

DHCP (**D**ynamic **H**ost **C**onfiguration **P**rotocol) - A networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

DMZ (**De**militarized **Z**one) - Removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet.

DNS (**D**omain **N**ame **S**erver) - The IP address of your ISP's server, which translates the names of websites into IP addresses.

Domain - A specific name for a network of computers.

Download - To receive a file transmitted over a network.

DSL (**D**igital **S**ubscriber **L**ine) - An always-on broadband connection over traditional phone lines.

DTIM (**D**elivery **T**raffic **I**ndication **M**essage) - A message included in data packets that can increase wireless efficiency.

Dynamic IP Address - A temporary IP address assigned by a DHCP server.

Encryption - Encoding data transmitted in a network.

Ethernet - A networking protocol that specifies how data is placed on and retrieved from a common transmission medium.

Finger - A program that tells you the name associated with an e-mail address.

Firewall - A set of related programs located at a network gateway server that protects the resources of a network from users from other networks.

Firmware - The programming code that runs a networking device.

Fragmentation -Breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

FTP (**F**ile **T**ransfer **P**rotocol) - A protocol used to transfer files over a TCP/IP network.

Full Duplex - The ability of a networking device to receive and transmit data simultaneously.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - The physical aspect of computers, telecommunications, and other information technology devices.

HTTP (**H**yper**T**ext **T**ransport **P**rotocol) - The communications protocol used to connect to servers on the World Wide Web.

Infrastructure - A wireless network that is bridged to a wired network via an access point.

IP (**I**nternet **P**rotocol) - A protocol used to send data over a network.

IP Address - The address used to identify a computer or device on a network.

IPCONFIG - A Windows 2000 and XP utility that displays the IP address for a particular networking device.

IPSec (**I**nternet **P**rotocol **S**ecurity) - A VPN protocol used to implement secure exchange of packets at the IP layer.

ISM band - Radio bandwidth utilized in wireless transmissions.

ISP (**I**nternet **S**ervice **P**rovider) - A company that provides access to the Internet.

LAN (**L**ocal **A**rea **N**etwork) - The computers and networking products that make up your local network.

MAC (**M**edia **A**ccess **C**ontrol) **Address** - The unique address that a manufacturer assigns to each networking device.

Mbps (Mega**B**its **P**er **S**econd**)** - One million bits per second; a unit of measurement for data transmission.

mIRC - An Internet Relay Chat program that runs under Windows.

Multicasting - Sending data to a group of destinations at once.

NAT (Network **A**ddress **T**ranslation**)** - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

NAT (Network **A**ddress **T**ranslation**) Traversal** -A method of enabling specialized applications, such as Internet phone calls, video, and audio, to travel between your local network and the Internet. STUN is a specific type of NAT traversal.

Network - A series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

NNTP (Network **N**ews **T**ransfer **P**rotocol**)** - The protocol used to connect to Usenet groups on the Internet.

Packet - A unit of data sent over a network.

Ping (Packet **IN**ternet **G**roper**)** - An Internet utility used to determine whether a particular IP address is online.

POP3 (Post **O**ffice **P**rotocol **3)** - A standard mail server commonly used on the Internet.

Port - The connection point on a computer or networking device used for plugging in cables or adapters.

RJ-45 (Registered **J**ack**-45)** - An Ethernet connector that holds up to eight wires.

Router - A networking device that connects multiple networks together.

RTP (Real-time **T**ransport **P**rotocol**)** - A protocol that enables specialized applications, such as Internet phone calls, video, and audio, to occur in real time.

RTS (Request **To S**end**)** - A networking method of coordinating large packets through the RTS Threshold setting.

Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

SMTP (**S**imple **M**ail **T**ransfer **P**rotocol) - The standard e-mail protocol on the Internet.

SNMP (**S**imple **N**etwork **M**anagement **P**rotocol) - A widely used network monitoring and control protocol.

Software - Instructions for the computer. A series of instructions that performs a particular task is called a "program".

SOHO (**S**mall **O**ffice/**H**ome **O**ffice) - Market segment of professionals who work at home or in small offices.

Static IP Address - A fixed address assigned to a computer or device that is connected to a network.

Static Routing - Forwarding data in a network via a fixed path.

STUN (**S**imple **T**raversal of **U**DP through **N**ATs) - A protocol that enables specialized applications, such as Internet phone calls, video, and audio, to travel between your local network and the Internet. STUN is a specific type of NAT traversal.

Subnet Mask - An address code that determines the size of the network.

Switch - 1. A data switch that connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

TCP (**T**ransmission **C**ontrol **P**rotocol) - A network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

TCP/IP (**T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol) - A set of instructions PCs use to communicate over a network.

Telnet - A user command and TCP/IP protocol used for accessing remote PCs.

TFTP (**T**rivial **F**ile **T**ransfer **P**rotocol) - A version of the TCP/IP FTP protocol that has no directory or password capability.

Throughput - The amount of data moved successfully from one node to another in a given time period.

Topology - The physical layout of a network.

TX Rate - Transmission Rate.

UDP (**U**ser **D**atagram **P**rotocol) - A network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent.

Upgrade - To replace existing software or firmware with a newer version.

Upload - To transmit a file over a network.

URL (**U**niform **R**esource **L**ocator) - The address of a file located on the Internet.

VPN (**V**irtual **P**rivate **N**etwork) - A security measure to protect data as it leaves one network and goes to another over the Internet.

WAN (**W**ide **A**rea **N**etwork)- The Internet.

WINIPCFG - A Windows 98 and Me utility that displays the IP address for a particular networking device.

Appendix D: Specifications

Model	PAP2
Standards	SIP v2 Session Initiation Protocol (RFC 3261, 3262, 3263, 3264)
Voice Codecs	G.729 A+B, G.711 a-law, G.711μ-law, G.726
Ports	Power, Ethernet, Phone 1, Phone 2
Cabling Type	CAT 5 (RJ45) for Ethernet Port and RJ11 for Phone Ports
LEDs	Power, Ethernet, Phone 1, Phone 2
Maximum Ringer Load	5 REN
Ring Frequency	10-40 Hz
FXS Port Impedance	Eight Configurable Settings Including North America 600 ohms, European CTR21
Ring Voltage	60-90 Vrms Configurable
Security Features	Password Protected Administration

Dimensions (W x H x D)	3.98" x 3.98" x 0.59" (101 mm x 101 mm x 15 mm)
Unit Weight	4.59 oz. (0.13 kg)
Power	5 V DC, 2.0 A
Certifications	FCC, cUL, CE
Operating Temp.	41º~113ºF (5º~45ºC)
Storage Temp.	-13º~185ºF (-25º~85ºC)
Operating Humidity	10~90% Non-Condensing
Storage Humidity	5~90% Non-Condensing

Appendix E: Warranty Information

LIMITED WARRANTY

Vonage warrants to You that, for a period of one year (the "Warranty Period"), your Linksys Product will be substantially free of defects in materials and workmanship under normal use. Your exclusive remedy and Vonage's entire liability under this warranty will be for Vonage at its option to repair or replace the Product or refund Your purchase price less any rebates. This limited warranty extends only to the original purchaser.

If the Product proves defective during the Warranty Period call Vonage Technical Support in order to obtain a Return Authorization Number, if applicable. If You are requested to return the Product, mark the Return Authorization Number clearly on the outside of the package. You are responsible for shipping defective Products to Vonage.

ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE WARRANTY PERIOD. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to You. This warranty gives You specific legal rights, and You may also have other rights which vary by jurisdiction.

This warranty does not apply if the Product (a) has been altered, except by Vonage, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Vonage, or (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Vonage does not warrant that the Product will be free of vulnerability to intrusion or attack.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL VONAGE BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF VONAGE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL VONAGE' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or

remedy provided under this Agreement fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to You.

Please contact Vonage regarding the warranty for the Product. Refer to "Appendix G: Contact Information" for Vonage contact information.

Appendix F: Regulatory Information

FCC STATEMENT

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna

• Increase the separation between the equipment or devices

• Connect the equipment to an outlet other than the receiver's

• Consult a dealer or an experienced radio/TV technician for assistance

SAFETY NOTICES

Caution: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Do not use this product near water, for example, in a wet basement or near a swimming pool.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Appendix G: Contact Information

Vonage

Need to contact Vonage?

If you wish to speak with Vonage Customer Care, you can call Vonage at:	24-hour: 1-VONAGE-HELP (866-243-4357) (toll-free from US)
If you are located in Canada, then call Vonage at:	24-hour: 877-272-0528 (toll-free from Canada)
If you are located outside of the US, then call Vonage at:	732-650-6699
Or fax your request in to:	732-333-1353
Visit Vonage online to access your account at:	http://www.vonage.com

Linksys

Need to contact Linksys?

Visit Linksys online for information on the latest products and updates to your existing products at:	http://www.linksys.com or ftp.linksys.com
Can't find information about a product you want to buy on the web? Do you want to know more about networking with Linksys products?	
Give the Linksys advice line a call at:	800-546-5797 (LINKSYS)
Or fax your request in to:	949-823-3002