

Hamlet

NANO POWERLINE 500 500Mbps Powerline Adapter



USER MANUAL HNPL500S

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EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011

EN 55022: 2010 + AC: 2011 / Class B

EN 55024: 2010

EN 50412-2-1: 2005 + AC: 2009

EN 61000-3-2: 2006 + A1: 2009 + A2: 2009 / Class A

EN 61000-3-3: 2008

EN 61000-6-3: 2007



The complete CE declaration of conformity of the product can be obtained by contacting Hamlet at info@hamletcom.com.

The information on the importer for your country can be found in the “About Us” section of the Hamlet website at www.hamletcom.com.

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1 – Introduction

1.1 Overview

The Hamlet Powerline Adapter operates on HomePlug AV standard, providing up to 500Mbps data speed over the existing household power supply. This product is cost-effective, easy to create a home network without spending time and money to run expensive CAT-5 cabling.

1.2 Specification

- Standard: IEEE 1901 and HomePlug AV compliant
- Speed: up to 500Mbps
- Modulation: supports OFDM 4096/1024/256/64/16/8 QAM, QPSK, BPSK, and ROBO modulation schemes.
- Frequency: 2 MHz ~ 68 MHz
- Security: 128-bits AES encryption
- IEEE802.3 10Base-T, IEEE802.3U 100Base-TX

1.3 Package Contents




- Powerline Ethernet Adaptor
- RJ-45 Ethernet Network cable
- Configuration Utility CD
- User's Guide

1.4 System Requirements

The Powerline Adapter can support any operating system. The configuration utility included in the CD supports only Windows XP/Vista/7/8.

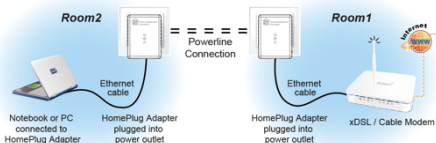
1.5 LED Indicators

The Powerline Adaptor has three LEDs indicator.

	Power indicator
	Powerline (PLC) active indicator
	Ethernet active indicator

2 – Installation & Uninstallation

Connection of Powerline Ethernet Adapter



2.1 Installing Powerline Device

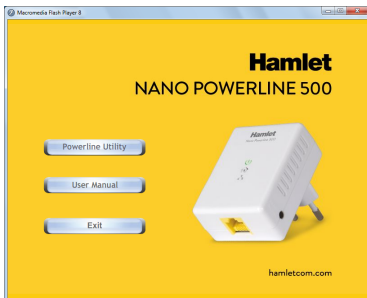
1. Connect the supplied RJ45 Ethernet cable from your PC's Ethernet port to the Powerline Ethernet Adapter's LAN Ports.
2. Connect the Powerline Ethernet Adapter to your wall-mounted power outlet.
3. Check if the PLC led of Powerline Ethernet Adapter is ON, the Powerline Ethernet Adapter is connected and suitable for Internet Connections.
4. Check if the PLC led is OFF, the Powerline Ethernet Adapter isn't connected and suitable for Internet Connections.

2.2 Installation of Powerline Utility

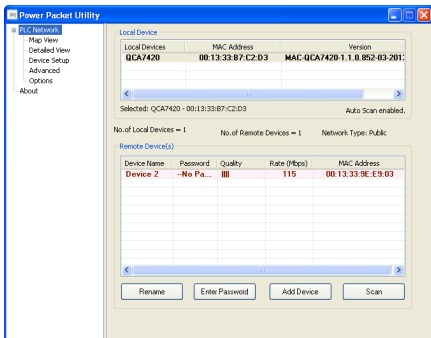
The Configuration Utility enables the users to identify HomePlug devices on the Powerline network, measures data rate performance, ensures privacy and performs

diagnostics by setting user defined secure Powerline networks. Users are requested to verify that no other Encryption Management Utilities are installed prior to the installation of this utility. Other utilities should be uninstalled before installing this utility. All PPU screen shots in this document are generated from Windows XP; screen shots for Windows 7, Vista and Windows 8 will be similar.

1. In order to install, insert the Configuration Utility CD-ROM into the computer's CD-ROM drive.
2. The program shall run automatically. Alternatively this can also be done manually by double clicking the **autorun.exe** file on the CD.
3. Please click "**Powerline Utility**" button to continue.

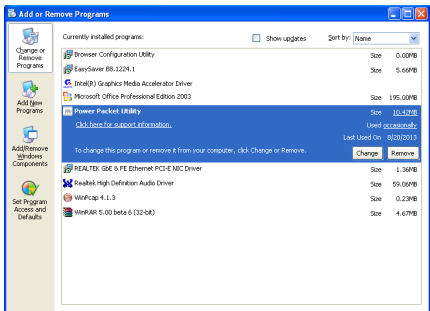


- Follow the steps of the setup wizard to install the software.
- Once the installation is complete, in order to start the utility, double-click the utility icon on desktop.
- You can see your device working well. The top panel of the screen shot shows a Homeplug device connected locally to your computer. The bottom panel shows one device connected remotely to the computer running the utility.



2.2 Uninstallation of Powerline Utility

1. To uninstall the Configuration Utility, go to the “**Control Panel**” of your system.
2. Open the “**Add/Remove Programs**” windows.
3. Select and double click on the “**Power Packet Utility**” in the Add/Remove Programs list.



4. Follow the on screen instructions to uninstall the Powerline Utility.

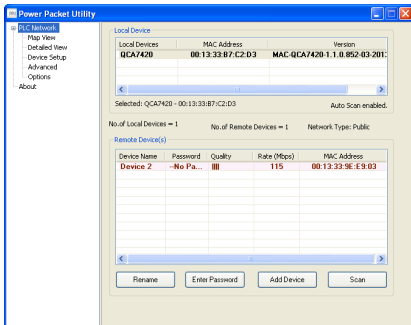
3 – Configuration Utility Setup

Introduction

The Configuration Utility enables the users to identify HomePlug devices on the powerline network, measures data rate performance, ensures privacy and performs diagnostics by setting user defined secure powerline networks.

3.1 Map View

In order to start the utility, double-click the powerline utility icon on desktop. The software starts showing the main screen of the Configuration Utility.



The top panel of the screen shot shows a HomePlug AV device connected locally to the host computer. The bottom panel shows one device connected remotely to the computer running the utility.

The Main screen provides a list of all powerline devices logically connected to the computer when the utility is running. The top panel shows all local HomePlug devices connected to the computer's NIC (Network Interface Card).

In most cases, only one device will be seen. In situations where there are more than one local device being connected, such as a USB or an Ethernet adapter, the user can select the local device by clicking on it and then click the Connect button to its right.

The status area above RESET/NET.ID button indicates that your PC is connected to that same device. 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 indicate with a message 'No homeplug adapters detected'.

This tab displays the list of local devices and the list of remote devices currently associated with the selected local device. It shows the device type, MAC address and the version string.

There are text indicators displaying which device is currently selected device, count of local devices, count of

remote devices, network type and the auto scan status. Once all the local devices are identified, the remote devices associated with the currently selected local device are displayed. Also along with the remote device MAC the signal strength, device DAK (if available) and device alias name (if available) is displayed.

Following are the list of fields which are to be displayed:

- Device alias name: A user defined name by which a device with that particular MAC address will be referred as.
- Password: The valid DAK of the device if it has been entered by the user.
- Quality: Signal quality shown in one of the selected formats selected in the OEM preference editor.
- Rate: Signal strength in Mbps.
- MAC address: MAC address of the selected device.

Password column by default is blank and **Enter Password** button can be used to enter it.

To set the password of the device (required when creating a private network), first select the device by clicking on its name in the lower panel and then click on the **Enter Password** button. A dialog box will appear as shown in Figure 3-3 to type the password. The selected device name is shown above the password field and the password can be verified by hitting the **OK** button. The Password field accepts the Device password in any case formats, with or without dashed between them. If a device

was not found, the user will be notified along with the suggestions to resolve common problems. This process might take a few seconds to get completed.



Figure 3-3: Set Device Password

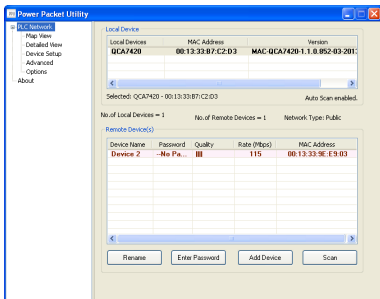
Add Device button is used to add a remote device to the existing network by entering the device password of the device. A dialog box will appear as shown below.



The dialog box allows the user to enter both a device name and the password. If a device was not found, the user will be notified and suggestions to resolve common problems will be presented.

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.

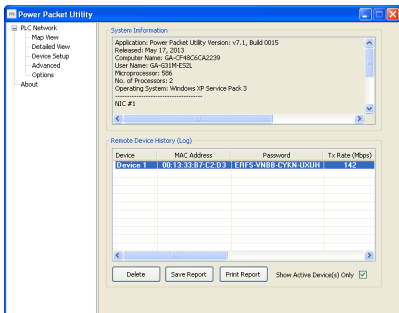
The **Scan** button is used to perform an immediate search of the HomePlug devices connected to the Powerline network. By default, the utility automatically scans every few seconds and updates the display screen.



3.2 Detailed View

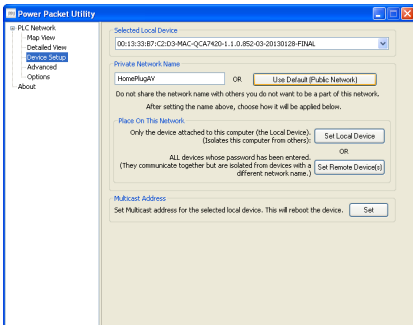
The PPU should have local system information and also should maintain the history of remote devices. This information can be saved or printed. The following is the list of information required to be stored for a remote device:

- Device alias name
- MAC address
- Password
- Rate
- Network
- Last seen
- Vendor Name
- Firmware Version



3.3 Device Setup

All the device setup related options can be found in this view. A combo box displays the local Devices. If the Network Name has been pre-configured on a local device to a value other than HomePlug or HomePlugAV (e.g. the push button pairing function on AV devices), the PPU will show the name as “Unknown Network name”. Although a pre-configured Network Name cannot be displayed, the hidden Network Name will be used to add new devices to the local network.

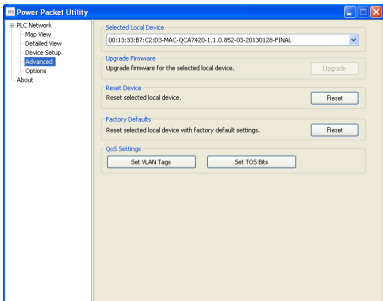


- **Set Local Device:** This button will set the network name for the local device.

- Set Remote Device(s): This button will set the network name (network password) in the local device as well the connected remote devices.
- Use Default: This button will reset the value of the network name to "HomePlugAV"
- "Set" – Multicast: This button will update the multicast filter addresses present in the local device configuration. PPU throws a message "This device does not support this update multicast settings option." Firmware versions less than v4.4 in INT/AR6400 devices and less than v5.2 in INT/AR7400 devices does not support this feature. Please note that firmware v4.5 in INT/AR6400 does not support this feature.

3.4 Advanced

This view contains the advanced options. All operations are with respect to selected local devices only. A combo box displays the local devices.



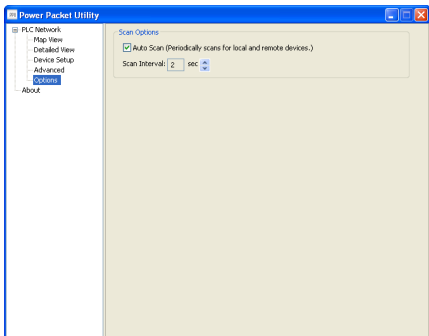
Following are operations supported:

- Upgrade firmware: To upgrade the firmware in a device click the **Upgrade** button. Use the browse buttons to select the firmware and PIB files.
NOTE: The utility only supports upgrading of the local device. Remote device upgrades are not supported. Also if the device is in “Bootloader” mode (i.e) it has MAC address as 00:b0:00:00:00:01 then the firmware cannot be upgraded.

- Reset Device.
- Reset to factory defaults.
- Set VLAN Tags.
- Set TOS bits.

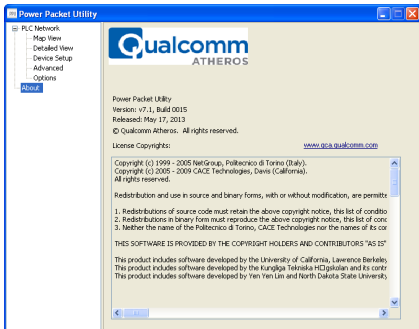
3.5 Options

This view is used to configure PPU settings. For now scan options is the only thing present in which auto scan can be checked and scan interval can be set (minimum 2 seconds and maximum is 60 seconds).



3.6 About Screen

The About screen shows the software version information, logo, release date, licenses, and web link.



4 – Reset and Network ID Setting

4.1 Reset function

Push RESET/NET.ID button can reset to the factory default settings. Be careful, when you press the reset button, please remove the Ethernet cable (RJ-45cable) first, and then press the reset button. After press the reset button for less than 3 seconds and then wait the PWR led light again.

4.2 Network ID button

Auto secure and group the Powerline devices, the follow is the scenario for secure button.

Network ID button trigger state conditions

There are two possible state conditions for a Powerline Adapter:

“*Adder state*” for a device providing the NMK (Network Membership Key) for an existing AVLN (HomePlug AV Logical Network).

“*Joiner state*” for a device that will join an AVLN.

Pushing buttons on any two devices results in one of them becoming an “adder” and the other one a “joiner”.

5 – Four possible scenarios

This section describes how to add and remove devices using HomePlug AV Simple Connect Technology and covers some of the technical details of how the technology works.

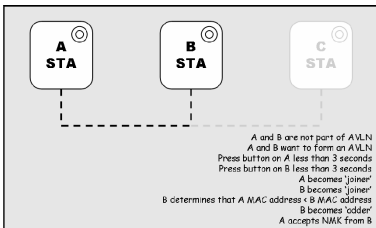
5.1 Case 1: Forming a Network

Two devices with different network membership key (NMK) values are connected to the same powerline. The user wants them to form a logical network.

1. Press each device **RESET/NET.ID** button for 5-8 sec till all LEDs re-flash to generate the random network password key first.
2. Press RESET/NET.ID button on the first device for less than 3 seconds.
3. Press RESET/NET.ID button on the second device for less than 3 seconds. RESET/NET.ID button on the second device must be pressed within 1 minute, by default however the interval is programmable.
4. Wait for connection to complete and the **PLC** led will be **ON**.

The PWR led on both devices will flash evenly at 1-second intervals until the operation succeeds or fails. It will illuminate steadily on successful completion. If an error occurs, the PWR led on the 'adder' will flash unevenly until the RESET/NET.ID button on the 'adder' is pressed again

or the 'joiner' is reset by holding the RESET/NET.ID button down for 10-15 seconds.



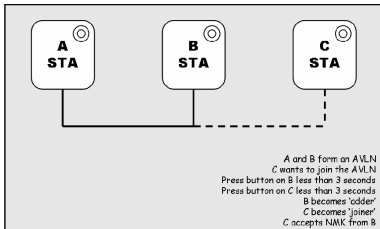
The join operation can be cancelled by pressing the RESET/NET.ID button on the first device again, for less than 3 seconds, instead of pressing RESET/NET.ID button on the second device.

5.2 Case 2: Joining a Network

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

1. Press the **RESET/NET.ID button** on the 'joiner' for less than 3 seconds.
2. Press the **RESET/NET.ID button** on any network device for less than 3 seconds, making it the 'adder'. You have 1 minute, by default, to press this **RESET/NET.ID button**.
3. Wait for connection to complete and the **PLC** led will be **ON**.

The PWR 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 PWR led on the 'adder' will flash unevenly until the **RESET/NET.ID button** on the 'adder' is pressed again or the 'joiner' is reset by pressing the **RESET/NET.ID button** for 5-8 seconds, as described in Case 3:



The join operation can be cancelled by pressing the RESET/NET.ID button on the first device again, for less than 3 seconds, instead of pressing the RESET/NET.ID button on the second device.

If you press RESET/NET.ID button on three or more devices, only the first two will respond. The others will not. See Case 4 for a variation on this rule.

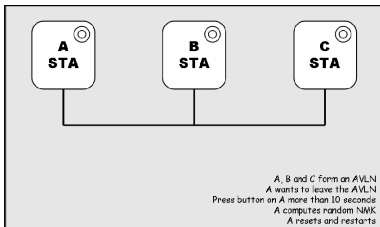
You can press the RESET/NET.ID button on the 'adders' before pressing the RESET/NET.ID button on the 'joiners'. It does not matter which is pressed first. See Case 4 for a case where the 'adders' may be pressed before the 'joiners'. Once a 'joiner' becomes a member of the network, it may become the 'adder' in the next join operation.

5.3 Case 3: Leaving a Network

A network exists. The user wants to remove one device, the 'leaver', from that network, for whatever reason..

1. Press the **RESET/NET.ID** button on the 'leaver' for 5-8 seconds. The device will reset and restart with a random NMK.
2. Wait for reset to complete and the **PLC** led will be **OFF**.

The PWR 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.

5.4 Case 4: Join Multiple Devices to a Network

To add several new devices to an existing network, the process in Case 2 must be repeated for each 'joiner'. A vendor may implement a mode of operation in which an 'adder' device in the network remains in the adder state for an extended period allowing additional 'joiners' to be added in turn. This lets you press the 'adder' RESET/NET.ID button once then press each 'joiner' RESET/NET.ID button in turn.

If RESET/NET.ID buttons are pressed on two or more joiners, only the first one will respond. The second will not. This makes timing important.