PL-200AV-PEW
USER MANUAL

Contents

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1 Introduction

This PL-200AV-PEW wallmount Wireless extender for transmitting data up to 200 Mbps across the household power line and every power socket becomes a WLAN access point. Through the combination of these two technologies, you can wirelessly surf on line conveniently in the complicated corner that is used to be unreachable with wiring and data rate is up to 54 Mbps. It is suitable for using in a wide range of both residential (in-home) and commercial (offices, apartments, hotels, warehouses) network applications. No cables, no drilling. These adapters enable the effortless creation of a high-speed network that supports video, voice and data.

1.1 Features

- Wallmount type and power voltage range of 100 V to 240 V AC 50/60Hz
- Compatible with IEEE 802.11b/g and HomePlug AV
- Support QAM 256/64/16/8, QPSK, BPSK, and ROBO modulation schemes
- Physical layer data rate up to 200 Mbps
- 128-bit AES link encryption for PLC
- IEEE 802.11b/g
- Support WAP, WAP2, 64/128/152-bit WEP, SSID hide
- Wireless module supports AP and VAP mode
- Support GUI WEB interface

1.2 System Requirements

- Operating System: Microsoft Windows 2000 or XP, Vista 32-bit
- CPU: Intel Pentium III or better, clock rate faster than 2.0GHz recommended
- RAM: At least 128MB
- Screen Resolution: Any resolution

- Free Disk Space: At least 20MB
- Network Interface: At least one fast Ethernet (100 Mbps) network card, and Ethernet cord

1.3 Package Contents

- PL-200AV-PEW x 1
- CD ROM x 1
- RJ45 Ethernet cable x 1

2 Safety Notice

This device is intended for connection to the AC power line. For installation instructions, please refer to the installation section of this guide. The following precautions should be taken when using this product.

- Read all instructions before installing and operating this product.
- Follow all warnings and instructions marked on the product.
- Unplug the device from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
- Do not operate this product near water.
- This product should never be placed near or over a radiator or heat register.
- 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

3 About the Adapter

3.1 The Ethernet Interface

Ethernet: The Ethernet port connects to an Ethernet network cable. The other end of the cable will connect to your computer or other Ethernet-enabled network device.

3.2 The Adapter's Buttons

Button	Description
Reset	The Reset button is used to restore the factory defaults.
Security	The Security button is used to set the membership state.

Note:

Restoring the PL-200AV-PEW factory defaults will erase all of settings that you have set before, and replace them with the factory defaults. Please be careful for not retaining the reset button if you want to retain the former settings.

3.3 The Adapter's LEDs

All adapter's LEDs are located on the front panel, there are 3 LEDs to indicate the adapter's status.

Indicator	Status	Description
Power(Green/Red)	On	When the LED is green, it indicates that the device is ready for use.
	Flash	When the LED is orange, it indicates that the device is loading firmware.
PLC(Green/Red)	On	When the PLC indicator is green, it indicates that powerline link is detected
	Flash	When serving as a STATION, the LED is green and flashes to indicate powerline activity. When serving as a CCO, the LED is green and lights steadily ON, even in the presence of powerline activity.
LAN (Green)	On	Ethernet link is detected
	Flash	It indicates that data over Ethernet is activated.
WLAN (Green)	On	WLAN link is detected.
	Flash	It indicates that data over Wi-Fi link is activated.

3.4 Connecting the PL-200AV-PEW

Step 1 Put the PL-200AV-PEW to the AC power socket directly.

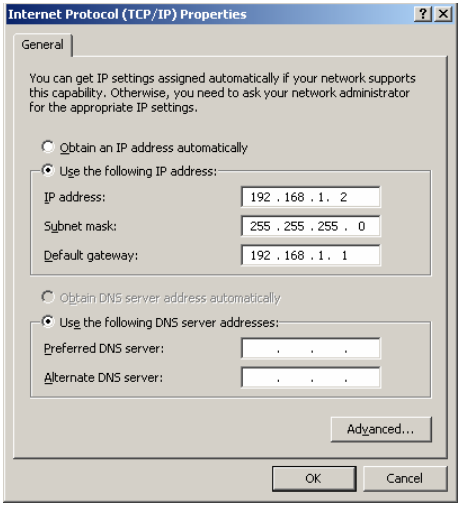
Step 2 Use one end of Ethernet network cable to connect to the PL-200AV-PEW Ethernet port, and another end connect to your PC Ethernet port.

4 Wi-Fi Web configuration

This chapter mainly describes how to configure the Access Point through Web page.

4.1 Setting TCP/IP Properties

The default IP address of PL-200AV-PEW is 192.168.1.1, you should set your PC's IP address in the same subnet.



4.2 Login

Open IE and enter http://192.168.1.1 at the URL column to log in to PL-200AV-PEW web page.

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

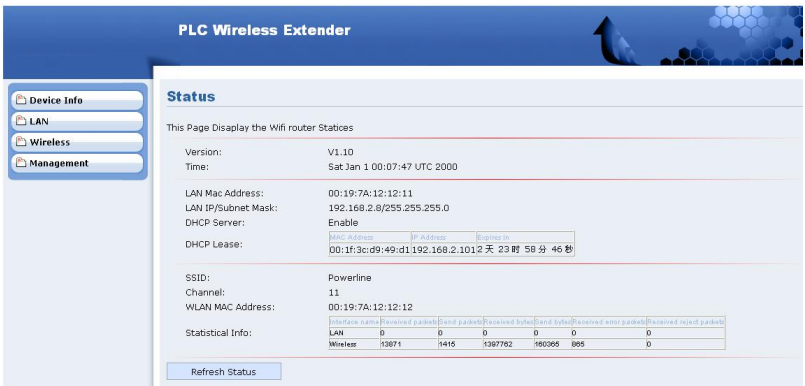
The default user name is admin.

The default password is password.

Click **OK** to log in to the web page, otherwise click **Cancel** to exit.

4.3 Overview

After finish login, the default page **Overview** appears. The **Overview** page displays the current status information, including version, LAN interface, wireless LAN and statistic information.



Firmware Version: The current firmware version of Wi-Fi module.

LAN MAC Address: The physics address of Ethernet interface.

LAN IP/Subnet Mask: The IP address and the subnet mask of Ethernet interface.

DHCP Server: It shows whether the DHCP server function is enabled or not.

Channel: It shows the current channel of the wireless network settings.

WLAN MAC Address: The physics address of Wi-Fi interface.

This field shows the packets statistic information of Wi-Fi module

Click **Update** to refresh the statistic information.

4.4 LAN

Click **LAN** and the following page appears. This page allows you to configure the LAN interface.

IP Address: If necessary, you may set a fixed private IP address for Ethernet interface.

Subnet Mask: According to the net segment to set the subnet mask.

DHCP server automatically assigns an IP address to each computer on LAN,

unless it already has one. It is highly recommended you enable the device as a DHCP server.

When **Disable** is selected, the function of DHCP server is shut off. When **Enable** is selected, the function of DHCP server is activated and the following items appear.

Lease Time: The life time of assigned IP that the DHCP server leases to.

IP address Pool: The IP address range that DHCP Server leases to.

After finishing the settings above, click **Apply**, and then the new settings take effect. The Wi-Fi module saves all changes to Flash.

Click **Cancel** to discard all changes.

4.5 Wireless

Click **Wireless** and the following page appears. This page allows you to configure the wireless LAN interface.

Mode: It consists three types of modes, including 802.11b, 802.11b/g Compatible and 802.11g Only. You may select the proper network mode. It is highly recommended that you select 802.11b/g Compatible.

SSID (Service Set Identifier): The wireless network name shared among all the devices is case-sensitive and must not exceed 32 alphanumeric characters which may be any keyboard character. Make sure this setting is the same for all devices in the wireless network.

Channel: Select the proper channel in the drop-down list. All devices in the wireless network must use the same channel in order to run correctly.

Beacon Interval: If the value of beacon interval is small, it can accelerate the link speed. If the value is big, it can help to save power. The interval time range is between 25 and 500. The default value is 100.

Data Rate: It is the wireless physics rate. It is highly recommended that you select **Auto**. If you select **Auto**, the data rate will automatically negotiate with other devices according to the situation. For a fixed data rate, you should set the proper data rate according to the Wi-Fi mode (such as 802.11b or 802.11g).

After finishing the settings above, click **Apply**, and then the new settings take effect. The Wi-Fi module saves all changes to Flash.
Click **Cancel** to discard all changes.

4.6 Security

Click **Security** and the following page appears. This page allows you to configure security for the wireless LAN interface.

Encrypt: Select **Enable** to enable VAP security configuration or select **Disable** to disable it.

Authentication Type: There are five types of authentication types, including Open System, Shared Key, Open & Shared, WPA-PSK, and WPA2-PSK.The default value is Open System, and also Shared Key can be used. For Open System, the sender and the recipient do not use a WEP key for authentication. For Shared Key authentication, the sender and recipient use a WEP key for authentication. In most cases, please keep the default value.

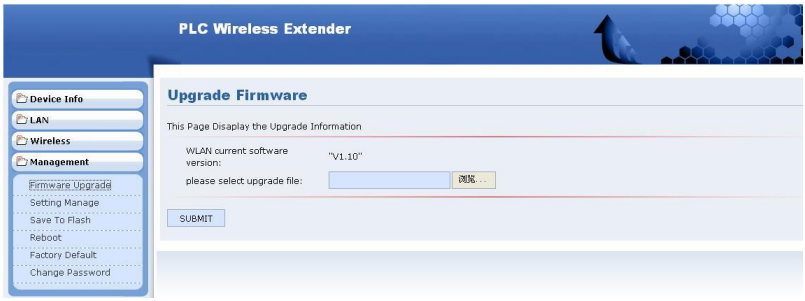
If you select Open System, Shared Key, or Open & Shared mode, you may configure VAP WEP.

WEP Key1-4: WEP keys are used to create an encryption scheme for wireless network transmissions. When not using a Passphrase, you can manually enter a set of values, and do not leave a key field blank. If you are using 64-bit WEP encryption, the key must be exactly 10 hexadecimal characters in length. If you are using 128-bit WEP encryption, the key must be exactly 26 hexadecimal characters

in length. Valid hexadecimal characters are “0”-“9” and “A”-“F”.

4.7 Management

Click **Management** and the following page appears. This page allows you to upgrade the firmware.



Fireware Upgrade:Current Firmware Version: This field shows the current firmware version.

Locate New Firmware: Click **Browse** to select the new firmware in your PC. Click **Upgrade** to download the new firmware to the device.

Restore Factory Defaults: Click the **Restore** button, then the all current configuration returns to factory default.

Click the **Save** button, the all configuration will be stored into Flash.

New Password: Set a new password for logging in to the Wi-Fi web.

Confirm Password: Enter the new password again.

After finishing the settings above, click **Apply**, and then the new settings take effect.

The Wi-Fi module saves all changes to Flash.

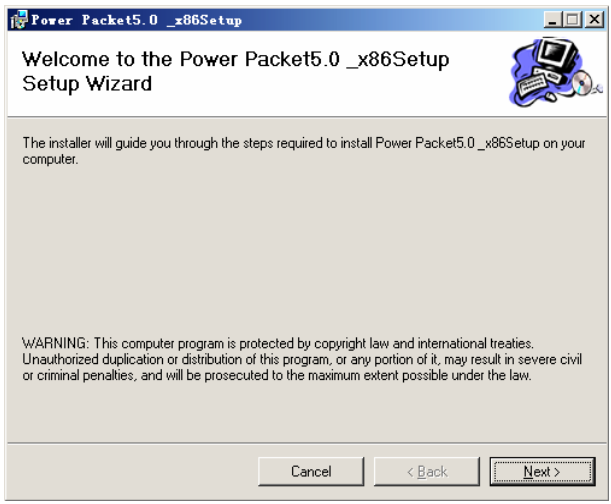
Click **Cancel** to discard all changes.

5 Installing PLC Utility Software

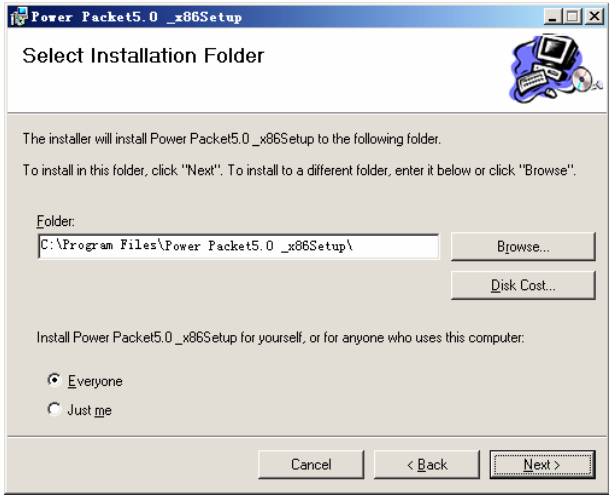
Note:

Before installing the PLC utility software, make sure that there is no any other Powerline Utility installed on your computer. If there is another utility installed, please uninstall it and restart your computer.

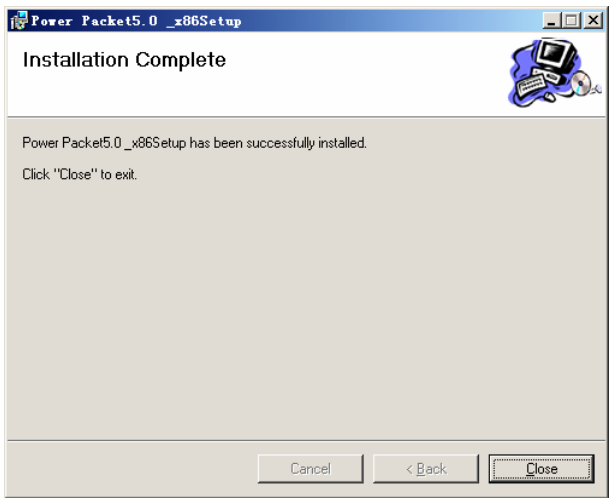
Please insert the utility CD-ROM into the computer's CD-ROM drive. Double click the setup.exe, and then a page for installing the utility software appears.



Click **Next** to show the following page.



Click **Browse** to select the installation folder, and then click **Next** to continue.



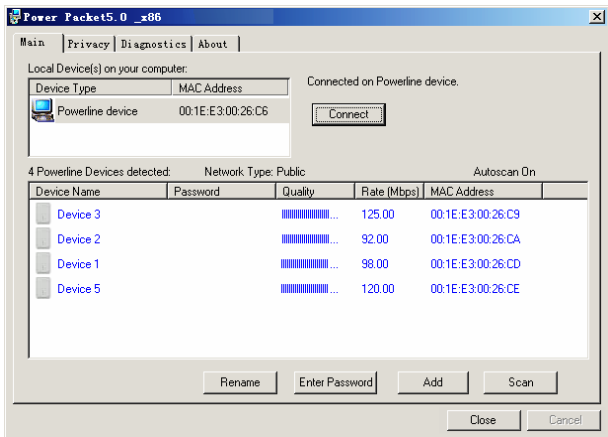
Click **Close** to finish the installation.

6 How to Use the Utility Software

6.1 Main Page

The **Main** page provides a list of all powerline devices logically connected to the computer when the utility is running.

The **Device Type** shows local HomePlug devices connected to the computer's NIC (Network Interface Card). User can click the **Connect** button to make NIC connect to the local devices. Once connected to the local device, the utility will automatically scan the power line periodically for any other HomePlug devices. If no local HomePlug devices are discovered, the status area above the **Connect** button will show a message "**NO HOMEPLUG ADAPTERS DETECTED**".



This page also 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 above the **Device Name**. 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 MAC Address. The following information for all devices is displayed in the page.

● Device Name

This field shows the default device name. User may modify the name by either using the **Rename** button or by clicking on the name to edit it.

● MAC Address

This field shows the remote device's MAC address.

● Password

By default, this field is blank. Click **Enter Password** button, user may modify the password.

To set the **Password** of the device (It is necessary when creating a private network), first select the device by clicking on its name and then click the **Enter Password** button. **Set Device Password** dialog box appears for setting the password. Enter your password in the password field. The password can be in any case formats, with or without dashed between them. Click **OK** to confirm the password.

A confirmation box will appear if the password was entered correctly. If a device was not found, system will pop up the prompt for trouble shooting. This process may take a few seconds to get completed.

- **Add**

This button is used to add a remote device to the existing network by entering the device password of the device. A **Add Device to Network** dialog box appears. You are allowed to set the device name and the password.

A confirmation box will appear if the password was entered correctly and if the device was found in the powerline network. If a device was not found, system will pop up the prompt for trouble shooting.

Note:

The device must be present on the power line (plugged in) in order for the password to be confirmed and added to the network. If the device could not be located, a warning message will be shown.

- **Scan**

This button is used to search the HomePlug devices connected to the Powerline network. By default, the utility automatically scans every few seconds and updates the information.

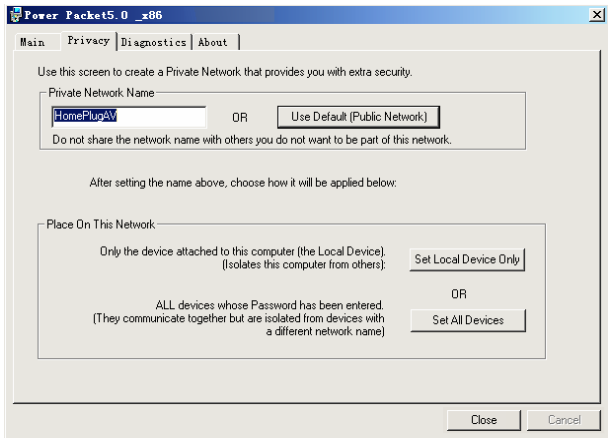
6.2 Privacy page

The **Privacy** page allows you to create a private network to keep the security of logical network.

All HomePlug devices are using a default logical network (network name), usually

"**HomePlug**". The **Privacy** page allows user to change to a private network by modifying the network name (network password) of devices.

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



Note:

Changing the network name to anything other than HomePlug, the main page will show the network type as Private.

● Set Local Device Only

This 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 displayed on the previous main page will be no longer existed in the new network. Therefore, the local

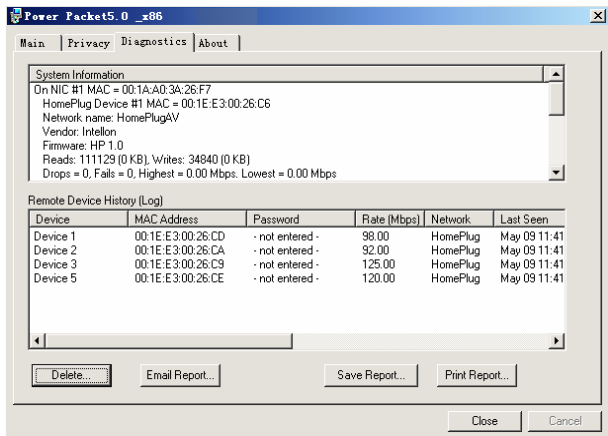
device can not communicate with the devices in the previous logical network. Devices previously set with the same logical network (same network name) will appear in the device list after selecting this option.

- **Set All Devices**

This button is used to change the logical network of all devices that appear on the main page whose Device's Password had been entered in the same logical network. After finishing modifying, a dialog box appears to remind you that the operation is successful. If the device password is not entered, it reminds you that the operation is failed.

6.3 Diagnostics page

The **Diagnostics** page shows the information about system and the history of all remote devices over a period of time.



The **System Information** shows software and hardware technical specifications of

the host computer on the Powerline network. It includes the following information.

- Operating system platform or version
- Host Network Name
- User Name
- MAC Address of all NICs (Network interface card) connected to the host
- Versions of all Driver DLLs and libraries used (NDIS) (optional)
- 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

The Lower panel contains the history information of all remote devices displayed on the computer over a certain period of time. All devices that were on the powerline 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 field. For the devices on the other networks, or devices that may no longer exist, “?” symbols are shown in the corresponding Rate fields. Remote Divice History displays the following information.

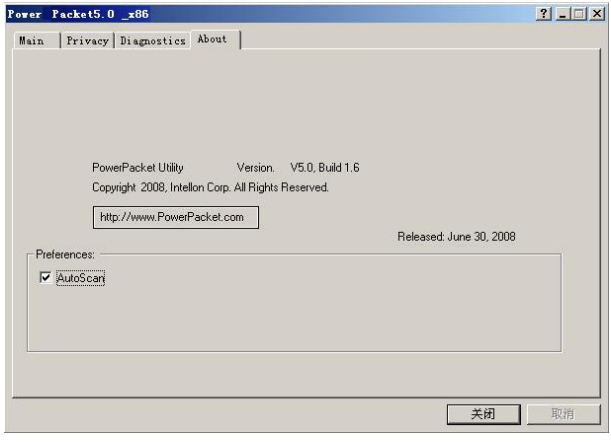
- Device alias name
- Device MAC address
- Device password
- Up-to-the-minute rate
- Up-to-the-minute network name
- HomePlug chipset manufacturer name
- Up-to-the-minute date and time
- MAC firmware version

The diagnostics information displayed may be saved as a text file for backup, or can be printed for reference as technical support. For the devices that are not part of the

network anymore, can be deleted by using the delete button. A dialog box pops up with a confirmation message if we try to delete a device whose password has been entered.

6.4 About page

The **About** screen shows the software version and provides a HTML link to the manufactory website.



Preferences

You may select enable or disable auto-scan feature.

7 How to Use the SECURITY Pushbutton

This section describes how to add new devices to, or remove old devices from a HomePlug AV logical network(AVLN） by using a SECURITY pushbutton.

The operation progress and outcome can be monitored by observing the status of the Power LED.

7.1 Creating a HomePlug AV Logical Network

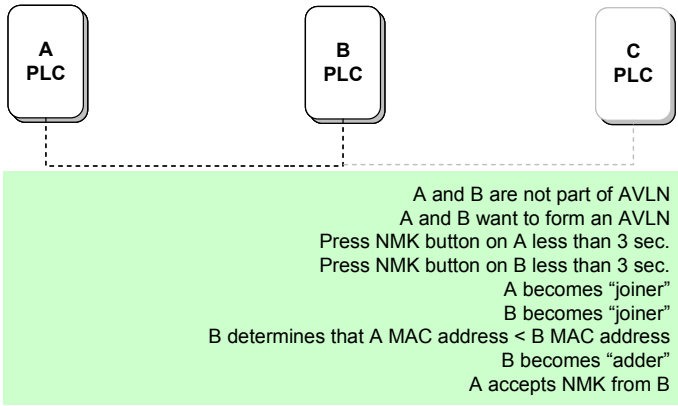
If you want to create a logical network through two devices with different SECURITY values and the two devices are connected to the same powerline, you can follow the steps below.

Step 1 Press the SECURITY button on the first device A for less than 3 seconds.

Step 2 Press the SECURITY button on the second device B for less than 3 seconds. The button on device B must be pressed within 1 minute.

Step 3 Wait for the connection between A and B to complete.

The Power LED on both devices will flash evenly at 1-second intervals until the operation succeeds or fails. If the operation succeeds, the power LED will illuminate steadily. If an error occurs, the power LED on the ‘adder’ will flash unevenly until the pushbutton on the ‘adder’ is pressed again or the ‘joiner’ is reset by holding the pushbuttons down for more than 10 seconds.



7.2 Joining a Network

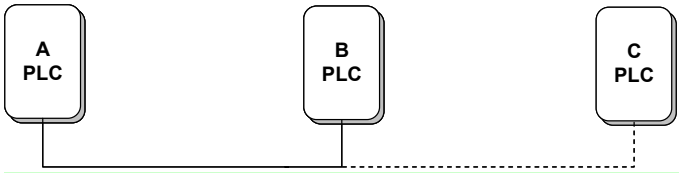
In this scenario a network exists, a new device, the ‘joiner’, wants to join the network. Any device on the existing network can become the ‘adder’.

Step 1 Press the pushbutton on the ‘joiner’ for at least 3 seconds.

Step 2 Press the pushbutton on any network device for less than 3 seconds, making it the ‘adder’. Please press this pushbutton within 1 minute.

Step 3 Wait for connection to complete.

The Power LED on both devices will flash at 1-second intervals until the process succeeds or fails. It will illuminate steadily on success. If an error occurs, the Power LED on the ‘adder’ will flash unevenly until the pushbutton on the ‘adder’ is pressed again or the ‘joiner’ is reset by pressing the pushbutton for more than 10 seconds.



A and B form an AVLN
C wants to join the AVLN
Press NMK button on B less than 3 sec.
Press NMK button on C less than 3 sec.
B becomes “adder”
C becomes “joiner”
C accepts NMK from B

7.3 Leaving a Network

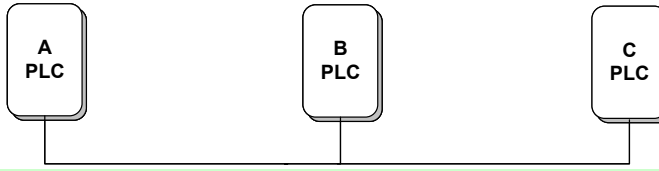
A network exists. The user wants to remove one device, the ‘leaver’, from that network, for whatever reason. He may want to remove the device from service altogether or have it join another logical network.

Step 1 Press the pushbutton on the ‘leaver’ for at least 10 seconds. The device will reset and restart with a random SECURITY.

Step 2 Wait for reset to complete.

The Power LED on the ‘leaver’ will momentarily extinguish during reset, flash during restart then illuminate steadily. No errors can occur.

Once the process completes, the user 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 NMK button on A more than 10 sec.
A computes random NMK
C resets and restarts

Appendix A Specifications

PLC Module SPEC	
PLC Chipset	Intellon INT6400/INT1400
Serial Flash	16MB
SDRAM:	128MB
Firmware	Support North America/Europe/APAC/Japan
Protocol	HomePlug AV, coexists with existing HomePlug 1.0
PLC Rate	200Mbps
Data Rate	65Mbps TCP 90Mbps UDP
Modulation Band	2 MHz~30MHz
Modulation Schemes	Support 1024/256/64/16/8-QAM, QPSK,BPSK and ROBO
Encryption	128-bit AES
QoS	Support contention-free access, four-level priority based contention access, and multi segment bursting Support VLAN Priority Support ToS and CoS Packet Classifier
Work Mode	TDMA and priority based CSMA/CA
Multicast Support	Supports IGMP managed multicast sessions
Wi-Fi Module SPEC	
Wireless Chipset	Atheros AR2317
Protocol	IEEE 802.11b/g
Wireless Rates	For 802.11b: 11 Mbps, 5.5 Mbps, 2 Mbps, and 1Mbps For 802.11g: 54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps and 6Mbps
Security	WPA, WPA2, 64/128/152-bit WEP, Hide SSID

	MAC Address Access Control List
Frequency Range	2.4GHz~2.4835GHz
Work Mode	Access Point
System SPEC	
System Support	Windows 98SE, 2000, ME, XP 32/64 bit and Vista 32/64bit
LED's	Power: The power LED lights up when the adapter is powered on. PLC: PLC link and activity LAN: Ethernet link and activity WLAN: Wireless link and activity
Push Button	Reset: Reset system or restore the factory defaults. Security: Used to set the membership state.
Ethernet Interface	1 x RJ45 for 10/100 Ethernet (Auto MDI/MDI-X)
Consumption	5.5W (Max)
Environment Requirement	
Operating Temperature	0ºC~40ºC
Storage Temperature	-20ºC~70ºC
Operating Humidity	10%~85%, non-condensing
Storage Humidity	5%~90%, non-condensing
Input Rating	100V-240 V AC, 50/60Hz
EMC and Safety	
Regulatory Compliance	FCC Part 15 Class B CE
Safety Regulations	UL
Green Standard	RoHS
Physical Characteristics	
Dimension	L×W×H: 117mm×75mm×47mm
Weight	216g

Appendix B Acronyms and Abbreviations

AVLN	AV In-home Logical Network, the AVLAN is the set of STAs that possess the same network Membership key, every AVLN is managed by a single CCo
CCo	Central Coordinator, the CCo is a superset of a STA which provisioning of terminal equipment identifiers and global link identifiers
CSMA/CA	Carrier Sense Multiple Access / Collision Avoidance
DAK	Device Access Key
IGMP	Internet Group Management Protocol
NEK	Network Encryption Key
NID	Network ID (Identification)
SECURITY	Network Membership Key
PLC	Power Line Communication
PIB	Parameter Information Block
STA	Station, a STA in the network with a connection to the power line and being able to source or sink traffic
TDMA	Time Division Multiple Access
TEI	Terminal Equipment Identifier
TOS	Type Of Service
VLAN	Virtual Local Area Network

Appendix C About PLC QoS

PL-200AV-PEW allows 4 levels of Channel Access Priority CAP (0~3). The 8 levels of VLAN Ethernet tags must be mapped to the 4 levels of CAP priority, where CAP 3 is the highest priority and CAP 0 is the lowest. CAP 3 priority might be used for voice and network management frames. CAP 2 is used for streaming video and music while CAP 1 and CAP 0 are used for data.

Default CAP

The 'Default CAP' group allows for default priority mapping of packets that do not have a VLAN TAG. Settings are available for Unicast (directed to a host).

- IGMP - (default CAP 3) - sets the channel access priority for IGMP frames - these are the group management frames, not the stream data.
- Unicast - (default CAP 1) - sets the default channel access priority for unicast frames not matching any other classification or mapping.
- IGMP managed Multicast Stream (Fixed to CAP 2) - sets the default channel access priority for stream data belonging to a snooped IGMP multicast group.
- Multicast/Broadcast - sets the default CAP for multicast frames not in a snooped group and for broadcast frames.

- The following are the factory default settings for VLAN Tags and TOS Bits:

VLAN Tag User riority	Default CAP Priority	TOS Bit User Priority	Default CAP Priority
0	CAP1	0	CAP1
1	CAP0	1	CAP0
2	CAP0	2	CAP0
3	CAP1	3	CAP1

4	CAP2	4	CAP2
5	CAP2	5	CAP2
6	CAP3	6	CAP3
7	CAP3	7	CAP3