D-Link

Version 1.01 |10/28/2014

User Manual

PowerLine AV 500 Wireless AC600 Extender

DHP-W312AV

Table of Contents

Product Overview 4
Package Contents 4
System Requirements 5
Introduction 5
Connections 7
Side 8
LEDs 9

Hardware Installation 10
Wireless Installation Considerations 11
Powerline Installation Considerations 12
Safety 13

Configuration 14
Setup 14
Hybrid Link Setup 15
Wireless Settings 16
LAN Settings 17
LAN Settings - Static IP 18
PLC Settings 19
Advanced 20
MAC Address Filter 20
Advanced Wireless 21
User Limit 22
Tools 23
Admin 23
System 24
Firmware 25
Time 26
System Check 27
Status 28
Device Info 28
Logs 29
Statistics 30
Wireless 31
IPv6 32
Support 33

Wireless Security 34
What is WEP? 34
What is WPA? 35
Configuring WEP 36
Configuring WPA/WPA2Personal 37

Connecting to a Wireless Network 38
Using Windows® 7 38
Using Windows Vista® 41
Configuring Wireless Security 43
Using Windows® XP 45
Configuring WPA-PSK 46

Troubleshooting 48

Wireless Basics 50
What is Wireless? 51

How does wireless work? 51
Wireless Local Area Network (WLAN) 51

Networking Basics 54
Check your IP address.....54
Statically Assign an IP address.....55

Technical Specifications 56

Product Overview
Package Contents

D-Link DHP-W312AV PowerLine AV 500 Wireless AC600 Extender

CAT5 Ethernet Cable

Wi-Fi Configuration Card

System Requirements

Network Requirements
- IEEE 802.11ac, 802.11n or 802.11g
- 10/100 Ethernet clients

Browser Requirements
- Internet Explorer 7.0 or higher
- Firefox 3.5 or higher
- Safari 4.0 or higher
- Chrome 8.0 or higher

Introduction

The DHP-W312AV allows you to connect both wired and wireless computers, high-definition TVs, networking devices, and gaming consoles using the most pervasive medium in your home - the electrical wiring. Share Internet connections and experience smooth file transfers, streaming multimedia, online gaming and more. The PowerLine AV 500 Wireless AC600 Extender features easy plug-and-play installation and can be connected to any Ethernet-enabled device.

The PowerLine AV 500 Wireless AC600 Extender incorporates the latest technology to improve on the AV technology's data speeds over a home's existing electrical wiring. This fast transmission speed provides ample bandwidth suitable for streaming high-quality video HDTV signals while simultaneously providing high-speed Internet access throughout the home. With Quality of Service (QoS) support, the performance of applications which require real-time communication, such as VoIP phonecalls and multiplayer online games, will not be compromised even while streaming Internet TV and music.

Data Transmission Over electrical Wiring

The D-Link DHP-W312AV PowerLine AV 500 Wireless AC600 Extender, compliant with the HomePlug AV standard, uses your home's existing electrical wiring[1] to create a network or extend your existing network. It turns every power outlet into a potential network connection to access digital media devices, game consoles, print servers, computers, and network storage devices throughout your home. Additionally, Wireless N provides high speed transfers without the need for unsightly network cables.

Faster Wireless Speeds & Wider Operational Range

The Wireless AC technology incorporated into the DHP-W312AV offers increased speed and range beyond standard 802.11n technology. Initial wireless setup can be accomplished quickly, thanks to a convenient setup wizard. WPA and WPA2 encryption keep your network traffic safe and secure.

Ideal For Bandwidth-Intensive Applications

The DHP-W312AV is capable of delivering Powerline AV data transfer rates even higher than the old AV standard. This rapid transmission speed makes it ideal for bandwidth-intensive applications, guaranteeing smooth HD video streaming, clear VoIP calls, and lag-free online gaming experiences. In addition, it prioritizes Internet traffic, ensuring that multimedia applications do not experience glitches while web surfing and downloads are in progress. This device provides ample network bandwidth, enabling digital home consumers to tap into existing electrical wiring for high-quality multimedia streaming.

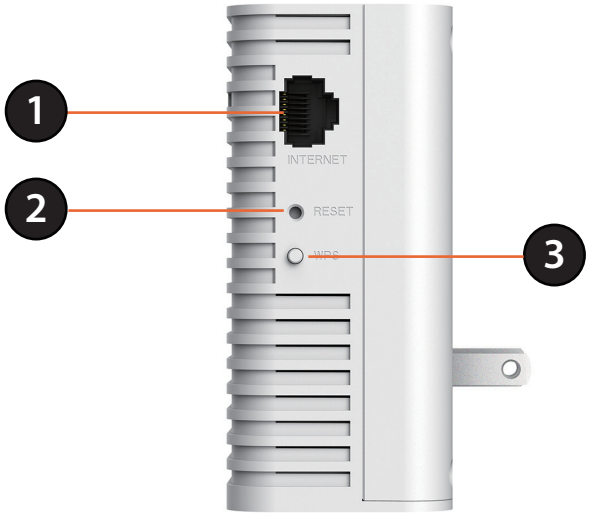
Convenient Setup and Secure Operation

The DHP-W312AV plugs directly into a power outlet, and does not require any additional cables. Extend your home network by connecting multiple devices in the farthest corners of your home via Ethernet cable or Wireless AC. For convenient setup, wired or wireless encryption keys can be quickly configured with the push of a button on top of the device. The adapter implements 128-bit AES data encryption to protect the network from unauthorized wiretapping. With hassle-free plug and play installation, the DHP-W312AV is an ideal solution to create a wall-to-wall home network.

[1]Power outlets and electrical wiring must all be part of the same electrical system. Certain electrical conditions in your home, such as wiring condition and configuration, may affect the performance of this product. Additional D-Link Powerline AV adapters are required to add new devices to the network. A minimum of two D-Link Powerline AV Network Adapters are required to create a network. Connecting this product to a power strip with a surge protector may adversely affect the performance of this product. For best results, plug the adapter directly into a wall outlet.

Hardware Overview

Connections



1	Internet Port	
2	Reset	
3	WPS	

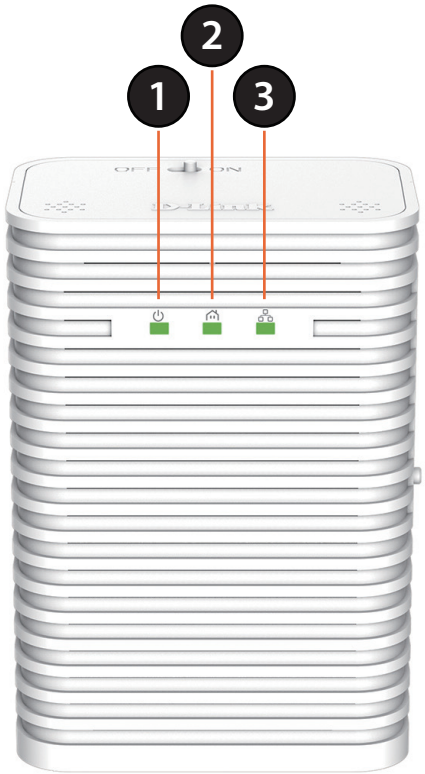
Hardware Overview

Side

1	**ON/OFF**	Turns the device ON or OFF

Hardware Overview

LEDs



1	**Power LED**	A solid light indicates a proper connection to the power supply. A blinking light indicates it is in sleep mode or seeking a Powerline connection.
2	**Powerline LED**	A solid light indicates that a Powerline connection is established.
3	**Ethernet LED**	A solid light indicates a connection to an Ethernet-enabled device.

Hardware Installation

Note: A minimum of two Powerline devices (your DHP-W312AV and another pre-existing device) are required to create a Powerline network.

Power

Plug the DHP-W312AV into an AC wall outlet where you want to extend your network. The Power LED on the DHP-W312AV will turn on to indicate it is receiving power. This may take up to 60 seconds.

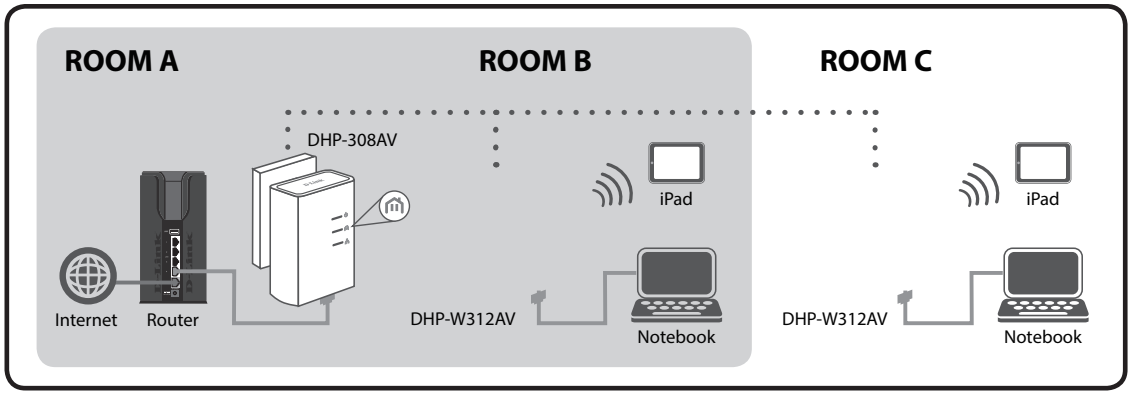
Plug in the Ethernet Cable

Connect one end of the supplied CAT5 Ethernet cable to the Ethernet port on the DHP-W312AV and the other end of the cable to the device's Ethernet interface.

Connect to Existing Network

Press the **Common Connect Button** on the existing Powerline AV device for 3 seconds. Then, press the **Common Connect Button** on the DHP-W312AV PowerLine AV 500 Wireless AC600 Extender for 3 seconds. This must be done within two minutes after pressing the Common Connect Button on the first device. The Powerline devices will reboot. Read the Wi-Fi advice on the next page, and continue to Configuration.

Note: *Network connectivity is confirmed when the Powerline LEDs indicators on both Powerline devices are steadily lit. This will indicate that your network is now secure.*



Wireless Installation Considerations

The DHP-W312AV lets you access your network using a wireless connection from anywhere within the operating range of your wireless network. Keep in mind that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

1. Keep the number of walls and ceilings between the DHP-W312AV and other network devices to a minimum. Each wall or ceiling can reduce your adapter's range by 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.

2. Be aware of the direct line between network devices. A wall that is 1.5 feet thick (.5 meters) at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.

3. Building materials make a difference. A solid metal door or aluminum studs may have a negative effect on range. Try to position the wireless DHP-W312AV and computers so that the signal passes through drywall or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.

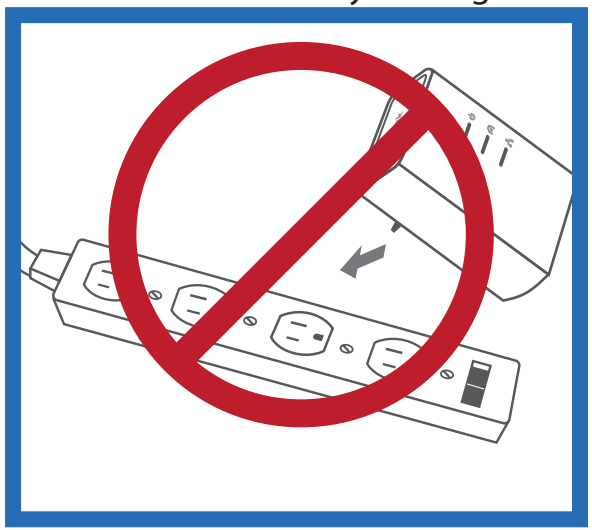
4. Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.

5. If you are using 2.4GHz cordless phones or wireless products such as ceiling fans, lights, and home security systems, your wireless connection may degrade dramatically or drop completely. Make sure your 2.4GHz phone base is as far away from your wireless devices as possible. The base transmits a signal even if the phone is not in use.

Powerline Installation Considerations

Plan the location of your Powerline devices:

1. Connect Powerline devices to electrical outlets that are not controlled by a wall switch to avoid accidentally turning off power to the device.



2. Do not connect the Powerline devices to an extension cord, surge protector, or power strip as this might prevent it from working correctly, or negatively impact network performance.

3. Avoid using the Powerline devices in an electrical outlet that is located near an appliance that uses a lot of power, such as a washer or dryer, or a refrigerator. This may prevent the adapter from working correctly, or negatively impact network performance.

4. Verify that your Powerline devices are electrically rated to operate with the power available in your location.

5. To help prevent against electrical shock, be sure to plug the power cables into properly grounded electrical outlets.

Safety

Please read all of the safety and operating instructions before using your device:

1. Do not open the device or attempt to repair or service the device.

3. Ensure that the device is plugged into the wall in a vertical position.

4. Use the device in a dry location, and avoid placing it in humid environments.

5. Do not submerge the device in liquid or attempt to clean it with liquids or solvents. To clean the device, disconnect it from the power outlet and use a damp towel.

6. Keep the device out of direct sunlight.

7. Do not cover or block the vents on the device.

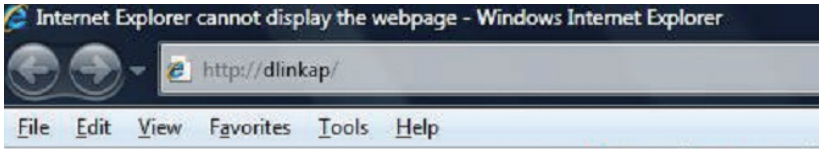
8. Make sure that the device has adequate room for ventilation.

9. Avoid placing the device near a heater or radiator.

Configuration

Setup

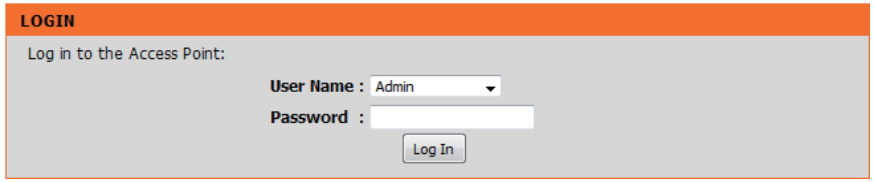
If you wish to change the default settings or optimize the performance of the DHP-W312AV, you may use the web-based configuration utility.



To access the configuration utility, open a web browser such as Internet Explorer and enter either **http://dlinkapWXYZ.local.** (this is on the Wi-Fi Configuration Card) or **http://192.168.0.50** in the address field.

By default, **Admin** will be the User Name . Leave the password blank.

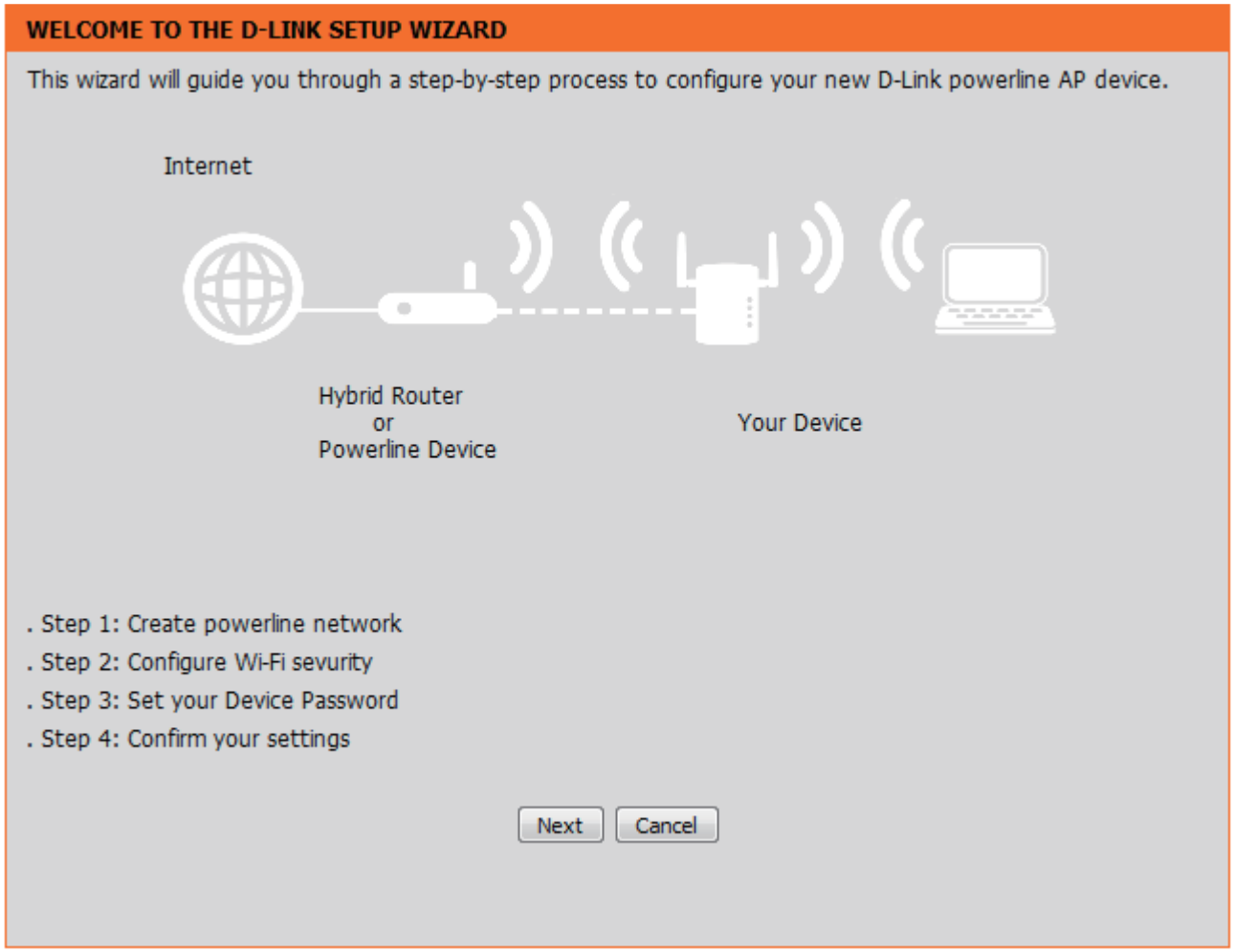
If you receive a "Page Cannot be Displayed" error, please refer to "Troubleshooting" on page **48** for assistance.



You will automatically proceed to the **Setup** heading after logging in.

Hybrid Link Setup

Use the wizard's on-screen incstructions to conveniently set up your network if you have not yet. You can also manually configure your network. Wi-Fi settings are covered at "Wireless Settings" on page 16 and Powerline settings are at "PLC Settings" on page 19.



Wireless Settings

The DHP-W312AV lets you customize your wireless settings for your access point. This device allows you to extend your current network so you can roam about the house while staying connected the entire time.

Wireless Network Name: The Service Set Identifier (SSID) is the name of your wireless network. Create a name using up to 32 characters. The SSID is case-sensitive. Enable Auto Channel.

Enable Auto Channel Scan: The auto channel selection setting can be selected to allow this device to choose the channel with the least amount of interference.

Wireless Channel: By default the channel is set to 1. The Channel can be changed to fit the channel setting for an existing wireless network or to customize the wireless network. If you enable Auto Channel Selection, this option will be greyed out.

Wireless Security & WPA: WPA/WPA2 is more secure than WEP. WEP should only be used if you have older devices that are unable to use WPA. Use of TKIP/AES security framework provides the optimum mix of security and compatibility. Please refer to "Wireless Security" on page 34 for more information.

Password: Choose a password that is strong. A good password uses both letters and numbers in unpredictable places. Example bad passwords could be *password* or *12345678*.

LAN Settings

This section will allow you to change the local network settings of the DHP-W312AV and to configure the DHCP settings.

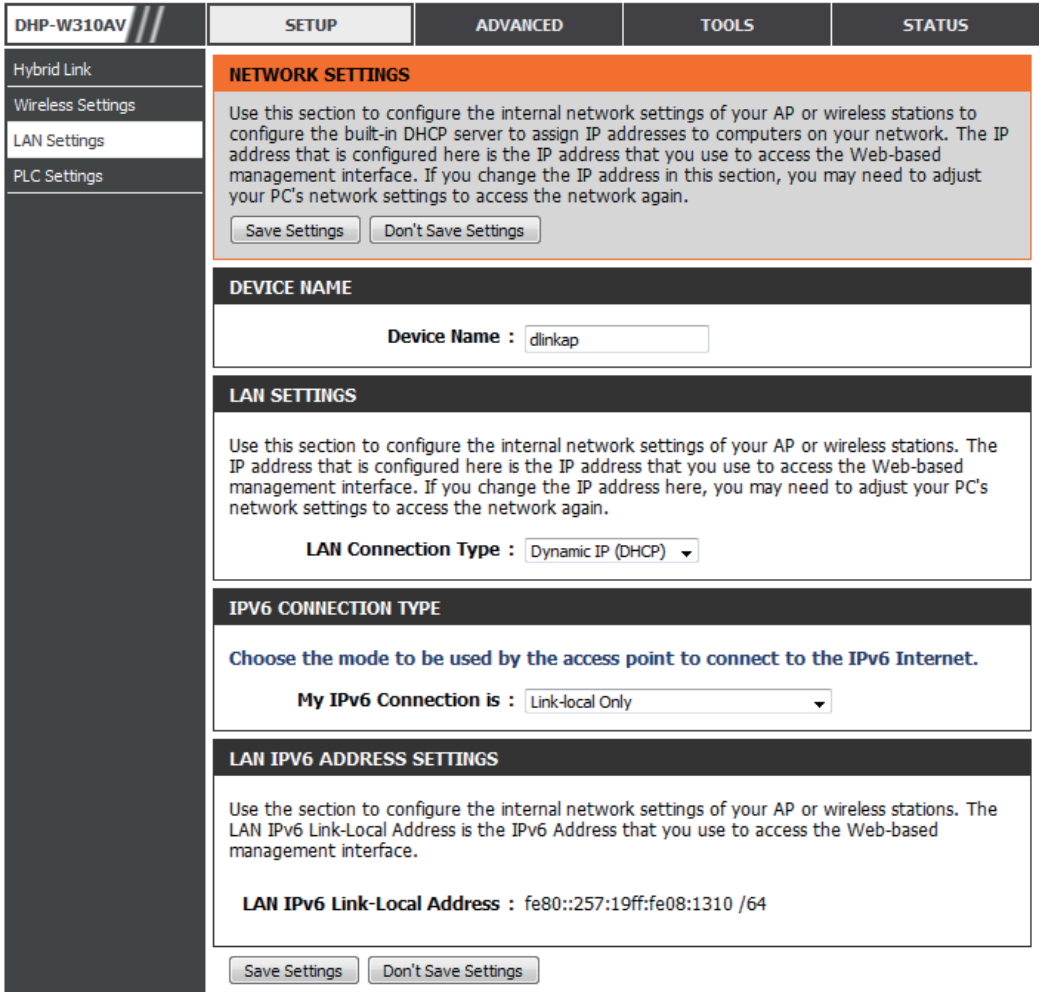
Device Name: Enter the Device Name of this DHP-W312AV. You will use this name to connect to it through a web browser. The default name is listed on your Wi-Fi Configuration Card.

LAN Connection Type: Use the drop-down menu to select Dynamic IP (DHCP) to automatically obtain an IP address on the LAN/private network. For Static IP setup, see the next page.

IPv6 Connection Type: Your Internet Service Provider (ISP) may require this to be set a certain way for Internet access. Contact your ISP regarding such requirements.

LAN IPv6 Address Settings: This shows the current IPv6 address of the DHP-W312AV on your network.

Save Settings: Click **Save Settings** to save and activate the new changes.



LAN Settings - Static IP

Select Static IP to manually enter the IP address, subnet mask, and default gateway addresses.

LAN Connection Type: Select Static IP from the drop-down menu.

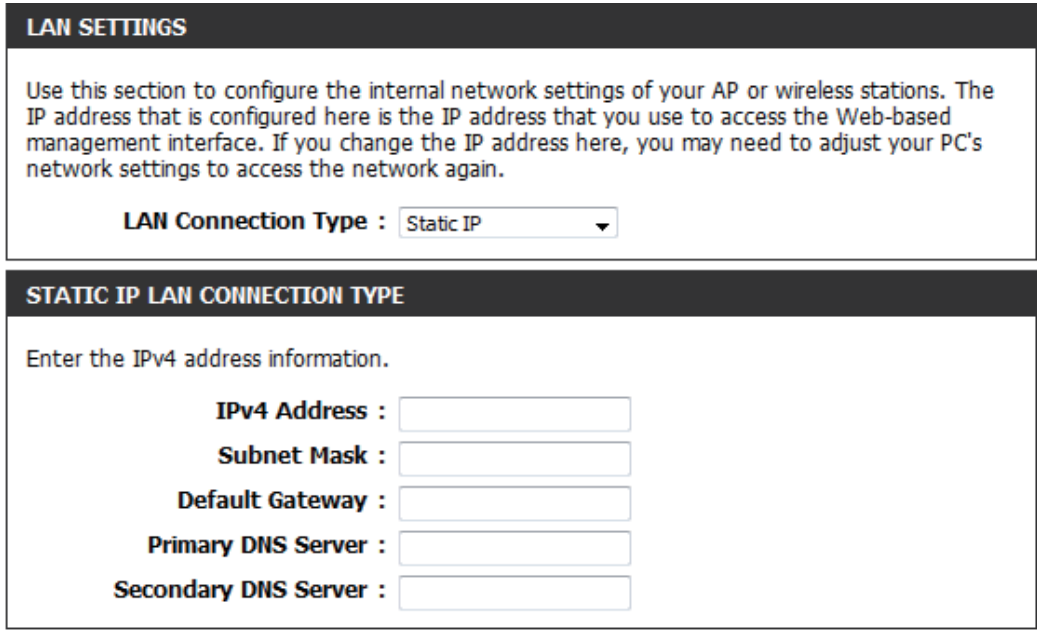
IP Address: Enter the IP address of the DHP-W312AV. The default IP address is 192.168.0.50. If you change the IP address, once you click Apply, you will need to enter the new IP address in your browser to return to the configuration utility. You can also connect with the device name. (See previous page.)

Subnet Mask: Enter the Subnet Mask.

Default Gateway: Enter the Gateway. This is usually the LAN or internal IP address of your router.

DNS Server: This is the Domain Name Server that looks up addresses on the Internet, you may have a specific one you need to connect to.

Save Settings: Click **Save Settings** to save and activate the new changes.



PLC Settings

This section will show you how to configure your new D-Link Powerline AV using the web-based configuration utility.

Power Saving: Power save mode.

Network Name: You can set the name of your network and to make it either public or private. Make sure the Network Name of all of the devices within your Powerline network is the same.

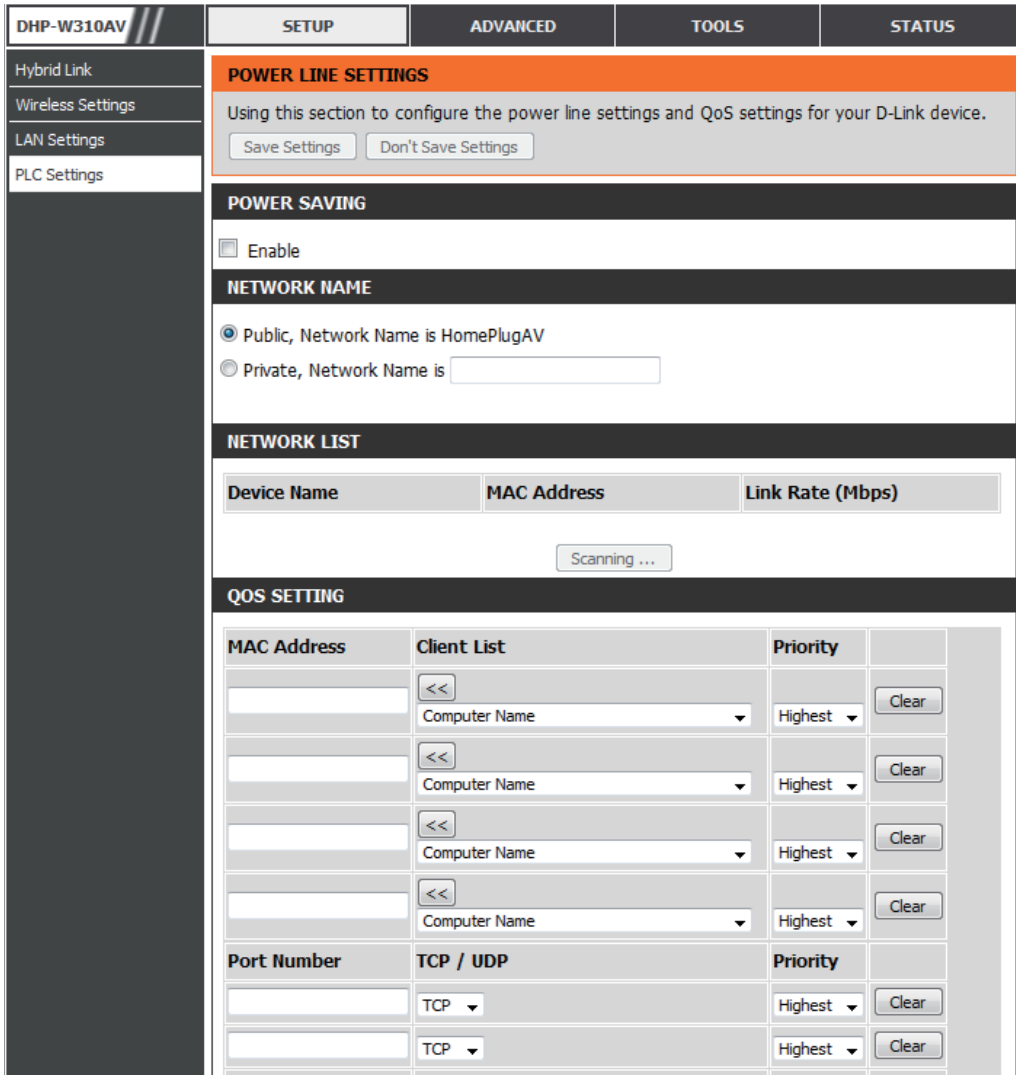
Public Network Name: Select this option if you would like to make your Powerline network public with the default Network Name of "HomePlugAV". Since this is a commonly used Network Name, it is less secure than a private Network Name.

Private Network Name: Select this option if you wish to make your Powerline network more secure by using a private Network Name.

Scan: Click this button to scan for new Powerline devices. This is automatically done periodically and upon loading this page.

Member List: This section provides information on the Powerline AV devices on your Powerline network.

QoS Setting: Here you can set the Quality of Service (QoS) settings for each network device. QoS helps you prioritize network traffic based on device or the port the traffic is on.

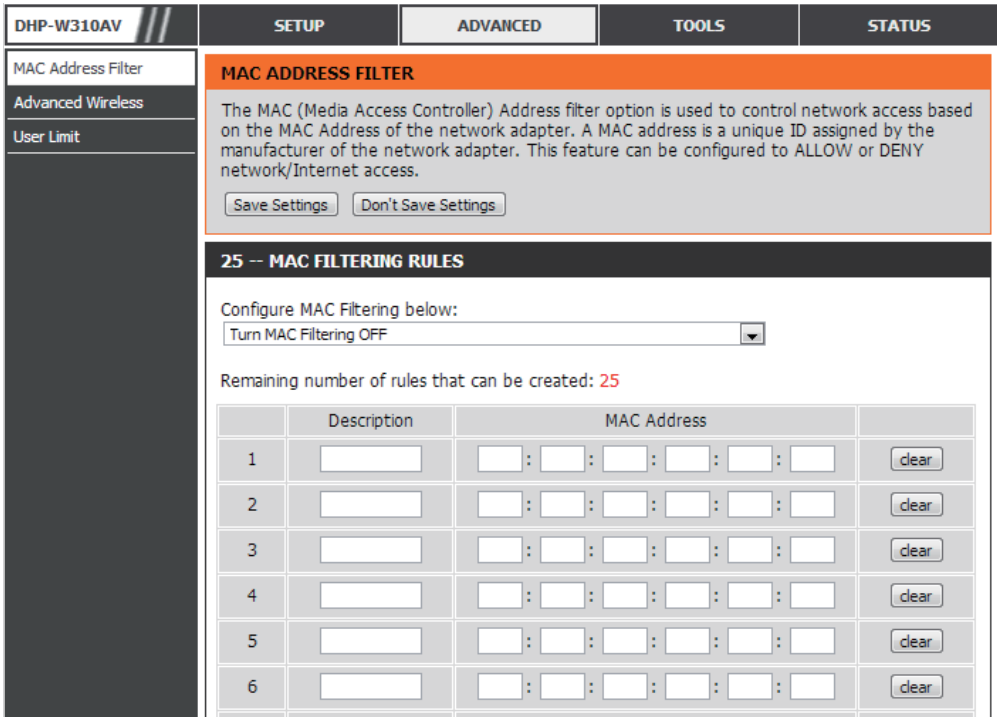


MAC Address/ Port Number: Select a device from the **Computer Name** dropdown box and then click the **<<** above **Computer Name** to automatically fill in the device's MAC Address. Or, Set the priority for the device under the **Priority** dropdown box. Clear settings for a rule with the **Clear** button. Remember to click **Save Settings** after making changes.

Advanced

MAC Address Filter

Use MAC (Media Access Control) Filters to authorize wireless clients to access your network by their MAC addresses. When enabled, you can choose to block the devices listed, or only allow the devices listed.



MAC Filtering Rules: Set MAC Filtering to ALLOW, DENY, or OFF. ALLOW means only the devices listed can access the network. DENY means the devices listed cannot access the network. OFF means this function is currently disabled.

Description: You may make a note for your convenience, such as "My PC" or "My friend's smartphone"

MAC Address: Enter the MAC address you would like to filter. To find the MAC address on a computer, please refer to "Networking Basics" on page 54. Click Save Settings to activate and save.

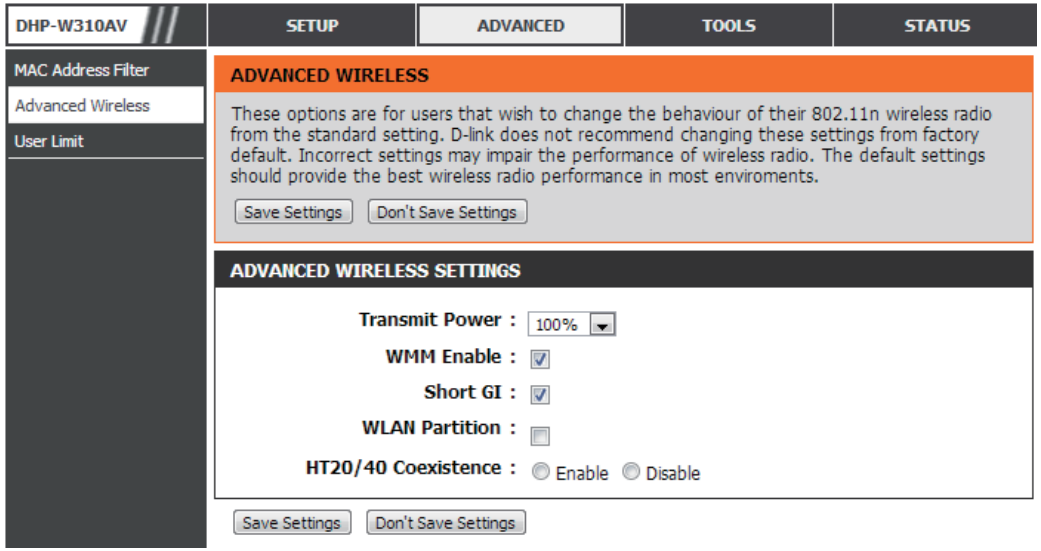
Note: If you are filtering to ALLOW only the listed devices, make sure to add your own computer to the list or you will be denied access to the network and the configuration utility. If you DENY the listed addresses be sure not to include your computer.

Clear: Clear the rule from the list. Note you will have to save the settings in order for it to take effect.

Save Settings: Click **Save Settings** to save and activate the new changes.

Advanced Wireless

The Advanced Wireless section allows you to change several advanced settings on your DHP-W312AV. Most users will not need to modify this section.



Transmit Power: Sets the transmit power of the antennas.

WMM Enable: WMM is a Quality of Service (QoS) system for your wireless network. Enabling this feature will improve the quality of video and voice applications for your wireless clients.

Short GI: Check this box to reduce the guard interval time therefore increasing the data capacity. However, this setting may decrease stability and reliability.

IGMP Snooping: Select this checkbox to enable IGMP snooping. IGMP snooping is a layer 2 feature which enables the device to learn Multicast group membership based on IGMP messages passing through the built-in switch. Because the switch learns the IGMP messages and knows which clients are involved in the multicast group membership, it is able to forward multicast traffic only to the ports that requested it (based on their membership).

WLAN Partition: Select this checkbox to enable WLAN partition. If this feature is enabled, then there is no barrier between communication among wireless stations connecting to the DHP-W312AV. If this is disabled, wireless clients are not allowed to exchange data through the DHP-W312AV.

HT20/40 Coexistence: Enabling this function allows compatibility with both 802.11n devices as well as 802.11b/g at the cost of speed. Disabling this will give higher speeds but only allow 802.11n devices to function.

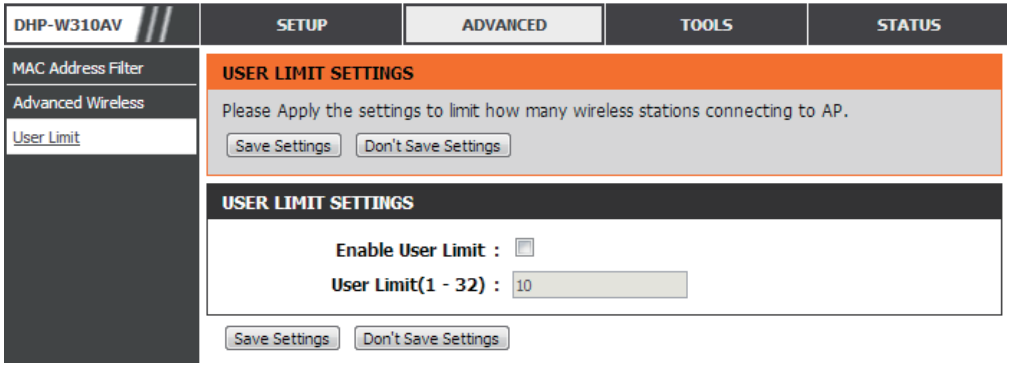
User Limit

This screen lets you set the maximum number of wireless clients that can connect at one time to your DHP-W312AV

Enable User Limit: Check the Enable User Limit box to enable limiting the number of devices that can connect to the DHP-W312AV.

User Limit: Enter the maximum number of clients, between 1 and 32.

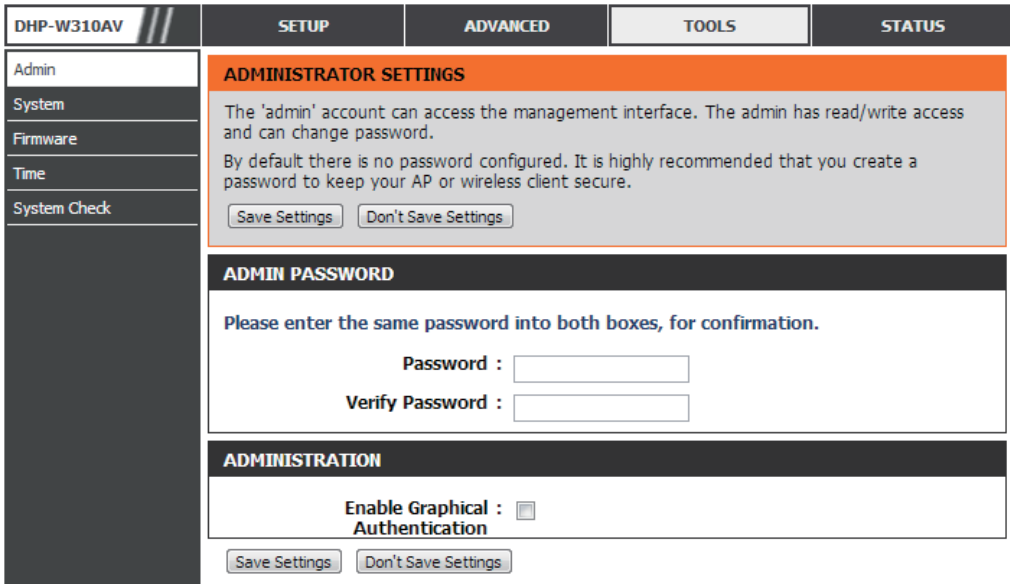
Save Settings: Click **Save Settings** to save and activate the new changes.



Tools

Admin

This page will allow you to change the administrator password, which is used to access the configuration interface and change settings.



Password: Enter a new password for the admin user name. The administrator account can change the configuration of the device.

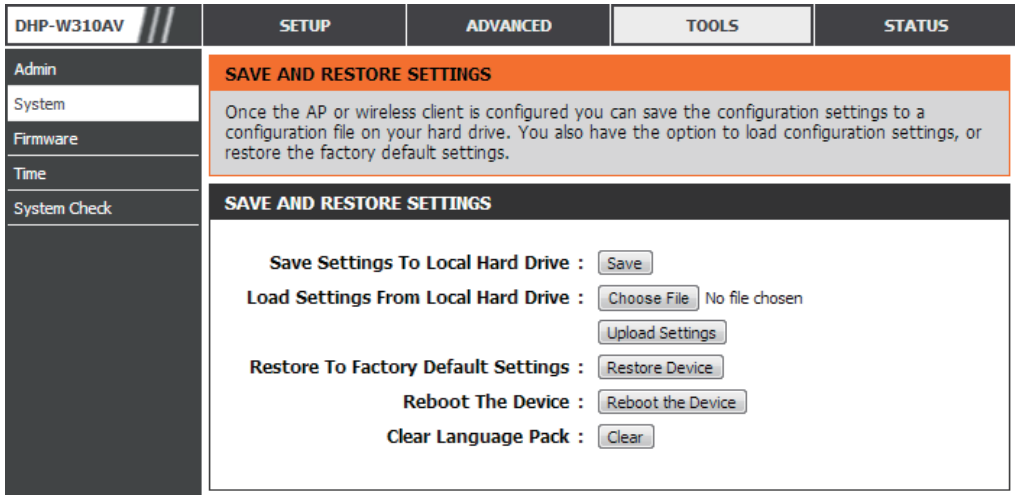
Verify Password: Enter the same password that you entered in the previous textbox in order to confirm its accuracy.

Enable Graphical Authentication: Enables a CAPTCHA verification which will require users to type letters or numbers from a distorted image displayed on the screen to prevent online hackers and unauthorized users from gaining access to your device's configuration. This feature is disabled by default.

Save Settings: Click **Save Settings** to save and activate the new changes.

System

This page lets you both save and delete settings on your DHP-W312AV.



Save Settings To Local Hard Drive: Use this option to save the current DHP-W312AV configuration settings to a file on the computer you are using. Click the **Save** button. You will then see a file dialog where you can select a location and file name for the settings.

Load Settings From Local Hard Drive: Use this option to load previously saved DHP-W312AV configuration settings. Click **Browse** to find a previously saved configuration file. Then, click the **Upload Settings** button to transfer those settings to the DHP-W312AV.

Restore to Factory Default Settings: This option will restore all configuration settings back to the settings that were in effect at the time the DHP-W312AV was shipped from the factory. Any settings that have not been saved will be lost, including any rules that you have created. If you would like to save the current DHP-W312AV configuration settings, use the **Save** button above.

Reboot the Device: Click to reboot the DHP-W312AV.

Clear Language Pack: Clears any language pack that is currently installed. For more about language packs, refer to “Firmware” on page 25.

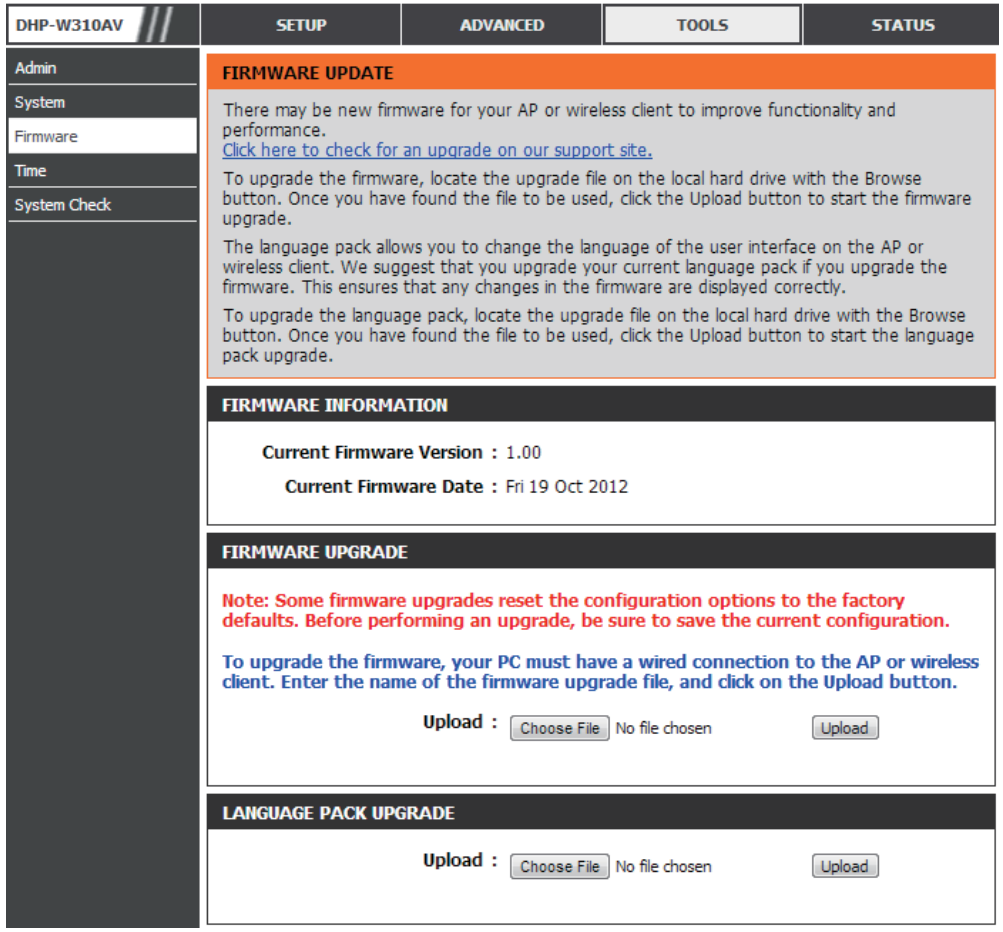
Firmware

You can upgrade the firmware of the DHP-W312AV from this page. Make sure the firmware you would like to use is on the local hard drive of your computer. Click **Browse...** to locate the firmware file to be used for the update. Please check the D-Link support site for firmware updates at http://support.dlink.com. You can download firmware upgrades to your hard drive from the D-Link support site.

Firmware Information: Click on the blue hyperlink at the top of the page the to find out if there is an updated firmware or language pack. If a new version exists, download the new firmware to your hard drive.

Firmware Upgrade: After you have downloaded the new firmware, click **Browse...** to locate the firmware update on your hard drive. Click **Upload** to complete the firmware upgrade.

Language Pack Upgrade: You can change the interface language of the device by uploading a language pack. To install a language pack, click the **Browse...** button to locate the D-Link language pack upgrade file on your computer. Once you have found the file, click the **Upload** button to begin the language pack upgrade process. This can take a minute or more. Finally, wait for the device to reboot. This process can take about 75 seconds.



Time

The Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in. Daylight Saving can also be configured to automatically adjust the time when needed.

Time Zone: Select the Time Zone from the drop-down menu.

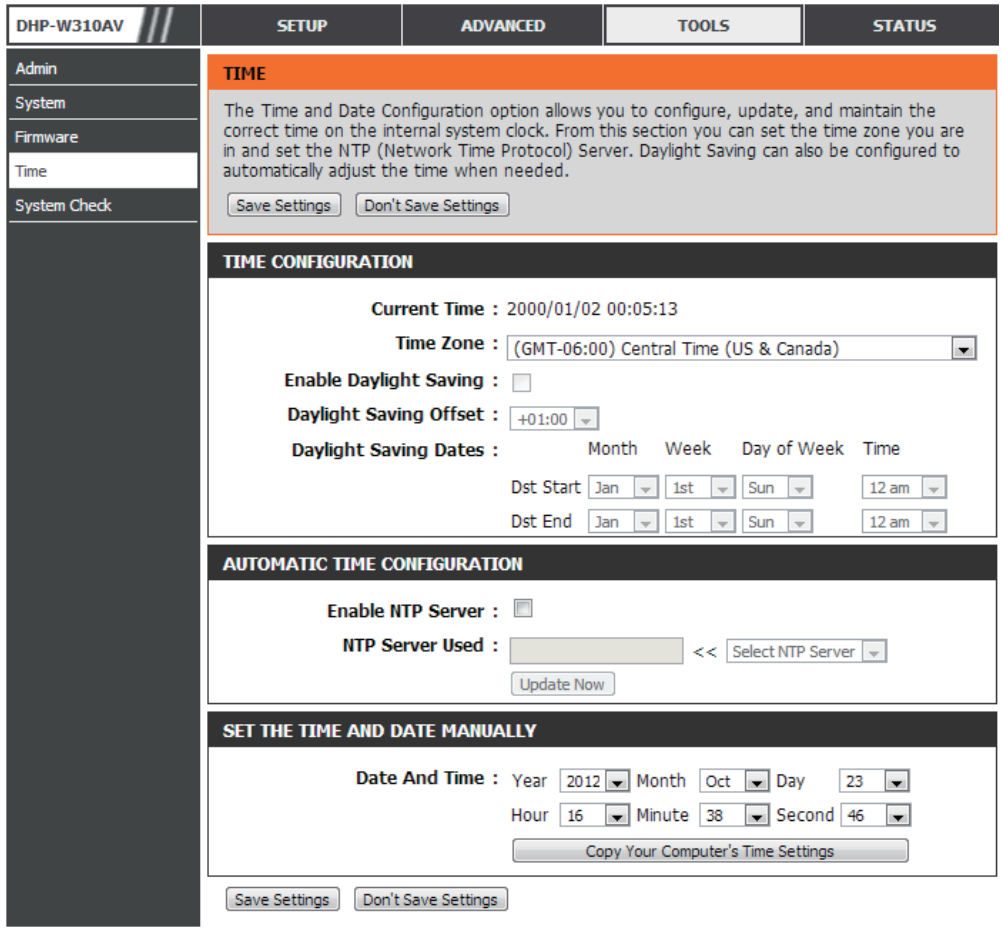
Daylight Saving: To enable Daylight Saving time adjustment, click the Enable Daylight Saving check box. Next, use the drop-down menu to select a Daylight Saving Offset and then enter a start date and an end date for daylight saving time.

Enable NTP Server: NTP (Network Time Protocol) allows the device to automatically set the system clock based on an Internet NTP server. Check this box to use a NTP server. This will only connect to a server on the Internet, not a local server.

NTP Server Used: Enter the NTP server or select one from the drop-down menu.

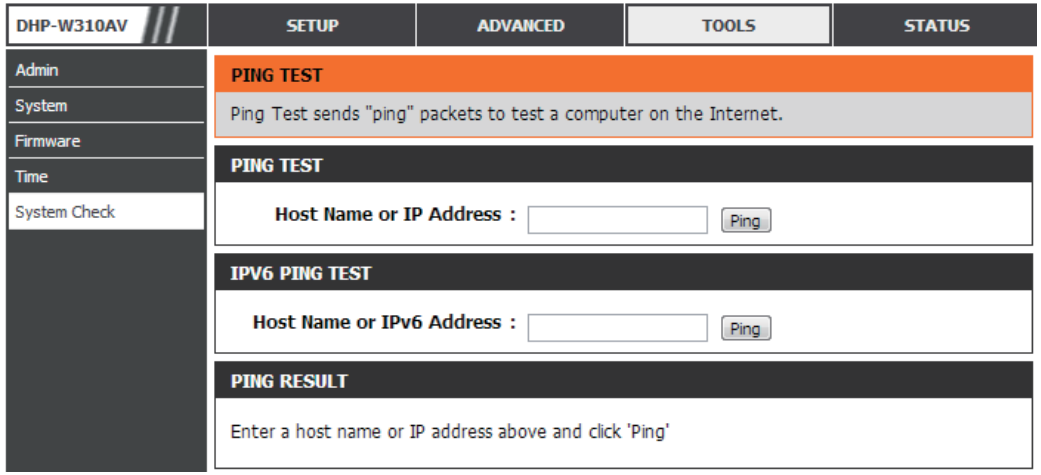
Date and Time: To manually input the time, enter the values in these fields for the Year, Month, Day, Hour, Minute, and Second and then click Save Settings. You can also click the Copy Your Computer's Time Settings button at the bottom of the screen.

Save Settings: Click **Save Settings** to save and activate the new changes.



System Check

This page helps you to diagnose connection problems.



Ping Test: A ping test sends a tiny bit of information to a website and anticipates a response. Pinging an extremely stable site such as your favorite search engine or news site can help tell you if your Internet connection is working properly. If you can ping a site or address from here but your computer is getting no connectivity, then the DHP-W312AV is working properly but there is the problem with the computer.

IPv6 Ping Test: This is similar to the regular Ping Test but using a IPv6 address.

Ping Result: "Ping timeout" means that the site did not respond. This happens if the site is down or does not exist, but also if you do not have Internet connectivity. If you ping several common websites and all result in a timeout then there is likely an issue with your Internet connection. If the result says a site is alive, then your Internet connection is working.

Status

Device Info

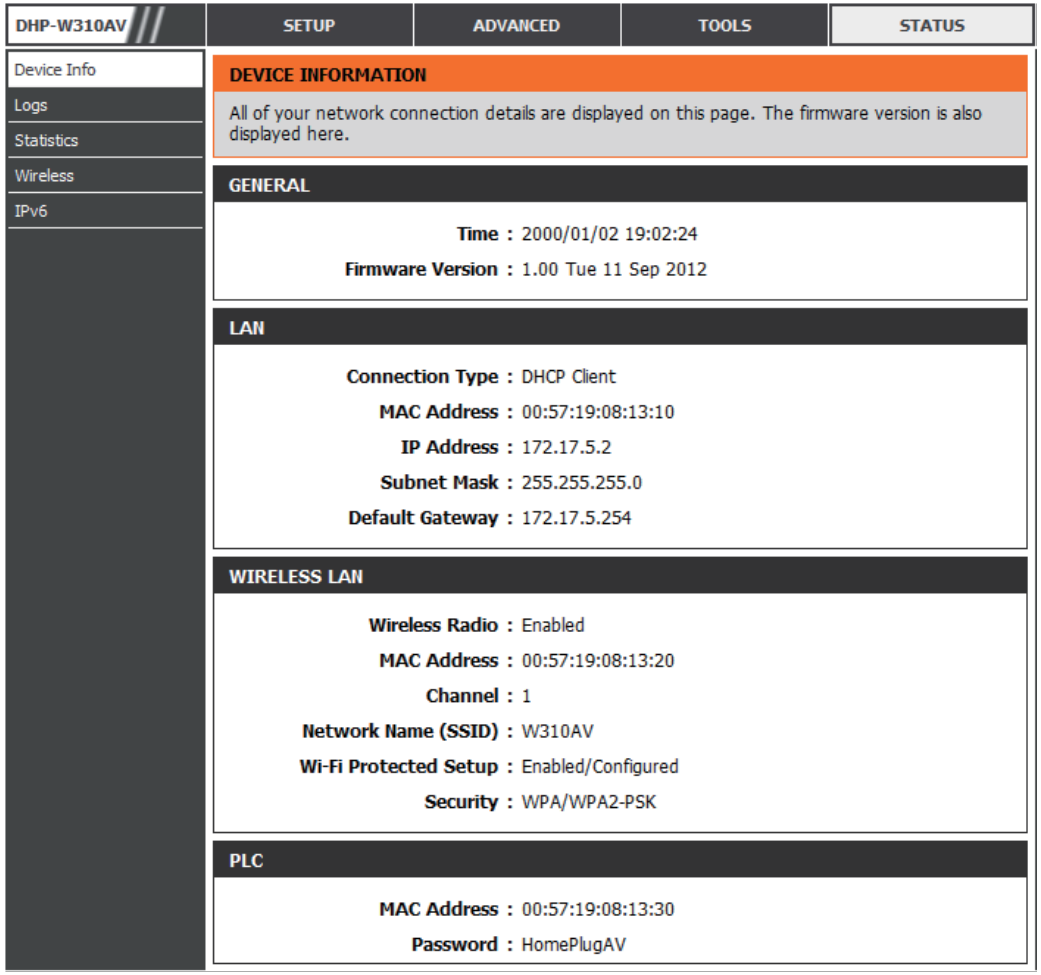
This page displays the current information for the DHP-W312AV. It will display the LAN and wireless LAN information.

General: Displays the DHP-W312AV's time and firmware version.

LAN: Displays the MAC address and the private (local) IP settings for the DHP-W312AV.

Wireless LAN: Displays the wireless MAC address and your wireless settings such as SSID and Channel.

PLC: Shows the DHP-W312AV's Powerline Connection settings.



Logs

The DHP-W312AV keeps a running log of events and activities occurring on the DHP-W312AV. If the AP is rebooted, the logs are automatically cleared. You can save the log files prior to clearing them.

Log Options: You can select the types of messages that you would like to display from the log: System Activity, Wireless Activity, Critical, Warning, Information. Select the types you want to view and click **Save Settings**.

Save Log File: Save the log to your hard drive.

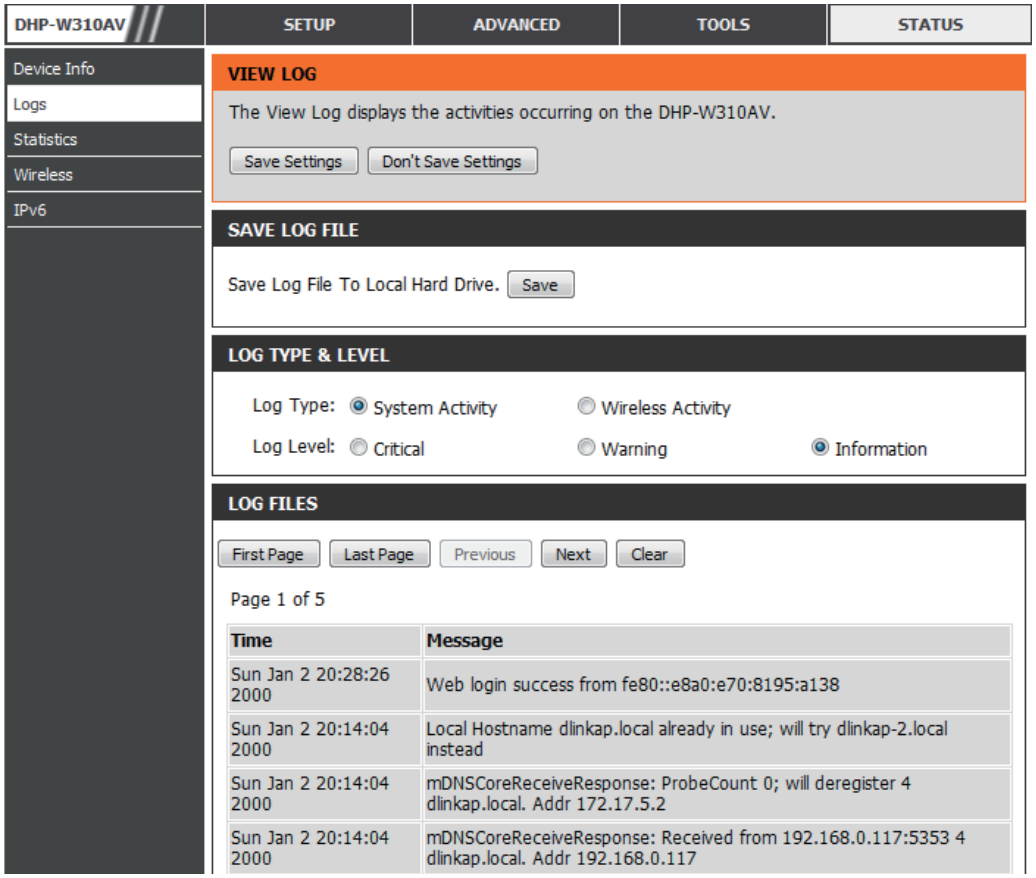
First Page: Go to the first page of the log.

Last Page: Go to the last page of the log.

Previous: Go to the previous page of the log.

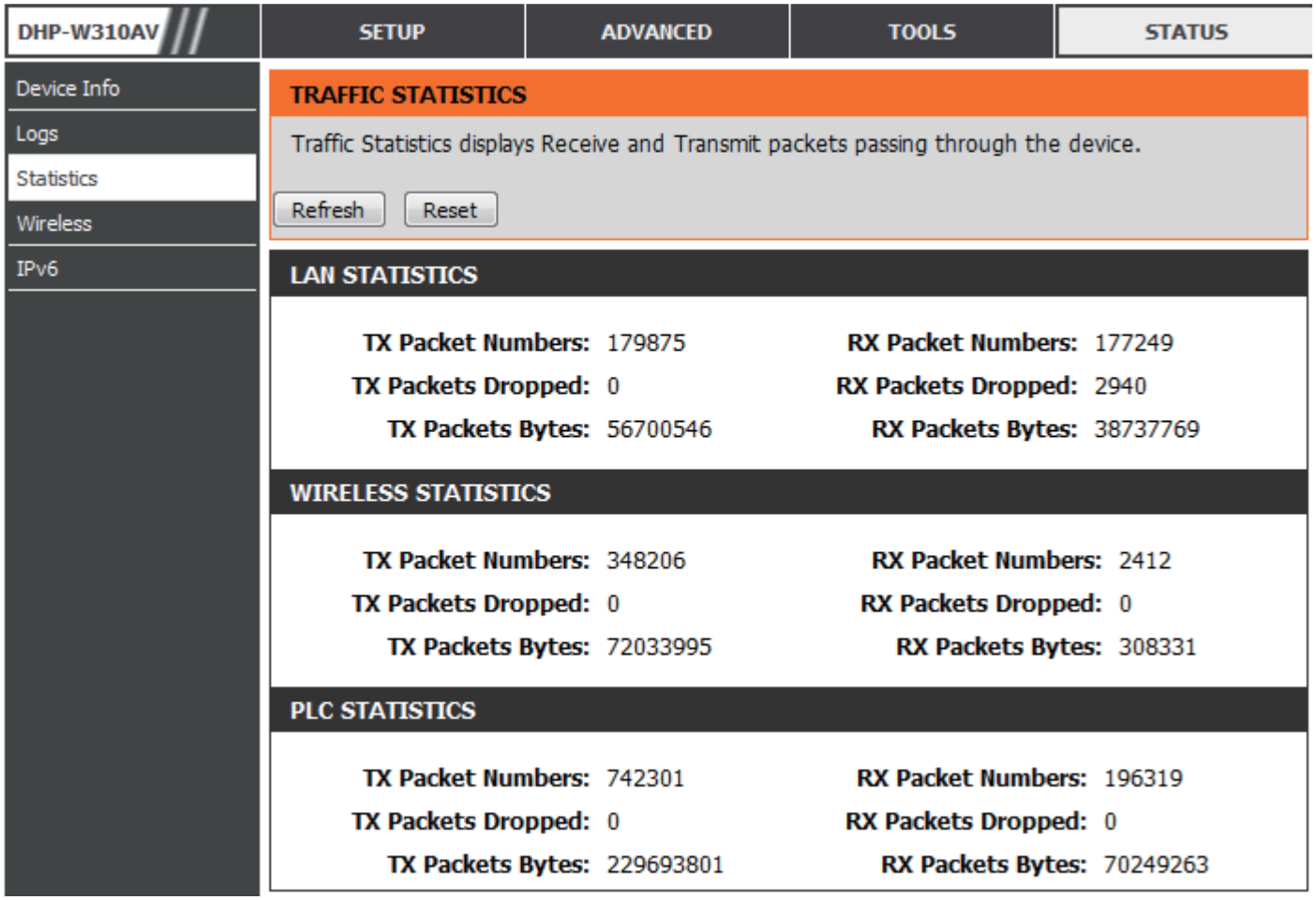
Next: Go to the next page of the log.

Clear: This button clears all current log content.



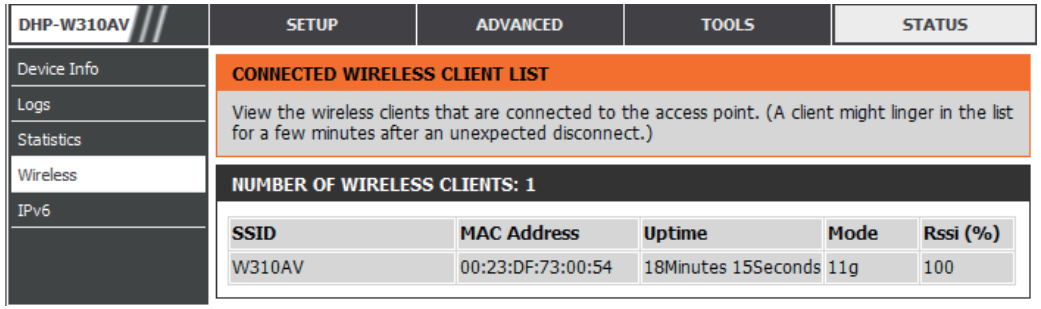
Statistics

The DHP-W312AV keeps statistics on the traffic that passes through it. You can view the amount of packets that pass through the LAN and wireless portions of the network. The traffic counter will reset if the DHP-W312AV is rebooted.



Wireless

This section allows you to view the wireless devices that are connected to your wireless DHP-W312AV.



Number of Wireles Clients: Displays the number of devies that are connected to the DHP-W312AV via wireless.

SSID: The wireless network's name.

MAC Address: Displays the Ethernet ID (MAC address) of the wireless client.

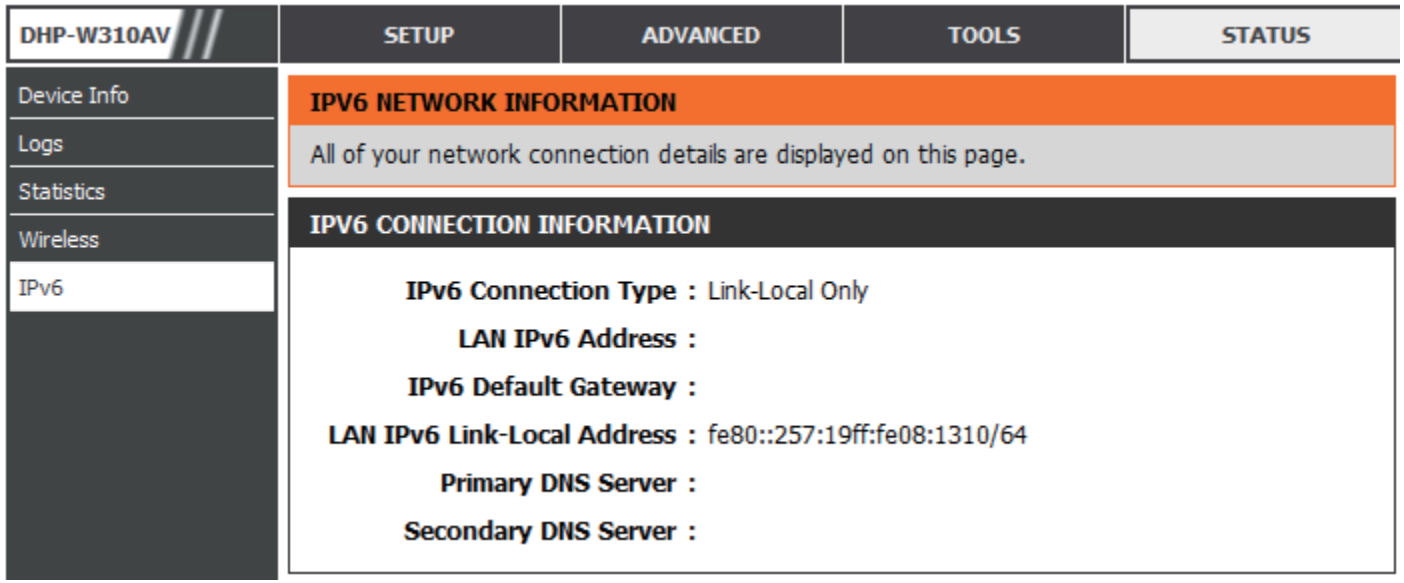
Uptime: Shows how long that device has been connected to the DHP-W312AV.

Mode: Shows the mode the device is using to connect to your DHP-W312AV. This should be 11b, 11g, or 11n.

Rssi (%): This shows the strength of your device's connection.

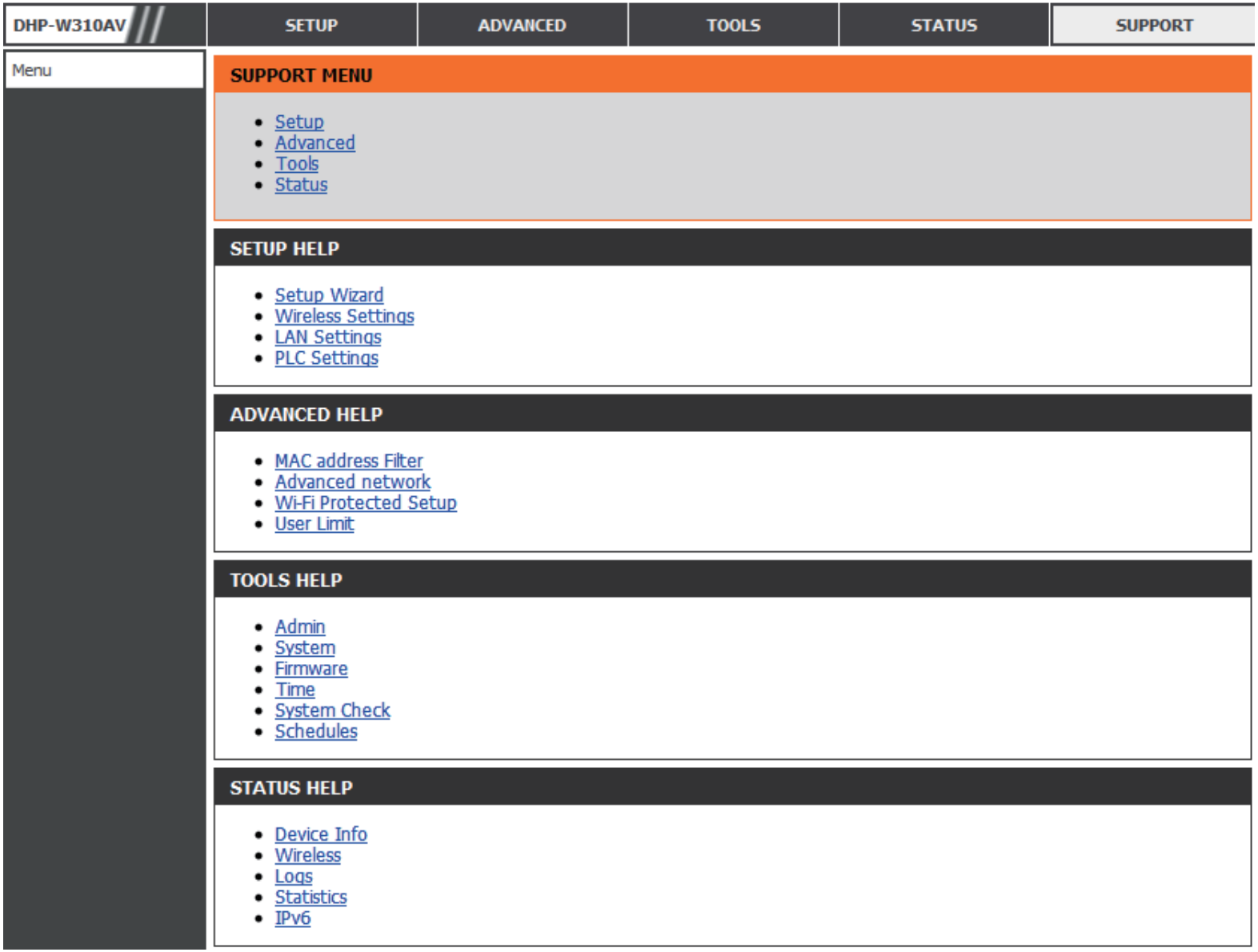
IPv6

This section will display all of your IPv6 Internet and network connection details.



Support

Click on a link in the Support heading for more information on each section of the firmware.



Wireless Security

This section will show you the different levels of security you can use to protect your data from intruders. The DHP-W312AV offers the following types of security:

- WPA2 (Wi-Fi Protected Access 2)
- WPA (Wi-Fi Protected Access)
- WEP (Wired Equivalent Privacy)
- WPA2-PSK (Pre-Shared Key)
- WPA-PSK (Pre-Shared Key)

What is WEP?

WEP stands for Wired Equivalent Privacy. It is based on the IEEE 802.11 standard and uses the RC4 encryption algorithm. WEP provides security by encrypting data over your wireless network so that it is protected as it is transmitted from one wireless device to another.

To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange – alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily.

What is WPA?

WPA, or Wi-Fi Protected Access, is a Wi-Fi standard that was designed to improve the security features of WEP (Wired Equivalent Privacy). The 2 major improvements over WEP:

- Improved data encryption through the Temporal Key Integrity Protocol (TKIP). TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys haven't been tampered with. WPA2 is based on 802.11i and uses Advanced Encryption Standard (AES) instead of TKIP.

- User authentication, which is generally missing in WEP, through the extensible authentication protocol (EAP). WEP regulates access to a wireless network based on a computer's hardware-specific MAC address, which is relatively simple to be sniffed out and stolen. EAP is built on a more secure public-key encryption system to ensure that only authorized network users can access the network.

WPA-PSK/WPA2-PSK uses a passphrase or key to authenticate your wireless connection. The key is an alpha-numeric password between 8 and 63 characters long. This key must be the exact same key entered on your wireless bridge or DHP-W312AV.

WPA/WPA2 incorporates user authentication through the Extensible Authentication Protocol (EAP). EAP is built on a more secure public key encryption system to ensure that only authorized network users can access the network.

Configuring WEP

It is recommended to enable encryption on your wireless DHP-W312AV before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

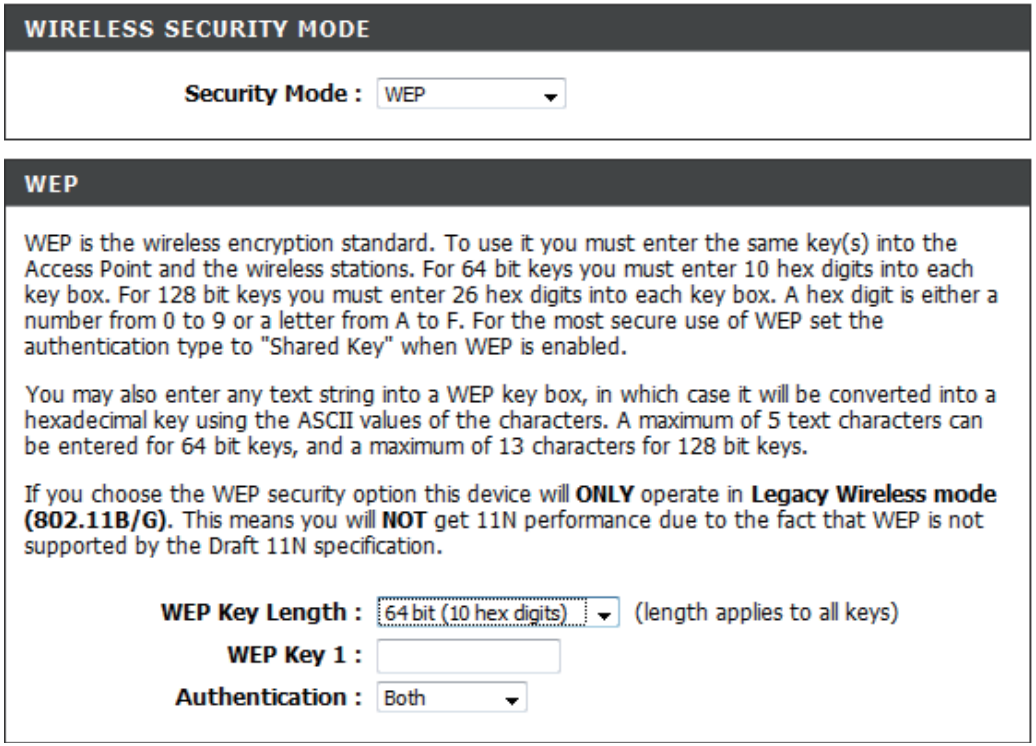
1. Log into the web-based configuration by opening a web browser and entering **http://dlinkapWXYZ.local.** (on the Wi-Fi Configuration Card) or the IP address of the DHP-W312AV (**192.168.0.50**). Click on **Setup** and then click **Wireless Settings** on the left side.

2. Next to Security Mode in the Wireless Security Mode section, select **WEP Mode**.

3. Next to WEP Encryption, select **64-bit** or **128-bit** encryption.

4. Next to WEP Key 1, enter a WEP key that you create. Make sure you enter this key exactly on all your wireless devices.

5. Next to Authentication, select **Both** or **Shared Key**.



Configuring WPA/WPA2 Personal

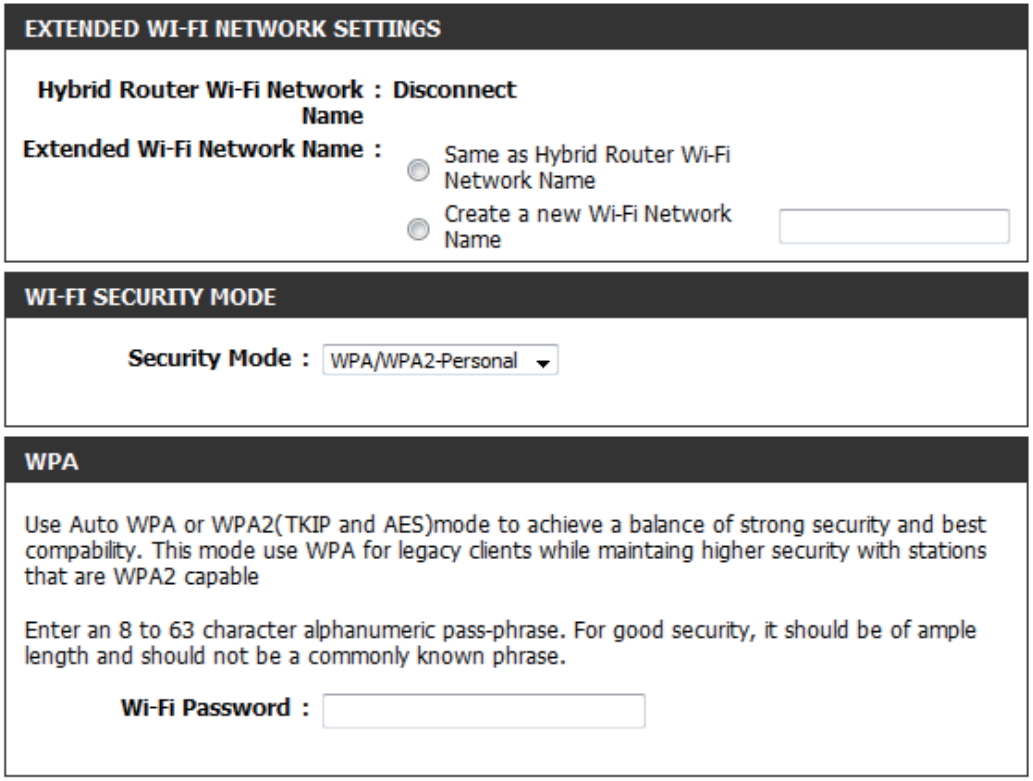
It is recommended to enable encryption on your wireless DHP-W312AV before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the DHP-W312AV (**192.168.0.50**) or **http://dlinkapWXYZ.local.** (on the Wi-Fi Configuration Card) then click on **Setup** and then click **Wireless Settings** on the left side.

2. For **Security Mode,** select **WPA/WPA2Personal.**

3. For **Wi-Fi Password**, enter a key. The password must be between 8-63 characters and use numbers, letters, and/or special characters.

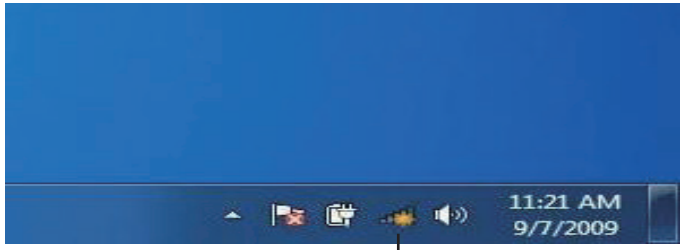
6. Click **Save Settings** at the top of the window to save your settings. If you are configuring the DHP-W312AV with a wireless adapter, you will lose connectivity until you enable WPA on your adapter and enter the same passphrase as you did on the DHP-W312AV.



Connecting to a Wireless Network
Using Windows® 7

It is recommended to enable wireless security (WPA/WPA2) on your DHP-W312AV before configuring your wireless adapter. If you are joining an existing network, you will need to know the security key or passphrase being used.

1. Click on the wireless icon in your system tray (lower-right corner).



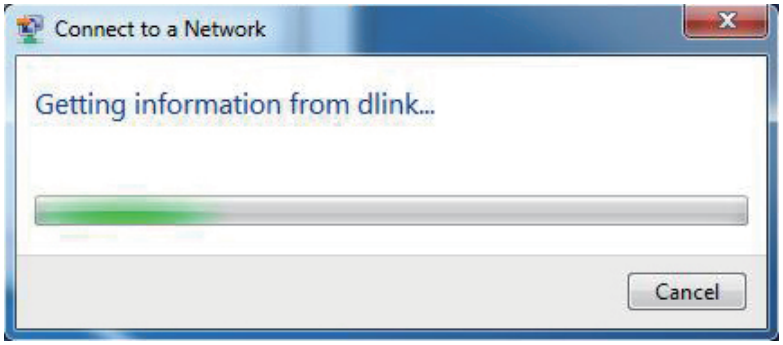
Wireless Icon

2. The utility will display any available wireless networks in your area.

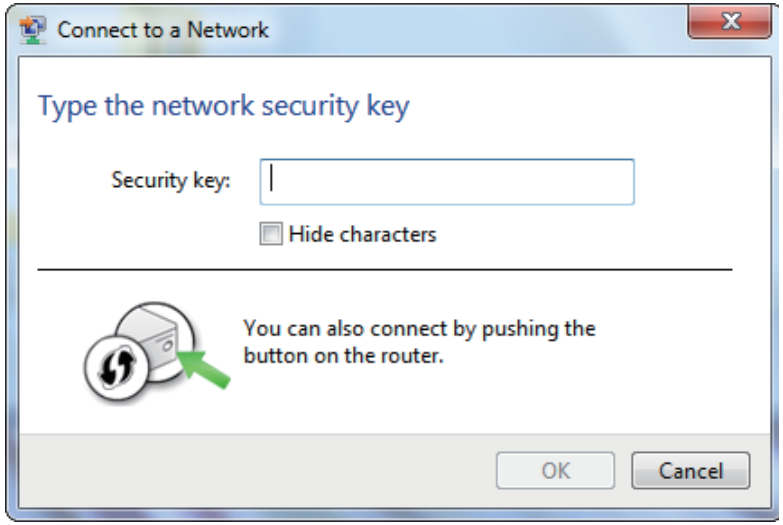
3. Highlight the wireless network (SSID) you would like to connect to and click the Connect button. The Wi-Fi Configuration Card will list your device's specific network, it will not be simply dlink.

   If you get a good signal but cannot access the Internet, check your TCP/IP settings for your wireless adapter. Refer to the Networking Basics section in this manual for more information.

4. The following window appears while your computer tries to connect to the router.



5. Enter the same security key or passphrase that is on your DHP-W312AV and click **Connect**.



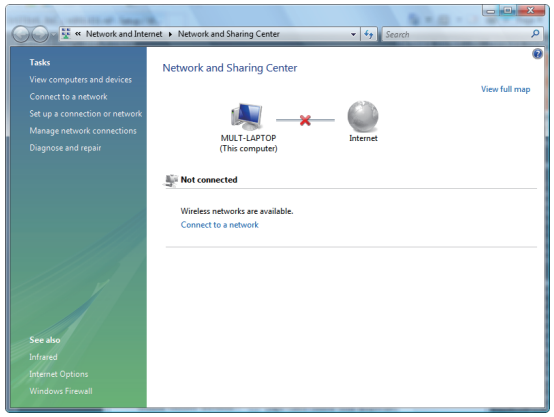
It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the security settings are correct. The key or passphrase must be exactly the same as on the wireless router.

Additionally, you may connect using Wi-Fi Protected Setup (WPS) and Push Button Configuration (PBC). When the window to the right is displayed, press the Common Connect Button on the DHP-W312AV.

Connecting to a Wireless Network
Using Windows Vista®

Windows Vista® users may use the convenient, built-in wireless utility. Follow these instructions:

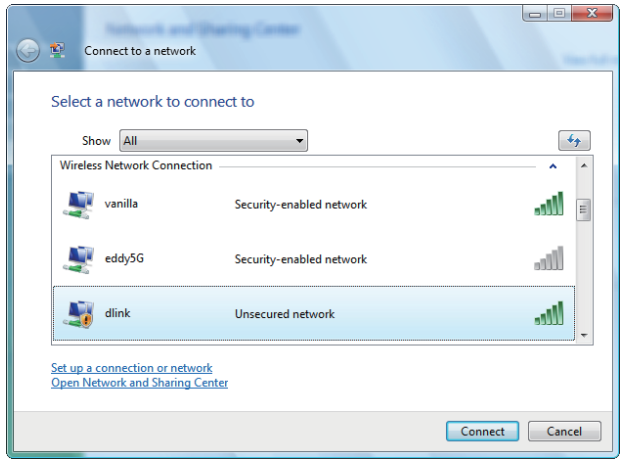
From the **Start menu**, go to **Control Panel**, and then click on Network and Sharing Center.



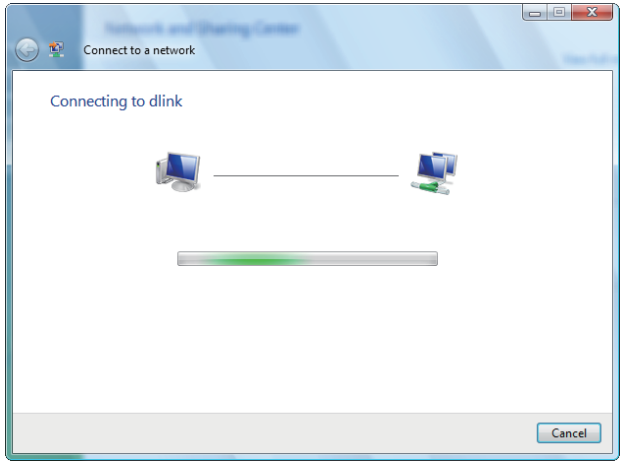
The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button. The Wi-Fi Configuration Card will list your device's specific network, it will not be simply dlink.

If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.

Click **Connect Anyway** to continue.



The utility will display the following window to indicate a connection is being made.



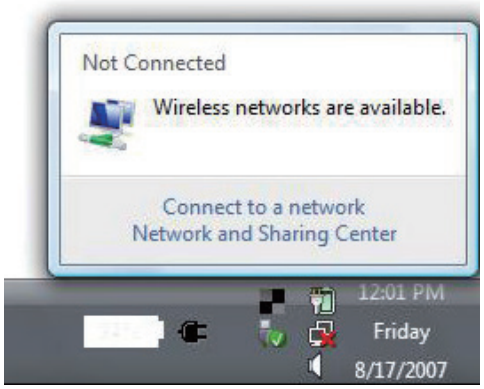
The final window indicates the establishment of a successful connection.

The next two pages display the windows used to connect to either a WEP or a WPA-PSK wireless network.

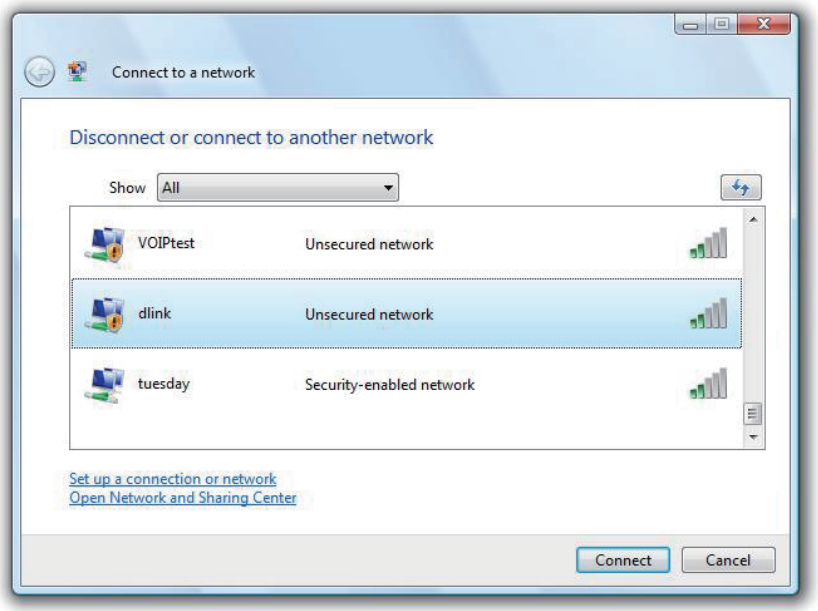
Configuring Wireless Security

It is recommended to enable wireless security (WPA/WPA2) on your wireless router or DHP-W312AV before configuring your wireless adapter. If you are joining an existing network, you will need to know the security key or passphrase being used.

1. Open the Windows Vista® Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower right corner of screen). Select **Connect to a network**.



2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



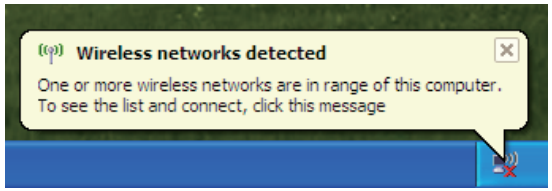
3. Enter the same security key or passphrase that is on your router and click **Connect**.

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the security settings are correct. The key or passphrase must be exactly the same as on the wireless router.

Connecting to a Wireless Network Using Windows® XP

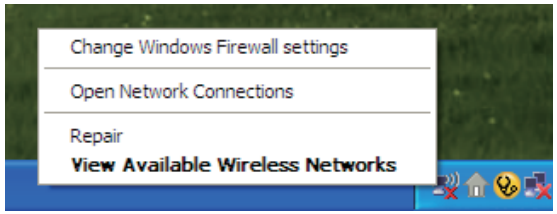
Windows XP users may use the built-in wireless utility (Zero Configuration Utility). The following instructions are for Service Pack 2 users. If you are using another company's utility or Windows 2000, please refer to the user manual of your wireless adapter for help with connecting to a wireless network. Most utilities will have a "site survey" option similar to the Windows XP utility as seen below.

If you receive the **Wireless Networks Detected** bubble, click on the center of the bubble to access the utility.



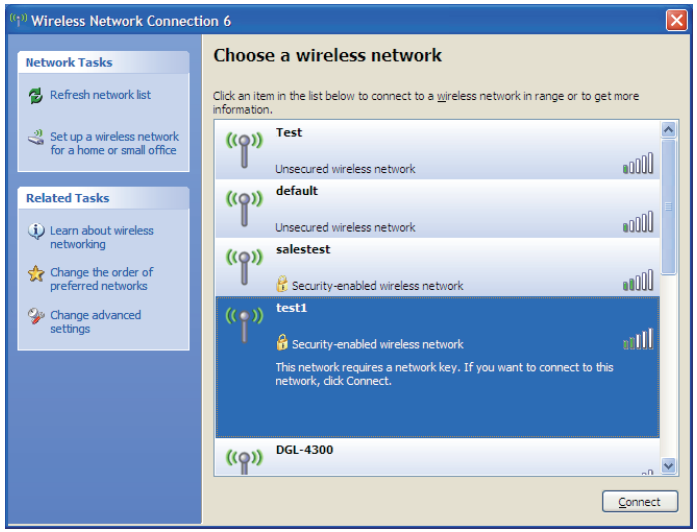
or

Right-click on the wireless computer icon in your system tray (lower right corner next to the time). Select **View Available Wireless Networks**.



The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button. The Wi-Fi Configuration Card will list your device's specific network, it will not be simply dlink.

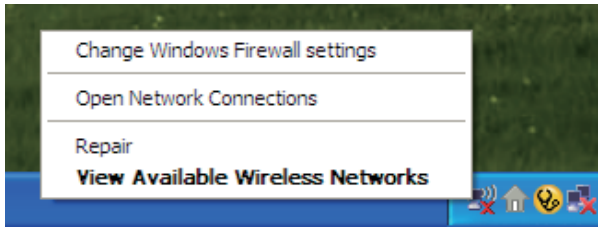
If you get a good signal but cannot access the Internet, check your TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.



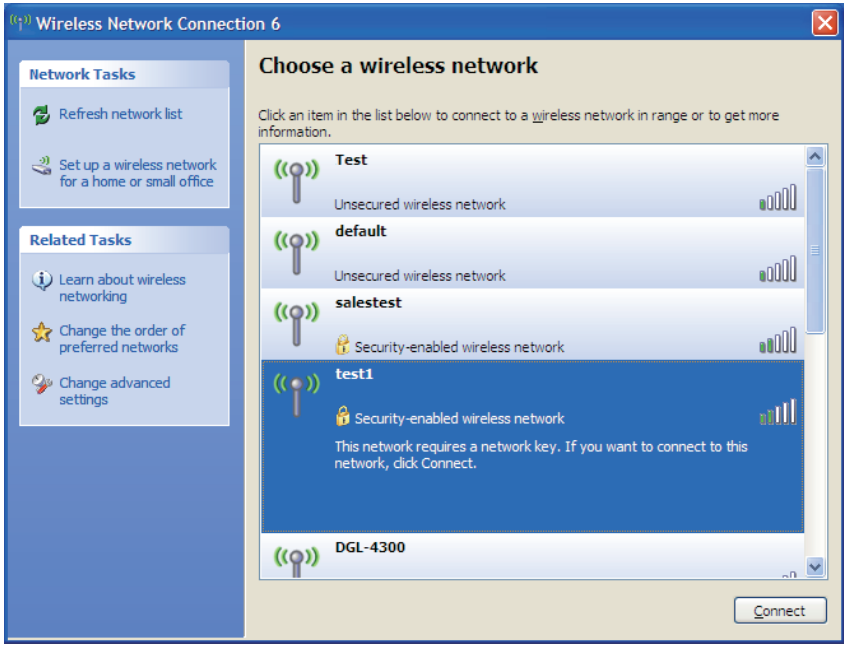
Configuring WPA-PSK

It is recommended to enable encryption on your wireless router or DHP-W312AV before configuring your wireless adapter. If you are joining an existing network, you will need to know the passphrase being used.

1. Open the Windows® XP Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower-right corner of screen). Select **View Available Wireless Networks**.

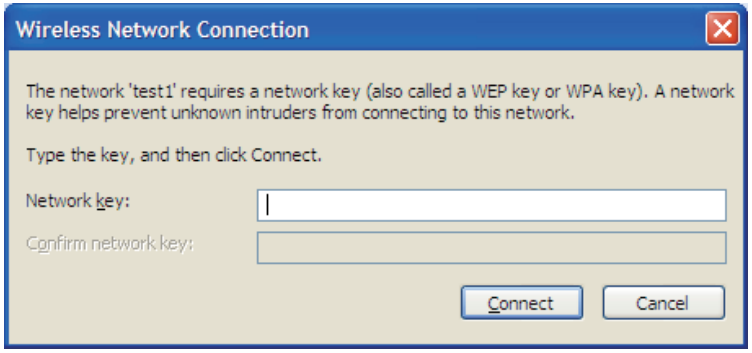


2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



3. The **Wireless Network Connection** box will appear. Enter the WPA-PSK passphrase and click **Connect**.

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the WPA-PSK settings are correct. The WPA-PSK passphrase must be exactly the same as on the wireless router.



Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DHP-W312AV. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows® XP. If you have a different operating system, the screenshots on your computer will look similar to the following examples.)

1. Why am I unable to access the web-based configuration utility?

When entering the IP address of the D-Link DHP-W312AV (**192.168.0.50**), you are not connecting to a website on the Internet or have to be connected to the Internet. The device has the utility built-in from the factory. Your computer must be on the same IP subnet to connect to the web-based utility. You may also enter **http://dlinkapWXYZ.local.** (on the Wi-Fi Configuration Card) instead of the IP address.

- Make sure you have an updated Java-enabled web browser. We recommend the following:
  - Microsoft Internet Explorer® 7.0 and higher
  - Mozilla Firefox 3.5 and higher
  - Google™ Chrome 8.0 and higher
  - Apple Safari 4.0 and higher

- Verify physical connectivity by checking for solid link lights on the device. If you do not get a solid link light, try using a different cable or connect to a different port on the device if possible. If the computer is turned off, the link light may not be on.

- Disable any internet security software running on the computer. Software firewalls such as Zone Alarm, Black Ice, Sygate, Norton Personal Firewall, and Windows® XP firewall may block access to the configuration pages. Check the help files included with your firewall software for more information on disabling or configuring it.

- Configure your Internet settings:

- Go to **Start** > **Settings** > **Control Panel**. Double-click the Internet Options Icon. From the Security tab, click the button to restore the settings to their defaults.
- Click the Connection tab and set the dial-up option to Never Dial a Connection. Click the **LAN Settings** button. Make sure nothing is checked. Click **OK**.
- Go to the Advanced tab and click the Reset... button to restore these settings to their defaults. Click **OK** three times.
- Close your web browser (if open) and open it.
- Access the web management. Open your web browser and enter the IP address of your D-Link DHP-W312AV in the address bar. This should open the login page for your the web management.
- If you still cannot access the configuration, unplug the power to the DHP-W312AV for 10 seconds and plug back in. Wait about 30 seconds and try accessing the configuration. If you have multiple computers, try connecting using a different computer.

2. What can I do if I forgot my password?

If you forgot your password, you must reset your DHP-W312AV. Unfortunately this process will change all your settings back to the factory defaults. To reset the DHP-W312AV, locate the reset button (hole) on the rear panel of the unit. With the DHP-W312AV powered on, use a paperclip to hold the button down for 5 seconds. Release the button and the DHP-W312AV will go through its reboot process. Wait about 30 seconds to access the DHP-W312AV. The default IP address is 192.168.0.50. When logging in, the username is Admin and leave the password box empty

3. Why can't my Powerline AV device detect my other Powerline AV devices?

This may due to the accidental change of the device password. Use the web-based configuration utility and select **Setup** > **PLC SETTINGS**. Fill in the password in the blank. Then repeat the same procedure to the other Powerline AV device via web-based configuration utility.

4. I cannot start my Powerline AV device.

Please check your power supply is working. Powerline AV device operates from the power supplied by the home electrical wiring and can not operate without a working power supply.

Wireless Basics

D-Link wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. Strictly adhering to the IEEE standard, the D-Link wireless family of products will allow you to securely access the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking delivers.

A wireless local area network (WLAN) is a cellular computer network that transmits and receives data with radio signals instead of wires. Wireless LANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Wireless users can use the same applications they use on a wired network. Wireless adapter cards used on laptop and desktop systems support the same protocols as Ethernet adapter cards. Under many circumstances, it may be desirable for mobile network devices to link to a conventional Ethernet LAN in order to use servers, printers or an Internet connection supplied through the wired LAN.

What is Wireless?

Wireless or Wi-Fi technology is another way of connecting your computer to the network without using wires. Wi-Fi uses radio frequency to connect wirelessly, so you have the freedom to connect computers anywhere in your home or office.

D-Link is the worldwide leader and award winning designer, developer, and manufacturer of networking products.
D-Link delivers the performance you need at a price you can afford. D-Link has all the products you need to build your network.

How does wireless work?

Wireless works similar to how cordless phone work, through radio signals to transmit data from one point A to point B. But wireless technology has restrictions as to how you can access the network. You must be within the wireless network range area to be able to connect your computer. There are two different types of wireless networks Wireless Local Area Network (WLAN), and Wireless Personal Area Network (WPAN).

Wireless Local Area Network (WLAN)

In a wireless local area network, a device called an DHP-W312AV (AP) connects computers to the network. The DHP-W312AV has a small antenna attached to it, which allows it to transmit data back and forth over radio signals. With an indoor DHP-W312AV as seen in the picture, the signal can travel up to 300 feet. With an DHP-W312AV the signal can reach out up to 30 miles to serve places like manufacturing plants, industrial locations, college and high school campuses, airports, golf courses, and many other venues.

Who uses wireless?

Wireless technology has become so popular in recent years that almost everyone is using it. Whether it's for home, or office D-Link has a wireless solution for it.

Home

- Gives everyone at home broadband access
- Surf the web, check email, instant message, etc.
- Gets rid of the cables around the house
- Simple and easy to use

Small Office and Home Office

- Stay on top of everything at home as you would at office
- Remotely access your office network from home
- Share Internet connection and printer with multiple computers
- No need to dedicate office space

Where is wireless used?
Wireless technology is expanding everywhere not just at home or office. People like the freedom of mobility and it's becoming so popular that more and more public facilities now provide wireless access to attract people. The wireless connection in public places is usually called "hotspots".

Using a D-Link Cardbus Adapter with your laptop, you can access the hotspot to connect to Internet from remote locations like: Airports, Hotels, Coffee Shops, Libraries, Restaurants, and Convention Centers.

A wireless network is easy to setup, but if you're installing it for the first time it could be quite a task not knowing where to start. That's why we've put together a few setup steps and tips to help you through the process of setting up a wireless network.

Tips
Here are a few things to keep in mind, when you install a wireless network.

Centralize your DHP-W312AV or DHP-W312AV
Make sure you place the bridge/DHP-W312AV in a centralized location within your network for the best performance. Try to place the bridge/DHP-W312AV as high as possible in the room, so the signal gets dispersed throughout your home. If you have a two-story home, you may need a repeater to boost the signal to extend the range.

Eliminate Interference
Place home appliances such as cordless telephones, microwaves, wireless speakers, and televisions as far away as possible from the bridge/DHP-W312AV. This would significantly reduce any interference that the appliances might cause since they operate on same frequency.

Security
Don't let your next-door neighbors or intruders connect to your wireless network. Secure your wireless network by turning on the WPA, WPA2, or WEP security feature on the DHP-W312AV.

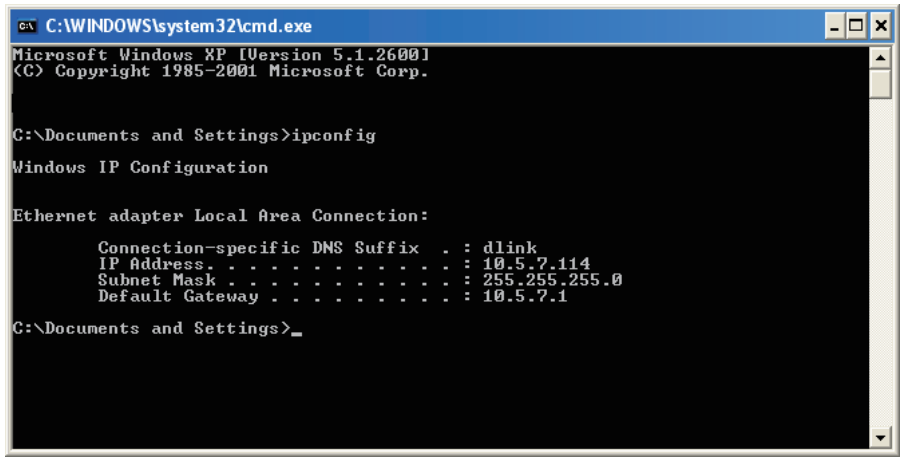
Networking Basics

Check your IP address

After you install your new D-Link adapter, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless router) automatically. To verify your IP address, please follow the steps below.

Click on **Start** > **Run**. In the run box type **cmd** and click **OK**. (Windows® 7/ Vista® users type **cmd** in the Start Search box.)

At the prompt, type **ipconfig** and press **Enter**.
This will display the IP address, subnet mask, and the default gateway of your adapter.



If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your DHP-W312AV. Some firewall software programs may block a DHCP request on newly installed adapters.

If you are connecting to a wireless network at a hotspot (e.g. hotel, coffee shop, airport), please contact an employee or administrator to verify their wireless network settings.

Statically Assign an IP address

If you are not using a DHCP capable gateway/DHP-W312AV, or you need to assign a static IP address, please follow the steps below:

Step 1
Windows Vista® - Click on Start > Control Panel > Network and Internet > Network and Sharing Center > Manage Network Connections.
Windows® XP - Click on Start > Control Panel > Network Connections.
Windows® 2000 - From the desktop, right-click My Network Places > Properties.

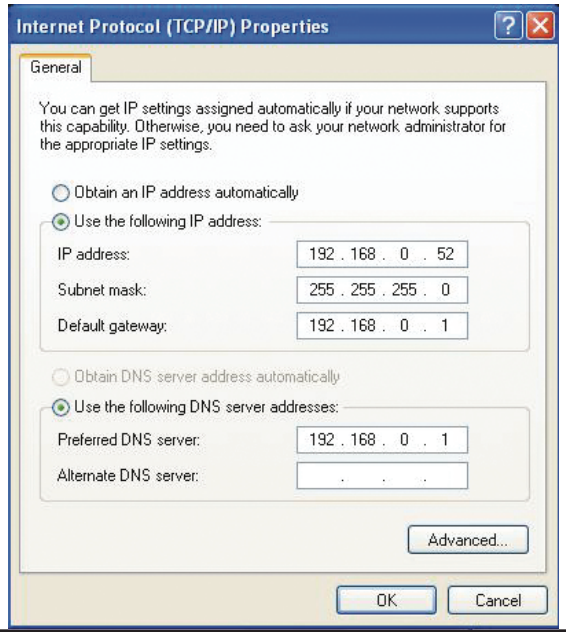
Step 2
Right-click on the Local Area Connection which represents your D-Link network adapter and select Properties.

Step 3
Highlight Internet Protocol (TCP/IP) and click Properties.

Step 4
Click Use the following IP address and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.
Example: If the AP's LAN IP address is 192.168.0.50, make your IP address 192.168.0.X where X is a number between 2 and 99 (excluding the number 50). Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your router (192.168.0.1).

Set Primary DNS the same as the LAN IP address of your router (192.168.0.1).
The Secondary DNS is not needed or you may enter a DNS server from your ISP.

Step 5
Click **OK** twice to save your settings.



Technical Specifications

Standards

- IEEE 802.11ac
- IEEE 802.11n
- IEEE 802.11g
- IEEE 802.3
- IEEE 802.3u
- IEEE P1905.1 draft
- IEEE 1901

Network Interfaces

- One 10/100 Ethernet port
- Wireless AC
- Powerline

AC Input

- 100 - 240 VAC 50/60 Hz

Security

- WPA
- WEP
- WPA2

Wireless Signal Rates*

- 300Mbps
- 108Mbps
- 54Mbps
- 48Mbps
- 36Mbps
- 18Mbps
- 24Mbps
- 12Mbps
- 11Mbps
- 9Mbps
- 6Mbps
- 5.5Mbps
- 2Mbps
- 1Mbps

MSC (0-15)

- 130Mbps (270)
- 104Mbps (216)
- 66Mbps (135)
- 52Mbps (108)
- 26Mbps (54)
- 12Mbps (27)
- 117Mbps (243)
- 78Mbps (162)
- 58.5Mbps (121.5)
- 39Mbps (81)
- 19.5Mbps (40.5)
- 6.5Mbps (13.5)

Frequency Range

- 2.4GHz to 2.497GHz

Encryption

- 128-bit AES
- WEP/WPA/WPA2

Operating Temperature

- 32 to 104 °F (0 to 40 °C)

Storage Temperature

- 14 to 158 °F (-10 to 70 °C)

Humidity

- Operation: 10% to 90% Relative Humidity
- Storage: 5% to 90% Relative Humidity

Transmitter Output Power

- 13 dBm (+/- 2dB)

* Maximum wireless signal rate derived from IEEE Standard 802.11g and 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental factors will adversely affect wireless signal range.

LEDs

- Power
- WLAN
- Ethernet
- Powerline

Safety & Emissions

- FCC
- CE
- RoHS
- UL, CE LVD

Dimensions

- 101 x 75 x 45 mm (3.54 x 2.56 x 1.97 inches)

Weight

- United Kingdom: 185.7 g (.41 lbs)
- United States: 174.5 g (.38 lbs)
- Australia: 179.1 g (.39 lbs)
- Europe: 174.8 g (.38 lbs)

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.

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.

Operation of this device is restricted to indoor use only.

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

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.

Country Code selection feature to be disabled for products marketed to the US/CANADA

Industry Canada statement:
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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;

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;

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.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Input rating: 100-240 Vac, 50-60 Hz, 0.15A