



# PlugLink HD AV Adapter User's Guide

PL9660-Q1

**PlugLink**<sup>®</sup>  
by Asoka<sup>®</sup>

## QUICKFIND LOCATOR

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Installation

66-0375-01Rev.001

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Revision	Date	Description
66-0375-01Rev.001	July 2012	Preliminary Release

## Changes in This Revision

- Not applicable (preliminary release)

## Contact Information

For more information about the PlugLink HD AV Adapter or any of Asoka's other leading-edge solutions, please contact us using any of the following methods:

- **Voice calls:** We welcome your calls Monday through Friday, from 9:00 am to 5:00 pm Pacific Time at (408) 550-8167. Voice mail is available during non-business hours.
- **Email:** If you prefer, you can send information requests to our e-mail address: [sales@asokatech.com](mailto:sales@asokatech.com).
- **Fax calls:** You can also send your requests for information to our 24-hour fax number: (408) 884-2390.
- **Web site:** Our Web site contains valuable information about our products, solutions, and services. We encourage you to visit us at <http://www.asokatech.com>.

## Getting Help

Asoka USA backs its products with unparalleled customer service and technical support for our valued customers.

## Customer Service

Customer service, the customer-satisfaction arm of Asoka USA, is available Monday through Friday, from 9:00 am to 5:00 pm Pacific Time, by calling (408) 550-8167 or emailing [custserv@asokatech.com](mailto:custserv@asokatech.com).

## Technical Support

Technical support is available Monday through Friday, from 6:00 am to 6:00 pm Pacific Time, by calling (408) 550-8173 or through email at [support@asokatech.com](mailto:support@asokatech.com).

Please provide the following information about the problem:

- Product name, model number, part number (if applicable) and serial number
- System configuration, including a description of the devices connected to your PL9660
- The circumstances surrounding the error or failure
- A detailed description of the problem and what has been done to try to solve it

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# 1

## Simple Installation

**Congratulations on your purchase of the PlugLink HD AV Adapter !**

This adapter allows you to network your home or office by plugging directly into an electrical outlet. With your PlugLink HD AV Adapter, you can easily share your high-speed Internet, mp3s, video, and gaming throughout the home or office.

This manual describes how to connect your PlugLink HD AV Adapter to a PC or cable/DSL Router.

### Package Contents

- PlugLink HD AV Adapter(PL9660-Q1)
- 6-foot Ethernet cable
- Quick Installation Guide
- Installation Resource CD (for advanced users only)
- Warranty and Support Information Card



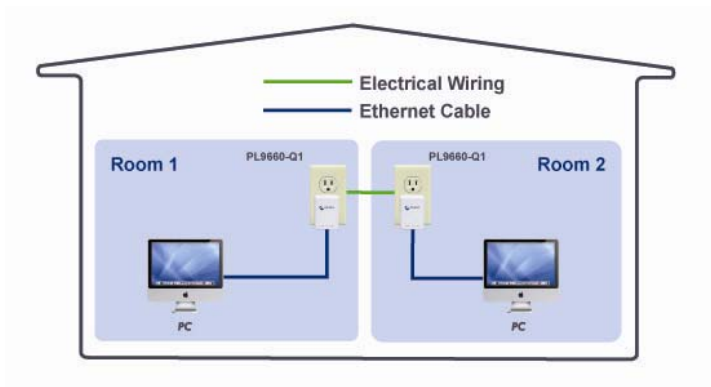
If any of the parts are incorrect, missing, or damaged, contact the retailer where you made your purchase. Keep the carton, including the original packing materials, in case you need to return the unit for repair.

### Types of Connections


This section describes what you need to do to before installing the PlugLink HD AV Adapter. You can set up a home or an office network or compliment your existing network by connecting to any device with a 10BaseT/100BaseT Ethernet- capable device.

## Simple Connection (Peer to Peer)

To share a simple connection between computers, attach one PL9660-Q1 device to each computer.



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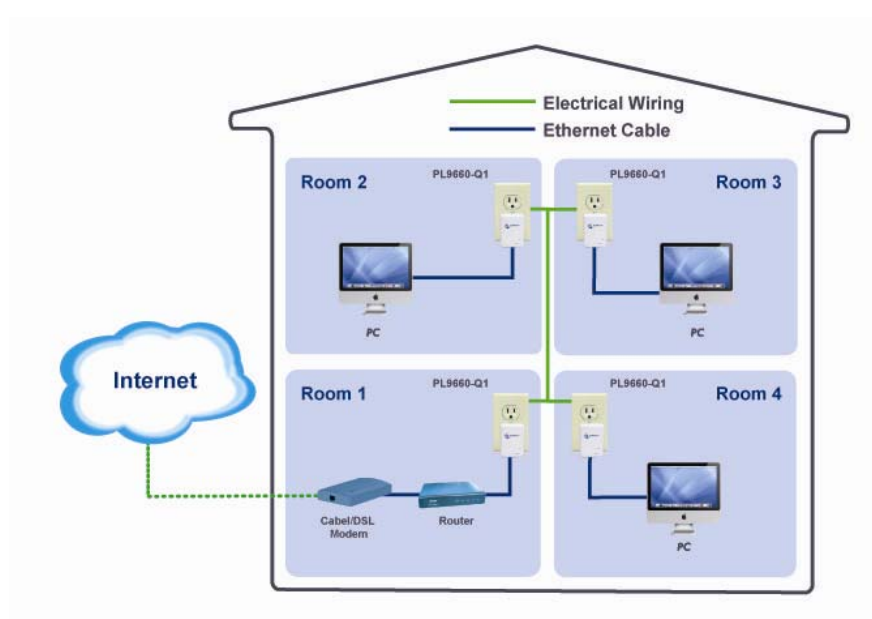
 **NOTE:** Do not connect the PlugLink HD AV Adapter into a power strip, extension cord, un-interruptible power supply (UPS), or surge protector. This may prevent the unit from working properly or degrade the network performance.

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## Simple Broadband Connection

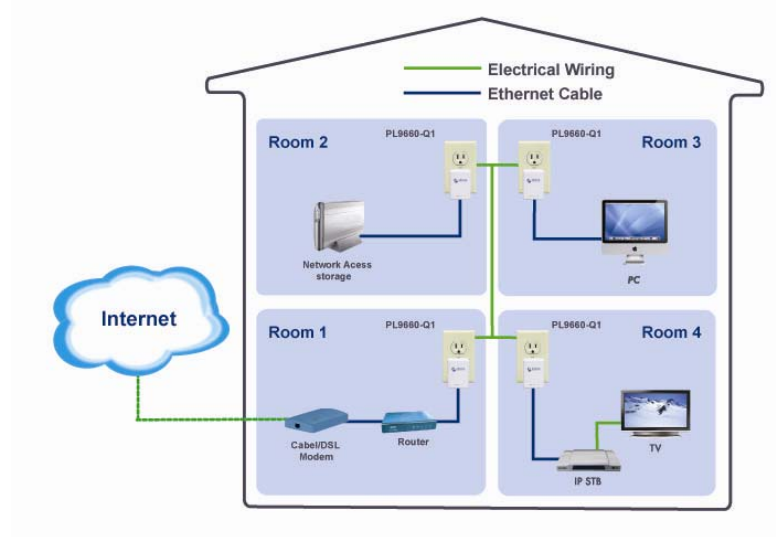
The following items are needed to share a Broadband connection with computers:

- One (1) PL9660-Q1 device attached to a standard cable, DSL, or wireless router;
- One (1) PL9660-Q1 device attached to each computer;



## Other Connections

You can also use the PlugLink HD AV Adapter with other Ethernet enabled devices, such as IP Cameras, IP set top box, game consoles, etc. "Up to eight (8) PL9660 can be placed on the same PLC (Powerline Communication) network."



## Finding a Suitable Location

Find a suitable location to install your PlugLink HD AV Adapter. Where you install the units can affect their performance. Find a location that is:

- Acceptable temperature and humidity ranges.
- Free of strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
- An electrical outlet for your PlugLink HD AV Adapter. Outlet must be within six feet (1.82 meters) of the device you are connecting to.

## Installing the Hardware

Connect each of your PlugLink HD AV Adapter.

1. Connect the unit into a nearby wall outlet (Do not plug the adapter into a power strip).
2. Connect the enclosed Ethernet cable to the Ethernet port of the unit.
3. Connect the other end of the cable to the Ethernet port of the PC or device.



**Congratulations!** You have completed the installation of the PL9660 for normal use.

# 2

## Advanced Configuration (Expert Users Only)

This chapter provides information on installing and setting up the PlugLink HD AV Adapter.



**NOTE:** Do not connect the PlugLink HD AV Adapter into a power strip, extension cord, un-interruptible power supply (UPS), or surge protector. This may prevent the unit from working properly or degrade the network performance.

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### Installing the Software

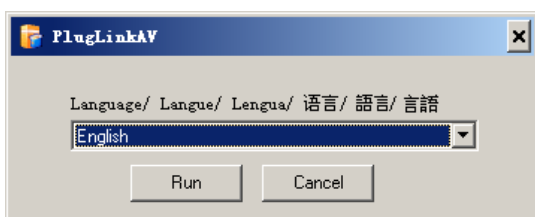
Following are software installation procedures for advanced users.



**NOTE:** Software installation is not required for normal use. The utility is used to change the security settings and view information about the network.

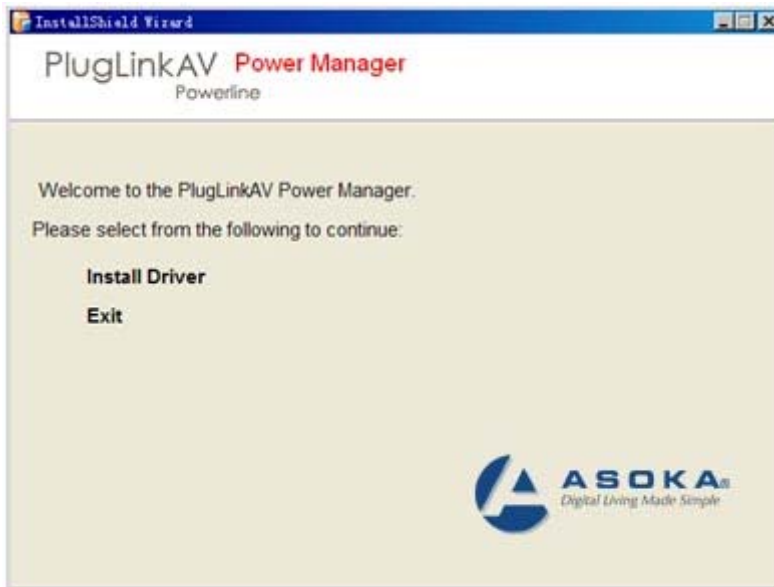
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1. Insert the enclosed Installation Resource CD into your CD-ROM drive. If the PlugLink HD AV Adapter Installation Utility does not appear within 30 seconds, select your CD-ROM drive and double-click the **Setup.exe** icon to start the Installation Utility.
2. Select the language preference, and click the **Run** button.

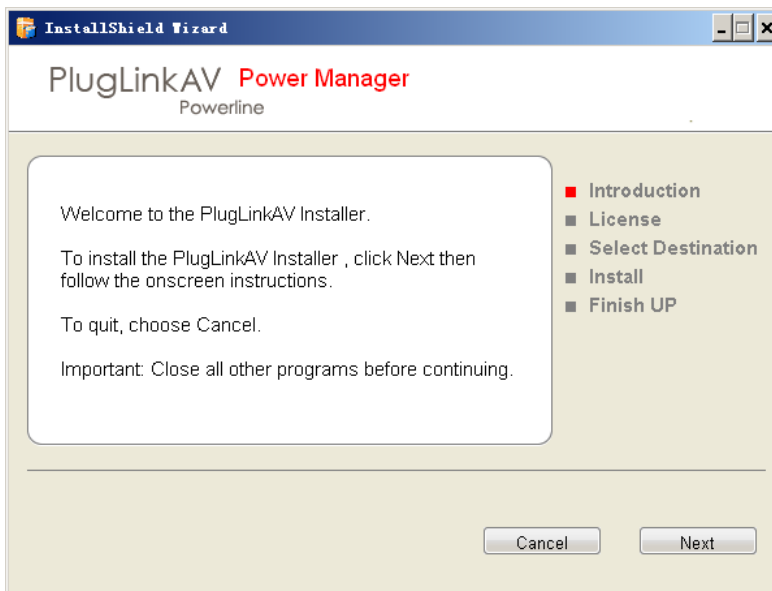




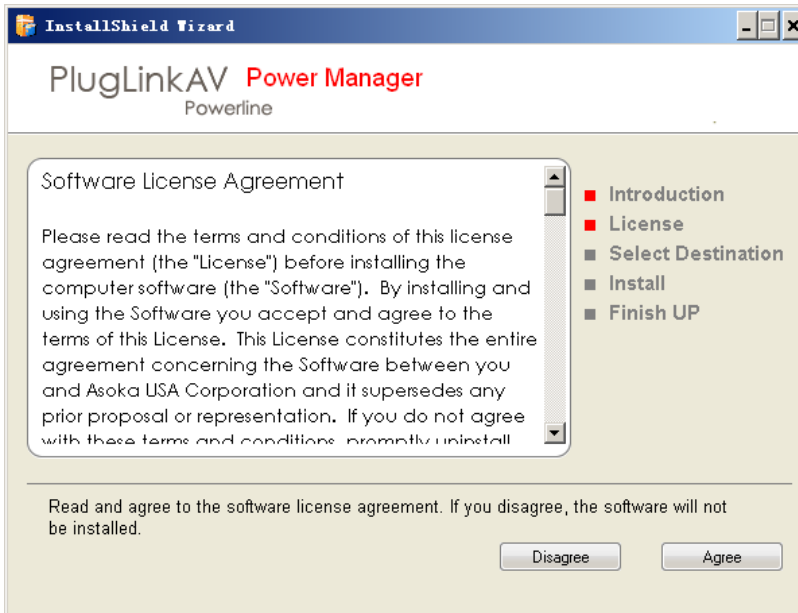
3. In the Start screen, click **Install Driver** to start the installation.



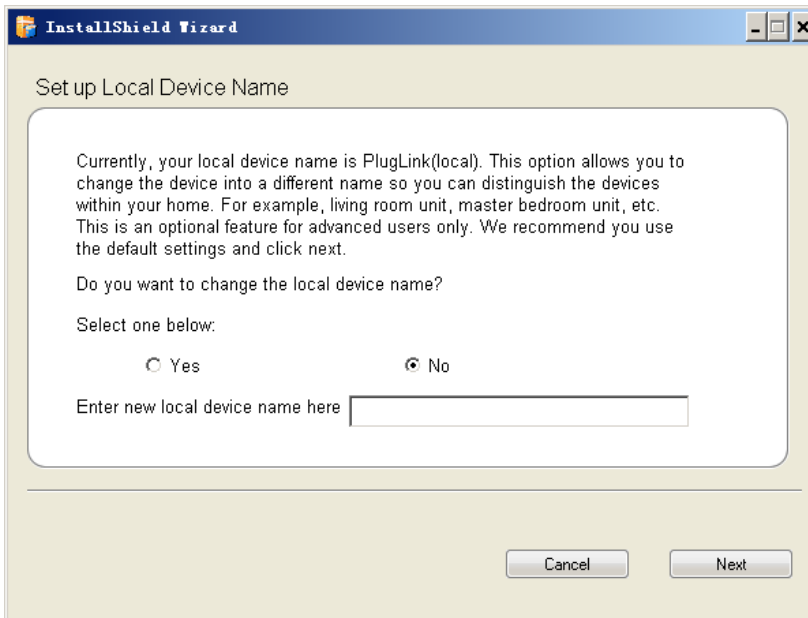
4. In the **Welcome** screen of the screen of the wizard, click **Next** to begin the installation.



5. Read the End User Software License Agreement, and if you agree, click the **Agree** button to continue the installation.



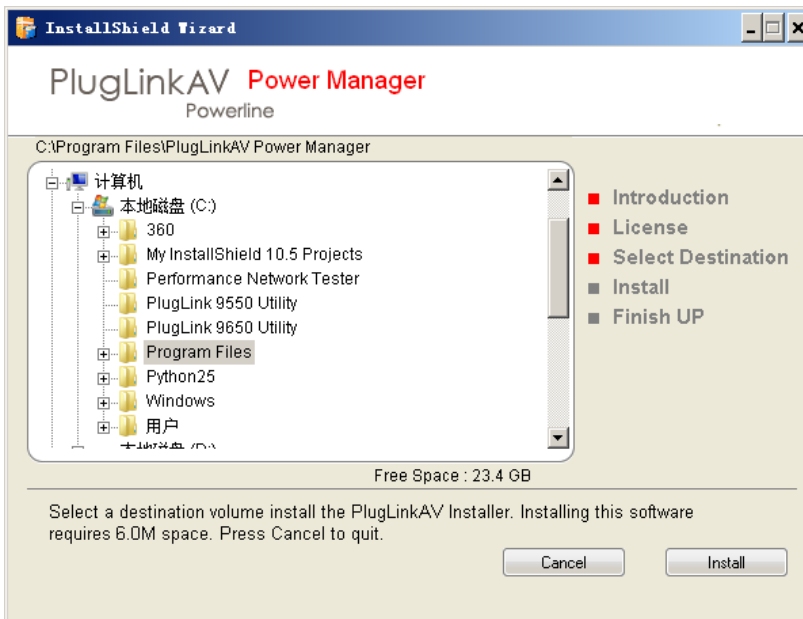
6. To change the name of the PlugLink AV unit, select **Yes**, and enter a name in the text field. Otherwise, select **No**. Click **Next** to advance to the next screen.



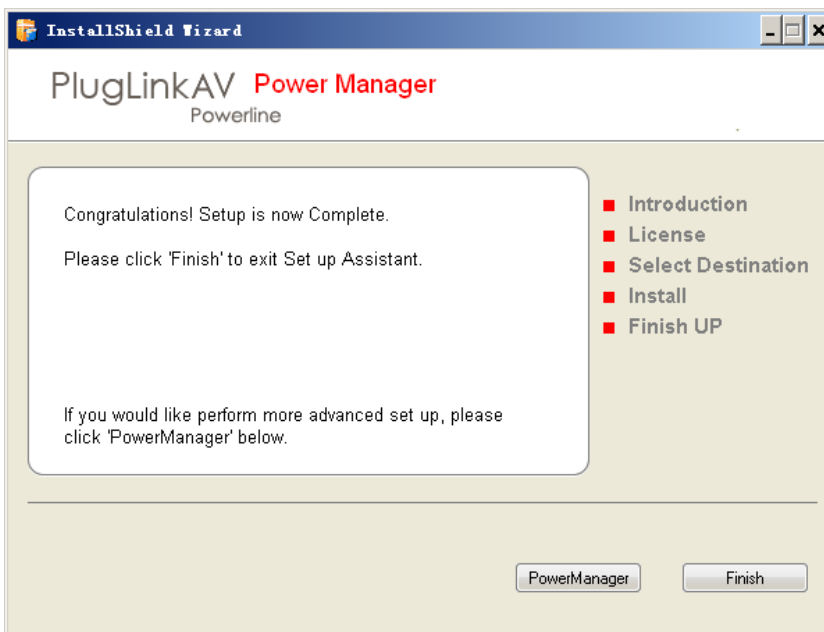


**NOTE:** All devices on your network must share the same password to communicate. Use care when changing the network password. The default password is HomePlug AV.

7. Select the location where you want to install the drivers and software and click the **Install** button.



8. When the installation of the PlugLink drivers and software is complete, you can use Power Manager Utility for advanced configuration of your PL9660 unit. Click **Finish** to finish the installation wizard.



## Network Management

The PlugLinkAV Power Manager utility software allows you to manually configure a PlugLink HD AV Adapter that is directly connected to your Personal Computer or to any PlugLinkAV Adapters that are remotely residing on your PlugLinkAV Home network.



**NOTE:** The Power Manager Utility software is for all Asoka PlugLinkAV devices.

---

### Viewing the Device Information (Profile)

Run the PlugLinkAV Power Manager and use the *Profile* screen to view information on your PlugLinkAV device attached directly to your PC and other PlugLinkAV devices on your network.

The Profile screen displays the following information:

- Device Name
- MAC Address
- Firmware version of your devices
- Estimated device transmission rate

To refresh the list of your PlugLinkAV devices, click the *Rescan* button.



**NOTE:** Devices set up with a different Network Encryption Key (NEK) also known as the network password will NOT appear on this list.

---

The columns to the left list your network, all network devices and their MAC addresses. Click on any device to view individual device details.

Device Name	MAC Address	TX(Mbps)	RX(Mbps)
Michelle	00:B0:52:44:44:44	0	0
Smith	00:13:C1:07:7A:2A	CCo	CCo
William	00:13:C1:07:7A:2B	0	0
Intellon Enable...	00:13:C1:00:00:3D	95	96
Gateway	00:13:C1:07:7A:14	86	98
Printer-2	00:13:C1:07:7A:1E	0	0
Shawn9660	00:13:C1:00:CC:1A	97	58
Asoka-1	00:13:C1:07:7A:22	11	5
Intellon Enable...	00:13:C1:00:00:39	10	45
Asoka Enabled P...	00:12:C1:00:D2:11	0	0
2222	00:13:C1:07:7A:28	0	0
asokaman	00:13:C1:07:7A:1C	0	0

Selected Station Information	
Device Name	Michelle
Network Password	*****
MAC Address	00:B0:52:44:44:44
Firmware Version	INT7400-MAC-5-0-5010-01-650-20100818-FINAL-B

CCo Information	
MAC Address	00:13:C1:07:7A:2A

Profile Screen

## Changing your device Name and Network Encryption Key (NEK)

Use the *Device(s)* Screen to change your local and remote device name, also to change your local and remote device Network Encryption Key (NEK) (also known as the Network Password).

Select one or more devices to change their name/password and click 'Update'.

Device Name	MAC Address	TX(Mbps)	RX(Mbps)
<input checked="" type="checkbox"/> Test1	00:13:C1:07:7A:1C	0	0
<input type="checkbox"/> Conf 9164	00:13:C1:00:00:47	CCo	CCo
<input type="checkbox"/> Gateway	00:13:C1:07:7A:14	0	0
<input type="checkbox"/> Printer-2	00:13:C1:07:7A:1E	0	0
<input type="checkbox"/> Intellon Enable...	00:13:C1:00:00:3D	0	0
<input type="checkbox"/> AAA9660	00:13:C1:07:7A:2A	0	0
<input type="checkbox"/> 888888	00:13:C1:00:CC:1A	0	0
<input type="checkbox"/> Asoka-1	00:13:C1:07:7A:22	0	0
<input type="checkbox"/> 2222	00:13:C1:07:7A:28	0	0
<input type="checkbox"/> Test	00:13:C1:07:7A:23	0	0
<input type="checkbox"/> William	00:13:C1:07:7A:2B	0	0
<input type="checkbox"/> Intellon Enable...	00:13:C1:00:00:39	0	0
<input type="checkbox"/> Damain-211	00:13:C1:07:7A:2C	0	0
<input type="checkbox"/> Atheros Enabled...	00:13:C1:00:D5:01	0	0
<input type="checkbox"/> Atheros Enabled...	00:12:C1:00:D2:11	0	0

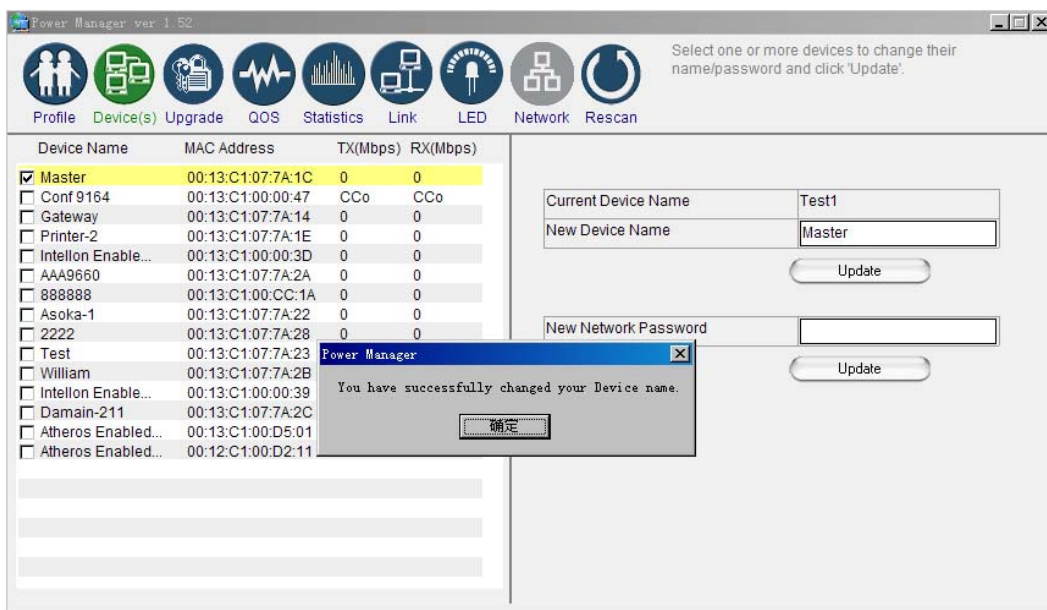
Current Device Name	Test1
New Device Name	<input type="text"/>
<input type="button" value="Update"/>	
New Network Password	<input type="text"/>
<input type="button" value="Update"/>	

Device(s) Screen

## DEVICE NAME

Changing your local device name:

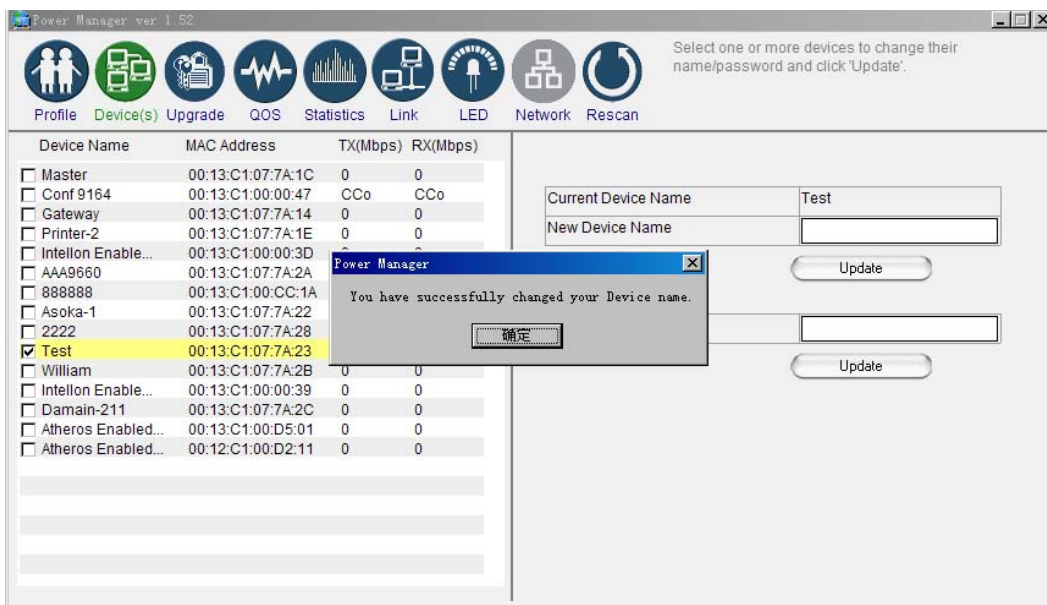
1. Connect your PlugLinkAV adapter to your PC. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 (Installing the Hardware).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to page 8 (Installing the Software).
3. From the Power Manager main menu, click "Device(s)".
4. A list of PlugLinkAV devices will appear on the left side of your Power Manager screen. Your Local Device will **always** be the first device in the list by default.
5. Select your local device, by clicking on the first device *MAC Address* from the list. Make sure that the device selected is highlighted in yellow. NOTE: It is not necessary to check the box to the left of the *Device Name*.
6. Enter the new name in the *New Device Name* field. The new name **must** be at least 4 characters long and can't have spaces.
7. Click "Update" to update the new name.
8. If the new name was accepted, the message "You have successfully changed your Device name." will appear.
9. Congratulations, you have successfully changed your local device name.



Changing your local device name

Changing your remote device name:

1. Connect your PC to one of your PlugLinkAV adapters. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 (Installing the Hardware).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to page 8 (Installing the Software).
3. From the Power Manager main menu, click "Device(s)".
4. A list of PlugLinkAV devices will appear on the left side of your Power Manager screen. Your Remote Devices will always appear under the first device in the list by default.
5. Select your remote device, by clicking on the device *MAC Address* from the list. Make sure that the device selected is highlighted in yellow. NOTE: It is not necessary to check the box to the left of the *Device Name*.
6. Enter the new name in the *New Device Name* field. The new name must be at least 4 characters long and can not have spaces.
7. Click "Update" to update the new name.
8. If the new name was accepted, the message "You have successfully changed your Device name." will appear.
9. Congratulations, you have successfully changed your remote device name.



Changing your remote device name

## DEVICE NETWORK ENCRYPTION KEY (NEK)

**Understanding the Network Encryption Key:** The Network Encryption Key (NEK) is similar to a domain name or work group. Only those devices encrypted with the same domain name or work group, will have access to your Powerline Network. All Asoka PlugLinkAV adapters are encrypted with the same default Network Encryption Key. The default Network Encryption Key is: HomePlugAV.

It is recommended to change your device default Network Encryption Key (NEK) to secure your Powerline Network from unauthorized access; especially if you live in an Apartment building.

Use caution when changing your device Network Encryption Key (also known as the Network Password). If you change the Network Encryption Key on one device, you must change the Network Encryption Key on all your PlugLinkAV adapters to the new Network Encryption Key.

You can change your device Network Encryption Key by:

- Using the PlugLinkAV Power Manager described in this section "Changing your local device Network Encryption Key" (bellow).
- Using the Network ID (SECURITY) button described on page 33 "SETTING A RANDOMIZED NETWORK PASSWORD".

Changing your local device Network Encryption Key (NEK):



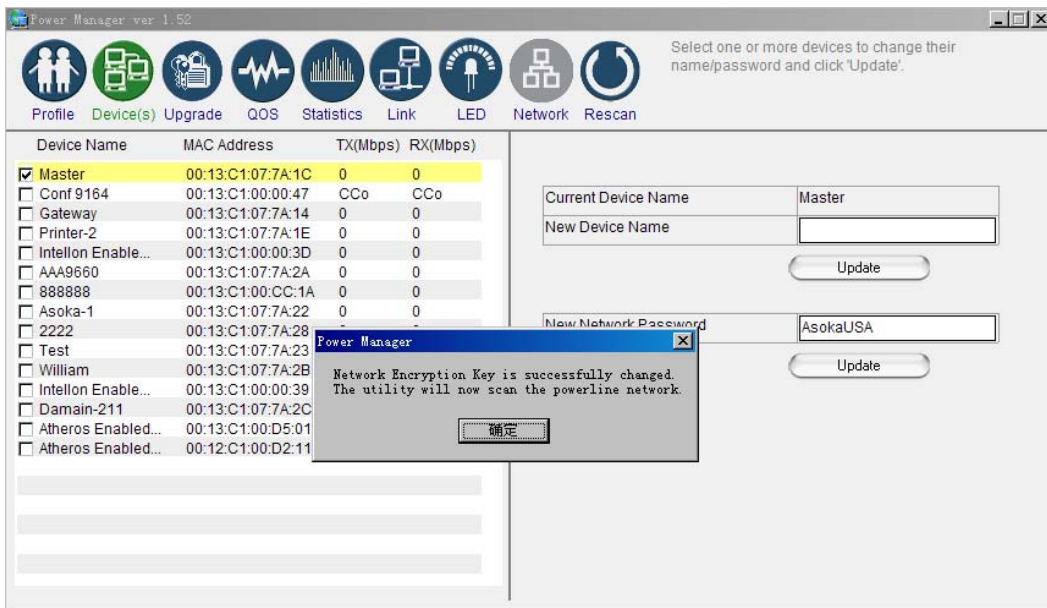
**WARNING:** If you change your local device Network Encryption Key (Network Password) your local device will no longer be able to communicate with all your other PlugLinkAV adapters. You must change the Network encryption key on all your PlugLinkAV adapters to the new Network Encryption Key in order for them to communicate.

---

1. Connect your PlugLinkAV adapter to your PC. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 (Installing the Hardware).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to page 8 (Installing the Software).
3. From the Power Manager main menu, click "*Device(s)*".
4. A list of PlugLinkAV devices will appear on the left side of your Power Manager screen. Your local Device will **always** be the first device in the list by default.



5. Select your local device, by clicking on the first device *MAC Address* from the list. Make sure that the device selected is highlighted in yellow. **IMPORTANT:** You **must** check the box to the left of the *Device Name*.
6. Enter the new Network Encryption Key (NEK) in the *New Network Password* field. The new Network Password **must** be at least 8 characters long and can not have spaces.
7. Click "*Update*" to update the new Network Password.
8. If the new Network Password was accepted, the message "*Network Encryption Key is successfully changed. The utility will now scan the powerline network*" will appear.
9. Congratulations, you have successfully changed your local device Network Password.



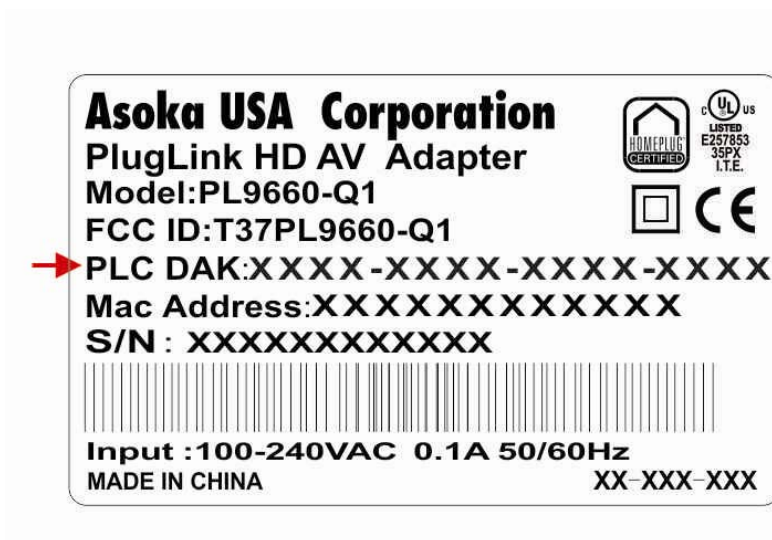
*Changing your local device Network Encryption Key (NEK)*

Changing your remote device Network Encryption Key (NEK):



**WARNING:** If you change your remote device Network Encryption Key (Network Password) your remote device will no longer be able to communicate with all your other PlugLinkAV adapters. You must change the Network encryption key on all your PlugLinkAV adapters to the new Network Encryption Key in order for them to communicate.

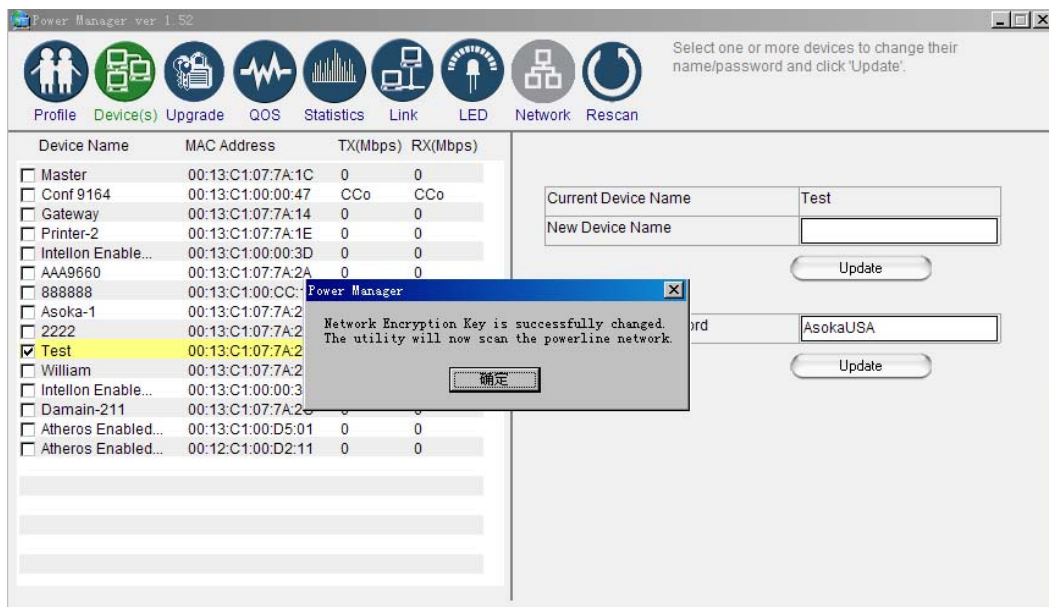
**NOTE:** When changing your remote device NEK, you will be prompted to enter the selected device 16-digit Password at least once. You can find the device password on the label. See image below.



1. Connect your PC to one of your PlugLinkAV adapters. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 (Installing the Hardware).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to page 8 (Installing the Software).
3. From the Power Manager main menu, click "*Device(s)*".
4. A list of PlugLinkAV devices will appear on the left side of your Power Manager screen. Your Remote Devices will **always** appear under the first device in the list by default.
5. Select your remote device, by clicking on the device *MAC Address* from the list. Make sure that the device selected is highlighted in yellow. **IMPORTANT:** You must check the box to the left of the *Device Name*. If you are prompted; enter the 16 digits remote device password (Example Password: AIAI-AFZO-FMP-FLUI). See image above for your reference.
6. Enter the new Network Encryption Key (NEK) in the *New Network Password* field. The new Network Password **must** be at least 8 characters long and Can't have spaces.
7. Click "*Update*" to update the new Network Password.



8. If the new Network Password was accepted, the message "Network Encryption Key is successfully changed. The utility will now scan the Powerline network" will appear.
9. Congratulations, you have successfully changed your local device Network Password.



Changing your remote device Network Encryption Key (NEK)

# Resetting and Upgrading the PlugLink HD AV Adapter

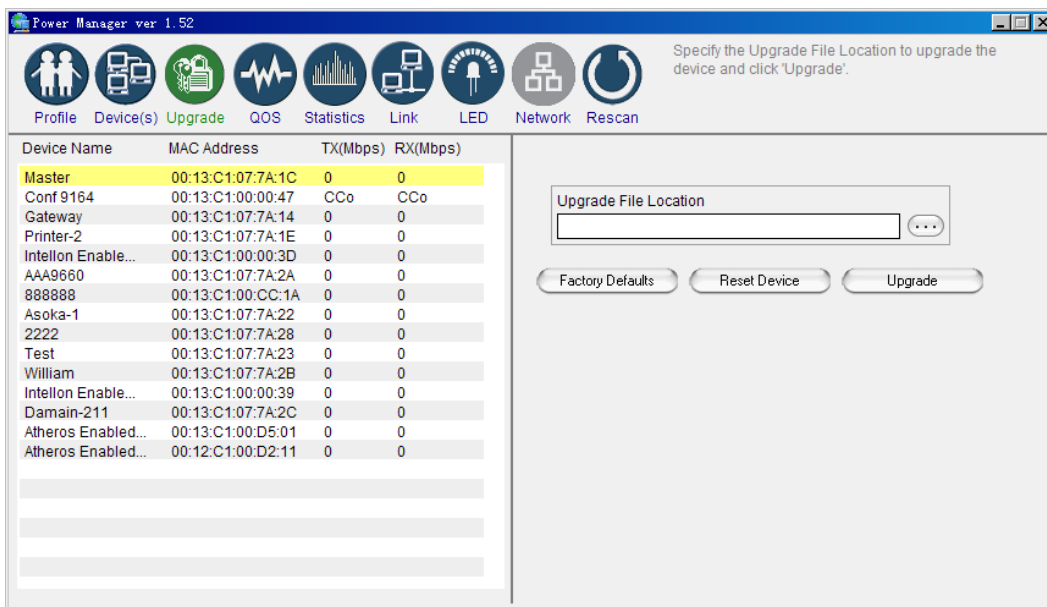
Run the PlugLinkAV Power Manager and use the *Upgrade* screen to:

- Reset your PlugLink HD AV Adapter to Factory Defaults
- Reset (Reboot) your PlugLink HD AV Adapter
- Upgrade the Firmware

How to reset your PlugLink HD AV Adapter to its Factory Defaults, reboot and Upgrade the firmware.

1. Connect your PC to one of your PlugLinkAV adapters. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 (Installing the Hardware).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to page 8 (Installing the Software).
3. From the Power Manager main menu, click "*Upgrade*".
4. A list of PlugLinkAV devices will appear on the left side of your Power Manager screen.
5. Select the device, by clicking on the device *MAC Address* from the list.
6. Select the option button that you want to perform (Factory Default, Reset Device or Upgrade).

NOTE: Asoka may, from time to time, create new firmware for your device. Visit [www.asokatech.com](http://www.asokatech.com) for the latest firmware. - Resetting the PlugLinkAV to its Factory Defaults, will reset the Network Encryption Key (NEK or Network Password) to HomePlugAV.



Upgrade Screen

## Prioritizing the Network Traffic

Use the QoS screen to prioritize your traffic through the device. QoS requirements are different for various data types such as streaming video or music, voice and raw data. To provide higher QoS for streaming data, priority levels can be set using tags at the beginning of data frames.

The QoS level settings are: CAP3: Highest CAP2: Medium and CAP1: Lowest.

- **IGMP management packets:** (Default to CAP3) - Sets the channel access priority for IGMP group management frames.
- **Unicast packets:** (Default to CAP1) - Sets the default channel access priority for Unicast frames not matching any other classification or mapping.
- **IGMP managed multicast stream:** (Default to CAP2) - Sets the default channel access priority for stream data belonging to a snooped IGMP multicast group.
- **Other multicast or Broadcast packets:** (Default to CAP3) - Sets the default CAP for multicast frames not in a snooped group and for broadcast frames.

Power Manager ver 1.52

QoS requirements are different for various data types such as streaming video or music, voice and raw data. To provide higher QoS for streaming data, priority levels can be set using tags at the beginning of data frames.

Device Name	MAC Address	TX(Mbps)	RX(Mbps)
Master	00:13:C1:07:7A:1C	0	0
Conf 9164	00:13:C1:00:00:47	CCo	CCo
Gateway	00:13:C1:07:7A:14	0	0
Printer-2	00:13:C1:07:7A:1E	0	0
Intellon Enable...	00:13:C1:00:00:3D	0	0
AAA9660	00:13:C1:07:7A:2A	0	0
888888	00:13:C1:00:CC:1A	0	0
Asoka-1	00:13:C1:07:7A:22	0	0
2222	00:13:C1:07:7A:28	0	0
Test	00:13:C1:07:7A:23	0	0
William	00:13:C1:07:7A:2B	0	0
Intellon Enable...	00:13:C1:00:00:39	0	0
Damain-211	00:13:C1:07:7A:2C	0	0
Atheros Enabled...	00:13:C1:00:D5:01	0	0
Atheros Enabled...	00:12:C1:00:D2:11	0	0

Local device QoS setting. CAP3: Highest CAP2: Medium CAP1: Lowest

IGMP management packets: CAP3

Unicast packets: CAP1

IGMP managed multicast stream: CAP2

Other multicast or Broadcast packets: CAP3

Update

QoS Screen

## Viewing the Network Statistics screen

The Statistics screen shows information on HomePlug packets that are transmitted and received by the devices in your network. To enable this function, click *Enable Statistics*. The value shown by the Power Manager is a cumulative total of the packet data that was collected from the start of the "Enabled Statistics" button.

The values shown by the Power Manager is a cumulative total of the packet data that was collected from the start of either the 'Enable Statistics' button or the 'Clear Statistics' button click.

Device Name	MAC Address	TX(Mbps)	RX(Mbps)
Master	00:13:C1:07:7A:1C	0	0
Conf 9164	00:13:C1:00:00:47	CCo	CCo
Gateway	00:13:C1:07:7A:14	0	0
Printer-2	00:13:C1:07:7A:1E	0	0
Intellon Enable...	00:13:C1:00:00:3D	0	0
AAA9660	00:13:C1:07:7A:2A	0	0
888888	00:13:C1:00:CC:1A	0	0
Asoka-1	00:13:C1:07:7A:22	0	0
2222	00:13:C1:07:7A:28	0	0
Test	00:13:C1:07:7A:23	0	0
William	00:13:C1:07:7A:2B	0	0
Intellon Enable...	00:13:C1:00:00:39	0	0
Damain-211	00:13:C1:07:7A:2C	0	0
Atheros Enabled...	00:13:C1:00:D5:01	0	0
Atheros Enabled...	00:12:C1:00:D2:11	0	0

Transmission Statistics	
PBs Success	n/a
PBs Unsuccess	n/a
MPDUs Ack'd	509
MPDUs Collided	8
MPDUs Failed	n/a

Reception Statistics	
PBs Success	n/a
PBs Unsuccess	n/a
MPDUs Rcvd	535
MPDUs Failed	n/a

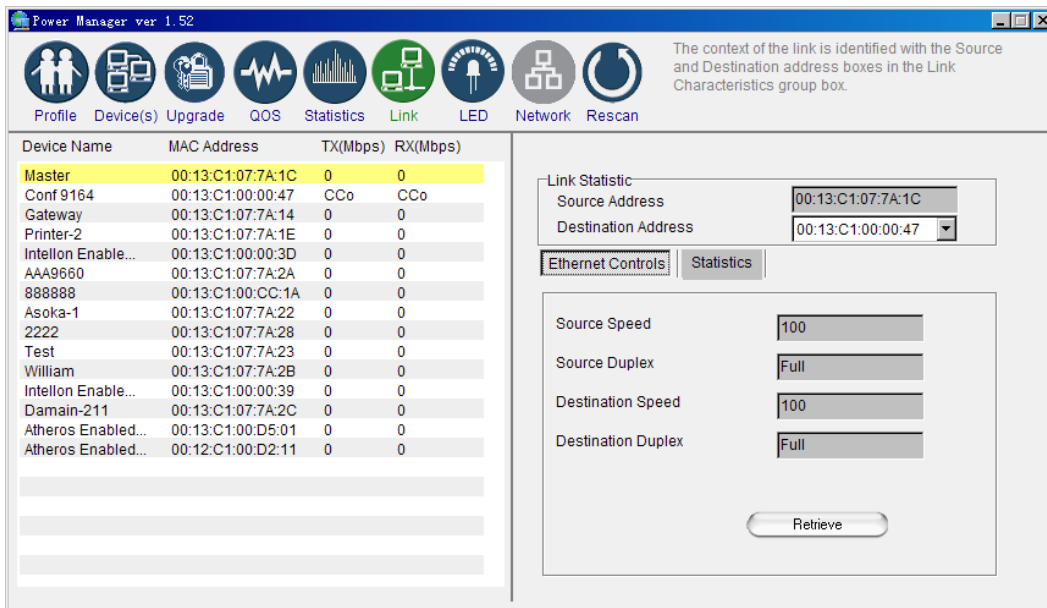
Statistics screen

## Viewing the Link screen

The *Link* Screen has two sub-screens that provide information about your Ethernet and HomePlug connection.

### Ethernet Sub Screen:

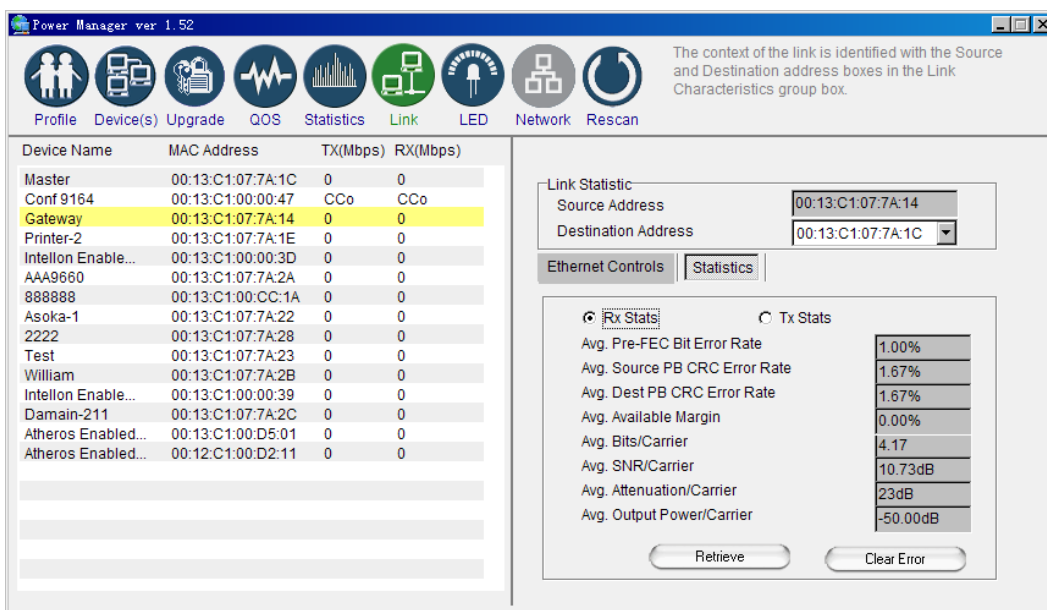
The Ethernet sub screen shows the Ethernet connection speed of the local and destination devices in your network. You can select the destination device in the *Destination Address* drop down menu. Click the Retrieve button to get the information.



Link Screen; Ethernet Sub-Screen

### Statistics Sub Screen:

Use the Statistics sub screen to view statistical information about your connection between a source device and a specific destination device in your network. Click the *Retrieve* button to start accumulating the statistical information.



Link Screen; Statistics sub screen



## Viewing the LED screen

This is the LED Manager tab. It allows you to configure the LED functionality threshold. IMPORTANT: YOU CAN ONLY ENTER WHOLE NUMBERS DIVISIBLE BY 4. Example: 100, 80, 60 (no odd numbers) etc. If you enter a value that is not divisible by 4; then you will get the message: " *The value Yellow or Green must divide by 4!*"

Device Name	MAC Address	TX(Mbps)	RX(Mbps)
Master	00:13:C1:07:7A:1C	0	0
Conf 9164	00:13:C1:00:00:47	CCo	CCo
Gateway	00:13:C1:07:7A:14	0	0
Printer-2	00:13:C1:07:7A:1E	0	0
Intellon Enable...	00:13:C1:00:00:3D	0	0
AAA9660	00:13:C1:07:7A:2A	0	0
888888	00:13:C1:00:CC:1A	0	0
Asoka-1	00:13:C1:07:7A:22	0	0
2222	00:13:C1:07:7A:28	0	0
Test	00:13:C1:07:7A:23	0	0
William	00:13:C1:07:7A:2B	0	0
Intellon Enable...	00:13:C1:00:00:39	0	0
Damain-211	00:13:C1:07:7A:2C	0	0
Atheros Enabled...	00:13:C1:00:D5:01	0	0
Atheros Enabled...	00:12:C1:00:D2:11	0	0

Throughput LED

Enable Throughput Indicator on Power LED  True

Threshold Value. Coded PHY Rate where LED turns R/Y/G

RED

YELLOW

GREEN

LED screen

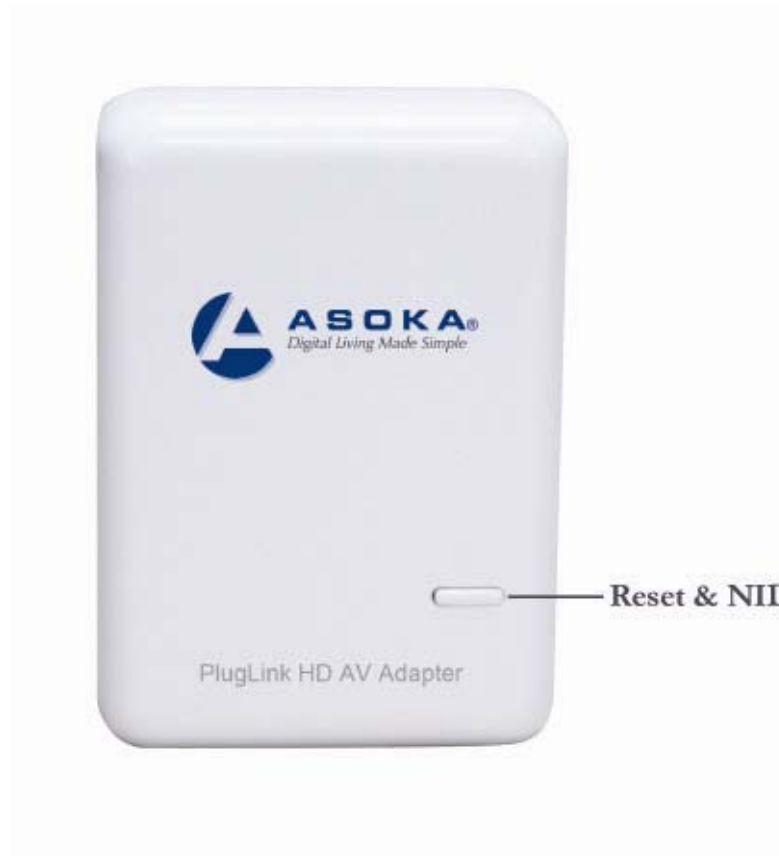
## Rescanning your Powerline Network

Use the *Rescan* button to scan for your Powerline devices under the same Network Password in your HomePlug network. This option refreshes the information on your Power Manager.



## Manually Resetting the Firmware and Network ID (NID)

You can use the buttons on your PlugLinkAV device to reset the firmware back to its factory defaults, and to create or associate your PlugLink HD AV Adapter to a randomized Powerline Network. For details on how to use the buttons on your PlugLinkAV adapter, please refer to page 33 of this manual.



Note: The PlugLinkAV device must be plugged into an electrical outlet when using these buttons. If you have questions, please contact Asoka USA Technical Support at (408) 550-8173.

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# 4

## Troubleshooting

Following are solutions to a few situations you might encounter. If you do not find a solution in this chapter, contact Asoka USA Technical Support by phone at (408) 550-8173 or through email at [support@asokatech.com](mailto:support@asokatech.com).

**Symptom:** I can't connect to anything and there are no lights activated on my PL9660-Q1.

### Solution:

1. Unplug the device from the electrical outlet in question.
2. Locate another available outlet in your home.
3. Test the outlet by plugging in another electrical device such as a lamp or radio.
4. Plug the PL9660-Q1 into the working electrical outlet.
5. Check to see if the lights work
6. If the above does not work, the device might be defective.
7. Please contact Technical Support for instructions on returning the device for repair or replacement.

**Symptom:** Some of my devices cannot connect to the Internet or other computers in my network. The lights seem to be functionally normally.

### Solution #1:

1. Re-Initialize the PL9660-Q1 device.
2. Unplug the PL9660-Q1 from the electrical outlet.
3. Disconnect the Ethernet cable from the device
4. Plug the PL9660-Q1 back into the electrical outlet.
5. Reconnect the Ethernet cable.

### **Solution #2:**

The Network Encryption Key (NEK) may not be correct on your devices.

1. Reset the Network Encryption Key using the Factory Reset button located on the bottom of your PL9660-Q1 device. This will reset the NEK back to the default of HomePlug.
2. Test your connection again. If this still does not work, perform the factory reset on all of your other PL9660-Q1 devices in your network.

### **Solution #3:**

It is possible some outlets in your home are not connect together.

1. Unplug the PL9660-Q1 from the current electrical outlet.
2. Locate another outlet in the home.
3. Plug the PL9660-Q1 into that outlet.
4. Attach a computer to the PL9660-Q1.
5. Open the Power Manager Utility (located on the enclosed CD).
6. Under the Profile button, check if your PL9660-Q1 is displayed (it Will be the first) and see if your other PL9660-Q1 devices can be seen. If you can see other devices under the Profile screen, your PL9660-Q1 device is functioning properly.

### **Solution #4:**

Your broadband connection may have stopped working.

1. Power down your broadband router and/or DSL/cable modem (if applicable) for about 30 seconds and then power them back on.
2. If this step fails, please contact your ISP for assistance.



# Specifications

This appendix lists the specifications for your PL9660-Q1.

Standards Compliance:	•HomePlug® AV • IEEE 802.3, IEEE 802.3x, IEEE 802.3u, IEEE1901
Software Utility System Requirements:	Microsoft Windows® 98 SE, 2000, ME, XP, Vista ,7 (32bit)and 7(64bit) operating systems
Network Protocol:	TCP/IP, CSMA/CA, TDMA (supported in the future)
Network Interface:	One-port 10/100 Mbps Ethernet (RJ-45)
PHY-Rates:	Up to 200 Mbps
Distance:	Over 300 Meter
Operating Frequency:	2 to 30 MHz
Modulation Schemes:	• Orthogonal Frequency Division Multiplexing (OFDM) • QAM 1024/256/64/16 • QPSK • BPSK
EMI and Safety:	• FCC Part 15 Class B • UL (US and Canada) • CE
Additional Protocols:	• Forward Error Correction (FEC) • Automatic Channel Adaptation
Power Supply:	100-240VAC
Surge Energy Rating:	4KV
Power Rating:	• 100-240VAC , 0.1A max, 50-60Hz
Security:	128-bit AES

Environmental Specifications:	<ul style="list-style-type: none"><li>• Operating temperature: 32°F to 113°F (0°C to 45°C)</li><li>• Operating humidity: 10% to 85% Non-condensing</li><li>• Storage temperature: -4°F to 158°F (-20°C to 70°C)</li><li>• Storage humidity: 5% to 90% Non-condensing</li></ul>
Quality of Service:	<ul style="list-style-type: none"><li>• ToS</li><li>• 802.1q</li><li>• TDMA (supported in the future)</li></ul>
Warranty:	lifetime



# Components

## Front Panel

Use the status lights on the front panel to verify connections.



The following table describes the status light functions in the front panel:

Status Light	State	Indication
Power	Illuminated Off Red and Green illuminate alternately	Device is powered on Devices has no power Stand by mode (After 3 minutes no link)
PLC Activity	Blinking Red Blinking Yellow Blinking Green Off	Low connection Good connection Excellent connection No connection
Eth Link	Illuminated Blinking Off	Ethernet connectivity Ethernet traffic No Ethernet connectivity

## Bottom Panel

The bottom panel of the PL9660-Q1 contains the following components:

- RJ-45 Ethernet port



The label on the rear panel of the PlugLink HD AV Adapter contains the information listed below.

- MAC address
- Model number
- Part number
- Serial number
- Password



Note: Write this information down in your Warranty Support Information card for future reference.

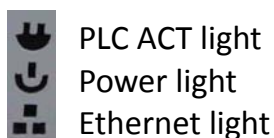


## Buttons

The PlugLink HD AV Adapter device has two hardware push buttons:

- **FW RST (Firmware Default Reset )** button - Resets the PlugLink HD AV Adapter back to factory default settings. Press and hold the button with a pin or sharp object for about 2 seconds until you see the lights on the device flash briefly.
- **SECURITY (Network ID)** button - All PlugLink HD AV Adapter devices have a default password Network Encryption Key (NEK) set to "HomePlugAV" allowing them to communicate to each other. The SECURITY button allows you to set a devices' password to a randomized Network Encryption Key (NEK) for maximum security. You can then set other devices to the same NEK by using their SECURITY button. Only units with the same NEK can communicate to each other.

## SETTING A RANDOMIZED NETWORK PASSWORD



Device A



Device B

1. Select a PlugLink HD AV Adapter (Device A) and plug into an AC outlet. The **POWER** light indicator should be lit solid green.
  - a. Press the **SECURITY** button **BRIEFLY** (1 second) and release. The

- POWER light should now be blinking green.
- b. **IMPORTANT:** If the POWER light is not blinking green, repeat Step “a” until the power light blinks green.
  - c. This unit is now ready to create a new randomized NEK (Net Encryption Key) network. This unit will remain in this “adder” mode for about 2 minutes.
2. Select another PlugLink HD AV Adapter (Device B) and plug into a second outlet.
    - a. Press the SECURITY button BRIEFLY (1 second) and release. The POWER light should now be blinking green.
    - b. **IMPORTANT:** If the power light is not blinking green, repeat Step “a” until the power light is blinking green.
  3. In about 15 seconds the POWER light will change from flashing green to solid green and the PLC ACT (Power line Communication Activity) light will turn solid green (flashing green when there is data traffic) indicating they are synchronized with the same NEK.
  4. Congratulations, you are done!

### ADDING A THIRD OR MORE PLUGLINK HD AV DEVICES



PLC ACT light  
Power light  
Ethernet light



Device A



Device B



Device C

1. Plug your new PlugLink HD AV Adapter (Device C) into an AC outlet. The POWER light indicator should be lit solid green.
  - a. Press the SECURITY button BRIEFLY (1 second) and release. The POWER light should now be blinking green.
  - b. **IMPORTANT:** If the POWER light is not blinking green, repeat Step “a” until the power light is blinking green.
  - c. This unit is now ready to join the existing HD AV network. This unit will remain in this “adder” mode for about 2 minutes.
2. From your existing devices (either device A or device B) press the SECURITY button BRIEFLY (1 second) then release. The POWER light should now be blinking green.
  - d. **IMPORTANT:** If the power light is not blinking green, repeat Step “2” until the power light is blinking green.
3. In about 15 seconds the POWER light will change from flashing green to solid green and the PLC ACT (Power line Communication Activity) light will turn solid green (flashing green when there is data traffic) indicating they are synchronized with the same NEK.
4. To add more PlugLink devices; simple repeat this process per device.
5. Congratulations, you are done!

#### Notes:

1. The other devices already in the Power line network with the proper NEK

- are not affected and do not need to be reconfigured.
2. If you disconnect power from any device, its NEK value will remain and will not default back to "HomePlugAV" NEK.
  3. An adapter can only generate a private key once. To replace a private key, first reset the unit back to its factory defaults by pressing the Firmware Default Reset (FW RST) button for 1 second, then follow the procedure above.



The use of the SECURITY (Network ID) button is optional. You may also use the application software described in the manual to set NEK's as well.

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## Warranty

Asoka warrants that (a) the hardware components of the product will be free from defects in materials and workmanship under normal use from the date of purchase when used within the limits set forth in the Specifications section of the User Guide, and (b) the software components will perform substantially in accordance with Asoka's published specifications for lifetime from the date of purchase, but does not warrant that the software will be error-free or free of all defects.

Should a product fail to perform as described in the User Guide, it will be repaired or replaced with the same or functionally equivalent product by Asoka, at its discretion, free of charge provided that you: (a) return the failed product to an Asoka designated repair facility with shipping charge prepaid, and (b) provide Asoka with proof of the original date of purchase. Repaired or replacement products will be returned to you with shipping charges prepaid. Asoka warrants any replaced or repaired product or component for the life of the product.

This warranty extends only to you, the original purchaser and is not transferable to any subsequent purchasers.

This warranty does not apply if, in the judgment of Asoka, the product fails due to damage from shipment, handling, storage, accident, abuse, misapplication or misuse, or if it has been used or maintained in a manner not conforming to product manual instructions, has been modified in any way, or has had any serial number removed or defaced. Repair by anyone other than Asoka or an approved agent will void this warranty. The maximum liability of Asoka under this warranty is limited to the purchase price of the

product covered by the warranty. Prior to returning any defective product, the purchaser or the authorized merchant from whom the purchaser originally bought the product must obtain a Return Material Authorization (RMA) number from Asoka. All defective products should be returned to Asoka with shipping charges prepaid. Asoka will not accept collect shipments.

WHILE ASOKA HAS MADE EVERY EFFORT TO PROVIDE CLEAR AND ACCURATE TECHNICAL INFORMATION ABOUT ITS PRODUCTS, ASOKA ASSUMES NO LIABILITY FOR ANY EVENTS ARISING OUT OF THE USE OF THE TECHNICAL INFORMATION OR THE PRODUCT, EXCEPT AS SPECIFICALLY PROVIDED IN THIS AGREEMENT OR AS REQUIRED BY LAW. THE WARRANTIES AND REMEDIES STATED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, ORAL OR WRITTEN, EXPRESS OR IMPLIED. ANY AND ALL OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS ARE EXPRESSLY EXCLUDED. ASOKA SHALL NOT BE LIABLE, UNDER ANY CIRCUMSTANCES, TO ANY PERSON OR ENTITY FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, DAMAGES RESULTING FROM THE USE OR MALFUNCTION OF THE PRODUCTS, LOSS OF PROFITS OR REVENUES, BUSINESS INTERRUPTION, OR COSTS OF REPLACEMENT GOODS, EVEN IF ASOKA IS INFORMED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES.



## FCC Notice

### 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 FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates 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 or more 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

This device complies with Part 15 of 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.

**Note:** The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. such modifications could void the user's authority to operate this equipment.

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