

# Powerline Communication

**Powerline Ethernet Bridge – PL-104E**

**USB Powerline Adapter - PL-104U**

## USER'S MANUAL



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## Revision

User's Manual for Powerline Communication product

Model: PL-104E, PL-104U

Rev: 1.0 (Aug. 2004)

Part No. EM-PL104

## ***Important Safety Instructions***

- 1. Read these instructions carefully.*
- 2. Follow all warnings and instructions marked on the product.*
- 3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.*
- 4. Do not use this product near water.*
- 5. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation provided.*
- 6. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.*
- 7. This product relies on the building's electrical installation for short-circuit (over current) protection. Ensure that a fuse or circuit breaker no larger than 240 VAC (depends on the power supply type in your country) is used on the phase conductors (all current-carrying conductors).*
- 8. Plug the device directly into a 240 VAC (depends on the power supply type in your country) wall outlet. Do not use an extension cord between the adapter and the AC power source.*
- 9. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks as well as ruin product warranty. Refer all servicing to qualified service personnel.*
- 10. Unplug the AC coupler 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.*

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# 1. Introduction

Powerline communication is revolution in home and small office networking, greatly simplifying the task of installing a high-speed local area network. With PLANET's powerline communication products, you can utilize existing AC power outlets and wires to connect your computers, servers and other devices safely, securely and at true LAN speeds of up to 14Mbit/second. No complex and expensive specialized wiring usually associated with LAN's is required, or management, security and interference problems associated with 802.11 wireless technologies – just convenient, reliable, secure and simple networking where you need it most. PLANET's Powerline products allow you to place a computer anywhere in your home or small office with flawless, uninterrupted high-speed network connection, simply by plugging your computer's Ethernet or USB interface into PL-104E/U equipped power outlet – and you're almost guaranteed to have one of these wherever you need it.

The PL-104E is a Powerline to Ethernet Bridge with a 10base-T RJ-45 Ethernet interface for directly connecting to a computer's Ethernet card or existing Ethernet switch, hub or broadband router. The PL-104U is an USB to Powerline network adapter with an USB type B connector for directly connecting to computer's USB port. Both of them provide a power socket for connecting to wall outlet.

Security of PLANET's Powerline communication technology is assured by the use of 56-bit DES encryption – the same system used to protect banking systems all over the world, and is interference free, avoiding the problems of wireless systems.

## **1.1 Powerline Ethernet Bridge – PL-104E**

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The PLANET Powerline Ethernet Bridge PL-104E offers a complete Internet connection solution for your home powerline network. The PL-104E makes sharing your high-speed broadband Internet access easier than ever. Build a strong and simple-to-use home network by taking advantage of the most pervasive medium - powerline.

The PL-104E is ideal for users who already have a router. It can be plugged into an Ethernet port on a router to equip a network with powerline capabilities and take advantage of the router's features. The PL-104E can also be plugged directly into a cable or DSL modem to allow Internet access and data transfer rates up to 14Mbps over powerline.

### **1.1.1 Features**

- ◆ HomePlug Powerline Alliance Specification 1.0 compliant
- ◆ Built-in power plug for both powerline network and power supply
- ◆ Connects 10/100 Ethernet network to powerline Network for seamless integration
- ◆ 56-bit data encryption to ensure data security and reliability
- ◆ Easy to use Windows-based security key configuration utility
- ◆ Easy to read LED indicators
- ◆ Support CSMA/CA protocol on power line interface
- ◆ Up to 90m between powerline nodes
- ◆ Plug-and-play operation provides easy setup
- ◆ Shares internet access across your entire home powerline network
- ◆ Up to 14 Mbps data transfer over powerline

### **1.1.2 Package Content**

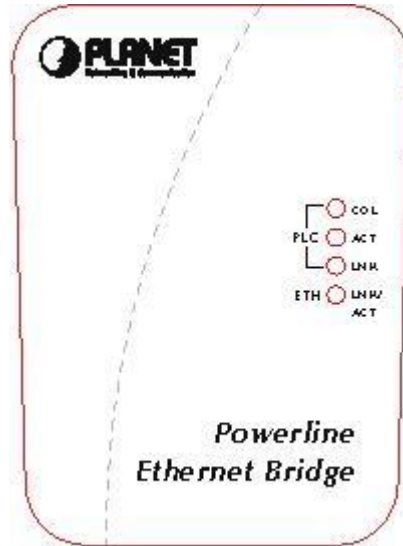
Check the contents of your package for following parts:

- One Powerline Ethernet Bridge
- One RJ-45 cable
- One Manual and Utility CD-ROM
- One Quick Installation Guide

If any of these pieces are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

### 1.1.3 Hardware Description

PL-104E front panel:



#### LEDs status

LED		Description
PLC	COL	Blinking indicates there exists collision in powerline network
	ACT	Blinking indicates there exists powerline network traffic
	LNK	Steady on indicates PL-104E has connected to a powerline network
ETH	LNK/ACT	Steady on indicates the RJ-45 port has correctly connected to the network card of your PC or the Ethernet network

### 1.1.4 System Requirements

- Existing Ethernet/fast Ethernet network or an existing Ethernet/fast Ethernet network adapter and network cable
- TCP/IP protocol
- CD-ROM Drive (for installing Encryption Utility)

## **1.2 USB to Powerline Network Adapter – PL-104U**

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The newest and fastest way to network your PCs is through powerline networking, which allows you to turn the powerline in your home into your network cable. The easiest way to integrate any PC or laptop into such a powerline network is with PLANET Powerline USB Adapter. Use your existing USB port with your existing powerline. The Plug-and-Play USB Adapter connects directly to virtually any USB-ready PC – just plug it in and you are ready to share data, printers, or high-speed Internet access over your existing powerline network. For desktop installation, you do not have to open your PC case. With user-friendly software, it is simple to set up.

Not only is PL-104U easy to install and use, but it also powerful. You can send and receive data at speeds of up to 12Mbps. Plug it into the USB port; set it up, and you are ready to go. So for full desktop and notebook PC flexibility and powerline convenience, the PL-104U provides the perfect solution.

### **1.2.1 Features**

- ◆ HomePlug Powerline Alliance Specification 1.0 compliant
- ◆ Power plug for powerline network
- ◆ Shares internet access across your entire home powerline network
- ◆ Provides powerline connectivity through Your USB port
- ◆ 56-bit data encryption to ensure data security and reliability
- ◆ Easy to use Windows-based security key configuration utility
- ◆ Easy to read LED indicators
- ◆ Support CSMA/CA protocol on power line interface
- ◆ Plug-and-play operation provides easy setup
- ◆ Up to 14 Mbps data transfer rate
- ◆ Compatible with Windows 98SE, ME, 2000 and XP

### **1.2.2 Package Contents**

Check the contents of your package for following parts:

- One powerline USB adapter
- One USB cable
- One Manual and Utility CD-ROM
- One Quick Installation Guide

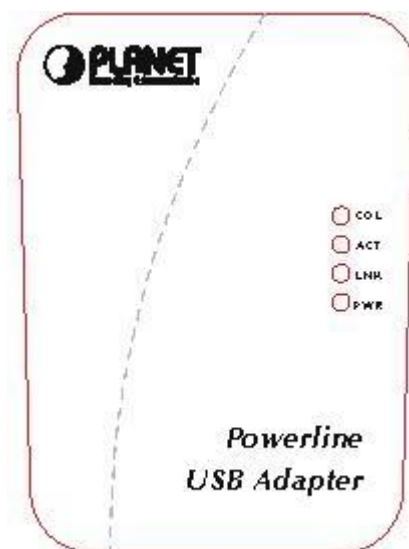
If any of these pieces are missing or damaged, please contact your dealer



immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

### 1.2.3 Hardware Description

#### PL-104U front panel



#### LEDs status

LED	Description
PWR	Steady on indicates PL-104U has correctly connected to the USB port of your PC
LNK	Steady on indicates PL-104U has connected to a powerline network
ACT	Blinking indicates there exists powerline network traffic
COL	Blinking indicates there exists collision in powerline network

#### USB port

The USB port is where you will connect your USB cable. To work with USB ports, your computer must be running Windows 98SE, ME, 2000 or XP.

## 1.2.4 System Requirements

- Pentium-class 90 MHz or higher
- Minimum 32 MB RAM
- USB-ready PC
- Windows 98SE, ME, 2000 and XP
- CD-ROM Drive (for installing driver and Encryption Utility)

## 1.3 Specification

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Product	Powerline Ethernet Bridge	Powerline USB Adapter
Model	PL-104E	PL-104U
Standards	HomePlug 1.0 IEEE 802.3 10Base-T	HomePlug 1.0 USB 1.1
Ports	One Powerline Port One 10Mbps Ethernet RJ-45 port	One Powerline port One USB type B jack
Speed	LAN: 10Mbps  Powerline: 14Mbps (actual throughput is about 6Mbps)	USB: 12Mbps  Powerline: 14Mbps (actual throughput is about 6Mbps)
Powerline Frequency Band	4.3MHz to 20.9MHz	
Encryption	56-bit DES with Key configuration software	
Dimension	65 x 93 x 78 mm	
Weighty	230g	110g
Certifications	FCC Class B, CE	
Operating Temp.	0 ~ 50 degree C	
Storage Temp.	-20 ~ 70 degree C	
Operating Humidity	10~90% non-condensing	
Storage Humidity	5~95% non-condensing	

OS support	Any system that provides an Ethernet interface	Windows 98SE, 2000, Me and XP
Utility compatibility	Windows 98SE, 2000, Me and XP	



## 3. Powerline Ethernet Bridge Installation

### 3.1 Hardware Installation

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1. Plug one end of an UTP category 5 cable into the computer, switch or hub's LAN port.
2. Plug the other end of the network cable into the 10/100 RJ-45 Ethernet ports on PL-104E.
3. Plug the PL-104E to the power outlet.

**NOTE:** Because PL-104E sends data over the powerline of your house; it is best to plug it directly into a power outlet. Do not plug PL-104E into a UPS power strip with surge protection. PL-104E has its own power filter for protection against surges.

4. Perform procedure 1~3 for all other PL-104E on your network.

### 3.2 Driver Installation

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PL-104E does not need any driver to work if connected to a PC, since the PC should install an Ethernet Adapter and its driver already.

## 4. Powerline USB Adapter Installation

### 4.1 Connecting USB to Powerline Network Adapter

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1. Plug the other end of the USB cable into the computer's USB port.
2. Plug the USB cable into the USB port on PL-104U.
3. Plug the PL-104U directly into a power outlet.

**NOTE:** Because PL-104U sends data over the powerline of your house; it is best to plug it directly into a power outlet. Do not plug PL-104U into a UPS power strip with surge protection. PL-104U has its own power filter for protection against surges.

### 4.2 Powerline USB Adapter Driver Installation

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The installation procedure for the network driver will vary depending on which operating system you are using on your computer. PL-104U support Windows 98SE, Me, 2000 and XP. The following procedure is for installation under Windows XP. Installation on other operation system is similar.

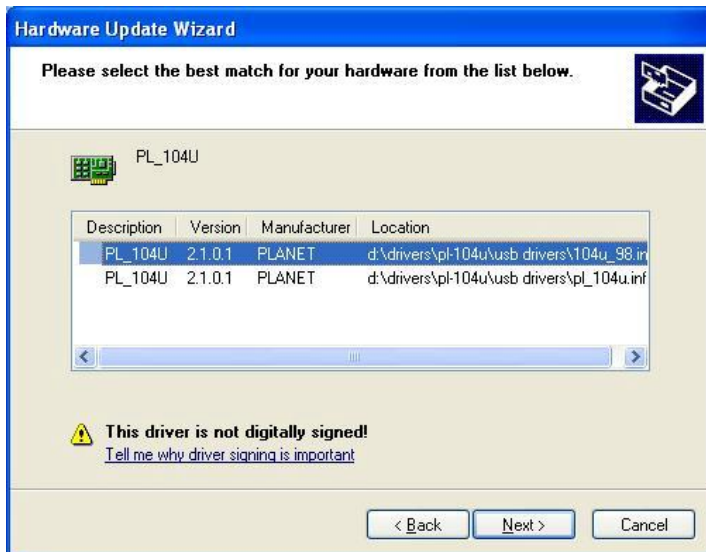
1. Windows will automatically detect the presence of the USB Adapter hardware in your computer once you have completed the hardware installation. Insert the bundled CD, select **“Install the software automatically (Recommended)”** and click the **Next** button.



- Windows will start to search the CD to find the suitable driver.



- Windows may ask you to select the suitable driver to install. Please select "pl\_104u.inf" for Windows 2000 and XP, "104u\_98.inf" for Windows 98SE and Me. Click "Next" to continue.



NOTE: Windows 2000 and XP will inform you that there is no digital signature found. Click the **Yes** button to continue the installation.



4. Windows will tell you when it has finished installing the new driver. Click the **Finish** button.



5. If Windows ask you to restart the system, please click the **Yes** button to restart your computer, or click the No button to restart later.



# 5. Powerline Configuration Utility

## 5.1 Install the Powerline Configuration Utility

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The installation procedure for the Powerline Configuration utility will vary depending on which operating system you are using on your computer. The following procedure is for installation under Windows XP. Installation on other operation system is similar.

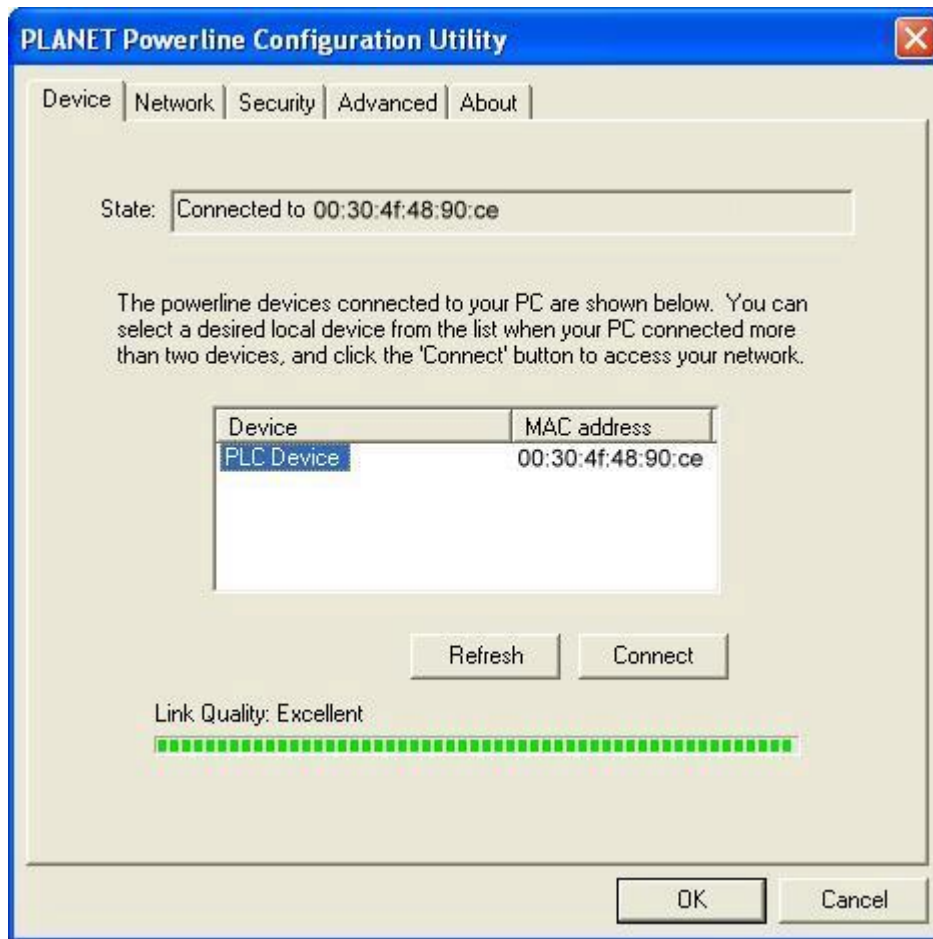
1. Insert the CD-ROM into the CD-ROM drive to initiate the autorun program. Once completed, a menu screen will appear.
2. Click on the “Powerline Configuration Utility” hyperlink in PL-104E or PL-104U field to start the installation. If the menu screen is not shown, you can start the installation as follows.
  - Click on **Start Menu/ Run**.
  - Enter “**E:\Utility\PL-104E\setup.exe**” in the appeared box, where “E” is the letter of your CD-ROM drive.
  - Click on “**OK**” button.
3. The utility will be installed into your computer and a new icon called “PLANET Powerline Configuration” will appear on your desktop.



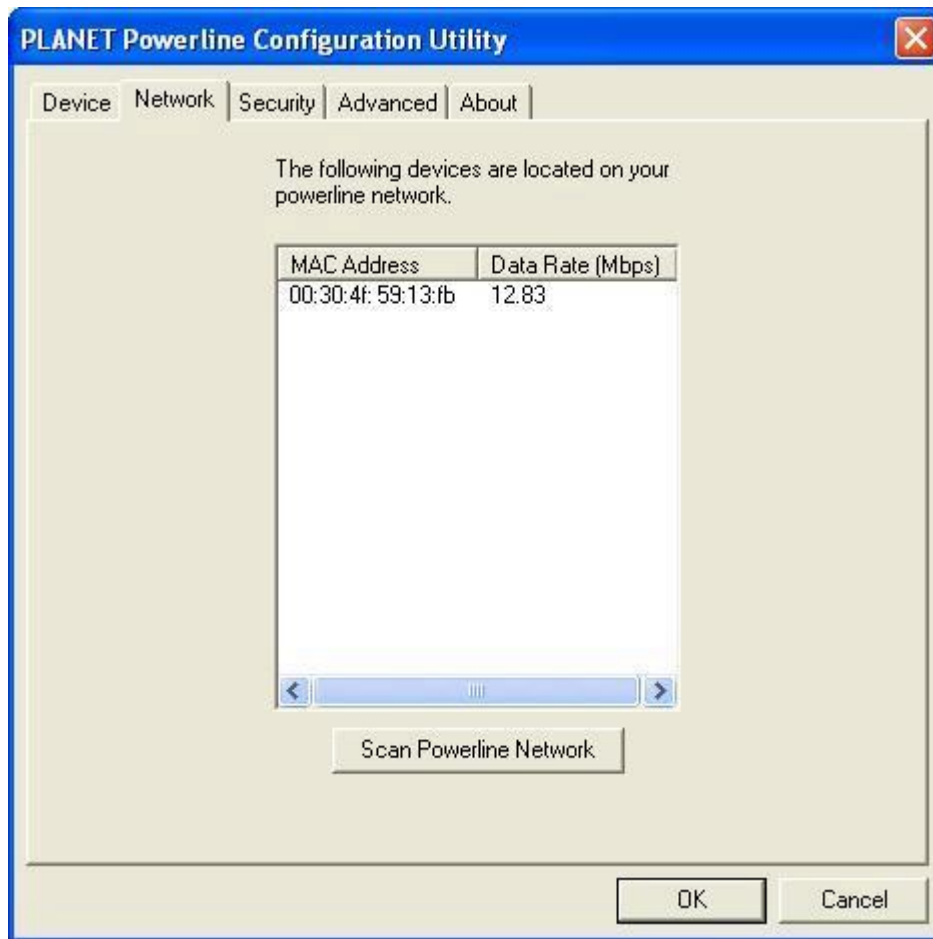
## 5.2 Using the PLANET Powerline Configuration Utility

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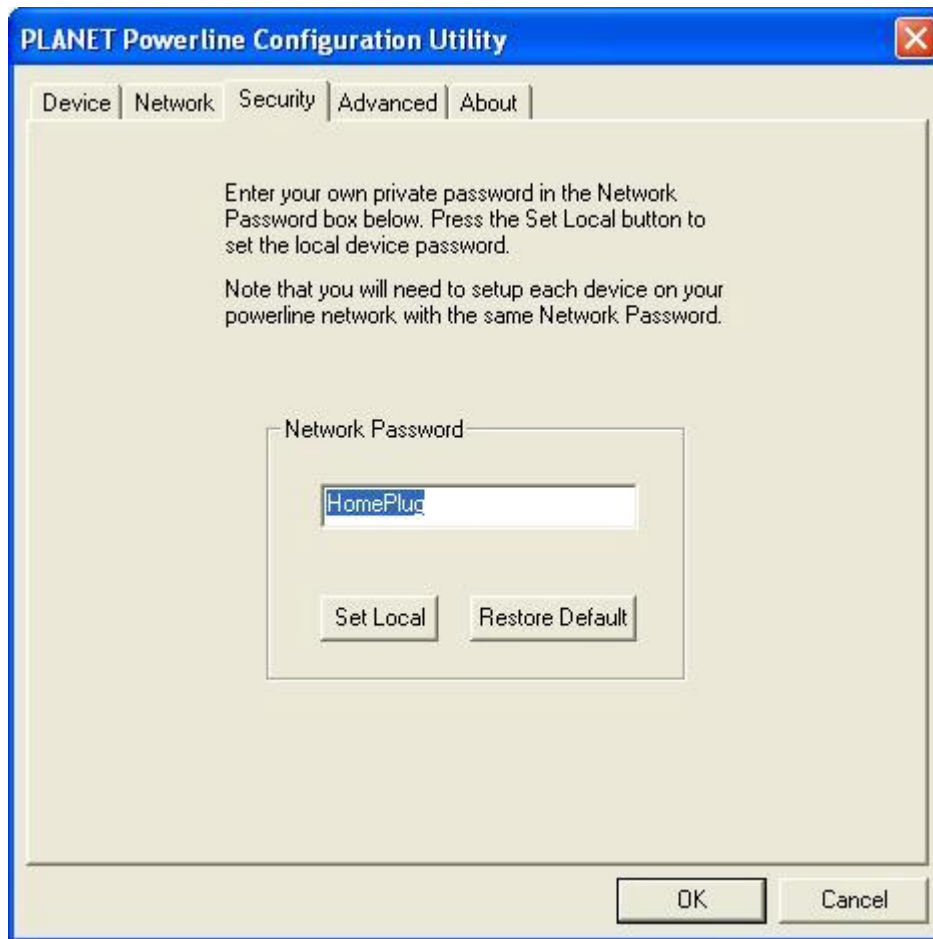
1. Double click the **PLANET Powerline Configuration Utility** icon shown on your desktop. The Device tab shows the MAC address of your Powerline device connected to your computer. If you have installed more than two Powerline devices, select the preferred one and click **Connect** to access your network. Click **Refresh** whenever you add or eliminate Powerline devices. The Link Quality depends on the site’s power circuit condition, power stability, etc.



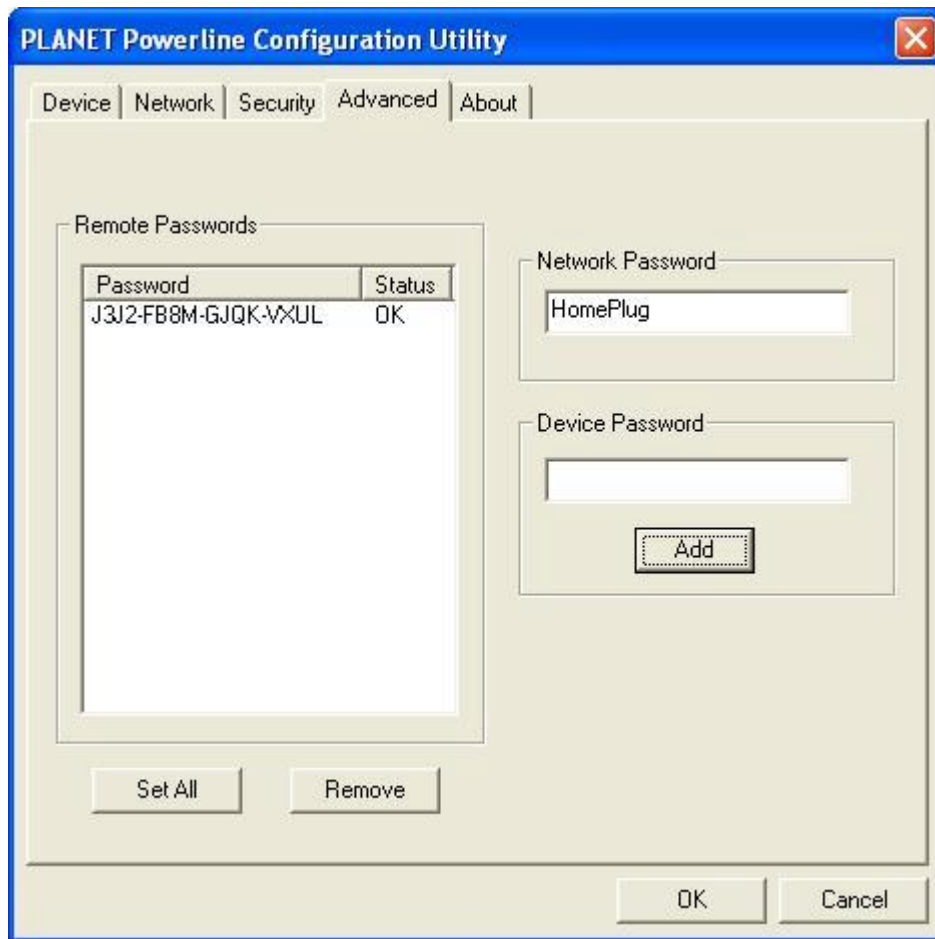
2. The Network tab shows all Powerline devices present on your network. Click **Scan Powerline Network** to update Powerline network.



3. The **Security** tab shows the default network password is **HomePlug**. Enter your own private network password if needed and click **Set Local**.



4. The **Advanced** tab allows you to add other remote device password. You don't need this password unless other devices set different network password with yours. Each device password is different and listed on the bottom case label stuck on each Powerline Adapter. Enter the device password (The format is xxxx-xxxx-xxxx-xxxx) and click **Add**. Click **Set All** to activate the new-added password and the status column will be shown OK.



5. Click **OK** to close the Utility program.

## 6. Troubleshooting

- ♦ Why other Powerline Adapters aren't listed on the network of my Configuration Utility?

A: Make sure other devices are working properly and correctly installed. Please also check if every device uses the same network password. Try to set each device with the same network password or add other device's device password into your remote password list.

- ♦ What types of security problems will I be encountering?

A: If your house is on the same power grid as your neighbor, it is possible for a hacker to get in your network. However, this problem can be easily overcome by activating the encryption key of each Powerline device.

- ♦ Will HomePlug operate on different circuit breakers?

A: HomePlug can operate on different circuit breakers without affecting the performance. However, the signal will not pass through the power transformers outside your house.

- ♦ What OS does the HomePlug utility software fully support?

A: Windows 98SE, ME, 2000, and XP. Windows NT and Mac are only supported by the Ethernet Powerline Adapter as a Bridge.

- ♦ How does 56bit-DES compare with Wireless 802.11b 128bit-WEP encryption?

A: 56bit-DES is superior because of its DES type encryption. Just because 802.11b uses 128bit-WEP with more bits doesn't mean the encryption is better. HomePlug devices use hardware 56bit-DES encryption. With hardware encryption the signal is almost impossible to crack. The hardware encryption process does not affect bandwidth, and the encryption is enabled at all times.

- ♦ I cannot connect to other computers on my powerline network or to the Internet.

A: Make sure the IP address and TCP/IP protocol are set up correctly for all the powerline networked computers.

- ♦ Do the PL-104E/U device cause interference with other home networking or products?

A: No. PL-104E/U can co-exist with phoneline and wireless networking technologies.

PL-104E/U operates in a different frequency band than powerline control and co-exists with technologies such as X-10, CEBus and LONworks.

- ◆ How do the PL-104E/U devices handle signal interference between two adjacent homes? How is eavesdropping prevented?

A: PL-104E/U 56-bit DES security encryption to ensure network separation between homes. To enable 56-bit DES security encryption on PL-104E/U, you must run the security configuration utility on each and every PL-104E/U.

- ◆ How does PL-104E/U handle node address on the network?

A: PL-104E/U adheres to standard Ethernet addressing protocols using destination and source MAC address.

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