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, Universal Repeater, Ethernet Client or Wireless ISP.

- 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 **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.
- As an **Ethernet Client**, the AP+4 connects via its LAN ports to up to four game consoles or computers, and links them wirelessly to a Zoom X6 or other wireless router.
- As a **Wireless ISP**, the AP+4 can connect up to four wired PCs or game consoles, give them Network Address Translation protection, and connect them wirelessly to an access point. If you select this mode, use the **Wireless Basic Setup** page to configure the AP+4 as a wireless client.

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.

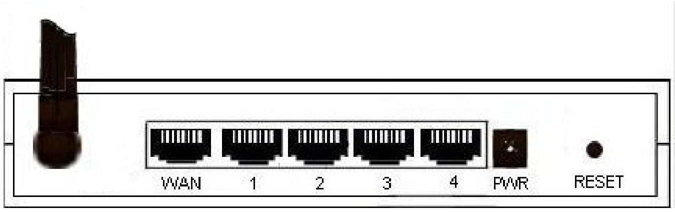
When we update information about the AP+4, the information is provided at this Zoom web site:

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 Configuration**, on page 20.



AP+4 Back Panel Connectors

Connector	Description
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 consoles or other network devices.
PWR	This port connects to a live power source using the supplied power cube.
RESET	To reset the modem to its factory settings, insert a paper clip and press and hold for 10 seconds.

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.)

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. When you do this, the **WAN** LED turns on if the broadband device is on and its Ethernet port is working.

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

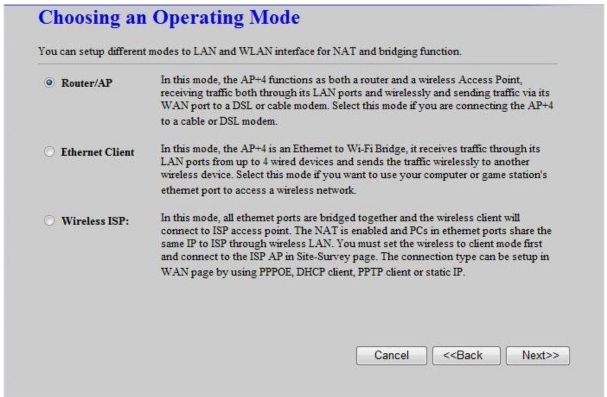
Setting Up the AP+4

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:



Choosing an Operating Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

● **Router/AP** In this mode, the AP+4 functions as both a router and a wireless Access Point, receiving traffic both through its LAN ports and wirelessly and sending traffic via its WAN port to a DSL or cable modem. Select this mode if you are connecting the AP+4 to a cable or DSL modem.

○ **Ethernet Client** In this mode, the AP+4 is an Ethernet to Wi-Fi Bridge, it receives traffic through its LAN ports from up to 4 wired devices and sends the traffic wirelessly to another wireless device. Select this mode if you want to use your computer or game station's ethernet port to access a wireless network.

○ **Wireless ISP:** In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.

Router/Access Point. In this mode, which is the one most users will select, the AP+4 links all wireless enabled computers and other devices to a network and gives those devices shared access to your broadband Internet connection.

If you are using the AP+4 as a Repeater, on the **Wireless Basic Setup** page at the **Mode** option, select **AP+WDS**. Then, on the **WDS Settings** page, enter the MAC addresses of access points you are communicating with.

Ethernet Client. This mode lets up to four computers, game consoles or other devices plug into the AP+4 for wireless access to a wireless network. (In this mode, the AP+4 acts as a full bridge, just passing data back and forth between the Internet and network devices.)

Wireless ISP. In this mode, the AP+4 connects to the Ethernet ports of up to four wired PCs or game consoles, and connects those devices wirelessly to a wireless access point. Use this mode if you know you need to use the AP+4's NAT functionality. Most users who need to connect a computer or game console to an access point should set up the AP+4 as an Ethernet Client instead.

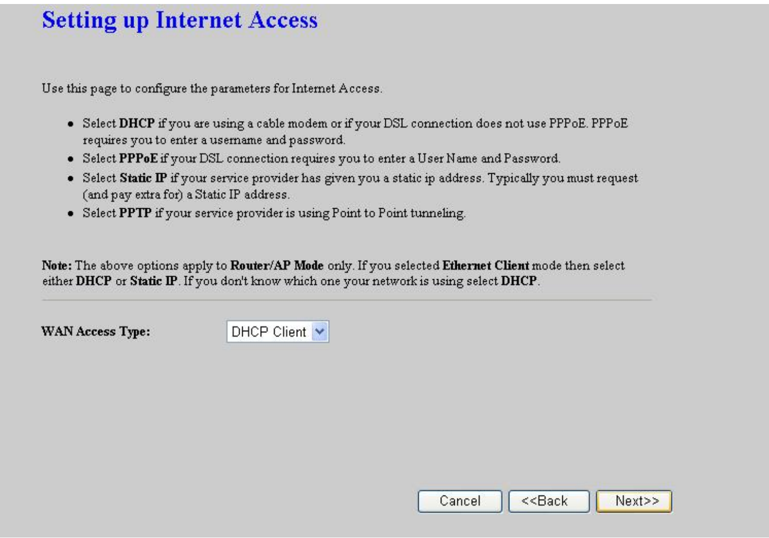
If you select Wireless ISP mode, use the **Wireless Basic Setup** page to configure the AP+4 as a wireless client.

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 need to set up or modify your wired local network, use the **LAN Interface Setup** page (see page 37 of this manual for more information).

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



Setting up Internet Access

Use this page to configure the parameters for Internet Access.

- Select **DHCP** if you are using a cable modem or if your DSL connection does not use PPPoE. PPPoE requires you to enter a username and password.
- Select **PPPoE** if your DSL connection requires you to enter a User Name and Password.
- Select **Static IP** if your service provider has given you a static ip address. Typically you must request (and pay extra for) a Static IP address.
- Select **PPTP** if your service provider is using Point to Point tunneling.

Note: The above options apply to **Router/AP Mode** only. If you selected **Ethernet Client** mode then select either **DHCP** or **Static IP**. If you don't know which one your network is using select **DHCP**.

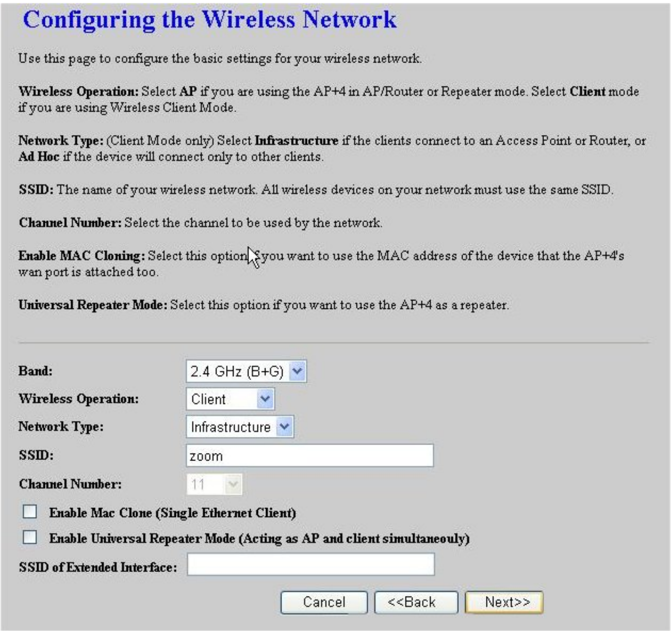
WAN Access Type: DHCP Client

- If you are among the great majority of customers who are using the AP+4 as a Router/Access Point or with a cable modem, at **WAN Access Type** select **DHCP Client**.
- If you select DHCP Client and at the end of the installation process you have not connected successfully to the Internet, it is possible that you are running PPPoE software. In that case, at **WAN Access Type** select **PPPoE** (**P**oint-to-**P**oint **P**rotocol **o**ver **E**thernet). Then enter the **User Name** and **Password** given to you by your service provider.

- If you are using the AP+4 as an Ethernet Client or a Repeater, at **WAN Access Type** you should also select **DHCP Client** *unless* you have requested a Static IP from your Internet Service Provider. If so, select **Static IP** and 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. Most people don't.)

Click **Next** to continue.

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



Configuring the Wireless Network

Use this page to configure the basic settings for your wireless network.

Wireless Operation: Select **AP** if you are using the AP+4 in AP/Router or Repeater mode. Select **Client** mode if you are using Wireless Client Mode.

Network Type: (Client Mode only) Select **Infrastructure** if the clients connect to an Access Point or Router, or **Ad Hoc** if the device will connect only to other clients.

SSID: The name of your wireless network. All wireless devices on your network must use the same SSID.

Channel Number: Select the channel to be used by the network.

Enable MAC Cloning: Select this option if you want to use the MAC address of the device that the AP+4's wan port is attached too.

Universal Repeater Mode: Select this option if you want to use the AP+4 as a repeater.

Band: 2.4 GHz (B+G)

Wireless Operation: Client

Network Type: Infrastructure

SSID: zoom

Channel Number: 11

□ **Enable Mac Clone (Single Ethernet Client)**

□ **Enable Universal Repeater Mode (Acting as AP and client simultaneouly)**

SSID of Extended Interface:

- 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

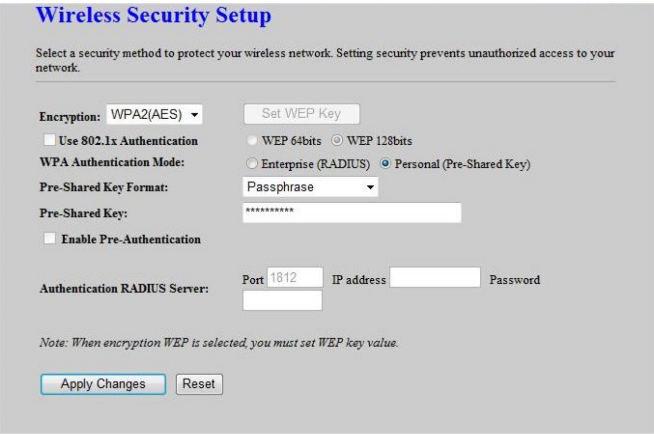
        - **G** if the network includes only 802.11g devices

    - 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.
        - **AP+WDS** if 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** if for some reason you want to use the MAC address of a device in the network instead of the AP+4's MAC address.
- **Enable Universal Repeater Mode** (unavailable)
    - **SSID of Extended Interface** (unavailable)

Click **Next** to continue.

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



Wireless Security Setup

Select a security method to protect your wireless network. Setting security prevents unauthorized access to your network.

Encryption: WPA2(AES) ▾

□ Use 802.1x Authentication ○ WEP 64bits ● WEP 128bits

WPA Authentication Mode: ○ Enterprise (RADIUS) ● Personal (Pre-Shared Key)

Pre-Shared Key Format: Passphrase ▾

Pre-Shared Key: **********

□ Enable Pre-Authentication

Authentication RADIUS Server: Port 1812 IP address Password

Note: When encryption WEP is selected, you must set WEP key value.

Note: If all the wireless devices on your network use WPA2 or WPA security, you can automatically configure WPA2 or WPA on each device using the Wi-Fi Protected Setup (**WPS**) page on the AP+4 **Advanced Setup** menu. See page 34.

If you do not choose to use WPS, at **Encryption** select a security method.

- 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.

    — — — — — — — — — — — — —

    — — — — — — — — — — — — —

    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.

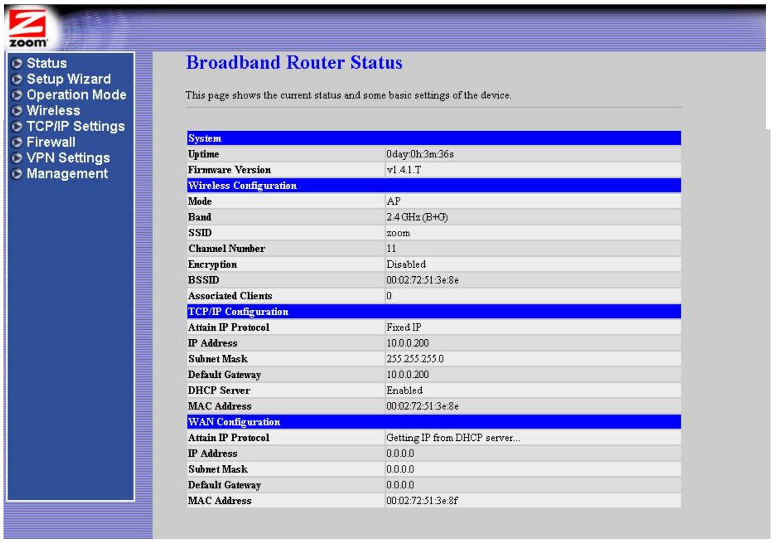
- If you are using the AP+4 as a *Router/Access Point*, your broadband modem is already connected. You can plug up to four computers, game consoles, or other devices into the AP+4's LAN ports. The AP+4 can also link wireless devices to your network.
- If you are using the AP+4 as a *Repeater,* you can 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 are using the AP+4 as an *Ethernet Client* or *Wireless ISP* to provide access to your wireless network, you can plug up to four computers, game consoles, or other devices into the AP+4's LAN ports.

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:



Broadband Router Status

This page shows the current status and some basic settings of the device.

System	
Uptime	0day:0h:3m:36s
Firmware Version	v1.4.1.T
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G)
SSID	zoom
Channel Number	11
Encryption	Disabled
BSSID	00:02:72:51:3e:8e
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	10.0.0.200
Subnet Mask	255.255.255.0
Default Gateway	10.0.0.200
DHCP Server	Enabled
MAC Address	00:02:72:51:3e:8e
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:02:72:51:3e:8f

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 24.
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

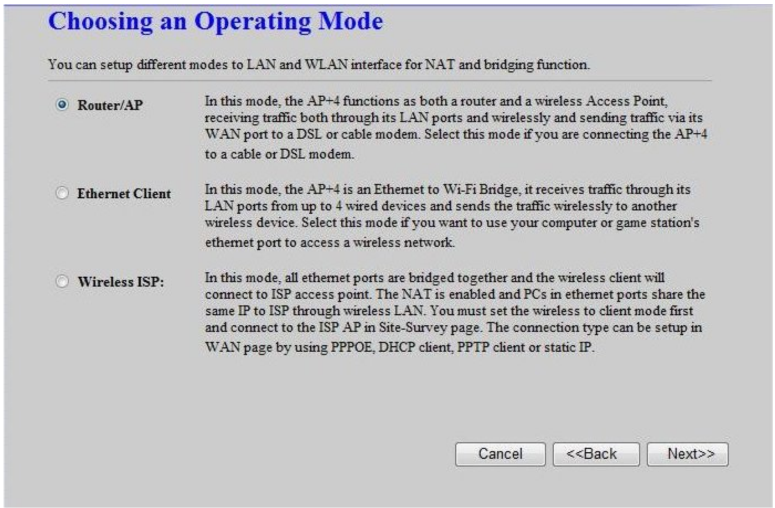
Field	Data displayed
WAN Configuration	
Attain IP Protocol	**DHCP server** if the AP+4 is connected directly to an ADSL or cable modem **Fixed IP** if the AP+4 is using a static IP address **PPPoE connected** if you have an ADSL modem and your ISP requires PPPoE **PPTP connected** if you have set up 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**. See the mode descriptions on page 9.



Choosing an Operating Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

● **Router/AP** In this mode, the AP+4 functions as both a router and a wireless Access Point, receiving traffic both through its LAN ports and wirelessly and sending traffic via its WAN port to a DSL or cable modem. Select this mode if you are connecting the AP+4 to a cable or DSL modem.

○ **Ethernet Client** In this mode, the AP+4 is an Ethernet to Wi-Fi Bridge, it receives traffic through its LAN ports from up to 4 wired devices and sends the traffic wirelessly to another wireless device. Select this mode if you want to use your computer or game station's ethernet port to access a wireless network.

○ **Wireless ISP:** In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.

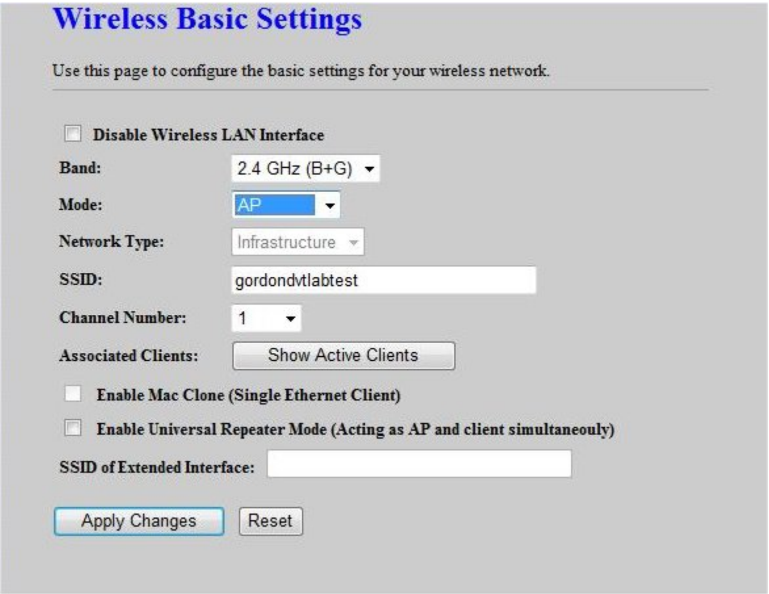
4

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.



Wireless Basic Settings

Use this page to configure the basic settings for your wireless network.

□ Disable Wireless LAN Interface

Band:	2.4 GHz (B+G)
Mode:	AP
Network Type:	Infrastructure
SSID:	gordondvtlabtest
Channel Number:	1
Associated Clients:	Show Active Clients

□ Enable Mac Clone (Single Ethernet Client)

□ Enable Universal Repeater Mode (Acting as AP and client simultaneouly)

SSID of Extended Interface:

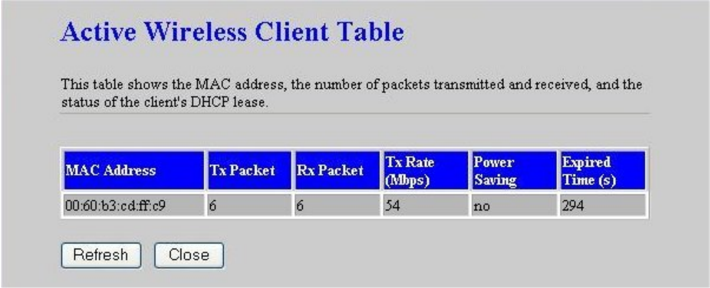
Parameter	Select or enter . . .
Disable Wireless LAN Interface	To deny access to the AP+4 network by wireless devices, select this check box. When you disable the wireless LAN, the **WLAN** LED on the front panel stops flashing, indicating that the AP+4 is no longer broadcasting its SSID.
Band	Select: • **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 consoles 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 **Error! Reference source not found.**). **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.

Parameter	Select or enter . . .
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.
Enable Universal Repeater Mode	(Reserved)
SSID of Extended Interface	(Reserved)

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 devices (clients):



Active Wireless Client Table

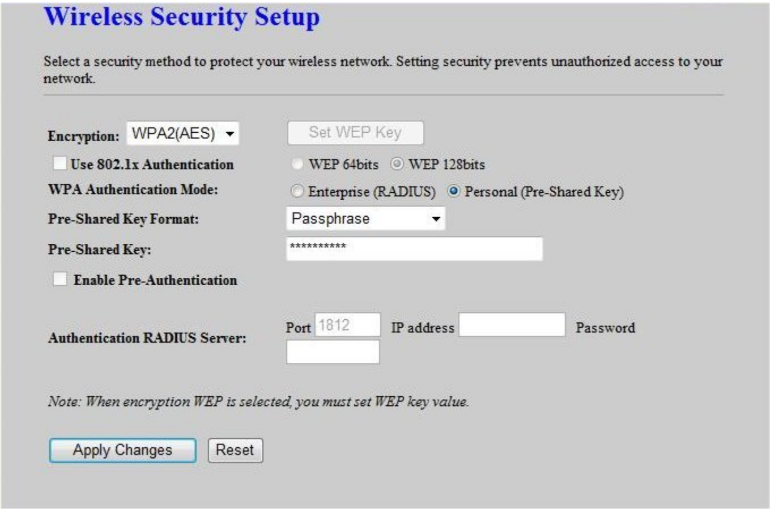
This table shows the MAC address, the number of packets transmitted and received, and the status of the client's DHCP lease.

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
00:60:b3:cd:ff:c9	6	6	54	no	294

Parameter	Data displayed
MAC Address	MAC address of the network device
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 device's DHCP lease has expired, making the IP address available for another device.

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).



Wireless Security Setup

Select a security method to protect your wireless network. Setting security prevents unauthorized access to your network.

Encryption: WPA2(AES) | Set WEP Key

□ **Use 802.1x Authentication** | ○ WEP 64bits ● WEP 128bits

WPA Authentication Mode: ○ Enterprise (RADIUS) ● Personal (Pre-Shared Key)

Pre-Shared Key Format: Passphrase

Pre-Shared Key: **********

□ **Enable Pre-Authentication**

Authentication RADIUS Server: Port 1812 IP address Password

Note: When encryption WEP is selected, you must set WEP key value.

Apply Changes | Reset

Note: If all the wireless devices on your network use WPA2 or WPA security, you can automatically configure WPA2 or WPA on each device using the Wi-Fi Protected Setup (**WPS**) page on the AP+4 **Advanced Setup** menu. See page 34.

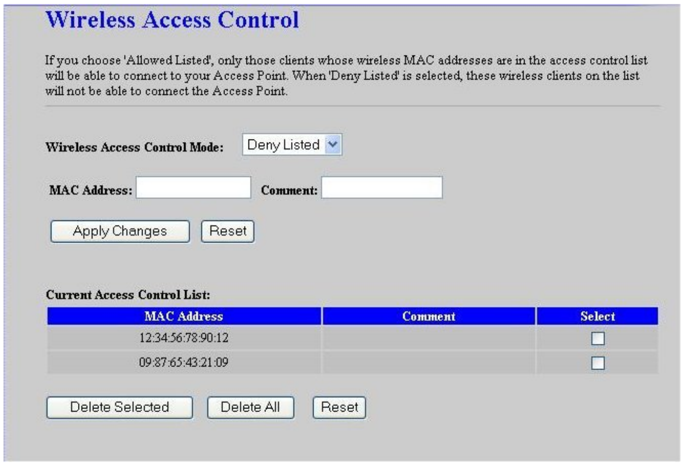
Parameter	Select or enter . . .
Encryption	Select: **WPA2-AES** if all the devices in your network support WPA2. **WPA Mixed** if some of your network devices support WPA2 and some support WPA. **WPA-TKIP** if all the devices in your network support WPA. **WEP** only if the devices in your network do 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.



Wireless Access Control

If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point.

Wireless Access Control Mode: Deny Listed

MAC Address: Comment:

Current Access Control List:

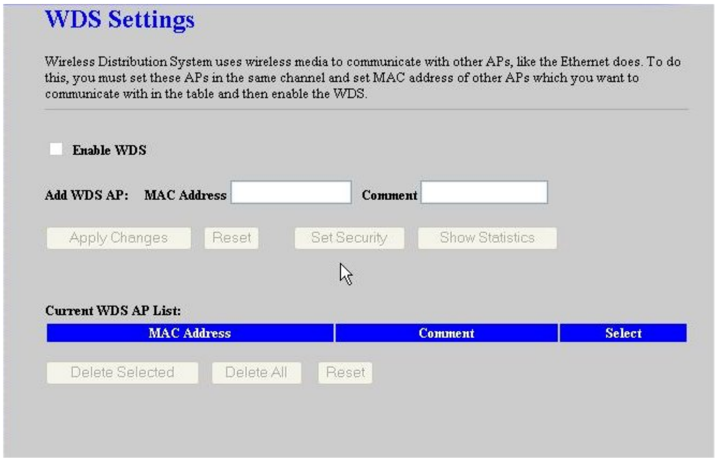
MAC Address	Comment	Select
12:34:56:78:90:12		□
09:87:65:43:21:09		□

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.

To use the AP+4 as a Repeater, on the **Wireless Basic Setup** page at the **Mode** option, select **AP+WDS**. Then, on the **WDS Settings** page, enter the MAC addresses of access points you are communicating with.



WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.

□ Enable WDS

Add WDS AP: MAC Address Comment

Current WDS AP List:

MAC Address	Comment	Select

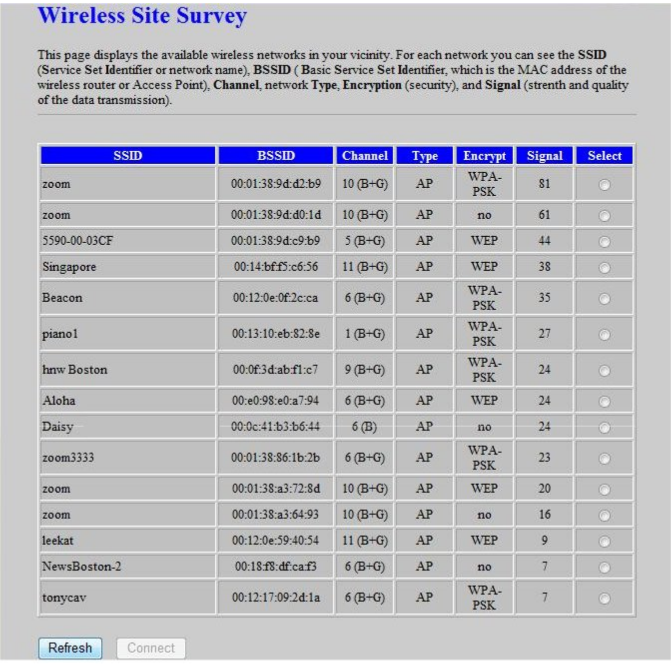
Parameter	Select or enter . . .
Enable WDS	Select the check box to enable WDS.
Add WDS AP	Enter Access Point MAC addresses, one at a time. • Click **Apply Changes** after each entry. The AP MAC addresses appear one at a time in the **Current WDS AP List**. • Click **Reset** to clear the current entry 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.
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.



Wireless Site Survey

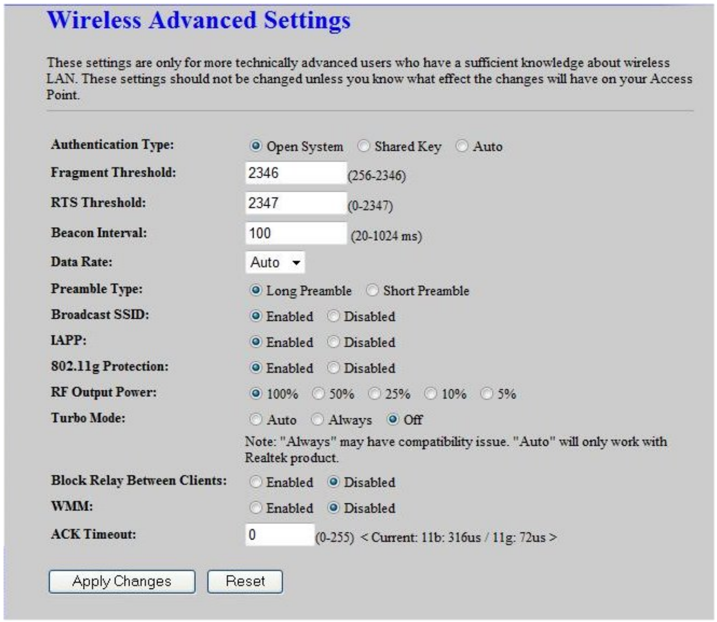
This page displays the available wireless networks in your vicinity. For each network you can see the **SSID** (Service Set Identifier or network name), **BSSID** (Basic Service Set Identifier, which is the MAC address of the wireless router or Access Point), **Channel**, network **Type**, **Encryption** (security), and **Signal** (strenth and quality of the data transmission).

SSID	BSSID	Channel	Type	Encrypt	Signal	Select
zoom	00:01:38:9d:d2:b9	10 (B+G)	AP	WPA-PSK	81	○
zoom	00:01:38:9d:d0:1d	10 (B+G)	AP	no	61	○
5590-00-03CF	00:01:38:9d:c9:b9	5 (B+G)	AP	WEP	44	○
Singapore	00:14:bf:f5:c6:56	11 (B+G)	AP	WEP	38	○
Beacon	00:12:0e:0f:2c:ca	6 (B+G)	AP	WPA-PSK	35	○
piano1	00:13:10:eb:82:8e	1 (B+G)	AP	WPA-PSK	27	○
hnw Boston	00:0f:3d:ab:f1:c7	9 (B+G)	AP	WPA-PSK	24	○
Aloha	00:e0:98:e0:a7:94	6 (B+G)	AP	WEP	24	○
Daisy	00:0c:41:b3:b6:44	6 (B)	AP	no	24	○
zoom3333	00:01:38:86:1b:2b	6 (B+G)	AP	WPA-PSK	23	○
zoom	00:01:38:a3:72:8d	10 (B+G)	AP	WEP	20	○
zoom	00:01:38:a3:64:93	10 (B+G)	AP	no	16	○
leekat	00:12:0e:59:40:54	11 (B+G)	AP	WEP	9	○
NewsBoston-2	00:18:f8:df:ca:f3	6 (B+G)	AP	no	7	○
tonycav	00:12:17:09:2d:1a	6 (B+G)	AP	WPA-PSK	7	○

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.



Wireless Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access Point.

Authentication Type:	● Open System ○ Shared Key ○ Auto
Fragment Threshold:	2346 (256-2346)
RTS Threshold:	2347 (0-2347)
Beacon Interval:	100 (20-1024 ms)
Data Rate:	Auto
Preamble Type:	● Long Preamble ○ Short Preamble
Broadcast SSID:	● Enabled ○ Disabled
IAPP:	● Enabled ○ Disabled
802.11g Protection:	● Enabled ○ Disabled
RF Output Power:	● 100% ○ 50% ○ 25% ○ 10% ○ 5%
Turbo Mode:	○ Auto ○ Always ● Off Note: "Always" may have compatibility issue. "Auto" will only work with Realtek product.
Block Relay Between Clients:	○ Enabled ● Disabled
WMM:	○ Enabled ● Disabled
ACK Timeout:	0 (0-255) < Current: 11b: 316us / 11g: 72us >

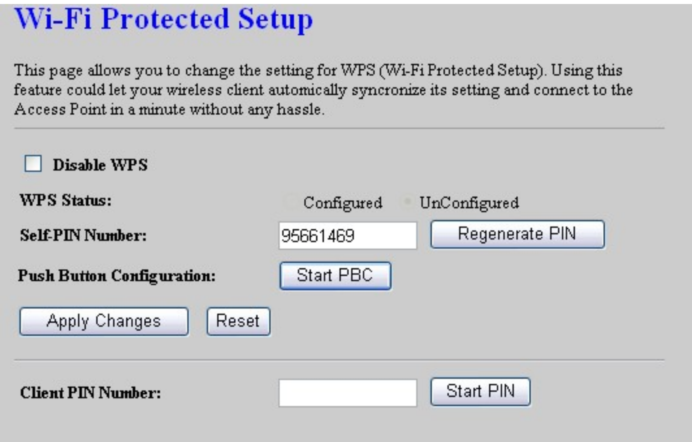
Parameter	Select or enter . . .
Authentication Type	These settings are used with WEP. Select: • **Open System** to allow a client to associate with the AP+4 without the correct WEP key or even without having WEP enabled. As long as the client has the correct SSID, it can obtain a connection. *However, 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.
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.
Broadcast SSID	Select **Enabled** to allow the AP+4 to broadcast its SSID. Select **Disabled** if you want to require clients to know the AP+4's SSID in order to join the network.
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%.

Turbo Mode	If the device you want to connect to supports Turbo mode, set this parameter to **Auto** to achieve significantly faster communication.
Block Relay Between Clients	Use this feature to prevent two AP+4 clients from communicating directly. This option enhances network security.
WMM (**W**iFi **M**ulti **M**edia)	Enable this option to give priority to voice and video communication.
ACK Timeout	This setting determines how long the AP+4 waits for an acknowledgement before resending the data.

WiFi Protected Setup™ (WPS)

If there are devices on your home or office network that support WiFi Protected Setup (WPS), this protocol can greatly simplify the process of configuring WPA2 or WPA security on the devices.



Wi-Fi Protected Setup

This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automically syncronize its setting and connect to the Access Point in a minute without any hassle.

□ Disable WPS

WPS Status: ○ Configured ● UnConfigured

Self-PIN Number: 95661469

Client PIN Number:

With WPS, you set security on one network device at a time.

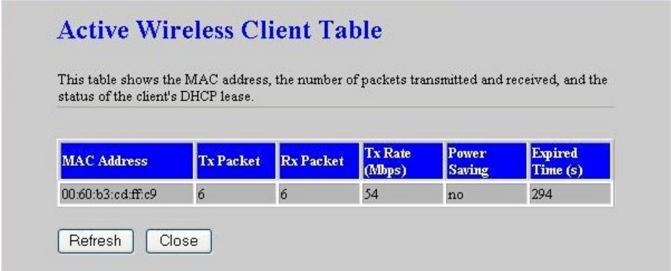
When WPS is initiated on the AP+4, it attempts for 2 minutes to associate with the device. When an association is made, the AP+4 then sends its network name and security key, in encrypted form.

At the Client PIN Number option, enter the network device's PIN number and then click **Start PIN**. This is the most secure method, because only a device with the Client PIN can associate with the AP+4. The PIN may be printed on a sticker on the device, or there may be a display showing the PIN.

Alternatively, if the device has a hardware *Secure Setup* or similarly named button, or a virtual pushbutton on a software display, you can use the **Push Button Configuration** (PBC) option.

Parameter	Select or enter . . .
Disable WPS	Select this check box to turn off WPS. By default, WPS is enabled.
Self PIN Number	(Display only) Automatically generated AP+4 PIN. For a different number, click **Regenerate PIN**.
Push Button Configuration (PBC)	To have the AP+4 search for another WPS-enabled device for 2 minutes, click **Start PBC**. The network device you want to configure must be turned on, have WPS enabled, be within range of the AP+4, and – as noted above – must have a hardware or software pushbutton. After you click Start PBC, go to the device and press or click its pushbutton.
Apply Changes	Click to save your settings.
Reset	Click to return to the defaults.
Client PIN Number	Enter the network device's PIN number. Look for a sticker on the device or a display showing the PIN.
Start PIN	Click this button to initiate the security setup process. The device must be turned on, have WPS enabled, and be within range of the AP+4 – approximately 150 feet , but this may vary greatly depending on the environment.

To confirm that WPS automatic configuration has been successful, on the menu select **Wireless**, and on the **Wireless Basic Settings** page click **Show Active Clients**:

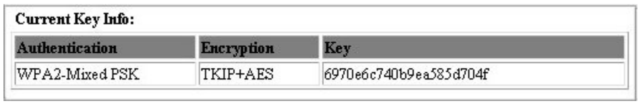


Active Wireless Client Table

This table shows the MAC address, the number of packets transmitted and received, and the status of the client's DHCP lease.

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
00:60:b3:cd:ff:c9	6	6	54	no	294

Note: As indicated above in the discussion of the **WPS Status** option, you can use the WPS page to configure security simultaneously on the AP+4 and the first device in the network. When you select either **Start PBC** or **Start PIN**, the AP+4 configures itself and the network device with the defaults shown below (the randomly generated key will not be the same):



Current Key Info:

Authentication	Encryption	Key
WPA2-Mixed PSK	TKIP+AES	6970e6c740b9ea585d704f

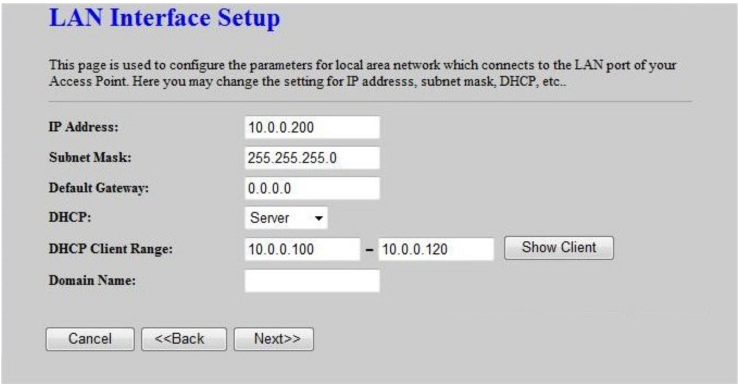
All future devices on the network will be configured with those settings.

5

TCP/IP Settings

LAN Interface

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



LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP addresss, subnet mask, DHCP, etc..

IP Address: 10.0.0.200

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DHCP: Server

DHCP Client Range: 10.0.0.100 – 10.0.0.120

Domain Name:

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.

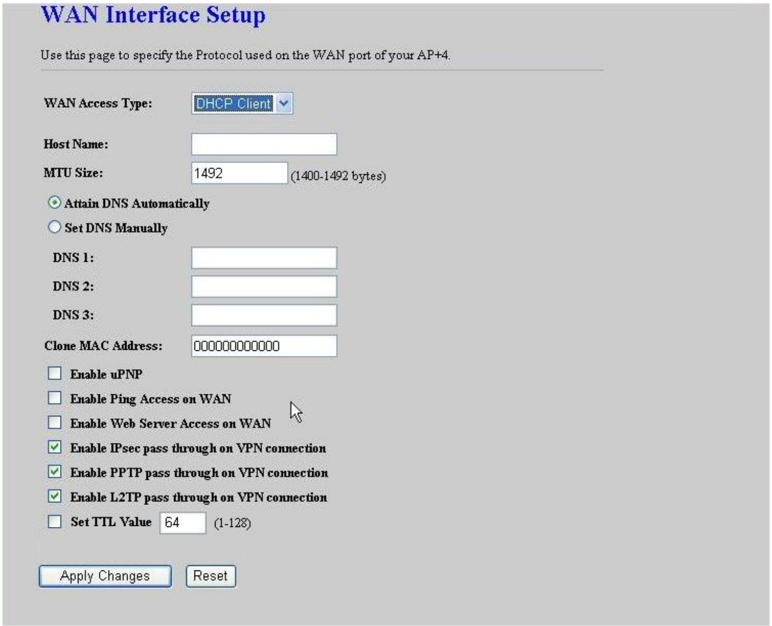
DHCP Client Range	The default range is shown: 10.0.0.1 to 10.0.0.199. Enter a different range if desired. Click **Show Clients** to view a list of connected devices.
Domain Name	If you have a large network that uses domains, enter a name.

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**:



WAN Interface Setup

Use this page to specify the Protocol used on the WAN port of your AP+4.

WAN Access Type: DHCP Client

Host Name:

MTU Size: 1492 (1400-1492 bytes)

● Attain DNS Automatically

○ Set DNS Manually

DNS 1:

DNS 2:

DNS 3:

Clone MAC Address: 000000000000

□ Enable uPNP

□ Enable Ping Access on WAN

□ Enable Web Server Access on WAN

☑ Enable IPsec pass through on VPN connection

☑ Enable PPTP pass through on VPN connection

☑ Enable L2TP pass through on VPN connection

□ Set TTL Value 64 (1-128)

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

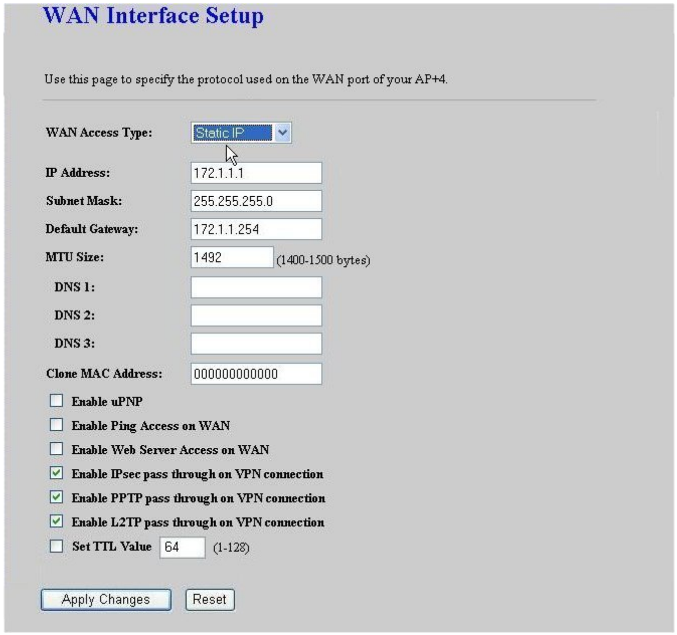
If you select **DHCP Client** as your WAN Access Type, you see the following parameters:

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.

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 **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.
Set TTL (Time to Live timer) Value	Enter the number of hops a packet can make before it is discarded.

Static IP

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



WAN Interface Setup

Use this page to specify the protocol used on the WAN port of your AP+4.

WAN Access Type:	Static IP
IP Address:	172.1.1.1
Subnet Mask:	255.255.255.0
Default Gateway:	172.1.1.254
MTU Size:	1492 (1400-1500 bytes)
DNS 1:	
DNS 2:	
DNS 3:	
Clone MAC Address:	000000000000

□ Enable uPNP

□ Enable Ping Access on WAN

□ Enable Web Server Access on WAN

☑ Enable IPsec pass through on VPN connection

☑ Enable PPTP pass through on VPN connection

☑ Enable L2TP pass through on VPN connection

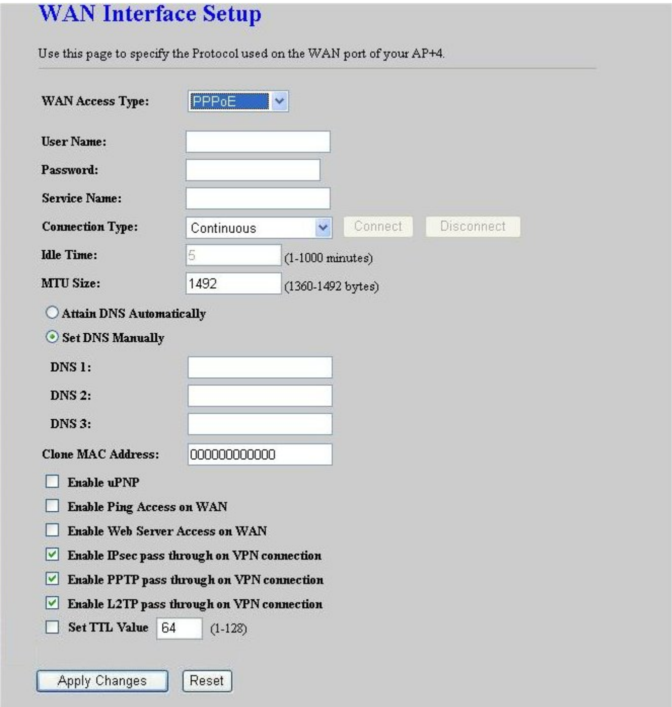
□ Set TTL Value 64 (1-128)

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.
Set TTL (Time to Live timer) Value	Enter the number of hops a packet can make before it is discarded.

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:



WAN Interface Setup

Use this page to specify the Protocol used on the WAN port of your AP+4.

WAN Access Type: PPPoE

User Name:

Password:

Service Name:

Connection Type: Continuous

Idle Time: 5 (1-1000 minutes)

MTU Size: 1492 (1360-1492 bytes)

○ Attain DNS Automatically

● Set DNS Manually

DNS 1:

DNS 2:

DNS 3:

Clone MAC Address: 000000000000

□ Enable uPNP

□ Enable Ping Access on WAN

□ Enable Web Server Access on WAN

☑ Enable IPsec pass through on VPN connection

☑ Enable PPTP pass through on VPN connection

☑ Enable L2TP pass through on VPN connection

□ Set TTL Value 64 (1-128)

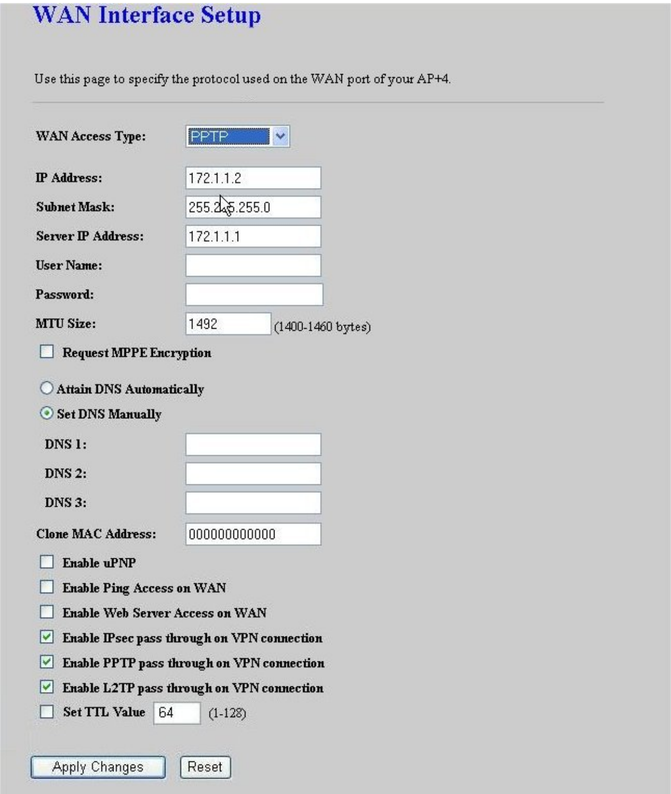
Parameter	Select or enter . . .
User Name	The login name given to you by your ISP – typically the characters preceding the @ sign in your email address.
Password	The login password given to you by your ISP.
Service Name	(Usually not required) Your service provider's name – given to you by the ISP.
Connection 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.
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.

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 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.
Set TTL (Time to Live timer) Value	Enter the number of hops a packet can make before it is discarded.

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:



WAN Interface Setup

Use this page to specify the protocol used on the WAN port of your AP+4.

WAN Access Type: PPTP

IP Address: 172.1.1.2

Subnet Mask: 255.255.255.0

Server IP Address: 172.1.1.1

User Name:

Password:

MTU Size: 1492 (1400-1460 bytes)

□ Request MPPE Encryption

○ Attain DNS Automatically

● Set DNS Manually

DNS 1:

DNS 2:

DNS 3:

Clone MAC Address: 000000000000

□ Enable uPNP

□ Enable Ping Access on WAN

□ Enable Web Server Access on WAN

☑ Enable IPsec pass through on VPN connection

☑ Enable PPTP pass through on VPN connection

☑ Enable L2TP pass through on VPN connection

□ Set TTL Value 64 (1-128)

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.
Set TTL (Time to Live timer) Value	Enter the number of hops a packet can make before it is discarded.

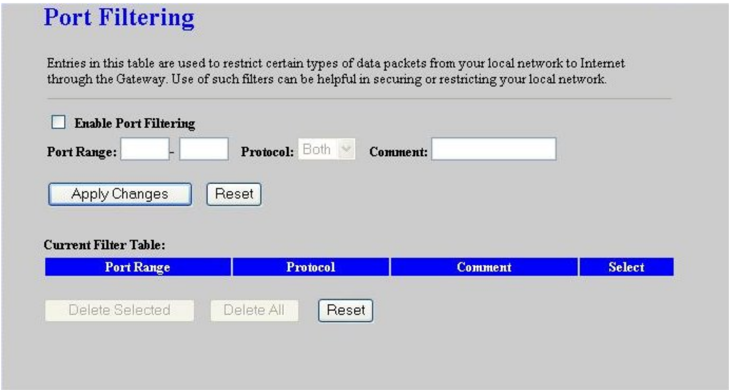
6

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.



Port Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

□ **Enable Port Filtering**

Port Range: ___ - ___ **Protocol:** Both **Comment:** ___

Current Filter Table:

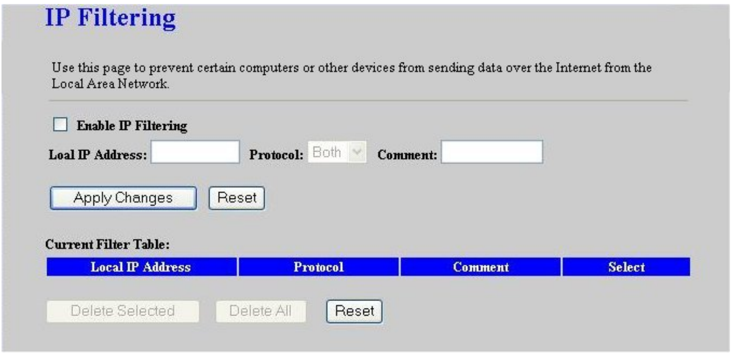
Port Range	Protocol	Comment	Select

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.
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.

Parameter	**Select or enter . . .**
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 data from certain IP addresses being sent over the Internet to computers or other devices on the Local Area Network.



IP Filtering

Use this page to prevent certain computers or other devices from sending data over the Internet from the Local Area Network.

□ Enable IP Filtering

Loal IP Address: Protocol: Both Comment:

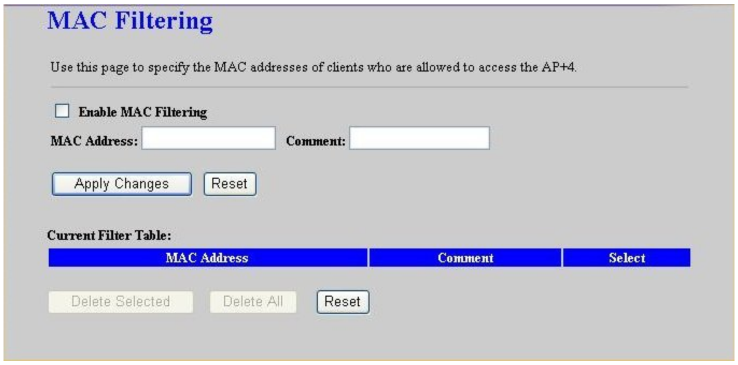
Current Filter Table:

Local IP Address	Protocol	Comment	Select

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 devices who are allowed to join the wireless network.



MAC Filtering

Use this page to specify the MAC addresses of clients who are allowed to access the AP+4.

□ Enable MAC Filtering

MAC Address: Comment:

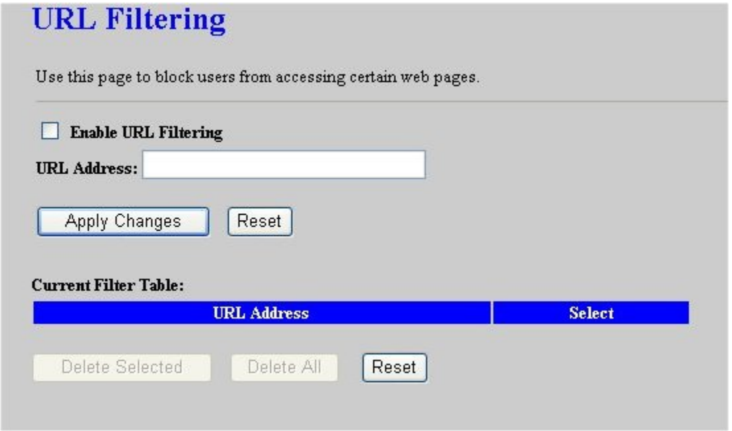
Current Filter Table:

MAC Address	Comment	Select

Parameter	Select or enter . . .
Enable MAC Filtering	When you select this check box, the AP+4 will compare the MAC address of a device requesting access to the network with the **Current Filter Table**. Devices not on the list will be denied access.
MAC Address	Enter the 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).



URL Filtering

Use this page to block users from accessing certain web pages.

□ **Enable URL Filtering**

URL Address:

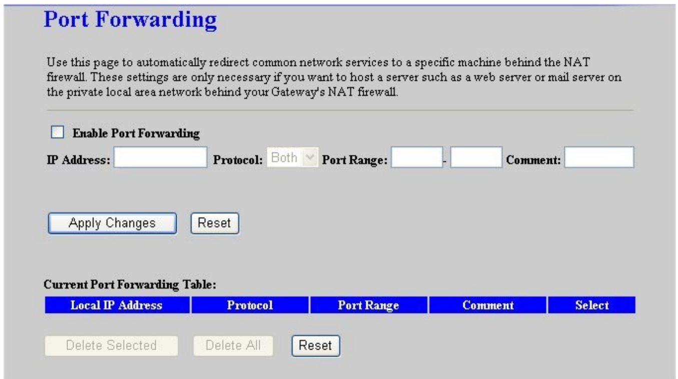
Current Filter Table:

URL Address	Select

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.



Port Forwarding

Use this page to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you want to host a server such as a web server or mail server on the private local area network behind your Gateway's NAT firewall.

☐ Enable Port Forwarding

IP Address: Protocol: Both Port Range: - Comment:

Current Port Forwarding Table:

Local IP Address	Protocol	Port Range	Comment	Select

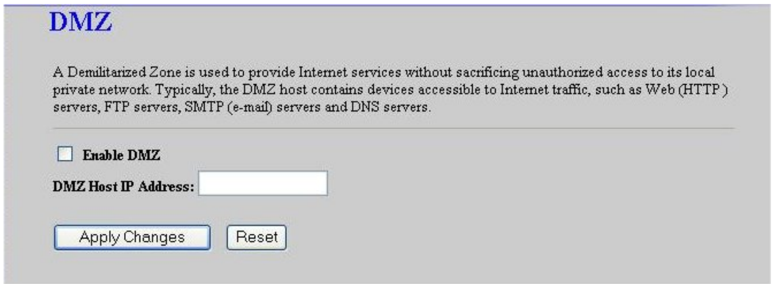
Parameter	Select or enter . . .
Enable Port Forwarding	Select this check box to allow one or a small number of ports on a network computer to be opened to external Internet communication.
IP Address	Enter the IP address of the network computer allowed to receive direct Internet traffic.
Protocol	Select **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**militarized **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.



DMZ

A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.

□ **Enable DMZ**

DMZ Host IP Address:

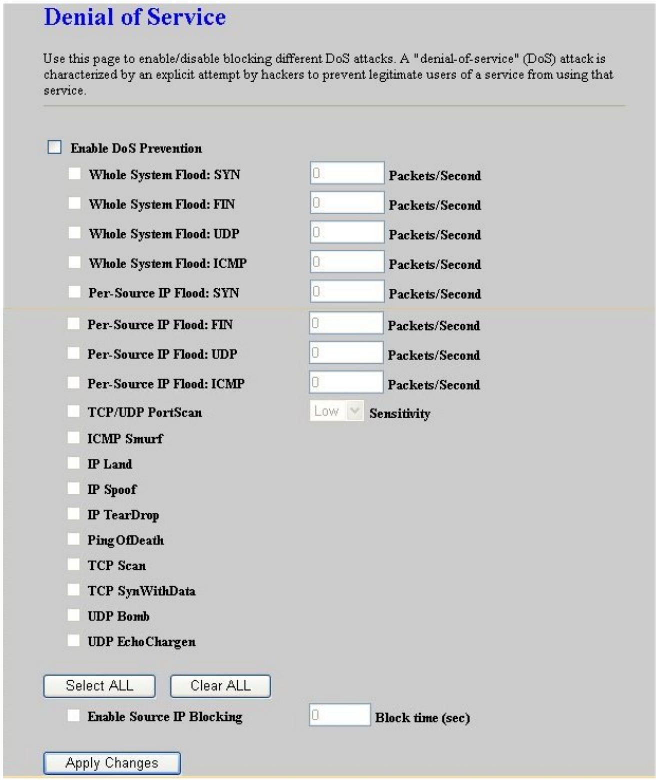
Parameter	Select or enter . . .
Enable DMZ	When you select this check box, you can designate one of the computers in the LAN as a DMZ. That computer can serve as a web server, email server, FTP server, or DNS server.
DMZ Host IP Address	Enter the IP address of the computer designated as a DMZ.
Apply 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



Denial of Service

Use this page to enable/disable blocking different DoS attacks. A "denial-of-service" (DoS) attack is characterized by an explicit attempt by hackers to prevent legitimate users of a service from using that service.

□ Enable DoS Prevention

□ Whole System Flood: SYN	0	Packets/Second
□ Whole System Flood: FIN	0	Packets/Second
□ Whole System Flood: UDP	0	Packets/Second
□ Whole System Flood: ICMP	0	Packets/Second
□ Per-Source IP Flood: SYN	0	Packets/Second
□ Per-Source IP Flood: FIN	0	Packets/Second
□ Per-Source IP Flood: UDP	0	Packets/Second
□ Per-Source IP Flood: ICMP	0	Packets/Second
□ TCP/UDP PortScan	Low	Sensitivity
□ ICMP Smurf		
□ IP Land		
□ IP Spoof		
□ IP TearDrop		
□ PingOfDeath		
□ TCP Scan		
□ TCP SynWithData		
□ UDP Bomb		
□ UDP EchoChargen		

□ Enable Source IP Blocking 0 Block time (sec)

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.

Parameter	Select or enter . . .
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.

Parameter	Select or enter . . .
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.
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.

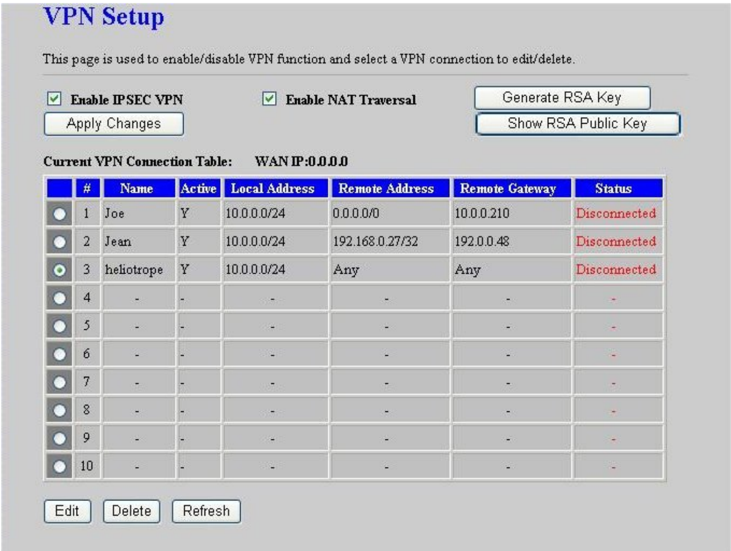
Parameter	Select or enter . . .
TCP Syn with Data	Select this check box to defend against an attack where the TCP port scanner generates a SYN packet. If the target port is open, it will respond with a SYN-ACK packet. The scanner responds with a RST packet, closing the connection before the handshake is completed.
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:



VPN Setup

This page is used to enable/disable VPN function and select a VPN connection to edit/delete.

☑ **Enable IPSEC VPN** ☑ **Enable NAT Traversal**

Current VPN Connection Table: **WAN IP:0.0.0.0**

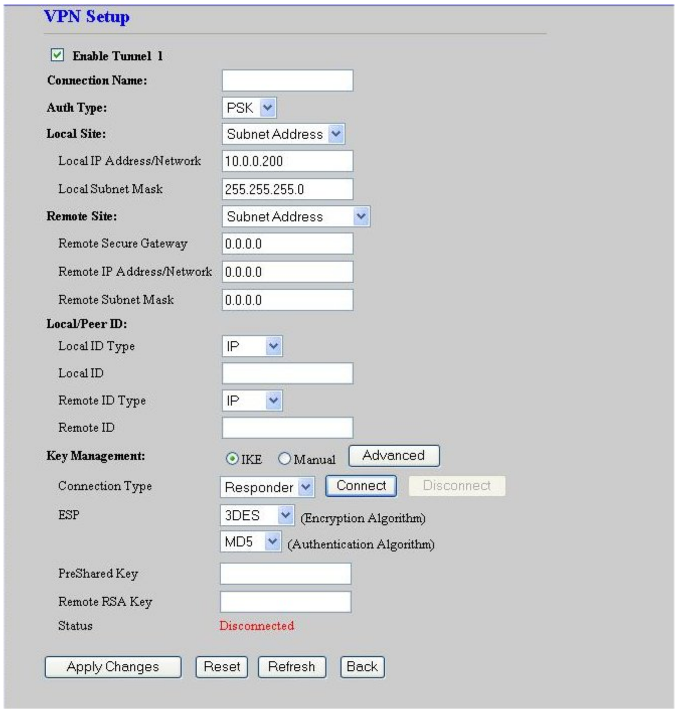
	#	Name	Active	Local Address	Remote Address	Remote Gateway	Status
○	1	Joe	Y	10.0.0.0/24	0.0.0.0/0	10.0.0.210	Disconnected
○	2	Jean	Y	10.0.0.0/24	192.168.0.27/32	192.0.0.48	Disconnected
●	3	heliotrope	Y	10.0.0.0/24	Any	Any	Disconnected
○	4	-	-	-	-	-	-
○	5	-	-	-	-	-	-
○	6	-	-	-	-	-	-
○	7	-	-	-	-	-	-
○	8	-	-	-	-	-	-
○	9	-	-	-	-	-	-
○	10	-	-	-	-	-	-

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.

Parameter	Select or enter . . .
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 63).
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:



VPN Setup

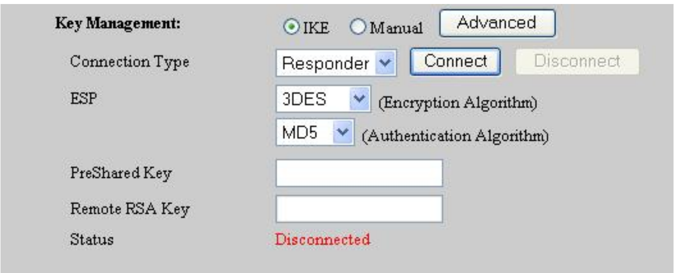
☑ Enable Tunnel 1

Connection Name:	
Auth Type:	PSK
Local Site:	Subnet Address
Local IP Address/Network	10.0.0.200
Local Subnet Mask	255.255.255.0
Remote Site:	Subnet Address
Remote Secure Gateway	0.0.0.0
Remote IP Address/Network	0.0.0.0
Remote Subnet Mask	0.0.0.0
Local/Peer ID:	
Local ID Type	IP
Local ID	
Remote ID Type	IP
Remote ID	
Key Management:	● IKE ○ Manual [Advanced]
Connection Type	Responder [Connect] [Disconnect]
ESP	3DES (Encryption Algorithm) MD5 (Authentication Algorithm)
PreShared Key	
Remote RSA Key	
Status	Disconnected

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 67). **Manual** to enter encryption and authentication keys.

If you select IKE, the following options appear:



Key Management: ● IKE ○ Manual

Connection Type: Responder

ESP: 3DES (Encryption Algorithm)

MD5 (Authentication Algorithm)

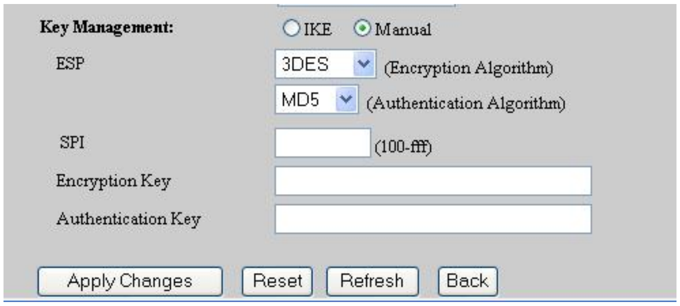
PreShared Key:

Remote RSA Key:

Status: Disconnected

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:



Key Management: ○ IKE ● Manual

ESP: 3DES (Encryption Algorithm)

MD5 (Authentication Algorithm)

SPI: (100-fff)

Encryption Key:

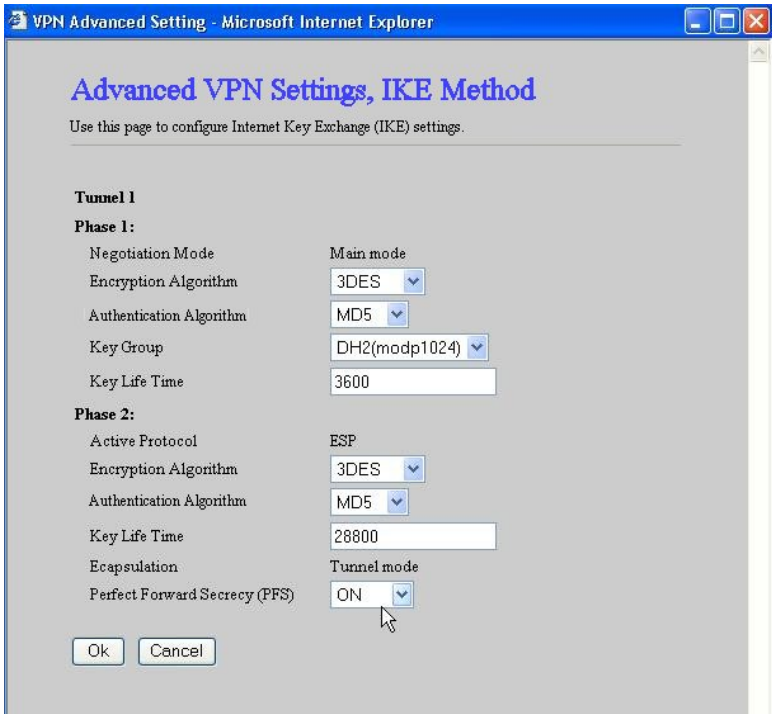
Authentication Key:

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:



Advanced VPN Settings, IKE Method

Use this page to configure Internet Key Exchange (IKE) settings.

Tunnel 1

Phase 1:

Negotiation Mode	Main mode
Encryption Algorithm	3DES
Authentication Algorithm	MD5
Key Group	DH2(modp1024)
Key Life Time	3600

Phase 2:

Active Protocol	ESP
Encryption Algorithm	3DES
Authentication Algorithm	MD5
Key Life Time	28800
Ecapsulation	Tunnel mode
Perfect Forward Secrecy (PFS)	ON

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)

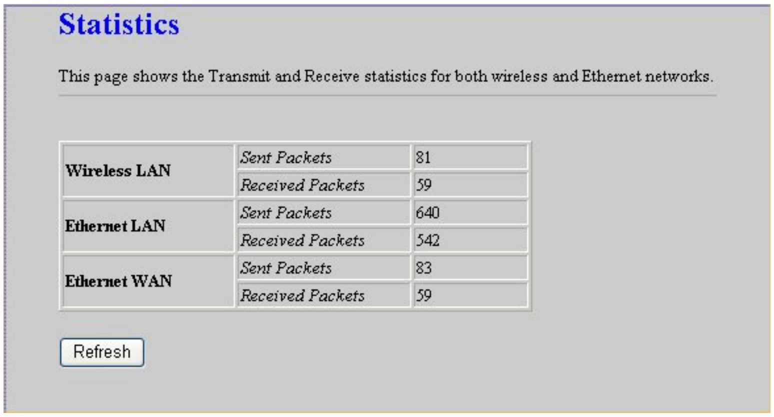
Authentication Algorithm	Select: **MD5** (A digital signature algorithm) **SHA1** (**S**ecure **H**ash **A**lgorithm)
Key Group	Select one of the following DH (**D**iffe-**H**elman) encryption algorithms, which allow two parties that have no prior knowledge of each other to establish a shared secret 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:



Statistics

This page shows the Transmit and Receive statistics for both wireless and Ethernet networks.

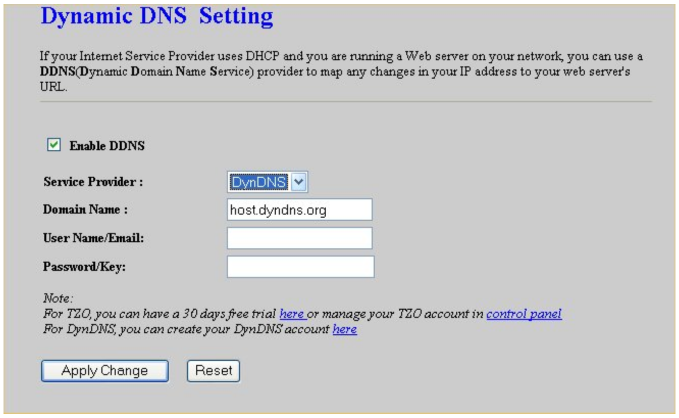
Wireless LAN	*Sent Packets*	81
	Received Packets	59
Ethernet LAN	*Sent Packets*	640
	Received Packets	542
Ethernet WAN	*Sent Packets*	83
	Received Packets	59

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 assign a Static IP Address to the AP+4.

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



Dynamic DNS Setting

If your Internet Service Provider uses DHCP and you are running a Web server on your network, you can use a **DDNS**(**D**ynamic **D**omain **N**ame **S**ervice) provider to map any changes in your IP address to your web server's URL.

☑ **Enable DDNS**

Service Provider : DynDNS

Domain Name : host.dyndns.org

User Name/Email:

Password/Key:

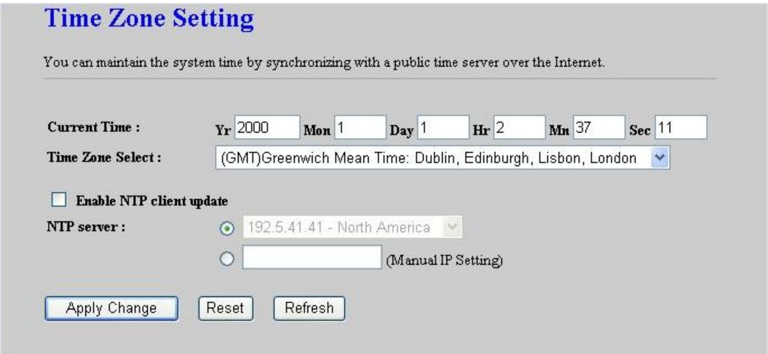
Note:
For TZO, you can have a 30 days free trial here or manage your TZO account in control panel
For DynDNS, you can create your DynDNS account here

Parameter	Select or enter . . . .
Enable DDNS	Select this check box to designate a network computer as a DMZ.
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.

Parameter	Select or enter . . . .
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**:



Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

Current Time : Yr 2000 Mon 1 Day 1 Hr 2 Mn 37 Sec 11

Time Zone Select : (GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London

□ Enable NTP client update

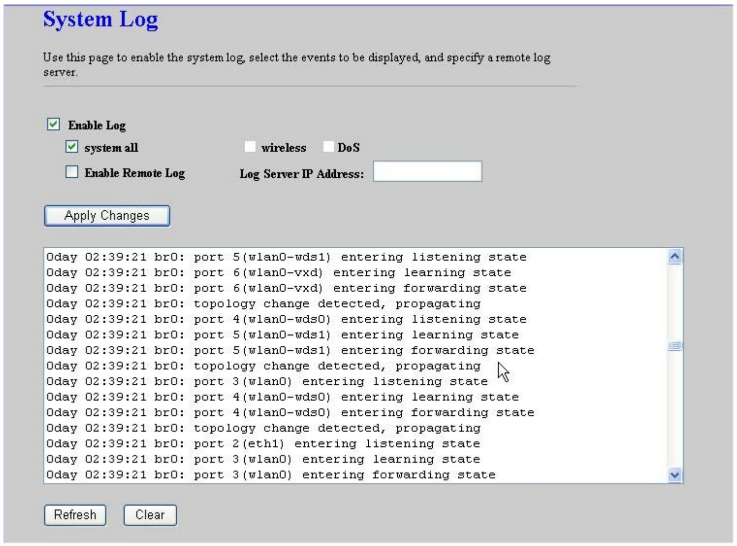
NTP server : ● 192.5.41.41 - North America

○ (Manual IP Setting)

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**:



System Log

Use this page to enable the system log, select the events to be displayed, and specify a remote log server.

☑ Enable Log

☑ system all □ wireless □ DoS

□ Enable Remote Log Log Server IP Address:

```
Oday 02:39:21 br0: port 5(wlan0-wds1) entering listening state
Oday 02:39:21 br0: port 6(wlan0-vxd) entering learning state
Oday 02:39:21 br0: port 6(wlan0-vxd) entering forwarding state
Oday 02:39:21 br0: topology change detected, propagating
Oday 02:39:21 br0: port 4(wlan0-wds0) entering listening state
Oday 02:39:21 br0: port 5(wlan0-wds1) entering learning state
Oday 02:39:21 br0: port 5(wlan0-wds1) entering forwarding state
Oday 02:39:21 br0: topology change detected, propagating
Oday 02:39:21 br0: port 3(wlan0) entering listening state
Oday 02:39:21 br0: port 4(wlan0-wds0) entering learning state
Oday 02:39:21 br0: port 4(wlan0-wds0) entering forwarding state
Oday 02:39:21 br0: topology change detected, propagating
Oday 02:39:21 br0: port 2(eth1) entering listening state
Oday 02:39:21 br0: port 3(wlan0) entering learning state
Oday 02:39:21 br0: port 3(wlan0) entering forwarding state
```

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.

Parameter	Select or enter . . . .
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

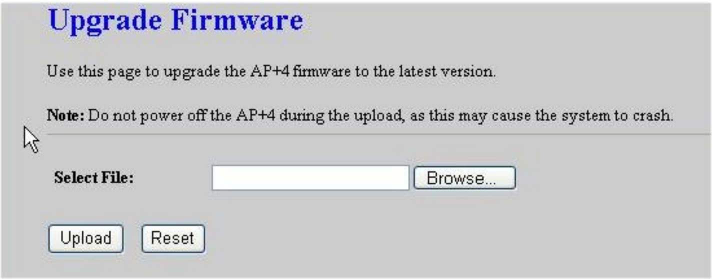
From time to time, Zoom may release updated firmware for your AP+4.

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**:



Upgrade Firmware

Use this page to upgrade the AP+4 firmware to the latest version.

Note: Do not power off the AP+4 during the upload, as this may cause the system to crash.

Select File:

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.

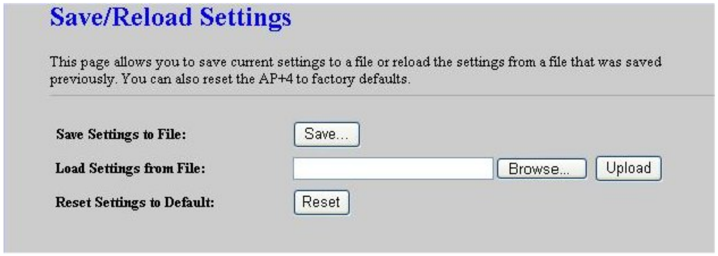
Save/Reload Configuration

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**:



Save/Reload Settings

This page allows you to save current settings to a file or reload the settings from a file that was saved previously. You can also reset the AP+4 to factory defaults.

Save Settings to File:

Load Settings from File:

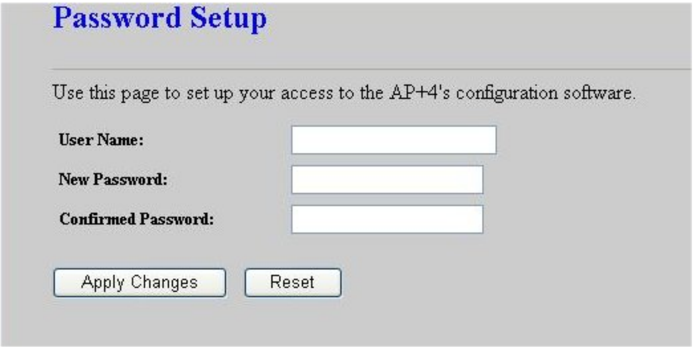
Reset Settings to Default:

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:**



Password Setup

Use this page to set up your access to the AP+4's configuration software.

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 Vista Users:

1 On the desktop, click the **Start** button, select **Control Panel**, and then double-click **Network and Sharing Center**.

2 In the Network and Sharing Center window, in the **Tasks** pane, select **Manage Network Connections**.

3 In the Network Connections window, select **Local Area Connection**.

If a message appears saying *Windows needs your permission to continue*, click **Continue**.

4 In the Local Area Connection Properties dialog box, select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.

5 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.

6 Click **OK**, then click **Close.**

7 Re-enter 10.0.0.200 in your web browser's address bar.

Windows XP Users:

1 On the Windows desktop, click the **Start** button, open **Control Panel**, in the left pane select **Classic View**, 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 78.

  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 Customer Support

Please fill in the following information, since it will speed up support if you ever need it.

Product Name ______________________________________

Product Model Number _______________________________

Product Serial Number (see below) ____________________

Date Installed _______________________________________

The serial number is easy to find. For external products, the serial number is located on the bottom of the unit below the barcode. The serial number for internal modems is located below the barcode on the silver-colored bracket near the phone jacks. The serial number for PC cards is located below the barcode on the back of the card.

Customer Support from Zoom

Zoom has a skilled staff of Boston-based support specialists to assist you. If you would like help, we recommend that you familiarize yourself with the support alternatives described in this flyer.

SmartFacts™ Q&A Search Engine

SmartFacts™ is an automated intelligent database of Frequently Asked Questions (FAQs) about Zoom products. It allows you to search for solutions to your Customer 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 email for a response tailored to your questions. 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 information that was 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

World Wide Web

Zoom's Web page lets you request assistance via e-mail, register online, access product reviews and descriptions, and do a whole lot more. Visit the Zoom Technical Support area for the latest flash upgrades and drivers for your Zoom product. To access Zoom's Web page, please log onto your local Internet Service Provider, then go to the Web browser and select:

www.zoom.com

From Zoom's home page you can easily go to Customer Support or many other useful areas on the site.

Contacting Zoom by E-mail

You can e-mail Zoom with any product questions you have, and one of our Customer Support specialists will respond by e-mail within 2 business days. Send your questions to:

www.zoom.com/techmail

When e-mailing Zoom, be sure to include the following:

- Your full name and e-mail address
- Product name and serial number
- A detailed description of your problem.

Contacting Zoom by Phone

Zoom's support lines can be reached by dialing this U. S. phone number: **(617) 753-0961**

Certain countries can also dial an in-country number to reach Zoom support:

United Kingdom:	0870 720 0090
Portugal:	+35 1221451012
Spain:	+34 911516304
Switzerland:	+41 435000369

For Zoom's extensive Customer Support hours, please check:

www.zoom.com/contact/contact_techsupport.html

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
Δήλωση Συμμόρφωσης
Declaração de Conformidade
Uyum Beyanatı

Déclaration de conformité
Dichiarazione di conformità
Declaración de conformidad
Cam kết về sự tuân thủ ở Châu Âu

Konformitätserklärung
Deklaracja zgodności
Konformitetsdeklaration

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
21 March, 2008
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