# IEEE 802.11g HomePlug WLAN AP

# User's Guide

# 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.

## IMPORTANT NOTE:

## FCC 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.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

# *TABLE OF CONTENT*

# *INTRODUCTION*

Congratulations on your purchase of this HomePlug Wireless LAN Access Point. This manual helps to features the innovating wireless technology that can help you build a wireless network easily! This manual contains detailed instructions in operation of this product. Please keep this manual for future reference.

With a WLAN (IEEE 802.11g) Access Point, a mobile computer can share data with another mobile computer in a wireless way. Easy-to-use utilities are bundled with WLAN Access Point for configuration and monitoring purposes.

WLAN networking can wirelessly transmit and receive data, minimizing the need for wired connections, at a speed of up to Fifty-four megabit per second. With WLAN networking, you can locate your PC wherever you want without wires and cables.

WLAN networking provides users with an access to real-time information anywhere in their organization. The mobility provides productivity and service, which are not available under wired networks.

## About the HomePlug WLAN AP

The HomePlug WLAN AP allows user to connect with other WLAN/LAN enabled devices through AC power line at home or office.

## Product Freture

◆ HomePlug 1.0 Turbo compliant

◆ Wireless 802.11g AP Mode

◆ HomePlug data rate up to 85Mbps on existing AC power line with auto adaptation

◆ Supports 56-bit DES Protection for Secure Data Transmission

◆ Supports 3 LED indicators for Power, HomePlug and WLAN

◆ Supports Web based configuration

◆ Designed with universal power rating.

# *UNPACKING AND SETUP*

This chapter provides unpacking and setup information for the HomePlug WLAN AP.

## Unpacking

Open the box of the HomePlug WLAN AP and carefully unpack it. The box should contain the following items:

◆ One HomePlug Wireless LAN Access Point

◆ One 2dBi dipole antenna

◆ One CD-ROM with Configuration Utility and User's Guide

If any item is found missing or damaged, please contact your local reseller for replacement.

## Setup

The setup of the HomePlug WLAN AP can be performed properly using the following methods:

◆ Visually inspect the AC power plug and make sure that it is fully secured to the AC power outlet.

◆ Make sure that there is proper heat dissipation from and adequate ventilation around the HomePlug WLAN AP.

◆ Fix the direction of the antennas. Try to place the HomePlug WLAN AP in a position that can best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be. The antenna's position enhances the receiving sensitivity.

# *HARDWARE INSTALLATION*

The HomePlug WLAN AP is designed to be simple and easy install.

## AC Power Plug

Plugging into the AC power outlet.

## Antenna

Detachable 2 dBi Gain Antenna for wireless connection.

## Reset hole

Use a pin-shape item to push to reset this device to factory default settings. It will be useful too when the manager forgot the password to login, but the setting will be back to default setting.

## LED Indicators

**Power:**      This LED lights green when the switch is receiving power.

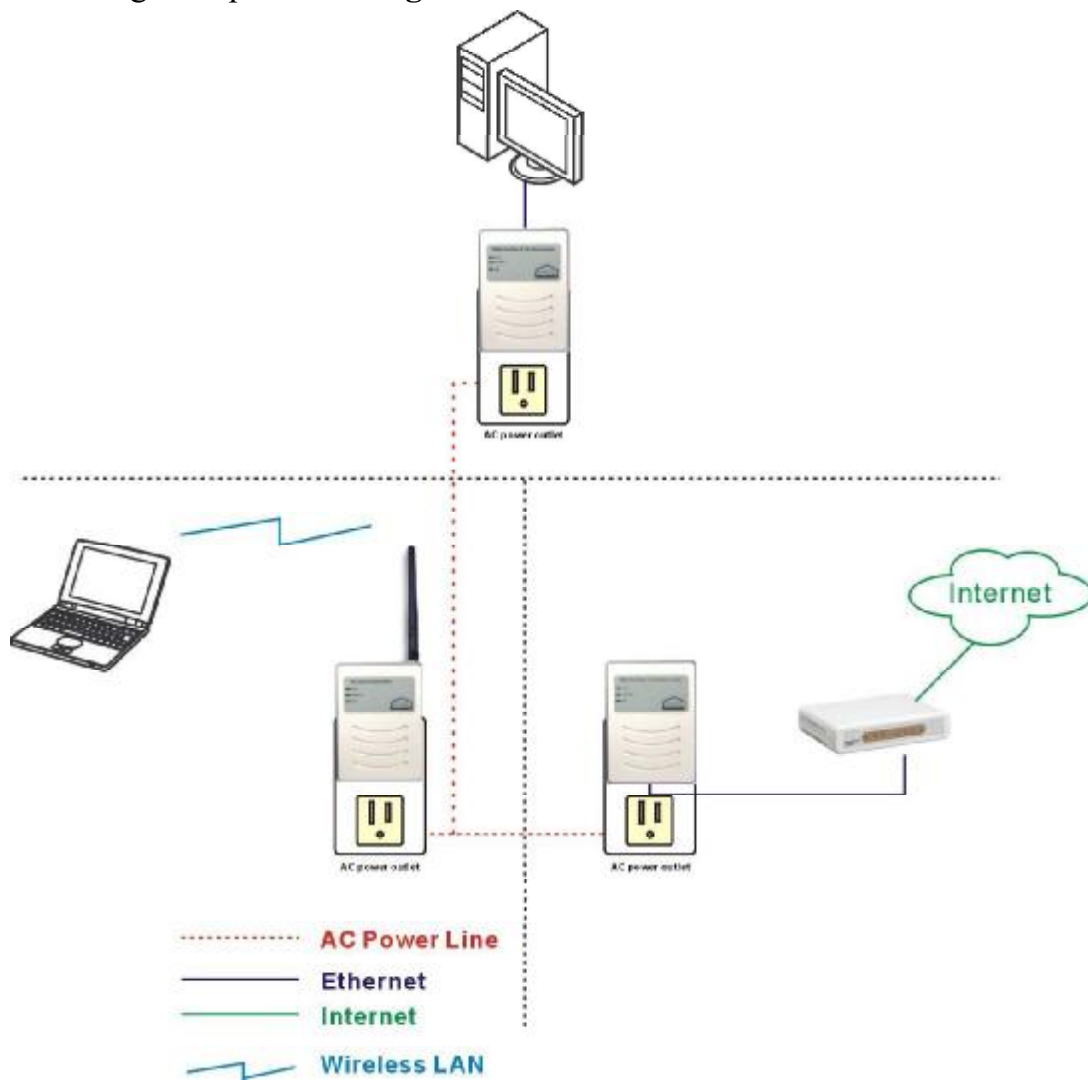**HomePlug:** This LED will blink when there is HomePlug activity.

**WLAN:**      This LED will blink when there is wireless LAN activity.
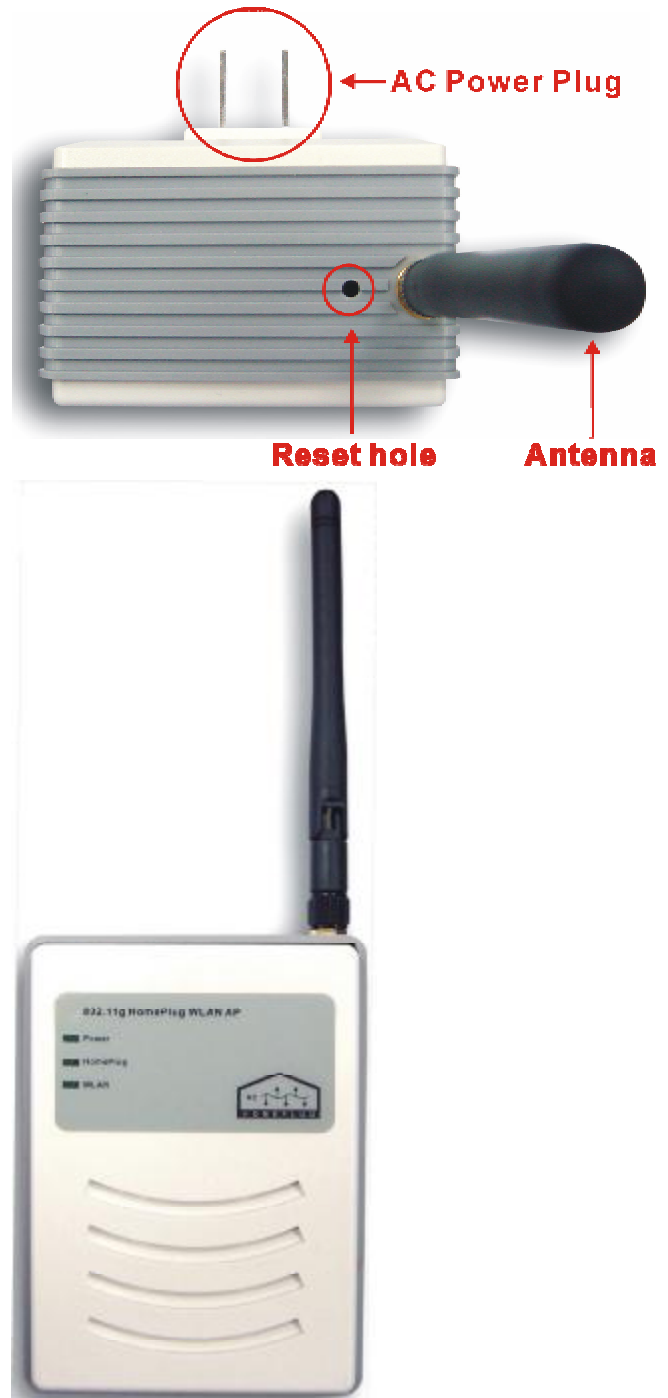
## Connecting to the HomePlug WLAN AP

1. Plug the HomePlug WLAN AP into an outlet.

2. Setup your WLAN Card for below parameters:

   ◆ SSID: **powerline-ap**

   ◆ Channel: **6**

   ◆ Security: **disable**

   ◆ IP Address: **192.168.1.1**

   ◆ HomePlug Group: **HomePlug**

# *PC NETWORK TCP/IP SETTING*

The network TCP/IP settings differ based on the computer's operating system (Win95/98/ME/NT/2000/XP) and are as follows.

## Windows 95/98/ME

1. Click on the "**Network neighborhood**" icon found on the desktop.

2. Click the right mouse button and a context menu will be show.

3. Select "**Properties**" to enter the TCP/IP setting screen.

4. Select "**Obtain an IP address automatically**" on the "**IP address**" field.



**Figure 1. Windows 95/95/Me IP setup**
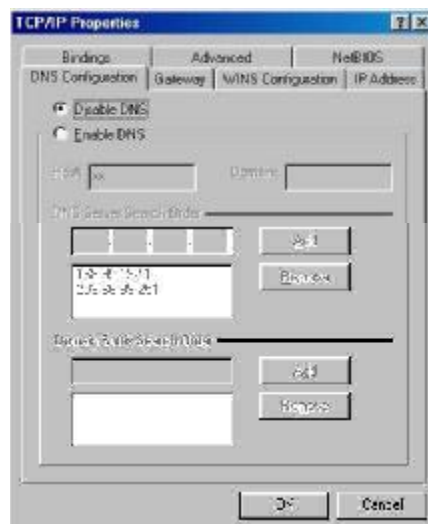
5. Select "**Disable DNS**" in the "**DNS**" field.



**Figure 2. Windows 95/98/Me DNS setup**

6. Select "**None**" for the "**Gateway address**" field.
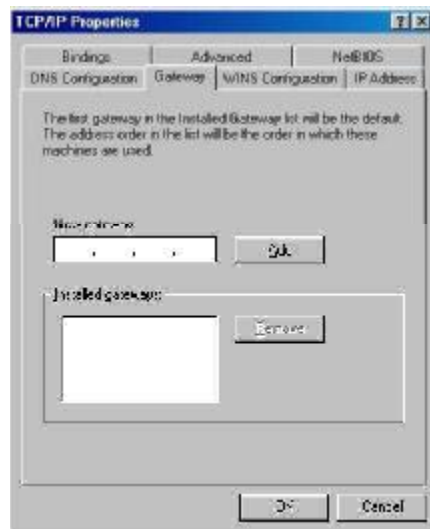


Figure 3. Windows 95/98/Me Gateway setup

## Windows 2000

Double click on the "**My computer**" icon on the desktop. When "**My computer**" window opens, open the "**Control panel**" and then open the "**Network dialup connection**" applet. Double click on the "Local area network connection" icon. Select "Properties" to enter the TCP/IP setting window.

1. In the "**Local area network status**" window, click on "**Properties**."

2. In the "**Local area network connection**" window, first select TCP/IP setting and then select "**Properties**."

3. Set both "**IP address**" and "**DNS**" to **Automatic configuration**.



Figure 4. Windows 2000 IP and DNS setup

## Windows XP

Point the cursor and click the right button on the "My Network Place" icon.
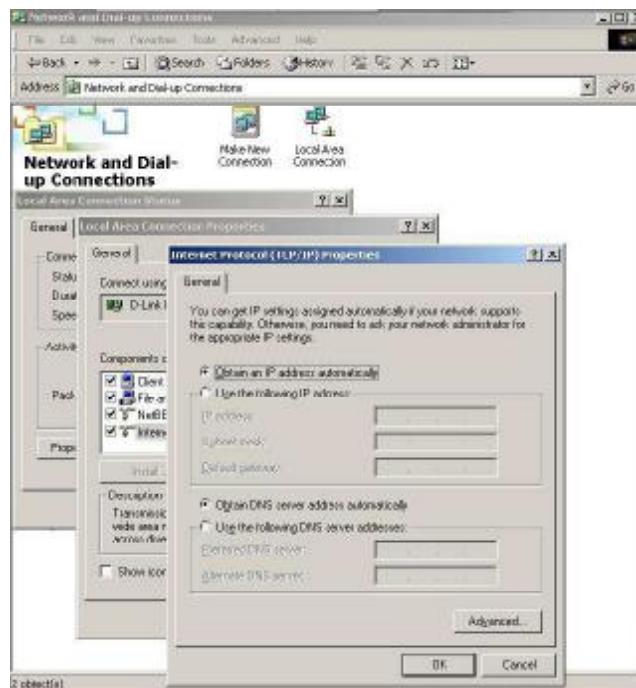
Select "properties" to enter the TCP/IP setting window.

1.  Set "**IP address**" to "**Obtain an IP address automatically**."
2.  Set "**DNS**" to "**Obtain DNS server address automatically**."



**Figure 5. Windows XP IP and DNS setup**

# *HOMEPLUG CONFIGURATION UTILITY*

To start the Configuration Utility, double click the icon on the desktop, the Configuration Utility will be executed.

The Configuration Utility was divided into four tabs, Main, Privacy, Diagnostics and About, for details instruction, follow the below section.



**Figure 6. Screen shot of the Configuration Utility**

## Main

The Main screen provides a list of all HomePlug devices logically connected to the computer when the utility is running.

The top panel shows all local HomePlug connected to the computer's NIC (Network Interface Card). In most cases, only one device will be seen. In situations where there are more than one local device being connected, such as a USB or an Ethernet adapter, the user can select the local device by clicking on it and then click the Connect button to its right. The status area above the button indicates that your PC is connected to that same device. Once connected to the local device, the utility will automatically scan the HomePlug periodically for any other HomePlug devices. If no local HomePlug devices are discovered, the status area above the connect button will indicate with a message *'NO HomePlug ADAPTERS DETECTED'*.

The lower panel displays all the HomePlug remote devices, discovered on the current logical network. The total number of remote devices connected on the same network can be found on top of the remote device panel. The Network type (Public or Private) is also displayed based on the network status of the local device. The scan status option is displayed on the top right corner above the Remote devices panel showing whether the auto scan functionality is turned ON or OFF. The following information is displayed for all devices that appear in the lower panel.

## Device Name

Column shows the default device name, which may be user re-defined. A user can change the name by either using the rename button or by clicking on the name and editing in-place. (**Figure 7**)



**Figure 7. Change Device Name**

## MAC Address

Column shows the Remote device's MAC address.

## Password

Column by default is blank and 'Enter Password' button can be used to enter it.

To set the Password of the device (required when creating a private network). First select the device by clicking on its name in the lower panel and then click on the Enter Password button. A dialog box will appear as shown in **Figure 8** to type the password. The selected device name is shown above the password field and the password can be verified by hitting the OK button. The Password field accepts the Device password in any case formats, with or without dashed between them.



**Figure 8. Set device password**

A confirmation box will appear if the password was entered correctly (錯誤! 找不到參照來源。). If a device was not found, the user will be notified along with the suggestions to resolve common problems. This process might take a few seconds to get completed.



**Figure 9.**

The Add button is used to add a remote device to the existing network by entering the device password of the device. A dialog box will appear as shown below in Figure 10. The dialog box allows the user to enter both a device name and the password.



**Figure 10. Add remote device**

A confirmation box will appear if the password was entered correctly (Figure 9) and if the device was found in the HomePlug network. If a device was not found, the user will be notified and suggestions to resolve common problems will be presented.

The Scan button is used to perform an immediate search of the HomePlug devices connected to the HomePlug network. By default, the utility automatically scans every few seconds and updates the display screen.

## Privacy

The Privacy screen provides the user with an option to maintain security for their logical network and also to select the devices that has to be included in the network. The appearance is shown in Figure 11.



**Figure 11. Privacy screen**

All HomePlug devices are shipped using a default logical network (network name), which is normally "HomePlug". The Privacy dialog screen allows user to change to a private network by changing the network name (network password) of devices.

### User Default Button

The user can always reset to the HomePlug network (Public) by entering "HomePlug" as the network name or by clicking on the Use Default button.

### Set Local Device Only button

The Set Local Device Only button can be used to change the network name (network password) of the local device. If a new network password is entered, all the devices seen on the Main panel prior to this will be no longer present in the new network, effectively making the local devices not to communicate to the devices that were in the old logical network. Devices previously set up with the same logical network (same network name) will appear in the device list afterward selecting this option.

### Set All Device button

The Set All Devices button is used to change the logical network of all devices that appear on the Main panel whose Device's Password had been entered for the same logical network. A dialog window will appear to report the success of this operation. For devices whose device passwords were not entered, this operation will fail and will report a failure message.

# Diagnostics

The Diagnostics screen shows System information and a history of all remote devices seen over a period of time. The appearance is shown in Figure 12.



**Figure 12. Diagnostics screen**

The Upper panel shows technical data concerning software and hardware present on the host computer which were used to communicate over HomePlug on the Power line network. It shall include the following:

◆ Operating System Platform/Version

◆ Host Network Name

◆ User Name

◆ MAC Address of all NICs (Network interface card) connected to the host

◆ Identify versions of all Driver DLLs and Libraries used (NDIS) and optionally

◆ HomePlug chipset manufacturer name (Turbo Only devices)

◆ MAC Firmware Version (Turbo Only devices)

◆ MAC addresses of all devices connected locally to the host

◆ Version of the Configuration Utility

The Lower panel contains a history of all remote devices seen on the computer over a certain period of time. All devices that were on the power line network are listed here along with a few other parameters. Devices that are active on the current logical network will show a transfer rate in the Rate column; devices on other networks, or devices that may no longer exist are shown with a "?" in the Rate column. The following remote device information is available from the diagnostics screen:

◆ Operating System Platform/Version

◆ Host Network Name

◆ User Name

◆ MAC Address of all NICs (Network interface card) connected to the host

◆ Identify versions of all Driver DLLs and Libraries used (NDIS) and optionally

- ◆ HomePlug chipset manufacturer name (Turbo Only devices)
- ◆ MAC Firmware Version (Turbo Only devices)
- ◆ MAC addresses of all devices connected locally to the host
- ◆ Version of the Configuration Utility
- ◆ Vendor name

## About

The About screen shows the software version and Preferences setting.

### Preferences

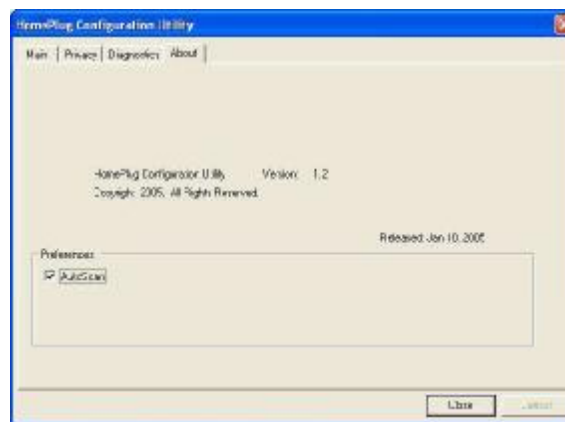AutoScan function enable or disable.



**Figure 13. About dialog screen**

# *WEB BASED AP CONFIGURATION*

First make sure that the network connections are functioning normally.

This HomePlug WLAN AP can be configured using Internet Explorer 5.5 or newer web browser versions.

## Login to the HomePlug WLAN AP

Before configuring the HomePlug WLAN AP through WLAN, make sure that the SSID, Channel and the WEP is set properly.

The default setting of the HomePlug WLAN AP that you will use:

◆ SSID: **powerline-ap**

◆ Channel: **6**

◆ Security: **disable**

◆ IP Address: **192.168.1.1**

◆ HomePlug Group: **HomePlug**

## Using the Web Browser

1. Open Internet Explorer 5.5 or above Internet browser.

2. Enter IP address ***http://192.168.1.1*** (the factory-default IP address setting) to the URL web address location.

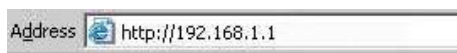**Figure 14. Web address**

3. When the following dialog box appears, enter the user name and password to login to the main configuration window, the default username and password is "***admin***".

**Figure 15. Login**

Note: If needed to set a password, then refer to the **System – Password Setting**.

After entering the password, the main page comes up, the screen will display the device information.

**Figure 16. Device information**

## Configuration Menu

When the main page appears, find the *Configuration menu* in the left side of the screen. Click on the setup item that you want to configure. There are six main options: *IP Setting, Wireless, Access Control, HomePlug, System and Wizard* as shown in the Configuration Menu screen.



**Figure 17. Configuration Menu**

## LAN Setting

The function enables user to configure the HomePlug WLAN AP IP address & DHCP Server.

### Basic

This page leads to set the HomePlug WLAN AP properties, such as the host name, IP address, and subnet mask.



**Figure 18.**

The default IP address of this HomePlug WLAN AP is 192.168.1.1 with the subnet mask of 255.255.255.0. User can type in other values for IP Address, Subnet Mask and Gateway and click **"Apply"** button for the changes to be effective.

User can also set the HomePlug WLAN AP to obtain the IP from a DHCP server, but it is not recommended. Select the option "Obtain IP Automatically" and click **"Apply"** button for the changes to be effective.

**Host Name:** Type the host name in the text box. The host name is required by some ISPs. The default host name is "powerline-ap"

**IP Address:** This is the IP address of the HomePlug WLAN AP. The default IP address is 192.168.1.1.

**Subnet Mask:** Type the subnet mask for the HomePlug WLAN AP in the text box. The default subnet mask is 255.255.255.0.

**Gateway:** Type the gateway address of the network. Contact the ISP or network administrator for this information.

**DNS Server:** Type up to DNS IP address in the text boxes. Your ISP will provide you with this information.

**DHCP**



**Figure 19.**

**DHCP Server:** Enables the DHCP server to allow the HomePlug WLAN AP to automatically assign IP addresses to devices connecting to the LAN. DHCP is enabled by default.

**DHCP Server Start IP:** Type an IP address to serve as the start of the IP range that DHCP will use to assign IP addresses to all LAN devices connected to the HomePlug WLAN AP.

**DHCP Server End IP:** Type an IP address to serve as the end of the IP range that DHCP will use to assign IP addresses to all LAN devices connected to the HomePlug WLAN AP.

**Lease Time:** The lease time specifies the amount of connection time a network user be allowed with their current dynamic IP address.

**Dynamic DHCP List:** All dynamic DHCP client computers are listed in the table and providing the Host name, IP address, and MAC address and Expired Time of the client.

## Wireless setting

This section enables user to set wireless communications parameters for the HomePlug WLAN AP's wireless LAN feature.

### Basic

This page allow user to enable and disable the wireless LAN function, create a SSID, and select the channel for wireless communications.



**Figure 20.**

**Wireless:** Enables or disables the wireless LAN function of the HomePlug WLAN AP.

**SSID:** Type an SSID in the text box. The SSID of any wireless device must match the SSID typed here in order for the wireless device to access the LAN via the HomePlug WLAN AP.

**SSID Broadcast:** While SSID Broadcast is enabled, all wireless clients will be able to view the HomePlug WLAN AP's SSID. For security purposes, users may want to disable SSID Broadcast to ensure only authorized clients have access.

**Channel:** Select a transmission channel for wireless communications. The channel of any wireless device must match the channel selected here in order for the wireless device to access the LAN via the HomePlug WLAN AP.

## Security

This function enables user to set authentication type for secure wireless communications. Open System allows public access to the HomePlug WLAN AP via wireless communications. Shared Key requires the user to set a WEP key to exchange data with other wireless clients that have the same WEP key. This HomePlug WLAN AP also supports WPA, WPA2 and WPA-PSK, WPA2-PSK.



**Figure 21.**

**Security:** Enable or Disable the wireless LAN security.

WEP



**Figure 22.**

**WEP:** Open System and Shared Key requires the user to set a WEP key to exchange data with other wireless clients that have the same WEP key.

**WEP Key Format:** Select the key format from the drop-down list HEX or ASCII.

**WEP Key Length:** Select the level of encryption from the drop-down list. The HomePlug WLAN AP supports, 64 and 128-bit encryption.

**WEP Key 1 ~ 4:** Enables users to create up to 4 different WEP keys. Manually enter a set of values for each key. Select a key to use by clicking the radio button next to the key. Click "Clear" to erase key values.

## WPA-PSK / WPA2-PSK



**Figure 23.**



**Figure 24**

If WPA or WPA2 **PSK** is selected, the above screen is shown.

**Encryption Type:** Select the encryption type for TKIP or AES encryption.

**Passphrase:** The length should be 8 characters at least.

## WPA / WPA2



**Figure 25.**



**Figure 26**

If WPA or WPA2 **EAP** is selected, the above screen is shown. Please set the length of the encryption key and the parameters for the RADIUS server.

**Encryption Type:** Select the encryption type for TKIP or AES encryption.

**RASIUS Server:**

1. Enter the IP address, Port used and Shared Secret by the Primary Radius Server.
2. Enter the IP address, Port used and Shared Secret by the Secondary Radius Server. (optional)

**Advanced**

This function enables user to configure advanced wireless functions.



**Figure 27.**

**Beacon Interval:** Type the beacon interval in the text box. User can specify a value from 20 to 1000. The default beacon interval is 100.

**RTS Threshold:** Type the RTS (Request-To-Send) threshold in the text box. This value stabilizes data flow. If data flow is irregular, choose values between 256 and 2432 until data flow is normalized.

**Fragmentation Threshold:** Type the fragmentation threshold in the text box. If packet transfer error rates are high, choose values between 1500 and 2346 until packet transfer rates are minimized. (NOTE: set this fragmentation threshold value may diminish system performance.)

**DTIM Interval:** Type a DTIM (Delivery Traffic Indication Message) interval in the text box. User can specify a value between 1 and 255. The default value is 1.

**TX Rates:** Select one of the wireless communications transfer rates, measured in megabytes per second, based upon the speed of wireless adapters connected to the WLAN.

**Antenna Transmit Power:** Adjust the power of the antenna transmission by selecting from the drop down list: full, half (-3dB), quarter (-6dB), eighth (-9dB) or min.

*Note: Antenna Transmit power is regulated by international standard and users are forbidden to change its maximum limit.*

**WMM Function:** Select to enable or disable the WMM function (Wi-Fi Multimedia QoS).

# Access Control Setting

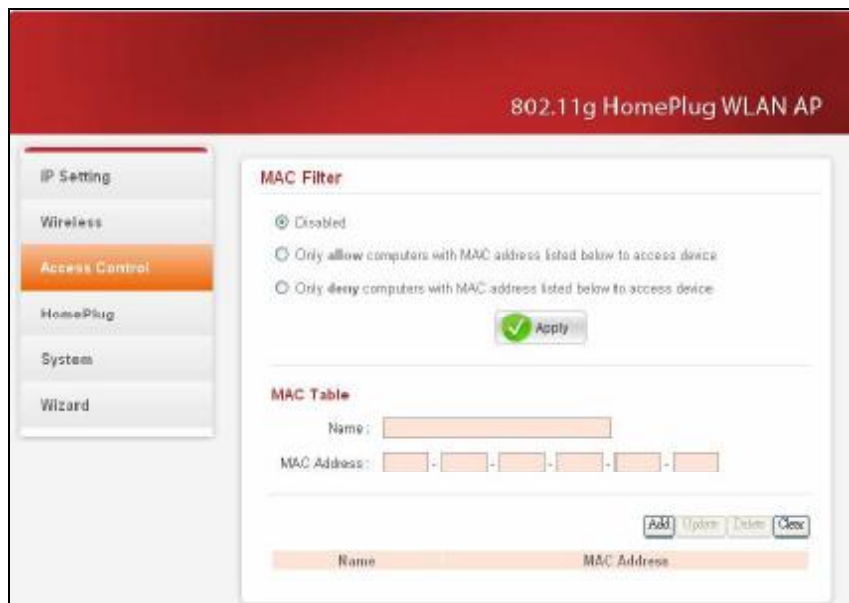This access control enables you to define access restrictions for MAC filter.



**Figure 28.**

**MAC Filter:** Enables you to allow or deny Internet access to users within the LAN based upon the MAC address of their network interface. Click the radio button next to Disabled to disable the MAC filter.

**Disable:** Disable the MAC filter function.

**Allow:** Only allow computers with MAC address listed in the MAC Table.

**Deny:** Computers in the MAC Table are denied Internet access.

**MAC Table:** Use this section to create a user profile which Internet access is denied or allowed. The user profiles are listed in the table at the bottom of the page. (Note: Click anywhere in the item. Once the line is selected, the fields automatically load the item's parameters, which you can edit.)

**Name:** Type the name of the user to be permitted/denied access.

**MAC Address:** Type the MAC address of the user's network interface.

**Add:** Click to add the user to the list at the bottom of the page.

**Update:** Click to update information for the user, if you have changed any of the fields.

**Delete:** Select a user from the table at the bottom of the list and click to remove the user profile.

**Clear**: Click to erase all fields and enter new information.

## HomePlug Setting

The HomePlug setting provides the user with an option to maintain security for their logical network and also to select the devices that has to be included in the HomePlug network

All HomePlug devices are shipped using a default logical network (network name), which is normally "HomePlug". The Privacy dialog screen allows user to change to a private network by changing the network name (network password) of devices.
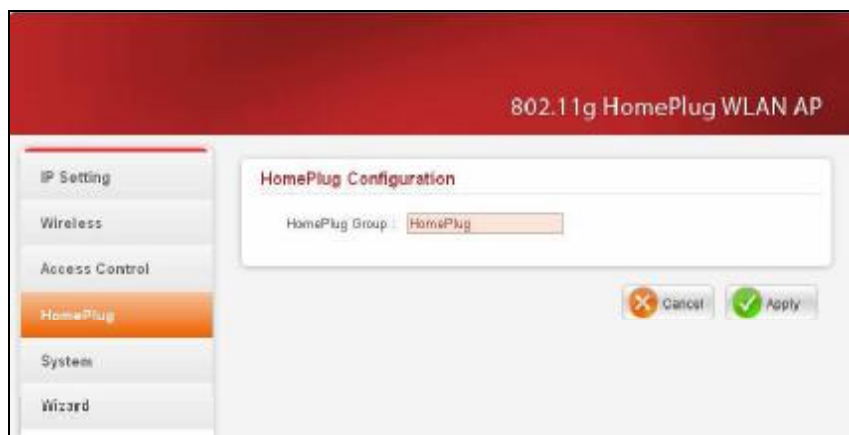


**Figure 29.**

## System Setting

This system setting enables users to change password, set the device time, view the device information, restart the system, save and load different settings as profiles, restore factory default settings, upgrade the firmware….etc.

### Password

This function enables users to set administrative and password. These passwords are used to gain access to the HomePlug WLAN AP.



**Figure 30**

**Device Information**

This function enables users to view the system status and configuration of the HomePlug WLAN AP.



<div align="center">

**Figure 31**

</div>

**System:** This section displays the HomePlug WLAN AP configuration including the MAC address, IP Address, Subnet Mask, and DHCP Server Status.

**Wireless:** This section displays the wireless configuration information, including the MAC address, the Connection status, SSID, Channel and Authentication type.

## Log

This function enables users to view a running log of HomePlug WLAN AP system statistics, events, and activities. The log displays up to 200 entries. Older entries are overwritten by new entries.



**Figure 32.**

The Log screen commands are as follows:

Click *"First Page"* to view the first page of the log

Click *"Last Page"* to view the final page of the log

Click **"*Previous Page*"** to view the page just before the current page

Click **"*Next Page*"** to view the page just after the current page

Click **"*Clear Log*"** to delete the contents of the log and begin a new log

Click **"*Refresh*"** to renew log statistics

## Statistic

This function displays a table that shows the rate of packet transmission of the HomePlug and Wireless LAN interface (in bytes per second).



**Figure 33.**

Click **"Reset"** to erase all statistics and begin logging statistics again.

## Restart

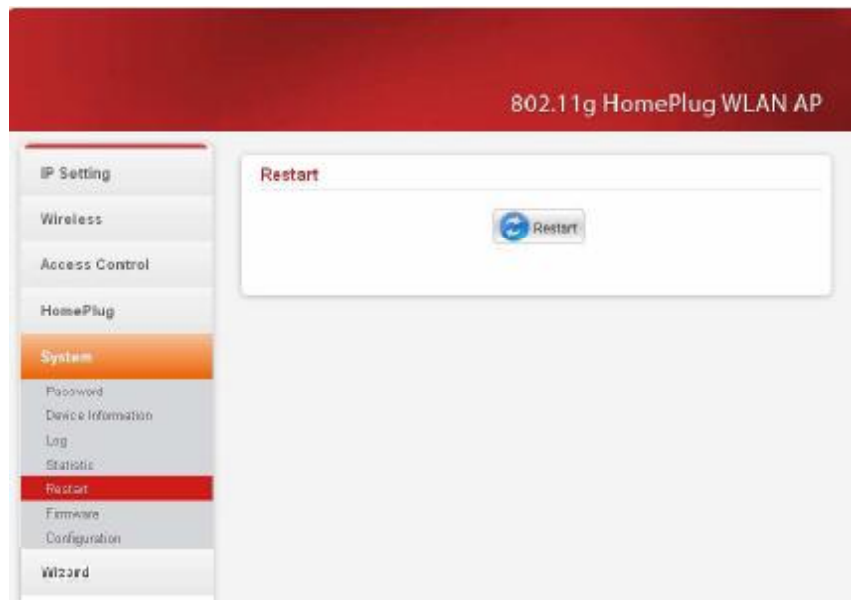Click *"Restart"* to restart the system in the event the system is not performing correctly.



**Figure 34.**

## Firmware

This function enables users to keep the HomePlug WLAN AP firmware up to date.



**Figure 35.**

Please follow the below instructions:

Download the latest firmware from the manufacturer's Web site, and save it to disk.

Click **"Browse"** and go to the location of the downloaded firmware file.

Select the file and click **"Upgrade"** to update the firmware to the latest release.

## Configuration

This function enables users to save settings as a profile and load profiles for different circumstances. User can also load the factory default settings, and run a setup wizard to configure the HomePlug WLAN AP.



**Figure 36.**

## Setup Wizard

Setup wizard is provided as the part of the web configuration utility. User can simply follow the step-by-step process to get the HomePlug WLAN AP configuration ready to run in 4 easy steps by clicking on the "Wizard" button on the function menu. The following screen will appear. Please click "Next" to continue.



**Figure 37. Setup Wizard**

## Step 1: Set up new Password

User can change the password and then click "Next" to continue.

**Figure 38. Setup Wizard – Set Password**

## Step 2: Set Wireless LAN Connection

Please type the name of SSID you like and select the channel. Then, click "Next" to continue.

**Figure 39. Setup Wizard – Set Wireless LAN Connection**

**Step 3: Set Wireless Encryption**

If user wants to enable WEP, please click "Enabled". Then, select the key size of WEP encryption and enter the key value in the key text box. Please click "Next" to continue.



**Figure 40. Setup Wizard – Set Wireless Encryption**

**Step 4: Setup Completed**

The Setup wizard is now completed. The new settings will be effective after the HomePlug WLAN AP restarted. Please click *"RESTART"* to reboot the HomePlug WLAN AP. If user does not want to make any changes, please click *"EXIT"* to quit without any changes. User also can go back to modify the setting by clicking *"BACK"*.
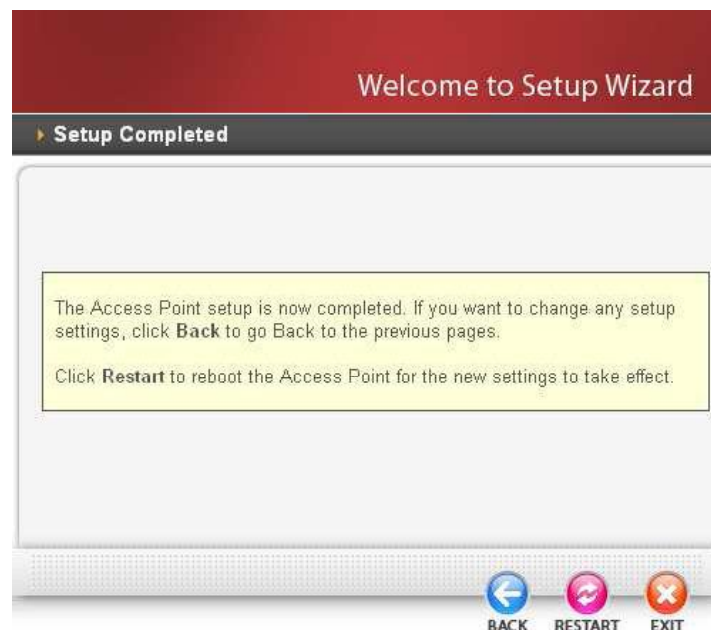


**Figure 41. Setup Wizard – Setup Completed**

# *TECHNICAL SPECIFICATIONS*

| General | |
|---|---|
| Standards | HomePlug 1.0 Turbo<br>IEEE 802.11g / IEEE 802.11b |
| Media Access Protocol | CSMA/CA (PowerLine)<br>CSMA/CA (WLAN) |
| PowerLine Data Rate | Up to 85Mbps (auto adaptation) |
| AP Data Rate | 802.11g: 54,48,36,24,18,12,9,6Mbps, auto fallback under noisy environment<br>802.11b: 11, 5.5, 2, 1Mbps, auto fallback under noisy environment |
| Receiver Sensitivity | 11Mbps: -82dBm @ 8% PER(typical)<br>54Mbps: -67dBm @ 10% PER(typical) |
| Antenna | 2dBi Dipole Antenna |
| Powerline Frequency band | 2MHz ~ 30MHz  (4~21Mhz) |
| RF Frequency | 2400 ~ 2483.5MHz (for US, Canada, and ETSI)<br>2400 ~ 2497MHz (for Japan) |
| Modulation Technology | Powerline - OFDM<br>802.11g - OFDM<br>802.11b - CCK, DQPSK, DBPSK |
| Modulation Schemes | DBPSK/DQPSK/CCK/OFDM |
| Security | PowerLine -56-bit Data Encryption with Key Management<br>WLAN: 64/128 bit WEP Encryption, WPA, WPA2, WPA-PSK, WPA2-PSK |
| Range Coverage | Indoor: Up 50 meters (depends on environment)<br>Outdoor: Up to 100 meters  (depends on environment) |
| Diagnostic LEDs | Power<br>Homeplug<br>WLAN |
| Physical and Environmental | |
| Power | 100~240VAC, Universal |
| Continuous Current Consumption | 3.8 watts. (max.) |
| Temperature | Operating: $0^O \sim 40^O$ C, Storage: $-10^O \sim 70^O$ C |
| Humidity | Operating: 10% ~ 90%, Storage: 5% ~ 95% |
| Dimensions | 102 x 75 x 48.5 mm (W x H x D) without Plug |
| EMI: | FCC Class B, CE Mark B |