AP+4

USER GUIDE

zoom®

Contents

Package Contents

The AP+4 package contains the following:

- AP+4
- Power cube
- Ethernet cable
- Quick Start
- CD containing warranty information and this documentation

If anything is missing or damaged, please contact Zoom Customer Support or the vendor from whom you purchased the AP+4.

Overview

You can use the AP+4 as a Router/Access Point, as a Wireless Client, or as a Universal Repeater.

- As a **Router/AP**, the AP+4 handles local network traffic both wirelessly and through its four LAN (**L**ocal **A**rea **N**etwork) ports, and communicates via its WAN (**W**ide **A**rea **N**etwork) port to an ADSL modem, cable modem, or other Internet-connected device.
- As a **Wireless Client**, the AP+4 connects via its LAN ports to up to four gaming devices or computers, and links them wirelessly to a Zoom X6 or other wireless router.
- As a **Universal Repeater**, the AP+4 is placed near the edge of a wireless network – for example, a Zoom X6 network – and wirelessly links up to 200 more devices to the network.

See **Setting Up the AP+4** on page 8 to choose an operating mode.

This User Guide provides instructions for connecting and configuring your AP+4 and setting up wireless and wired local area networks. It includes details about security, firewalls, Virtual Private Networks and administrative tasks.

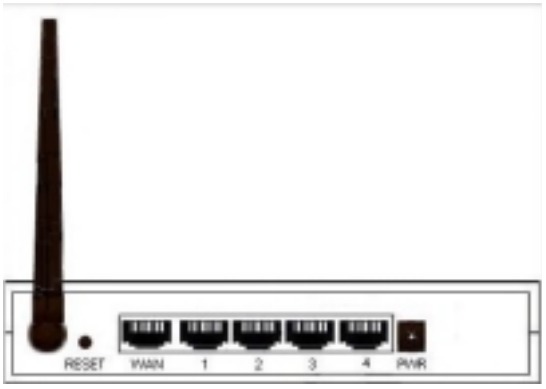
When we update information about the AP+4, the information is provided at this Zoom web site:

http://www.zoom.com/techsupport/wirelessg_support.html

1

Installing the AP+4

This chapter provides basic instructions for connecting the hardware and configuring the AP+4 using the Setup Wizard. If you have already done this by following the instructions in the printed *Quick Start*, skip to **Chapter 2, Wireless Settings**, on page 20.



AP+4 Back Panel Connectors

Connector	Description
RESET	To reset the modem to its factory settings, insert a paper clip and press and hold for 10 seconds.
WAN	This port connects to the LAN or Ethernet port of an ADSL or cable modem, using an Ethernet cable.
LAN 1 - 4	These **L**ocal **A**rea **N**etwork ports connect via Ethernet cable to up to four computers, game stations or other network devices.
PWR	This port connects to a live power source using the supplied power cube.

Connecting the Hardware

1 Put the AP+4 near a computer to be used for setup. That computer needs an Ethernet (LAN) port.

2 Turn off the computer.

3 Connect one end of the supplied power cube to the AP+4 **PWR** jack, and the other end to a live power source.

> **Important!** Only use the power cube shipped with the AP+4. Other power cubes may damage the device.

The **PWR** LED on the AP+4 front panel should turn on and the **WLAN** LED should flash. (The WLAN LED continues to flash to signify broadcast activity as long as the Wireless LAN is enabled. It is enabled by default.)

4 Connect one end of the supplied Ethernet cable to the computer's Ethernet port and the other end to one of the AP+4's LAN ports.

5 Turn on the computer.

The **WLAN** LED continues flashing and the connected **LAN** port and the **ACT** (Activity) LEDs become steady on. (If you have a 10 Mbps Ethernet connection, the LAN LED does not turn on.)

6 If you want the AP+4 to have access to the Internet, connect its WAN port to the Ethernet port on your cable modem, ADSL modem, or other broadband device.

The **WAN** LED turns on.

LED	Status	The AP+4 is . . .
PWR	Steady	connected to a power source
WLAN	Flashing	broadcasting its SSID (network name)
	Steady	not broadcasting its SSID and therefore not available to wireless devices seeking a wireless network connection
WAN	Steady	connected either wirelessly or via Ethernet cable to a broadband modem that connects to the Internet
	Flashing	transmitting or receiving data
LAN 1-4	Steady	connected via Ethernet cable to up to four computers or gaming devices
ACT (**Act**ivity)	Steady	connected via the associated LAN port to a computer or other network device
	Flashing	transmitting or receiving data via the associated LAN port

Setting Up the AP+4

1 Open your web browser, enter 10.0.0.200 in the address bar, and press the **Enter** key to open the Zoom AP+4 configuration software. The **Status** page appears first.

2 In the left pane, select **Setup Wizard**.

3 On the **Welcome** page, click **Next**.

4 On the **Choosing an Operating Mode** page, select the way you want to use the AP+4:

- **Ethernet Client** means that the AP+4 connects to the Ethernet ports of one or more PCs or game stations to provide wireless access to a wireless network.
- **Router/Access Point** is for all other uses of the AP+4, including a Repeater (a Repeater extends the range of a wireless network).

Click **Next** to continue.

5 To have the AP+4's clock automatically updated by an NTP server, on the **Selecting a Time Zone** page, select a **Time Zone** and an **NTP Server**, and click **Next**.

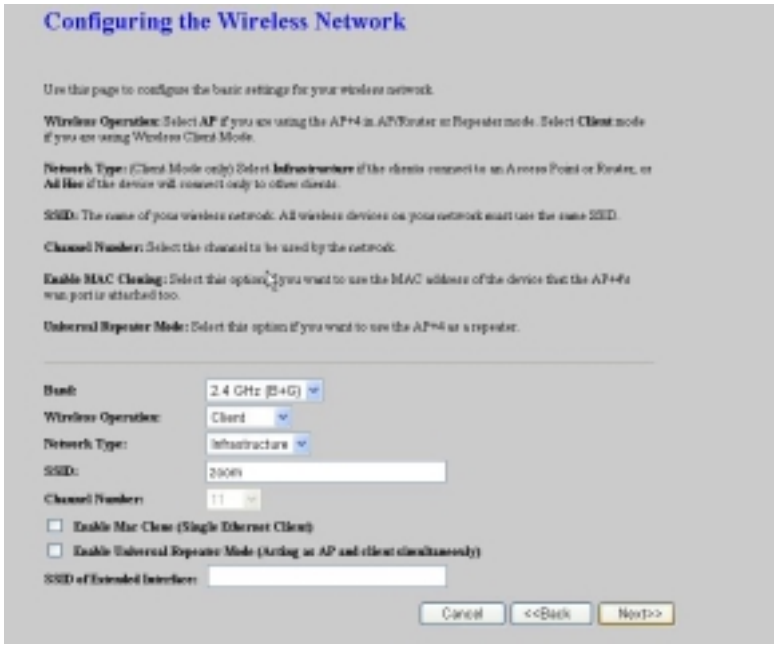
6 If you want to connect to the Internet, select the method on the **Setting Up Internet Access** page.

- If you are using the AP+4 as a Router/Access Point or with a cable modem, at **WAN Access Type** select **DHCP Client.**
- If you have an ADSL modem and you are running PPPoE software on your computer, select **PPPoE** (**P**oint-to-**P**oint **P**rotocol **o**ver **E**thernet) and enter the **User Name** and **Password** given to you by your Internet Service Provider. If you are unsure whether you are using PPPoE software, select DHCP Client.
- If you are using the AP+4 as an Ethernet Client or Repeater, at **WAN Access Type** select **DHCP Client** (most users) or **Static IP**.

  If you have a Static IP, enter the values for **IP Address**, **Subnet Mask**, **Default Gateway** and **DNS Server** that you want to use on your network.
- If you are setting up a Virtual Private Network (VPN) select PPTP. (Your ISP will tell you if you need to select this protocol.)

Click **Next** to continue.

7 On the **Configuring the Wireless Network** page, enter your wireless network parameters.



- At **Band**, select the type(s) of devices in your network:
  - **B+G** if the network includes both 802.11b and 802.11g devices (default). This option is best for most users.
  - **B** if the network includes only 802.11b devices
  - **G** if the network includes only 802.11g devices
- At **Wireless Operation**, select
  - **AP** if you are using the AP+4 as a Router/Access Point or a Repeater
  - **Client** if you are using the AP+4 as an Ethernet Client
  - **WDS** if you want to use the AP+4 as a Repeater in WDS (**W**ireless **D**istribution **S**ystem) mode.

Note: To use the AP+4 as a repeater, we recommend that you select AP and then select the **Enable Universal Repeater Mode** check box at the bottom of this page. Do not select WDS unless you are sure you want to set up a WDS network.

  - **AP+WDS** in the unlikely event that you want the AP+4 to operate as both an Access Point and a Repeater in WDS mode.

- At **Network Type** (available only if the AP+4 is operating as a Client) select Infrastructure (most users) or Ad Hoc.
- At **SSID** (**S**ervice **S**et **ID**entifier), enter a network name. All wireless devices on your network should use the same name.
- At **Channel Number** (available only if you selected Ad Hoc channel as your Network Type), select a channel number that isn't being used by another nearby network. If you are unsure which channel to use, try Channel 6.
- Select **Enable MAC Clone** in the unlikely event that you want to use the MAC address of a device in the network instead of the AP+4's MAC address.
- Select **Enable Universal Repeater Mode** if you want to use the AP+4 to extend the range of an existing wireless network.
  - If you select Enable Universal Repeater Mode, at **SSID of Extended Interface**, enter the SSID (network name) of the network to be extended. You can normally get this SSID from the user interface of the network's router.

Click **Next** to continue.

8 On the **Setting up Wireless Security** page, select an encryption method to protect your wireless communication. *We strongly recommend that you set up security*.

At **Encryption**:

- Select **WPA2 (AES)** if all of the devices in your network support this method. **Note:** If you are not sure of the encryption method, check the documentation that came with the device(s).

  In the **Pre-Shared Key Format** list, select **Passphrase** or **Hex (64 characters)**. We recommend that you select Passphrase.

  In the **Pre-Shared Key** text box, if you selected Passphrase, enter a password or sentence. If you selected Hex, enter up to 64 hexadecimal values.

  Enter the Passphrase or Hex string here for future reference:

  —

  —

- Select **WPA2 Mixed** if some of the devices in your network support WPA2 and some support WPA, and then follow the instructions for WPA2 above.
- Select **WPA (TKIP)** if all the devices in your network support this method, and then follow the instructions for WPA2 above.
- Select **WEP** only if the devices in your network do not support WPA2 or WPA.

  In the **Key Length** list, select 64 bits or 128 bits (128 bits preferred).

  In the **Key Format** list, if all the wireless devices in the network are Zoom products, select **ASCII**. Otherwise, select **Hex**.

  In the **Default Tx Key** list, select Key 1 (the default).

  In the **Encryption Key 1** text box, enter Key 1 in the format you selected, Hex or ASCII.

  If you selected Hex and you chose a 128-bit key length, write your 26-hexadecimal key in the space below for future reference, and then enter the key in the Encryption Key 1 box.

  — — — — — — — — — — — — —

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  If *you selected Hex* and you chose a 64-bit key length, write your 13-hexadecimal key in the space below for future reference, and then enter the key in the Encryption Key 1 box.

  — — — — — — — — — — — — —

  If you selected ASCII and you chose a 128-bit key length, write your 13-ASCII-character key in the space below for future reference, and then enter the key in the Encryption Key 1 box.

  — — — — — — — — — — — — —

If you selected ASCII and you chose a 64-bit key length, write your 5-ASCII-character key in the space below for future reference, and then enter the key in the Encryption Key 1 box.

— — — — —

Click **Finished**, and at the **Settings changed successfully!** message, click **OK**.

Your basic setup is complete! You don't need to keep the AP+4 plugged into the setup computer.

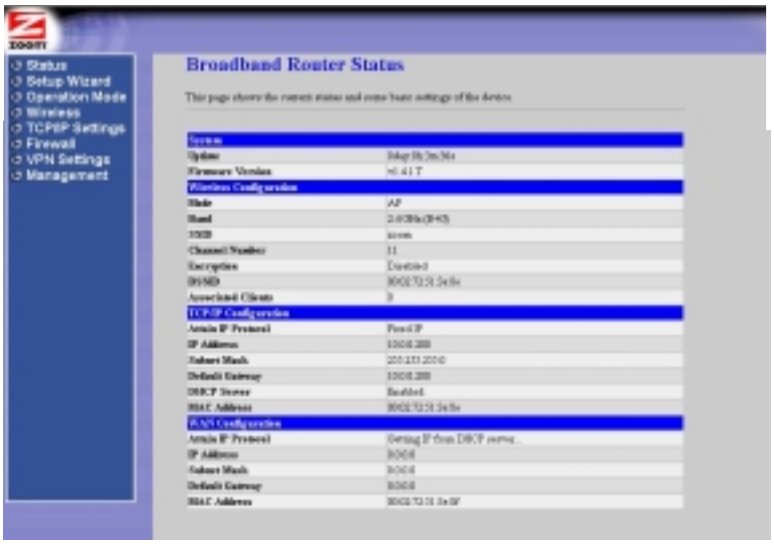
- If you are using the AP+4 as a *Router/Access Point*, your broadband modem is already connected. You can plug up to four computers, game stations, or other devices into the AP+4's LAN ports. The AP+4 can also link wireless devices to your network.
- If you are using the AP+4 as an *Ethernet Client* to provide access to your wireless network, you can plug up to four computers, game stations, or other devices into the AP+4's LAN ports.
- If you are using the AP+4 as a *Repeater,* you can unplug the computer from the AP+4's LAN port and locate the AP+4 near the edge of the wireless network you want to extend.

If you decide that you want to make changes to any of the parameters you have configured using the Setup Wizard, turn to **Chapter 3**, **Operating Mode**. Continue with **Chapter 4, Wireless Configuration**, and **Chapter 5, TCP/IP Settings**.

2

Monitoring AP+4 Status

The **Status** page is displayed when you open the AP+4 configuration software:



Field	Data displayed
System	
Uptime	The elapsed time of the current AP+4 session
Firmware Version	The AP+4 revision number. If you contact Zoom Technical Support, you will be asked for this number.

Field	Data displayed
Wireless Configuration	
Mode	Selected operating mode: AP, Client, WDS (**W**ireless **D**istribution **S**ystem), or AP+WDS
Band	Selected wireless frequency band. 2.4 GHz B indicates a network of 802.11b devices, 2.4 GHz G indicates a network of 802.11g devices, and 2.4 GHz B+G indicates a network that includes both 802.11b and 802.11g devices.
SSID	**S**ervice **S**et **ID**entifier: network name
Channel Number	Selected radio channel
Encryption	Selected security method: WPA2, Mixed, WPA, WEP or None. See page 23.
BSSID	**B**asic **S**ervice **S**et **ID**entifier: the MAC address of the AP+4
Associated Clients	MAC addresses of computers, game consoles or other devices on the network
TCP/IP Configuration (Local Area Network)	
Attain IP Protocol	DHCP or Static, depending on operating mode
IP Address	AP+4 IP address
Subnet Mask	AP+4 subnet mask
Default Gateway	AP+4 default gateway
DHCP Server	**Enabled** if the AP+4 is providing dynamic IP addresses to network clients **Client** if another device on the network is providing the addresses **None** if the AP+4 is operating as a bridge
MAC Address	AP+4 MAC address

Field	Data displayed
WAN Configuration	
Attain IP Protocol	**DHCP server** if the AP+4 is connected directly to an ADSL or cable modem **Fixed IP** if the AP+4 is using a static IP address **PPPoE connected** if you have an ADSL modem and your ISP requires PPPoE **PPTP connected** if you have set up a VPN and you have a static IP address.
IP Address	AP+4 IP address
Subnet Mask	Supplied by DHCP server or entered manually on the WAN Setup page
Default Gateway	Supplied by DHCP server or entered manually on the WAN Setup page
MAC Address	AP+4 WAN MAC address

3

Operating Mode

Selecting an Operating Mode is the first step in configuring your AP+4.

You may have completed this step using the Setup Wizard described in Chapter 1. If you want to change these settings, or if you are manually configuring the AP+4, in the left menu pane select **Operation Mode**.

Note: To use the AP+4 as a Repeater, choose **Router/AP,** and then on the **Wireless Basic Settings** page, select **Enable Universal Repeater Mode** (see page 12).

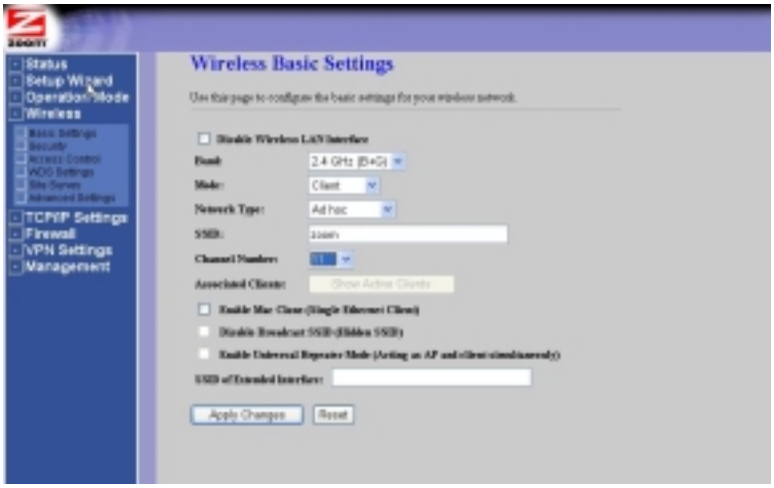
4

Wireless Configuration

To set up or modify the parameters for your wireless network, in the left menu pane select **Wireless**.

Basic Settings

This page includes all the parameters on the Setup Wizard's **Configuring the Wireless Network** page, plus advanced options.



Parameter	Select or enter . . .
Disable Wireless LAN Interface	To deny access to the AP+4 network by wireless devices, select this check box. When you disable the wireless LAN, the **WLAN** LED on the front panel stops flashing, indicating that the AP+4 is no longer broadcasting its SSID.
Band	Select: • **2.4 GHz B** if you have a network of 802.11b devices • **2.4 GHz G** if you have a network of 802.11g devices • **2.4 GHz B+G** if your network includes both 802.11b and 802.11g devices
Mode	Select a wireless operating mode: **AP**. In this mode the AP+4 handles local network traffic wirelessly and through its four LAN ports, and communicates via its WAN port to an ADSL modem, cable modem, or other Internet-connected device. **Client**. In this mode the AP+4 connects via its LAN ports to up to four game stations or computers, and links them wirelessly to a Zoom X6 or other wireless router. **WDS.** In this mode the AP+4 acts as a Repeater in WDS (**W**ireless **D**istribution **S**ystem) mode. **Note:** The AP+4 can act as a Repeater in either Universal Repeater mode (see below) or WDS mode. Most users who want to configure the AP+4 as a repeater should choose Universal Repeater mode, because it is easier to set up than a WDS network and it provides better performance. (See above). **AP+WDS.** In this mode the AP+4 acts as both an Access Point and a Repeater in WDS mode.
Network Type	(Client mode only) Select **Infrastructure** or **Ad Hoc**.
SSID	Enter the AP+4's SSID (network name). All wireless devices should use the same SSID.
Channel Number	*Infrastructure network*: Leave the default **Auto**. The AP+4 automatically selects the channel with the least interference.

	Ad Hoc network: Select a channel.
Associated Clients	Click **Show Active Clients** for a list of devices on the wireless network.
Enable MAC Clone	(Usually optional) Enter the MAC address of a device in the LAN network if you want to use that address for Internet access instead of the AP+4's MAC address.
Disable Broadcast SSID	Select this check box if you want to require clients to know the AP+4's SSID in order to join the network.
Enable Universal Repeater Mode	(AP mode only) Select this check box to set up the AP+4 as a repeater. You also need to select a channel.
SSID of Extended Interface	If the AP+4 is operating as a repeater, enter the SSID (network name) of the AP whose range is being extended.

Click **Apply Changes** to save your edits.

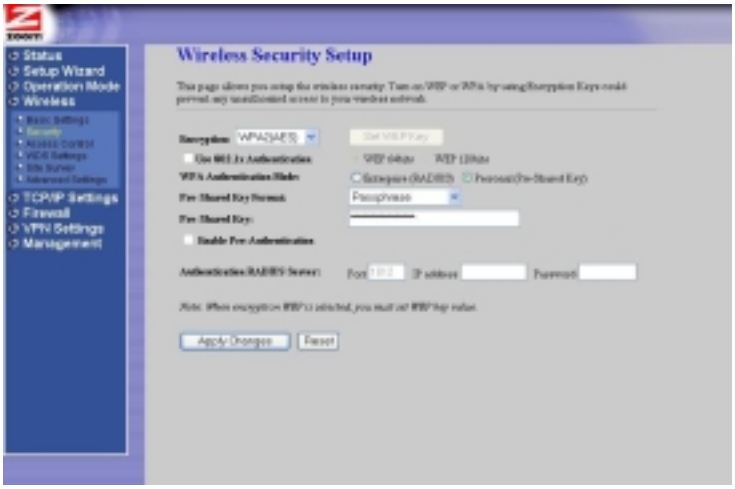
Active Wireless Client Table

On the **Wireless Basic Settings** page, click **Show Active Clients** to display a list of network clients:

Parameter	Data displayed
MAC Address	MAC address of the network client
Tx Packet	Number of data packets transmitted without error
Rx Packet	Number of data packets received without error
Tx Rate	Data transmission speed
Power Saving	Number of Power Save occurrences
Expired Time(s)	Indicates whether the client's DHCP lease has expired, making the IP address available for another client.

Wireless Security

We strongly recommend that you set up security to protect your network communication. The encryption method of choice is WPA2-AES (**W**iFi® **P**rotected **A**ccess **2** – **A**dvanced **E**ncryption **S**tandard).



Parameter	Select or enter . . .
Encryption	Select: **WPA2-AES** if all the devices in your network support WPA2.

	WPA Mixed if some of your network devices support WPA2 and some support WPA. **WPA-TKIP** if all the devices in your network support WPA. **WEP** only if the devices in your network do not support WPA2 or WPA. **None** (not recommended)
WPA2 (AES), WPA (TKIP), or **WPA Mixed**	
Enterprise (RADIUS)	Select this option in the unlikely event that your network connects to a RADIUS server. Then select **Use 802.1x Authentication** and enter the RADIUS server's **Port**, **IP Address** and **Password**.
Personal (Pre-Shared Key)	Select this option if the network does not connect to a RADIUS server. *Most users will select this.* In the **Pre-Shared Key Format** list, select **Passphrase** or **Hex** (64 values). • Write your key in the space below for future reference, and then enter it in the **Pre-Shared Key** text box: —
Enable Pre-Authentication	Select this option if you want to allow devices to authenticate before they move into the AP+4's wireless network range, so that they can gain immediate access when they are within range.

WEP	Click **Set WEP Key** and enter the following information.
Key Length	Select an encryption key length of 64 bits or 128 bits (128 bits preferred).
Key Format	If all the wireless devices in the network are Zoom products, select **ASCII**. Otherwise, select **Hex**.
Default Tx Key	Select **Key 1** as the default key to use for encryption of transmitted messages.
Encryption Key 1	*If you selected Hex format* and you chose a 128-bit key length, 26 hexadecimal values are required. Write the 26-hexadecimal key in the space below for future reference, and then enter it in the Key 1 box. — — — — — — — — — — — — — — — — — — — — — — — — — — *If you selected Hex format* and you chose a 64-bit key length, 13 hexadecimal values are required. Write the 13-hexadecimal key in the space below for future reference, and then enter it in the Key 1 box. — — — — — — — — — — — — — *If you selected ASCII format*, and you chose a 128-bit key length, 13 ASCII characters are required. Write the 13-ASCII-character key in the space below for future reference, and then enter it in the Key 1 box. — — — — — — — — — — — — — If you selected ASCII format, and you chose a 64-bit key length, 5 ASCII characters are required. Write the 5-ASCII-character key in the space below for future reference, and then enter it in the Key 1 box. — — — — —

Access Control

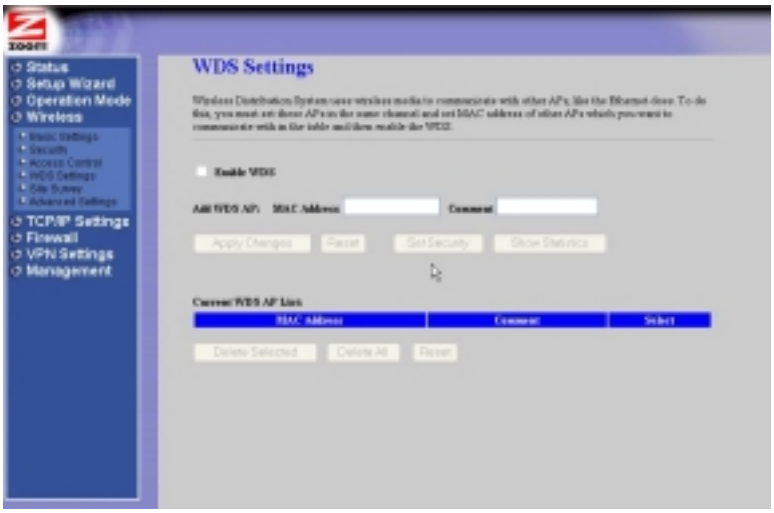
Use this page to allow or deny access to the network.

Parameter	Select or enter . . .
Wireless Access Control Mode	Select: • **Deny Listed** to prevent access by clients whose MAC addresses are listed • **Allow Listed** to permit access by clients whose MAC addresses are listed
MAC Address	Enter client addresses, one at a time. • Click **Apply Changes** after each entry. • Click **Reset** to clear the current entry before you apply the change.
Delete Selected	In the **Current Access Control List**, click the **Select** check box for one or more MAC addresses and then click this button.
Delete All	Click this button to clear the list.
Reset	Click this button to clear the **Select** check boxes.

WDS Settings

A **W**ireless **D**istribution **S**ystem (WDS) expands a wireless network by using multiple Access Points connected wirelessly. All APs must use the same channel.

Note: Most users who want to configure the AP+4 as a repeater should choose Universal Repeater Mode (see Wireless Basic Settings, page 20) instead of WDS, because a Universal Repeater is easier to set up and provides the best performance.



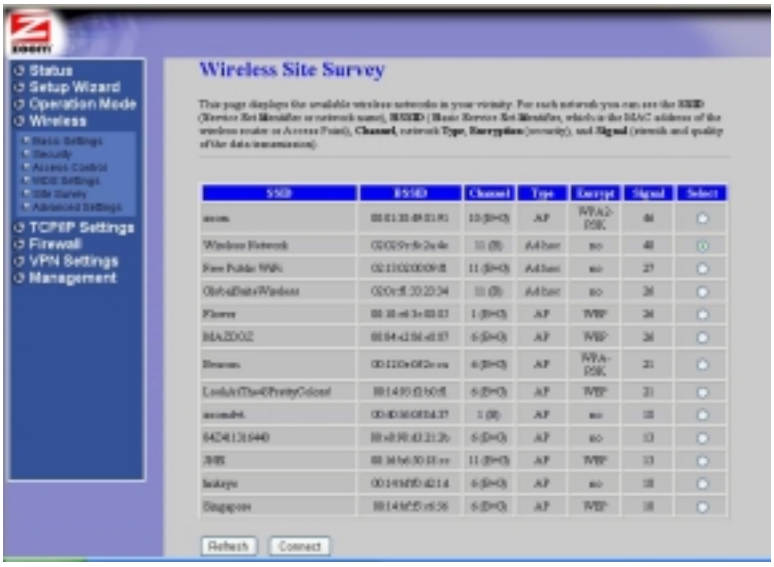
Parameter	Select or enter . . .
Enable WDS	Select the check box to enable WDS.
Add WDS AP	Enter Access Point MAC addresses, one at a time. • Click **Apply Changes** after each entry. The AP MAC addresses appear one at a time in the **Current WDS AP List**. • Click **Reset** to clear the current entry before you apply the change. • Click **Set Security** to open the **Wireless Security Setup** page and configure security for the additional AP. The security method must be the same as on the AP+4.

	• Click **Show Statistics** to display Transmit and Receive information for each configured AP.
Delete Selected	In the **Current Access Control List**, click the **Select** check box for one or more MAC addresses and then click this button to delete.
Parameter	**Select or enter . . .**
Delete All	Click this button to clear the list.
Reset	Click to clear the **Select** check boxes.

Site Survey

This page displays the available wireless networks in your vicinity. Click **Refresh** after the page opens to make sure the list is up-to-date.

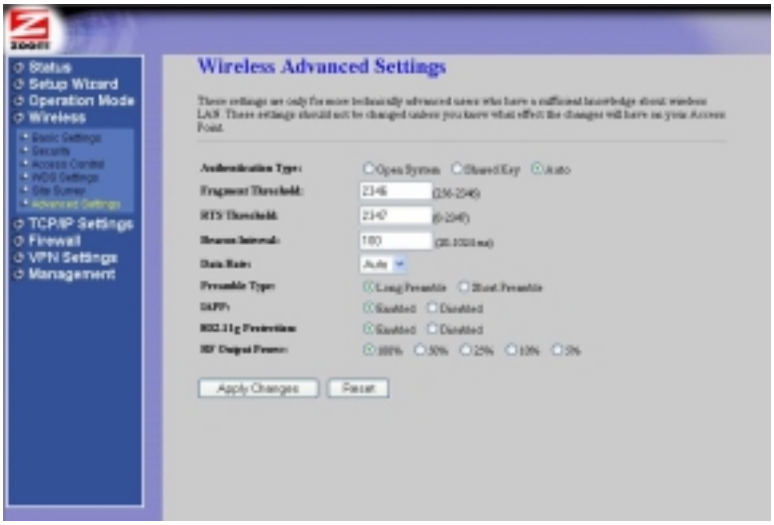
If the AP+4 is in Client mode, you can select a network and click **Connect** to join it.



Parameter	Displays . . .
SSID	**S**ervice **S**et **ID**entifier: Network name
BSSID	**B**asic **S**ervice **S**et **ID**entifier: MAC address of the network's access point
Channel	Radio channel and the type of devices in the network (802.11g, 802.11b or both)
Type	Network type: • AP (or Infrastructure), where devices communicate with each other through an access point • Ad Hoc, where devices communicate directly with each other
Encrypt	Security configured – Yes or No
Signal	Strength of the wireless signal, which generally depends on the proximity of the access point
Select	Click a button to select a network, and then click the **Connect** button to join the network. Security configured on the AP+4 must match the security on the selected network.

Advanced Settings

As explained on this page, the Advanced Settings are designed for people with wireless network knowledge and experience. Most people will not need to change these settings.



Parameter	Select or enter . . .
Authentication Type	These settings are used with WEP. Select: • **Open System** to allow a client to associate with the AP+4 without the correct WEP key or even without having WEP enabled. As long as the client has the correct SSID, it can obtain a connection. *However, no communication will be possible.* If the AP+4 is set up as Open, it will not work with a Shared Key client. • **Shared Key** to allow a client with the correct SSID and WEP key to connect and communicate. If the AP+4 is set up as Shared Key, it will not work with an Open client. • **Auto** to allow either Open or Shared Key clients with the correct SSID and WEP key to connect and communicate.

Parameter	Select or enter . . .
Fragment Threshold	**Fragment** (Data fragmentation) **Threshold:** If the AP+4 often transmits large files, you can set a limit on packet size. If the limit is exceeded, the AP+4 will split the packet. The default is **Disabled** (2346).
RTS Threshold	**RTS** (**R**equest **T**o **S**end) **Threshold**: This is a mechanism designed to ensure that all devices in a network can send data to the AP+4. If some laptops are having trouble communicating, enter the maximum packet size of data to be sent – 0 to 1500 is recommended. If the packet size exceeds the value you set, RTS will be activated. The default is **Disabled** (2347).
Beacon Interval	Length of time between broadcasts of the beacon frame by the AP. The beacon frame contains control information and can be used by mobile stations to locate an AP. The default is 100 milliseconds.
Data Rate	Select the AP+4's data transmission rate.
Preamble Type	Select the length of the message header.
IAPP	IAPP (**I**nter-**A**ccess **P**oint **P**rotocol) is an extension to the IEEE 802.11 standard that permits wireless communications among multivendor access points. Select **Enabled** or **Disabled**.
802.11g Protection	*If you selected the 2.4 GHz B+G band on the Wireless Basic Settings page,* select this option to allow 802.11b clients to work with the AP+4.
RF Output Power	Select a **R**adio **F**requency output of 5% to 100%.

5

TCP/IP Settings

LAN Interface

To modify a wired Local Area Network, in the left menu pane select **TCP/IP Settings → LAN Interface**:

Parameter	Select or enter . . .
IP Address	AP+4's IP address
Subnet Mask	AP+4's subnet mask
Default Gateway	AP+4's default gateway
DHCP	Select: • **Server** (the default) if the AP+4 is acting as a dynamic Internet address server. • **Client** if another device on the network is providing the dynamic IP addresses. • **None** if the AP+4 is operating as a bridge.

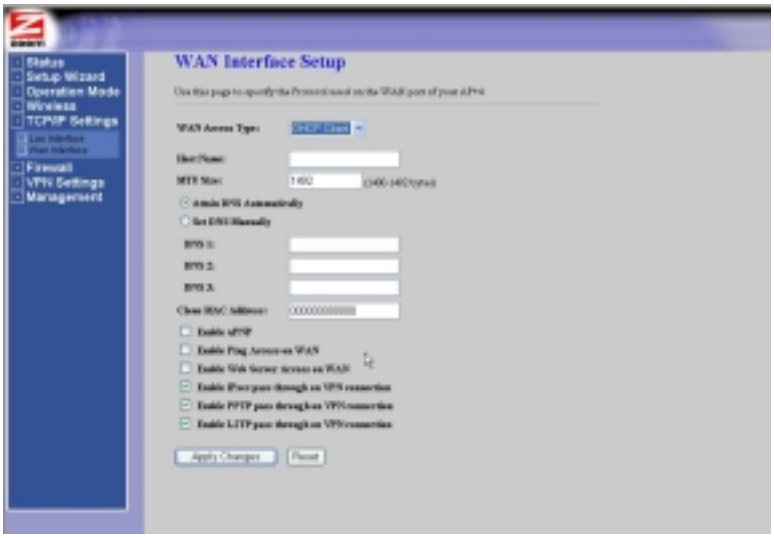
DHCP Client Range	The default range is shown: 10.0.0.1 to 10.0.0.199. Enter a different range if desired. Click **Show Clients** to view a list of connected devices.
Domain Name	If you have a large network that uses domains, enter a name.
802.1d Spanning Tree	If the AP+4 is operating as a bridge, select **Enable** to use this protocol, which limits the chances of network failure.
Clone MAC Address	(Optional) Enter the MAC address of one of the devices in the network, which will be sent to the Internet Service Provider instead of the AP+4's address.

Click **Apply Changes** to save your entries or **Reset** to return to the defaults.

Important: After you make changes, **you must reboot all devices** attached to the AP+4.

WAN Interface

To set up or modify the way the AP+4 connects to the Internet, in the left menu pane select **TCP/IP Settings → WAN Interface**:



Parameter	Select or enter . . .
WAN Access Type	• **DHCP Client** if you are connected directly to an ADSL or cable modem. (Most users will select this option.) • **Static IP** if you are connected directly to an ADSL modem and are using a Static IP. You usually have to make special arrangements with your Internet Service Provider to get a Static (fixed) IP address. • **PPPoE** if you have an ADSL modem and your provider requires PPPoE. • **PPTP** if you are setting up a Virtual Private Network (VPN). You must get a Static IP address from your Internet Service Provider.

DHCP Client

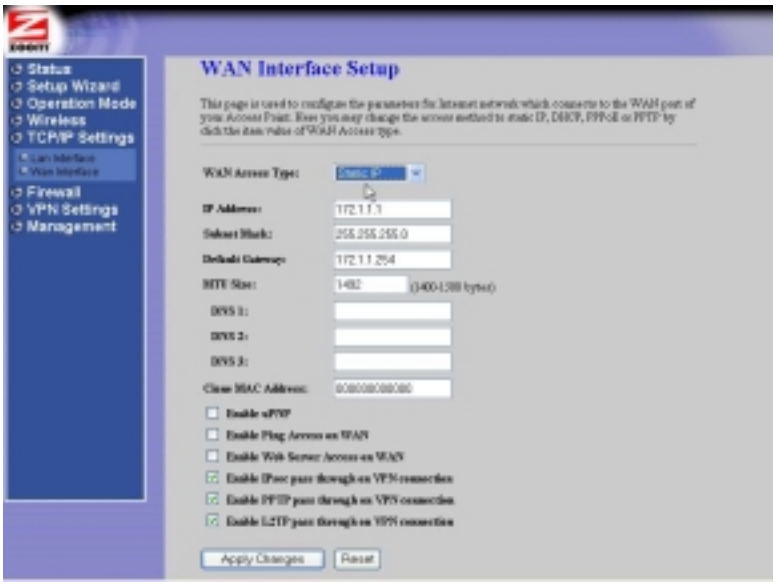
If you select **DHCP Client** as your WAN Access Type, you see the following parameters:

Parameter	Select or enter . . .
Host name	A network name negotiated with the ISP
***MTU Size**	The size of the **M**aximum **T**ransmission **U**nit, the largest physical packet size that a network can transmit. The default is 1492 bytes.
Attain DNS Automatically	If you select this option, your ISP provider assigns a **D**omain **N**ame **S**erver (DNS), which maps the user-friendly domain names (URLs) that you type into your web browser (for example, www.zoom.com) to the numerical IP addresses that are used for Internet routing. When you type a URL into your browser, your PC sends a request to a DNS server to find the equivalent numerical address.
Set DNS Manually	If you select this option, enter the IP address(es) of one or more Domain Name Servers in the following text boxes. **DNS 1:** The IP Address of the primary Domain Name Server **DNS 2:** The address of an alternate DNS server to use in case DNS Server #1 is down or very slow **DNS 3:** The address of an alternate DNS server to use in case DNS Servers #1 and #2 are down or very slow
Clone MAC Address	(Usually optional) Enter the MAC address of a device in the LAN network if you want to use that address for Internet access instead of the AP+4's MAC address.
Enable uPNP	Select this check box to enable **U**niversal **Pl**ug a**n**d **P**lay, which lets LAN devices connect automatically to one another.
Enable Ping Access on WAN	Select this check box to allow someone to ping the AP+4 over the Internet . This is useful for troubleshooting – it can allow a technician to remotely ping the AP+4 to see if it is working. In normal use, this option should be disabled for security reasons.

Enable Web Server Access on WAN	Select this check box to allow someone to remotely access the AP+4's built-in HTTP server. Web server access is useful for troubleshooting – it can allow a technician to remotely check the AP+4 configuration settings. In normal use, this option should be disabled for security reasons.
Enable IPsec passthrough on VPN connection	(PPTP/VPN only) Select this check box to let network devices communicate via a **V**irtual **P**rivate **N**etwork (VPN) using **I**nternet **P**rotocol **sec**urity (IPsec), in which sending and receiving devices share a public key for encryption and decryption. The AP+4 simply passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable PPTP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **P**oint-to-**P**oint **T**unneling **P**rotocol. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable L2TP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **L**ayer **2** **T**unneling **P**rotocol, an enhancement of PPTP and L2F protocols. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.

Static IP

If you select **Static IP** as your WAN Access Type, you see the following parameters:

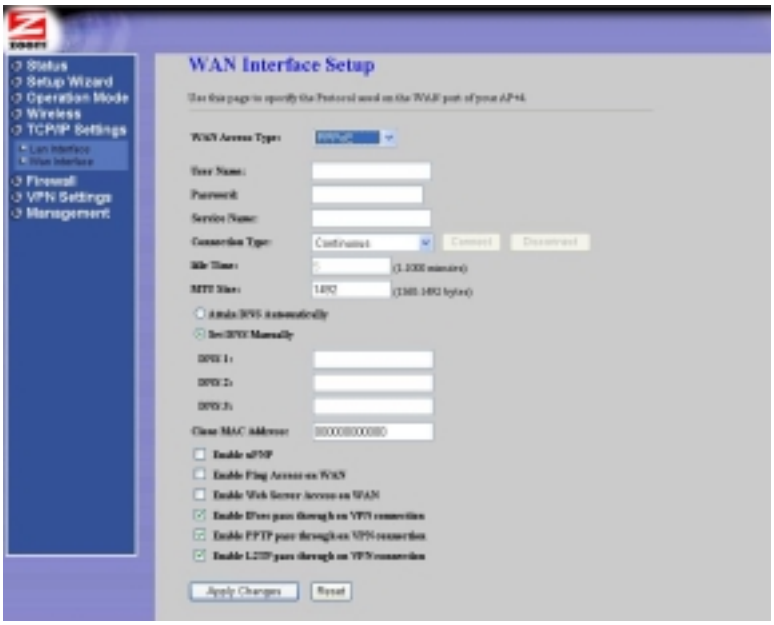


Parameter	Select or enter . . .
IP Address	If you are directly connected to an ADSL modem, enter the IP Address assigned by your Internet Service Provider.
Subnet Mask	If you are directly connected to an ADSL modem, enter the Subnet Mask assigned by your ISP.
Default Gateway	If you are directly connected to an ADSL modem, enter the Default Gateway address assigned by your ISP.
MTU Size	The size of the **M**aximum **T**ransmission **U**nit, the largest physical packet size that a network can transmit. The default is 1492 bytes.
DNS 1	The IP Address of the primary Domain Name Server
DNS 2	The address of an alternate DNS server to use in case DNS Server #1 is down or very slow

DNS 3	The address of an alternate DNS server to use in case DNS Servers #1 and #2 are down or very slow
Clone MAC Address	(Usually optional) Enter the MAC address of a device in the LAN network if you want to use that address for Internet access instead of the AP+4's MAC address.
Enable uPNP	Select this check box to enable **U**niversal **Pl**ug a**n**d **P**lay, which lets devices connect automatically to one another over the LAN,
Enable Ping Access on WAN	Select this check box to allow someone to ping the AP+4 over the Internet . This is useful for troubleshooting – it can allow a technician to remotely ping the AP+4 to see if it is working. In normal use, this option should be disabled for security reasons.
Enable Web Server Access on WAN	Select this check box to allow someone to remotely access the AP+4's built-in HTTP server. Web server access is useful for troubleshooting – it can allow a technician to remotely check the AP+4 configuration settings. In normal use, this option should be disabled for security reasons.
Enable IPsec passthrough on VPN connection	(PPTP/VPN only) Select this check box to let network devices communicate via a **V**irtual **P**rivate **N**etwork (VPN) using **I**nternet **P**rotocol **sec**urity (IPsec), in which sending and receiving devices share a public key for encryption and decryption. The AP+4 simply passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable PPTP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **P**oint-to-**P**oint **T**unneling **P**rotocol. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable L2TP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **L**ayer **2** **T**unneling **P**rotocol, an enhancement of PPTP and L2F protocols. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.

PPPoE (ADSL only)

If you select **PPPoE** (**P**oint-to-**P**oint **P**rotocol **o**ver **E**thernet) as your WAN Access Type, you see the following parameters:



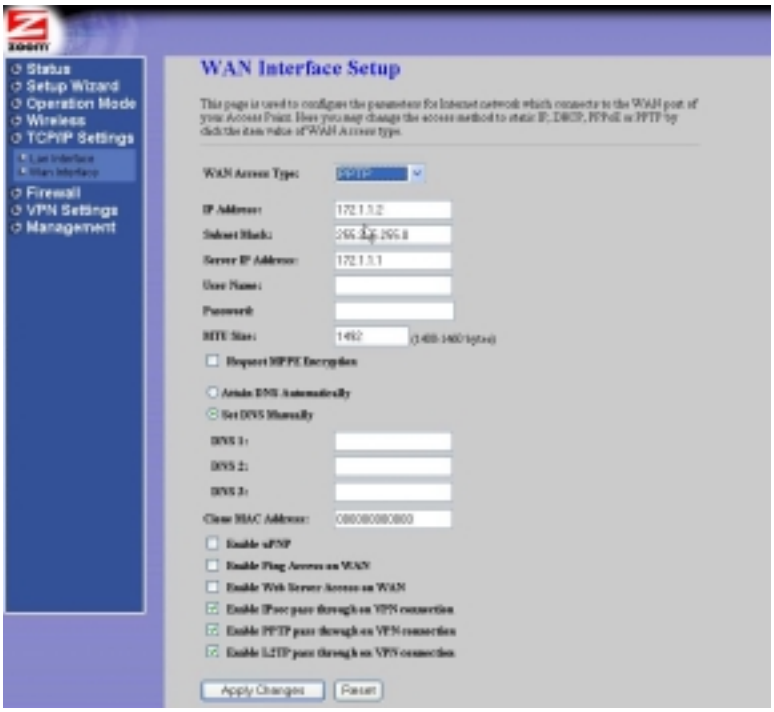
Parameter	Select or enter . . .
User Name	The login name given to you by your ISP – typically the characters preceding the @ sign in your email address.
Password	The login password given to you by your ISP.
Service Name	(Usually not required) Your service provider's name – given to you by the ISP.
Connection Type	• **Continuous** if the AP+4 is automatically connected at power up and remains connected. If the connection is dropped, it will automatically be restored. • **Connect on demand** if you connect when you initiate communication over the Internet. When the **Idle Time** interval expires, the connection is dropped. • **Manual** if you must select the **Connect** and **Disconnect** buttons on this page.

Parameter	Select or enter . . .
Idle Time	The number of minutes of inactivity after which the connection is dropped.
MTU Size	The size of the **M**aximum **T**ransmission **U**nit, the largest physical packet size, measured in bytes, that a network can transmit. The default is 1492 bytes.
Attain DNS Automatically	If you select this option, your ISP provider assigns a **D**omain **N**ame **S**erver (DNS). A DNS maps the user-friendly domain names that you type into your web browser (for example, www.zoom.com) to the numerical IP addresses that are used for Internet routing. When you type a domain name into your browser, your PC sends a request to a DNS server to find the equivalent numerical address.
Set DNS Manually	If you select this option, enter the IP address(es) of Domain Name Server(s) in the following text boxes. **DNS 1:** The IP Address of your primary Domain Name Server. **DNS 2:** The address of an alternate DNS server to use in case DNS Server #1 is out of service or heavily congested. **DNS 3:** The address of an alternate DNS server to use in case DNS Servers #1 and #2 are out of service or heavily congested.
Clone MAC Address	(Usually optional) Enter the MAC address of a device in the LAN network if you want to use that address for Internet access instead of the AP+4's MAC address.
Enable uPNP	Select this check box to enable **U**niversal **Pl**ug a**n**d **P**lay, which lets devices connect automatically to one another over the LAN.
Enable Ping Access on WAN	Select this check box to allow someone to ping the AP+4 over the Internet . This is useful for troubleshooting – it can allow a technician to remotely ping the AP+4 to see if it is working. In normal use, this option should be disabled for security reasons.
Enable Web Server Access on WAN	Select this check box to allow someone to remotely access the AP+4's built-in HTTP server. Web server access is useful for

	troubleshooting – it can allow a technician to remotely check the AP+4 configuration settings. In normal use, this option should be disabled for security reasons.
Enable IPsec passthrough on VPN connection	(PPTP/VPN only) Select this check box to let network devices communicate via a **V**irtual **P**rivate **N**etwork (VPN) using **I**nternet **P**rotocol **sec**urity (IPsec), in which sending and receiving devices share a so-called public key for encryption and decryption. The AP+4 simply passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable PPTP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **P**oint-to-**P**oint **T**unneling **P**rotocol. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable L2TP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **L**ayer **2** **T**unneling **P**rotocol, an enhancement of PPTP and L2F protocols. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.

PPTP (VPN only)

If you select PPTP (**P**oint-to-**P**oint **T**unneling **P**rotocol) as your WAN Access Type, you see the following parameters:



Parameter	Select or enter . . .
IP Address	The static IP address assigned by your Internet Service Provider
Subnet Mask	The Subnet Mask assigned by your ISP
Server IP Address	The IP address of your ISP's PPTP server
User Name	The name assigned by your ISP
Password	The password assigned by your ISP
MTU Size	The size of the **M**aximum **T**ransmission **U**nit, the largest physical packet size, measured in bytes, that a network can transmit. The default is 1492 bytes.

Request MPPE Encryption	Select this option to use **M**icrosoft **P**oint-to-**P**oint **E**ncryption, technology developed by Microsoft for encrypting communication over a VPN tunnel.
Attain DNS Automatically	If you select this option, your ISP provider assigns a **D**omain **N**ame **S**erver (DNS). A DNS maps the user-friendly domain names that you type into your web browser (for example, www.zoom.com) to the numerical IP addresses that are used for Internet routing. When you type a domain name into your browser, your PC sends a request to a DNS server to find the equivalent numerical address.
Set DNS Manually	If you select this option, enter the IP address(es) of Domain Name Server(s) in the following text boxes. **DNS 1:** The IP Address of your primary Domain Name Server. **DNS 2:** The address of an alternate DNS server to use in case DNS Server #1 is out of service or heavily congested. **DNS 3:** The address of an alternate DNS server to use in case DNS Servers #1 and #2 are out of service or heavily congested.
Clone MAC Address	(Usually optional) Enter the MAC address of a device in the LAN network if you want to use that address for Internet access instead of the AP+4's MAC address.
Enable uPNP	Select this check box to enable **U**niversal **Pl**ug a**n**d **P**lay, which lets devices connect automatically to one another over the LAN.
Enable Ping Access on WAN	Select this check box to allow someone to ping the AP+4 over the Internet . This is useful for troubleshooting – it can allow a technician to remotely ping the AP+4 to see if it is working. In normal use, this option should be disabled for security reasons.

Parameter	Select or enter . . .
Enable Web Server Access on WAN	Select this check box to allow someone to remotely access the AP+4's built-in HTTP server. Web server access is useful for troubleshooting – it can allow a technician to remotely check the AP+4 configuration settings. In normal use, this option should be disabled for security reasons.
Enable IPsec passthrough on VPN connection	(PPTP/VPN only) Select this check box to let network devices communicate via a **V**irtual **P**rivate **N**etwork (VPN) using **I**nternet **P**rotocol **sec**urity (IPsec), in which sending and receiving devices share a public key for encryption and decryption. The AP+4 simply passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable PPTP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **P**oint-to-**P**oint **T**unneling **P**rotocol. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.
Enable L2TP passthrough on VPN connection	(PPTP/VPN only) Select this check box to protect VPN communication via **L**ayer Two (**2**) **T**unneling **P**rotocol, an enhancement of PPTP and L2F protocols. The AP+4 passes the encrypted packets back and forth between the VPN clients and the ISP's VPN server.

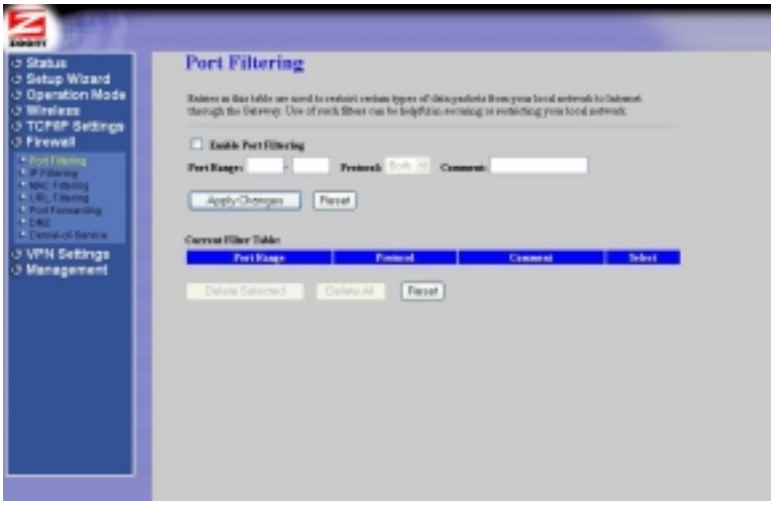
6

Firewall Settings

The AP+4 lets you set up firewall protection for your network. There are several ways you can filter out unwanted communication to and from the network devices. To access the filters, in the left menu pane click **Firewall**.

Port Filtering

This filter can disable a range of ports on the network clients.



Parameter	Select or enter . . .
Enable Port Filtering	Select this check box to prevent certain types of data from being sent over the Internet by computers or other devices in the Local Area Network.

Parameter	Select or enter . . .
Port Range	Enter a range of ports to be disabled. **Note:** You can enter more than one range, but you must click **Apply Changes** after each entry.
Protocol	Select • **TCP** (**T**ransmission **C**ontrol **P**rotocol) • **UDP** (**U**ser **D**atagram **P**rotocol) • **Both** Click **Apply Changes** to add the Port Range and protocol to the **Current Port Filter** list.
Delete Selected	In the **Current Filter Table**, click the **Select** check box for one or more Port Ranges and then click this button to delete.
Delete All	Click this button to clear the Filter Table.
Reset	Click to clear the **Select** check boxes.

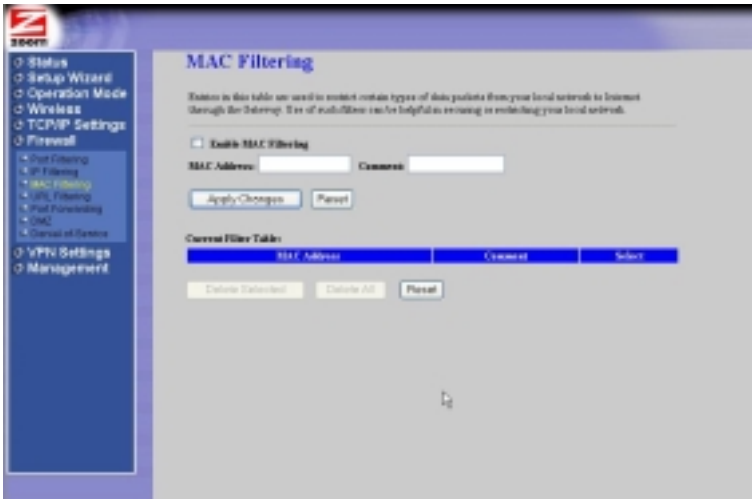
IP Filtering

This filter can prevent certain types of data from being sent over the Internet to computers or other devices in the Local Area Network.

Parameter	Select or enter . . .
Enable IP Filtering	Select this check box to protect computers or other devices in the Local Area Network from receiving unwanted Internet communication.
Local IP Address	Enter the IP addresses, one at a time, of devices that are prevented from sending data to your LAN.
Protocol	Select • **TCP** (**T**ransmission **C**ontrol **P**rotocol) • **UDP** (**U**ser **D**atagram **P**rotocol) • **Both**
Apply Changes	Click this button to add the IP address and protocol to the **Current Filter Table**.
Reset	If you make a mistake, click this button to return to the defaults on this page.
Delete Selected	In the **Current Filter Table**, click the **Select** check box for one or more IP addresses and then click this button to delete.
Delete All	Click this button to clear the table.
Reset	Click to clear the **Select** check boxes.

MAC Address Filtering

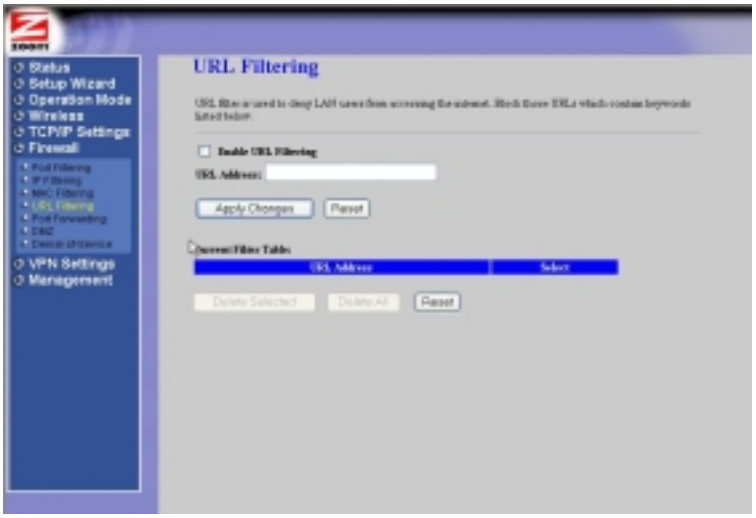
Use this page to specify the MAC addresses of clients who are allowed to join the wireless network.



Parameter	Select or enter . . .
Enable MAC Filtering	When you select this check box, the AP+4 will compare the MAC address of a client requesting access to the network with the **Current Filter Table**. Clients not on the list will be denied access.
MAC Address	Enter the client MAC addresses – *without separators* – one at a time.
Apply Changes	Click this button to add the MAC address to the **Current Filter Table**.
Reset	If you make a mistake, click this button to return to the defaults on this page.
Delete Selected	In the **Current Filter Table**, click the **Select** check box for one or more MAC addresses and then click this button to delete.
Delete All	Click this button to clear the table.
Reset	Click to clear the **Select** check boxes.

URL Filtering

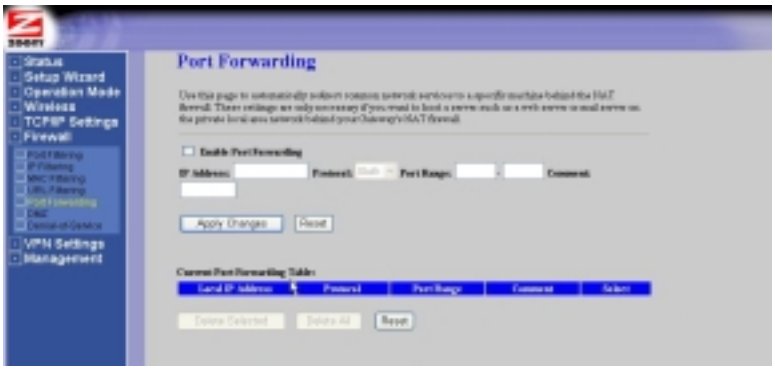
Use this page to prevent access by devices on the Local Area Network to certain web sites (URLs).



Parameter	Select or enter . . .
Enable URL Filtering	When you select this check box, the AP+4 will block acccess by devices on the LAN to web site addresses (URLs) displayed in the **Current Filter Table**.
URL Address	Enter web site addresses or keywords, one at a time. If you enter just the word *poker*, for example, all URLs containing the word “poker” will be blocked.
Apply Changes	Click this button to add the web site address to the **Current Filter Table**.
Reset	If you make a mistake, click this button to return to the defaults on this page.
Delete Selected	In the **Current Filter Table**, click the **Select** check box for one or more URLs and then click this button to delete.
Delete All	Click this button to clear the table.
Reset	Click to clear the **Select** check boxes.

Port Forwarding

Port forwarding is a way of creating a tunnel through the AP+4's firewall so that computers on the Internet can communicate via a single port to one of the computers on your LAN. Port forwarding is safer than creating a DMZ – where all ports on one computer inside the LAN are opened to all Internet traffic – because only one port (or a small series of ports) is exposed to the Internet.



Parameter	Select or enter . . .
Enable Port Forwarding	Select this check box to allow one or a small number of ports on a network computer to be opened to external Internet communication.
IP Address	Enter the IP address of the network computer allowed to receive direct Internet traffic.
Protocol	Select **TCP**, **UDP**, or **Both**.
Port Range	Enter one port or a small range of ports to receive direct traffic.
Apply Changes	Click this button to save your entries.
Reset	Click this button to clear all entries.
Current Port Forwarding Table	
Delete Selected	In the **Current Port Forwarding Table** click the **Select** check box for one or more IP addresses and then click this button to delete.
Delete All	Click this button to clear the table.
Reset	Click to clear the **Select** check boxes.

DMZ

Use this page to designate a computer on the Local Area Network as a DMZ (**De**-**mi**litarized **Z**one). All ports on this computer are opened up to all Internet traffic – the computer is no longer protected by the AP+4's NAT firewall.

You may want to create a DMZ if a computer in your network is acting as a web server or hosting Internet games.

You need to assign a Static IP address to the DMZ.

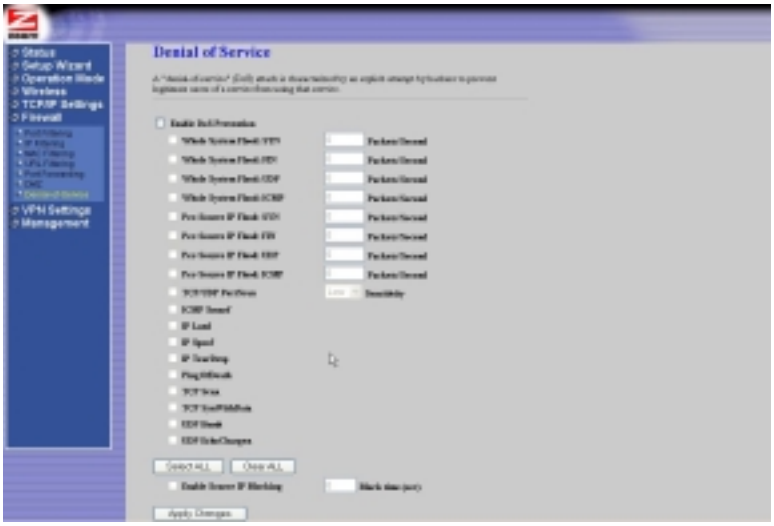
Parameter	Select or enter . . .
Enable DMZ	When you select this check box, you can designate one of the computers in the LAN as a DMZ. That computer can serve as a web server, email server, FTP server, or DNS server.
DMZ Host IP Address	Enter the IP address of the computer designated as a DMZ.
Apply Changes	Click this button to create the DMZ.
Reset	If you make a mistake, click this button to return to the defaults on this page.

Denial of Service

Also known as “cyber attacks” or “nukes,” Denial of Service attacks are deliberate attempts by hackers to bring your network down.

Attacks include

- System floods, which overwhelm a network with more requests than it can handle
- Attempts to cause a particular individual’s computer to crash
- Attempts to disrupt service to a specific system or person



Parameter	Select or enter . . .
Enable DoS Prevention	Select this check box and then select the types of Denial of Service attacks that you want to prevent.
Whole System Flood: SYN	This type of attack sends large numbers of SYN (Synchronization or Start Connection) packets, which create “half-open” connections to the Internet and prevent the AP+4 from accepting any new requests to connect. Select the check box and enter the number of SYN **Packets/Second** that will be accepted.

Whole System Flood: FIN	This DoS attack involves large numbers of FIN (Finish) packets, which terminate the connection between the sender and recipient. Select the check box and enter the number of FIN **Packets/Second** that will be accepted.
Whole System Flood: UDP	This type of attack sends a large amount of traffic to ports 7 and 19 on LAN clients. Select the check box and enter the number of UDP **Packets/Second** that will be accepted.
Whole System Flood: ICMP	This type of attack involves large numbers of ICMP (**I**nternet **C**ontrol **M**essage **P**rotocol) requests, such as ping or netmask, etc. Select the check box and enter the number of ICMP **Packets/Second** that will be accepted.
Per Source IP Flood: SYN	This type of attack involves large numbers of SYN packets with the source address spoofed (faked) to appear to be the address of a LAN client. Select the check box and enter the number of SYN **Packets/Second** that will be accepted.
Per Source IP Flood: FIN	This type of attack involves large numbers of FIN (Finish) packets, with the source address spoofed to appear to be the address of a LAN client. Select the check box and enter the number of FIN **Packets/Second** that will be accepted.
Per Source IP Flood: UDP	This type of attack involves a large amount of traffic directed to ports 7 and 19 on LAN clients. In these messages the source address is spoofed to appear to be the address of a LAN client. Select the check box and enter the number of UDP **Packets/Second** that will be accepted.
Per Source IP Flood: ICMP	This type of attack involves large numbers of ICMP (**I**nternet **C**ontrol **M**essage **P**rotocol) requests, such as ping or netmask, etc., with the source address spoofed to appear to be the address of a LAN client. Select the check box and enter the number of ICMP **Packets/Second** that will be accepted.

Parameter	Select or enter . . .
TCP/UDP Port Scan	Select this check box to defend against a search for open TCP or UDP ports, to which huge amounts of data can be sent in an attempt to trigger a buffer overflow. Select the **Sensitivity** level (the rigor with which the AP+4 looks at the data) of the scan.
ICMP Smurf	Select this check box to defend against an attack involving large numbers of ICMP (**I**nternet **C**ontrol **M**essage **P**rotocol) packets with the source address spoofed to appear to be the address of a LAN client.
IP Land	Select this check box to defend against a LAND attack, which involves sending a spoofed TCP SYN packet to the targeted machine with an open port as both source and destination. The attack causes the target to reply to itself continuously and eventually crash.
IP Spoof	Select this check box to defend against attacks involving a forged (spoofed) source IP address.
IP TearDrop	Select this check box to defend against a Teardrop attack, which involves sending message fragments with overlapping oversized payloads to the target machine, crashing the operating system as a result.
Ping of Death	Select this check box to defend against a fragmented ping packet larger than 65,536 bytes, which when reassembled can cause a system crash.
TCP Scan	Select this check box to defend against an attack where a TCP port scanner finds an open port, allows the target operating system to complete the TCP three-way handshake, and then immediately closes the connection.
TCP Syn with Data	Select this check box to defend against an attack where the TCP port scanner generates a SYN packet. If the target port is open, it will respond with a SYN-ACK packet. The scanner responds with a RST packet, closing the connection before the handshake is completed.

Parameter	Select or enter . . .
UDP Bomb	Select this check box to defend against an attack which overloads the operating system and makes the target device difficult or impossible to use.
UDP Echo Chargen	Select this check box to defend against an attack on UDP ports 7 and 19 involving large numbers of ECHO and CHARGEN requests.
Select All	Click to select all types of attacks listed.
Clear All	Click to clear all selected types of attack.
Enable Source IP Blocking	Select this check box to block all packets coming from a source IP address.
Block Time	Enter the number of seconds during which all traffic from a source IP address will be blocked.
Apply Changes	Click to save your entries.

7

VPN Settings

Use these pages to set up a VPN (**V**irtual **P**rivate **N**etwork) to allow your company's remote employees to communicate privately over the Internet.

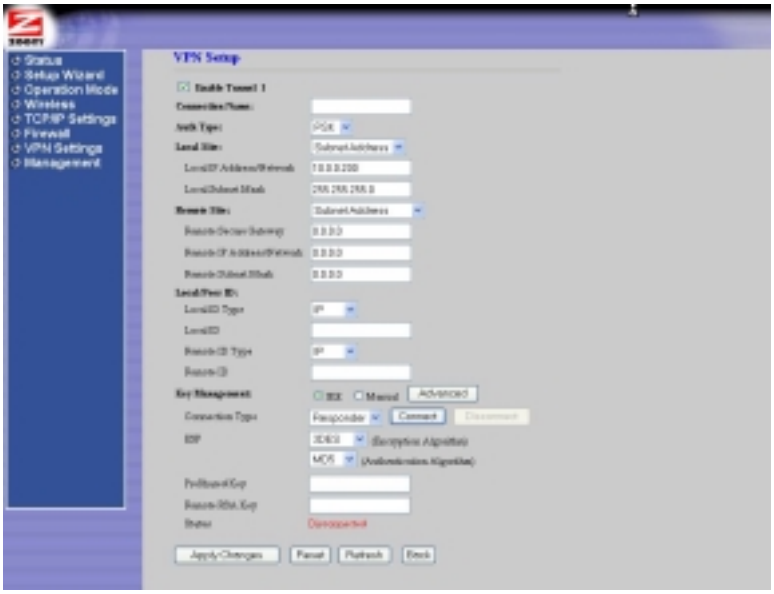
From the left menu pane, select **VPN Settings** to open the **VPN Setup** page:

Parameter	Select or enter . . .
Enable IPsec VPN	Select this check box to enable a **V**irtual **P**rivate **N**etwork with **I**nternet **P**rotocol **sec**urity. Ipsec provides authentication and encryption at the packet-processing layer of network communication.
Enable NAT Traversal	Select this check box to send IPsec-protected traffic across a **N**etwork **A**ddress **T**ranslator (NAT).

Generate RSA Key	Click this button to create a private cryptographic key (RSA are the initials of the three inventors), which will be used in conjunction with a public key. The public key encrypts the data, while the private key decrypts the data.
Show RSA Public Key	Click this button to display the current RSA public key.
Apply Changes	Click this button to save your VPN security choices.
Current VPN Connection Table	
Edit	Select the option button for a VPN client and then click **Edit** to open the **VPN Client Setup** page (see page 58).
Delete	Select the option button for a VPN client and then click **Delete** to remove the client from the Current VPN Connection Table.
Refresh	Click this button to refresh the Current VPN Connection Table.

VPN Setup (Client)

On the main **VPN Setup** page, select the option button for a VPN client and then click **Edit** to open the VPN client setup page:



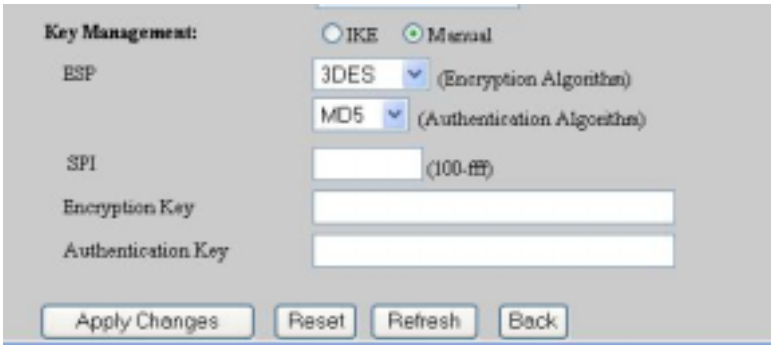
Parameter	Select or enter . . .
Enable Tunnel x	Select this check box to enable a VPN tunnel between the AP+4 and another VPN endpoint. *Note:* You can configure multiple tunnels but you can enable only one at a time.
Connection Name	Enter a client name of your choice.
Auth Type	Select an authentication method: • **PSK**, then enter a Pre-Shared Key in the Key Management section at the bottom of the page. • **RSA** if you generated an RSA key on the main VPN Setup page.
Local Site	Select **Subnet Address** or **Single Address**
Local IP Address/Network	Enter 10.0.0.0

Local Subnet Mask	(If Subnet Address is selected) Enter 255.255.255.0
Remote Site	Select **Subnet Address**, **Single Address**, **Any Address**, or **NAT-T Address**
Remote Secure Gateway	Enter the WAN IP address of the remote VPN connection.
Remote IP Address/Network	Enter the LAN IP address or the LAN network IP address of the remote VPN connection.
Remote Subnet Mask	Enter the Subnet Mask of the remote VPN connection.
Local/Peer ID	These four options let you limit use of the VPN to a single user at each end of the tunnel.
Local ID Type	Select the type of identification entered by the user at the local site: **IP**, **DNS** (URL), or **Email.**
Local ID	Enter the local user's IP address, URL, or email address.
Remote ID Type	Select the type of identification entered by the user at the remote site: **IP**, **DNS** (URL), or **Email.**
Remote ID	Enter the remote user's IP address, URL, or email address.
Key Management	Select: **IKE** to use **I**nternet **K**ey **E**xchange Protocol. Click the **Advanced** button to configure IKE (see page 62). **Manual** to enter encryption and authentication keys.

If you select IKE, the following options appear:

Parameter	Select or enter . . .
Connection Type	Select **Responder** or **Initiator**. If you select Responder, the **Connect** button is available.
ESP (**E**ncapsulating **S**ecurity **P**ayload, an Ipsec transport layer protocol that provides encryption)	*Select an encryption algorithm:* **3DES** (a mode of the **D**ata **E**ncryption **S**tandard algorithm that encrypts data three times) **AES 128** (128-bit **A**dvanced **E**ncryption **S**tandard) **NULL** – no encryption *Select an authentication algorithm:* **MD5** (A digital signature algorithm) **SHA1** (**S**ecure **H**ash **A**lgorithm)
Pre-Shared Key	If the **Auth Type** is PSK, enter the pre-shared key.
Remote RSA Key	If the **Auth Type** is RSA, enter the private cryptographic key which will be used in conjunction with a public key.
Apply Changes	Click this button to save your entries.
Reset	Click to restore the VPN Client defaults.
Refresh	Click to update the connection status.
Back	Click to return to the main VPN Setup page.

If you select Manual, the following options appear:



Parameter	Select or enter . . .
ESP (**E**ncapsulating **S**ecurity **P**ayload)	*Select an encryption algorithm:* **3DES** (a mode of the **D**ata **E**ncryption **S**tandard algorithm that encrypts data three times) **AES 128** (128-bit **A**dvanced **E**ncryption **S**tandard) **NULL** – no encryption *Select an authentication algorithm:* **MD5** (A digital signature algorithm) **SHA1** (**S**ecure **H**ash **A**lgorithm)
SPI (**S**ecurity **P**arameters **I**ndex)	The **S**ecurity **P**arameters **I**ndex is a random value added to the packet header in Ipsec-protected traffic. The SPI serves as an index to a table of security parameters such as hash algorithm, secret data, and many other parameters. Enter a numeric or hex value 100-FFF.
Encryption Key	Enter an encryption key.
Authentication Key	Enter an authentication key.
Apply Changes	Click this button to save your entries.
Reset	Click to restore the VPN Client defaults.
Refresh	Click to update the connection status.
Back	Click to return to the main VPN Setup page.

Advanced VPN Settings for IKE

IKE (**I**nternet **K**ey **E**xchange) is the protocol used by VPNs to establish a connection between a server and a remote client.

On the VPN client setup page, in the **Key Management** section click the **IKE** button to open the **VPN Settings for IKE** page:

Parameter	Select or enter . . .
Tunnel x	Displays the VPN tunnel number.
Phase 1	
Encryption Algorithm	Select: **3DES** (a mode of the **D**ata **E**ncryption **S**tandard algorithm that encrypts data three times) **AES 128** (128-bit **A**dvanced **E**ncryption **S**tandard)

Authentication Algorithm	Select: **MD5** (A digital signature algorithm) **SHA1** (**S**ecure **H**ash **A**lgorithm)
Key Group	Select one of the following DH (**D**iffe-**H**elman) encryption algorithms, which allow two parties that have no prior knowledge of each other to establish a shared secret key: **DH1(modp768) –** 768-bit prime modulus group **DH2(modp1024) –** 1024-bit prime modulus group **DH5(modp1536) –** 1536-bit prime modulus group
Key Lifetime	Enter a duration in seconds for the IKE encryption key, after which the key automatically changes.
Phase 2	
Encryption Algorithm	Select: **3DES** (a mode of the **D**ata **E**ncryption **S**tandard algorithm that encrypts data three times) **AES 128** (128-bit **A**dvanced **E**ncryption **S**tandard) **NULL**
Authentication Algorithm	Select: **MD5** (A digital signature algorithm) **SHA1** (**S**ecure **H**ash **A**lgorithm)
Key Lifetime	Enter a duration in seconds for the IKE encryption key, after which the key automatically changes.
Perfect Forward Secrecy (PFS)	PFS involves a Diffe-Hellman shared secret value, which guarantees that if an encryption key is exposed, previous and future keys will remain secure because they are not derived from the exposed key. Select **ON** or **NONE.**
OK	Click to save your settings and return to the VPN client setup page, where you are reminded to click **Apply Changes**.
Cancel	Click to return to the VPN client setup page.

8

Management

Statistics

In the left menu pane, under **Management,** select **Statistics** to display the Transmit and Receive statistics for the AP+4's wireless and wired connections:

DDNS

DDNS stands for **D**ynamic **D**omain **N**ame **S**ervice. If the AP+4 receives dynamic IP addresses from your Internet Service Provider, the AP+4's address changes whenever it connects to your ISP. If you are running a Web server on your network, clients will not know the AP+4's IP address and will be unable to connect.

However, you can use this page to sign up for a free trial dynamic domain name service that will map changes in the IP address to the Web server's URL, so that network clients can connect using that URL instead of an IP address. The client software for both of the services is built into the AP+4 firmware.

In the left menu pane, under **Management,** select DDNS to display the **Dynamic DNS Settings** page.

Parameter	Select or enter . . . .
Enable DDNS	Select this check box to allow the AP+4 to subscribe to a Dynamic Domain Name Service. Use the links at the bottom of the page to sign up with one of the services.
Service Provider	Select one of these DDNS providers: **DynDNS** or **TZO**.
Domain name	If you selected DynDNS, the default is <yourname>.dyndns.org. If you selected TZO, enter <yourname>.tzo.com
User name/Email	If you selected DynDNS, enter a User Name.

	If you selected TZO, enter your email address.
Password/Key	If you selected DynDNS, enter a password. If you selected TZO, enter a key.
Apply Changes	Click this button to save your selections.
Reset	Click this button to restore the default settings.

Time Zone Settings

To synchronize the AP+4 with an NTP (**N**etwork **T**ime **P**rotocol) server, in the left menu pane, under **Management,** select **Time Zone Settings**:

Parameter	Select or enter . . . .
Current Time	Displays the current time in your time zone.
Time Zone Select	Select your time zone from the list.
Enable NTP client update	Select this check box to let the AP+4 receive time stamps from an NTP server.
NTP server	Click the option button for the time server displayed in the text box, or click the second option button to enter a different server.
Apply Changes	Click this button to save your Time settings.
Reset	Click this button to return to the default settings.
Refresh	Click this button to refresh the NTP current date and time in the **Current Time** text boxes.

Log

To display the AP+4's log, in the left menu pane, under **Management,** select **Log**:

Parameter	Select or enter . . . .
Enable Log	Select this check box to display the AP+4's event log.
System All	Select this check box to display all events. **Note**: Enabling a system-wide log generates a very large amount of data and may adversely affect performance.
Wireless	Select this check box to display wireless network events.
DoS	Select this check box to display Denial of Service attempts.
Enable Remote Log	Select this check box to view events at the remote end of the VPN tunnel. The remote log is valuable when you are troubleshooting VPN connection problems.
Log Server IP Address	Enter the IP address of the remote log server.
Apply Changes	Click this button to save your log settings.
Refresh	Click this button to update the log display.
Clear	Click this button to clear the log.

Upgrade Firmware

From time to time, Zoom may release updated firmware for your AP+4.

1 To see if there is an update, periodically visit the Zoom Web site: www.zoom.com.

2 Download the upgrade files from the web site to your computer, and unzip the files if necessary.

3 Use the Upgrade Firmware page to install the new firmware onto the AP+4.

To access this page, in the left menu pane, under **Management**, select **Upgrade Firmware**:

Parameter	Select or enter . . . .
Select File	Enter the path and filename of the firmware upgrade, or click **Browse** to select the file.
Upload	Click this button to upload the firmware upgrade from your computer to the AP+4.
Reset	Click this button to clear the **Select File** text box.

Save/Reload Configuration

Use this page to download the current settings from the AP+4 and save them to a file on your PC.

You can reload a previously downloaded configuration file back to the AP+4.

This page also allows you to set the AP+4 back to its factory default configuration.

In the left menu pane, under **Management**, select **Save/Reload Configuration**:

Parameter	Select or enter . . . .
Save Settings to File	Click **Save** to save the AP+4's current configuration to a file.
Load Settings from File	Enter the path and filename of a saved configuration file or click **Browse** to select a file.
Upload	Click this button to upload the selected configuration file to the AP+4.
Reset Settings to Default	Click this button to restore the factory defaults to the AP+4.

Password Setup

Use this page to set a password to protect the AP+4's settings from unauthorized access.

In the left menu pane, under **Management**, select **Password:**

Parameter	Select or enter . . . .
User Name	Enter a user name of up to 30 characters.
New Password	Enter a password of up to 29 characters.
Confirm Password	Re-enter the password.
Apply Changes	Click this button to save your User Name and Password.
Reset	Click this button to restore the page defaults.

Appendix A

Troubleshooting

Problem

I followed the instructions for connecting the AP+4 hardware and entered 10.0.0.200 in my web browser's address bar, but I cannot access the AP+4.

Solution

First, manually reset the AP+4: insert a paper clip into the RESET opening on the back panel and press and hold for 10 seconds. After you've done that, re-enter 10.0.0.200 in your web browser's address bar.

If you still cannot access the AP+4, follow these steps to check the computer's TCP/IP settings.

Windows XP Users:

1. On the Windows desktop, click the **Start** button, open **Control Panel,** and double-click **Network Connections**.
2. Right-click the **Local Area Connection** icon and select **Properties**.
3. Highlight the **Internet Protocol (TCP/IP)** entry and click the **Properties** button.
4. Select **Use the following IP address** and enter **10.0.0.100** and **255.255.255.0** as the **IP address** and **Subnet mask**, respectively.
5. Click **OK**, then click **Close.**
6. Re-enter 10.0.0.200 in your web browser's address bar.

Windows 2000 Users:

1. On the Windows desktop, click **Start**, point to **Settings**, select **Control Panel** and then select **Network and Dial-up Connections.**
2. Right-click the **Local Area Connection** icon and select **Properties**.
3. Highlight the **Internet Protocol (TCP/IP)** entry and click the **Properties** button.
4. Select **Use the following IP address** and enter **10.0.0.100** and **255.255.255.0** as the **IP address** and **Subnet mask**, respectively.
5. Click **OK**, then click **OK** again.
6. Re-enter 10.0.0.200 in your web browser's address bar.

Windows Me or 98 Users:

1. On the Windows desktop, click **Start**, point to **Settings**, and select **Control Panel.**
2. In the **Control Panel** window, double-click the **Network** icon.
3. In the **Network** dialog box, highlight the **TCP/IP** entry, click the **Properties** button and then click **OK**.
4. On the **IP Address tab**, ensure that **Specify an IP address** is selected and enter **10.0.0.100** and **255.255.255.0** as the **IP Address** and **Subnet Mask**, respectively.
5. Click **OK**, then click **OK** again.Re-enter 10.0.0.200 in your web browser's address bar.
6. Re-enter 10.0.0.200 in your web browser's address bar.

Problem

I set up my AP+4 as an access point, but the devices I set up on my **zoom** wireless network cannot access the Internet.

Solution

1 Verify that a “wired” computer can access the Internet.

- If it cannot, try the following:

  a Make sure the associated LAN port LED on the AP+4 front panel is lit.

  b Check the TCP/IP settings on the computer (see above, page 71.

  c Perform a Release/Renew operation on the computer or reboot.

- If the wired computer can access the Internet, reboot the devices(s) on your wireless network and try to access the Web again.

  If you still cannot connect to the Internet wirelessly, go to Step 2.

2 Verify that security is not set on the AP+4 or the client. If it is, ensure that the wireless devices are using the same security settings.

3 Verify that the devices are connected to the correct wireless network and that the signal strength is adequate. (Try repositioning the devices if the signal strength is too low.)

4 In the AP+4 menu pane, select **Wireless→Site Survey** to view other wireless networks in the area. Then on the **Wireless Basic Settings** page, select a channel number for your network that is not being used by another network. If possible, try to maintain a 5-channel difference between your network and other nearby networks.

5 If you are using Windows XP with built-in wireless access:

a On your Windows desktop, click the **Start** button, then click **Control Panel**.

b Double-click the **Network Connections** icon.

c Click the **Wireless Network Connection** icon.

d Look at the details that appear on the left side of the screen. If the signal strength is low, try repositioning the antennas of the AP+4. You can also try moving the wireless devices closer to the AP+4. You should also verify that **zoom** is selected as the wireless network. If it is not, then you are connected to the wrong network.

6 If you are using a computer with a wireless network card installed, access the network card's software and verify that it is connected to the **zoom** network and that the signal strength is adequate. Refer to the documentation that came with the network card if you need help doing this.

Appendix B

Zoom Technical Support Services

Zoom has a variety of technical support services available to our customers. We strive to provide convenient, professional support responsive to our customers' needs and capabilities. If you find yourself unable to get your Zoom product to operate, and you have thoroughly reviewed your owner's manual and all relevant documentation, please feel free to contact us for help.

For your records, and to facilitate Technical Support from either your equipment supplier or Zoom, please record the following information when you receive your Zoom product.

Product Information

Product Name

_____

Product Model Number

_____

Product Serial Number

_____

Date Installed

_____

The Serial Number (S/N) is located on the bottom of the unit above the barcode. Once you have located the Serial Number, please be sure to write it down. This will greatly speed up your service and insure that the service representative is addressing the proper model of the product.

Calls to Zoom's voice technical support staff are the most time consuming, and at times you may find it difficult to get through.

We do not want you left on hold for long periods of time, so we limit the queue length. We recommend that you take the time to familiarize yourself with the other services described in this section before calling. Many questions can be answered more quickly using e-mail or our World Wide Web Home page.

World Wide Web

Zoom's Web page lets you send e-mail for assistance, register on-line, access product reviews and descriptions, and do a whole lot more. Visit the Zoom Technical Support area for the latest Flash Files and Drivers for your Zoom Product. To access Zoom's Web page, please go to your Web browser and select: **www.zoom.com**

From Zoom's Homepage you can easily go to Technical Support or many other useful areas.

Smart Facts™ Q&A Search Engine (English Only)

Smart Facts™ is an automated intelligent database of Frequently Asked Questions (FAQ's) about Zoom Products. It allows you to search for solutions to your Technical Support questions, by product or via a powerful Keyword Search Engine. If you still cannot find a solution to your question, SmartFacts lets you access our Technicians via e-mail for a personalized response. SmartFacts provides you with a way to track the history of your problem and to add or change the description without having to enter any facts that were previously sent. SmartFacts can even contact you automatically if there is an update to your modem or software that helps to address the question you had. You can access SmartFacts from **www.zoom.com/techsupport**

Contact Zoom by E-mail

You can e-mail Zoom with any tech support questions you might have and one of our Technical Support Engineers will respond by e-mail within 2 business days. You may request personal assistance via e-mail at www.zoom.com/techmail. When e-mailing Zoom, be sure to include the following:

- Serial Number
- Your full name and address
- A detailed description of your problem

Contact Zoom by Phone

You can reach Technical Support by calling these numbers:

- In the **United States**, call **(561) 241-4371**.
- In the **UK**, call **0870 720 0090**.
- From continental Europe:

  Portugal: **+35 221451012**

  Spain: **+34 911516304**

  Switzerland: **+41 435000369**

  Other (US number): **(561) 997-9683**

Appendix C

Regulatory Information

U.S. FCC Part 15 Emissions Statement

This equipment has been tested and found to comply with the limits 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 and, if not installed and used in accordance with 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 can be determined 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 and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

Industry Canada Emissions Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique

de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Operation is subject to the following two conditions:

1) this device may not cause interference and

2) this device must accept any interference, including interference that may cause undesired operation of the device.

Countries of Operation & Conditions of Use in the European Community

This device is intended to be operated in all countries of the European Community.

This device may be operated *indoors or outdoors* in all countries of the European Community using the 2.4 GHz band: Channels 1 - 13, except where noted below.

- In Italy the end-user must apply for a license from the national spectrum authority to operate this device outdoors.
- In Belgium outdoor operation is only permitted using the 2.46 - 2.4835 GHz band: Channel 13.
- In France outdoor operation is only permitted using the 2.4-2.454 GHz band: Channels 1-7.

Electrostatic Discharge Statement

The unit may require resetting after a severe electrostatic discharge event.

Additional compliance information is located on the CD.

Declaration of Conformity

Declaration of Conformity	Déclaration de conformité	Konformitätserklärung
Δήλωση Συμμόρφωσης	Dichiarazione di conformità	Deklaracja zgodności
Declaração de Conformidade	Declaración de conformidad	Konformitetsdeklaration
Uyum Beyanatı	Cam kết về sự tuân thủ ở Châu Âu	

Manufacturer/Producent/Fabrikant/Constructeur/Hersteller/ Κατασκευαστής/Fabbricante/Fabricante/Tillverkare/Üretici/ Nhà sản xuất	**Zoom Technologies, Inc.** 207 South Street, Boston, MA 02111 USA 617-423-1072 www.zoom.com
Brand/Varemærke/Merk/Marque/Marke/Μάρκα/ Marchio/Marka/Marca/Märke/Thương hiệu	**Zoom AP+4**
Type/Typ/Μάρκα/Tipo/Türü/Kiểu mẫu	**Models** 4401, 4420-A

The manufacturer declares under sole responsibility that this equipment is compliant to Directive 1999/5/EC via the following. This product is CE marked.

Producenten erklærer under eneansvar, at dette udstyr er i overensstemmelse med direktivet 1999/5/EC via følgende. Dette produkt er CE-mærket.

De fabrikant verklaart geheel onder eigen verantwoordelijkheid dat deze apparatuur voldoet aan Richtlijn 1999/5/ EC op grond van het onderstaande. Dit product is voorzien van de CE-markering.

Le constructeur déclare sous son entière responsabilité que ce matériel est conforme à la Directive 1999/5/EC via les documents ci-dessous. Ce produit a reçu le marquage CE.

Hiermit erklärt Zoom die Übereinstimmung des Gerätes modem mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EC. Dieses Produkt ist das gekennzeichnete CE.

Ο κατασκευαστής δηλώνει με αποκλειστική του ευθύνη ότι αυτό το προϊόν συμμορφώνεται με την Οδηγία 1999/5/EC μέσω των παρακάτω. Αυτό το προϊόν φέρει τη Σήμανση CE.

Il fornitore dichiara sotto la sola responsabilità che questa apparecchiatura è compliant a 1999/5/EC direttivo via quanto segue. Questo prodotto è CE contrassegnato.

Producent stwierdza że to urządzenie zostało wyprodukowane zgodnie z Dyrektywą 1999/5/EC. Jest to potwierdzone poprzez umieszczenie znaku CE na urządzeniu.

O fabricante declara sob sua exclusiva responsabilidade que este equipamento está em conformidade com a Directiva 1999/5/EC através do seguinte. Este produto possui Marcação CE.

El fabricante declara bajo su exclusiva responsabilidad que este equipo satisface la Directiva 1999/5/EC por medio de lo siguiente. Este producto tiene marca CE.

Nhà sản xuất cam kết với trách nhiệm của mình là thiết bị này tuân theo Hướng dẫn 1999/5/EC thông qua các mục sau. Sản phẩm này được đánh dấu là CE.

73/23/EEC – LVD	EN 60950-1: 2001
89/336/EEC – EMC	EN 301 489-1 v1.4.1: 2002 EN 301 489-17 v1.2.1: 2002 EN 55022:1998 +A1: 2000 +A2: 2003, Class B EN 55024:1998 +A1: 2001 +A2: 2003
1999/5/EC	EN 300 328 v1.6.1: 2004 EN 50385: 2002

CE

Andy Pollock
28 November, 2006
1056/TF, Boston, MA, USA

Director, Hardware Engineering / Direktør, Hardware Engineering / Director, Sustaining Engineering / Directeur, ingénierie de soutien / Direktør, Sustaining Engineering / Διευθυντής, Μηχανικής Διατήρησης / Direttore, Hardware Engineering / Dyrektor, Inżynieria ciągła / Director, Engenharia de Manutençã / Director, Ingeniería de apoyo / Giám Đốc Kỹ thuật Phần cứng

NOTICE