User Guide

Linksys E2500 | Advanced Dual-Band N Router

Contents

Chapter 1: Advanced Configuration

After setting up the Router with the setup software (located on the CD-ROM), the Router will be ready for use. If you would like to change its advanced settings, use the Router's browser-based utility. This chapter describes each web page of the utility and each page's key functions. You can access the utility via a web browser on a computer connected to the Router.

The browser-based utility has these main tabs: *Setup*, *Wireless*, *Security*, *Storage*, *Access Restrictions*, *Applications & Gaming*, *Administration*, and *Status*. Additional tabs will be available after you click one of the main tabs.

How to Access the Browser-Based Utility

To access the browser-based utility, launch the web browser on your computer, and enter the Router's default IP address, **192.168.1.1** in the *Address* field. Then press **Enter**.

NOTE: You can also access the browser-based utility on Windows computers by entering the device name in the *Address* field. Refer to *Device Name* under "**Router Address**" on page 4.

A login screen will appear. (Non-Windows 7 users will see a similar screen.) In the *User name* field, enter **admin**. Then enter the password created during the setup software. (If you did not run the setup software, then use the default password, **admin**. You can set a new password on the *Administration* > *Management* screen. Refer to "**Administration > Management**" on page 21.) Click **OK** to continue.

Windows 7 Login Screen

NOTE: You can also access the browser-based utility through the Cisco Connect software. For more information, refer to "**Router Settings**" on page 10.

Setup > Basic Setup

The first screen that appears is the *Basic Setup* screen. This allows you to change the Router's general settings.

Setup > Basic Setup

Language

Select your language To use a different language, select one from the drop-down menu. The language of the browser-based utility will change five seconds after you select another language.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Internet Setup

The *Internet Setup* section configures the Router to your Internet connection. Most of this information can be obtained through your Internet Service Provider (ISP).

Internet Connection Type

Select the type of Internet connection your ISP provides from the drop-down menu. The available types are:

- Automatic Configuration - DHCP
- Static IP
- PPPoE
- PPTP
- L2TP
- Telstra Cable

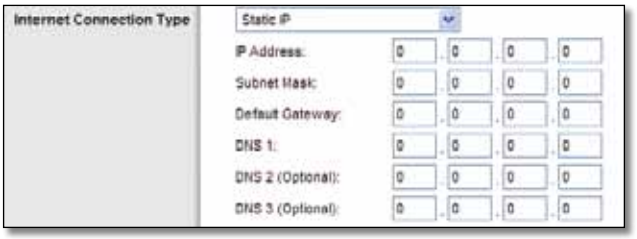
Automatic Configuration - DHCP

The default Internet Connection Type is set to **Automatic Configuration - DHCP**. Keep the default only if your ISP supports DHCP (Dynamic Host Configuration Protocol) or if you connect using a dynamic IP Address. (This option usually applies to cable connections.)

Internet Connection Type > Automatic Configuration - DHCP

Static IP

If you are required to use a permanent IP address to connect to the Internet, select **Static IP**.



Internet Connection Type > Static IP

IP Address This is the Router's IP address, when seen from the Internet. Your ISP will provide you with the IP address you need to enter here.

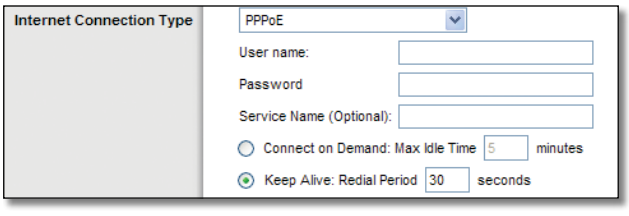
Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

Default Gateway Your ISP will provide you with the Gateway address, which is the ISP server's IP address.

DNS Your ISP will provide you with at least one DNS (Domain Name System) server IP address.

PPPoE

Some DSL-based ISPs use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections. If you are connected to the Internet through a DSL line, check with your ISP to see if they use PPPoE. If they do, you will have to enable **PPPoE**.



Internet Connection Type > PPPoE

User Name and Password Enter the User Name and Password provided by your ISP.

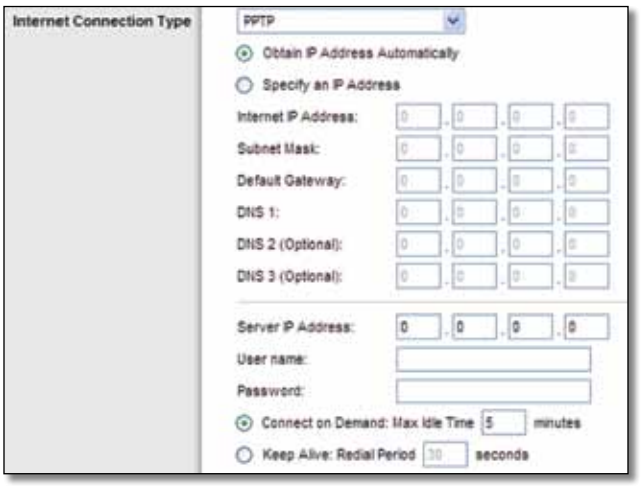
Service Name (optional) If provided by your ISP, enter the Service Name.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to elapse before your Internet connection terminates. The default is **5** minutes.

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, specify how often the Router should check the Internet connection. The default is **30** seconds.

PPTP

Point-to-Point Tunneling Protocol (PPTP) is a service that applies to connections in Europe only.



Internet Connection Type > PPTP

If your ISP supports DHCP or you are connecting through a dynamic IP address, then select **Obtain an IP Address Automatically**. If you are required to use a permanent IP address to connect to the Internet, then select **Specify an IP Address**. Then configure the following:

Internet IP Address This is the Router's IP address, as seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

Default Gateway Your ISP will provide you with the Gateway address, which is the ISP server's IP address.

DNS Your ISP will provide you with at least one DNS (Domain Name System) Server IP address.

Server IP Address Your ISP will provide you with the Server IP Address.

User Name and Password Enter the User Name and Password provided by your ISP.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to elapse before your Internet connection terminates. The default is **5** minutes.

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, specify how often the Router should check the Internet connection. The default is **30** seconds.

L2TP

Layer 2 Tunneling Protocol (L2TP) is a service that applies to connections in Israel only.

Internet Connection Type > L2TP

Server IP Address This is the IP address of the L2TP Server. Your ISP will provide you with the IP Address you need to specify here.

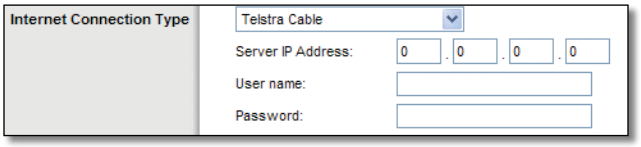
User Name and Password Enter the User Name and Password provided by your ISP.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to elapse before your Internet connection terminates. The default is **5** minutes.

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, specify how often the Router should check the Internet connection. The default is **30** seconds.

Telstra Cable

Telstra Cable is a service that applies to connections in Australia only.



Internet Connection Type > Telstra Cable

Server IP Address This is the IP address of the Telstra Cable. Your ISP will provide you with the IP Address you need to specify here.

User Name and Password Enter the User Name and Password provided by your ISP.

Optional Settings

Some of these settings may be required by your ISP. Verify with your ISP before making any changes.

Optional Settings

Host Name/Domain Name These fields allow you to supply a host and domain name for the Router. Some ISPs, usually cable ISPs, require these names as identification. You may have to check with your ISP to see if your broadband Internet service has been configured with a host and domain name. In most cases, leaving these fields blank will work.

MTU MTU is the Maximum Transmission Unit. It specifies the largest packet size permitted for Internet transmission. Select **Manual** if you want to manually enter the largest packet size that is transmitted. To have the Router select the best MTU for your Internet connection, keep the default setting, **Auto**.

Size When Manual is selected in the *MTU* field, this option is enabled. Leave this value in the 1200 to 1500 range. The default size depends on the Internet Connection Type:

- DHCP, Static IP, or Telstra: **1500**
- PPPoE: **1492**
- PPTP or L2TP: **1460**

Network Setup

The *Network Setup* section configures the IP settings for your local network.

Router Address

This presents the Router's IP Address, the Subnet Mask, and the Device Name as seen by your network.

Router IP Address

IP Address This is the IP address of the router and is used as the base for all of your local network settings.

Subnet Mask This is the subnet mask address for your router. It offers a selection of addresses from a drop-down menu. Most users will not need to change this setting.

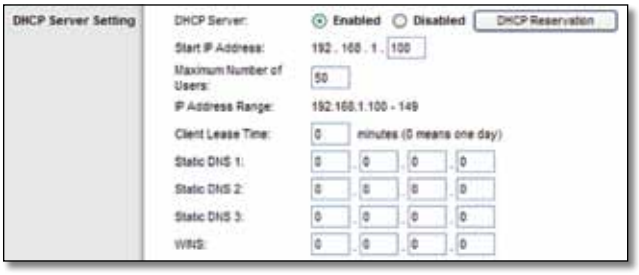
Device Name The default device name is **Ciscoxxxxx**. xxxxx represents the last 5 digits of your serial number. This can be found on the bottom of the router. (The Device name is also the Router's NetBIOS name.)

NOTE: If you used the setup software for installation, then the device name is synchronized with the name of your wireless network (up to 15 characters).

DHCP Server Settings

The settings allow you to configure the Router's DHCP server function. The Router can be used as a DHCP server for your network. A DHCP server automatically assigns an IP address to each computer or device on your network.

NOTE: If you choose to enable the DHCP server option, make sure there is no other DHCP server on your network.



DHCP Server Setting

DHCP Server DHCP is enabled by factory default. If you already have a DHCP server on your network, or you do not want a DHCP server, then select **Disabled** (no other DHCP features will be available).

DHCP Reservation Click **DHCP Reservation** if you want to assign a fixed local IP address to a specific device on your network. This is helpful if you have a device you need to access at the same address all the time such as a media server or print server. You can reserve the IP address for the specific device by selecting it from the list of devices or by manually entering the MAC address of the device.

DHCP Reservation

You will see a list of DHCP clients with the following information: Client Name, Interface, IP Address, and MAC Address.

DHCP Reservation

- **Select Clients from DHCP Table** Click the **Select** check box to reserve a client's IP address. Then click **Add Clients.**
- **Manually Add Client** To manually assign an IP address, enter the client's name in the *Enter Client Name* field. Enter the IP address you want it to have in the *Assign IP Address* field. Enter its MAC address in the *To This MAC Address* field. Then click **Add** and click **Save Settings**.

Clients Already Reserved

A list of DHCP clients and their fixed local IP addresses are displayed at the bottom of the screen. If you want to remove a client from this list, click **Remove**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes. To update the on-screen information, click **Refresh**. To exit this screen, click **Close**.

Start IP Address The Start IP Address specifies the starting IP address for the range of addresses assigned by your Router when it functions as a DHCP server. (The first IP address assigned by the Router will be randomly selected within the range you specify.)

Because the Router's default IP address is 192.168.1.1, the Start IP Address must be 192.168.1.2 or greater, but

smaller than 192.168.1.254. The default Start IP Address is **192.168.1.100**.

Maximum Number of Users Enter the maximum number of computers that you want the DHCP server to assign IP addresses to. This number cannot be greater than 253. The default is **50**.

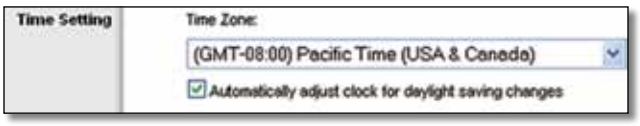
IP Address Range The range of available IP addresses is displayed.

Client Lease Time The Client Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" this dynamic IP address. After the time is up, the user will be automatically assigned a new dynamic IP address, or the lease will be renewed. The default is **0** minutes, which means one day.

Static DNS (1-3) The Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or URLs. Your ISP will provide you with at least one DNS Server IP Address. If you wish to use another, enter that IP Address in one of these fields. You can enter up to three DNS Server IP Addresses here. The Router will use these for quicker access to functioning DNS servers.

WINS The Windows Internet Naming Service (WINS) manages each computer's interaction with the Internet. If you use a WINS server, enter that server's IP address here. Otherwise, leave this blank.

Time Settings



Time Setting

Time Zone Select the time zone in which your network functions from this drop-down menu.

Automatically adjust clock for daylight saving changes Select this option to have the Router automatically adjust for daylight saving time.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Reboot

Reboot

Reboot Use this option to reboot your Router.

Setup > DDNS

The Router offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you are hosting your own website, FTP (File Transfer Protocol) server, or other server behind the Router.

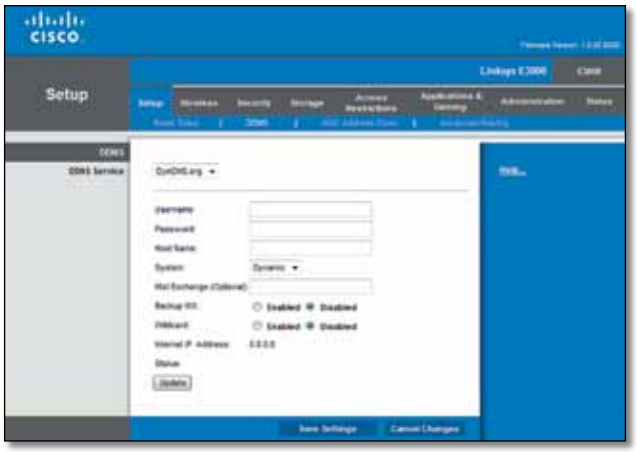
Before you can use this feature, you need to sign up for DDNS service with a DDNS service provider, **www.dyndns.org** or **www.tzo.com**. If you do not want to use this feature, keep the default, **Disabled**.

DDNS

DDNS Service

If your DDNS service is provided by DynDNS.org, then select **DynDNS.org** from the drop-down menu. If your DDNS service is provided by TZO, then select **TZO.com**. The features available on the *DDNS* screen will vary, depending on which DDNS service provider you use.

DynDNS.org



Setup > DDNS > DynDNS

Username Enter the Username for your DDNS account.

Password Enter the Password for your DDNS account.

Host Name The DDNS URL assigned by the DDNS service is displayed.

System Select the DynDNS service you use: **Dynamic**, **Static**, or **Custom**. The default selection is **Dynamic**.

Mail Exchange (Optional) Enter the address of your mail exchange server, so e-mails to your DynDNS address go to your mail server.

Backup MX This feature allows the Mail eXchange (MX) server to be a backup. To disable this feature, keep the default, **Disabled**. To enable the feature, select **Enabled**. If you are not sure which setting to select, keep the default, **Disabled**.

Wildcard This setting enables or disables wildcards for your host. For example, if your DDNS address is *myplace.dyndns.org* and you enable wildcards, then *x.myplace.dyndns.org* will work as well (x is the wildcard). To disable wildcards, keep the default, **Disabled**. To enable wildcards, select **Enabled**. If you are not sure which setting to select, keep the default, **Disabled**.

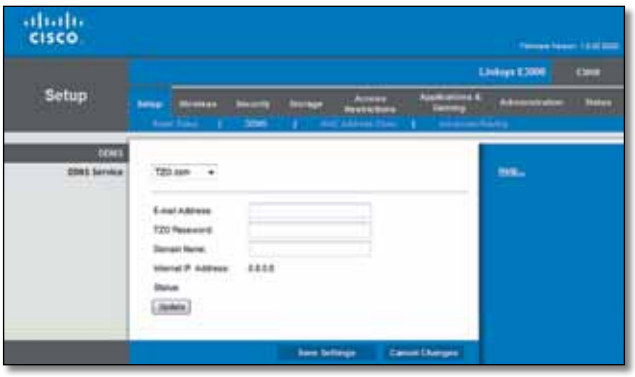
Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

Status The status of the DDNS service connection is displayed.

Update To manually trigger an update, click **Update**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

TZO.com



Setup > DDNS > TZO

E-mail Address, TZO Password, and Domain Name Enter the settings of the account you set up with TZO.

Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

Status The status of the DDNS service connection is displayed.

Update To manually trigger an update, click **Update**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Setup > MAC Address Clone

A MAC address is a 12-digit code assigned to a unique piece of hardware for identification. Some ISPs require you to register a MAC address in order to access the Internet. If you do not wish to re-register the MAC address with your ISP, you can use the *MAC Address Clone* feature to assign the currently registered MAC address to the Router.

Setup > MAC Address Clone

MAC Address Clone

Enabled/Disabled To have the MAC address cloned, select **Enabled**.

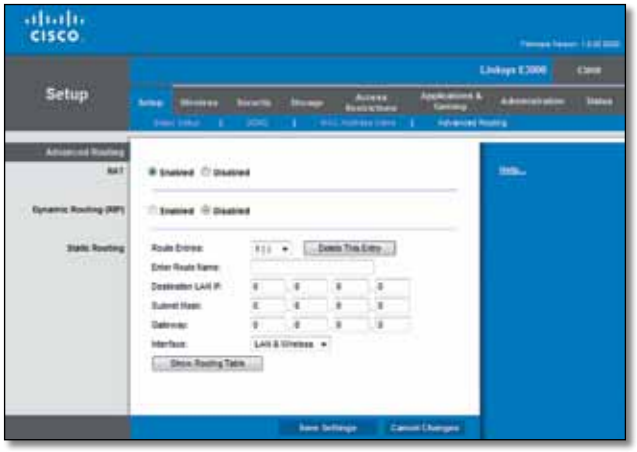
MAC Address Enter the MAC address registered with your ISP here.

Clone My PC's MAC Click this button to clone the MAC address of the computer you are using.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Setup > Advanced Routing

This screen is used to set up the Router's advanced functions. Operating Mode allows you to select the type(s) of advanced functions you use. Dynamic Routing automatically adjusts how packets travel on your network. Static Routing sets up a fixed route to another network destination.



Setup > Advanced Routing

Advanced Routing

NAT

Enabled/Disabled If this Router is hosting your network's connection to the Internet, keep the default, **Enabled**. If another router exists on your network, select **Disabled**. When the NAT setting is disabled, dynamic routing will be available.

Dynamic Routing (RIP)

Dynamic routing uses the Routing Information Protocol (RIP). This option enables the Router to automatically adjust to physical changes in the network's layout and exchange routing tables with other router(s). The Router determines the network packets' route based on the fewest number of hops between the source and the destination.

Enabled/Disabled When the NAT setting is enabled, the Dynamic Routing option is automatically disabled. When the NAT setting is disabled, this option is available. Select **Enabled** to use the Dynamic Routing option.

Static Routing

A static route is a pre-determined pathway that network information must travel to reach a specific host or network. Enter the information described below to set up a new static route.

Route Entries To set up a static route between the Router and another network, select a number from the drop-down list. Click **Delete This Entry** to delete a static route.

Enter Route Name Enter a name for the Route here, using a maximum of 25 alphanumeric characters.

Destination LAN IP The Destination LAN IP is the address of the remote network or host to which you want to assign a static route.

Subnet Mask The Subnet Mask determines which portion of a Destination LAN IP address is the network portion, and which portion is the host portion.

Gateway This is the IP address of the gateway device that allows for contact between the Router and the remote network or host.

Interface This interface tells you whether the Destination IP Address is on the **LAN & Wireless** (Ethernet and wireless networks) or the **Internet (WAN)**.

Click **Show Routing Table** to view the static routes you have already set up.

Routing Table

Routing Table

For each route, the Destination LAN IP address, Subnet Mask, Gateway, and Interface are displayed. Click **Refresh** to update the information. Click **Close** to exit this screen.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Wireless > Basic Wireless Settings

The basic settings for wireless networking are set on this screen.

There are two ways to configure the Router's wireless network(s), manual and Wi-Fi Protected Setup.

Wi-Fi Protected Setup is a feature that makes it easy to set up your wireless network. If you have client devices, such as wireless adapters, that support Wi-Fi Protected Setup, then you can use Wi-Fi Protected Setup.

Simultaneous Networks

For more wireless bandwidth, the Router can create two simultaneous yet separate Wireless-N networks, one using the Wireless-N 5 GHz band and one using the Wireless-N 2.4 GHz band. You can use Wi-Fi Protected Setup to easily configure and connect to both networks (refer to "**Wi-Fi Protected Setup**" on page 9), or you can manually configure the Router.

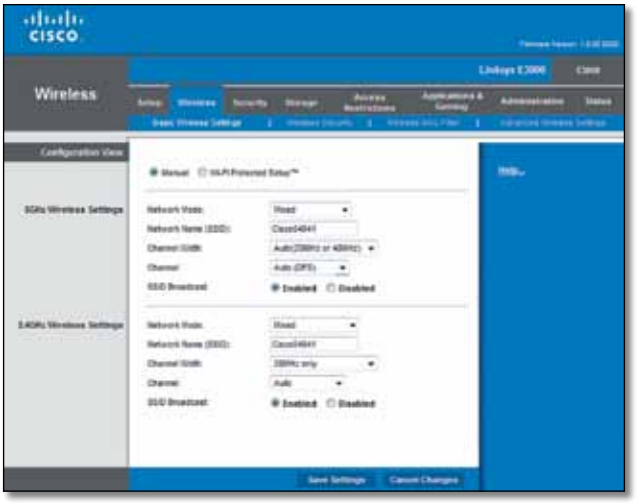
If you use manual configuration, then set up each network with the following:

- Unique Network Name (SSID)
- Wireless security settings (refer to "**5 GHz or 2.4 GHz Wireless Security**" on page 10)

Decide which computers and other wireless devices should join which network. Wireless-N devices support both the 5 GHz and 2.4 GHz bands, so they can join either the 5 GHz or 2.4 GHz network. Wireless-G and Wireless-B devices support only the 2.4 GHz band, so they should join the 2.4 GHz network. Wireless-A devices support only the 5 GHz band, so they should join the 5 GHz network.

For the 5 GHz network, configure all computers and other wireless devices with the same 5 GHz Network Name (SSID) and wireless security settings. For the 2.4 GHz network, configure all computers and other wireless devices with the same 2.4 GHz Network Name (SSID) and wireless security settings.

NOTE: Make sure each network uses a unique Network Name (SSID).



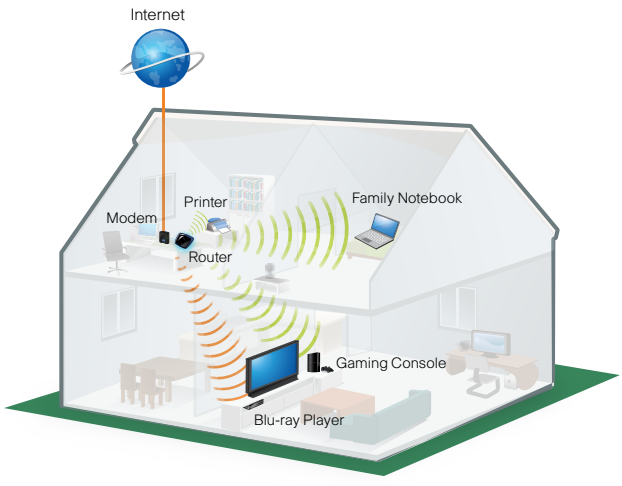
Wireless > Basic Wireless Settings

Configuration View To manually configure your wireless networks, select **Manual**. Proceed to the *Wireless Configuration (Manual)* section. To use Wi-Fi Protected Setup, select **Wi-Fi Protected Setup**. Proceed to "**Wi-Fi Protected Setup**" on page 9.

Wireless Configuration (Manual)

Your Linksys E2500 can run two networks at the same time, one network using the 5 GHz radio frequency band and the other network using the 2.4 GHz radio frequency band. This allows you to isolate higher-priority traffic, such as video and voice applications, on the 5 GHz network, which is less prone to interference.

The computers and devices running your video and voice applications can use the 5 GHz network, while your guest access and computers that are only browsing the web can use the 2.4 GHz network.



If you set the *Configuration View* to **Manual**, the *Basic Wireless Settings* screen displays the following fields.

5 GHz Wireless Settings

Network Mode Select the wireless standards running on your 5 GHz network.

- **Mixed** If you have both Wireless-A and Wireless-N (5 GHz) devices in your network, keep the default, **Mixed**.
- **Wireless-A Only** If you have only Wireless-A devices, select **Wireless-A Only**.
- **Wireless-N Only** If you have only Wireless-N (5 GHz) devices, select **Wireless-N Only.**
- **Disabled** If you do not have any Wireless-A and Wireless-N (5GHz) devices in your network, select **Disabled**.

Network Name (SSID) The Service Set Identifier (SSID) is the network name shared by all devices in a wireless network. It is case-sensitive and must not exceed 32 keyboard characters. The default is **Ciscoxxxxx** (xxxxx are the last five digits of the Router's serial number, found on the product label on the left side of the Router's bottom panel). The setup software that you use to install your Router and set up your wireless network changes the default Network Name to an easy-to-remember name.

NOTE: If you restore the Router's factory default settings (by pressing the Reset button or using the *Administration* > *Factory Defaults* screen), the Network Name will return to its default value, and all devices on your wireless network will need to be reconnected..

Channel Width For best performance in a network using Wireless-A and Wireless-N (5 GHz) devices, keep the default, **Auto (20MHz or 40MHz)**. For a channel width of 40 MHz, select **40MHz only**. For a channel width of 20 MHz, select **20MHz only**.

Channel Select the channel from the drop-down list for Wireless-A and Wireless-N (5GHz) networking. If you are not sure which channel to select, keep the default, **Auto**.

SSID Broadcast When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default, **Enabled**. If you do not want to broadcast the Router's SSID, then select **Disabled**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

2.4 GHz Wireless Settings

Network Mode Select the wireless standards running on your 2.4 GHz network.

- **Mixed** If you have both Wireless-B, Wireless-G and Wireless-N (2.4 GHz) devices in your network, keep the default, **Mixed**.

- **Wireless-B/G Only** If you have both Wireless-B and Wireless-G (2.4 GHz) devices in your network, select **Wireless-B/G Only**.
- **Wireless-B Only** If you have only Wireless-B devices, select **Wireless-B Only**.
- **Wireless-G Only** If you have only Wireless-G devices, select **Wireless-G Only**.
- **Wireless-N Only** If you have only Wireless-N (2.4 GHz) devices, select **Wireless-N Only**.
- **Disabled** If you do not have any Wireless-B, Wireless-G and Wireless-N (2.4 GHz) devices in your network, select **Disabled**.

Network Name (SSID) The Service Set Identifier (SSID) is the network name shared by all devices in a wireless network. It is case-sensitive and must not exceed 32 keyboard characters. The default is **Ciscoxxxxx** (xxxxx are the last five digits of the Router's serial number, found on the product label on the left side of the Router's bottom panel). The setup software that you use to install your Router and set up your wireless network changes the default Network Name to an easy-to-remember name.

NOTE: If you restore the Router's factory default settings (by pressing the Reset button or using the *Administration* > *Factory Defaults* screen), the Network Name will return to its default value, and all devices on your wireless network will need to be reconnected..

Channel Width For best performance in a network using Wireless-B, Wireless-G and Wireless-N (2.4 GHz) devices, select **Auto (20MHz or 40MHz)**. For a channel width of 20 MHz, keep the default, **20MHz only**.

Channel Select the channel from the drop-down list for Wireless-B, Wireless-G, and Wireless-N (2.4 GHz) networking. If you are not sure which channel to select, keep the default, **Auto**.

SSID Broadcast When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default, **Enabled**. If you do not want to broadcast the Router's SSID, then select **Disabled**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Wi-Fi Protected Setup

There are three methods available. Use the method that applies to the client device you are configuring.

Wireless > Basic Wireless Settings (Wi-Fi Protected Setup)

NOTE: Wi-Fi Protected Setup configures one client device at a time. Repeat the instructions for each client device that supports Wi-Fi Protected Setup.

1. **Use the Wi-Fi Protected Setup Button** Use this method if your client device has a Wi-Fi Protected Setup button.

   a. Click or press the **Wi-Fi Protected Setup** button on the client device.

   b. Click the **Wi-Fi Protected Setup** button on the Router's *Wi-Fi Protected Setup* screen.

   The Wi-Fi Protected Setup LED flashes blue for two minutes during the Wi-Fi Protected Setup process and lights up blue when the Wi-Fi Protected Setup process is successful.

   The LED lights up amber if there is an error during the Wi-Fi Protected Setup process. Make sure the client device supports Wi-Fi Protected Setup. Wait until the LED is off, and then try again.

   The LED flashes when a Wi-Fi Protected Setup session is active. The Router supports one session at a time. Wait until the LED is solidly lit, or off before starting the next Wi-Fi Protected Setup session.

   c. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

2. **Enter the client device's PIN on the Router** Use this method if your client device has a Wi-Fi Protected Setup PIN number.

   a. Enter the PIN number from the client device in the field on the Router's *Wi-Fi Protected Setup* screen.

b. Click the **Register button on the** Router's *Wi-Fi Protected Setup* screen.

c. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

3. **Enter the Router's PIN on your client device** Use this method if your client device asks for the Router's PIN number.

a. On the client device, enter the PIN number listed on the Router's *Wi-Fi Protected Setup* screen. (It is also listed on the label on the bottom of the Router.)

b. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

The Network Name (SSID), Security, and Passphrase are displayed at the bottom of the screen.

NOTE: If you have client devices that do not support Wi-Fi Protected Setup, note the wireless settings, and then manually configure those client devices.

Wireless > Wireless Security

The wireless security settings configure the security of your wireless network(s). The Router supports the following wireless security options: WPA/WPA2 Mixed Mode (default), WPA2 Personal, WPA Personal, WEP, and RADIUS. (WPA stands for Wi-Fi Protected Access. WEP stands for Wireless Equivalent Privacy. RADIUS stands for Remote Authentication Dial-In User Service.)

Personal Options

Security Option	Strength
WPA2 Personal	Strongest
WPA2/WPA Mixed Mode	WPA2: Strongest WPA: Strong
WPA Personal	Strong
WEP	Basic

Office Option

RADIUS is the security option offered for networks that use a RADIUS server for authentication.

5 GHz or 2.4 GHz Wireless Security

Wireless security is strongly recommended, and WPA2 is the strongest method available. Use WPA2 if it is supported by all of your wireless devices.

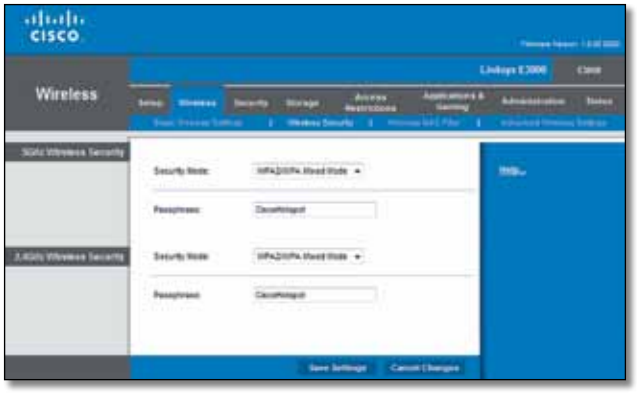
Security Mode

Select the security method for each wireless network. If you do not want to use wireless security, select **Disabled**.

NOTE: If you are not using WPA2/WPA Mixed-Mode then each device in your wireless network MUST use the same security mode and passphrase, or else the network will not function properly.

WPA2/WPA Mixed Mode

NOTE: If you select WPA2/WPA Mixed Mode as your Security Mode, each device in your wireless network MUST use the same passphrase.

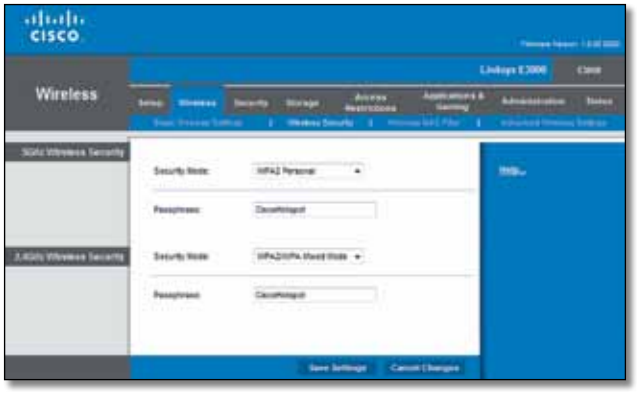


WPA2/WPA Mixed Mode

Passphrase Enter a passphrase of 8-63 characters. The default is **password**. The setup software that you use to install your Router and set up your wireless network changes the default passphrase.

WPA2 Personal

NOTE: If you select WPA2 Personal as your Security Mode, each device in your wireless network MUST use WPA2 Personal and the same passphrase.

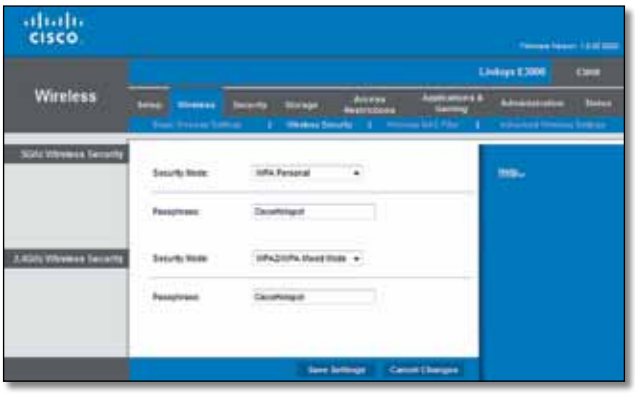


WPA2 Personal

Passphrase Enter a passphrase of 8-63 characters. The default is **password**. The setup software that you use to install your Router and set up your wireless network changes the default passphrase.

WPA Personal

NOTE: If you select WPA Personal as your Security Mode, each device in your wireless network MUST use WPA Personal and the same passphrase.



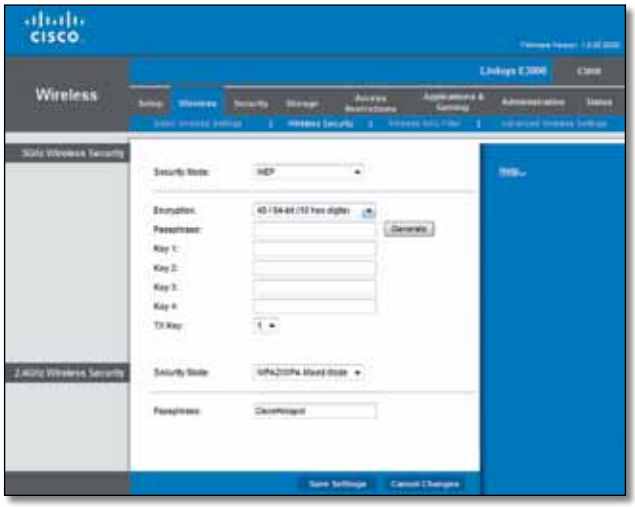
WPA Personal

Passphrase Enter a passphrase of 8-63 characters. The default is **password**. The setup software that you use to install your Router and set up your wireless network changes the default passphrase.

WEP

WEP is a basic encryption method, which is not as secure as WPA.

IMPORTANT: If you select WEP as your Security Mode, each device in your wireless network MUST use WEP and the same encryption and shared key.



WEP

Encryption Select a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. The default is **64 bits 10 hex digits**.

Passphrase Enter a Passphrase to automatically generate WEP keys. Then click **Generate**.

Key 1-4 If you did not enter a Passphrase, enter the WEP key(s) manually.

TX Key Select a default TX (Transmit) Key (choose which Key to use). The default is **1**.

RADIUS

This option features WEP used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.)

IMPORTANT: If you select RADIUS as your Security Mode, each device in your wireless network MUST use RADIUS and the same WEP encryption and shared key.

RADIUS

RADIUS Server Enter the IP address of the RADIUS server.

RADIUS Port Enter the port number of the RADIUS server. The default is **1812**.

Shared Key Enter the key shared between the Router and the server.

Encryption Select a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. The default is **64 bits 10 hex digits**.

Passphrase Enter a Passphrase to automatically generate WEP keys. Then click **Generate**.

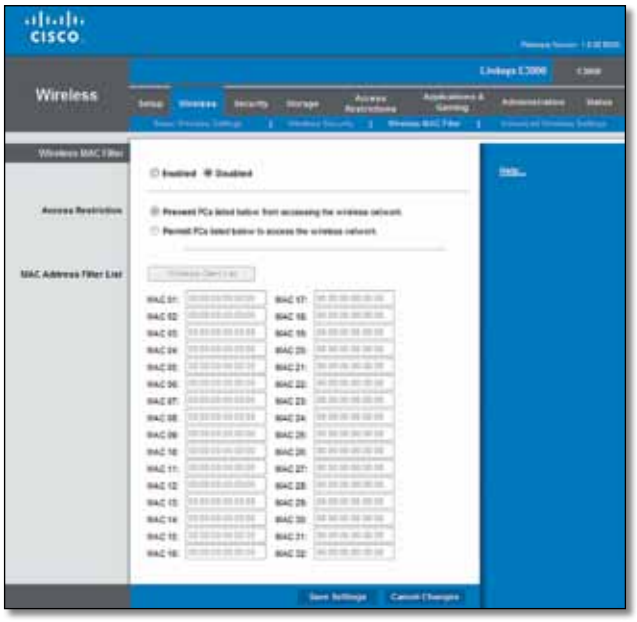
Key 1-4 If you did not enter a Passphrase, enter the WEP key(s) manually.

TX Key Select a default TX (Transmit) Key (choose which Key to use). The default is **1**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Wireless > Wireless MAC Filter

Wireless access can be filtered (restricted) by specifying the MAC addresses of the devices in your wireless network.



Wireless > Wireless MAC Filter

Wireless MAC Filter

Enabled/Disabled To filter wireless users by the MAC addresses of their computers or devices, select **Enabled**. Otherwise, keep the default, **Disabled**.

Access Restriction

Prevent When the Wireless MAC Filter is enabled and this option is selected, PCs listed in the MAC Address filter list will be prevented from accessing the wireless network.

Permit When the Wireless MAC Filter is enabled and this option is selected, only PCs listed in the MAC Address filter list will be granted access to the wireless network.

MAC Address Filter List

Wireless Client List Click this to open the *Wireless Client List* screen.

Wireless Client List

Wireless Client List

This screen shows computers and other devices on the wireless network. The list can be sorted by Client Name, Interface, IP Address, MAC Address, and Status.

Select **Save to MAC Address Filter List** for any device you want to add to the MAC Address Filter List. Then click **Add**.

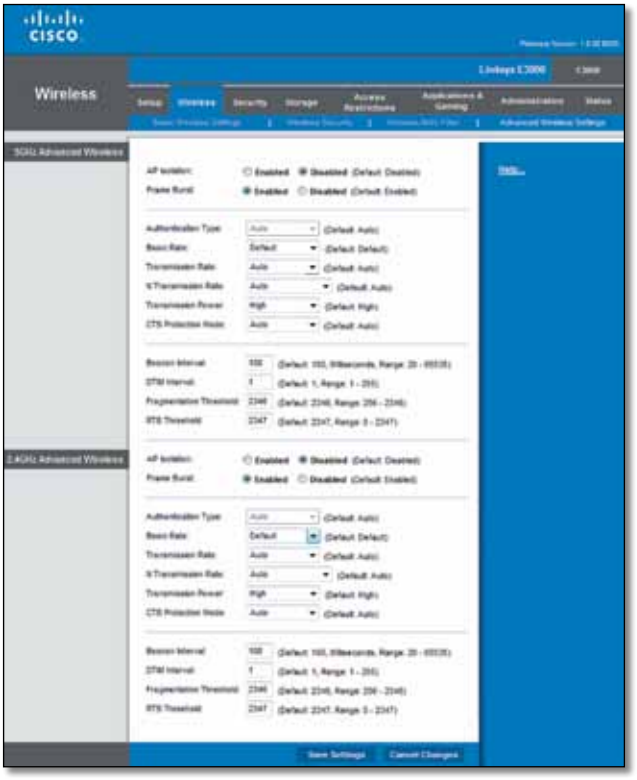
To update the on-screen information, click **Refresh**. To exit this screen and return to the *Wireless MAC Filter* screen, click **Close**.

MAC 01-32 Enter the MAC addresses of the devices whose wireless access you want to control.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Wireless > Advanced Wireless Settings

The *Advanced Wireless Settings* screen is used to set up the Router's advanced wireless functions. These settings should only be adjusted by an advanced user because incorrect settings can reduce wireless performance. In most cases, keep the default settings.



Wireless > Advanced Wireless Settings

5 GHz and 2.4 GHz Advanced Wireless

AP Isolation This isolates all wireless clients and wireless devices on your network from each other. Wireless devices will be able to communicate with the Router but not with each other. To use this function, select **Enabled**. AP Isolation is disabled by default.

Frame Burst Enabling this option should provide your network with greater performance, depending on the manufacturer of your wireless products. To use the Frame Burst option, keep the default, **Enabled**.

Authentication Type The default is **Auto**, which allows either Open System or Shared Key authentication to be used. With **Open System** authentication, the sender and the recipient do NOT use a WEP key for authentication. With **Shared Key** authentication, the sender and recipient use a WEP key for authentication.

Basic Rate The Basic Rate setting is not actually one rate of transmission but a series of rates at which the Router can transmit. (The Basic Rate is not the actual rate of data transmission. If you want to specify the Router's rate of data transmission, configure the Transmission Rate setting.) The Router will advertise its Basic Rate to the other wireless devices in your network, so they know which rates will be used. The Router will also advertise that it will automatically select the best rate for transmission. The default setting is **Default**, for transmission at all standard wireless rates (1-2 Mbps, 5.5 Mbps, 11 Mbps, 18 Mbps, and 24 Mbps).

Transmission Rate The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select **Auto** to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto**.

N Transmission Rate The rate of data transmission should be set depending on the speed of your Wireless-N networking. You can select from a range of transmission speeds, or you can select Auto to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default is **Auto**.

Transmission Power Select the appropriate level of transmission power: **High**, **Medium**, or **Low**. In most cases, keep the default, **High**.

CTS Protection Mode The Router automatically uses CTS (Clear-To-Send) Protection Mode when your Wireless-N and Wireless-G devices are experiencing severe problems and are not able to transmit to the Router in an environment with heavy 802.11b traffic. This option boosts the Router's ability to catch all Wireless-N and Wireless-G transmissions but severely decreases performance. To use this option, keep the default, **Auto**. To disable this option, select **Disabled**.

Beacon Interval A beacon is a packet broadcast by the Router to synchronize the wireless network. Enter a value between 20 and 1000 milliseconds. The Beacon Interval value indicates the frequency interval of the beacon. The default value is **100**.

DTIM Interval This value, between 3 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast messages. The default value is **3**.

Fragmentation Threshold This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. Only minor reduction of the default value is recommended. In most cases, it should remain at its default value of **2346**.

RTS Threshold Should you encounter inconsistent data flow, only minor reduction of the default value, **2347**, is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. The Router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. The RTS Threshold value should remain at its default value of **2347**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Security > Firewall

The *Firewall* screen is used to configure a firewall that can filter out various types of unwanted traffic on the Router's local network.

Security > Firewall

Firewall

SPI Firewall Protection To use firewall protection, keep the default selection, **Enabled**. To turn off firewall protection, select **Disabled**.

Internet Filters

Filter Anonymous Internet Requests This feature makes it more difficult for outside users to work their way into your network. This option is enabled by default. Disable it to allow anonymous Internet requests.

Filter Multicast Multicasting allows for multiple transmissions to specific recipients at the same time. If multicasting is permitted, then the Router will allow IP multicast packets to be forwarded to the appropriate computers. Select this option to enable the filter. This option is disabled by default.

Filter Internet NAT Redirection This feature is used to prevent a local computer from using a URL or Internet address to access the local server. Select this option to enable the filter. This option is disabled by default.

Filter IDENT (Port 113) The Filter IDENT (Identification) option keeps port 113 from being scanned by devices outside of your local network. This option is enabled by default. Disable it to allow port 113 to be scanned.

Web Filters

Proxy Use of WAN proxy servers may compromise the Gateway's security. Denying Proxy will disable access to any WAN proxy servers. Select this option to enable proxy filtering. Deselect the feature to allow proxy access.

Java Java is a programming language for websites. If you deny Java, you run the risk of not having access to Internet sites created using this programming language. Select this option to enable Java filtering. Deselect the feature to allow Java usage.

ActiveX ActiveX is a programming language for websites. If you deny ActiveX, you run the risk of not having access to Internet sites created using this programming language. Select this option to enable ActiveX filtering. Deselect the feature to allow ActiveX usage.

Cookies A cookie is data stored on your computer and used by Internet sites when you interact with them. Select this option to filter cookies. Deselect the feature to allow cookie usage.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Security > VPN Passthrough

The *VPN Passthrough* screen allows you to enable VPN tunnels using IPSec, L2TP, or PPTP protocols to pass through the Router's firewall.

Security > VPN Passthrough

VPN Passthrough

IPSec Passthrough Internet Protocol Security (IPSec) is a suite of protocols used to implement secure exchange of packets at the IP layer. To allow IPSec tunnels to pass through the Router, keep the default, **Enabled**.

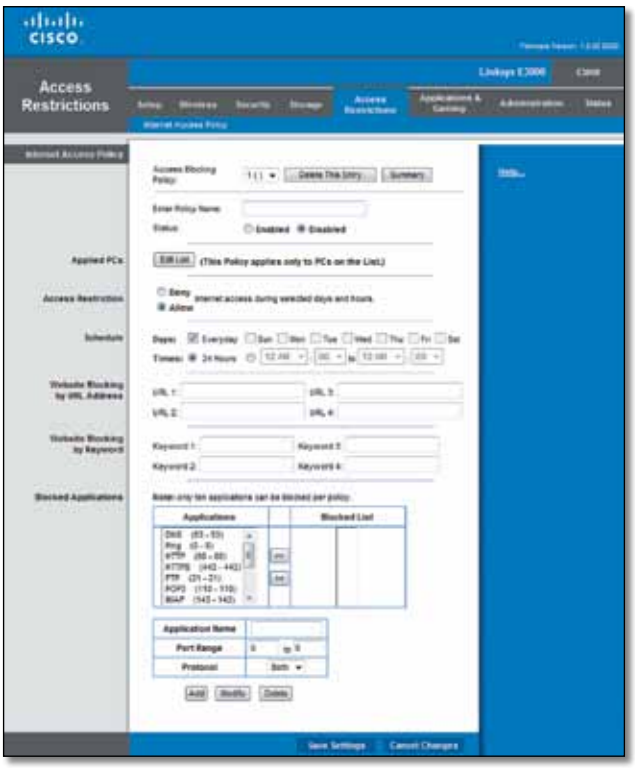
L2TP Passthrough Layer 2 Tunneling Protocol is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. To allow L2TP tunnels to pass through the Router, keep the default, **Enabled**.

PPTP Passthrough Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. To allow PPTP tunnels to pass through the Router, keep the default, **Enabled**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Access Restrictions > Internet Access Policy

The *Internet Access Policy* screen allows you to deny or allow specific kinds of Internet usage and traffic, such as Internet access, designated services, and websites during specific days and times.



Access Restrictions > Internet Access

Internet Access Policy

Access Policy Access can be managed by a policy. Use the settings on this screen to establish an access policy (after **Save Settings** is clicked). Selecting a policy from the drop-down menu will display that policy's settings. To delete a policy, select that policy's number and click **Delete This Policy**. To view all the policies, click **Summary**.

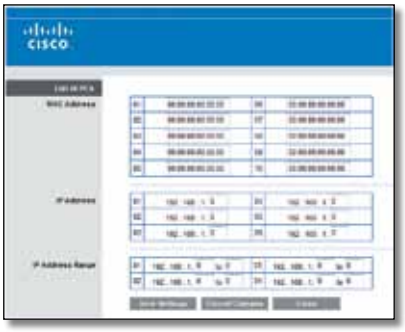
Summary

The policies are listed with the following information: No., Policy Name, Access, Days, Time, and status (Enabled). To enable a policy, select **Enabled**. To delete a policy, click **Delete**. Click **Save Settings** to save your changes, or click **Cancel Changes** to clear your changes. To return to the *Internet Access Policy* screen, click **Close**.

Status Policies are disabled by default. To enable a policy, select the policy number from the drop-down menu, and select **Enabled**.

To create a policy, follow steps 1-11. Repeat these steps to create additional policies, one at a time.

1. Select a number from the *Access Policy* drop-down menu.
2. Enter a Policy Name in the field provided.
3. To enable this policy, select **Enabled**.
4. Click **Edit List** to select which PCs will be affected by the policy. The *List of PCs* screen appears. You can select a PC by MAC address or IP address. You can also enter a range of IP addresses if you want this policy to affect a group of PCs. After making your changes, click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes. Then click **Close**.



List of PCs

5. Select the appropriate option, **Deny** or **Allow**, depending on whether you want to block or allow Internet access for the computers listed on the *List of PCs* screen.
6. Decide which days and what times you want this policy to be enforced. Select the individual days during which the policy will be in effect, or select **Everyday**. Then enter a range of hours and minutes during which the policy will be in effect, or select **24 Hours**.
7. You can block websites with specific URL addresses. Enter each URL in a separate *Website Blocking by URL Address* field.
8. You can also block websites using specific keywords. Enter each keyword in a separate *Website Blocking by Keyword* field.
9. You can filter access to various services accessed over the Internet, such as FTP or telnet. (You can block up to three applications per policy.)

   From the Applications list, select the application you want to block. Then click the >> button to move it to the Blocked List. To remove an application from the Blocked List, select it and click the << button.
10. If the application you want to block is not listed or you want to edit a service's settings, enter the application's name in the *Application Name* field. Enter its range in the **Port Range** fields. Select its protocol from the *Protocol* drop-down menu. Then click **Add**.

    To modify a service, select it from the Application list. Change its name, port range, and/or protocol setting. Then click **Modify**.

    To delete a service, select it from the Application list. Then click **Delete**.

11. Click **Save Settings** to save the policy's settings, or click **Cancel Changes** to clear the changes.

Applications and Gaming > Single Port Forwarding

The *Single Port Forwarding* screen allows you to customize port services for common applications.

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate servers (computers). Before using forwarding, you should assign static IP addresses to the designated servers (use the DHCP Reservation feature on the *Basic Setup* screen; refer to "**DHCP Reservation**" on page 4).

Applications and Gaming > Single Port Forwarding

Single Port Forwarding

Common applications are available for the first five entries.

Application Name Select the appropriate application.

To IP Address Enter the IP address of the server that should receive these requests.

Enabled For each application, select **Enabled** to activate port forwarding.

For additional applications, complete the following fields:

Application Name Enter the name you wish to give the application. Each name can have up to 12 characters.

External Port Enter the external port number used by the server or Internet application. Check with the Internet application documentation for more information.

Internal Port Enter the internal port number used by the server or Internet application. Check with the Internet application documentation for more information.

Protocol Select the protocol(s) used for this application, **TCP**, **UDP**, or **Both**.

To IP Address For each application, enter the IP address of the computer that should receive the requests. If you assigned a static IP address to the computer, then you can look up its static IP address; refer to "**DHCP Reservation**" on page 4.

Enabled For each application, select **Enabled** to enable port forwarding.

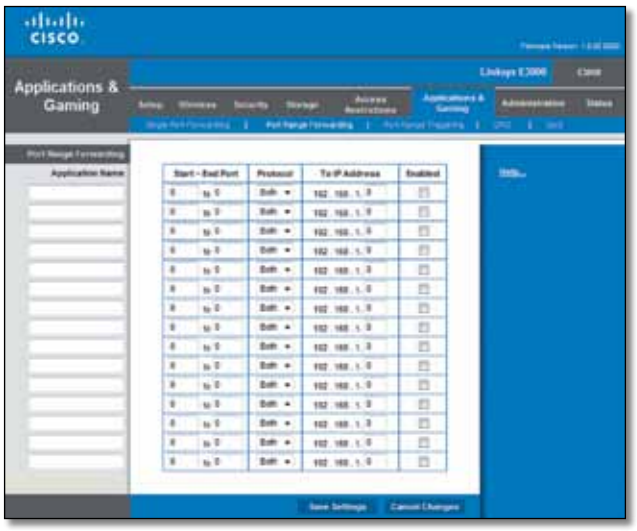
Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Applications and Gaming > Port Range Forwarding

The *Port Range Forwarding* screen allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. (Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. Some Internet applications may not require any forwarding.)

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate servers (computers). Before using forwarding, you should assign static IP addresses to the designated servers (use the DHCP Reservation feature on the *Basic Setup* screen; refer to "**DHCP Reservation**" on page 4).

If you need to forward all ports to one computer, click the **DMZ** tab.



Applications and Gaming > Port Range Forwarding

Port Range Forwarding

To forward a port, enter the information on each line for the criteria required.

Application Name In this field, enter the name you wish to give the application. Each name can be up to 12 characters.

Start~End Port Enter the number or range of port(s) used by the server or Internet application. Check with the Internet application documentation for more information.

Protocol Select the protocol(s) used for this application, **TCP**, **UDP**, or **Both**.

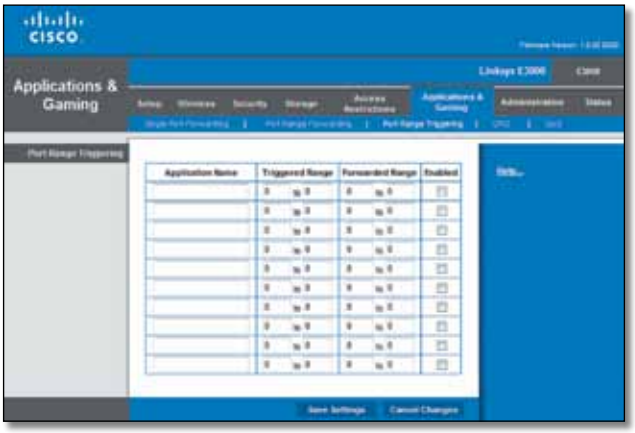
To IP Address For each application, enter the IP address of the computer running the specific application. If you assigned a static IP address to the computer, then you can look up its static IP address; refer to "**DHCP Reservation**" on page 4.

Enabled Select **Enabled** to enable port forwarding.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Applications & Gaming > Port Range Triggering

The *Port Range Triggering* screen allows the Router to watch outgoing data for specific port numbers. The IP address of the computer that sends the matching data is remembered by the Router, so that when the requested data returns through the Router, the data is pulled back to the proper computer by way of IP address and port mapping rules.



Applications and Gaming > Port Range Triggering

Port Range Triggering

Application Name Enter the application name of the trigger.

Triggered Range For each application, enter the starting and ending port numbers of the triggered port number range. Check with the Internet application documentation for the port number(s) needed.

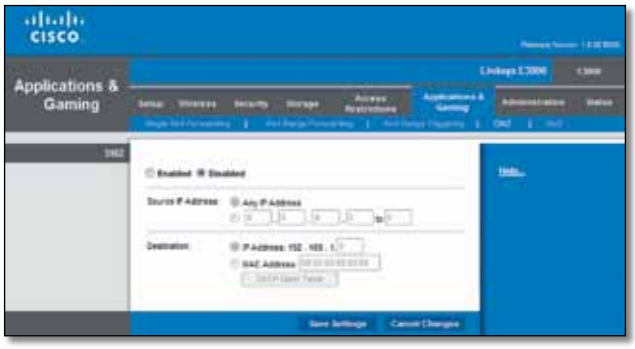
Forwarded Range For each application, enter the starting and ending port numbers of the forwarded port number range. Check with the Internet application documentation for the port number(s) needed.

Enabled Select **Enabled** to enable port triggering.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Applications and Gaming > DMZ

The DMZ feature allows one network computer to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC. The Port Range Forwarding feature is more secure because it only opens the ports you want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer to the Internet.



Applications and Gaming > DMZ

DMZ

Any computer whose port is being forwarded should have its DHCP client function disabled and have a new static IP address assigned to it because its IP address may change when using the DHCP function.

Enabled/Disabled To disable DMZ hosting, select **Disabled**. To expose one PC, select **Enabled**. Then configure the following settings:

Source IP Address If you want any IP address to be the source, select **Any IP Address**. If you want to specify an IP address or range of IP addresses as the designated source, select and complete the IP address range fields.

Destination If you want to specify the DMZ host by IP address, select **IP Address** and enter the IP address in the field provided. If you want to specify the DMZ host by MAC address, select **MAC Address** and enter the MAC address in the field provided. To retrieve this information, click **DHCP Client Table**.

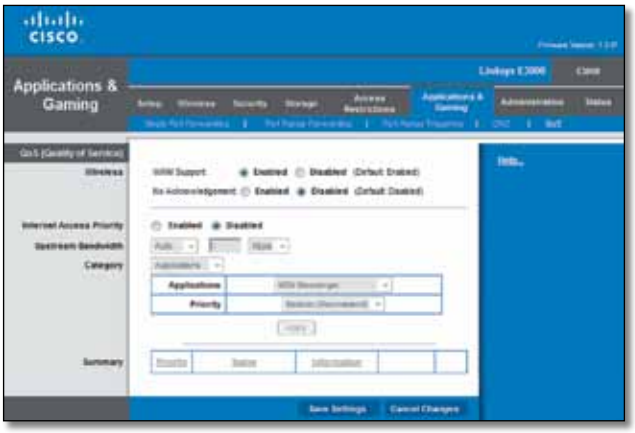
DHCP Client Table

The DHCP Client Table lists computers and other devices that have been assigned IP addresses by the Router. The list can be sorted by Client Name, Interface, IP Address, and MAC Address. To select a DHCP client, click **Select**. To update the on-screen information, click **Refresh**. To exit this screen and return to the *DMZ* screen, click **Close**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Applications and Gaming > QoS

Quality of Service (QoS) is a method that assigns priority to specific types of network traffic, which often are demanding, real-time applications, such as gaming, videoconferencing, video streaming, and Voice over Internet Protocol (VoIP) telephony. QoS helps to ensure optimal performance for these types of uses.



Applications and Gaming > QoS

QoS (Quality of Service)

Wireless

WMM Support Wi-Fi Multimedia (WMM) is a wireless Quality of Service feature that improves quality for audio, video, and voice applications by prioritizing wireless traffic. To use this feature, the wireless client devices in your network must support Wireless WMM. If you would like to disable this feature, select **Disabled**. Otherwise, keep the default, **Enabled**.

No Acknowledgement If you want to disable the Router's Acknowledgement feature, so the Router will not re-send data if an error occurs, select **Enabled**. Otherwise, keep the default, **Disabled**.

Internet Access Priority

In this section, you can set the bandwidth priority for a variety of applications and devices. There are four levels of priority; High, Medium, Normal, or Low. When you set priority, do not set all applications to High, because this will defeat the purpose of allocating the available bandwidth. If you want to select below normal bandwidth, select **Low**. Depending on the application, a few attempts may be needed to set the appropriate bandwidth priority.

Enabled/Disabled To use the QoS policies you set, select **Enabled**. Otherwise, select **Disabled**.

Upstream Bandwidth

Upstream Bandwidth This option sets the maximum outgoing bandwidth that applications can use. To allow the Router to set the maximum, keep the default, **Auto**. To specify the maximum, select **Manual**. Then enter the appropriate value and select **Kbps** or **Mbps**.

Category

Select one of the following categories: **Applications**, **Online Games**, **MAC Address**, or **Voice Device**. Proceed to the instructions for your selection.

Summary

This lists the QoS entries you have created for your applications and devices. Refer to "**Summary**" on page 21 for more information.

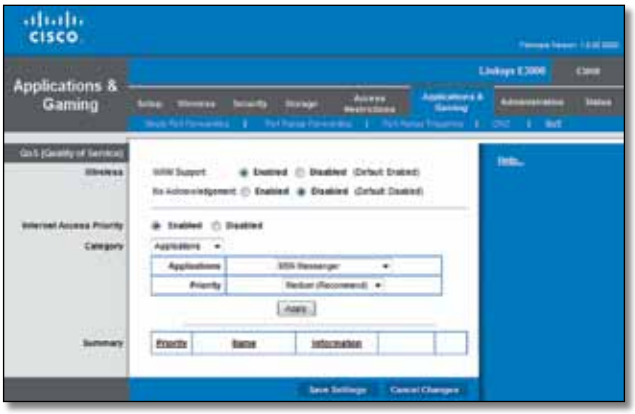
Applications

Applications Select the appropriate application. If you select Add a New Application, follow the instructions in the *Add a New Application* section.

Priority Select the appropriate priority: **High**, **Medium (Recommended)**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the Summary list.

Add a New Application



Add a New Application

Enter a Name Enter a name for this application.

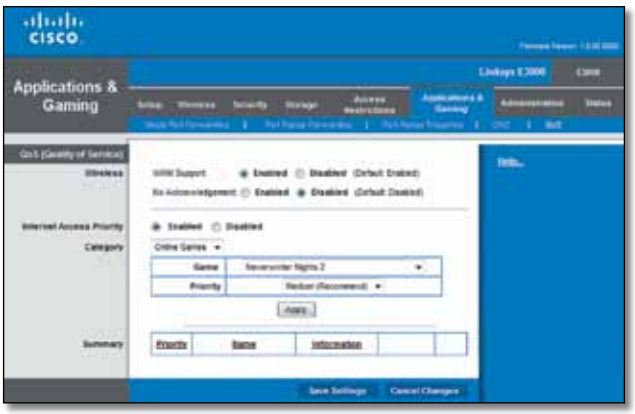
Port Range Enter the port range that the application will be using. For example, if you want to allocate bandwidth for FTP, you can enter 21-21. If you need services for an application that uses from 1000 to 1250, you enter 1000-1250 as your settings. You can have up to three ranges to define for this bandwidth allocation. Port numbers can range from 1 to 65535. Check your application's documentation for details on the service ports used.

Select the protocol **TCP** or **UDP,** or select **Both**.

Priority Select the appropriate priority: **High**, **Medium (Recommended)**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the Summary list.

Online Games



Online Games

Online Games

Games Select the appropriate game. If you select Add a New Game, follow the instructions in the *Add a New Game* section.

Priority Select the appropriate priority: **High**, **Medium (Recommended)**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the Summary list.

Add a New Game

Enter a Name Enter any name to indicate the name of the entry.

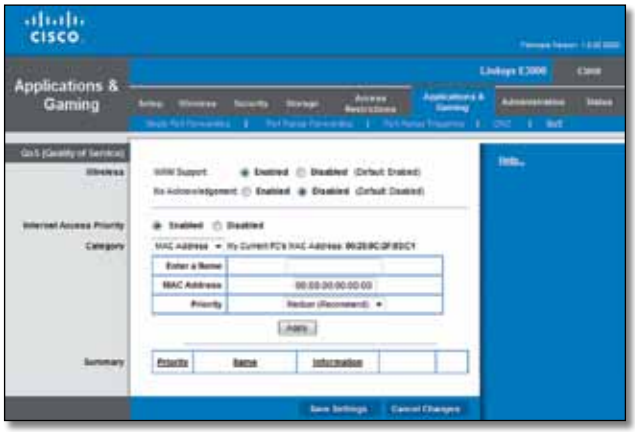
Port Range Enter the port range that the game will be using. You can have up to three ranges to define for this bandwidth allocation. Port numbers can range from 1 to 65535. Check your application's documentation for details on the service ports used.

Select the protocol **TCP** or **UDP,** or select **Both**.

Priority Select the appropriate priority: **High**, **Medium (Recommended)**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the Summary list.

MAC Address



MAC Address

The MAC address of the computer you are using is displayed.

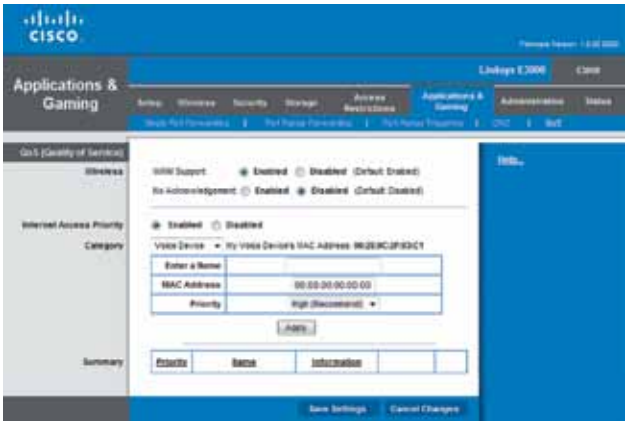
Enter a Name Enter a name for your device.

MAC Address Enter the MAC address of your device.

Priority Select the appropriate priority: **High**, **Medium (Recommended)**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the *Summary* list.

Voice Device



Voice Device

Enter a Name Enter a name for your voice device.

MAC Address Enter the MAC address of your voice device.

Priority Select the appropriate priority: **High (Recommended)**, **Medium**, **Normal**, or **Low**.

Click **Apply** to save your changes. Your new entry will appear in the Summary list.

Summary

This lists the QoS entries you have created for your applications and devices.

Priority This column displays the bandwidth priority of High, Medium, Normal, or Low.

Name This column displays the application, game, device, or port name.

Information This column displays the port range or MAC address entered for your entry. If a pre-configured application or game was selected, there will be no valid entry shown in this section.

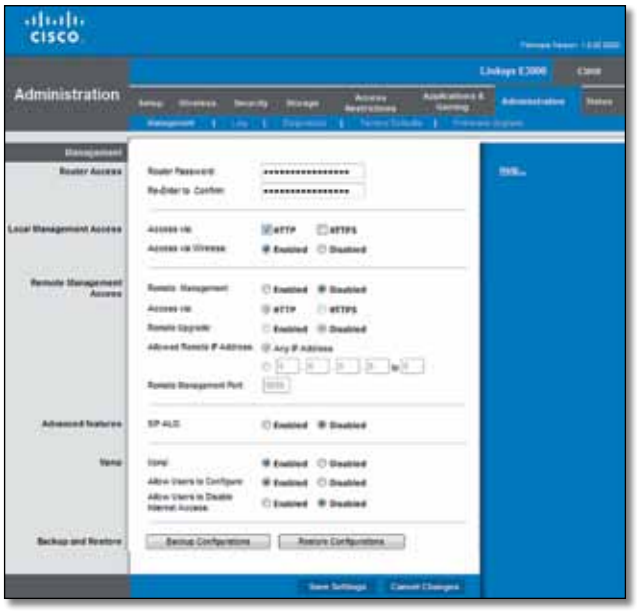
Remove Click this button to remove an entry.

Edit Click this button to make changes.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Administration > Management

The *Management* screen allows the network's administrator to manage specific Router functions for access and security.



Administration > Management

Router Password

Router Access

To ensure the Router's security, you will be asked for your password when you access the Router's browser-based utility. The default is **admin**.

Router Password Enter a new password for the Router.

Re-enter to confirm Enter the password again to confirm.

Local Management Access

Access via HTTP (HyperText Transport Protocol) is the communications protocol used to connect to servers on the World Wide Web. HTTPS uses SSL (Secure Socket Layer) to encrypt data transmitted for higher security. Select **HTTP** or **HTTPS**. The default is **HTTP**.

Access via Wireless If you are using the Router in a public domain where you are giving wireless access to your guests, you can disable wireless access to the Router's web-based utility. You will only be able to access the utility via a wired connection if you disable the setting. Keep the default, **Enabled**, to allow wireless access to the utility, or select **Disabled** to block wireless access to the utility.

Remote Management Access

Remote Management To permit remote access of the Router from the Internet (outside the local network), select **Enabled**. Otherwise, keep the default, **Disabled**.

Access via HTTP (HyperText Transport Protocol) is the communications protocol used to connect to servers on the World Wide Web. HTTPS uses SSL (Secure Socket Layer) to encrypt data transmitted for higher security. Select **HTTP** or **HTTPS**. **HTTP** is the default.

Remote Upgrade If you want to be able to upgrade the Router from the Internet (outside the local network), select **Enabled**. (You must have the Remote Management feature enabled as well.) Otherwise, keep the default, **Disabled**.

Allowed Remote IP Address If you want to be able to access the Router from any external IP address, select **Any IP Address**. If you want to specify an external IP address or range of IP addresses, then select the second option and complete the fields provided.

Remote Management Port Enter the port number that will be open to outside access. To access the Router, you will need to enter the Router's password.

NOTE: When you are in a remote location and wish to manage the Router, enter **http://xxx.xxx.xxx.xxx:yyyy** or **https://xxx.xxx.xxx.xxx:yyyy**, depending on whether you use HTTP or HTTPS. Enter the Router's specific Internet IP address in place of xxx.xxx.xxx.xxx, and enter the Remote Management Port number in place of yyyy.

Advanced Features

SIP ALG The Session Initiation Protocol (SIP) Application Layer Gateway (ALG) feature allows SIP packets, which are used for Voice over Internet Protocol (VoIP), to traverse the NAT firewall. For more information, contact your VoIP service provider.

To use the SIP ALG feature for VoIP service, select **Enabled**. If you are not using VoIP service, then keep the default, Disabled.

If your VoIP service provider uses other NAT traversal solutions such as Session Traversal Utilities for NAT (STUN), Traversal Using Relay NAT (TURN), or Interactive Connectivity Establishment (ICE), then keep the default, Disabled.

UPnP

Universal Plug and Play (UPnP) allows the appropriate Windows operating system to automatically configure the Router for various Internet applications, such as gaming and videoconferencing.

UPnP If you want to use UPnP, keep the default, **Enabled**. Otherwise, select **Disabled**.

Allow Users to Configure Keep the default, **Enabled**, if you want to be able to make manual changes to the Router while using the UPnP feature. Otherwise, select **Disabled**.

Allow Users to Disable Internet Access Select **Enabled**, if you want to be able to prohibit any and all Internet connections. Otherwise, keep the default, **Disabled**.

Backup and Restore

Backup Configurations To back up the Router's configuration settings, click this button and follow the on-screen instructions.

Restore Configurations To restore the Router's configuration settings, click this button and follow the on-screen instructions. (You must have previously backed up the Router's configuration settings.)

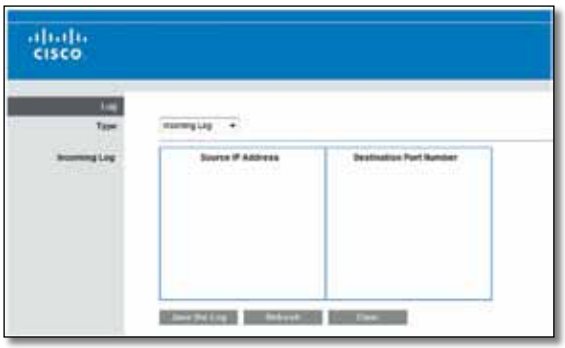
Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Administration > Log

The Router can keep logs of all traffic for your Internet connection.

Administration > Log

Log



Log To disable the Log function, select **Disabled**. To monitor traffic between the network and the Internet, keep the default, **Enabled**. With logging enabled, you can choose to view temporary logs.

Logviewer IP Address If your computer uses Logviewer software, you can enter the fixed IP address of the computer running the software. The Router will now send updated logs to that computer.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

View Log When you wish to view the logs, click this option.

Log > View Log

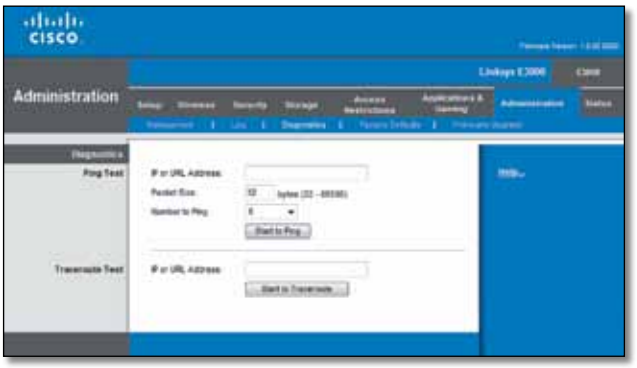
Log

- **Type** Select **Incoming Log**, **Outgoing Log**, **Security Log**, or **DHCP Client Log**.
- **<Type> Log** The Incoming Log displays a temporary log of the source IP addresses and destination port numbers for the incoming Internet traffic. The Outgoing Log displays a temporary log of the local IP addresses, destination URLs/IP addresses, and service/port numbers for the outgoing Internet traffic. The Security log displays the login information for the browser-based utility. The DHCP Client Log displays the local DHCP server status information.

  Click **Save the Log** to save this information to a file on your computer's hard drive. Click **Refresh** to update the log. Click **Clear** to clear all the information that is displayed.

Administration > Diagnostics

The diagnostic tests (Ping and Traceroute) allow you to check the connections of your network devices, including connection to the Internet.



Administration > Diagnostics

Diagnostics

Ping Test

Ping checks the status of a connection.

IP or URL Address Enter the address of the PC whose connection you wish to test.

Packet Size Enter the packet size you want to use. The default is **32** bytes.

Number to Ping Enter the number of times you wish to test the connection. The default is **5**.

Start Test To run the test, click this button. The *Ping* screen shows if the test is successful. Click **Close** to return to the *Diagnostics* screen. Click **Stop** to stop the test.

Ping

Traceroute Test

Traceroute checks the performance of a connection.

IP or URL Address Enter the address of the PC whose connection you wish to test.

Start Test Click to run the test. The *Traceroute* screen shows if the test is successful. Click **Close** to return to the *Diagnostics* screen. Click **Stop** to stop the test.

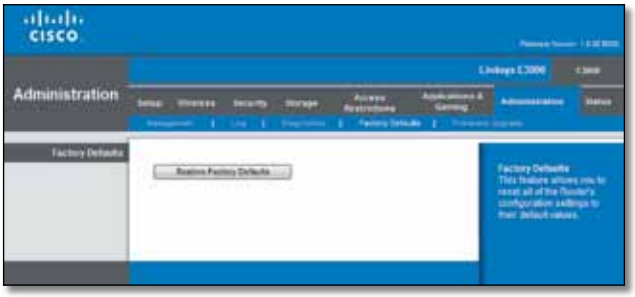
Traceroute

Administration > Factory Defaults

The *Factory Defaults* screen allows you to restore the Router's configuration to its factory default settings.

Factory Defaults

Restore Factory Defaults To reset the Router's settings to the default values, select **Restore Factory Defaults**. Any settings you have saved will be lost when the default settings are restored.

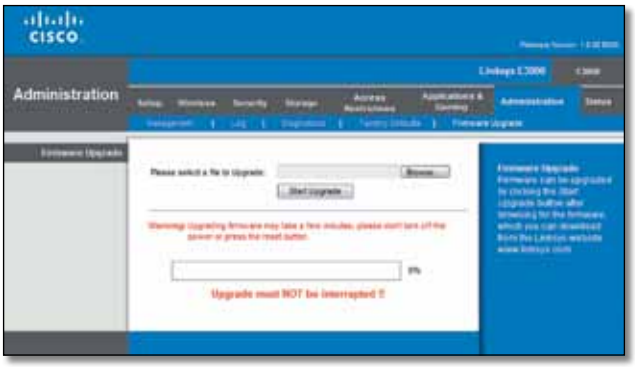


Administration > Factory Defaults

NOTE: Do not restore the factory defaults unless you are having difficulties with the Router and have exhausted all other troubleshooting measures. Once the Router is reset, you will have to re-enter all of your configuration settings.

Administration > Firmware Upgrade

The *Firmware Upgrade* screen allows you to upgrade the Router's firmware. Do not upgrade the firmware unless you are experiencing problems with the Router or the new firmware has a feature you want to use.



Administration > Firmware Upgrade

NOTE: The Router may lose the settings you have customized. Before you upgrade its firmware, write down all of your custom settings. After you upgrade its firmware, you will have to re-enter all of your configuration settings.

Firmware Upgrade

Before upgrading the firmware, download the Router's firmware upgrade file from our website at **www.linksys.com/support**.

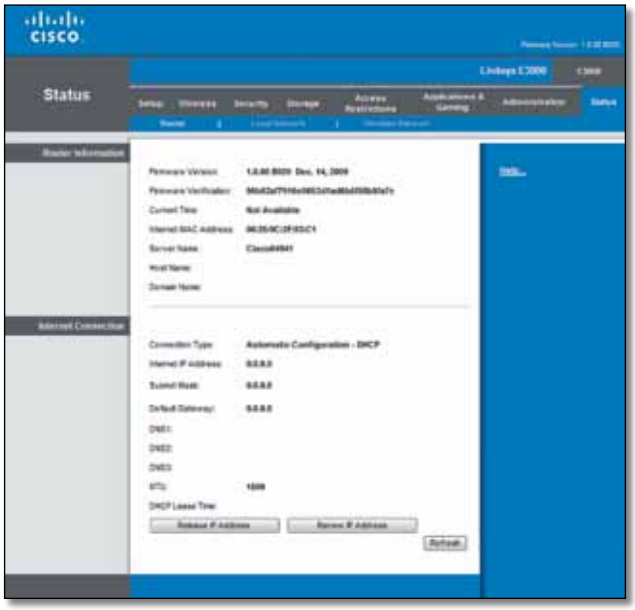
Please Select a File to Upgrade Click **Browse** and select the firmware upgrade file.

Start Upgrade After you have selected the appropriate file, click this button, and follow the on-screen instructions.

WARNING: Do not interrupt the upgrade process. You should not turn off the power or press the Reset button during the upgrade process. Doing so may disable the Router.

Status > Router

The *Router* screen displays information about the Router and its current settings.



Status > Router

Router Information

Firmware Version The version number of the Router's current firmware is displayed.

Firmware Verification The unique identifier of the firmware is displayed.

Current Time The time set on the Router is displayed.

Internet MAC Address The Router's MAC Address, as seen by your ISP, is displayed.

Server Name The Server Name is the name used for the USB network storage, FTP, and media server functions of the Router. The default, **Ciscoxxxxx**, is displayed. XXXXX represents the last 5 digits of your serial number. This can be found on the bottom of the router.

NOTE: If you used the setup software for installation, then the name of your wireless network (up to 15 characters) is the server name of the Router.

Host Name The Host Name of the Router is displayed (if it was entered on the *Setup* > *Basic Setup* screen).

Domain Name The Domain Name of the Router is displayed (if it was entered on the *Setup* > *Basic Setup* screen).

Internet Connection

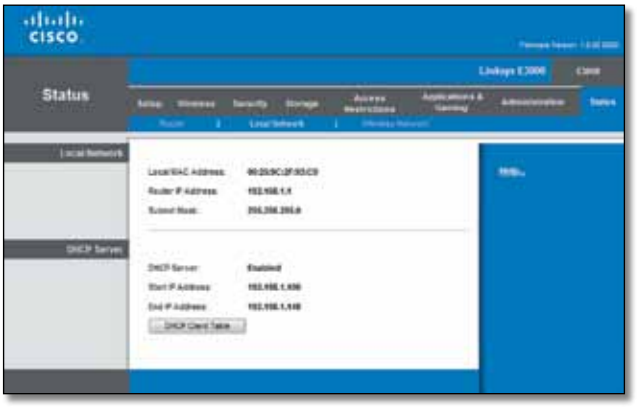
This section shows the current network information stored in the Router. The information varies depending on the Internet connection type selected on the *Setup* > *Basic Setup* screen.

For a DHCP connection, select **Release IP Address** or **Renew IP Address** as appropriate to release or renew a DHCP lease. For a PPPoE or similar connection, select **Connect** or **Disconnect** as appropriate to connect to or disconnect from the Internet.

Click **Refresh** to update the on-screen information.

Status > Local Network

The *Local Network* screen displays information about the local network.



Status > Local Network

Local Network

Local MAC Address The MAC address of the Router's local, wired interface is displayed.

Router IP Address The Router's IP address, as it appears on your local network, is displayed.

Subnet Mask The Subnet Mask of the Router is displayed.

DHCP Server

DHCP Server The status of the Router's DHCP server function is displayed.

Start IP Address For the range of IP addresses that can be used by devices on your local network, the starting IP address is displayed.

End IP Address For the range of IP addresses that can be used by devices on your local network, the ending IP address is displayed.

DHCP Client Table Click this option to view a list of computers or other devices that are using the Router as a DHCP server.

DHCP Client Table

DHCP Client Table

The DHCP Client Table lists computers and other devices that have been assigned IP addresses by the Router. The list can be sorted by IP Address, MAC Address, Interface, and Client Name. To remove a DHCP client, click **Delete**. To update the on-screen information, click **Refresh**. To exit this screen and return to the *Local Network* screen, click **Close**.

Status > Wireless Network

The *Wireless Network* screen displays the status information of your 5 GHz and/or 2.4 GHz wireless network(s).

Status > Wireless Network

5GHz/2.4GHz Wireless Network

MAC Address The MAC address of the Router's local, wireless interface is displayed.

Mode The wireless mode used by the network is displayed.

Network Name (SSID) The name of the wireless network, which is also called the SSID, is displayed.

Radio Band The Radio Band setting selected on the *Basic Wireless Settings* screen is displayed.

Wide Channel The Wide Channel setting selected on the *Basic Wireless Settings* screen is displayed.

Standard Channel The Standard Channel setting selected on the *Basic Wireless Settings* screen is displayed.

Security The wireless security method used by the Router is displayed.

SSID Broadcast The status of the SSID Broadcast feature is displayed.

Federal Communication Commission Interference 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 energy 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 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.

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.

For operation within 5.15 ~ 5.25GHz and 5.47~ 5.725GHz frequency range, it is restricted to indoor environment.

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.

IMPORTANT NOTE:
Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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.
Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

IMPORTANT NOTE:
Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
Caution:
(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
(ii) high-power radars are allocated as primary users (i. e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:
(i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Appendix A: Troubleshooting

Your computer cannot connect to the Internet.

Follow these instructions until your computer can connect to the Internet:

- Verify that the power adapter is connected to the Router and to a power outlet. If connected to a power strip, make sure the power strip is turned on.
- Make sure that the Power LED, Internet LED, and Wireless LED are on. If you have any wired computers connected to the Router, make sure the appropriate port LED is lit.

NOTE: The Power LED flashes after the power adapter is plugged in to the Router. If the light remains flashing for more than 30 seconds, it may indicate the Router is not working properly. For assistance, use a computer or device with Internet access to refer to our Linksys E2500 support section on the web at **www.linksys.com/support**

- Make sure that your DSL or cable modem is connected to your Router's Internet port using an Ethernet cable.
- Reset all of the devices on your network:
  1. Turn off all of your network computers and devices, and then unplug the power adapter from your Router.
  2. Unplug your modem's power cord (and coaxial cable if you have a cable modem), and wait two minutes.
  3. Reconnect your modem's power cord (and coaxial cable) and wait two more minutes.
  4. Reconnect the power adapter to the Router, and then power on all of your network computers and devices.

The modem does not have an Ethernet port.

The modem is a dial-up modem for traditional dial-up service. To use the Router, you need a cable/DSL modem and high-speed Internet connection.

You cannot use the DSL service to connect manually to the Internet.

After you have installed the Router, it will automatically connect to your Internet Service Provider (ISP), so you no longer need to connect manually.

The DSL telephone line does not fit into the Router's Internet port.

The Router does not replace your modem. You still need your DSL modem in order to use the Router. Connect the telephone line to the DSL modem, and then insert the setup CD into your computer. Click **Set up your Linksys Router** and follow the on-screen instructions.

When you double-click the web browser, you are prompted for a username and password. If you want to get rid of the prompt, follow these instructions.

Launch the web browser and perform the following steps (these steps are specific to Internet Explorer but are similar for other browsers):

1. Select **Tools** > **Internet Options**.
2. Click the **Connections** tab.
3. Select **Never dial a connection**.
4. Click **OK**.

The Router does not have a coaxial port for the cable connection.

The Router does not replace your modem. You still need your cable modem in order to use the Router. Connect your cable connection to the cable modem, and then insert the setup CD into your computer. Click **Set up your Linksys Router** and follow the on-screen instructions.

The computer cannot connect wirelessly to the network.

Make sure the wireless network name or SSID is the same on both the computer and the Router. If you have enabled wireless security, then make sure the same security method and key are used by both the computer and the Router.

You need to modify the settings on the Router.

Router settings can be modified using the Cisco Connect software, refer to "**How to Access Cisco Connect**" on page 12. To modify the advanced settings, go to *Advanced Settings*. Refer to "**Advanced Settings**" on page 12.

You want to access the browser-based utility from Cisco Connect.

To enter the browser-based utility from Cisco Connect, follow these steps:

1. Open Cisco Connect.
2. On the Main Menu, click **Router Settings**.
3. Click **Advanced Settings**.
4. Write down the username and password that are displayed. (To help protect your password, you can copy it to the Clipboard by clicking **Copy Password**.)
5. Click **OK**.

6. Your web browser automatically opens. Enter the username and password, and then click **OK**. (If you copied the password to the Clipboard in step 4, press **Ctrl-V** to paste it into the *Password* field.)

When you try to log into the browser-based utility, your password does not work.

Your wireless security password also serves as the browser-based utility's login password. To see this password:

1. Open Cisco Connect.
2. On the Main Menu, click **Router Settings**.
3. The *Password* is displayed on the left side of the screen.

The Router does not recognize your USB storage device.

Make sure the USB storage device uses the NTFS or FAT format. To check its format, follow these instructions:

1. Connect the USB storage device directly to your computer.
2. On your desktop, double-click **Computer** or **My Computer** icon.
3. Right-click the USB storage device, and click **Properties**.
4. The format is listed in the File system description. If the format is not NTFS or FAT, then back up the data on the USB storage device.

   After you have backed up the data on the USB storage drive, you can format it. Right-click the USB storage device, and click **Format**. Follow the on-screen instructions. For more information, refer to Windows Help.

If the Router still does not recognize the USB storage device, then remove the power adapter from the Router's Power port. Wait five seconds, and then re-connect the power adapter to the Router's Power port.

In Windows Vista, you do not see the USB storage device in the* Network *screen.

Make sure the Router and your computer use the same workgroup name. (The default workgroup name of the Router is **workgroup**. In Windows Vista, right-click the **Computer** icon and select **Properties**. Click **Advanced system settings**. Click the **Computer Name** tab. The workgroup name is displayed.) If they differ, then change the workgroup name of the Router. Follow these instructions:

1. Access the web-based utility of the Router. (Refer to "**How to Access the Browser-Based Utility**" on page 1.)
2. Click the **Storage** tab.
3. Click the **Administration** tab.
4. In the *Workgroup Name* field, enter the workgroup name of your computer.
5. Click **Save Settings**.

In Windows XP, you do not see the Router in the* My Network Places *screen.

In the *Network Tasks* section, click **Show icons for networked UPnP devices**. If the Router does not appear, follow these instructions:

1. Go to **Start > Control Panel > Firewall**.
2. Click the **Exceptions** tab.
3. Select **UPnP Framework**.
4. Click **OK**.

In Windows XP, you do not see your USB storage device in the* View workgroup computers *screen.

Make sure the Router and your computer use the same workgroup name. (The default workgroup name of the Router is **workgroup**. In Windows XP, go to **Start > Control Panel > System**. Click the **Computer Name** tab. The workgroup name is displayed.) If they differ, then change the workgroup name of the Router. Follow these instructions:

1. Access the web-based utility of the Router. (Refer to "**How to Access the Browser-Based Utility**" on page 1.)
2. Click the **Storage** tab.
3. Click the **Administration** tab.
4. In the *Workgroup Name* field, enter the workgroup name of your computer.
5. Click **Save Settings**.

WEB: If your questions are not addressed here, refer to our E2500 support section on the web, **www.linksys.com/support/E2500**

Appendix B: Specifications

Model Name	Linksys E2500
Description	Advanced Dual-Band N Router
Model Number	E2500
# of Antennas	4 total, 2 internal antennas per each 2.4 GHz & 5 GHz radio band
Detachable (y/n)	No
Modulation	802.11b: CCK, QPSK, BPSK 802.11g: OFDM 802.11a: OFDM 802.11n: BPSK, QPSK, 16-QAM, 64-QAM
Receive Sensitivity (Typical)	2.4 GHz 802.11b: -87 dBm @ 11Mbps 802.11g: -70 dBm @ 54Mbps 802.11n 20MHz: -70 dBm @ MCS15 802.11n 40MHz: -66 dBm @ MCS15 5GHz 802.11a: -70 dBm @ 54Mbps 802.11n 20MHz: -66 dBm @ MCS23 802.11n 40MHz: -62 dBm @ MCS23
Antenna Gain in dBi	2.4GHz: Antenna 1 (right rear): ≤3.5 dBi Antenna 2 (front right): ≤3.5 dBi 5GHz: Antenna 1 (right front): ≤5 dBi Antenna 2 (front left): ≤5 dBi
UPnP	Supported
Security features	WEP, WPA, WPA2
Security key bits	Up to 128-bit encryption

Environmental

Dimensions	8.86" x 1.38" x 7.09" (225 x 35 x 180 mm)
Unit Weight	15.94 oz (452 g)
Power	12V, 1A
Certifications	FCC, IC, CE, Wi-Fi A/B/G/N
Operating Temp.	0 to 40°C (32 to 104°F)
Storage Temp.	-20 to 60°C (-4 to 140°F)
Operating Humidity	10 to 80%, Relative Humidity and Noncondensing
Storage Humidity	5 to 90% Noncondensing

Specifications are subject to change without notice.

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