Actiontec®

MegaPlug

Wireless Network Extender

Model #: HPAP108T

User Manual

Ver 1.0

Solutions for the Digital Life™

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Introduction 1

Congratulations for purchasing the Actiontec MegaPlug Wireless Network Extender. The Extender is one of the easiest ways to augment your existing MegaPlug network by introducing wireless networking. Simply plug the Extender into a standard electrical outlet, and your AC-wire-based network is now wireless-capable. Using any wireless-equipped computer, you can surf the Web, exchange files, even print documents, all without the hassle of installing more cables. If you want to take your computer networking to the next level, the Actiontec MegaPlug Wireless Network Extender is sure to be one of the keys to your success.

Features

- Supports HomePlug Powerline Specification 1.0
- 85 Mbps data rate (maximum) over standard home power lines
- 56-bit DES encryption
- Supports IEEE 802.11b, IEEE 802.11g, IEEE 802.3, and IEEE 802.3u wireless standards
- Supports WEP 64/128/152-bit encryption, WPA, WPA-PSK, 56-bit DES encryption
- Two-pronged US power plug (fits ungrounded power outlets)
- Power and Wireless indicators

System Requirements

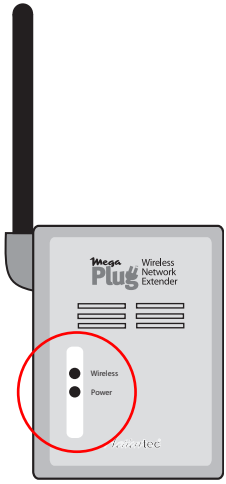
- Router or gateway with HomePlug capability
- Standard home power wiring
- Computer with the following:
  - CD-ROM drive
  - Windows 98SE, Me, 2000, or XP installed
  - Wireless capability
  - TCP/IP network protocol installed

Getting to Know the Network Extender

This section contains a quick description of the Network Extender's external features.

Front Panel

The Network Extender's front panel features 2 lights (LEDs):



Wireless Light

The Wireless light flickers green when the Extender is active.

Power Light

The Power light glows green when sychronized with another device, and flickers when data is being transferred across the Network Extender. If the Power light is off, it can still be powered up.

Information Sticker

The information sticker (located beneath the electrical prongs) displays the MAC (Media Access Control) address, device ID, serial number and other information about the Extender.

What is HomePlug?

HomePlug is a new networking technology that uses the existing power lines in a home to connect devices such as computers, print servers, etc., eliminating the need for installing new wiring when a device is added to the network. Today's HomePlug products are mainly adapter-type devices which plug into existing Ethernet networks, but more and more devices are being designed with HomePlug technology built-in. This means, in the near future, plugging in a device into an electrical outlet will not only power it, but also allow it to communicate with other HomePlug devices.

Technical Support

Actiontec Electronics prides itself on making durable, high-quality, high-performance products. If you need assistance, the Actiontec Technical Support Department is available all day every day to provide professional support.

Actiontec Electronics, Inc.

760 N. Mary Avenue
Sunnyvale, CA 94085

Technical Support

Phone: (USA) 1-888-436-0657
E-mail: http://support.actiontec.com/email_support/support_form.php
Internet: www.actiontec.com/support

Installing the Wireless Network Extender 2

This chapter explains how to plug in the Wireless Network Extender, how to load the Extender's Configuration Utility on a computer connected to the Homeline network, and how to access the Homeline network (via the Extender) with a wirelessly-equipped computer.

☞ ***Note:*** The following procedures assume that the user has already set up a Homeline network with a computer connected to the network.,

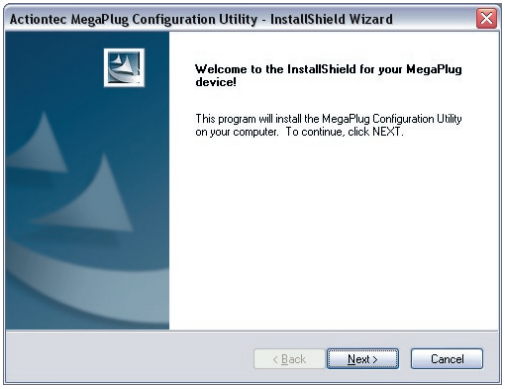
Plugging in the Extender

To use the Extender properly, it should be plugged into an electrical outlet already part of a Homeline network, with other devices (computers, printer servers, etc.) connected to the network. The Power light will glow steadily green when the Extender detects a HomeLine network.

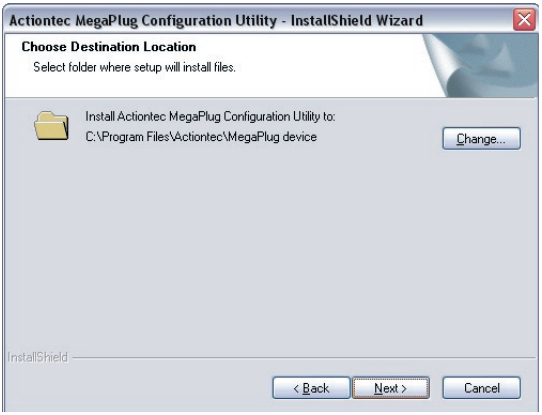
Installing the Configuration Utility

To install the Extender's Configuration Utility:

1. Insert the Installation CD in the CD-ROM drive of the computer connected to the Homeline network.
2. When the "Welcome" screen appears, click **Next**.



3. When the "Choose Destination Screen" appears, click **Next**.



4. When this window appears, click **Finish**.

The Extender's Configuration Utility is now installed on the computer. See chapter 3, "Using the Configuration Utility," for more information

Connecting a Wireless Computer to the Homeline Network

To connect a wirelessly-equipped computer to the Homeline network via the Extender:

1. On the wirelessly-equipped computer, access to the wireless network interface.
2. Enter "Actiontec" in the interface's "SSID" or "Network Name" text box. This is the Extender's default ESSID (Extended Service Set Identification) name.

   ☞ ***Note:*** The network name is case-sensitive, so make sure to enter it exactly as shown.

3. Enter "A374936DCA" in the interface's "WEP Key" text box. This is the Extender's default WEP key.
3. Close the wireless network interface on the computer. The Homeline network should be accessible on the wirelessly-equipped computer.

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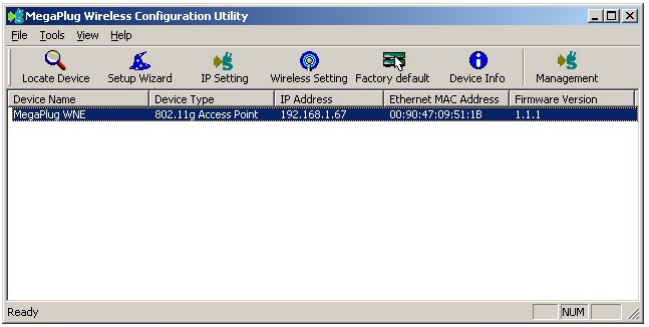
Using the Configuration Utility 3

Once the Wireless Network Extender has been properly connected and installed according to the Quick Start Guide, the user can further configure the Extender using the Actiontec MegaPlug Wireless Configuration Utility. The Utility also provides information about the network. After installing the CD in the computer's CD-ROM drive, the Utility starts up automatically and appears on the desktop. See the following sections for more information about the Utility's capabilities.



Across the top of the window are additional options: **Locate Device**, **Setup Wizard**, **IP Setting**, **Wireless Setting**, **Factory Default**, **Device Info**, and **Management**.

Locate Device

Clicking **Locate Device** causes the Utility to search for Wireless Network Extenders available on the Homeline network. A list of available Extenders will appear in the window, as shown in the figure above.

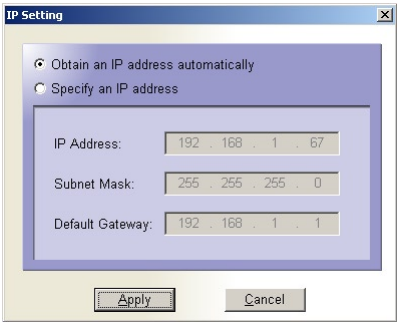
Setup Wizard

The Setup Wizard allows a quick set up of the Extender's basic settings. To use:

1. Click **Setup Wizard** in the Utility window. A "Login" window appears. Enter the user name and password in the appropriate text boxes, then click **Next**.
2. An "IP Setting" window appears. Select the appropriate setting (for more details, see "IP Setting" below), then click **Next**.
3. An "Device Name" window appears. Enter a name for the Extender in the appropriate text box, then click **Next**.
4. A "Wireless Setting" window appears. Select the appropriate configuration for the Extender (for more details, see "Wireless Setting" on page 11), then click **Next**.
5. A "Wireless Security" window appears. Select the appropriate security configuration for the Extender (for more details, see "Security" on page 12), then click **Next**.
6. Another window appears, relevant to the security setting. Enter the pertinent information, then click **Finish**. The Setup Wizard is complete.

IP Setting

Clicking **IP Setting** in the Utility window generates a Login window. After entering the proper user name and password (default user name is "Admin," and default password is blank [enter no password]), the "IP Setting" window appears. There are two options in this window: **Obtain an IP address automatically**, and **Specify an IP address**.



Obtain an IP Address Automatically

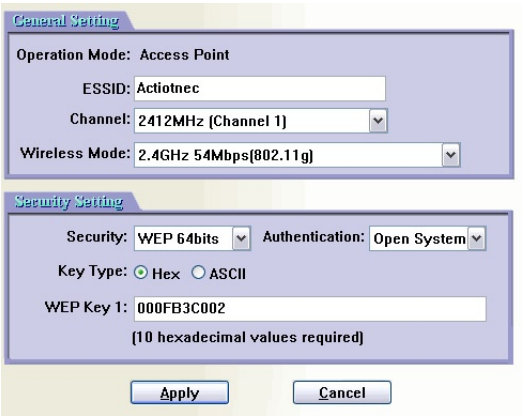
Select this option (by clicking the appropriate radio button) to have the Extender obtain an IP address automatically (from a router on the Homeline network).

Specify an IP Address

Select this option (by clicking the appropriate radio button) to specify an IP address. After selecting this option, enter the IP address, subnet mask address, and default gateway address in the appropriate text boxes.

Wireless Setting

Clicking **Wireless Setting** in the Utility window generates a Login window. After entering the proper user name and password (default user name is "Admin," and default password is blank [enter no password]), the "Wireless Setting" window appears. Here, the Extender's wireless settings can be configured.



ESSID

ESSID is the network name assigned to the Extender's wireless network. The factory default setting is "Actiontec." Although Actiontec recommends keeping the default value intact, the ESSID value can be modified, using any combination of alphanumeric characters (i.e., A-Z, a-z, 0-9). All wireless-capable computers included on the Extender's wireless network must have this same ESSID value.

Channel

Channel assigns the frequency band at which the Extender communicates. In the United States, use channels 1-11, or select **Smart Select**, which automatically selects a minimally used channel. (The factory default value is set to **Smart Select**.)

Wireless Mode

From this drop-down list, select the speed of the wireless network to be created. Options include **802.11b**, **802.11g**, **802.11 Super G static**, and **802.11 Super G dynamic**.

Security

From this drop-down list, select the type of security to be applied to the wireless network. Options include **Disabled**, **WEP 64 bits**, **WEP 128 bits**, **WEP 152 bits**, **WPA-PSK**, and **WPA**.

Disabled

Selecting this security option applies no security to the wireless network. Any user with a wireless-equipped computer will be able to join the network

WEP 64 bits

Selecting this security option applies 64-bit WEP (Wired Equivalent Privacy) security on the wireless network. 64-bit WEP requires a key composed of 10 hexadecimal digits or 5 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 64-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter ten hexadecimal digits or 5 ASCII characters in the "WEP Key 1" text box. After activating 64-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WEP 128 bits

Selecting this security option applies 128-bit WEP security on the wireless network. 128-bit WEP requires a key composed of 26 hexadecimal digits or 13 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 128-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter 26 hexadecimal digits or 13 ASCII characters in the "WEP Key 1" text box. After activating 128-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WEP 152 bits

Selecting this security option applies 152-bit WEP security on the wireless network. 152-bit WEP requires a key composed of 32 hexadecimal digits or 16 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 152-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter 32 hexadecimal digits or 16 ASCII characters in the "WEP Key 1" text box. After activating 152-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WPA-PSK

Selecting this security option applies WPA (Wi-Fi Protected Access) security with PSK (Passkey) protection to the wireless network. To set up WPA-PSK, select a "Cipher Type" (TKIP or AES), then enter 8-63 characters in the "Passphrase" text box. Once activated, all wireless-enabled devices must support WPA and know the PSK to join the wireless network.

WPA

Selecting this security option applies WPA (Wi-Fi Protected Access) security to the wireless network. To set up WPA security, select a "Cipher Type" (TKIP or AES), enter the IP address of the RADIUS server in the "RADIUS Server" text box, and then enter the secret key (for communication between the RADIUS server and the Network Extender) in the "RADIUS_Secret" text box.

Factory Default

Clicking **Factory Default** in the Utility window resets (after entering the user name and password in the pop-up window) the Extender's settings to their factory default settings.

Device Info

Clicking **Device Info** in the Utility window generates the "Device Information" window, which displays an overview of the Extender's settings.

Management

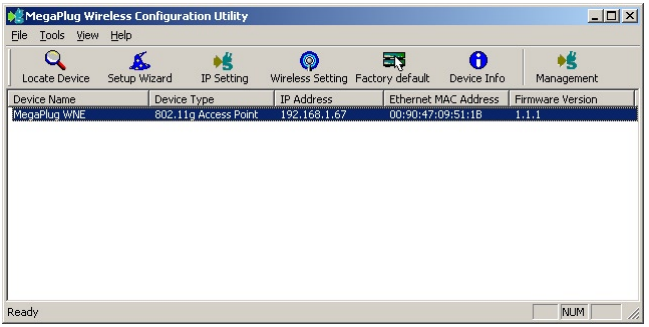
Clicking **Management** in the Utility window causes the Extender's Web Management Interface to appear in a Web browser. See chapter 4, "Using the Web Management Interface," for more information.

Using the Web Configuration Interface

4

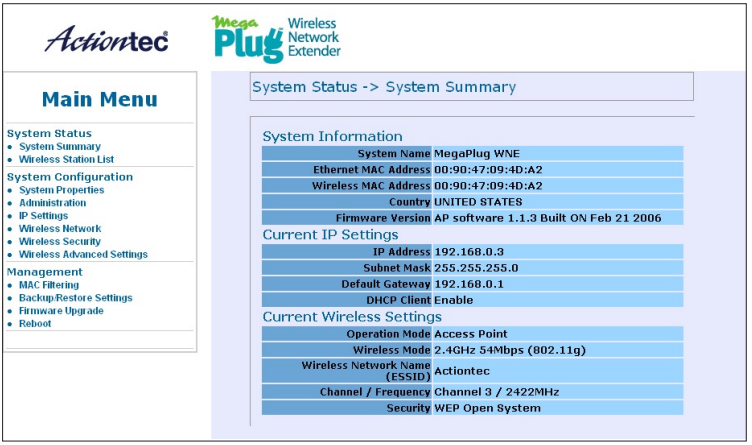
The Wireless Network Extender's Web Configuration Interface allows the user to configure and view various aspects of the Extender's wireless network, including wireless security. To access the Interface:

1. Insert the CD in the computer's CD-ROM drive. The Utility will start automatically.



2. A log-in screen appears. The default user name is "Admin" and there is no password.

3. Click **Management** at the top left of the Utility window. A web browser starts up, with the Interface displayed in it.

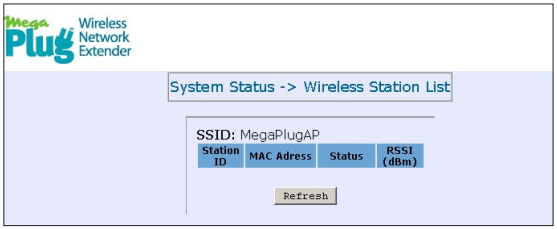


System Summary

Clicking **System Summary** on the left side of any Interface screen causes the "System Summary" screen to appear, as shown in the figure above. This screen displays an overview of the Extender's settings including system information, current IP settings, and current wireless settings. None of these setting can be changed from this screen.

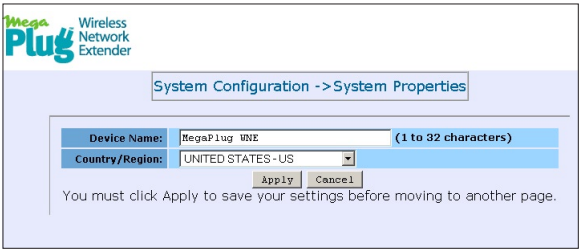
Wireless Station List

Click **Wireless Station List** on the left side of any Interface screen to generate the "Wireless Station List." This screen displays the wireless clients connected to the Extender.



System Properties

Clicking **System Properties** on the left side of any Interface screen causes the "System Properties" screen to appear.



Device Name

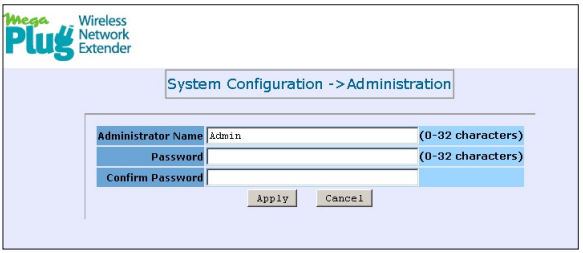
The "Device Name" text box contains the name of the Extender. It can be changed here; the new name must be from 1 to 32 characters long.

Country/Region

Select the country or region in which the Network Extender is being used from the "Country/Region" drop-down list. If a particular country or region is not found on the list, select "NO_COUNTRY_SET-NA."

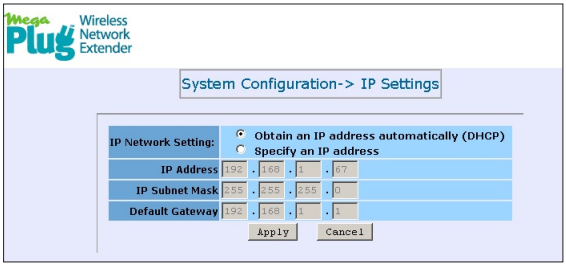
Administration

Clicking **Administration** on the left side of any Interface screen causes the "Administration" screen to appear. Change the user name and password used to access the Interface screens here. Actiontec recommends changing the default user name and password to something more secure, to prevent unwanted access to the Extender's settings. Once a new user name and password has been entered, write them down on a piece of paper and keep it in a safe place. The user name and password will be needed to access the Web Configuration Interface in the future.



IP Settings

Clicking **IP Settings** on the left side of any Interface screen causes the "IP Settings" screen to appear. There are two options in this window: **Obtain an IP address automatically**, and **Specify an IP address**.



Obtain an IP Address Automatically

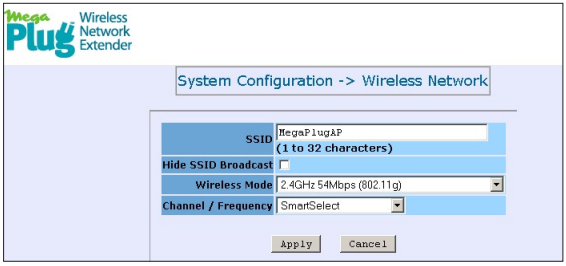
Select this option (by clicking the appropriate radio button) to have the Extender obtain an IP address automatically from a router on the Homeline etwork.

Specify an IP Address

Select this option (by clicking the appropriate radio button) to specify an IP address. After selecting this option, enter the IP address, subnet mask address, and default gateway address in the appropriate text boxes.

Wireless Network

Clicking **Wireless Network** on the left side of any Interface screen causes the "Wireless Network" screen to appear. Here, the Extender's wireless settings can be configured.



SSID

SSID is the network name assigned to the Extender's wireless network. The factory default setting is "Actiontec." Although Actiontec recommends keeping the default value intact, the ESSID value can be modified, using any combination of alphanumeric characters (i.e., A-Z, a-z, 0-9). All wireless-capable computers included on the Extender's wireless network must have this same ESSID value.

Hide SSID Broadcast

Select this check box to disable SSID broadcast. If deactivated, the SSID of the Extender's wireless network is available to any wireless device.

Wireless Mode

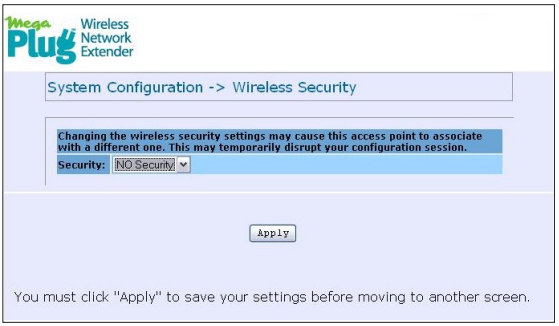
From this drop-down list, select the speed of the wireless network. Options include **802.11b**, **802.11g**, **802.11 Super G static**, and **802.11 Super G dynamic**.

Channel

Channel assigns the frequency band at which the Extender communicates. In the United States, use channels 1-11, or select **Smart Select**, which automatically selects a minimally used channel. (The factory default value is set to **Smart Select**.)

Wireless Security

Clicking **Wireless Security** on the left side of any Interface screen causes the "Wireless Security" screen to appear. Here, the Extender's wireless network security settings can be configured.



From the "Security" drop-down list, select the type of security to be applied to the wireless network. Options include **No Security**, **WEP 40/64 bits**, **WEP 104/128 bits**, **WEP 128/152 bits**, **WPA-PSK**, and **WPA**.

No Security

Selecting this security option applies no security to the wireless network. Any user with a wireless-equipped computer will be able to join the network

WEP 64 bits

Selecting this security option applies 64-bit WEP (Wired Equivalent Privacy) security on the wireless network. 64-bit WEP requires a key composed of 10 hexadecimal digits or 5 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 64-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter ten hexadecimal digits or 5 ASCII characters in the "WEP Key 1" text box. After activating 64-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WEP 104/128 bits

Selecting this security option applies 128-bit WEP security on the wireless network. 128-bit WEP requires a key composed of 26 hexadecimal digits or 13 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 128-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter 26 hexadecimal digits or 13 ASCII characters in the "WEP Key 1" text box. After activating 128-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WEP 128/152 bits

Selecting this security option applies 152-bit WEP security on the wireless network. 152-bit WEP requires a key composed of 32 hexadecimal digits or 16 ASCII characters. A hexadecimal digit consists of an alphanumeric character ranging from 0-9 or A-F; an ASCII character can be any character on the keyboard. To create a 152-bit WEP key, select "Hex" (hexadecimal) or "ASCII," then enter 32 hexadecimal digits or 16 ASCII characters in the "WEP Key 1" text box. After activating 152-bit WEP, a computer with wireless capability can join the network only if these same keys are entered in the computer's wireless encryption scheme.

WPA-PSK

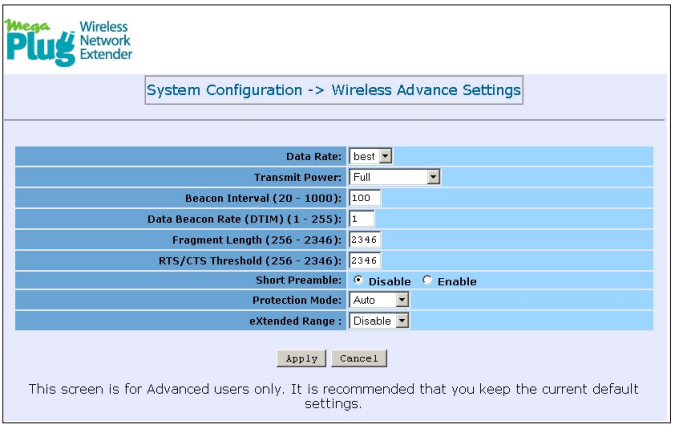
Selecting this security option applies WPA (Wi-Fi Protected Access) security with PSK (Passkey) protection to the wireless network. To set up WPA-PSK, select a "Cipher Type" (TKIP or AES), then enter 8-63 characters in the "Passphrase" text box. Once activated, all wireless-enabled devices must support WPA and know the PSK to join the wireless network.

WPA

Selecting this security option applies WPA (Wi-Fi Protected Access) security to the wireless network. To set up WPA security, select a "Cipher Type" (TKIP or AES), enter the IP address of the RADIUS server in the "RADIUS Server" text box, and then enter the secret key (for communication between the RADIUS server and the Extender) in the "RADIUS_Secret" text box.

Wireless Advanced Settings

Clicking **Wireless Advanced Settings** on the left side of any Interface screen causes the "Wireless Advanced Settings" screen to appear. Here, the Extender's advanced wireless network security settings can be configured. Only experienced network technicians should adjust these settings.



Data Rate

Adjust the Network Extender's data rate here.

Transmit Power

Adjust the Extender's transmit power here .

Beacon Interval

Adjust the beacon interval rate here. A beacon is a packet sent by the Network Extender across the network to let other connected devices know of its presence and readiness.

Data Beacon Rate

Adjust the data beacon rate here.

Fragment Length

Adjust the fragment length here.

RTS/CTS Threshold

Adjust the RTS/CTS threshold here.

Short Preamble

Ajust the short preamble length here

Protection Mode

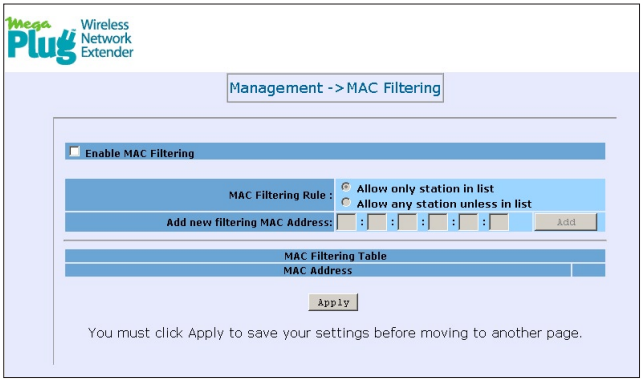
Activate/deactivate protection mode here.

Extended Range

Ajust the Extender's extended range here.

MAC Filtering

Clicking **MAC Filtering** on the left side of any Interface screen causes the "MAC Filtering" screen to appear. This feature allows the user to control the wireless network by denying or allowing wireless access by specifying the MAC (Media Access Control) address of the wireless client(s) allowed or denied access on the wireless network.

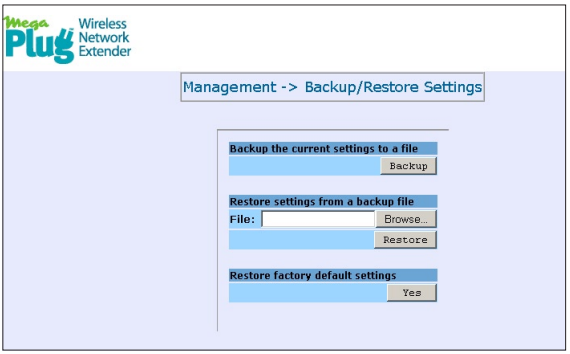


To create a list of MAC addresses allowed access on the network, activate "Allow only stations in list" by clicking on the appropriate radio button. Then, enter the wireless device's MAC address in the appropriate text boxes, then click **Add**. Repeat to add more wireless devices. When applied, only the devices whose MAC addresses are listed in the "MAC Filtering Table" will be allowed access to the wireless network. No other wireless devices will be allowed access.

To create a list of MAC addresses denied access to the network, activate "Allow any station unless in list" by clicking on the appropriate radio button. Then, enter the wireless device's MAC address in the appropriate text boxes, then click **Add**. Repeat to add more wireless devices. When applied, only the devices whose MAC addresses are listed in the "MAC Filtering Table" will be denied access to the wireless network. All other wireless devices will be allowed access.

Backup/Restore Settings

Clicking **Backup/Restore Settings** on the left side of any Interface screen causes the "Backup/Restore Settings" screen to appear.



Backup the Current Settings to a File

This option allows the user to save the settings of the Extender to a file that can be accessed later to reset the Extender to that particular configuration set. To save the currents settings, click **Backup**, then save the file to the computer's hard drive.

Restore Settings from a Backup File

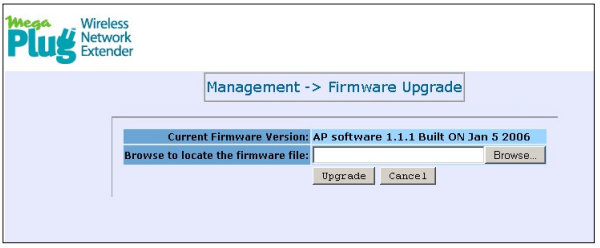
To reset the Extender's settings to a previously saved configuration set, click **Browse** to locate the configuration file. Once the file is located, select it, then press **Restore**. The Extender's configuration will be reset to the configuration file.

Restore Factory Default Settings

To restore the Extender's factory default settings, click **Yes**. The default settings will be restored to the Extender.

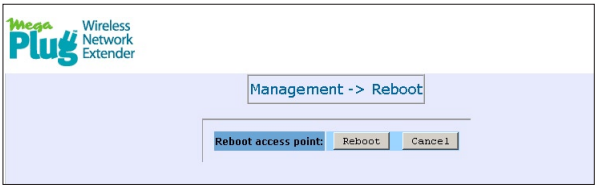
Firmware Upgrade

Clicking **Firmware Upgrade** on the left side of any Interface screen causes the "Firmware Upgrade" screen to appear. Actiontec periodically posts firmware upgrades to enhance the Extender's capabilities. Download the upgrade from the Internet to the computer's hard drive, then locate it by clicking **Browse**. Once the upgrade file has been located, select it, then click **Upgrade**. The Network Extender's firmware will be upgraded to the new version.



Reboot

Clicking **Reboot** on the left side of any Interface screen causes the "Reboot" screen to appear. Click **Reboot** in this screen to reboot the Extender.



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Troubleshooting 5

This chapter contains a list of problems that may be encountered while using the Wireless Network Extender, and techniques to solve them. Note that these techniques may not be successful in all cases. Also included is a list of frequently asked questions.

Troubleshooting

If the Extender is showing signs of trouble, before attempting any other troubleshooting procedures, plug the Extender into a working electrical wall socket.

The Power light doesn't light up after I plug the Extender into a wall outlet.

The Power light illuminates only if the Extender detects another Powerline device on the same circuit. If you're sure there is another Powerline device on the circuit, make sure the wall outlet is working by plugging other electric devices into it. If it is working, plug in the Extender again, and if the Power light still doesn't illuminate, try plugging it into other wall outlets. If the Extender is still experiencing this problem, contact technical support.

I can't connect to the Internet or any of the other computers on the network.

- Make sure the IP address and TCP/IP protocol are set up properly for all the computers on the network, then try to ping the gateway.
- Use the Extender's Configuration Utility to detect all other adapters on the network. Then, plug the adapters into adjacent sockets. If the Ethernet lights still don't illuminate, contact technical support.

The Power and Wireless lights are on, but I can't access the Extender from the computer

- Try plugging the Extender in different power outlets, preferably closer together.
- Make sure all devices on the network are using the same security parameters.

Frequently Asked Questions

What's the transfer speed over the Extender's Homeline network?

The Extender's network transfer speed is 85 Mbps (maximum) over a standard home power line network.

What's the estimated range of the Extender's network?

Approximately 300 meters (~985 ft.) in wall power lines (one household). The Extender's wireless network extends up to 300 meters.

Will the Extender work in any home?

The Extender will work in any home with built-in copper wiring. It may not operate in some older homes (pre-1950) with alternate wiring.

Will the Extender's Homeline network signal pass through circuit breakers?

Yes, the network signal will pass through circuit breakers. It will not, however, pass through power transformers.

Does the Extender work with a 100 – 240V AC input ?

Yes.

Does using the Extender cause any interference with other home networking devices?

No. The Extender operates at a different frequency than other power line control devices and can co-exist with technologies such as X-10, CEBus, and LONworks.

To set up the Extender's network correctly, do I have to install the Configuration Utility on each computer on the network?

No, the Configuration Utility is a diagnostic and security tool. Since the Extender is fully plug-and-play compatible, it needs no software drivers to operate.

Which wireless cards will work with the Extender?

The Extender will connect with any wireless card supporting the 802.11g or 802.11b wireless standards.

Can my wireless signal pass through floors, walls, and glass?

The physical environment around the Extender can have a varying effect on wireless signal strength and quality. The more dense an object, the greater the interference. Concrete or metal reinforced structures will cause a higher degree of signal loss than those made of wood, plaster, or glass.

I have an Apple computer that uses the Airport wireless device. Is this device compatible with the Extender?

Yes, the Apple Airport system complies with the 802.11b and 802.11g standards. If you use the WEP security feature, refer to the Apple Airport documentation for information on the proper method to enter the WEP key for compatibility with the Extender hexadecimal WEP entry.

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Setting Up Static IP Address

6

To communicate with a Wireless Network Extender from a computer on the network, the user may have to switch the IP address settings from DHCP-enabled to static IP, so that the computer and the Extender are on the same subnet.

To set up static IP on a computer, select the operating system and follow the instructions.

☞ ***Note***: The following procedures are based on the Extender's factory default IP address. If the Extender's IP address has been changed, enter the new IP address when instructed to enter an IP address.

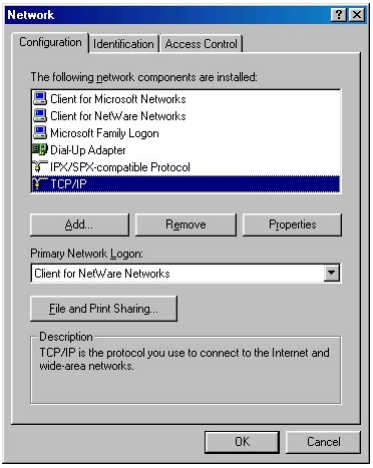
Windows 98 SE

1. From the desktop, click on the **Start** button in the lower left corner.
2. From the menu that appears, select **Settings**.

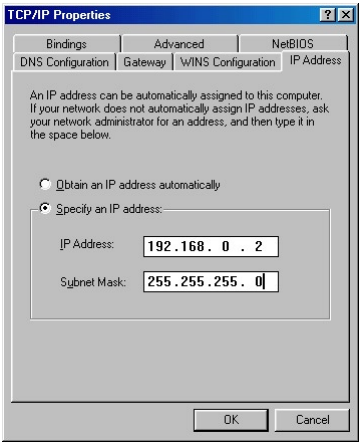
3. Another menu appears. Select **Control Panel**.

4. When the "Control Panel" window appears, double-click **Network**.

5. The "Network" window appears. In the "The following network components are installed" list box, locate and double-click **TCP/IP**.



6. The "TCP/IP Properties" window appears. Select **IP Address**.



7. In the IP Address tab, make sure the circle next to "Specify an IP Address" is selected. When active, a black dot appears in the circle. If the circle already contains a black dot, leave it alone.

8. Enter the following numbers in the "IP Address" text box:

`192.168.0.2`

Press the space bar on the keyboard to add the periods between the numbers.

9. Enter the following numbers in the "Subnet mask" text box:

`255.255.255.0`

Press the space bar on the keyboard to add the periods between the numbers.

10. Click **OK**. The TCP/IP Properties window disappears.

11. In the Network window, click **OK**. The Network window disappears.

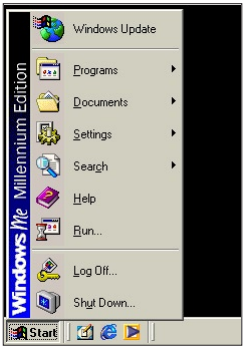
12. The "System Settings Change" window appears, asking whether the computer should be restarted. Click **Yes**.

The computer restarts. It is now set up with a static IP address.

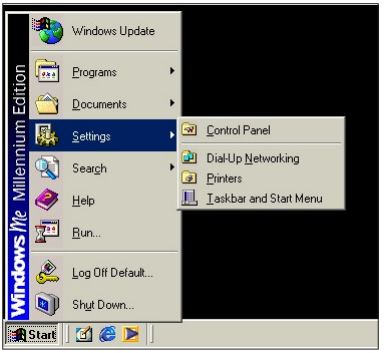
Windows Me

1. From the desktop, click on the **Start** button in the lower left corner.

2. From the menu that appears, select **Settings**.

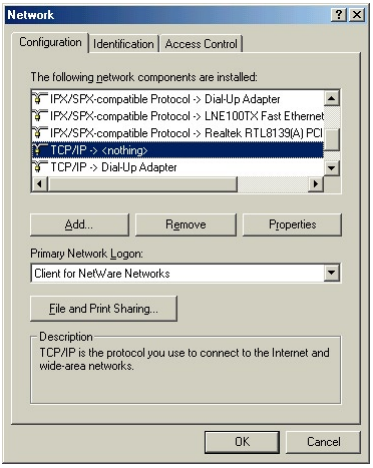


3. Another menu appears. Select **Control Panel**.

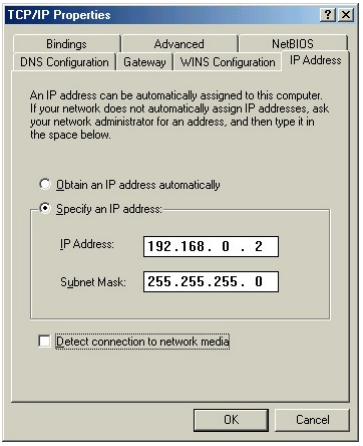


4. When the "Control Panel" window appears, double-click **Network**.

5. The "Network" window appears. In the "The following network components are installed" list box, locate and double-click **TCP/IP**.



6. The "TCP/IP Properties" window appears. Click **IP Address**.



7. In the IP Address tab, make sure the circle next to "Specify an IP Address" is selected. When active, a black dot appears in the circle. If the circle already contains a black dot, leave it alone.

8. Enter the following numbers in the "IP Address" text box:

`192.168.0.2`

Do not include the periods; they are automatically entered.

9. Enter the following numbers in the "Subnet mask" text box:

```
255.255.255.0
```

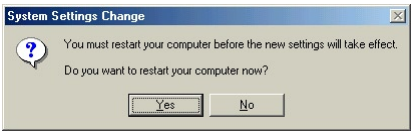
Do not include the periods; they are automatically entered.

10. Click **OK**. The TCP/IP Properties window disappears.

11. If there is a check in the box next to "Detect connection to network media," click on it to uncheck the box.

12. In the Network window, click **OK**. The Network window disappears.

13. The "System Settings Change" window appears, asking whether the computer should be restarted. Click **Yes**.



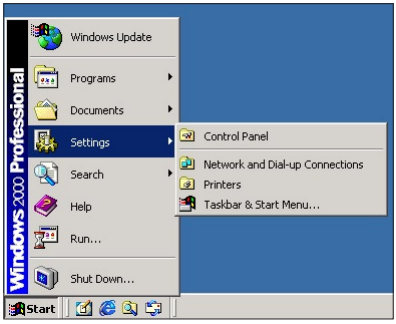
The computer restarts. It is now set up with a static IP address.

Windows 2000

1. From the desktop, click on the **Start** button in the lower left corner.

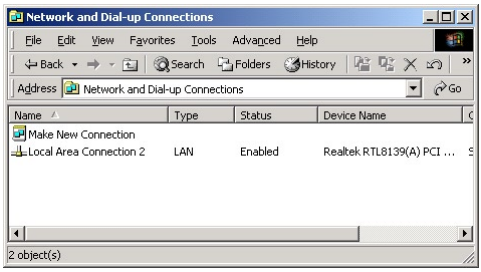
2. From the menu that appears, select **Settings**.

3. Another menu appears. Select **Control Panel**.

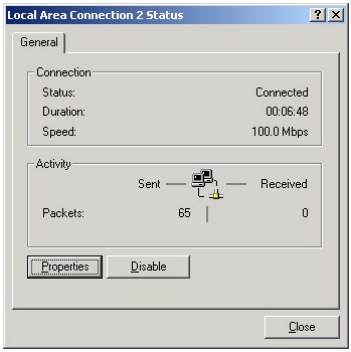


4. When the "Control Panel" window appears, double-click **Network and Dial-up Connections**.

5. In the "Network and Dial-up Connections" window, double-click **Local Area Connection**. A number may be displayed after the Local Area Connection. If there is more than one Local Area Connection listed, locate the one that corresponds to the network card installed in the computer by finding the name of the network card in the **Device Name** column.

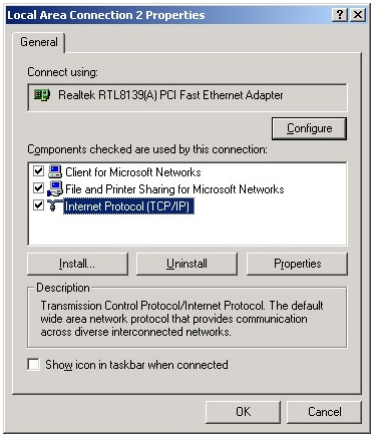


6. The "Local Area Connection Status" window appears. Select **General**, then click **Properties**.

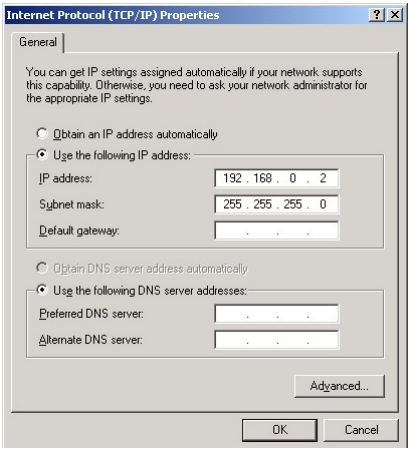


7. The "Local Area Connection Properties" window appears. Click **General**.

8. In the "Components checked are used by this connection" list box, double-click **Internet Protocol (TCP/IP)**.



9. The "Internet Protocol (TCP/IP) Properties" window appears.



10. In the **General** tab, make sure the circle next to "Use the following IP Address" is selected. When active, a black dot appears in the circle. If the circle already contains a black dot, leave it alone.

11. Enter the following numbers in the "IP Address" text box:

`192.168.0.2`

Press the space bar on the keyboard to add the periods between the numbers.

12. Enter the following numbers in the "Subnet mask" text box:

`255.255.255.0`

Press the space bar on the keyboard to add the periods between the numbers.

13. Click **OK**. The "Internet Protocol (TCP/IP) Properties" window disappears.

14 In the "Local Area Connection Properties" window, click **OK**. The Local Area Connection Properties window disappears.

15. Click **Close** in the Local Area Connection Status window. The window disappears.

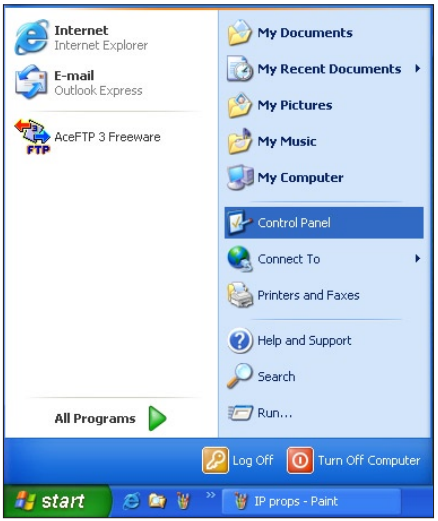
16. Close the Network and Dial-up Connections window by clicking on the "**x**" button at the upper right corner of the window.

The computer is now set up with a static IP address.

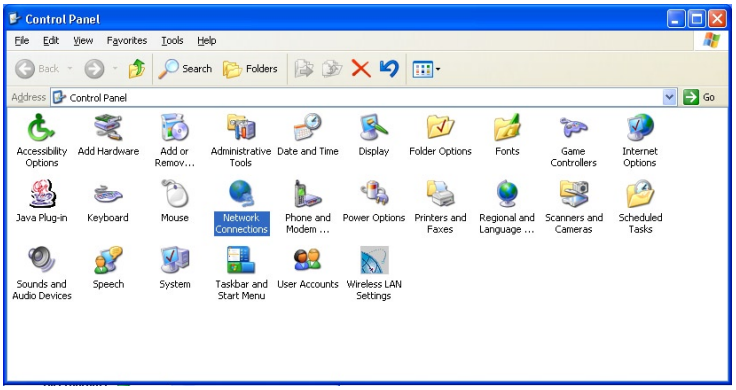
Windows XP

1. From the desktop, click **Start** button in the lower left corner.

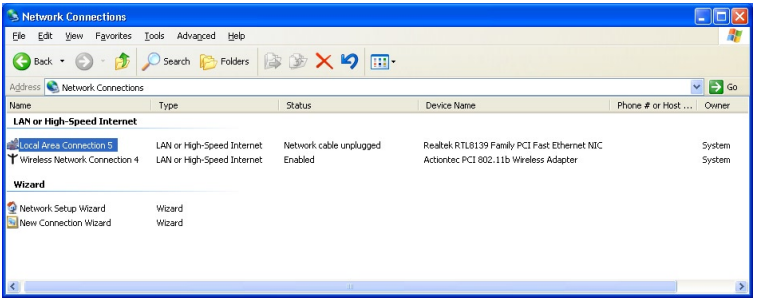
2. From the menu that appears, select **Control Panel**.



3. When the "Control Panel" window appears, double-click **Network Connections**.

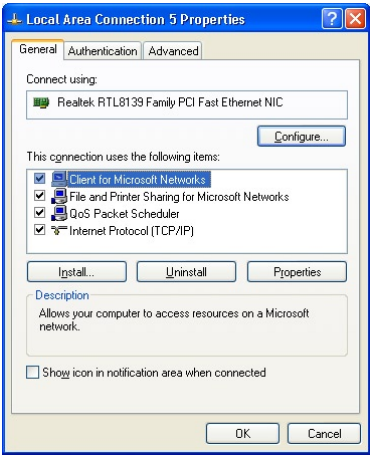


4. In the "Network Connections" window, double-click **Local Area Connection**. A number may be displayed after the Local Area Connection. If more than one Local Area Connection is listed, locate the one that corresponds to the network card installed in your computer by finding the name of the network card in the "Device Name" column.

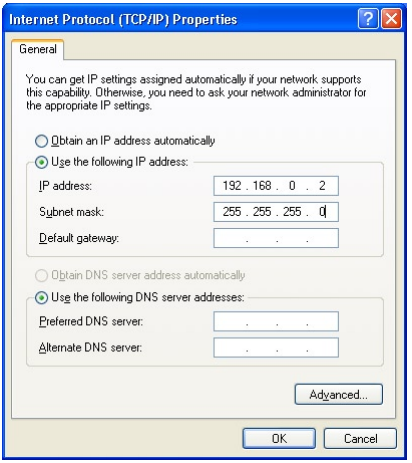


5. The "Local Area Connection Properties" window appears. Select **General**.

6. In the "This connection uses the following items" list box, double-click **Internet Protocol** (TCP/IP).



7. The "Internet Protocol (TCP/IP) Properties" window appears.



8. In the **General** tab, make sure the circle next to "Use the following IP Address" is selected. When active, a black dot appears in the circle. If the circle already contains a black dot, leave it alone.

9. Enter the following address in the "IP Address" text box:
   `192.168.0.2`
   Enter the periods in the address by pressing the space bar on the keyboard.

10. Enter the following address in the "Subnet mask" text box:
    `255.255.255.0`
    Enter the periods in the address by pressing the space bar on the keyboard.

11. Click **OK**. The Internet Protocol (TCP/IP) Properties window disappears.

12 In the Local Area Connection Properties window, click **OK**. The Local Area Connection Properties window disappears.

13. Click **Close** in the Local Area Connection Status window. The window disappears.

14. Close the Network and Dial-up Connections window by clicking on the "**x**" button at the upper right corner of the window.

The computer is now set up with a static IP address.

Setting Up File and Printer Sharing

7

This chapter describes how to share files, hard drives, and printers over the Wireless Network Extender's network.

File Sharing

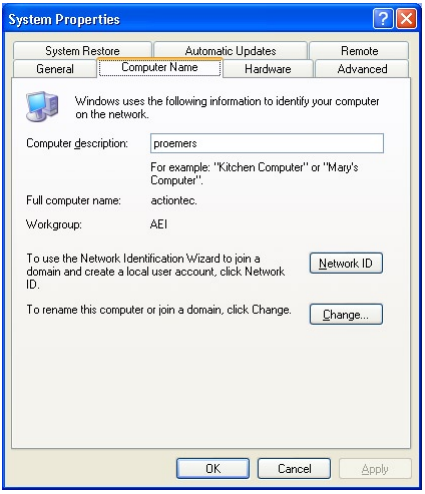
To share files, directories, or hard drives on the MegaPlug network, select the operating system running on the computer, then follow the instructions.

Windows XP

After installing and configuring the Extender, Windows XP automatically enables file sharing. The only item that needs to be altered is workgroup settings. All the computers on the network must have the same workgroup name, but different computer names. To check or change this:

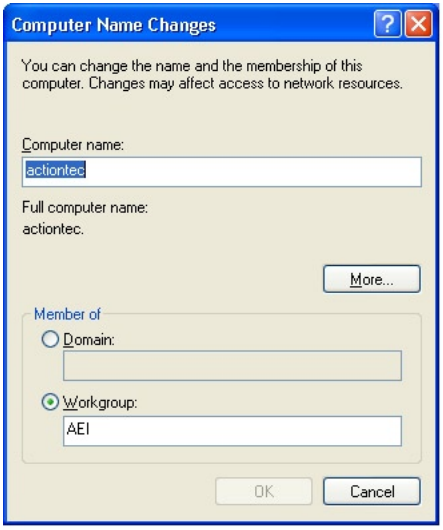
1. Right-click the **My Computer** icon and click **Properties**. The "System Properties" window appears.

2. Select the **Computer Name** tab.



3. Click **Change**.

4. When the "Computer Name Changes" window appears, enter a new computer name in the "Computer name" text box.



5. Enter a workgroup name in the "Workgroup" text book.

6. Click **OK**.

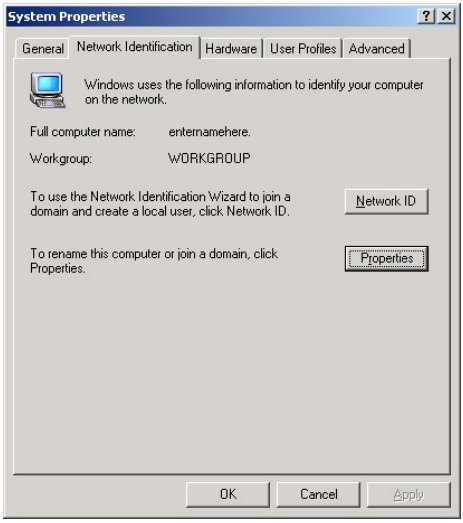
7. Restart the computer.

Windows 2000

After installing and configuring the Extender, Windows 2000 automatically enables file sharing. The only item that needs to be altered is workgroup settings. All the computers on the network must have the same workgroup name, but different computer names. To check or change this:

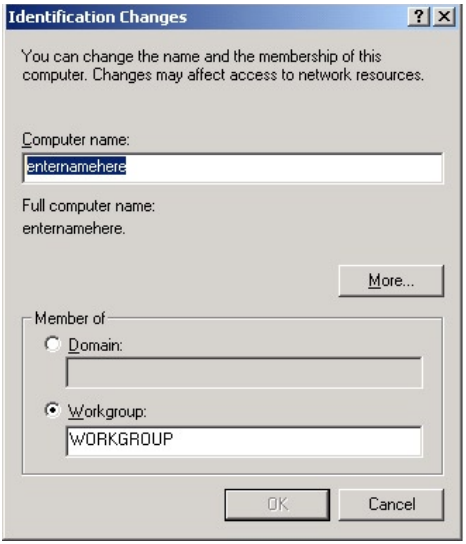
1. Right-click the **My Computer** icon on your desktop, then select **Properties**.

2. When the "System Properties" window appears, select **Network Identification**.



3. If the **Workgroup** name is already the same as all the other computers on the network, click **OK.** If it is not the same, click **Properties**.

4. The "Identification Changes" window appears. In the "Computer Name" text box, type a name different than the other computers on the network.



5. In the "Workgroup" text box, enter the network workgroup name. This is the same on each computer on the network.

6. Click **OK**.

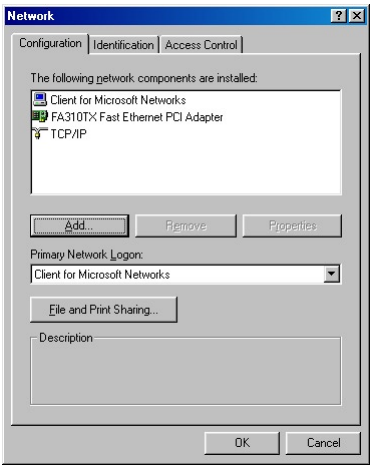
7. Click **OK** again.

8. Restart the computer.

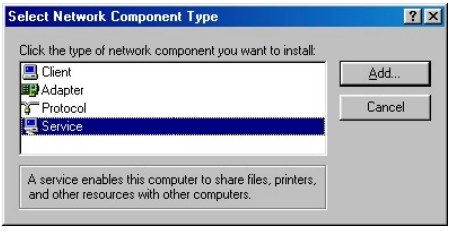
Windows 98SE and Me

1. Click **Start**, select **Settings**, then **Control Panel**.

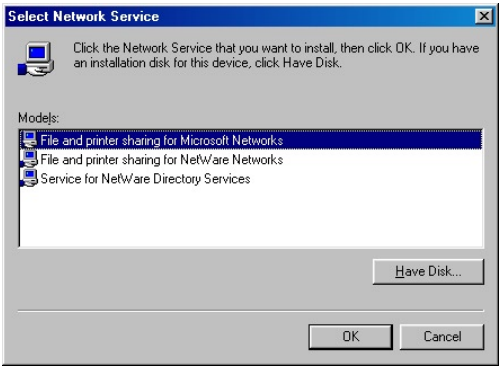
2. In the Control Panel window, double-click the **Network** icon. The Network window appears.



3. In the "Configuration" tab, click **Add**. The "Select Network Component Type" window appears.

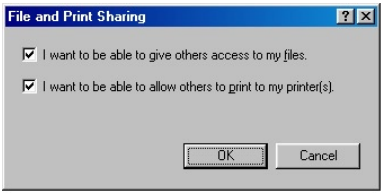


4. Select **Service**, then click **Add**. The "Select Network Service" window appears.



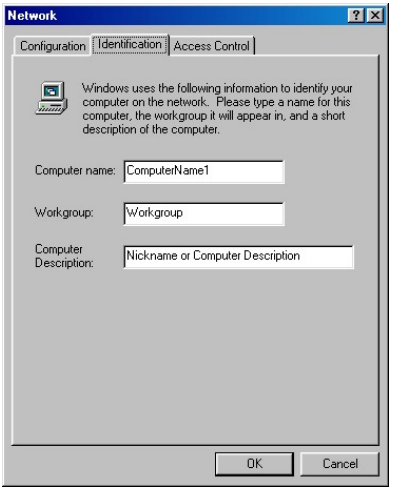
5. Highlight **File and printer sharing for Microsoft Networks**, then click **OK**.

6. The "File and Print Sharing" window appears. Make sure both options have a check mark in their check boxes. If not, click in the box to activate.



7. Click **OK**. The Network window reappears.

8. In the Network window, select **Identification**. The "Identification" tab appears.



9. In the "Computer Name" text box, type a name different than the other computers on the network.

10. In the "Workgroup" text box, enter the network workgroup name. This is the same on each computer on the network.

11. Enter any description in the "Computer Description" text box. Traditionally, the location name or main user's name is entered.

12. Select **Configuration** to display the Configuration window again.

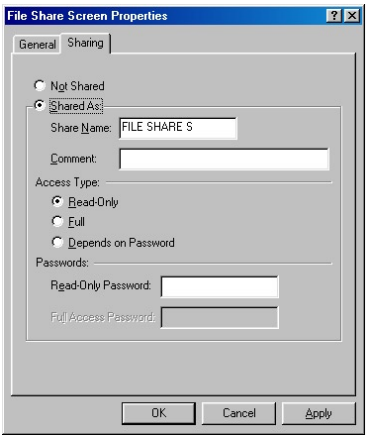
13. In the "Primary Network Logon" text box, make sure "Client for Microsoft Networks" is entered. If not, click the down arrow and select it from the list.

14. Click **OK**. A "System Settings Change" window appears. Click **Yes**.

15. After your computer restarts, Windows prompts for a user name and password. Enter a user name and password, then write them on a sheet of paper, as they will be needed to access the network in the future.

16. Find a file or hard drive to share, right-click its icon, and select **Sharing**. The "Properties" window appears.

17. In the Properties window, select **Sharing**. The "Sharing" tab appears.



18. Click in the circle next to "Shared As" to share the file or hard drive.

19. Select an **Access Type**:

Read Only - Allows other users on the network to view and read the file or hard drive selected. They will not be able to modify it in any way. You can further restrict their privileges by entering a password in the appropriate text box.

Full - Allows other users on the network to read, modify, move, and delete any information in the shared file or hard drive. You can further restrict their privileges by entering a user name and password.

Depends on Password - Allows you to set both Read Only and Full access on the shared file or drive. The level of access will depend on the passwords entered in the appropriate field.

20. When finished, click **Apply**, then **OK**.

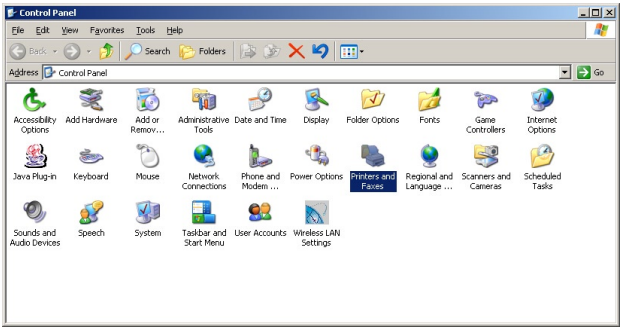
Printer Sharing

To share a printer connected to the computer, follow these instructions.

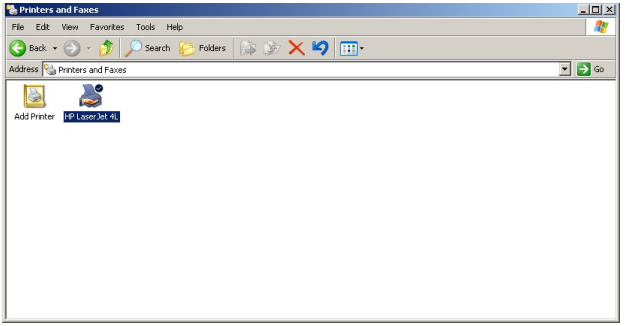
☞ ***Note***: These instructions are basically identical for Windows XP, 2000, Me, and 98 SE, with some minor differences.

1. Click **Start**, **Settings**, **Control Panel**.

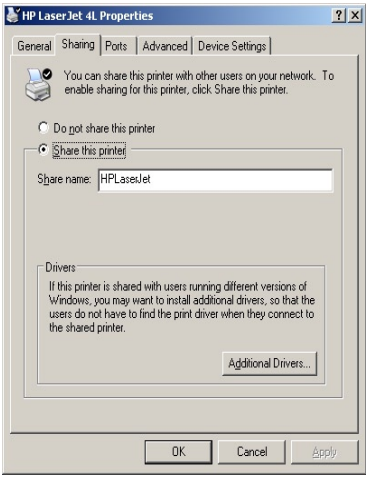
2. In the "Control Panel" window, double-click on the "Printers" icon.



3. In the "Printers" window, right-click on the icon of the printer to be shared and select **Sharing**.



4. A "Properties" window appears, with the "Sharing" tab displayed.



5. Select **Shared As or Share this Printer**. This automatically inserts a default name for the printer share name. You can set a password for the printer at this time if you want to restrict who on the network can use the printer. You can also set the default printer settings by modifying information on the other tabs of this window.

6. Click **OK**, and close all windows.

Specifications

A

General

Model Number

HPAP108T (MegaPlug Wireless Network Extender)

Standards

HomePlug Powerline Specification 1.0 (HomePlug)
IEEE 802.11b, IEEE 802.11g, IEEE 802.3, and IEEE 802.3u (wireless)
10BaseT

Security

56-bit DES data encryption (HomePlug)
WEP 64/128/152-bit encryption, WPA, WPA-PSK, 56-bit DES encryption (wireless)

Access Methods

CSMA/CA

HomePlug Operating Range

Up to 300 meters
Capable of passing through circuit breakers

Regulatory Compliance

FCC Part 15 Class B and Part 68
UL

Wireless

Frequency Band

2.4 GHz ~ 2.5 GHz

Modulation

OFDM

Carrier Modulation

DQPSK, BPSK, DBPSK, ROBO, 16 QAM, 64 QAM, CCK

Operating Range

30 - 300 meters

LED Indicators

Power, Wireless

Environmental

Power

External, 110 - 240v 0.2a, 50 - 60 Hz

Certifications

FCC part 15, CE

Operating Temperature

0º C to 40º C (32ºF to 104ºF)

Storage Temperature

-20ºC to 70ºC (-4ºF to 158ºF)

Operating Humidity

10% to 85% non-condensing

Storage Humidity

5% to 90% non-condensing

Note: Specifications are subject to change without notice.

Glossary

B

Access Point

A device that allows wireless clients to connect to one another. An access point can also act as a bridge between wireless clients and a "wired" network, such as an Ethernet network. Wireless clients can be moved anywhere within the coverage area of the access point and remain connected to the network. If connected to an Ethernet network, the access point monitors Ethernet traffic and forwards appropriate Ethernet messages to the wireless network, while also monitoring wireless traffic and forwarding wireless client messages to the Ethernet network.

ATM (Asynchronous Transfer Mode)

A networking technology based on transferring data in fixed-size packets

Client

A desktop or mobile computer connected to a network.

DHCP (Dynamic Host Configuration Protocol)

A protocol designed to automatically assign an IP address to every computer on your network.

DNS (Domain Name System) Server Address

Allows Internet host computers to have a domain name and one or more IP addresses. A DNS server keeps a database of host computers and their respective domain names and IP addresses so that when a user enters a domain name into a Web browser, the user is sent to the proper IP address. The DNS server address used by computers on the home network corresponds to the location of the DNS server the ISP has assigned.

DSL (Digital Subscriber Line) Modem

A modem that uses existing phone lines to transmit data at high speeds.

Encryption

A method to allow wireless data transmissions a level of security.

ESSID (Extended Service Set Identifier)

A unique identifier for a wireless network. Also known as "SSID."

Ethernet Network

A standard wired networking configuration using cables and hubs.

Firewall

A method preventing users outside the network from accessing and/or damaging files or computers on the network.

Gateway

A central device that manages the data traffic of your network, as well as data traffic to and from the Internet.

IP (Internet Protocol) Address

A series of four numbers separated by periods identifying a unique Internet computer host.

ISP Gateway Address

An IP address for the Internet router. This address is only required when using a cable or DSL modem.

ISP (Internet Service Provider)

A business that allows individuals or businesses to connect to the Internet.

LAN (Local Area Network)

A group of computers and devices connected together in a relatively small area (such as a house or an office). A home network is considered a LAN.

MAC (Media Access Control) Address

The hardware address of a device connected to a network.

NAT (Network Address Translation)

A method allowing all of the computers on a home network to use one IP address, enabling access to the Internet from any computer on the home network without having to purchase more IP addresses from the ISP.

PC Card

An adapter that inserts in the PCMCIA slot of a computer, enabling the communication with a device.

PPPoE (Point-To-Point Protocol over Ethernet)/
PPPoA (Point-To-Point Protocol over ATM)

Methods of secure data transmission.

Router

A central device that manages the data traffic of your network.

Subnet Mask

A set of four numbers configured like an IP address used to create IP address numbers used only within a particular network.

SSID

See "ESSID."

TCP/IP (Transmission Control Protocol/Internet Protocol)

The standard protocol for data transmission over the Internet.

WAN (Wide Area Network)

A network that connects computers located in separate areas, (i.e., different buildings, cities, countries). The Internet is a WAN.

WECA (Wireless Ethernet Compatibility Alliance)

An industry group that certifies cross-vender interoperability and compatibility of IEEE 802.11b wireless networking products and promotes the standard for enterprise, small business, and home environments.

WLAN (Wireless Local Area Network)

A group of computers and other devices connected wirelessly in a small area.

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Notices

Regulatory Compliance Notices

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, 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 implementing one or more of the following measures:

- Reorient or relocate the receiving antenna;
- Increase the separation between the equipment and receiver;
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected;
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Actiontec Electronics, Inc., may void the user's authority to operate the equipment.

Declaration of conformity for products marked with the FCC logo – United States only.

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
2. This device must accept any interference received, including interference that may cause unwanted operation

☞ ***Note***: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

For questions regarding your product or the FCC declaration, contact:

Actiontec Electronics, Inc.
760 North Mary Ave.
Sunnyvale, CA 94086
United States
Tel: (408) 752-7700
Fax: (408) 541-9005

Miscellaneous Legal Notices

Limited Warranty

Hardware: Actiontec Electronics, Inc., warrants to the end user ("Customer") that this hardware product will be free from defects in workmanship and materials, under normal use and service, for twelve (12) months from the date of purchase from Actiontec Electronics or its authorized reseller.

Actiontec Electronics' sole obligation under this express warranty shall be, at Actiontec's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, Actiontec Electronics may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of Actiontec Electronics, Inc. Replacement products may be new or reconditioned. Actiontec Electronics warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

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Return the product to:
(In the United States)
Actiontec Electronics, Inc.
760 North Mary Avenue
Sunnyvale, CA 94085

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Governing Law: This Limited Warranty shall be governed by the laws of the State of California, U.S.A., excluding its conflicts of laws and principles, and excluding the United Nations Convention on Contracts for the International Sale of Goods.