WPB3000

Powerline Wireless Network Extender

User Manual

V1.0

Contents

About the User Manual

This user manual mainly describes how to install and configure the WPB3000 Powerline Wireless Network Extender.

Our company reserves the right to modify this manual for product upgrade or other causes without notifying users in advance. This user manual is only for reference.

Organization

This user manual is organized as follows:

Chapter	Description
Chapter 1 Safety Precautions	Provide safety precaution information.
Chapter 2 Overview	Provide a general overview of the WPB3000 Powerline Wireless Network Extender and the packing list.
Chapter 3 Hardware Description and Device Connection	Mainly describe the hardware of the Powerline Wireless Network Extender and the procedure for connecting the wireless router.
Chapter 4 Configuring the LAN PC	Describe how to configure your PC and wireless connection.
Chapter 5 Web Configuration	Describe how to log in to the Powerline Wireless Network Extender and configure the parameters in the Web pages.
Chapter 6 Using the Security Pushbutton	Describe how to add a device to an existing network or remove a device from an existing network by the **Security** pushbutton.

Features

PLC Features

- Power voltage range is 100 to 240 V AC 50/60Hz.
- Support the HomePlug AV protocol and the IEEE1901 protocol.
- PLC physical link rate is up to 500Mbps.
- Support the following modulation schemes: OFDM QAM 4096/1024/256/64/16/8, QPSK, BPSK, and ROBO.
- Support 128-bit AES link encryption and user NMK authentication, for providing secure power line communication.
- Support windowed OFDM with noise mitigation based on patented line synchronization technique, for improving data integrity in noisy conditions.
- Support channel self-adaptation and channel estimation for maximizing real-time throughput.
- Support priority-based CSMA/CA channel access scheme for maximizing efficiency and throughput.
- Support four-level QoS.
- Support ToS and CoS packet classifications.
- Support IGMP multicast management session.

Wireless Features

- Support IEEE802.11b, IEEE802.11g, IEEE802.11n, IEEE802.3, IEEE802.3u, IEEE802.11i and IEEE802.11e.
- Support 2T2R mode. Transmission data rate is up to 300Mbps.
- Support WEP and WPA for secure data transmission.
- Support version upgrade through Web page.
- Support restoring factory default settings.
- Support the following wireless security modes: **WEP**, **WPA-PSK**, **WPA2-PSK**, and **WPA/WPA2-PSK**
- Support system status display.
- Support WPS & WPS Clone function.

1 Safety Precautions

This device is intended for connection to the AC power line. Before using this product, please read the following precautions:

- Follow all warnings and instructions marked on the product.
- Unplug the device from the wall outlet before cleaning. Use a dry cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
- Do not put this product near water.
- Do not put this product near a radiator or heat source.
- Do not use an extension cord between the device and the AC power source.
- Only a qualified technician should service this product. Opening or removing covers may result in exposure to dangerous voltage points or other risks.
- Unplug the device from the wall outlet and refer the product to qualified service personnel for the following conditions:
  - If liquid has been spilled into the product
  - If the product has been exposed to rain or water
  - If the product does not operate normally when the operating instructions are followed
  - If the product exhibits a distinct change in performance

2 Overview

2.1 Product Introduction

Thank you for purchasing the WPB3000 Powerline Wireless Network Extender.

The WPB3000 Powerline Wireless Network Extender is compatible with the HomePlug AV, IEEE1901 and 802.11b/g/n protocols. It supports CCK and OFDM modulation schemes. Its PLC physical link rate is up to 500Mbps, and its wireless physical rate is up to 300Mbps in the 802.11n mode.

The WPB3000 Powerline Wireless Network Extender supports 128-bit AES link encryption of power line communication and wireless security modes including WEP, WPA-PSK, WPA2-PSK, and WPA/WPA2-PSK, which provide secure and reliable communication for users.

2.2 Packing List

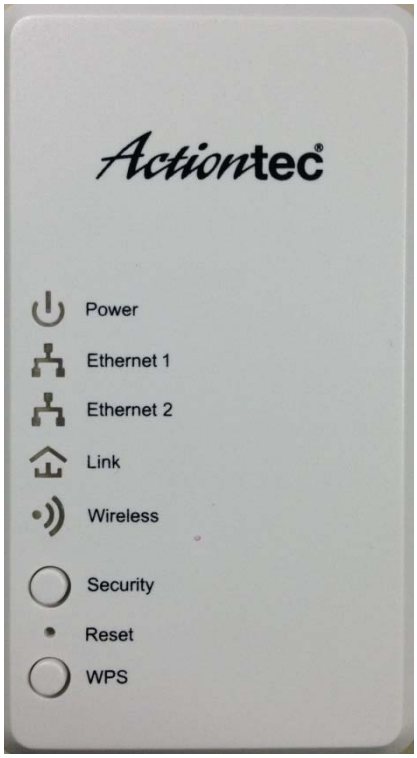
Please check whether your packing list includes the following items:

- 1 x WPB3000 Powerline Wireless Network Extender
- 1 x RJ45 network cable

3 Hardware Description and Device Connection

3.1 LED Status Description and Pushbutton Description

There are 5 LED indicators on the front panel of the Powerline Wireless Network Extender. By observing their status, you can check whether the device runs normally.



The following table describes the status of LED indicators on the front panel:

LED Indicator	Color	Description
Power	Solid green	System runs normally.
	Green	System is in the process of password synchronization.
	Off	Device is powered off or system is down.
Ethernet 1	Off	Ethernet cable not connected
	Flashing green fast	Packets are received or transmitted
	On	Ethernet cable is connected
Ethernet 2	Off	Ethernet cable not connected
	Flashing green fast	Packets are received or transmitted
	On	Ethernet cable is connected
Link	Off	Unable to join powerline network
	Solid green	Powerline network rate is greater than 40 mbps
	Solid Orange	Powerline network rate is between 5 and 40 mbps
	Solid Red	Powerline network rate is less than 5 mbps
	Flashing [color] fast	Packets are received or transmitted
Wireless	Off	Wireless disabled
	On	Wireless enabled
	Flashing orange slowly	WPS config sync in process
	Flashing orange	WPS config sync success

	fast	
	Solid red	WPS config sync fail
	Flashing green slowly	WPS client pairing in process
	Flashing green fast	WPS client pairing success
	Solid red	WPS client pairing fail
	Off	Wireless disabled
	On	Wireless enabled

The following table describes pushbuttons on the front panel:

Button	Description
Security	It is used to set the status of the device members. ● Press and hold the **Security** pushbutton for more than 10 seconds to exit the current network and generate a random password of network member. ● Press and hold the **Security** pushbutton for less than 3 seconds, and then the Powerline Wireless Network Extender becomes a member of the existing AVLN.
Reset	Press the **Reset** pushbutton for more than 3 seconds and then release it. System restores the factory default settings.
WPS	It has the following functions: ● Press the WPS pushbutton for less than 3 seconds to enable the negotiation of PBC mode.The WPS client pairing must start even if the WPS button is pressed for less than 1 seconds. ● Press the WPS pushbutton for 8 seconds to start configure WPS Clone function.

3.2 Interface and Switch Description

The following table describes interfaces and switch on the Powerline Wireless Network Extender:

Interface	Description
Ethernet 1	RJ45 LAN interface, for connecting a hub, switch, or computer on a LAN.
Ethernet 2	RJ45 LAN interface, for connecting a hub, switch, or computer on a LAN.
OFF ON	Turn on or turn off the device.

3.3 Hardware Installation

3.3.1 System Requirements

Before installing the device, please ensure that the following items are ready:

- At least one Ethernet RJ45 cable (10Base-T/100Base-T)
- One WPB3000 Powerline Wireless Network Extender
- One PLC device for PLC communication
- A PC that is installed with the TCP/IP protocol and can access the Internet.

3.3.2 Before You Begin

Before you install the device, please pay attention to the following items:

- When the device is connected to a computer, hub, router, or switch, the Ethernet cable should be shorter than 100 meters.

- Place this device on a stable surface or support. Do not put this device on the ground.
- Keep the device clean. Keep away the device from direct sunshine. Avoid any metal in the device.
- Place the device in the center of the placement area, and try to optimize the wireless coverage.

3.3.3 Connecting the Device

To connect the device, do as follows:

Step 1 Connect one end of the RJ45 cable to the LAN interface of the Powerline Wireless Network Extender.

Step 2 Connect the other end of the RJ45 cable to your PC.

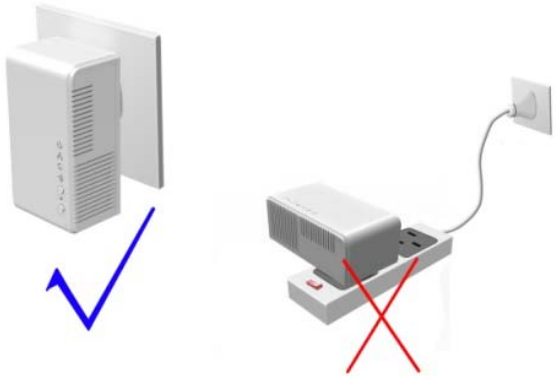
Step 3 Insert the power plug of the device into the wall socket directly.

3.4 Operation Range

The operation range of the Powerline Wireless Network Extender depends on the actual environment. The path and effect of signal transmission may vary with the deployment in a house or an office. In theory, the maximum PLC transmission distance can reach 300 meters. But for the practical application, the PLC transmission distance may vary due to the number of PLC devices connected to the power line network. For wireless transmission, straight transmission distance in the open air for some devices can reach 300 meters and indoor transmission distance can reach 100 meters.

3.5 Improving the Transmission Performance of Network

In order to improve the transmission performance of network, it is recommended that you insert the power plug of the device into the wall socket directly. Do not use the patch board.



4 Configuring the LAN PC

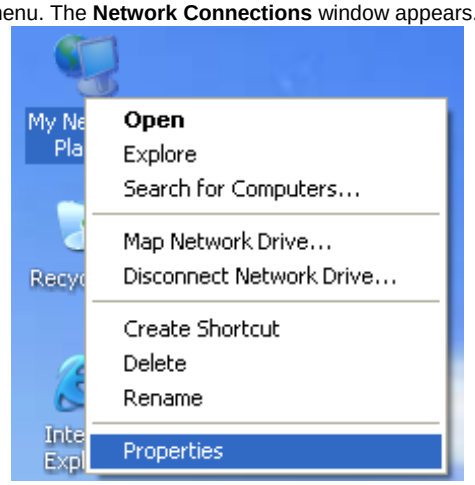
When the adapter is not connected with the uplink router, the LAN IP address of the Powerline Wireless Network Extender is **192.168.10.1** and the subnet mask is **255.255.255.0** by default. Please setting as following steps:

🕮 **Note:**

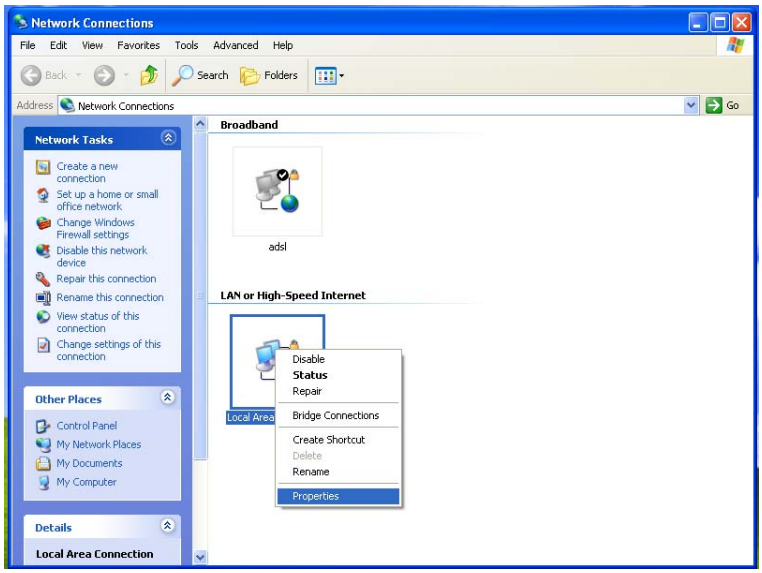
The configuration steps and figures on Windows XP are depicted as an example. The configuration process may vary depending on operation system of your PC.

To manually set the network adapter on Windows XP system, do as follows:

Step 1 Right-click the icon of **My Network Places** and choose **Properties** from the menu. The **Network Connections** window appears.



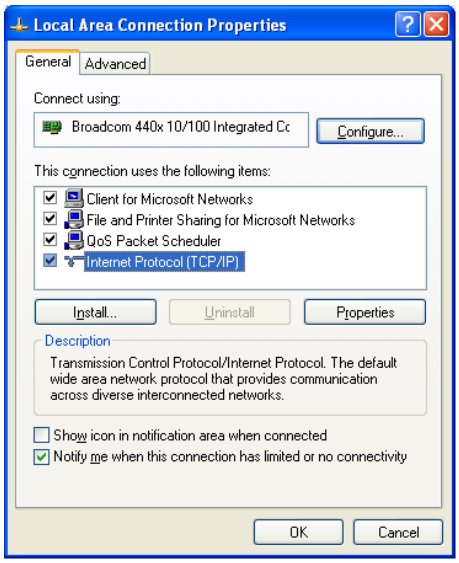
Step 2 Right-click the network adapter icon and choose **Properties** from the menu. The **Local Area Connections Properties** window appears.



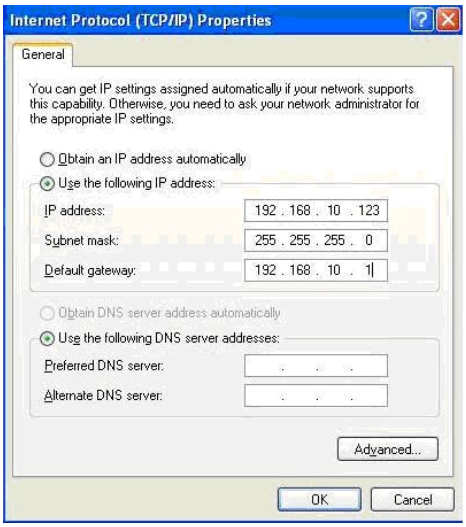
Note:

If multiple network cards are installed on your PC, a window other than the **Local Area Connections Properties** window may appears.

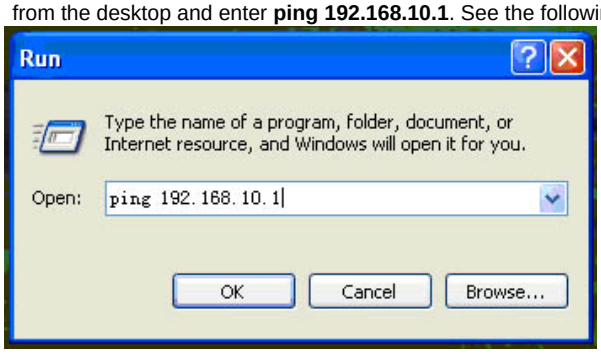
Step 3 Double-click Internet Protocol (TCP/IP) and the Internet Protocol (TCP/IP) Properties window appears.



Step 4 Select **Use the following IP address** and enter the IP address of the network adapter. Set the IP address to ***192.168. 10.X*** ('X' is a number in the range of 2 to 254) and set the subnet mask to ***255.255.255.0***. Configure the default gateway and IP addresses of the DNS servers according to your actual network, or leave them blank. After setting the parameters, click **OK**.



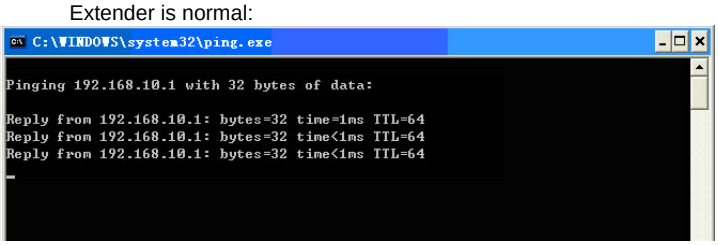
Step 5 Ping the default IP address of the Powerline Wireless Network Extender, to check whether the current connection between your PC and the Powerline Wireless Network Extender is normal. Choose **Start** > **Run** from the desktop and enter **ping 192.168.10.1**. See the following figure:



Note:

192.168.10.1 in the **ping** command is the default IP address of the LAN interface. If the IP address changes, enter the current IP address instead.

Step 6 If your PC can ping through the default IP address of the Powerline Wireless Network Extender, the following page appears, indicating that the connection between your PC and the Powerline Wireless Network Extender is normal:



Note：
When the adapter is connected with the uplink router and DHCP server open in uplink router, please set automatically get the IP in the PC in LAN side.

5 Web Configuration

This chapter describes how to log in to the Powerline Wireless Network Extender as a super user and how to configure the parameters in the Web pages.

5.1 Logging In to the Powerline Wireless Network Extender

If you log in to the Powerline Wireless Network Extender for the first time, do as follows:

Step 1 Open the IE browser, and enter ***http://192.168.10.1*** in the address bar.

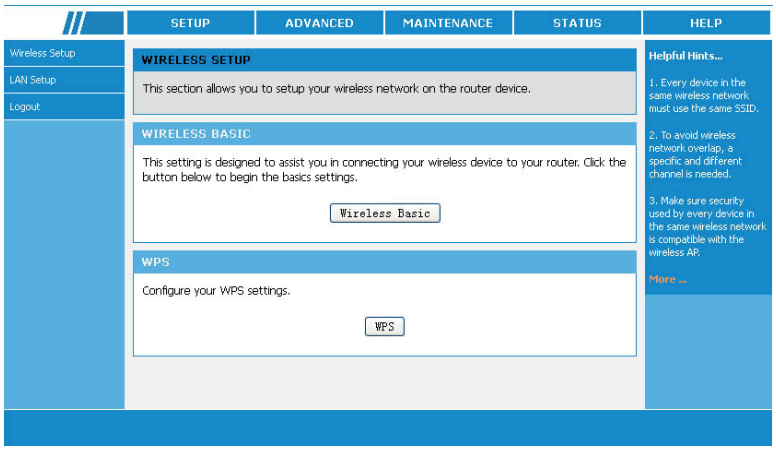
Note:
When the adapter is connected with the uplink router and DHCP server open in uplink router, please use“http://myextender”

Step 2 In the login page, enter the user name and password.

🕮 Note:

- Both the default user name and password of super user are **admin**.

Step 3 Click **Login**, and the following page appears.



Note:

The LAN user is allowed to access the Powerline Wireless Network Extender by user names and passwords (**admin**/**admin**).

5.2 Using WPS clone to sync WPB3000

If you want to sync WPB3000 wireless configuration parameter from uplink Router, you can consider WPS clone function. Steps as followed:

Step 1 Press “WPS” button over 10s, until “Wireless” LED blink with RED color. If the device has successfully cloned the wireless configuration parameter from Router, then the “Wireless” LED will blink with orange color.

If the synchronization failed, the “Wireless” LED will blink with RED color with high frequency. Then you can set the same wireless configuration parameter as Router in the website as below:

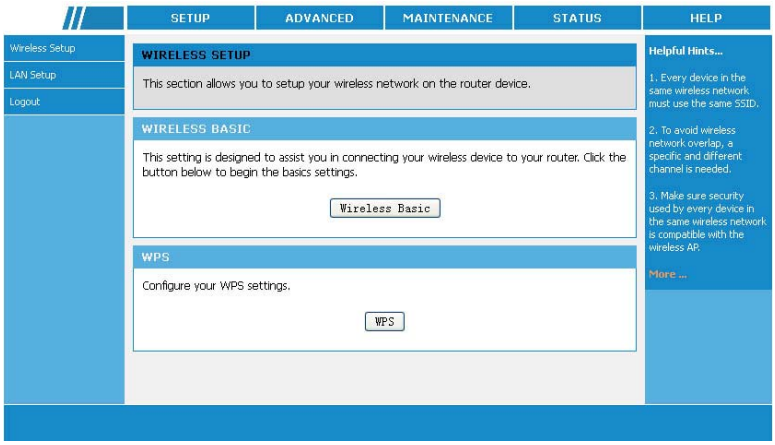
Step 1 Open the IE browser, and enter ***http://192.168.10.1*** in the address bar.
Note: When the WPB3000 is connected with the uplink router and DHCP server open in uplink router, please use “http://myextender”

Step 2 In the following page, you can set wireless configuration parameter of the Router (eg, SSID, security mode, password) , and then click “Apply”.

5.3 Setup

5.3.1 Wireless Setup

Choose **SETUP** > **Wireless Setup**, and the following page appears.



5.3.1.1 Wireless Basic Settings

Choose **Wirelss Setup** > **Wireless Basic** on the left pane or click **Wireless Basic** in the **WIRELESS SETUP** page to display the following page.

In this page, you can configure the basic wireless parameters.

The following table describes parameters in this page:

Field	Description
Enable Wireless Interface	Enable or disable the wireless interface.
Wireless Network Name (SSID)	The wireless network name (SSID) can contain up to 32 characters and can be letters, numerals, underlines, and any combinations of them. The SSID is case-sensitive.
Visibility Status	● If **Visible** is selected, the Powerline Wireless Network Extender broadcasts its SSID on the wireless network. ● If **Invisible** is selected, the Powerline Wireless Network

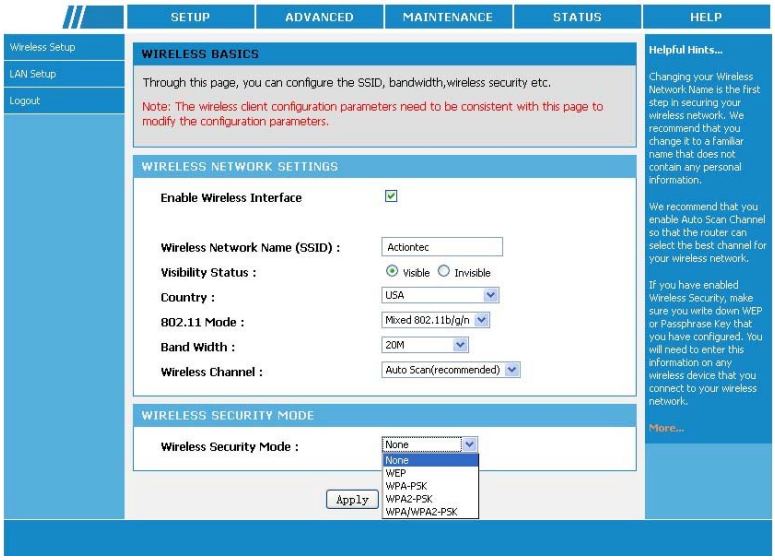
Field	Description
	Extender does not broadcast its SSID on the wireless network.
Country	Select the country where you are from the drop-down list.
802.11 Mode	Select the appropriate wireless mode. The default is **Mixed 802.11b/g/n**. ● **802.11b only**: The maximum rate is 11Mbps. ● **802.11g only**: The maximum rate is 54Mbps. ● **802.11n only**: For **20M** bandwidth, the maximum rate is 130Mbps (150Mbps for short preamble); for **40M Upper (+)** or **40M Lower (-)** bandwidth, the maximum rate is 270Mbps (300Mbps for short preamble). ● **Mixed 802.11b/g**: It is compatible with 802.11b and 802.11g. ● **Mixed 802.11n/g**: It is compatible with 802.11n and 802.11g. ● **Mixed 802.11b/g/n**: It is compatible with 802.11b, 802.11n, and 802.11g.
Band Width	Only in the 802.11 mode that is compatible with 802.11n, can you set the band width. For **20M** bandwidth, the maximum rate is 130Mbps (150Mbps for short preamble); for **40M Upper (+)** or **40M Lower (-)** bandwidth, the maximum rate is 270Mbps (300Mbps for short preamble).
Wireless Channel	Select the working channel of the wireless network. The default is **Auto Scan**, which indicates that the Powerline Wireless Network Extender automatically searches for the best channel among the available channels.

In this page, you can also configure the wireless security parameters.

Wireless security settings are very important in protecting the wireless base stations on your network and wireless communication between your router and wireless network. The Powerline Wireless Network Extender provides 5 types of wireless security modes, which contain **None**, **WEP**, **WPA-PSK**, **WPA2-PSK**, and **WPA/WPA2-PSK**.

(1) None

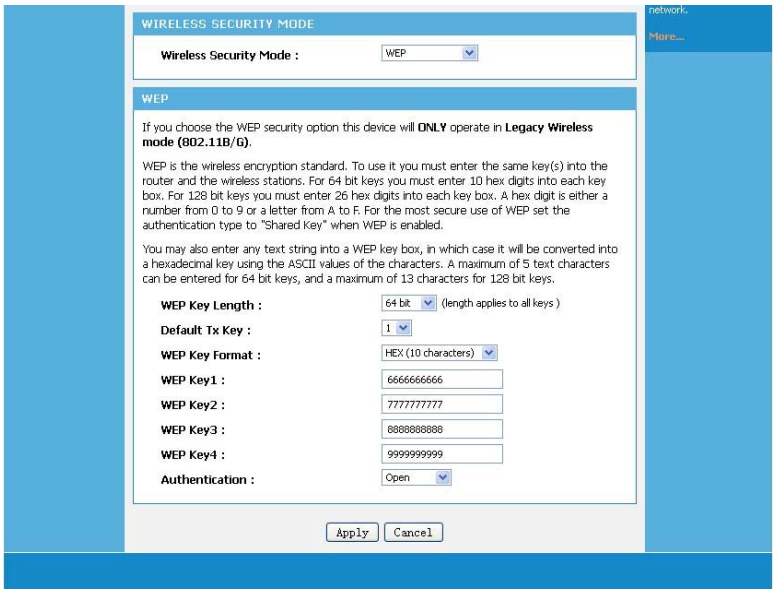
Select **None** from the drop-down list of wireless security mode to display the following page.



None means data encryption is not adopted and the network is not secure. Any station can access the network. This option is not recommended.

(2) WEP

Select **WEP** from the drop-down list of wireless security mode to display the following page.

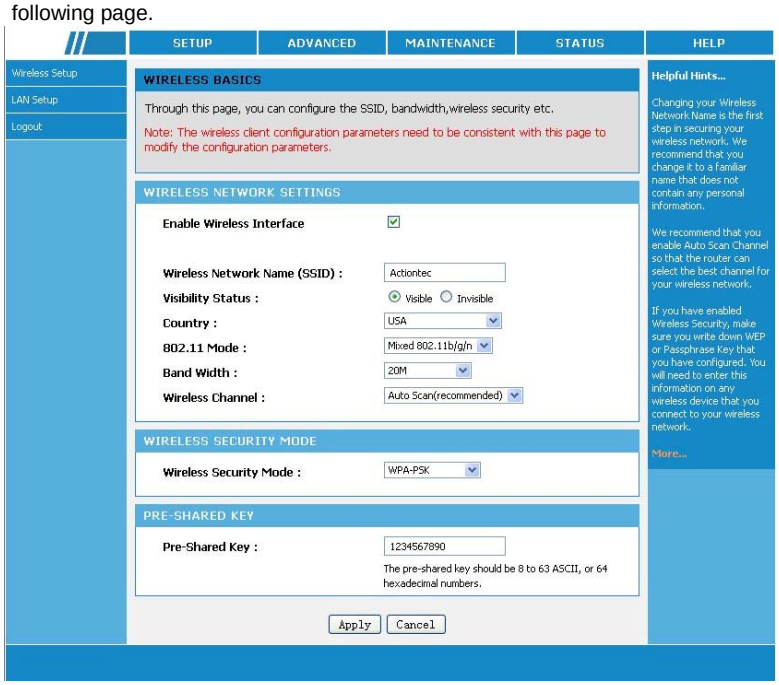


The following table describes parameters related to the WEP mode:

Field	Description
WEP Key Length	Select the encryption length of WEP key. You can select **64 bit** or **128 bit**.
Default Tx Key	Select one from the four keys as the default key of the wireless network.
WEP Key Format	● When the key format is **64 bit**, you need to enter 5 ASCII characters or 10 hexadecimal digits. ● When the key format is **128 bit**, you need to enter 13 ASCII characters or 26 hexadecimal digits.
WEP Key 1/2/3/4	Set 64-bit or 128-bit key according to the key format.
Authentication	Select the proper authentication mode. You can select **Open** or **Share Key**.

(3) WPA-PSK

Select **WPA-PSK** from the drop-down list of wireless security mode to display the following page.

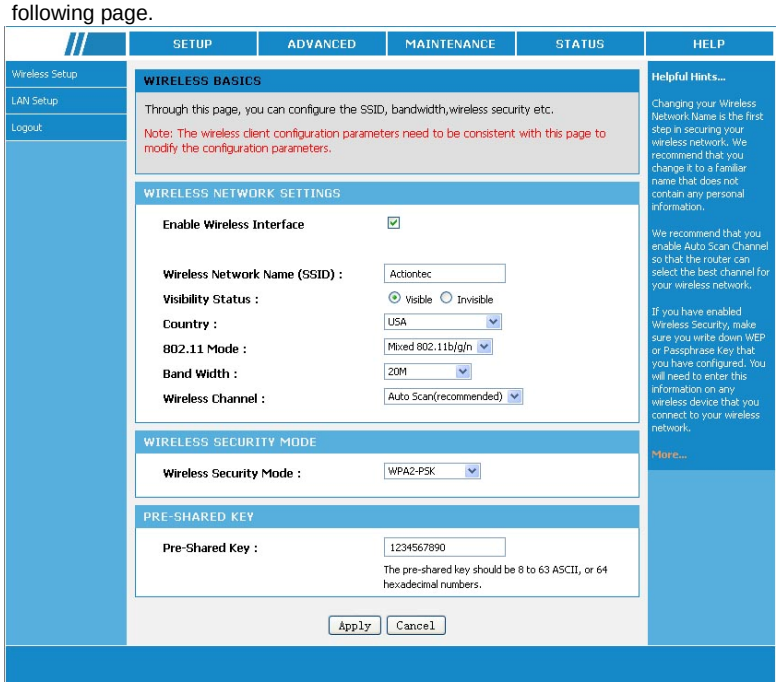


The following table describes parameters related to the WPA mode:

Field	Description
WPA Mode	Only **WPA-Personal** is available.
Encryption Mode	Only **TKIP** is available.
Group Key Update Interval	Set the update interval of group key.
Pre-shared Key	Set the pre-shared key. The Powerline Wireless Network Extender uses this key to authenticate the identity of workstation.

(4) WPA2-PSK

Select **WPA2-PSK** from the drop-down list of wireless security mode to display the following page.

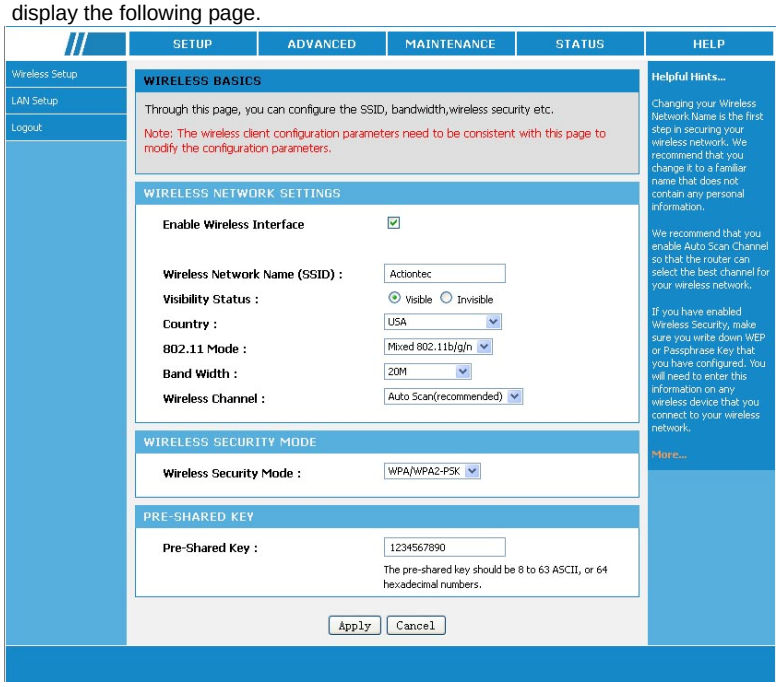


The following table describes parameters related to the WPA2 mode:

Field	Description
WPA Mode	Only **WPA2-Personal** is available.
Encryption Mode	Only **AES** is available.
Group Key Update Interval	Set the update interval of group key.
Pre-shared Key	Set the pre-shared key. The Powerline Wireless Network Extender uses this key to authenticate the identity of workstation.

(5) WPA/WPA2-PSK

Select **WPA/WPA2-PSK** from the drop-down list of wireless security mode to display the following page.



The following table describes parameters related to the **WPA/WPA2 Mixed** mode:

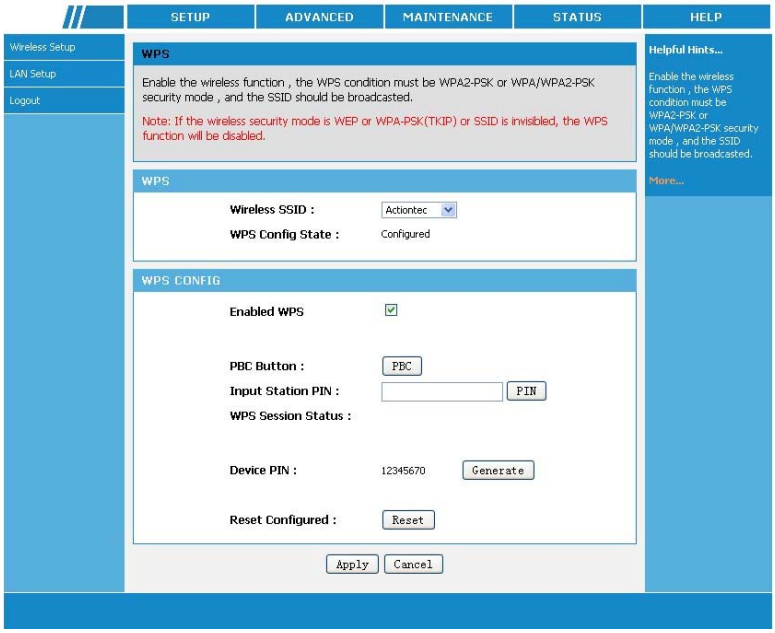
Field	Description
WPA Mode	Only **WPA/WPA2 Mixed-Personal** is available.
Encryption Mode	You can only select **Both**. **Both** indicates that it is compatible with **TKIP** or **AES**.
Group Key Update Interval	Set the update interval of group key.
Pre-shared Key	Set the pre-shared key. The Powerline Wireless Network Extender uses this key to authenticate the identity of workstation.

After setting the parameters, click **Apply** to save the settings.

5.3.1.2 WPS Settings

WPS refers to Wi-Fi Protected Setup. You can use the WPS setup function to add a wireless client to a network, without setting some specific parameters, such as SSID, security mode, and password. To use this function, a wireless client must support WPS. If the wireless client does not support WPS, you must manually configure the wireless settings of wireless client, and ensure that its SSID and other wireless security settings are the same as that of the Powerline Wireless Network Extender.

Choose **WireIss Setup** > **WPS** on the left pane or click **WPS** in the **WIRELESS SETUP** page to display the following page.



The following table describes parameters in this page:

Field	Description
Wireless SSID	Select a wireless SSID from the drop-down list.
WPA Mode	Display current WPA mode.
Enabled WPS	Enable or disable WPS.

Field	Description
Push Button	Click the **PBC** button in this page, and then click the **PBC** button in the configuration utility page of wireless network card or press the **WPS** pushbutton on the wireless network card within 2 minutes to finish WPS configuration.
Input Station PIN	Enter the PIN code that is generated randomly by the configuration utility of wireless card.
WPS Session Status	Display current WPS connection status.

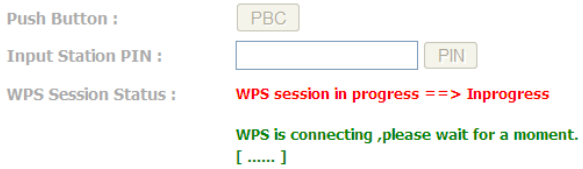
⚠ **Caution:**

If you want to use WPS, you must select the WPA-PSK, WPA2-PSK or WPA/WPA2-PSK mode and the SSID must be broadcasted.

WPS modes contain PBC mode and PIN mode.

- **PBC Mode**

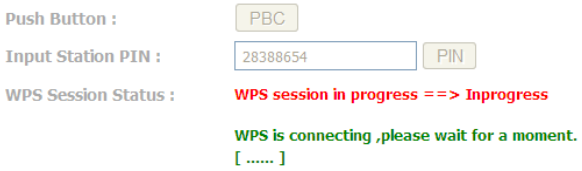
Click the **PBC** button in the WPS page or press the **WPS** button on the Powerline Wireless Network Extender to start WPS connection.



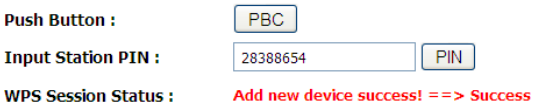
Press the **WPS** button on the network card or click the **PBC** button in the configuration utility page of network card within two minutes to start WPS connection. After WPS connection is established, the following page appears. The client can now visit the LAN.

- **PIN Mode**

Enter the PIN of the network card in the WPS page (refer to the client of the network card), and then click **PIN** to start WPS connection. The following page appears:

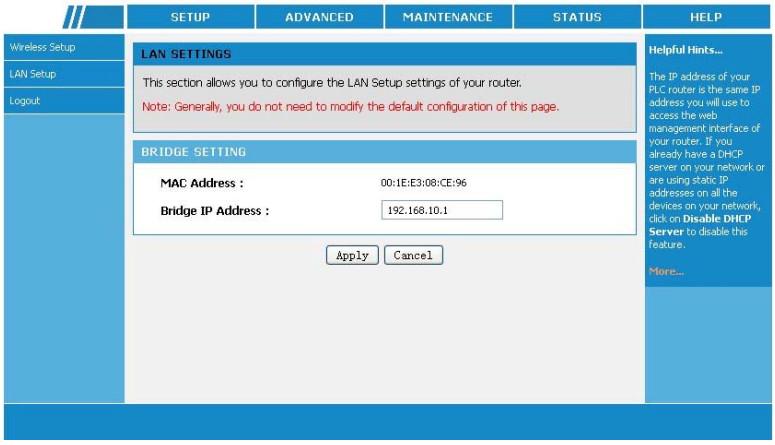


Click the **PIN** button in the configuration utility page of network card within two minutes to start WPS connection. After WPS connection is established, the following page appears. The client can now visit the LAN.



5.3.2 LAN Setup

Choose **SETUP** > **LAN Setup**, and the following page appears.



In this page, you can configure the LAN settings of the Powerline Wireless Network Extender. You can modify the IP address of the LAN interface according to the actual network environment. The default IP address is **192.168.10.1**. Please note that this is an optional operation. Usually, you need not to modify the default settings in this page.

The following table describes parameters in this page:

Field	Description
Router IP Address	Set the IP address that a LAN user uses to access the router. The default IP is ***192.168.10.1***. You can change it if necessary.

After setting the parameters, click **Apply** to save the settings.

5.3.3 Logout

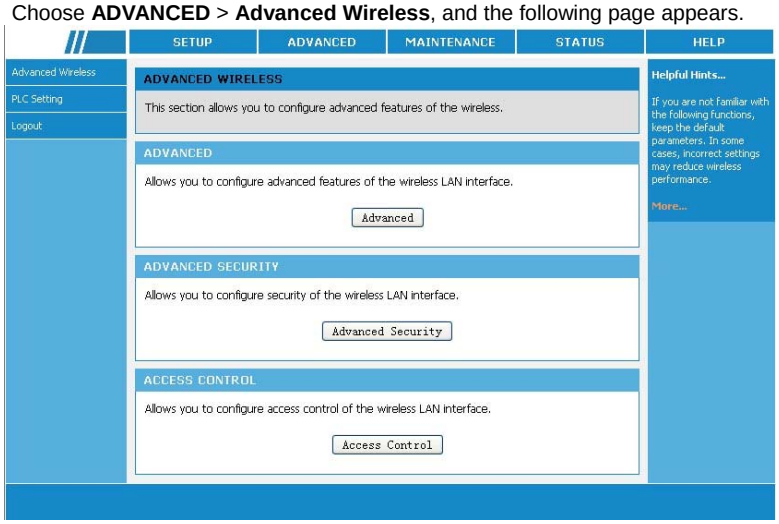
Choose **SETUP** > **Logout** to log out of the Web configuration page.

5.4 Advanced Settings

5.4.1 Advanced Wireless

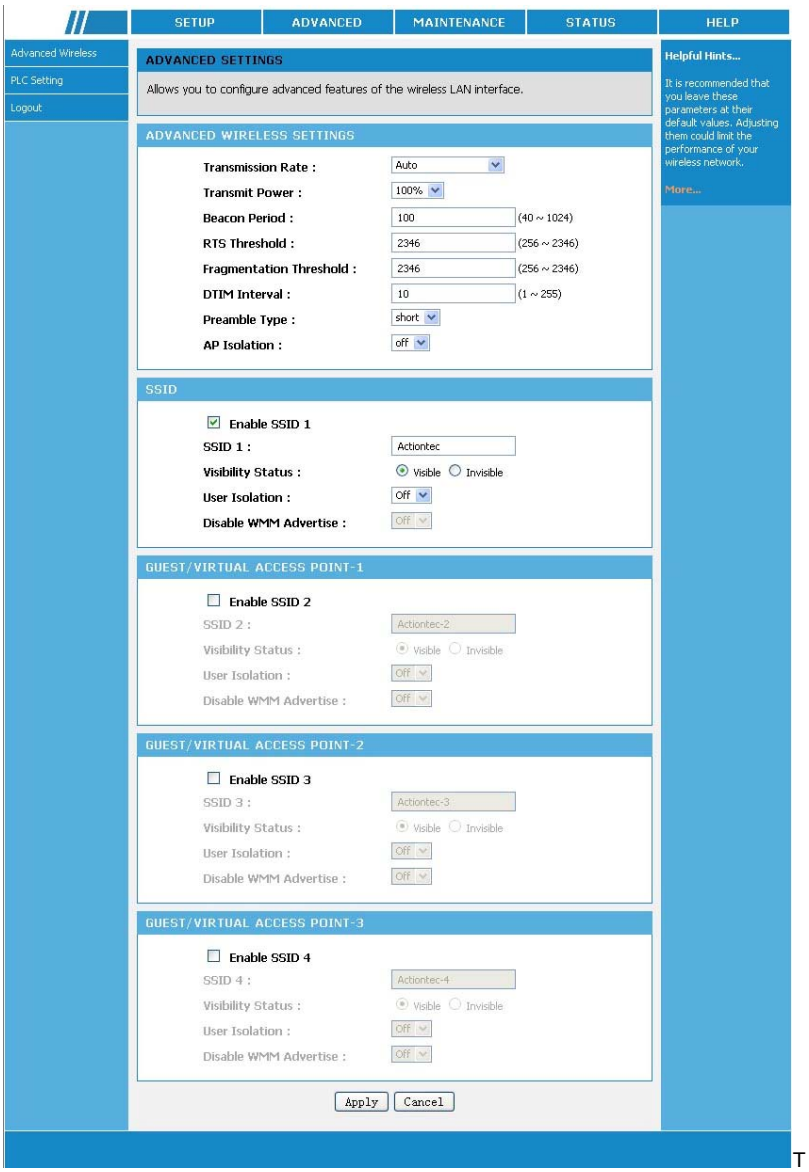
Usually, it is not recommended to modify the default settings of advanced wireless configuration page. The default settings can provide the optimal wireless performance. Improper modifications may influence the wireless performance.

Choose **ADVANCED** > **Advanced Wireless**, and the following page appears.



5.4.1.1 Advanced Wireless Settings

Choose **Advanced Wireless** > **Advanced** on the left pane or click **Advanced** in the **ADVANCED WIRELESS** page to display the following page.


SETUP
ADVANCED
MAINTENANCE
STATUS
HELP
Advanced Wireless
PLC Setting
Logout
ADVANCED SETTINGS
Allows you to configure advanced features of the wireless LAN interface.
ADVANCED WIRELESS SETTINGS
Transmission Rate : Auto
Transmit Power : 100%
Beacon Period : 100 (40 ~ 1024)
RTS Threshold : 2346 (256 ~ 2346)
Fragmentation Threshold : 2346 (256 ~ 2346)
DTIM Interval : 10 (1 ~ 255)
Preamble Type : short
AP Isolation : off
SSID
Enable SSID 1
SSID 1 : Actiontec
Visibility Status : Visible Invisible
User Isolation : Off
Disable WMM Advertise : Off
GUEST/VIRTUAL ACCESS POINT-1
Enable SSID 2
SSID 2 : Actiontec-2
Visibility Status : Visible Invisible
User Isolation : Off
Disable WMM Advertise : Off
GUEST/VIRTUAL ACCESS POINT-2
Enable SSID 3
SSID 3 : Actiontec-3
Visibility Status : Visible Invisible
User Isolation : Off
Disable WMM Advertise : Off
GUEST/VIRTUAL ACCESS POINT-3
Enable SSID 4
SSID 4 : Actiontec-4
Visibility Status : Visible Invisible
User Isolation : Off
Disable WMM Advertise : Off
Apply
Cancel
Helpful Hints...
It is recommended that you leave these parameters at their default values. Adjusting them could limit the performance of your wireless network.
More...

T

he following table describes parameters in this page:

Field	Description
Transmission Rate	Set the proper transmission rate.
Transmit Power	Select the proper transmission power from the drop-down list. You can select 100%, 80%, 60%, 40%, or 20%.
Beacon Period	Beacon period indicates the frequency of the Powerline Wireless Network Extender that sends the Beacon frame. By default, the Powerline Wireless Network Extender sends the beacon frame every other 100 ms. The range is 20~1024.
RTS Threshold	Set the CTS/RTS threshold. If the length of a packet is greater than the value, the router sends an RTS frame to the destination station for negotiation. After receiving the RTS frame, the wireless station responds with a Clear to Send (CTS) frame to the router, indicating that they can communicate with each other. The default value is 2346.
Fragmentation Threshold	Set the threshold of fragmentation length. If the length of a packet is greater than the value, the packet is automatically fragmented into several packets. Because too many packets lead to low performance of the wireless network, the value of fragmentation length cannot be too small. The default value is 2346.
DTIM Interval	DTIM interval indicates the frequency for sending the wireless packets. The range is 1~255 and the default value is 10.
Preamble Type	Set the preamble type. The default is short preamble. A preamble defines the length of the CRC correction block that is used for the communication between your router and wireless clients. Shorter preamble should apply to a network with intense traffic.
AP Isolation	**On** indicates that the wireless clients connecting to different SSIDs cannot communicate with each other. **Off** indicates that the wireless clients connecting to different SSIDs can communicate with each other.

Field	Description
Enable SSID1~4	Enable or disable the wireless function.
SSID1~4	Set the network name. The SSID can contain up to 32 characters and can be letters, numerals, underlines, and any combinations of them. The SSID is case-sensitive.
Visibility Status	● If **Visible** is selected, the Powerline Wireless Network Extender broadcasts its SSID on the wireless network, and the clients can scan the SSID. ● If **Invisible** is selected, the Powerline Wireless Network Extender does not broadcast its SSID on the wireless network and the clients cannot scan the SSID.
User Isolation	**On** indicates that the computers wirelessly connecting to the same SSID cannot communicate with each other. **Off** indicates that the computers wirelessly connecting to the same SSID can communicate with each other.
Disable WMM Advertise	This function is not available. If this function is disabled, the wireless PLC router adopts WMM to mark priority and to arrange the order of Wi-Fi network queues.

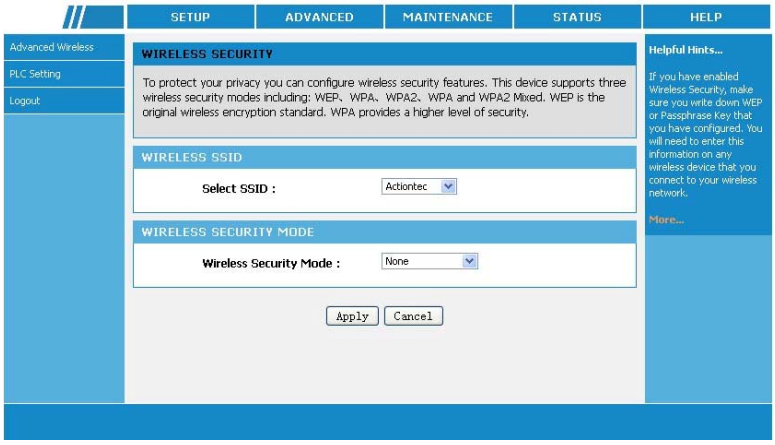
After setting the parameters, click **Apply** to save the settings.

⚠ **Caution:**

The settings in this page only apply to professional users who have deeper understanding in the wireless LAN. If you are not aware of the impact caused by the modification, please do not modify the settings in this page.

5.4.1.2 Advanced Security

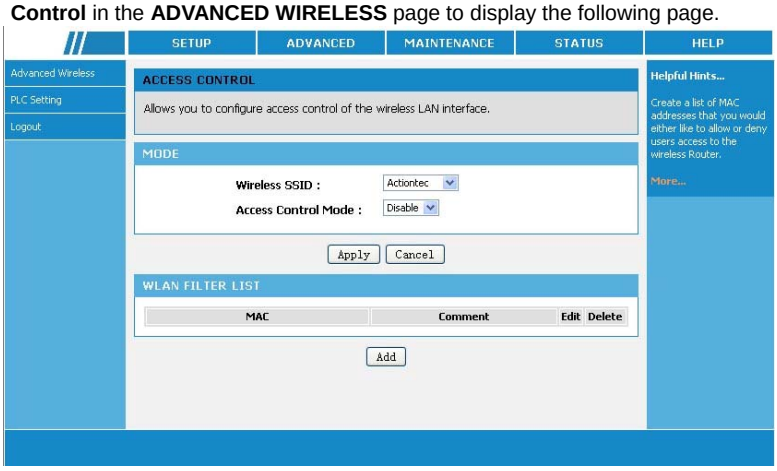
Choose **Advanced Wireless** > **Advanced Security** on the left pane or click **Advanced Security** in the **ADVANCED WIRELESS** page to display the following page.



For the parameters in this page, refer to **错误！未找到引用源。 错误！未找到引用源。**.

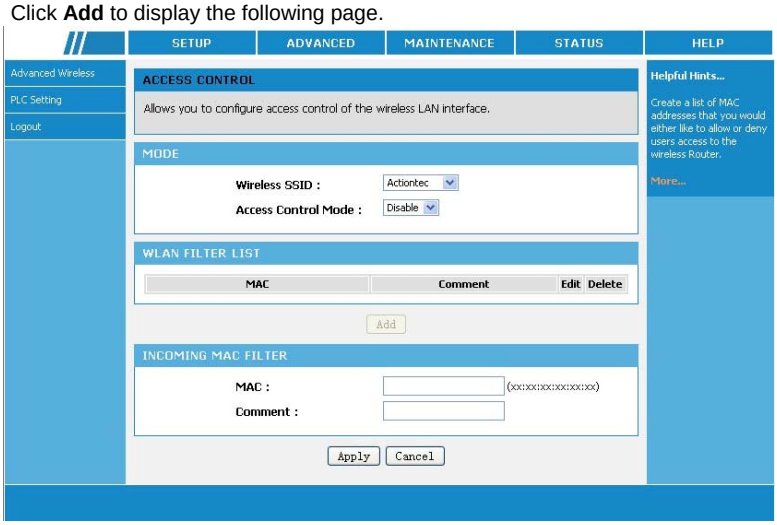
5.4.1.3 Access Control

Choose **Advanced Wireless** > **Access Control** on the left pane or click **Access Control** in the **ADVANCED WIRELESS** page to display the following page.



In this page, you can configure the access control settings of the wireless LAN interface.

Click **Add** to display the following page.



The following table describes parameters in this page:

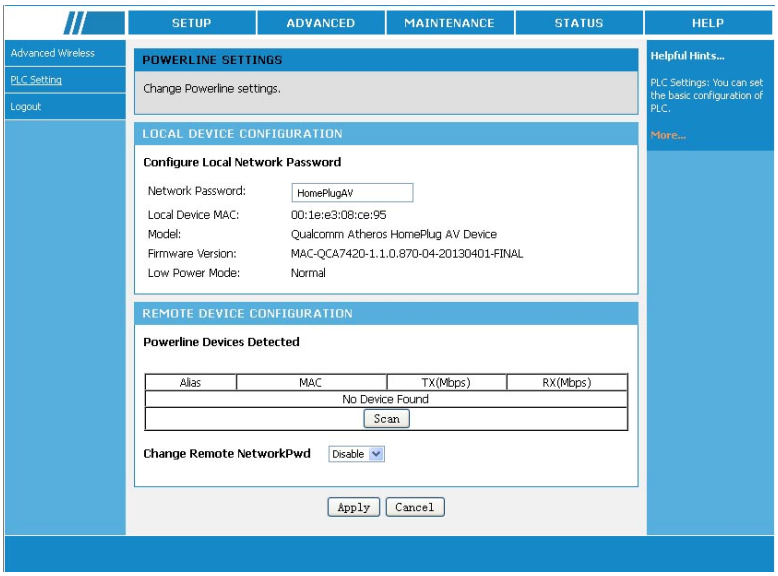
Field	Description
Wireless SSID	Select a port name of wireless SSID from the drop-down list.
Access control Mode	You can select **Disable**, **Allow**, or **Deny**.
MAC	Enter the MAC address that needs to be filtered in the WLAN.
Comment	Enter the comment about the filtering rule.

After setting the parameters, click **Apply** to save the settings.

Advanced Network

5.4.2 PLC Setting

Choose **ADVANCED** > **PLC Setting**, and the following page appears.



In this page, you can configure the parameters of PLC settings.

- **Local Device Configuration**

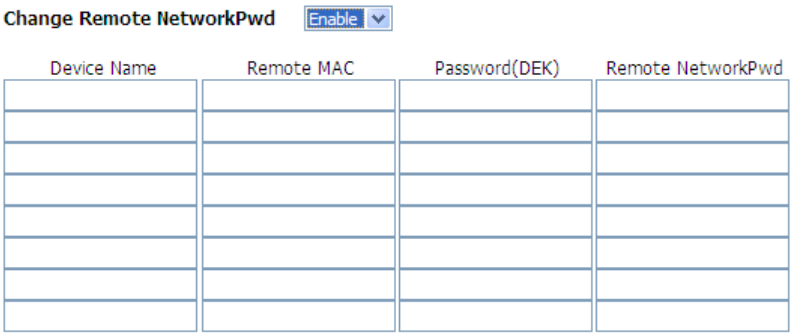
The local device configuration allows you to configure the local network password, and to view the information of the local device such as local device MAC, and firmware version.

- **Remote Device Configuration**

The **Remote Device Configuration** allows you to view the configuration information of the remote PLC devices and to set the network passwords of the remote devices.

You can search current remote PLC devices by clicking the **Scan** button.

Select **Enable** from the drop-down list of **Change Remote NetworkPwd** to display the following page.



You can set the passwords of remote PLC devices according to their MAC addresses and DEKs (Device Equipment Key).

The following table describes parameters in this page:

Field	Description
Device Name	Enter the device names of the remote devices.
Remote MAC	Enter the MAC addresses of the remote devices.
Password (DEK)	When you set the parameters of the remote devices, you need to enter this password for authentication.
Remote NetworkPwd	Set the network passwords for the remote PLC devices.

Note:

You can set up to 8 network passwords for the remote PLC devices.

You can access the Internet by network password synchronization. But network passwords of the two devices for password synchronization must be the same, and either of the PLC devices must be connected to the Internet.

After setting the parameters, click **Apply** to save the settings.

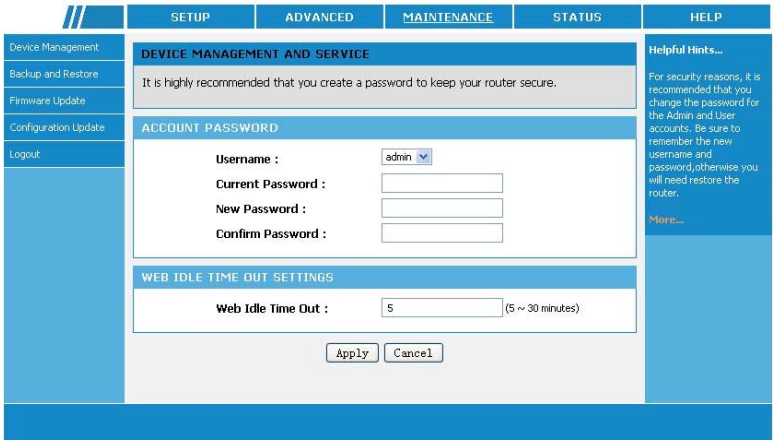
5.4.3 Logout

Choose **ADVANCED** > **Logout** to log out of the Web configuration page.

5.5 Maintenance

5.5.1 Device Management

Choose **MAINTENANCE** > **Device Management**, and the following page appears.



In this page, you can modify the password for logging in to the Powerline Wireless Network Extender, set Web idle timeout, and enable or disable the WAN connection service.

- **Account Password**

In order to ensure the network security, it is recommended you change the default login password. Please remember the new password if you change the default password. You may write it down and keep it well for future use. If you forget the login password, you need to restore the factory default settings of the Powerline Wireless Network Extender. After the default settings are restored, the PLC router will lose the new settings that you configure.

Note:

For the sake of network security, it is strongly recommended to change the password of **admin**. If you forget the login password, please restore the factory default settings of the Powerline Wireless Network Extender. The default user name and password of the super user are **admin**.

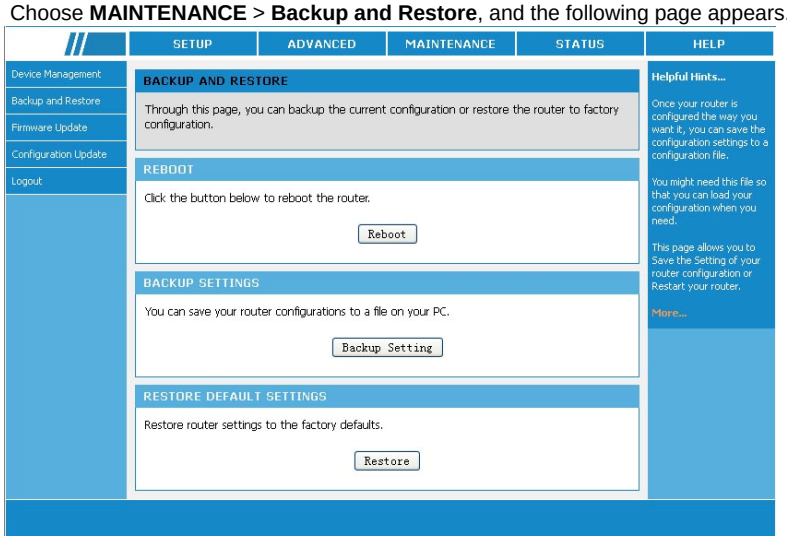
- **Web Idle Time Out Settings**

Web idle timeout setting is used to set the time for system automatically exiting the Web configuration page. The range is 5~30 minutes.

After setting the parameters, click **Apply** to save the settings.

5.5.2 Backup and Restoration

Choose **MAINTENANCE** > **Backup and Restore**, and the following page appears.



In this page, you can reboot the router, backup the configuration file, and restore the factory default settings of the router.

- **Reboot**

Click **Reboot** to reboot the router.

- **Backup Settings**

Click **Backup Setting** and select the path to save the configuration file of the router to your local PC.

- **Restore Default Settings**

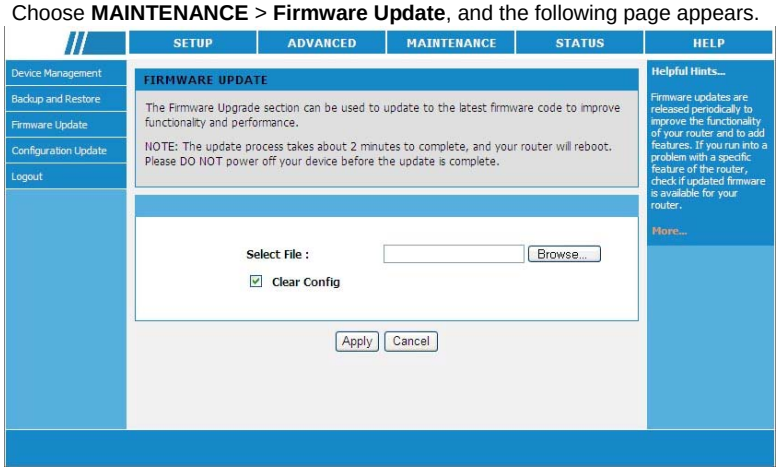
Click **Restore** to restore the factory default settings of the router. You may also press the **Reset** pushbutton on the front panel for 3 seconds to restore the factory default settings of the router.

⚠ **Caution:**

When operating in this page, do not press the Reset pushbutton.

5.5.3 Firmware Update

Choose **MAINTENANCE** > **Firmware Update**, and the following page appears.



In this page, you can update the firmware version of the Powerline Wireless Network Extender. You may obtain the firmware from the local server.

The following table describes parameters in this page:

Field	Description
Select File	Click **Browse…** to navigate to the latest firmware.
Clear Config	If you check **Clear Config**, the PLC router restores to the default settings after upgrade. Otherwise, the PLC router keeps the current settings.

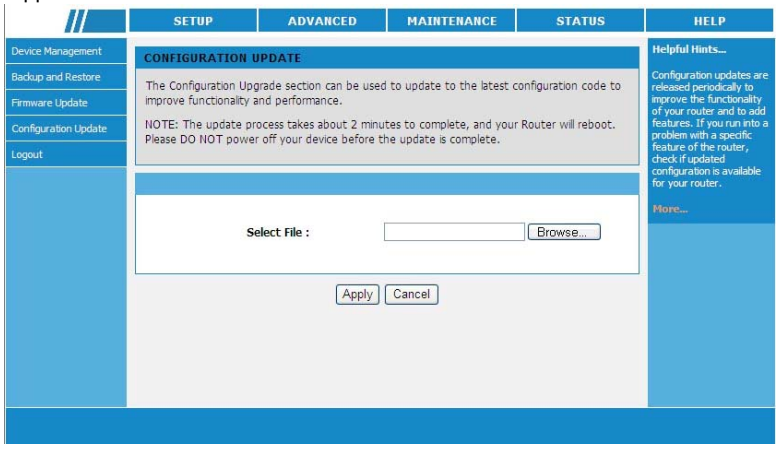
Click **Apply**, and then system begins to upgrade firmware.
After upgrade completes, the Powerline Wireless Network Extender automatically reboots.

⚠ **Caution:**

To avoid losing previous configuration of the router, save the configuration before upgrade.
During upgrade, do not power off the Powerline Wireless Network Extender or press the Reset pushbutton.
The default upgrade mode is Local, and it supports only the firmware with the format '.img'.

5.5.4 Configuration Update

Choose **MAINTENANCE** > **Configuration Update**, and the following page appears.



In this page, you can update the configuration file of the Powerline Wireless Network Extender. You may obtain the configuration file from the local server.
The following table describes parameters in this page:

Field	Description

Field	Description
Select File	Click **Browse…** to navigate to the latest configuration file.

Click **Apply**, and then system begins to upgrade configuration file.

After upgrade completes, the Powerline Wireless Network Extender automatically reboots.

⚠ **Caution:**

During upgrade, do not power off the router or press the Reset pushbutton.

The Powerline Wireless Network Extender supports only the firmware with the format *'.xml'*.

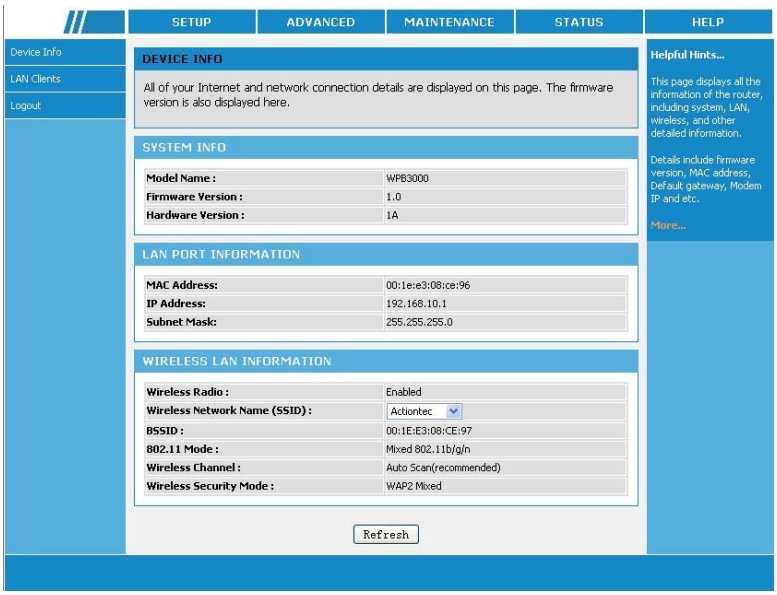
5.5.5 Logout

Choose **MAINTENANCE** > **Logout** to log out of the Web configuration page.

5.6 Status

5.6.1 Device Information

Choose **STATUS** > **Device Info**, and the following page appears.

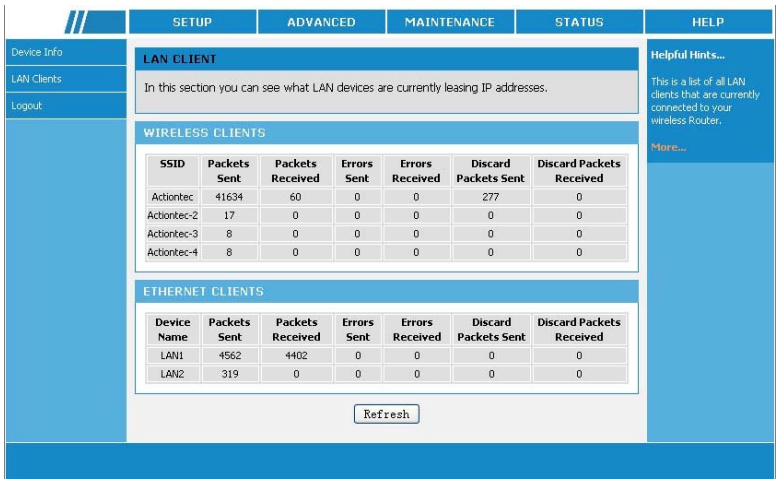


In this page, you can view basic information of the Powerline Wireless Network Extender, such as the information of system and LAN port, wireless LAN information.

Click **Refresh** to refresh the information in this page.

5.6.2 LAN Client

Choose **STATUS** > **LAN Clients**, and the following page appears.



In this page, you can view the status information of wireless clients, Ethernet clients.

Click **Refresh** to refresh the information in this page.

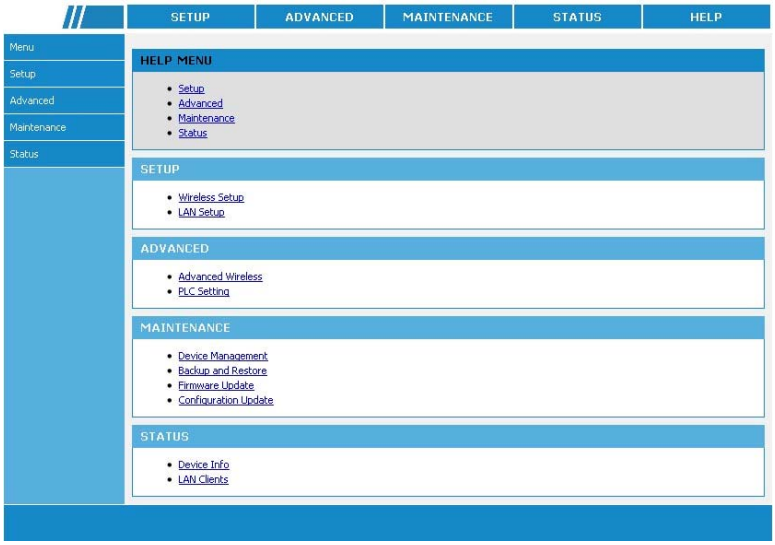
5.6.3 Logout

Choose **STATUS** > **Logout** to log out of the Web configuration page.

5.7 Help

Viewing the help information can help you know more about each configuration page of the Powerline Wireless Network Extender.

Choose **HELP**, and the following page appears.



In this page, you can click the menu that you are interested in to view the detailed information.

6 Using the Security Pushbutton

This chapter describes how to add new devices to, or remove old devices from a HomePlug AV logical network (AVLN). Both can be accomplished by using a **Security** (NMK) pushbutton.

Operation progress and outcome can be monitored by observing the behaviors of the Power and Link LED indicators.

6.1 Forming a HomePlug AV Logical Network

When two devices (A and B) with different NMK values are connected to the same power line, you want them to form a logical network. Do as follows:

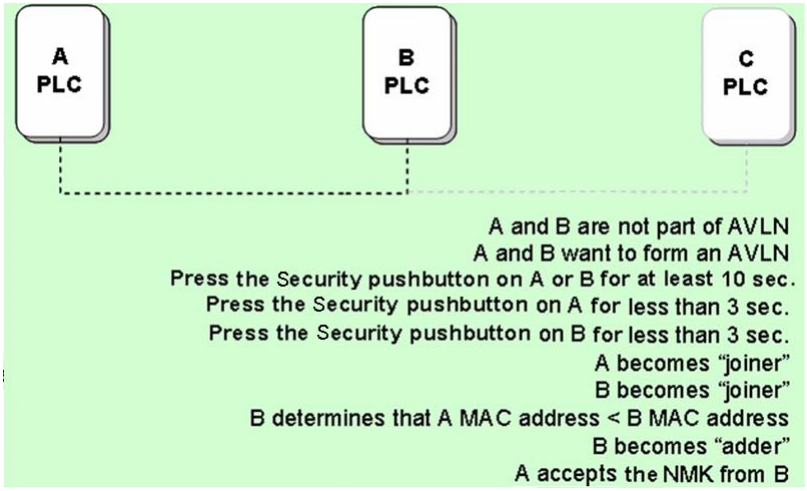
Step1 Press the **Security** pushbutton on A or B for at least 10 seconds. The device will reset and restart with a random NMK.

Step2 Press the **Security** pushbutton on the first device A for less than 3 seconds.

Step3 Press the **Security** pushbutton on the second device B for less than 3 seconds. Press the pushbutton on B within 2 minutes

Step4 Wait for the connection to complete.

The Power LED indicators on both devices will flash evenly at 1-second interval until the operation succeeds or fails. If the connection is successful, the Power and Link LED indicators on both devices illuminate steadily. If the connection is failed, the Power LED indicators on both devices still illuminate steadily, but the Link LED indicators on both devices go out. In that case, please repeat Step1 to Step4.



6.2 Joining an AVLN Network

Assume that a network exists, a new device, the 'joiner', wants to join the network. Any device on the existing network can become the 'adder'.

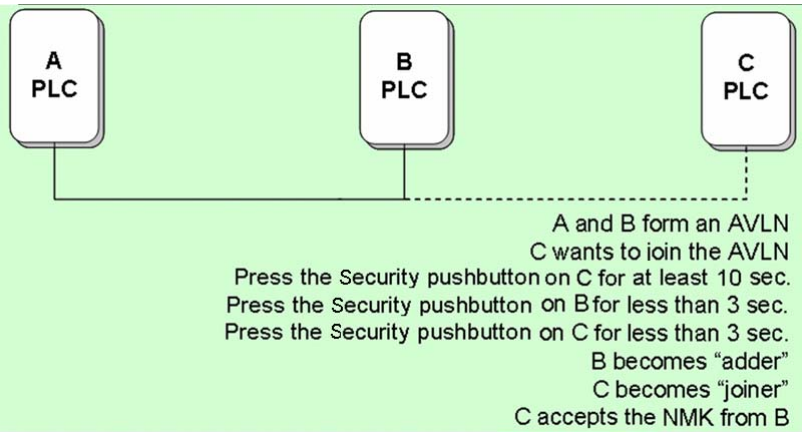
Step1 Press the **Security** pushbutton on the 'joiner' for at least 10 seconds. The device will reset and restart with a random NMK.

Step2 Press the **Security** pushbutton on the 'joiner' for less than 3 seconds.

Step3 Press the **Security** pushbutton on any network device for less than 3 seconds, making it the 'adder'. Please press this pushbutton within 1 minute.

Step4 Wait for the connection to complete.

The Power LED indicators on both devices will flash at 1-second interval until the process succeeds or fails. If the connection is successful, the Power and Link LED indicators on both devices illuminate steadily. If the connection is failed, the Power LED indicators on both devices still illuminate steadily, but the Link LED indicators on both devices go out. In that case please repeat Step1 to Step4.



6.3 Leaving an AVLN Network

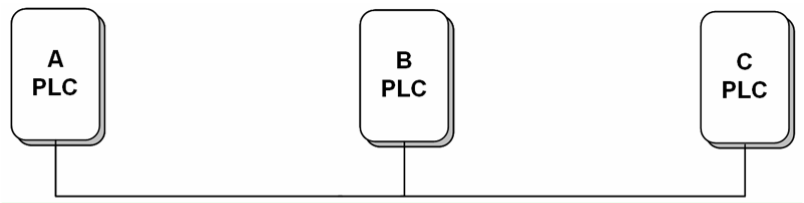
Assume that a network exists. If you want to remove one device, the 'leaver' from an AVLN network, or remove the device from the existing network and have it join another logical network, do as follows:

Step1 Press the **Security** pushbutton on the 'leaver' for more than 10 seconds. The device will reset and restart with a random NMK.

Step2 Wait for reset to complete.

The Power LED indicator on the 'leaver' will momentarily extinguish during reset and flash during restart, then illuminate steadily. The 'leaver' is removed from the existing network successfully.

Once the process completes, you may disconnect the device from the medium or join it to another logical network on the same medium.



A, B and C form an AVLN
A wants to leave the AVLN
Press the Security pushbutton on A for more than 10 sec.
A computes a random NMK
A resets and restarts

Troubleshooting

Why all the LED indicators are off?

Check the connection between the power adapter and power socket.

(1) Check the connection between the power adapter and power socket.

(2) Check whether the device is turned on.

Why the LAN1 or LAN2/WAN indicator is off?

(1) Check the connection between your Powerline Wireless Network Extender and computer, hub, or switch.

(2) Check the running status of your computer, hub, or switch, and verify whether they run normally or not.

(3) Check the network cable that is connected to the Powerline Wireless Network Extender and other devices.

Why you fail to access the Web page?

Follow the steps below to check the connection between the computer and the device:

(1) Click **start > Run** and enter ping command **ping 192.168.10.1** (the IP address of Powerline Wireless Network Extender).

(2) If you fail to access the Powerline Wireless Network Extender, check the following settings:

- The network cable type
- The connection between your router and the computer
- TCP/IP settings of PC

How to restore factory defaults after carrying out the incorrect configuration?

(1) Press the **Reset** pushbutton for more than 3s and then release it. The Powerline Wireless Network Extender restores the factory default settings.

(2) The default IP address of the Powerline Wireless Network Extender is **192.168.10.1** and the subnet mask is **255.255.255.0**.

(3) The user name and password of the super user are **admin**.

Specifications

PLC Module Specification	
Chip	Qualcomm Atheros AR7420/AR1540
Firmware	Support North America/Europe/APAC/Japan
Protocol	HomePlug AV IEEE1901 IEEE 802.3 10/100 Ethernet (100Mbps) IEEE 802.3u Fast Ethernet
PLC Rate	500Mbps
Signal Band	2~68MHz
Modulation Mode	Support OFDM 4096/1024/256/64/16/8-QAM, QPSK, BPSK, and ROBO
Encryption	128-bit AES
QoS	Support four-level QoS Support VLAN priority Support ToS and CoS packet classifications
Operation Mode	Support priority-based CSMA/CA channel access scheme
Multicast	Support IGMP management multicast session.
Wi-Fi Module Specification	
Chip	Qualcomm Atheros AR9341
Flash Memory	64Mbps
DDR SDRAM:	256Mbps
Protocol	IEEE 802.11b/g/n IEEE 802.3/3x/3u
Wireless Frequency Range	2.4 GHz~2.484 GHz
Channel	1~11
Wireless Signal Rate	11b: 11/5.5/2/1Mbps 11g: 54/48/36/24/18/12/9/6Mbps 11n: up to 300Mbps in 40MHz mode and up to 150Mbps in 20MHz mode.
Output Power	11b: 16~17 dBm 11g: 14~17 dBm 11n: 11~16 dBm
Receiving Sensitivity	11b: 11Mbps/-84dBm 11g: 54Mbps/-75dBm 11n: 300Mbps/-64dBm
Operation Mode	2Tx/2Rx
Multiple SSID	Up to 4 BSSIDs
Security Authentication	WEP, WPA-PSK, WPA2-PSK, and WPA/WPA2-PSK SSID hiding MAC address access control list
System Specification	
LED Indicator	Power: Indicate power status. Ethernet 1: Indicate the connection status of LAN1 interface. Ethernet 2: Indicate the connection status of LAN2/WAN interface. Link: Indicate PLC rate. Wireless: Indicate WLAN and WPS connection status.
Power Socket	Support power sockets of English-style, European-style, Japanese-style, and Chinese-style.
Ethernet Port	2 x RJ45 for 10/100 Ethernet (Auto MDI/MDI-X)
Antenna	PCB-Antenna x 2

Button	Security: Set the status of device members. Reset: Restore factory default settings. WPS: Press this pushbutton for less than 3 seconds to enable the negotiation of PBC mode. Press this pushbutton for more than 5 seconds to enable or disable WLAN.
Software Upgrade	Support software upgrade by Web page.
Consumption	6.5W
Environment Requirements	
Operating Temperature	0~40ºC
Storage Temperature	-10~70ºC
Operating Humidity	10%~85%, non-condensing
Storage Humidity	5%~90%, non-condensing
Rated Input	100~240 V AC, 50/60Hz
EMC and Safety	
Compliance	FCC Part 15 Class B, CE
Safety Authentication	UL
Green Standard	RoHS
Physical Characteristics	
Dimension	L × W × H: 107mm × 62mm × 48.5mm
Weight	180g

FCC 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.

Industry Canada Statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: 1) this device may not cause interference and 2) this device must accept any interference, including interference that may cause undesired operation of the

device.

IC Radiation Exposure Statement: This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment.

Avis d’Industrie Canada:

Cet appareil est conforme à la norme CNR-210 des règlements d’Industrie Canada. Son fonctionnement est sujet aux deux
conditions suivantes:
1) Cet appareil ne doit pas provoquer d’interférences et 2) Cet appareil doit accepter toutes les interférences, y compris celles pouvant entraîner son dysfonctionnement.
Avis d’Industrie Canada sur l’exposition aux Rayonnements: Cet appareil est conforme aux limites d’exposition aux
rayonnements d’Industrie Canada pour un environnement non contrôlé.