



PlugLink 500G Pass-Through Adapter User's Guide

PL9677-A5

PlugLink[®]
by Asoka[®]

QUICKFIND LOCATOR

Contact

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Installation

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Revision	Date	Description
66-0368-01Rev.001	May.2011	Preliminary Release

Changes in This Revision

- Not applicable (preliminary release)

Contact Information

For more information about the PlugLink 500G Pass-Through 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@asokausa.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.asokausa.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@asokausa.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@asokausa.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 PL9677
- 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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Simple Installation

Congratulations on your purchase of the PlugLink 500G Pass-Through Adapter !

This adapter allows you to network your home or office by plugging directly into an electrical outlet. With your PlugLink 500G Pass-Through 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 500G Pass-Through Adapter to a PC or cable/DSL Router.

Package Contents

- PlugLink 500G Pass-Through Adapter(PL9677-A5)
- 6-foot Ethernet cable
- Quick Installation Guide
- Installation Resource CD (for advanced users only)
- Warranty and Support Information Card



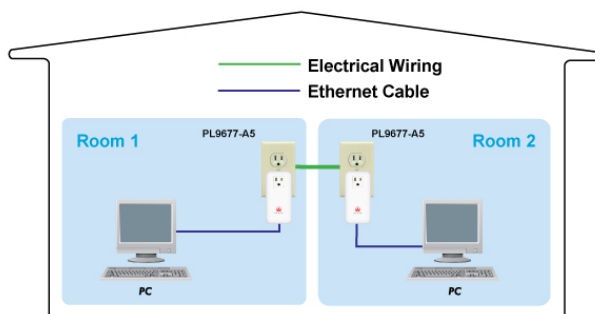
If any of the parts are incorrect, missing, or damaged, contact the retailer where you made your purchase. Keep the carton, including the original packing materials, in case you need to return the unit for repair.


Types of Connections

This section describes what you need to do to before installing the PlugLink 500G Pass-Through 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 /1000BaseT Ethernet- capable device.

Simple Connection (Peer to Peer)

To share a simple connection between computers, attach one PL9677-A5 device to each computer.

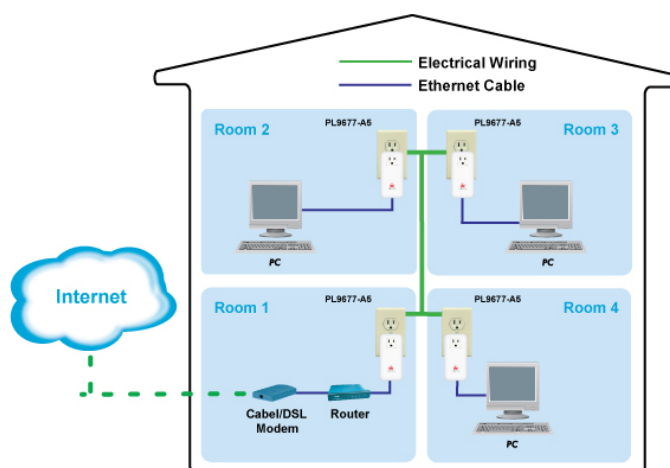


 **NOTE:** Do not connect the PlugLink 500G Pass-Through Adapter into a power strip, extension cord, un-interruptible power supply (UPS), or surge protector. This may prevent the unit from working properly or degrade the network performance.

Simple Broadband Connection

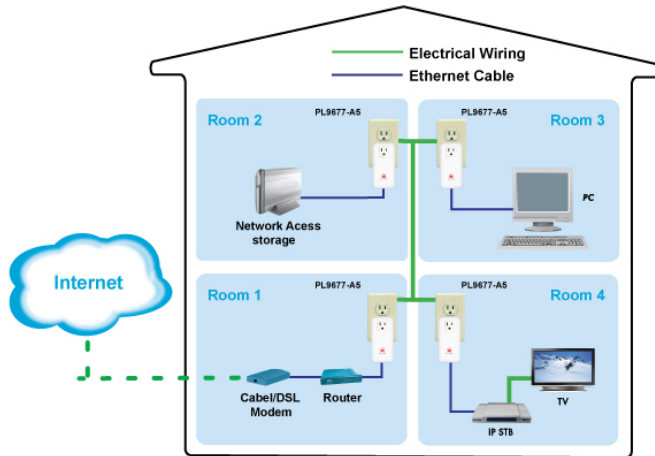
The following items are needed to share a Broadband connection with computers:

- One (1) PL9677-A5 device attached to a standard cable, DSL, or wireless router;
- One (1) PL9677-A5 device attached to each computer;



Other Connections

You can also use the PlugLink 500G Pass-Through Adapter with other Ethernet enabled devices, such as IP Cameras, IP set top box, game consoles, etc. "Up to eight (8) PL9677 can be placed on the same PLC (Powerline Communication) network."



Finding a Suitable Location

Find a suitable location to install your PlugLink 500G Pass-Through 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 500G Pass-Through 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 500G Pass-Through 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 PL9677 for normal use.

2

Advanced Configuration (Expert Users Only)

This chapter provides information on installing and setting up the PlugLink 500G Pass-Through Adapter.



NOTE: Do not connect the PlugLink 500G Pass-Through 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.

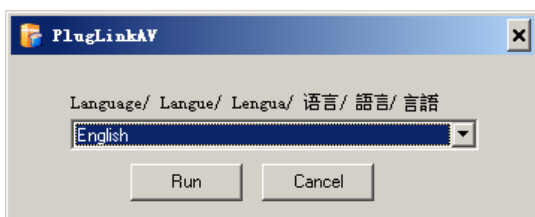
Installing the Software

Following are software installation procedures for advanced users.

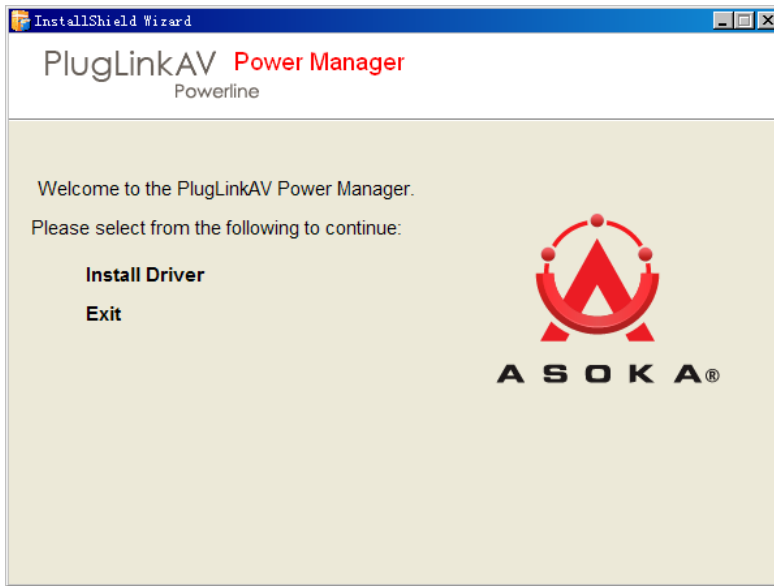


NOTE: Software installation is not required for normal use. The utility is used to change the security settings and view information about the network.

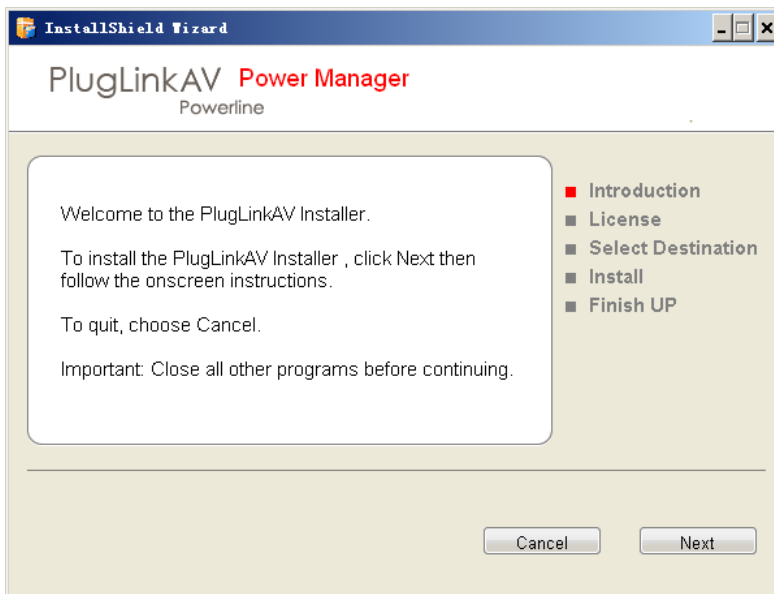
1. Insert the enclosed Installation Resource CD into your CD-ROM drive. If the PlugLink 500G Pass-Through Adapter Installation Utility does not appear within 30 seconds, select your CD-ROM drive and double-click the **Setup.exe** icon to start the Installation Utility.
2. Select the language preference, and click the **Run** button.



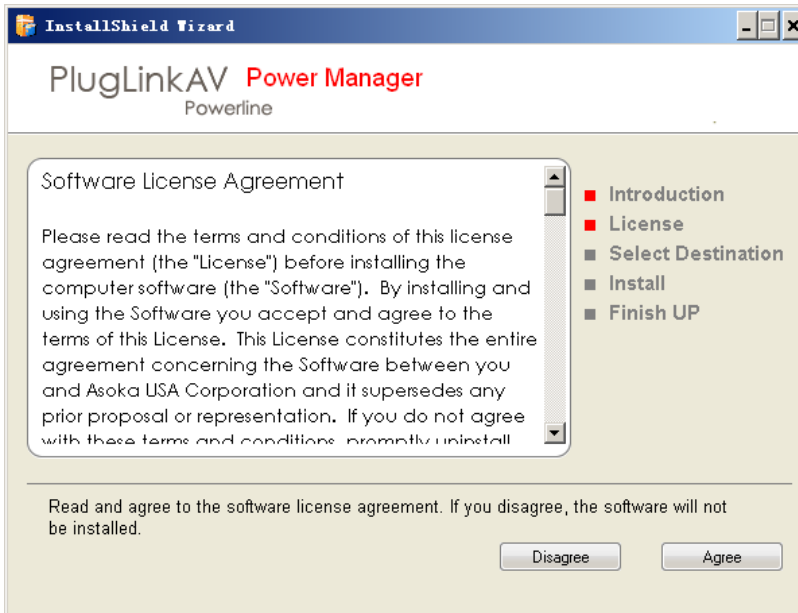
3. In the Start screen, click **Install Driver** to start the installation.



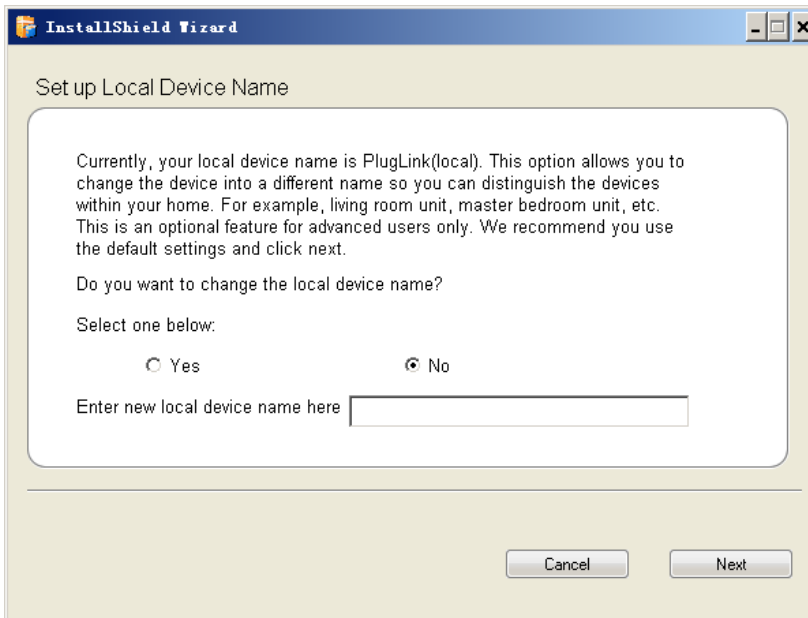
4. In the **Welcome** screen of the screen of the wizard, click **Next** to begin the installation.



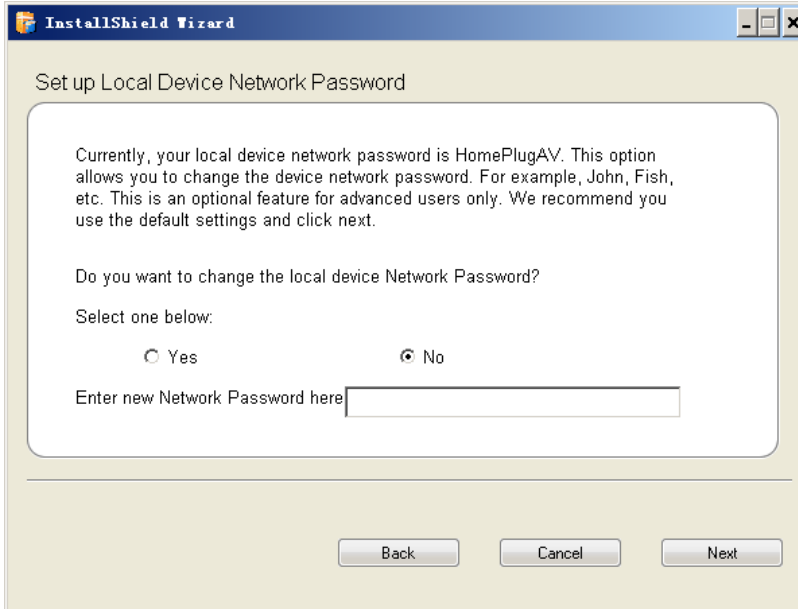
5. Read the End User Software License Agreement, and if you agree, click the **Agree** button to continue the installation.




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.

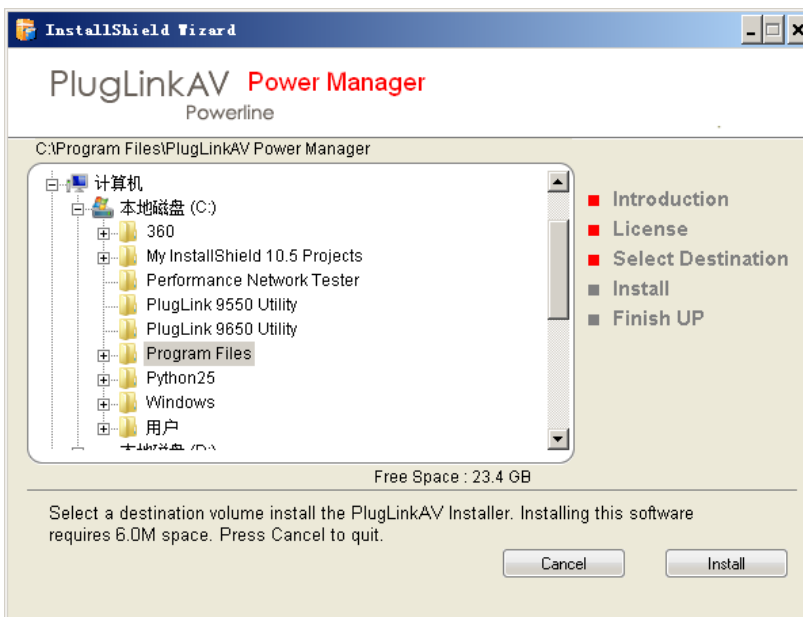


7. This following screen allows you to change the network password for your PL9677 units. To change the network password, select **Yes** and then enter the new password in the text field. Or, select **No** and click the **Next** button to continue.

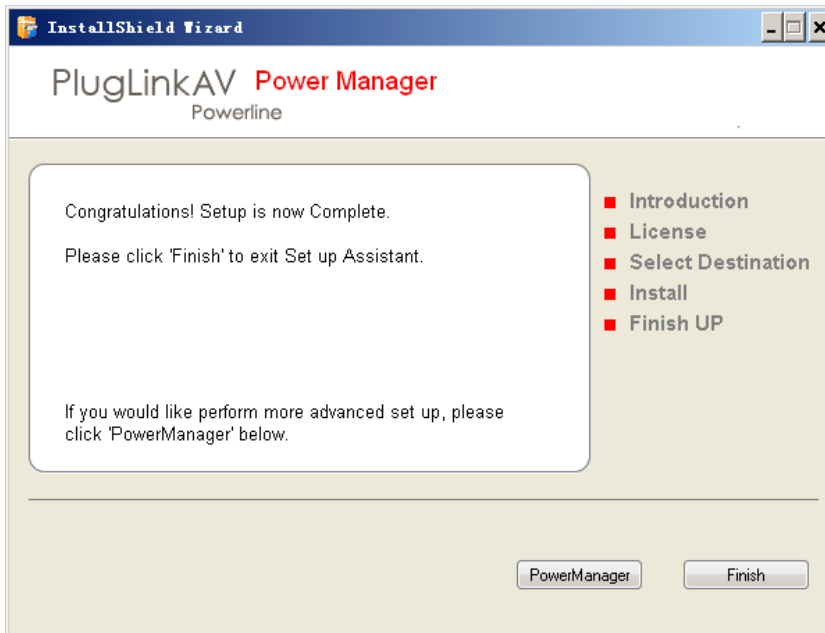


 **NOTE:** All devices on your network must share the same password to communicate. Use care when changing the network password. The default password is HomePlug AV.

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



9. When the installation of the PlugLink drivers and software is complete, you can use Power Manager Utility for advanced configuration of your PL9677 unit. Click **Finish** to finish the installation wizard.



Network Management

The PlugLinkAV Power Manager utility software allows you to manually configure a PlugLink 500G Pass-Through 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.

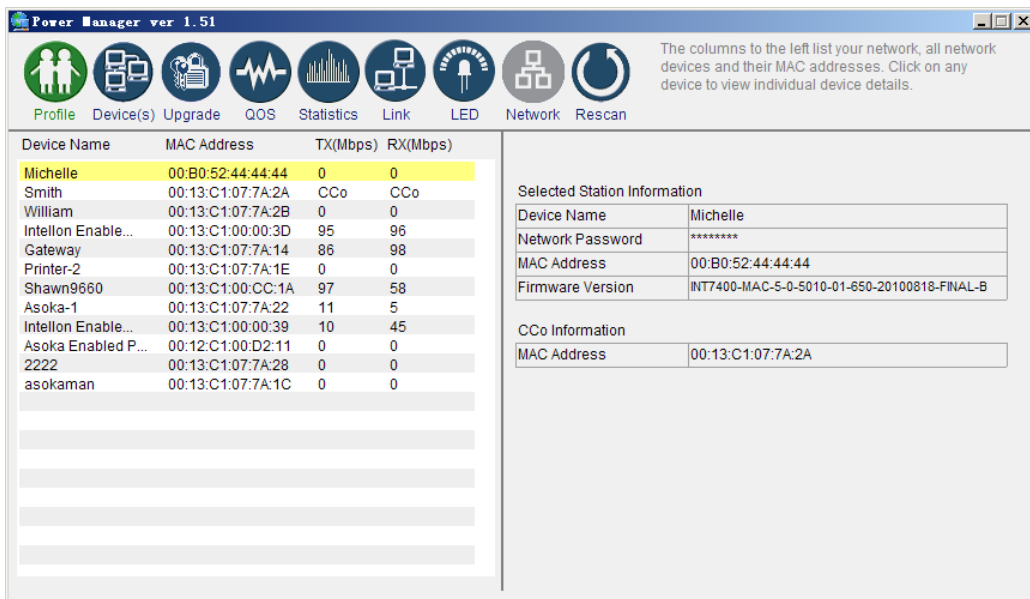
The Profile screen displays the following information:

- 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.



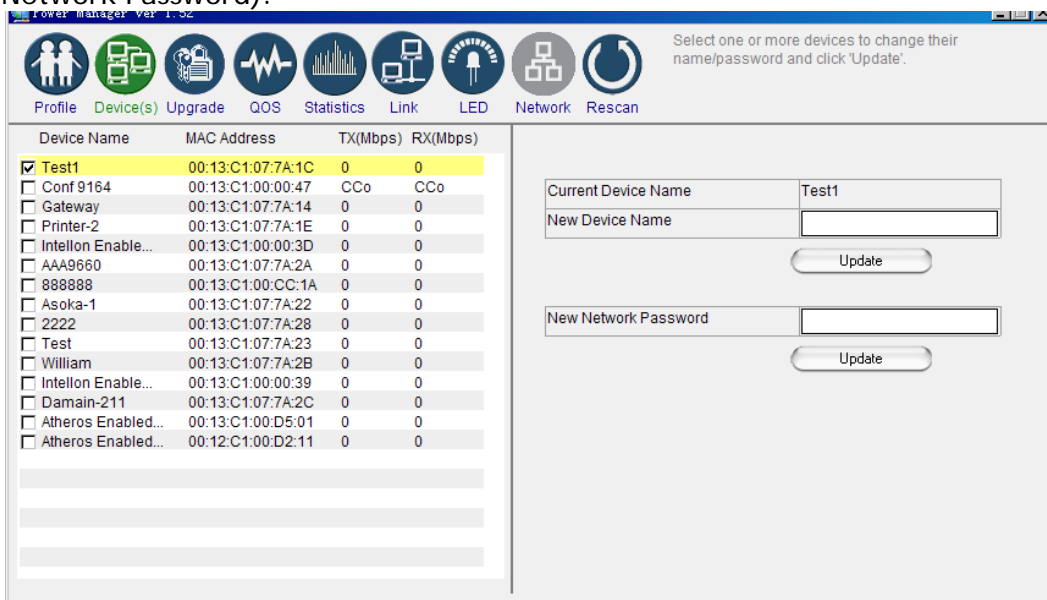
NOTE: Devices set up with a different Network Encryption Key (NEK) also known as the network password will NOT appear on this list.



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).

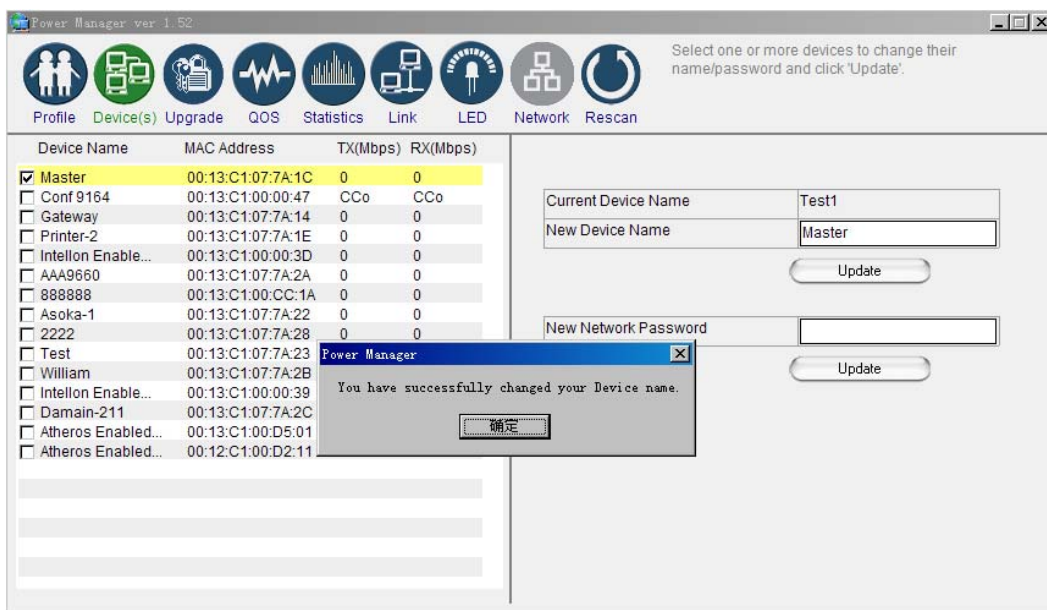


Device(s) Screen

DEVICE NAME

Changing your local device name:

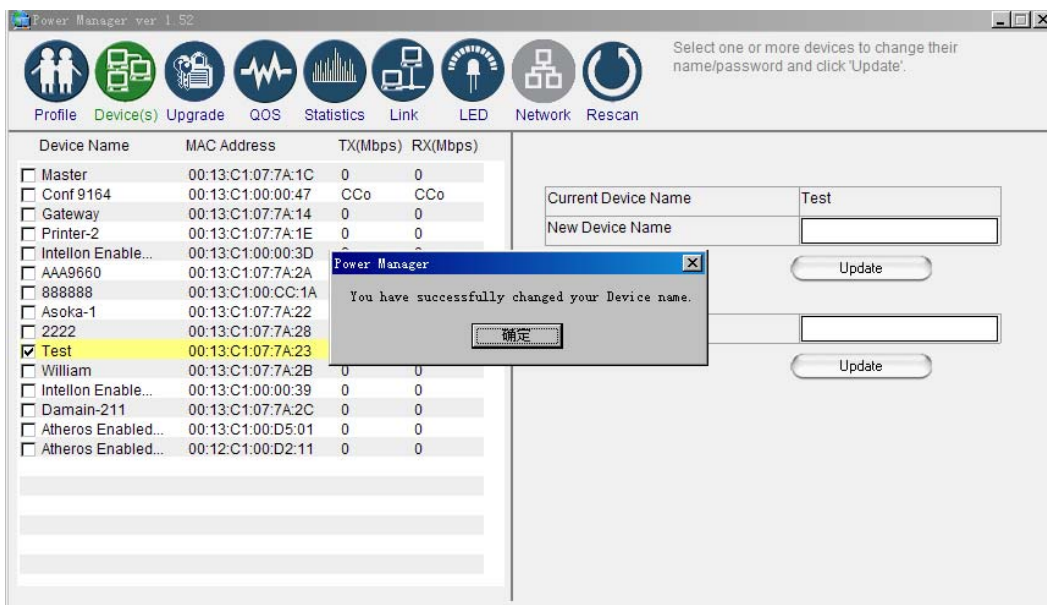
1. Connect your PlugLinkAV adapter to your PC. For instructions on how to connect your PlugLinkAV to your PC, please refer to page 7 ([Installing the Hardware](#)).
2. Run the PlugLinkAV Power Manager software. If you have not installed the PlugLinkAV Power Manager software onto a PC, please refer to 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](#)”.

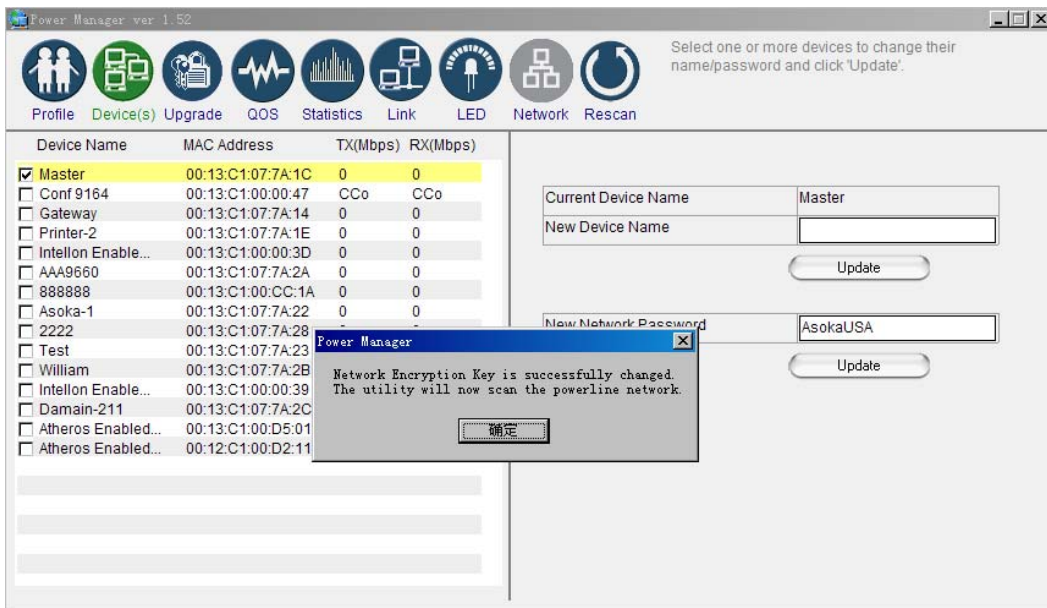
Changing your local device Network Encryption Key (NEK):



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.



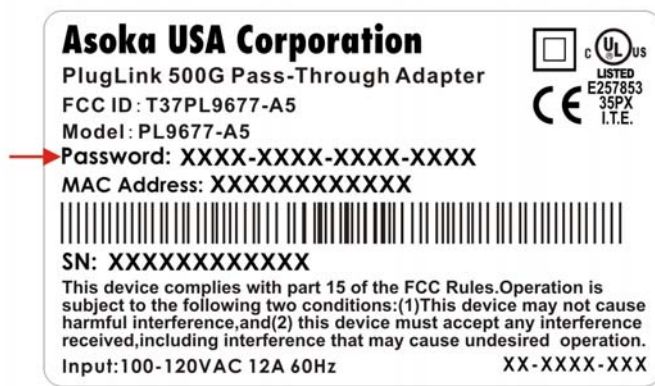
Changing your local device Network Encryption Key (NEK)

Changing your remote device Network Encryption Key (NEK):



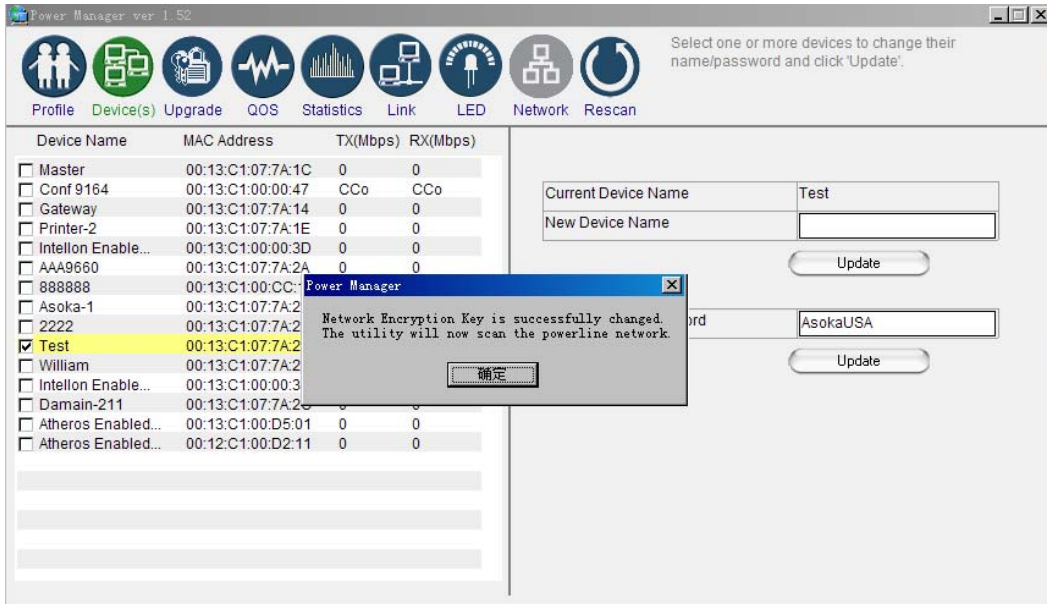
WARNING: If you change your remote device Network Encryption Key (Network Password) your remote device will no longer be able to communicate with all your other PlugLinkAV adapters. You must change the Network encryption key on all your PlugLinkAV adapters to the new Network Encryption Key in order for 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 500G Pass-Through Adapter

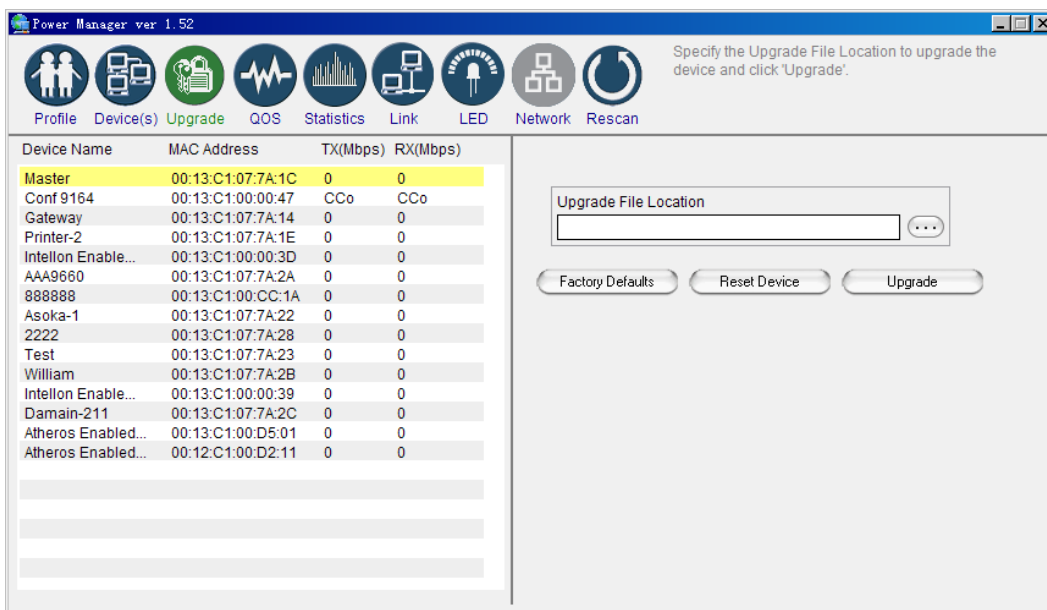
Run the PlugLinkAV Power Manager and use the *Upgrade* screen to:

- Reset your PlugLink 500G Pass-Through Adapter to Factory Defaults
- Reset (Reboot) your PlugLink 500G Pass-Through Adapter
- Upgrade the Firmware

How to reset your PlugLink 500G Pass-Through 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.asokausa.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

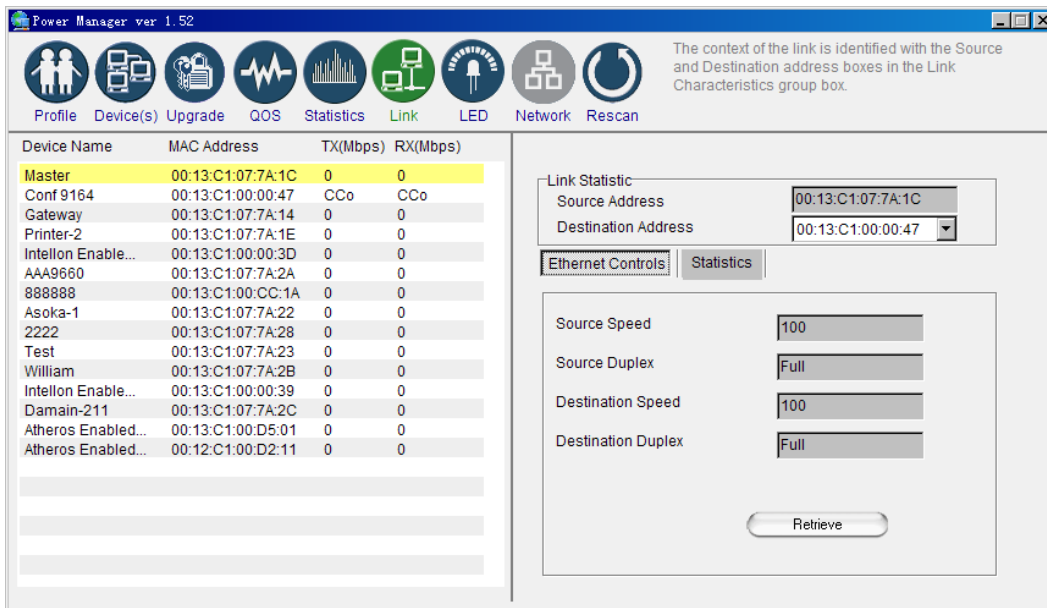
Statistics screen

Viewing the Link screen

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

Ethernet Sub Screen:

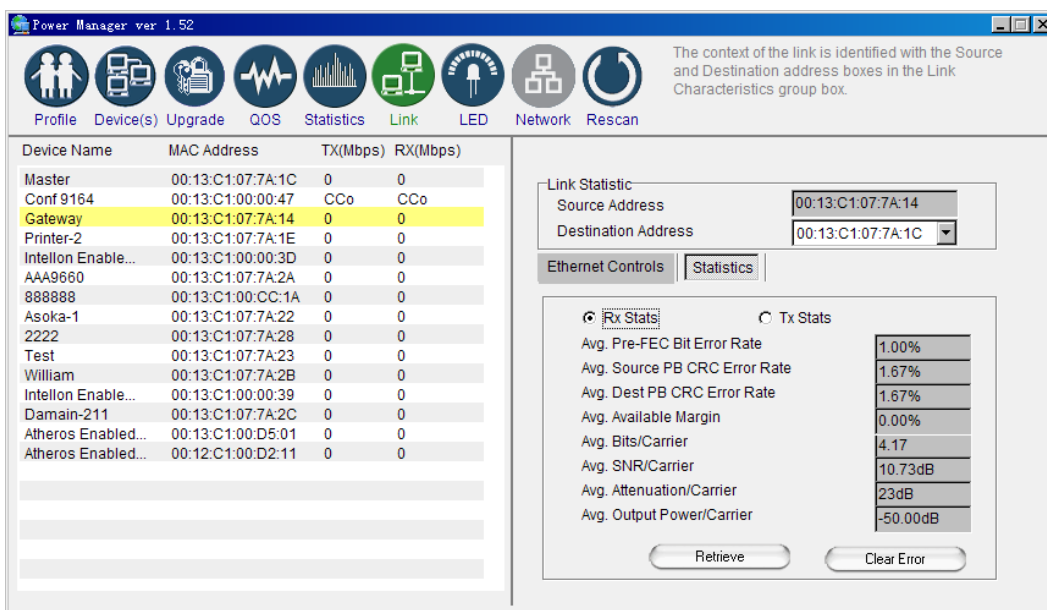
The Ethernet sub screen shows the Ethernet connection speed of the local and destination devices in your network. You can select the destination device in the **Destination Address** drop down menu. Click the Retrieve button to get the information.



Link Screen; Ethernet Sub-Screen

Statistics Sub Screen:

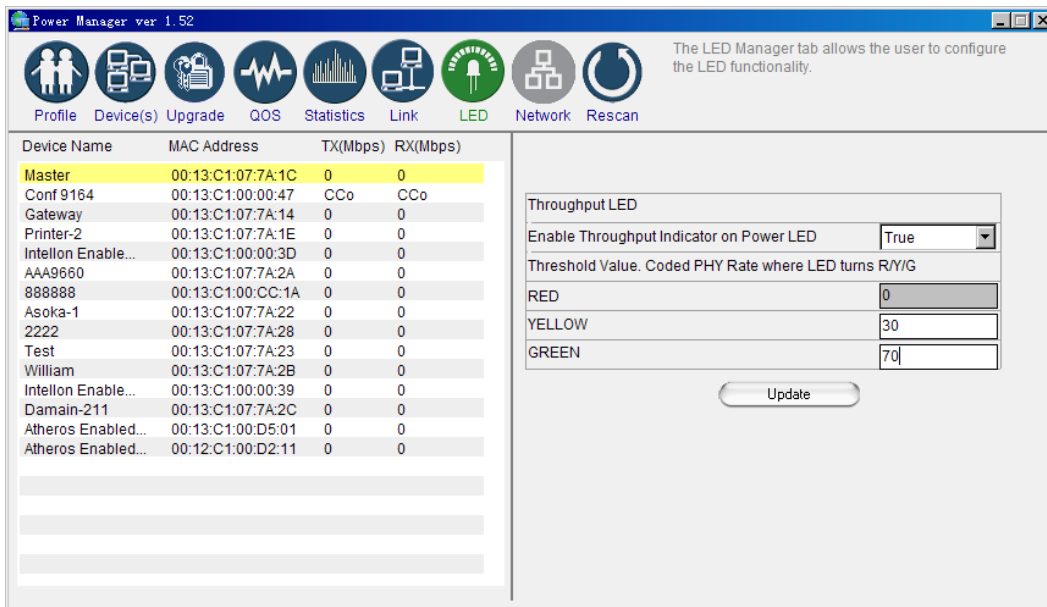
Use the Statistics sub screen to view statistical information about your connection between a source device and a specific destination device in your network. Click the *Retrieve* button to start accumulating the statistical information.



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!"*



The screenshot shows the LED Manager tab in Power Manager ver 1.52. The interface includes a navigation bar with icons for Profile, Device(s), Upgrade, QoS, Statistics, Link, LED, Network, and Rescan. The LED icon is highlighted. Below the navigation bar is a table of devices with columns for Device Name, MAC Address, TX(Mbps), and RX(Mbps). The 'Master' device is highlighted in yellow. To the right of the table is a configuration panel for the LED Manager. It includes a dropdown menu for 'Enable Throughput Indicator on Power LED' set to 'True'. Below this is a section for 'Threshold Value. Coded PHY Rate where LED turns R/Y/G' with three input fields: RED (0), YELLOW (30), and GREEN (70). An 'Update' button is located at the bottom of the configuration panel.

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
AA9660	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

LED screen

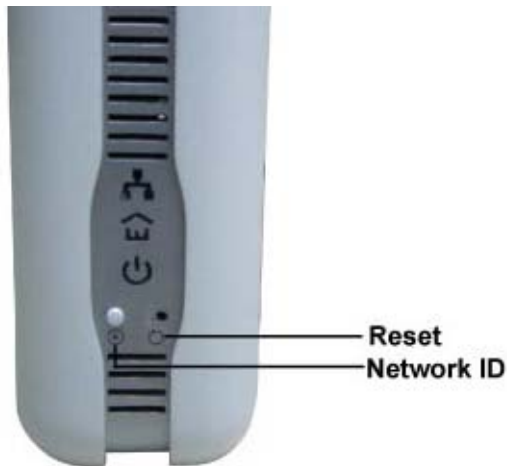
Rescanning your Powerline Network

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 500G Pass-Through 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.

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@asokausa.com.

Symptom: I can't connect to anything and there are no lights activated on my PL9677-A5.

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 PL9677-A5 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 PL9677-A5 device.
2. Unplug the PL9677-A5 from the electrical outlet.
3. Disconnect the Ethernet cable from the device
4. Plug the PL9677-A5 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 PL9677-A5 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 PL9677-A5 devices in your network.

Solution #3:

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

1. Unplug the PL9677-A5 from the current electrical outlet.
2. Locate another outlet in the home.
3. Plug the PL9677-A5 into that outlet.
4. Attach a computer to the PL9677-A5.
5. Open the Power Manager Utility (located on the enclosed CD).
6. Under the Profile button, check if your PL9677-A5 is displayed (it Will be the first) and see if your other PL9677-A5 devices can be seen. If you can see other devices under the Profile screen, your PL9677-A5 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 PL9677-A5.

Standards Compliance:	<ul style="list-style-type: none">• IEEE 1901 • HomePlug® AV • IEEE 802.3, IEEE 802.3x, IEEE 802.3u, IEEE 802.3ac
Software Utility System Requirements:	Microsoft Windows® 98 SE, 2000, ME, XP, Vista, Windows 7(32bit) and Windows 7(64bit) operating systems
Network Protocol:	TCP/IP, CSMA/CA, TDMA (supported in the future)
Network Interface:	One 10/100/1000M Ethernet (RJ-45) Port
PHY-Rate:	Up to 500 Mbps
Distance:	Over 300 meters
Operating Frequency:	2 to 70 MHz
Modulation Schemes:	<ul style="list-style-type: none">• Orthogonal Frequency Division Multiplexing (OFDM) • QAM 4096/1024/256/64/16 • QPSK • BPSK
EMI and Safety:	<ul style="list-style-type: none">• FCC Part 15 Class B • UL (US and Canada) • CE
Additional Protocols:	<ul style="list-style-type: none">• Forward Error Correction (FEC) • Automatic Channel Adaptation
Power Supply:	<ul style="list-style-type: none">• US Version: 100-120VAC • UK/EU Version: 200-240VAC
Surge Energy Rating:	4KV
Power Rating:	<ul style="list-style-type: none">• US Version: 100-120VAC 12A max, 60Hz• UK Version: 200-240VAC 13A max, 50/60 Hz ; EU Version: 200-240VAC 16A max, 50/ 60 Hz
Security:	128-bit AES

Environmental Specifications:	<ul style="list-style-type: none"> • Operating temperature: 32°F to 95°F (0°C to 35°C) • Operating humidity: 10% to 85% Non-condensing • Storage temperature: -4°F to 158°F (-20°C to 70°C) • Storage humidity: 5% to 90% Non-condensing
Quality of Service:	<ul style="list-style-type: none"> • ToS • 802.1q • TDMA (supported in the future)
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 PL9677-A5 contains the following components:

- RJ-45 Ethernet port




The label on the rear panel of the PlugLink 500G Pass-Through Adapter contains the information listed below.

- MAC address
- Model number
- Part number
- Serial number
- Unique device password

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


Asoka USA Corporation
PlugLink 500G Pass-Through Adapter
FCC ID: T37PL9677-A5
Model: PL9677-A5
Password: XXXX-XXXX-XXXX-XXXX
MAC Address: XXXXXXXXXXXXX



SN: XXXXXXXXXXXXX

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Input: 100-120VAC 12A 60Hz XX-XXXX-XXX



Buttons

The PlugLink 500G Pass-Through Adapter device has two hardware push buttons:

- **FW RST (Firmware Default Reset)** button - Resets the PlugLink 500G Pass-Through 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 500G Pass-Through 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



Ethernet light
PLC ACT light
Power light



Device A



Device B

1. Select a PlugLink 500G Pass-Through 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 500G Pass-Through 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



Ethernet light
 PLC ACT light
 Power light



Device A



Device B



Device C

1. Plug your new PlugLink 500G Pass-Through 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.



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: “Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.”

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PlugLink 500G Pass-Through Adapter
