SMC®
Networks

SMC2870W
EZ Connect™ g 2.4GHz 54Mbps Wireless Ethernet Adapter

USER GUIDE

Compliances

FCC - Class B

The Federal Communication Commission Radio Frequency Interference Statement includes the following paragraph:
The 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 instruction, may cause harmful interference to radio communication. 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 overcome 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.
The equipment is for home or office use.

FCC ID INFORMATION

The product contains an approved FCC module ID: "QDWWN360G".

CAUTION STATEMENT:

FCC Radiation Exposure Statement

FCC RF Radiation Exposure Statement: This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the antenna and your body and must not be co-located or operating in conjunction with any other antenna or transmitter.
Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada – Class B

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of Industry Canada.

Cet appareil numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le material brouilleur: "Appareils Numeriques," NMB-003 edictee par l'Industrie.

Low Power License-Exempt Radio communication Devices (RSS-210)

1. Warning Note: operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
2. Operation in 2.4GHz band: To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors
is subject to licensing.

Exposure of Humans to RF Fields for Mobile Radios Equipment (RSS-102)

1. Mobile radios that are not body worn (e.g. mounted on vehicles or placed on desks, shelves, etc.) and operated such that humans are normally separated from their radiating element by at least 20cm are not subject to SAR tests, but must have an RF evaluation
by the certification applicant, based on the calculated or measured field strength value. SAR evaluation can be used if so desired in lieu of a RF evaluation of field strength limits.
2. Exposures produced by such radios shall not exceed the exposure limits specified in Health Canada's Safety Code 6. Health Canada’ s address is:
775 Brookfield Road, Ottawa, Ontario
Canada K1A 1C1; Tel: (613) 954 -6699 / Fax:(613) 941-1734 ;
e-mail: alice_mackinnon@hc-sc.gc.ca.

EC Conformance Declaration - Class B

SMC contact for these products in Europe is:
SMC Networks Europe,
Edificio Conata II,
Calle Fructuós Gelabert 6-8, Planta 2,
08970 - Sant Joan Despí,
Barcelona, Spain.

This RF product complies with all the requirements of the Directive 1999/5/EC of the European parliament and the council of 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity(R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC. As of April 8, 2000.

Important Safety Notices

- Unplug this product from the AC power before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a dry cloth for cleaning.
- Route the power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.
- Situate the product away from heat sources such as radiators, heat registers, stoves, and other products that produce heat.
- To prevent fire or shock hazard, do not expose this unit to rain or moisture. Do not allow water or any foreign objects to enter the interior. This may cause a fire or electric shock. In the event that water or other foreign objects get into the product, immediately unplug the AC adapter from the electrical outlet and contact Customer Service for inspection and/or repair/replacement options.
- Do not take apart the equipment. This may cause fire, electric shock or other injuries.
- Do not overload wall outlets and extension cords as this can result in a fire or electric shock.
- This product is for use with the AC adapter that comes with it. Use with any other AC power is strongly discouraged as it may cause fire, electric shock, or damage to the equipment.

1 | System Requirements

- A web browser, such as Microsoft Internet Explorer 5.5 or above installed on one PC at your site for configuring the Wireless Ethernet Bridge
- CD-ROM drive
- An AC power outlet to supply power to the Wireless Ethernet Bridge
- Wired or Wireless Network Adapter
- An available RJ-45 (UTP) port on an Ethernet hub or switch
- TCP/IP network protocol installed on each PC that needs to access the Internet.

2 | Equipment Checklist

After unpacking the EZ Connect™ g 2.4GHz 54 Mbps Wireless Ethernet Bridge, check the contents of the box to be sure you have received the following components:

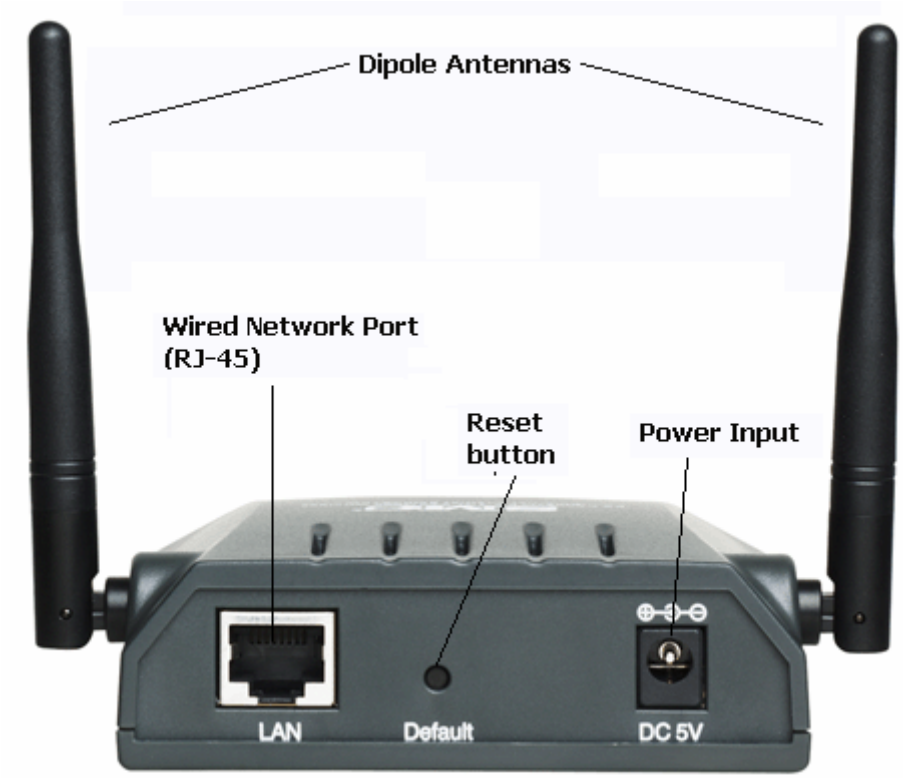
- 1 SMC2870W 2.4GHz 54 Mbps Wireless Ethernet Bridge
- 1 EZ Installation Wizard and Documentation CD
- 1 Quick Installation Guide

Immediately inform your dealer in the event of any incorrect, missing or damaged parts. If possible, please retain the carton and original packing materials in case there is a need to return the product.

Please register this product and upgrade the product warranty at SMC's Web site: http://www.smc.com

3 | Hardware Description

The EZ Connect™ g Wireless Ethernet Bridge supports high speed communication up to 54 Mbps. It incorporates support for PRISM Nitro which provides enhanced throughput and range. This device is fully compliant with 2.4 GHz DSSS and OFDM CSMA/CA wireless networking as defined in IEEE 802.11b and 802.11g. It can be connected via an RJ-45 connection to devices such as Nintendo GameCube, Microsoft Xbox, Sony PlayStation II, and Ethernet ready embedded devices. It can also function as an IEEE 802.11g Access Point, giving you the capability of creating a new 802.11g wireless network. In addition, this product supports Wireless Distribution System (WDS) for repeater functionality to extend the range of your wireless network.



The EZ Connect™ g 54 Mbps Wireless Ethernet Bridge has three types of LED indicators. Please check the following picture – the front view of the Bridge and the table below, which displays the current state the specific LED signifies.

LED	Status	Function
Power (PWR)	On (Green)	Power on.
	Off	No power.
Wireless LAN (TX/RX)	Blinking (Green) On (Green) Off	Blinking: Wireless LAN connection is transmitting. On: Wireless LAN connection is active. Off: Wireless LAN connection is not active.
LAN (LINK/ACT)	Blinking (Green) On (Green) Off	Blinking: Wired LAN connection is transmitting. On: Wired LAN connection is active. Off: Wired LAN connection is not active.

DEFAULT SETTINGS	
SSID	SMC
Wireless Adapter Name	SMC2870W
IP Address	192.168.2.25
Subnet Mask	255.255.255.0
Gateway	192.168.2.1
Mode	Wireless Bridge

4 | Applications

SMC's EZ Connect 2.4GHz 54 Mbps Wireless Ethernet Bridge (SMC2870W) can function as:

• an Ethernet to Wireless Bridge, providing a wireless connection via an RJ-45 connection to devices such as Microsoft Xbox and Ethernet ready embedded devices
• a standard IEEE 802.11g access point
• a wireless repeater, allowing you to effectively extend the coverage of another SMC2870W that is configured to operate in Access Point mode

This solution offers fast, reliable wireless connectivity with considerable cost savings over wired LANs (eliminates long-term maintenance overhead for cabling). Just install enough wireless access points to cover your network area, plug wireless cards into your notebooks or install wireless adapters into your desktops, and start networking.

Use this device in conjunction with SMC's EZ Connect™ Wireless Cards to create an instant network that integrates seamlessly with Ethernet LANs. Moreover, moving or expanding your network is as easy as moving or installing additional access points – no wires!

EZ Connect wireless products offer a fast, reliable, cost-effective solution for wireless Ethernet client access to the network in applications such as:

• **Video Game Systems**
Provides wireless Internet access for users of video game systems such as Nintendo GameCube, Microsoft Xbox and Sony PlayStation II

• **Remote access to corporate network information**
E-mail, file transfer, and terminal emulation

• **Difficult-to-wire environments**
Historical or old buildings, asbestos installations, and open areas where wiring is difficult to employ

• **Frequently changing environments**
Retailers, manufacturers, and banks which frequently rearrange the workplace or change locations

• **Temporary LANs for special projects or peak periods**
Trade shows, exhibitions, and construction sites that need a temporary setup. Retailers, airline, and shipping companies that need additional workstations for peak periods. Auditors who require workgroups at customer sites

• **Access to databases for mobile workers**
Doctors, nurses, retailers, or white-collar workers who need access to databases while being mobile in a hospital, retail store, in an office, or on a campus

• **SOHO users**
SOHO (Small Office and Home Office) users who need easy and quick installation of a small computer network

5 | Understanding Wireless Security

Anyone within range of your wireless network is a potential security risk. Without wireless security options configured on your network, a person outside of your physical location, but within your wireless range may be able to access the network and any data that is being transmitted over it. SMC Networks' wireless devices support the wireless security standard called Wired Equivalent Privacy (WEP) to prevent unauthorized users from accessing your network over a wireless connection. This security feature uses a secure network key, called a WEP key. The WEP key encrypts wireless data so that it is only readable by other computers that have the matching WEP key. The WEP key is stored on each wireless device, so that data can be encrypted and decrypted as it is transmitted over the network.

While the Institute of Electrical & Electronics Engineers (IEEE) 802.11i standard is being finalized, an interim solution called Wi-Fi Protected Access (WPA) has been introduced. The EZ Connect™ g Wireless Ethernet Bridge is the first device of its kind to support this new wireless security specification. WPA defines a set of interoperable security enhancements that greatly improve upon the level of data encryption and authentication or access control for existing and future wireless LAN systems. WPA includes Extensible Authentication Protocol (EAP), Temporal Key Integrity Protocol (TKIP) and 802.1X for authentication and dynamic key exchange. In the WPA-enabled network, the client first associates with the Access Point. The Access Point does not allow network access until the user can be successfully authenticated. If the client shows the correct credentials to the Remote Authentication Dial-In User Service (RADIUS) server, the client is allowed to join the network. If not, the client stays blocked from joining the LAN. Once the client joins the network, the authentication server distributes a TKIP encryption key to both the client and the Access Point. The client can then begin communicating on the network and maintain the connection, encrypting data back and forth with the Access Point. Note that for environments without a Remote Authentication Dial-In User Service (RADIUS) infrastructure, WPA supports the use of a pre-shared key (PSK). WPA-PSK specifies that encryption keys be dynamically changed (called rekeying) and authenticated between devices after a specified period of time, or after a specified number of packets has been transferred.

If you are transferring private information over this wireless connection, it is recommended to enable WEP or WPA for your EZ Connect™ g Wireless Ethernet Bridge.

6 | Hardware Installation

1. Select the Site – Choose a location for your Wireless Ethernet Bridge. Usually, the best location is at the center of your wireless coverage area, if possible within line-of-sight of all wireless devices.

2. Place the Wireless Ethernet Bridge in a position that gives it maximum coverage. Normally, the higher you place the antenna, the better the performance.

3. Position the antennas in the desired positions. For more effective coverage, position the antennas along different axes. For example, try positioning the antennas around 45 to 90 degrees apart. (The antennas emit signals along the toroidal plane – and thus provide more effective coverage when positioned along different axes.)

4. If used in Wireless Bridge mode, connect the Ethernet cable to the RJ-45 socket of the device will communicate wirelessly with an access point.

5. If used in Access Point mode, connect the Ethernet cable – The SMC2870W can be wired to an Ethernet network through an Ethernet device such as a hub or a switch using category 3, 4, or 5 UTP Ethernet cable and an RJ-45 connector.

6. Connect the power cable – Connect the power adapter cable to the 5 VDC power socket on the rear panel. Warning: Use only the power adapter supplied with the SMC2870W.

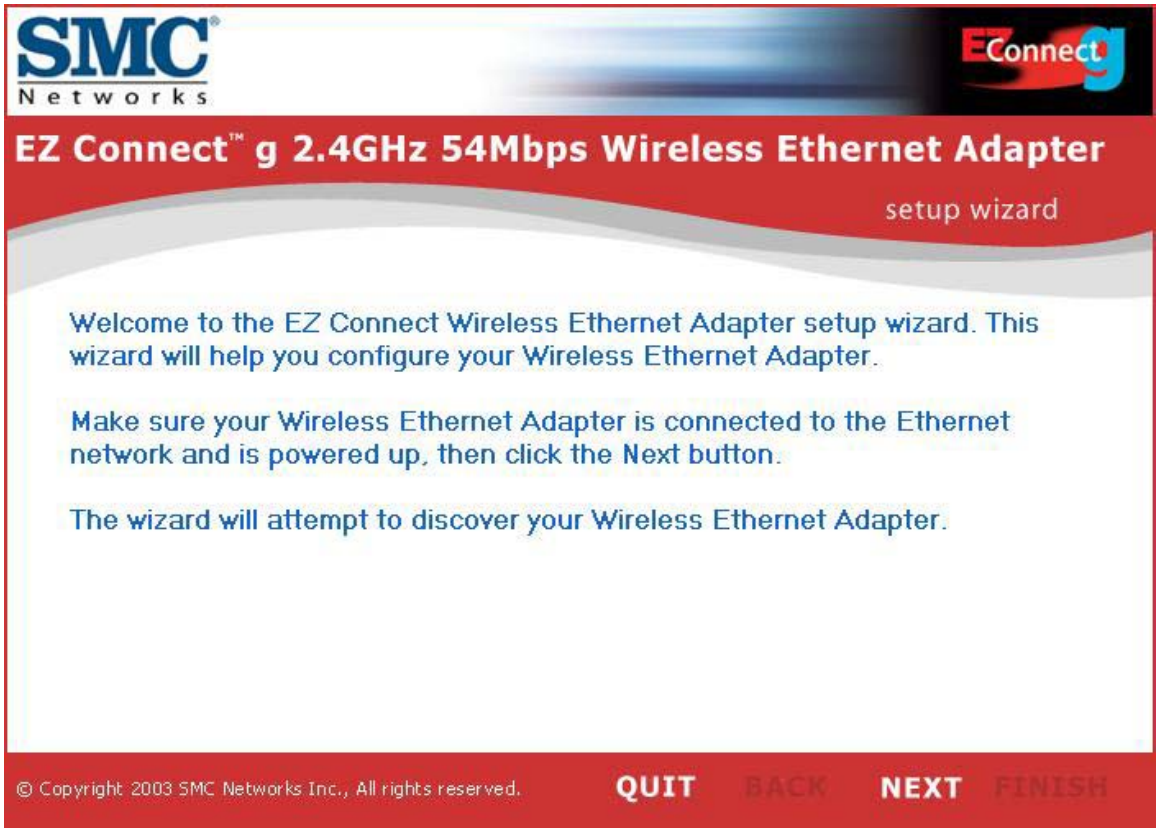
7. Check the LED's on the front of the unit to make sure the adapter is turned on properly and the status is okay.

7 | Using the EZ Installation Wizard

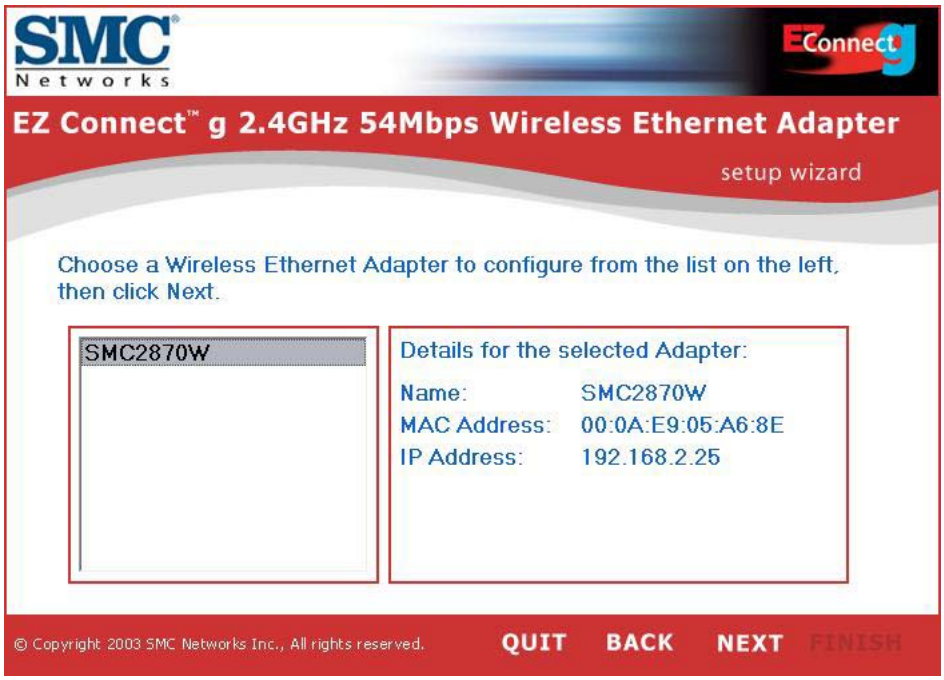
The installation method makes the process as simple and Plug-and-Play as possible. Please be sure that you have successfully completed the steps shown in Section 6 before proceeding.

1. Insert the EZ Installation Wizard and Documentation CD.

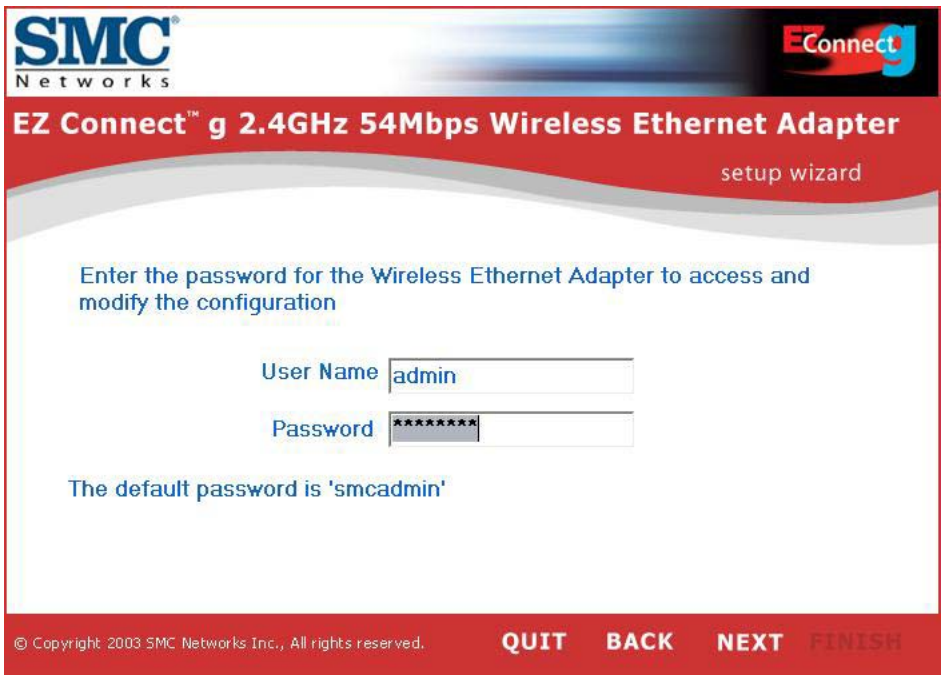
2. Click the [NEXT] button to continue.



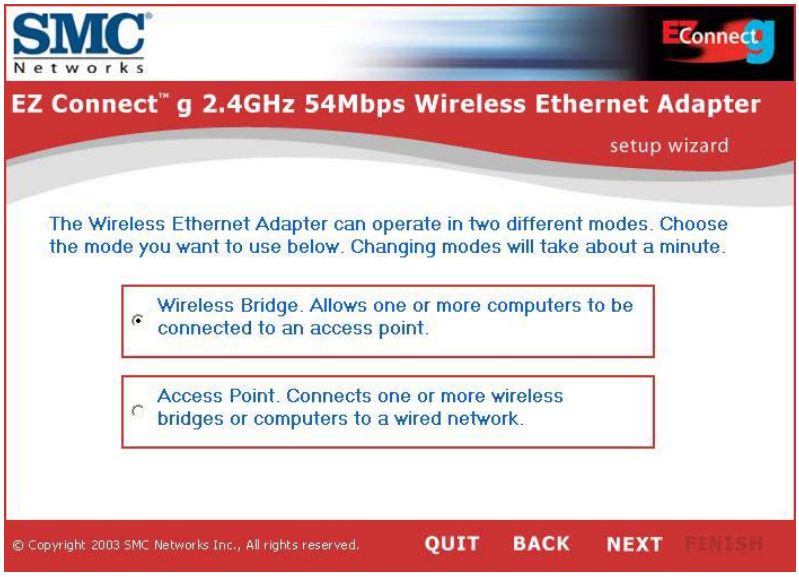
3. The wizard will scan for available SMC2870W's and then list them on the left column. Click [NEXT] to continue.



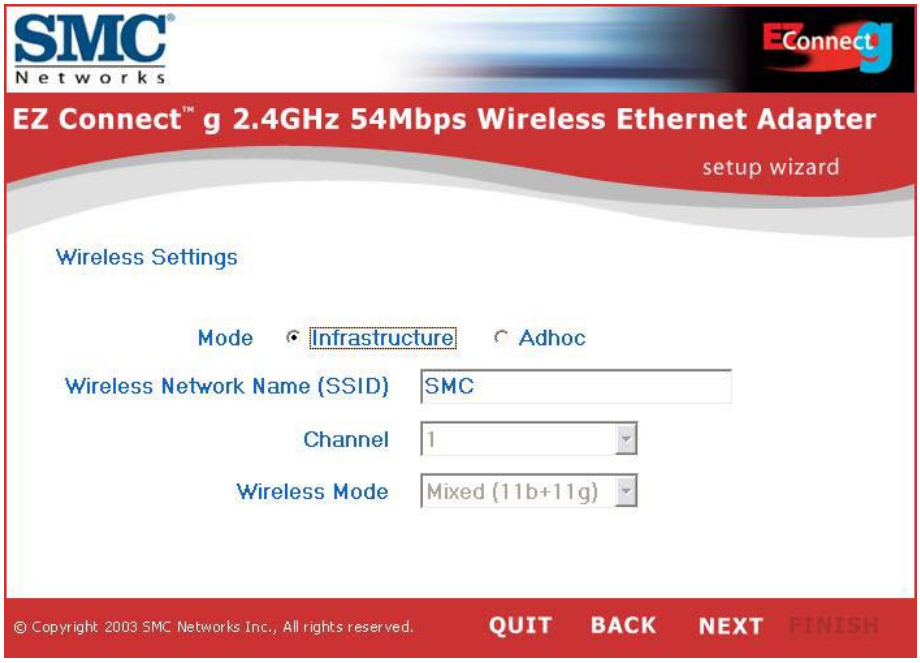
4. You will be asked to enter the password to modify the current configuration settings. By default, the username is "admin" and the password is "smcadmin". Please enter this information and press [NEXT].



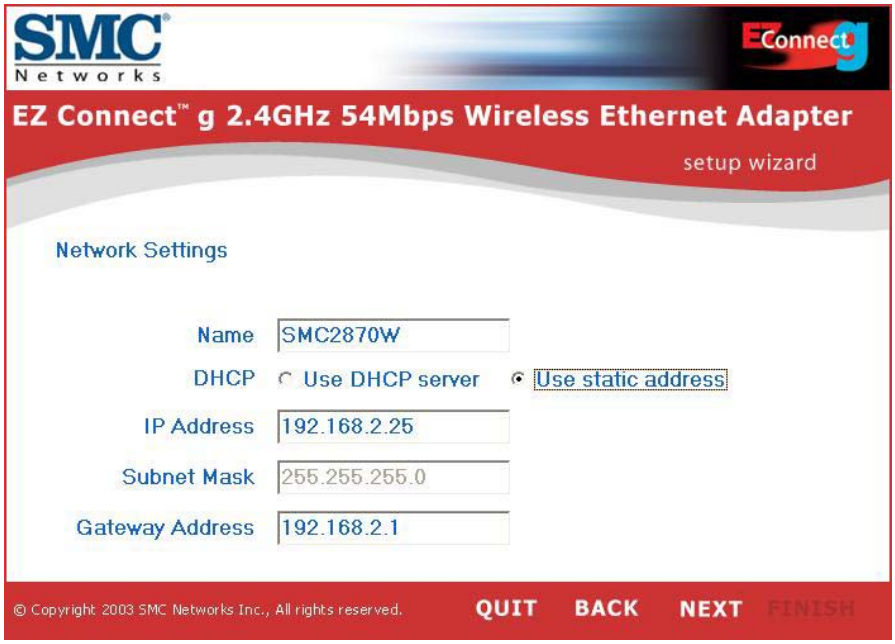
5. You will then be given the option to enable either "Wireless Bridge" or "Access Point" mode. If you are trying to create a new 802.11g network for your wireless clients to connect up to, please select "Access Point" and click [NEXT]. If you are trying to give an Ethernet-equipped device wireless connectivity, please select "Wireless Bridge" and click [NEXT]. If you selected "Wireless Bridge", please go to Step 6. If you selected "Access Point", go to Step 10.



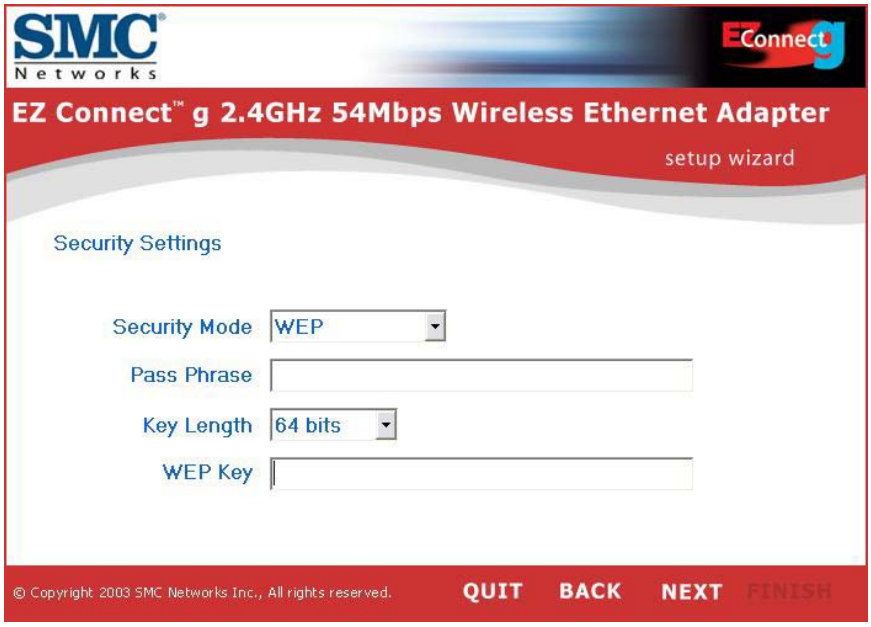
6. **Wireless Bridge configuration:** If you are connecting to an existing wireless network, select "Infrastructure" and enter the SSID of your network.



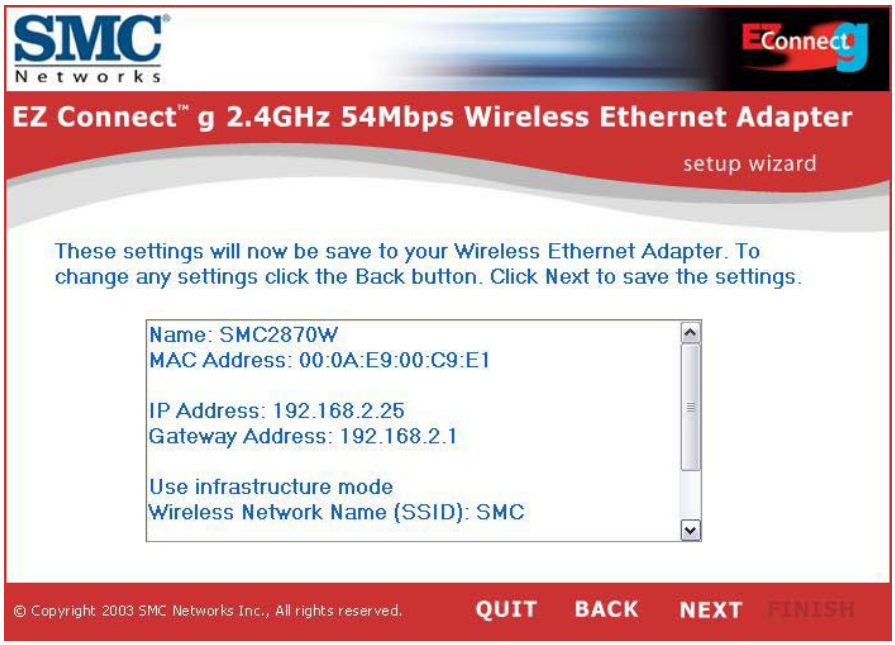
7. Now you will be asked to configure the Network Settings. If you are connecting to a network with a DHCP server, select "Use DHCP server" and click [NEXT]. If you do not have a DHCP server on your network, input a static IP address and click [NEXT].



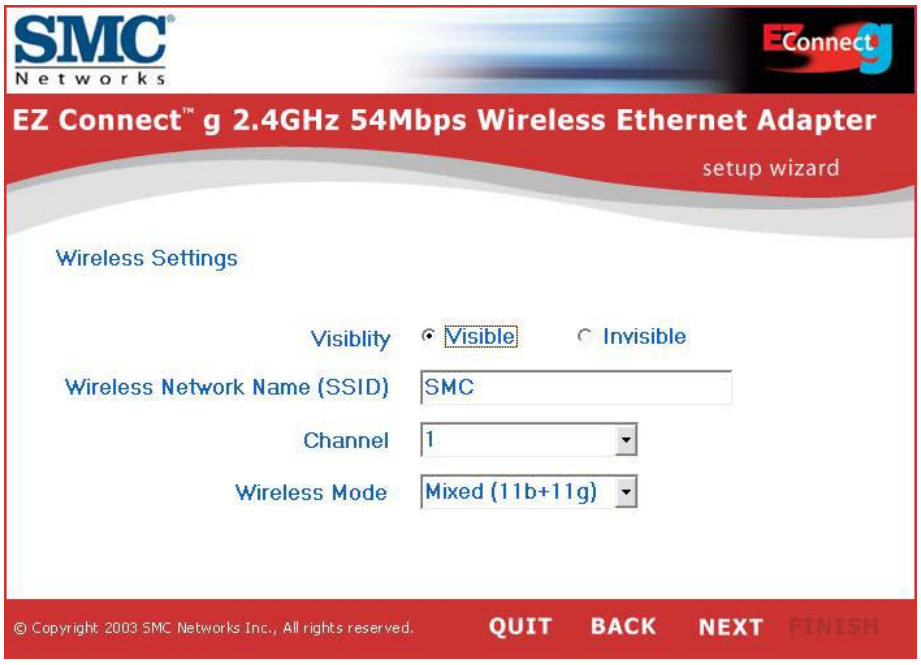
8. If you have enabled Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access (WPA) on your wireless network, please enter the private security key settings now. Select the drop down menus of "Security Mode" to choose between WEP and WPA. Select the drop down menus of "Key Length" to choose between 64 or 128-bit encryption.



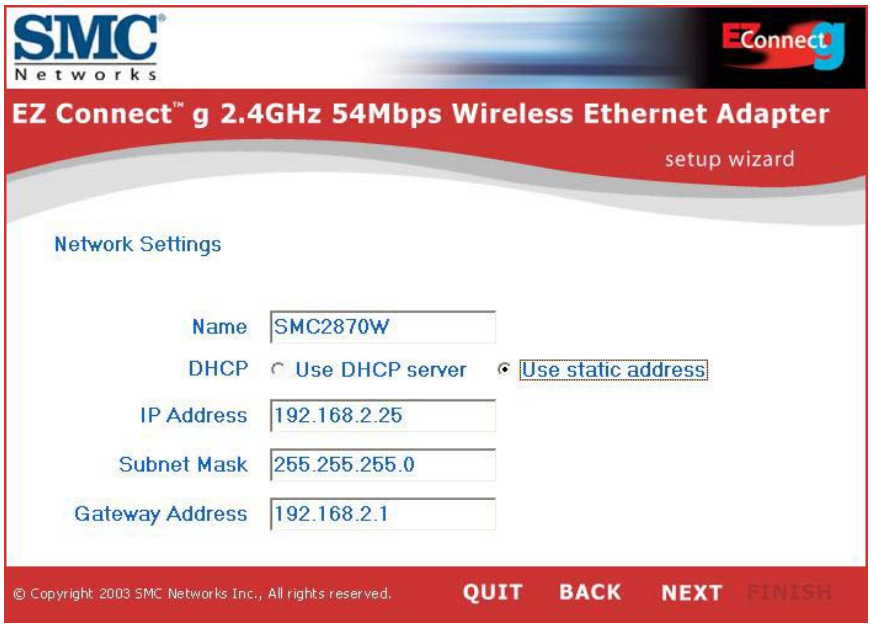
9. Finally, please verify all the settings you have entered. If any configuration changes still need to be made, please click [BACK] and make them now. Otherwise, click [NEXT] to make the settings take effect. This will take a few seconds. Please go to Step 14.



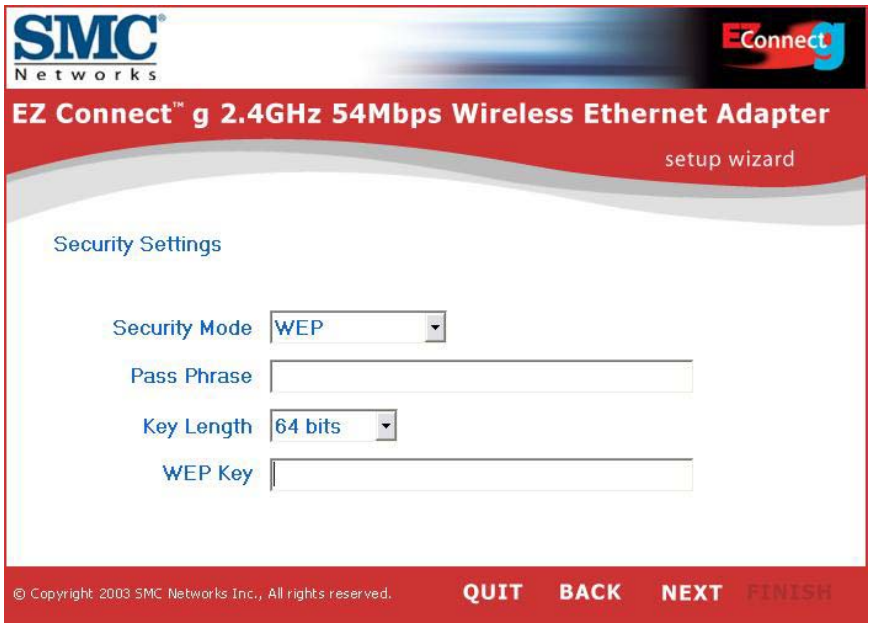
10. **Access Point configuration:** To disable SSID broadcast, select "Invisible". Please enter your desired SSID, Channel and Wireless Mode settings and click [NEXT] to continue.



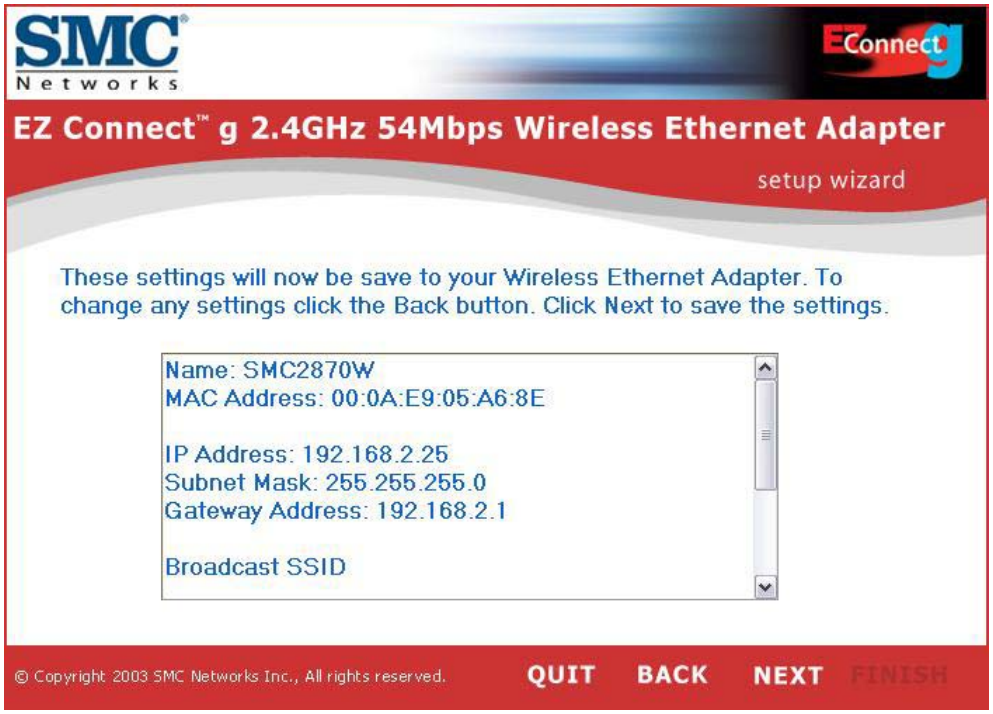
11. Now you will be asked to configure the Network Settings. If you are connecting to a network with a DHCP server, select "Use DHCP server" and click [NEXT]. If you do not have a DHCP server on your network, input a static IP address and click [NEXT].



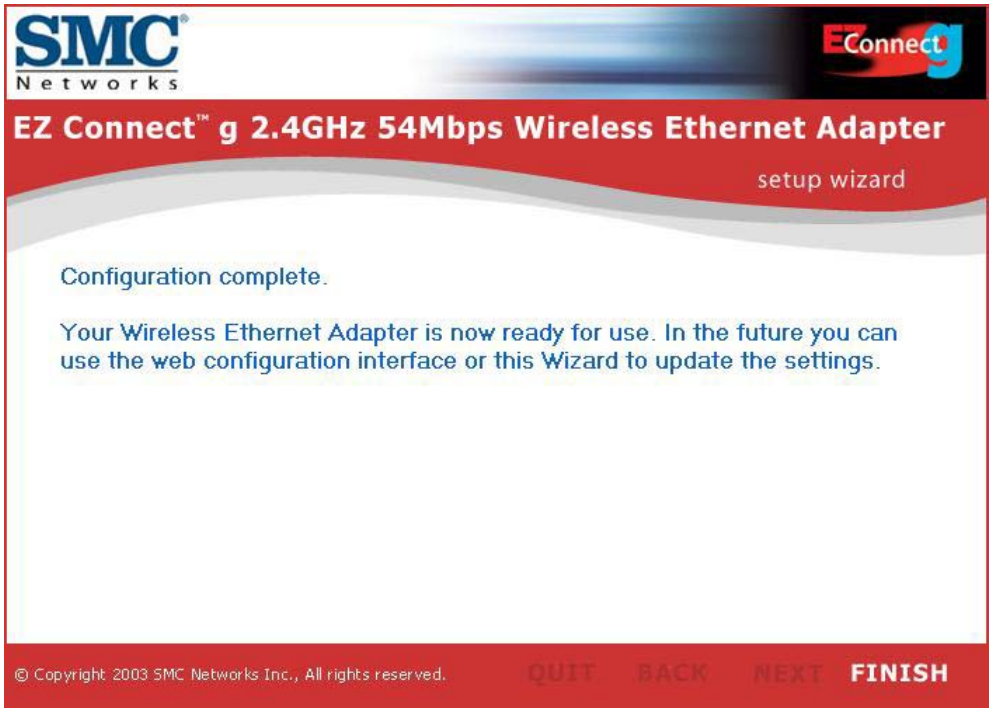
12. If you would like to enable Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access (WPA) on your wireless network, please enter the private security key settings now. Select the drop down menus of "Security Mode" to choose between WEP and WPA. Select the drop down menus of "Key Length" to choose between 64 or 128-bit encryption.



13. Finally, please verify all the settings you have entered. If any configuration changes still need to be made, please click [BACK] and make them now. Otherwise, click [NEXT] to make the settings take effect.



14. You have now completed the configuration. You can now begin to use your EZ Connect ™ g Wireless Ethernet Bridge.



8 | Configuring Your Computer

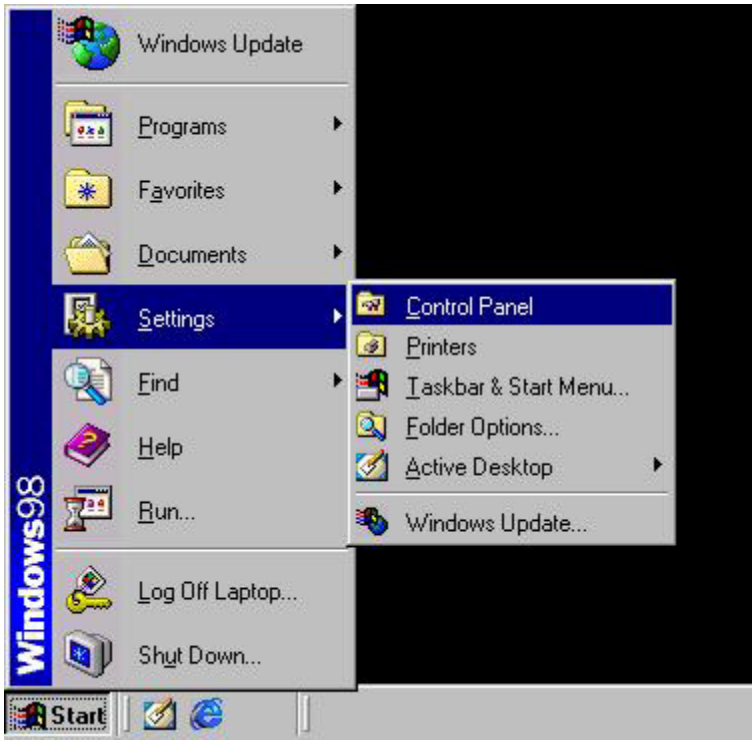
Using IPCONFIG

1) Click the "Start" button, click "Run" and type "command".
2) Press "OK" and a black command prompt will appear.
3) Type "ipconfig" and press enter
4) Verify that your IP Address is 192.168.2.xxx. If so, you can now use the web interface of the SMC2870W to configure additional advanced settings. If your IP Address is completely different, please go to the "Configure Your IP Address" section below.

Configuring Your IP Address
Windows 98/ME

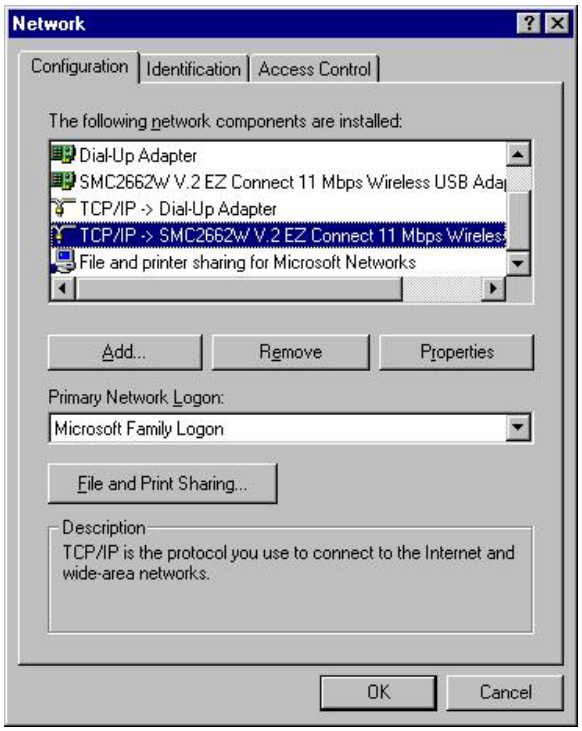
NOTE: Some Windows 9x/ME systems will request that you insert your Windows CD in order to complete the following configuration. Please have this CD ready.

1) Click the "Start" button, choose "Settings", and then click "Control Panel".

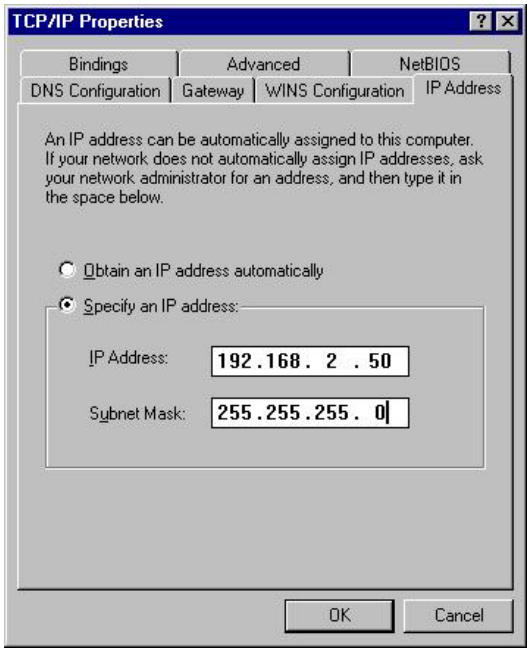


2) Double-click the "Network" icon.

3) Select the TCP/IP that is bound to the network adapter that you are currently using to configure your SMC2870W. Click "Properties".



4) Select the Specify an IP option and insert 192.168.2.x (where x is 2 ~ 24, 26 ~ 254). Then insert 255.255.255.0 for the subnet mask.

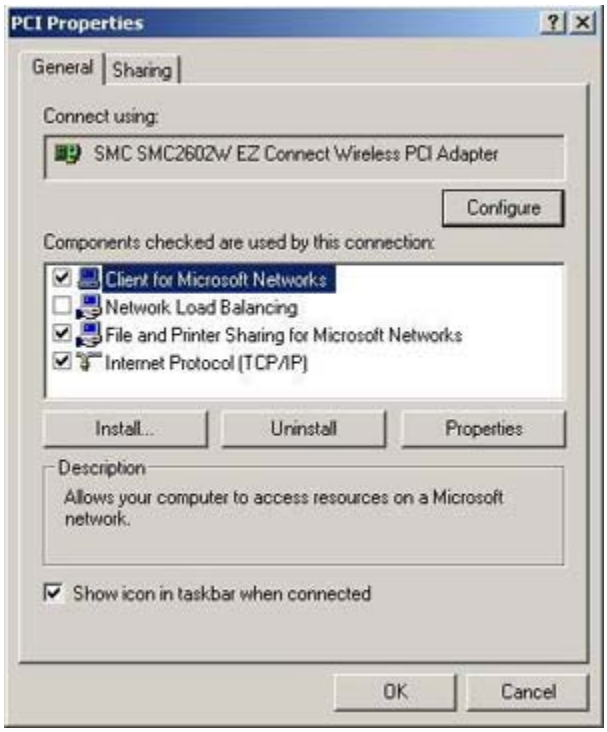


5) Press OK and reboot the machine when prompted to do so.

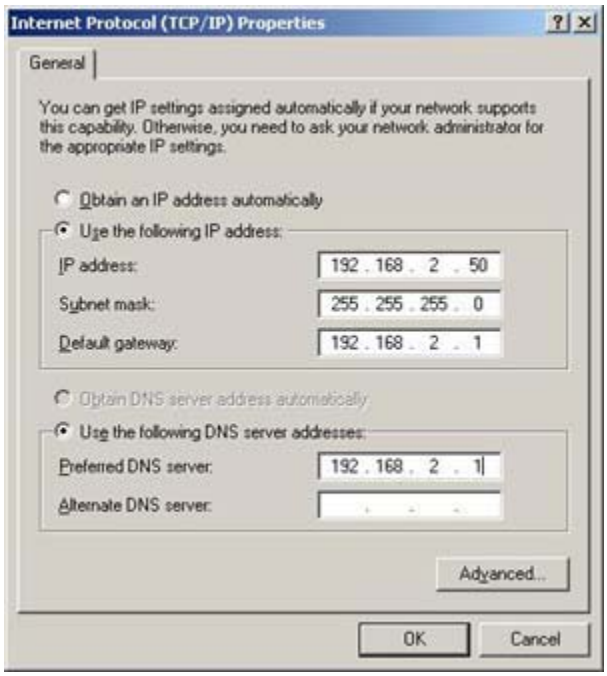
Windows 2000

1) Right-click the "Network Places" icon on your desktop and click "Properties".

2) Right-click your Local Area Connection and click "Properties".



3) Click “Internet Protocol TCP/IP” and click “Properties”. Select the "Use the following IP Address" option and insert 192.168.2.x (where x is 2 ~ 24, 25 ~254). If requested to enter a gateway and DNS, you can enter 192.168.2.1.



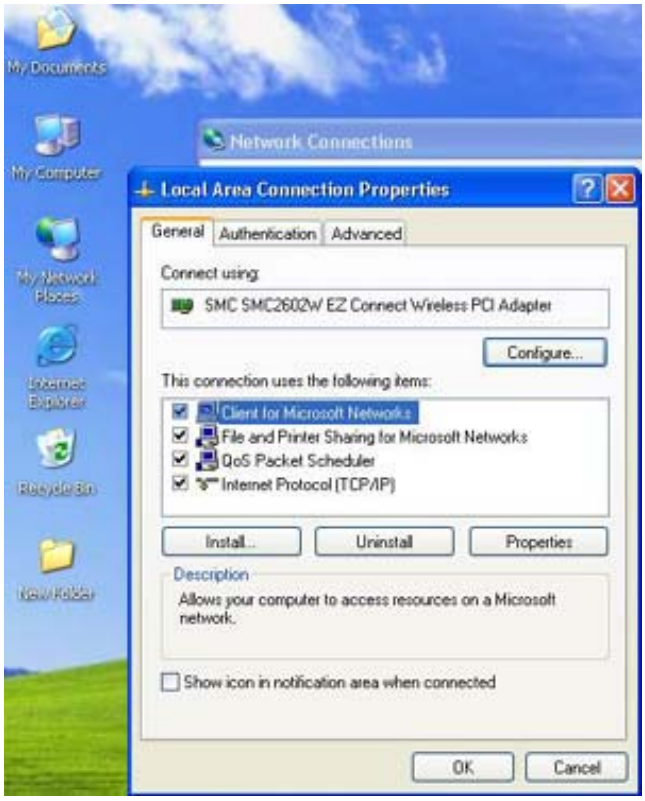
4) Click "OK" and click "Close" to continue and save the changes.

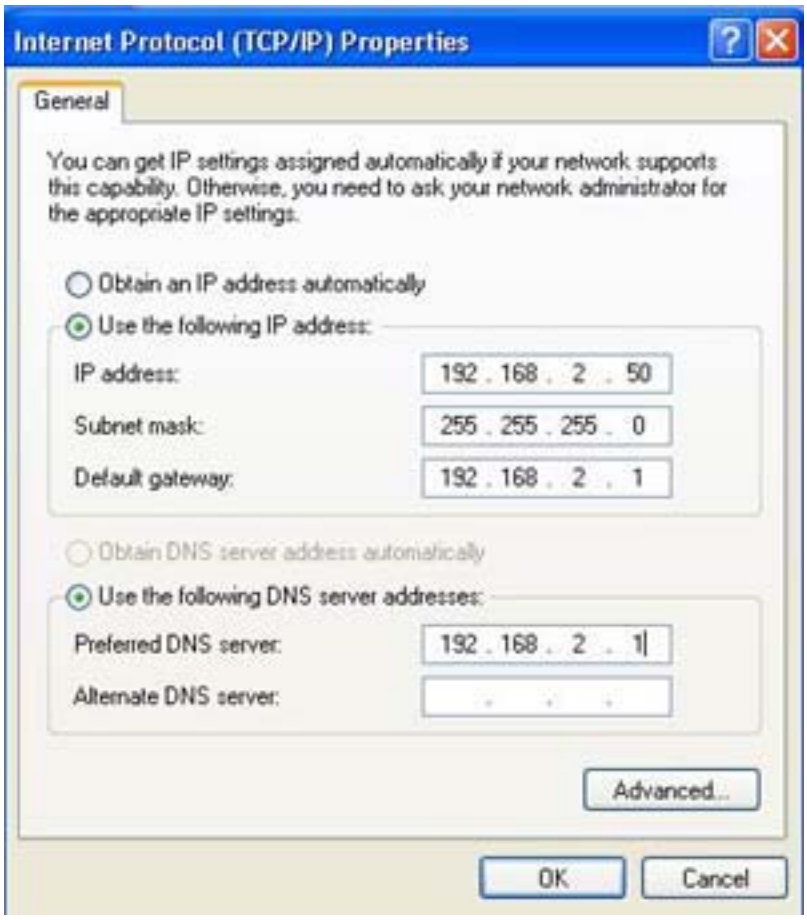
Windows XP

1) Right-click the "Network Places" icon on your desktop and click "Properties".

2) Right-click your "Local Area Connection" and click "Properties".

3) Click “Internet Protocol TCP/IP” and click “Properties”. Select the "Use the following IP Address" option and insert 192.168.2.x (where x is 2 ~ 24, 26 ~ 254) for the IP address. If requested to enter a gateway and DNS, you can type in 192.168.2.1.





4) Click "OK" and click "Close" to continue and save the changes.

9 | Advanced Web Configuration (Wireless Bridge mode)

Use the web management interface to define advanced system parameters, manage and control the Wireless Ethernet Bridge and its ports, or monitor network conditions. (Note: You MUST press [Save] and then [Reboot] for changes to take effect.)

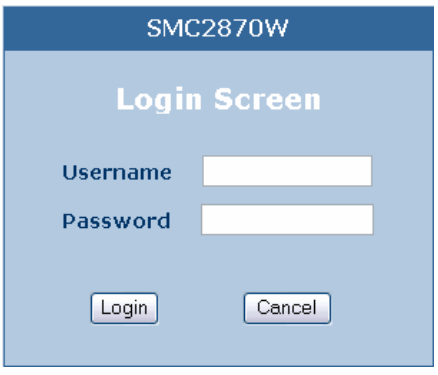
Browser Configuration
Confirm your browser is configured for a direct connection to the Internet using the Ethernet cable that is installed in the computer. This is configured through the options/preference section of your browser.

You will also need to verify that the HTTP Proxy feature of your web browser is disabled. This is so that your web browser will be able to view the SMC2870W configuration pages. The following steps are for Internet Explorer. Determine which browser you use and follow the appropriate steps.

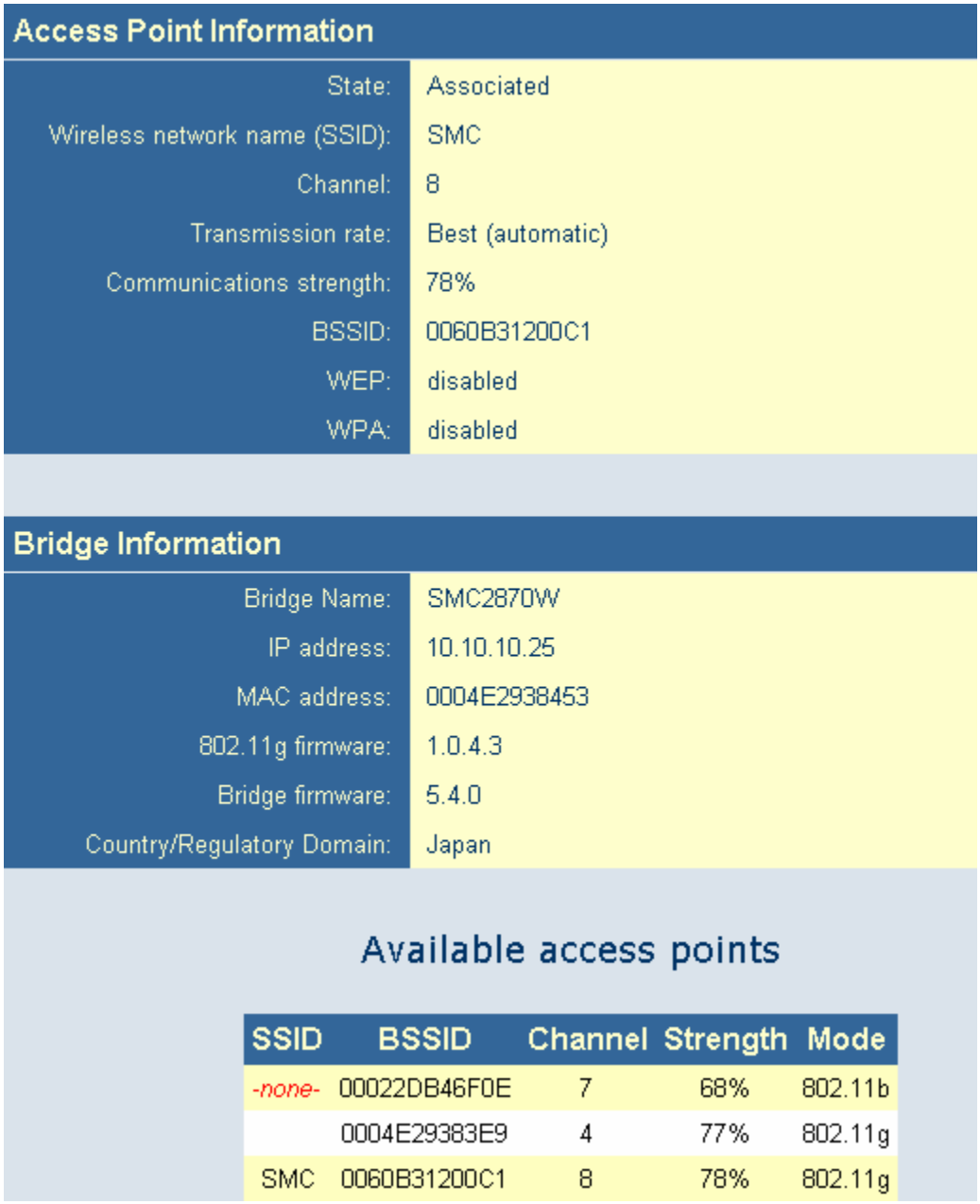
Internet Explorer in Windows
1. Open Internet Explorer. Click Tools, and then select Internet Options.
2. In the Internet Options window, click the Connections tab.
3. Click the LAN Settings button.
4. Clear all the check boxes and click OK to save these LAN settings changes.
5. Click OK again to close the Internet Options window.

Internet Explorer in Macintosh
1. Open Internet Explorer. Click Explorer/Preferences.
2. In the Internet/Explorer/Preferences window, under Network, select Proxies.
3. Uncheck all check boxes and click OK.

To access the SMC2870W's web management interface, enter the Wireless Ethernet Bridge IP address in your web browser as follows: http://192.168.2.25
Then enter the username and password and then click LOGIN.
Default username: admin
Default password: smcadmin



After logging into the SMC2870W, all the System Information will be displayed. You can proceed to another configuration page using the navigational menu on the left.



Access Point Information

State:	Associated
Wireless network name (SSID):	SMC
Channel:	8
Transmission rate:	Best (automatic)
Communications strength:	78%
BSSID:	0060B31200C1
WEP:	disabled
WPA:	disabled

Bridge Information

Bridge Name:	SMC2870W
IP address:	10.10.10.25
MAC address:	0004E2938453
802.11g firmware:	1.0.4.3
Bridge firmware:	5.4.0
Country/Regulatory Domain:	Japan

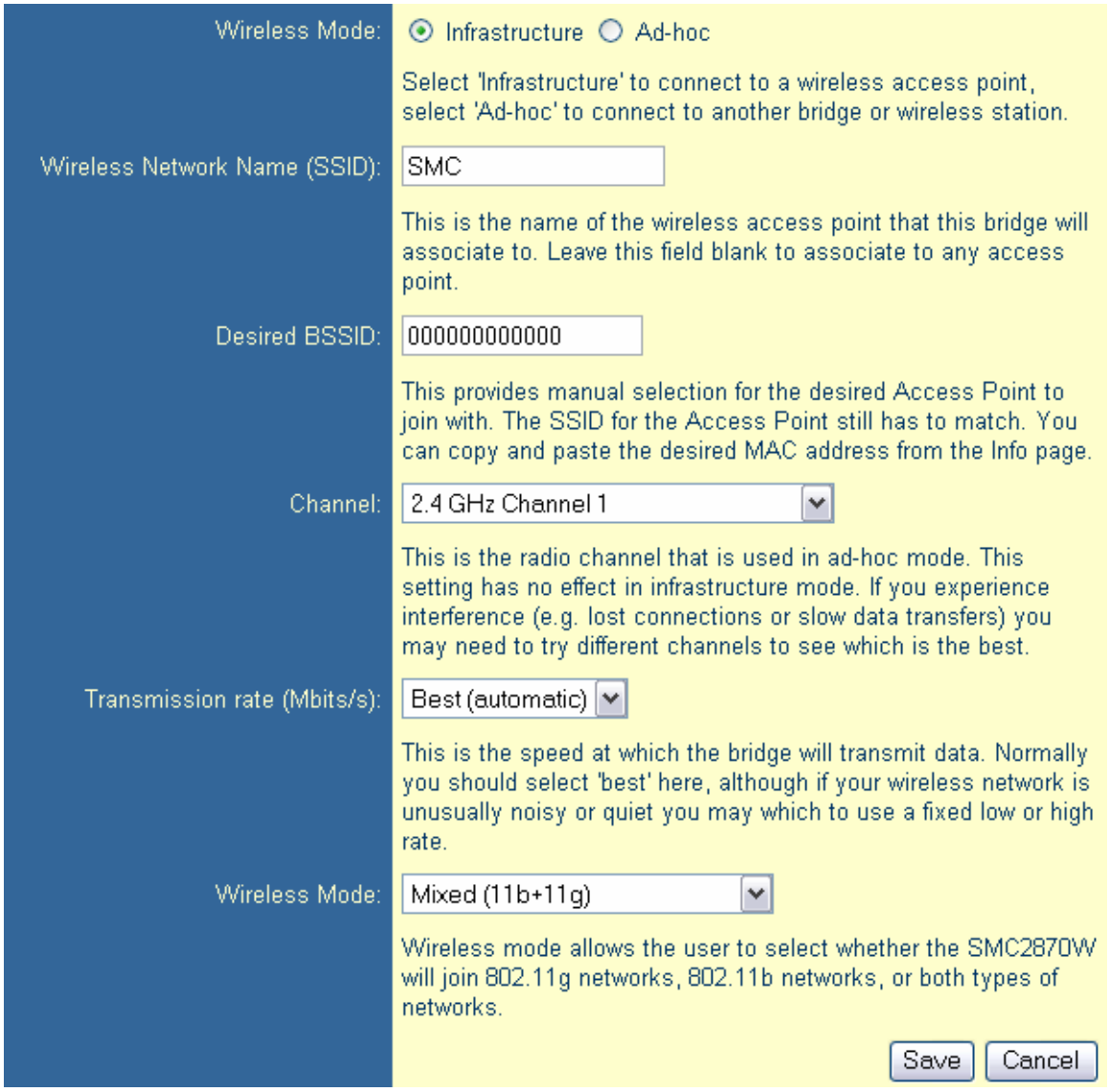
Available access points

SSID	BSSID	Channel	Strength	Mode
-none-	00022DB46F0E	7	68%	802.11b
	0004E29383E9	4	77%	802.11g
SMC	0060B31200C1	8	78%	802.11g

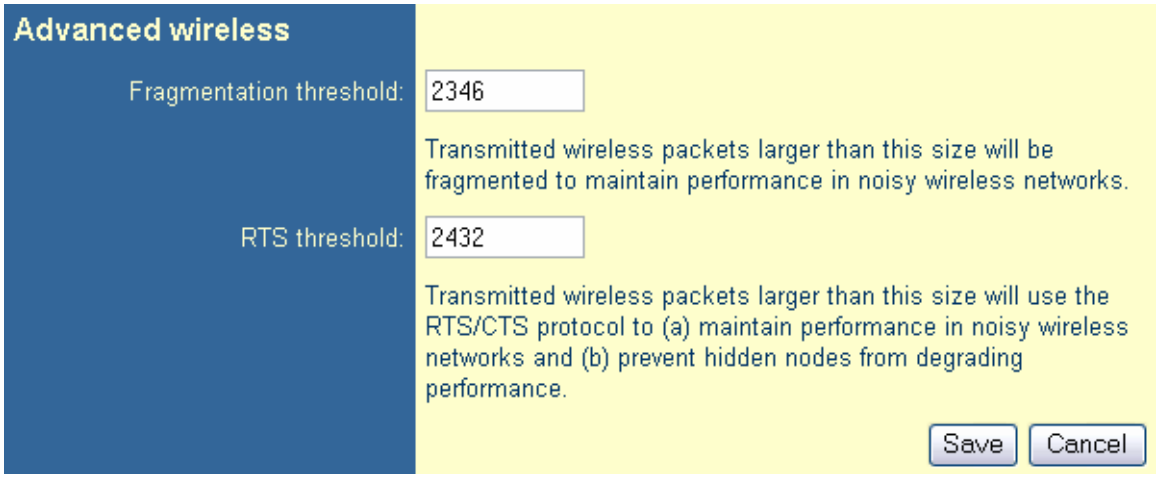
Note: If you know the SSID or BSSID of your desired network, you can automatically connect to it by moving your mouse over the appropriate BSSID of the network and then click the link.

Go to Wireless | Basic Settings to change the Wireless Bridge mode from Infrastructure to Adhoc, or you can also change the SSID, Channel, Transmission Rate and Wireless Mode.

Note that when configured as a Wireless Bridge, changing the channel of the SMC2870W has no effect because it must connect to the network using the same channel as your Access Point. If you wish to use a different channel, you must change the channel in your Access Point's configuration.



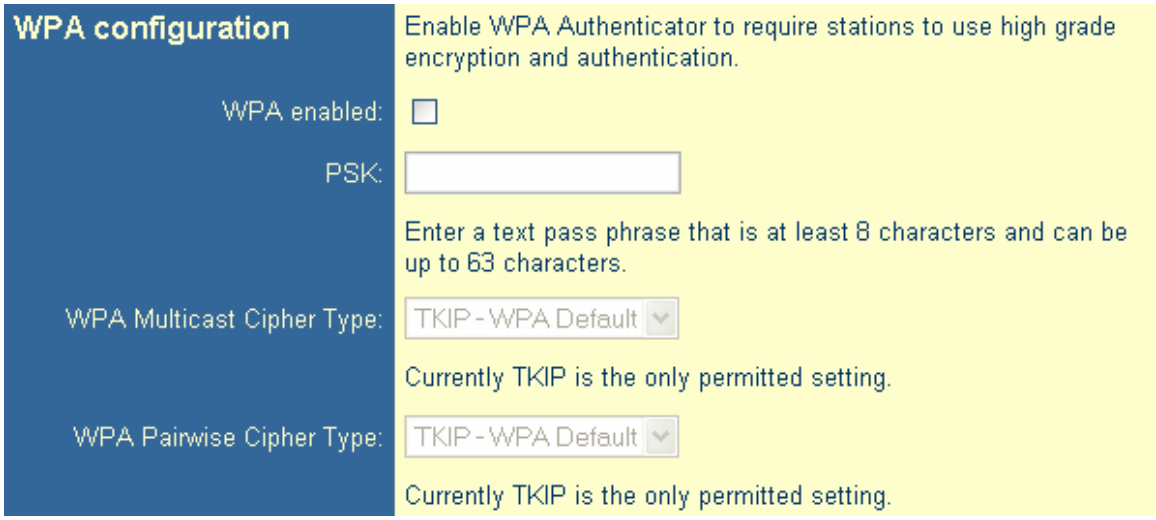
Go to Wireless | Advanced Settings in order to change the Fragmentation and RTS thresholds. (Note: It is recommended to leave these values at their default settings.)



RTS Threshold: Set the RTS (Request to Send) frame length. You may configure the access point to initiate an RTS frame. If the packet size is smaller than the preset RTS threshold size, the RTS/CTS mechanism will NOT be enabled.
The access point sends Request to Send (RTS) frames to a particular receiving station to negotiate the sending of a data frame. After receiving an RTS, the station sends a CTS (Clear to Send) frame to acknowledge the right of the sending station to send data frames. The access points contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this "Hidden Node Problem."

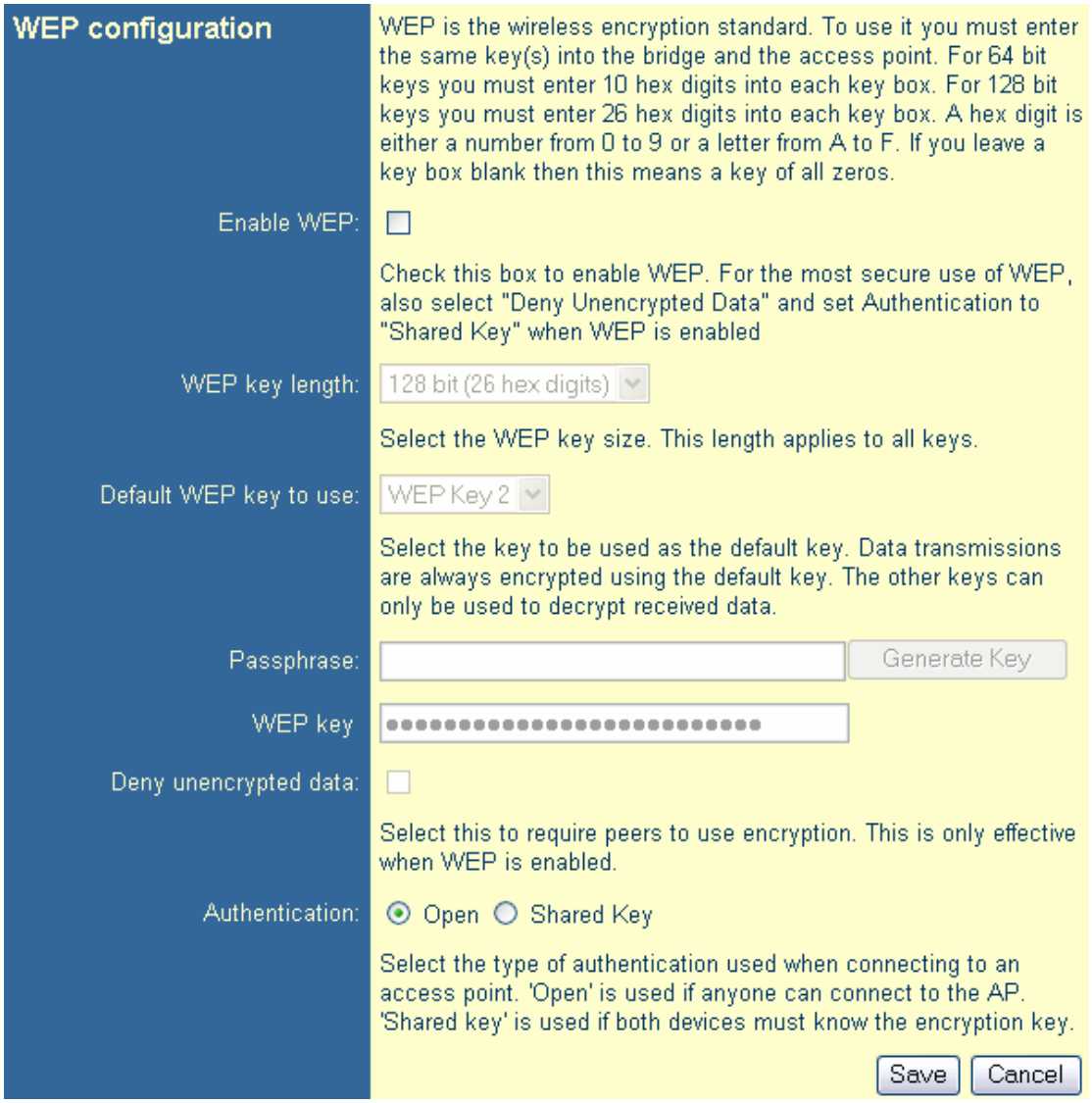
Fragmentation Threshold: If the packet size is smaller than the preset Fragment size, the packet will not be segmented. Fragmentation of the PDUs (Package Data Unit) can increase the reliability of transmissions because it increases the probability of a successful transmission due to smaller frame size. If there is significant interference present, or collisions due to high network utilization, try setting the fragment size to send smaller fragments. This will enable the retransmission of smaller frames much faster. However, it is more efficient to set the fragment size larger if very little or no interference is present because it requires overhead to send multiple frames.

Go to Wireless | Security to configure wireless security. If you have Wi-Fi Protected Access (WPA) security enabled on your wireless LAN, please click the [WPA enabled] checkbox and enter your pre-shared key (PSK):



If you have Wired Equivalent Privacy (WEP) security enabled on your wireless LAN, please click the [Enable WEP] checkbox. Then enter your desired key length and default WEP key. You can use the Passphrase function to automatically generate a WEP key or you can enter the full 10-digit (64-bit WEP) or 26-digit (128-bit WEP) manually in the "WEP key" field. Select your "Authentication" method and press [Save].

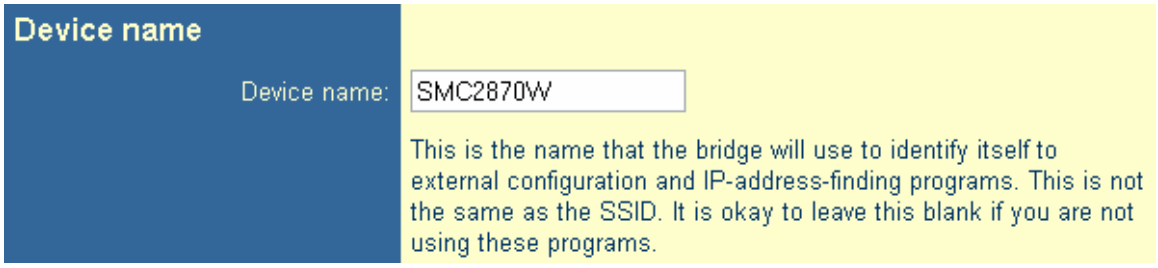
Note: A passphrase can contain up to 32 alphanumeric characters.



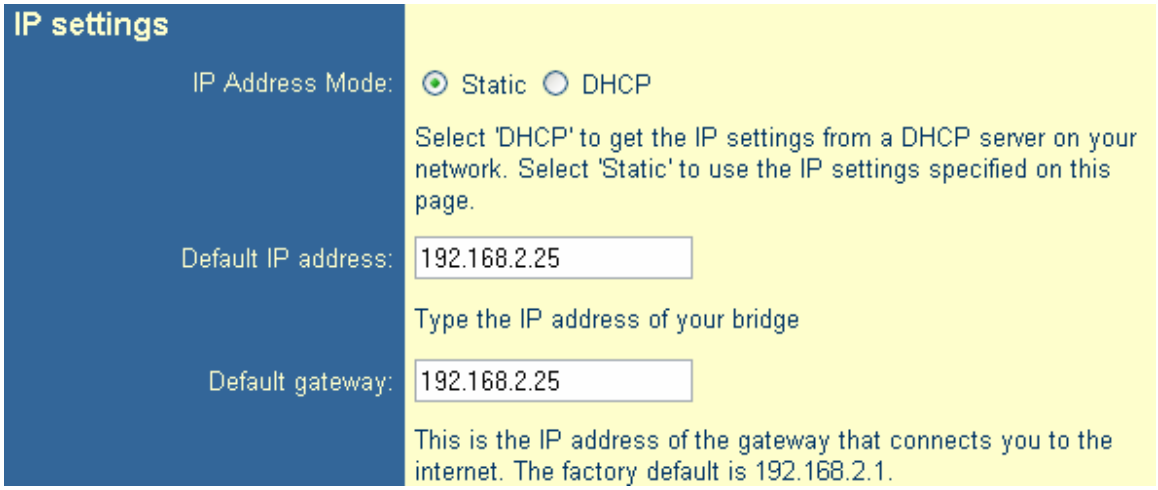
When setting up WEP without using the Passphrase function, only Hexadecimal characters (range: 0~9 and A~F) can be used. When encryption is set to 64-bit, a maximum of 10 Hex characters can be entered in the Key field. When encryption is set to 128-bit, a maximum of 26 Hex characters can be used.

Go to System | Admin Settings to change additional advanced settings. (Note: If you are not sure how to use a particular setting or what it means, please review the Terminology section before continuing. Any erroneous changes made here may cause unwanted results.)

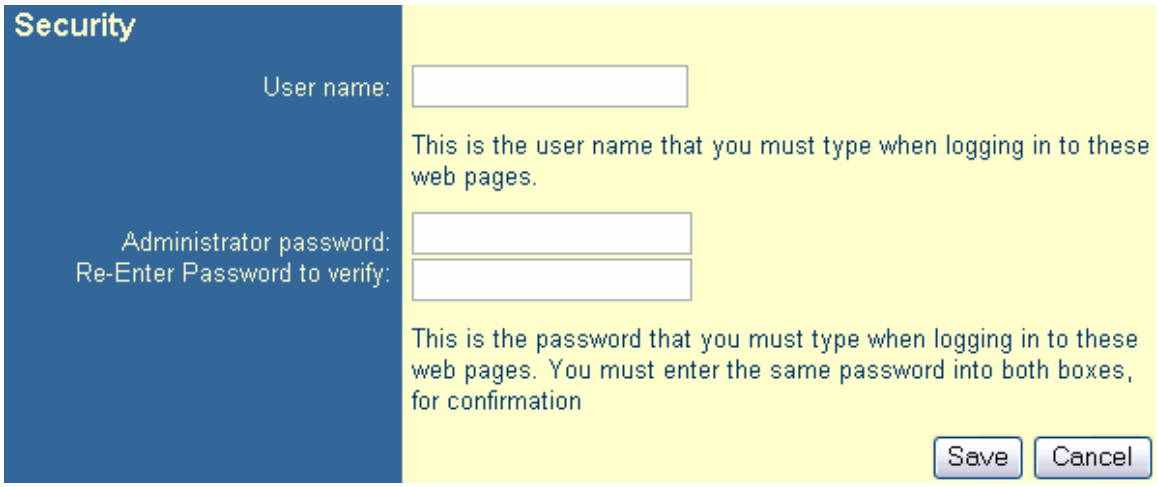
In the Device Name section, you can change the name of a particular SMC2870W device. This is very useful if you have more than one SMC2870W on your network.



In the IP Settings section, you can configure the unit with a static IP or set it up to use Dynamic Host Configuration Protocol (DHCP). Note: If you want to use DHCP, you must first make sure that you have a DHCP Server on your network ready to distribute additional IP Addresses.

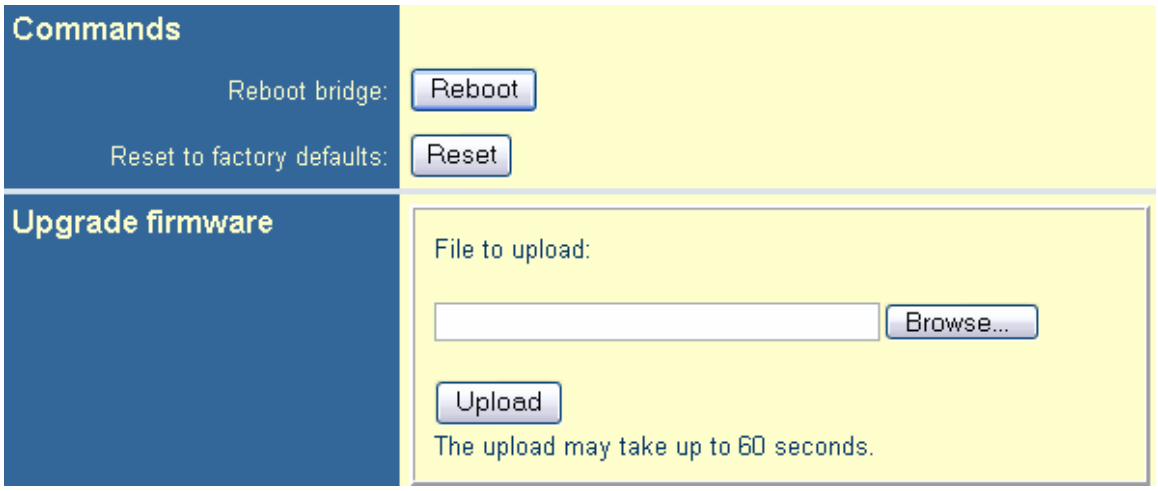


In the Security section, change the username and/or password used to log into the SMC2870W. It is a good idea to write down your username and password if you decide to change it. If you forget this information in the future, you will need to reset the SMC2870W to defaults.



In the Commands section, you can reboot your SMC2870W or reset it to defaults.

As we add functionality and future enhancements are made, firmware updates will be posted to SMC's website. After downloading the firmware, you need to update the SMC2870W via the web interface under this Upgrade Firmware section. Simply click the [Browse] button to locate and select the new firmware and then press [Upload].



10 | Advanced Web Configuration (Access Point mode)

Use the web management interface to define advanced system parameters, manage and control the Wireless Ethernet Bridge and its ports, or monitor network conditions.

Browser Configuration
Confirm your browser is configured for a direct connection to the Internet using the Ethernet cable that is installed in the computer. This is configured through the options/preference section of your browser.

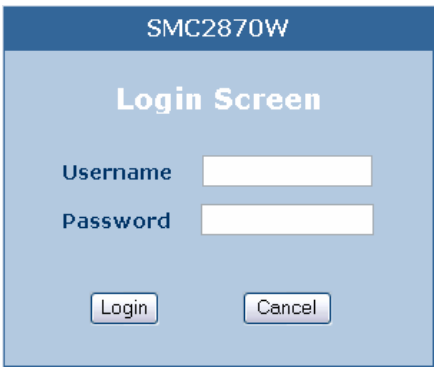
You will also need to verify that the HTTP Proxy feature of your web browser is disabled. This is so that your web browser will be able to view the SMC2870W configuration pages. The following steps are for Internet Explorer. Determine which browser you use and follow the appropriate steps.

Internet Explorer in Windows
1. Open Internet Explorer. Click Tools, and then select Internet Options.
2. In the Internet Options window, click the Connections tab.
3. Click the LAN Settings button.
4. Clear all the check boxes and click OK to save these LAN settings changes.
5. Click OK again to close the Internet Options window.

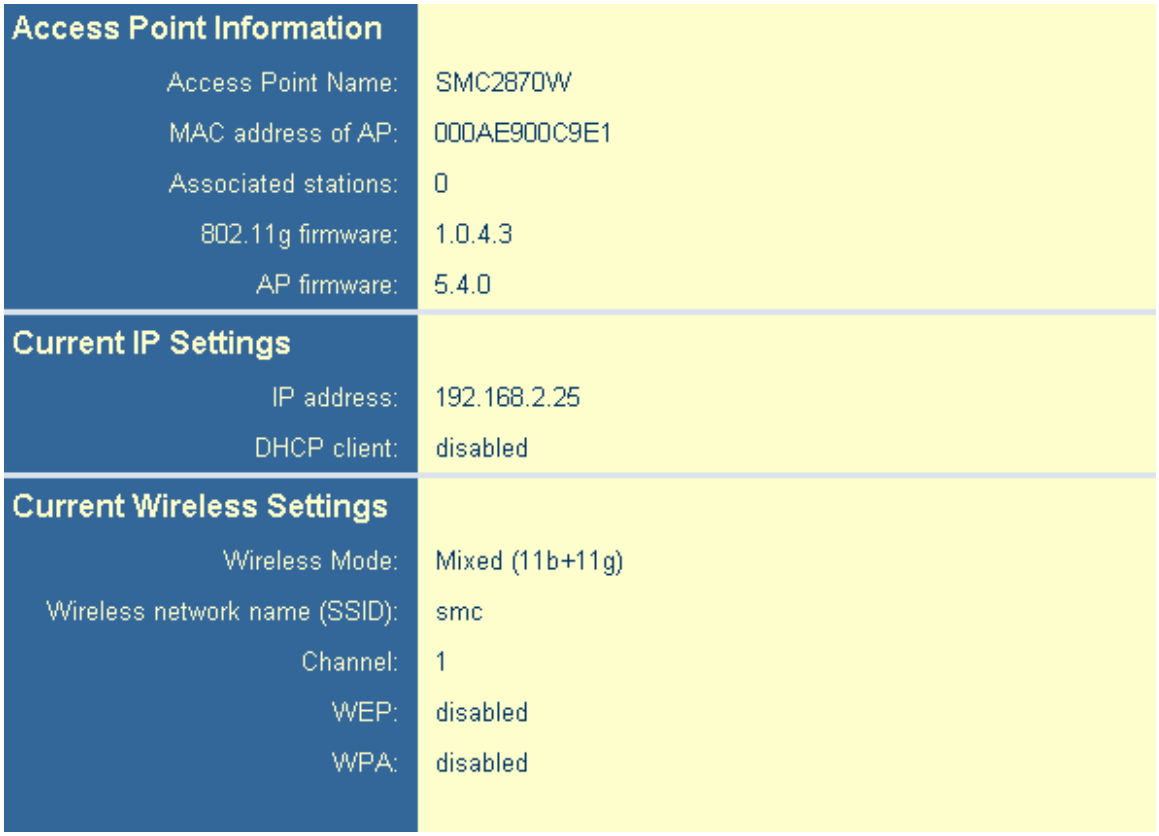
Internet Explorer in Macintosh
1. Open Internet Explorer. Click Explorer/Preferences.
2. In the Internet/Explorer/Preferences window, under Network, select Proxies.
3. Uncheck all check boxes and click OK.

To access the SMC2870W's web management interface, enter the Wireless Ethernet Bridge IP address in your web browser as follows: http://192.168.2.25
Then enter the username and password and then click LOGIN.

Default username: admin
Default password: smcadmin

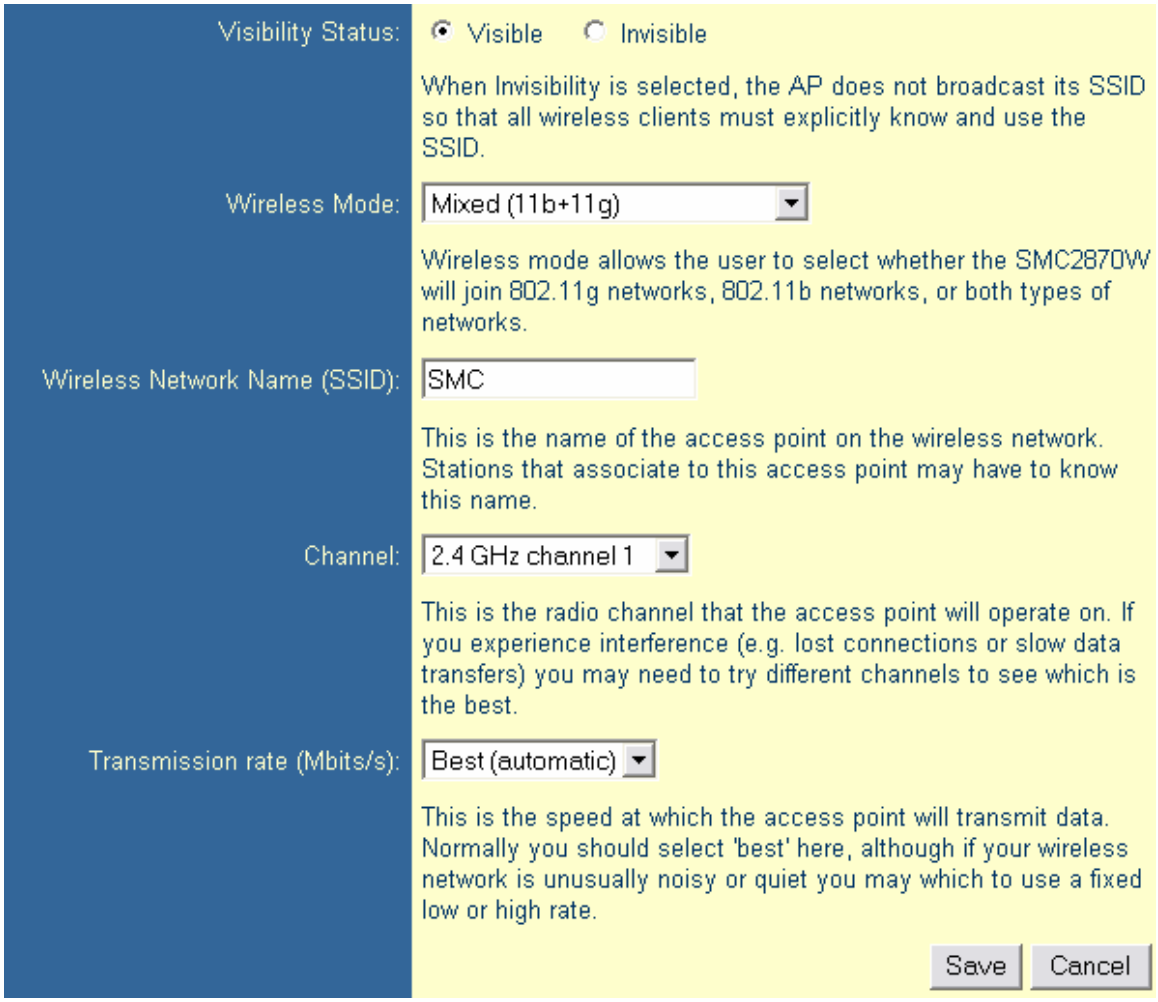


After logging into the SMC2870W, all the System Information will be displayed. You can proceed to another configuration page using the navigational menu on the left.

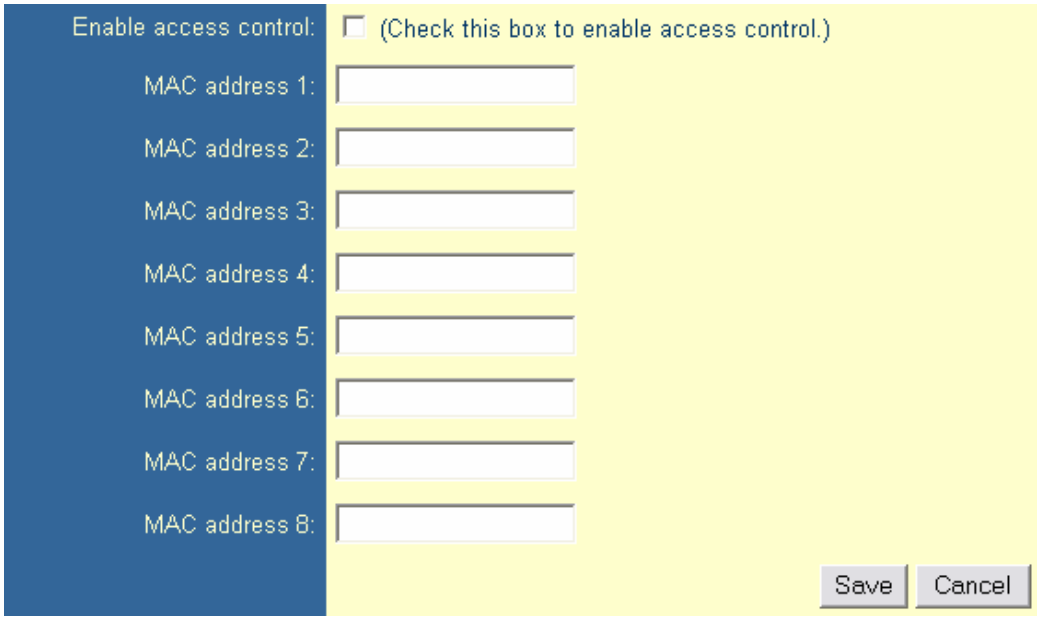


Go to the Status | Associations page to view all the wireless clients that are connected to your SMC2870W. The MAC Addresses of the clients will be shown. This is helpful if you plan to configure MAC Address Filtering in the future. You can simply highlight the appropriate MAC Address, copy and paste it in the section called Wireless | Access List.

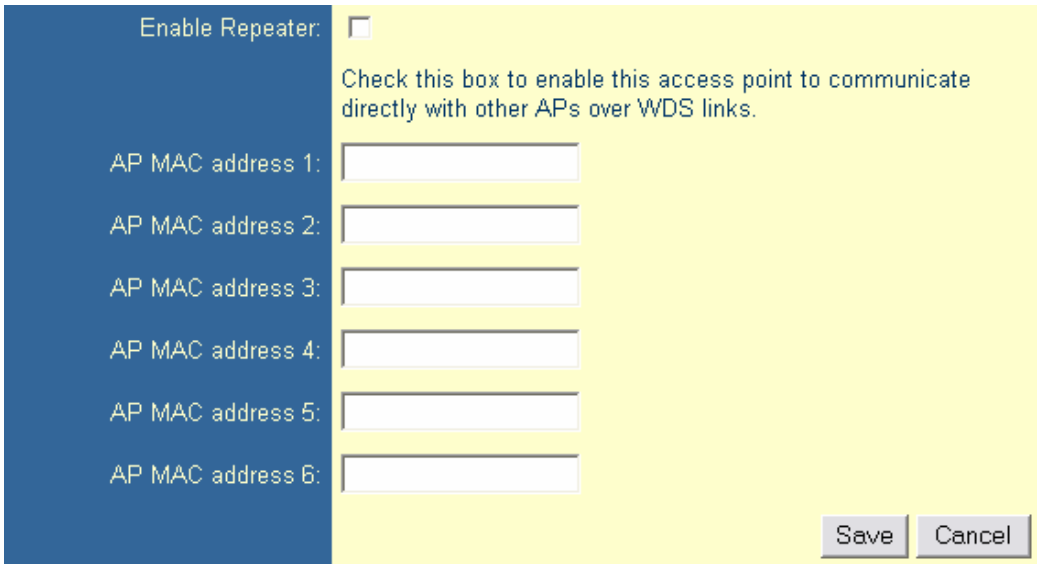
Go to Wireless | Basic Settings to change parameters such as the SSID, channel, and transmit rate. You can also change the "Visibility Status". Selecting [Visible] enables SSID broadcast whereas selecting [Invisible] disables the SSID broadcast. The "Wireless Mode" dictates what type of wireless client is allowed to associate to the SMC2870W. The supported modes are Mixed (11b+11g), Long Range Mixed (11b+11g), 11g Only, and 11b Only.



Go to Wireless | Access List to enter specific MAC Addresses that are allowed to connect to the SMC2870W. This function gives you added security without the overhead and increased processing that WEP or WPA may require.

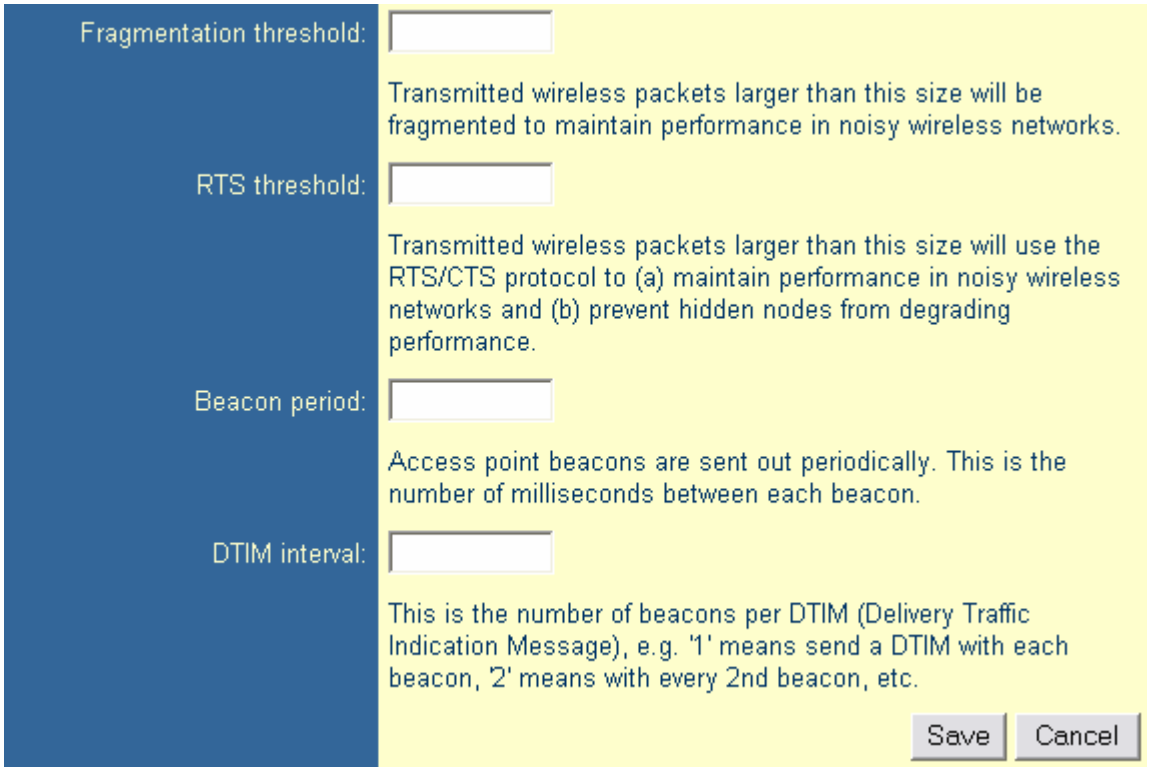


Go to Wireless | Repeater to make use of the repeating functionality to extend the wireless range of your network. (Note: You need at least two SMC2870W units in order to successfully enable repeating on your wireless LAN)



This function makes use of Wireless Distribution System (WDS) technology. You can specify up to six WDS links, where each link is defined by the MAC addresses of the other repeater capable SMC2870W. (Note: The repeater function must be enabled on both ends in order to function properly.)

Go to Wireless | Advanced Settings in order to change the Fragmentation and RTS thresholds. (Note: It is recommended to leave these values at their default settings.)



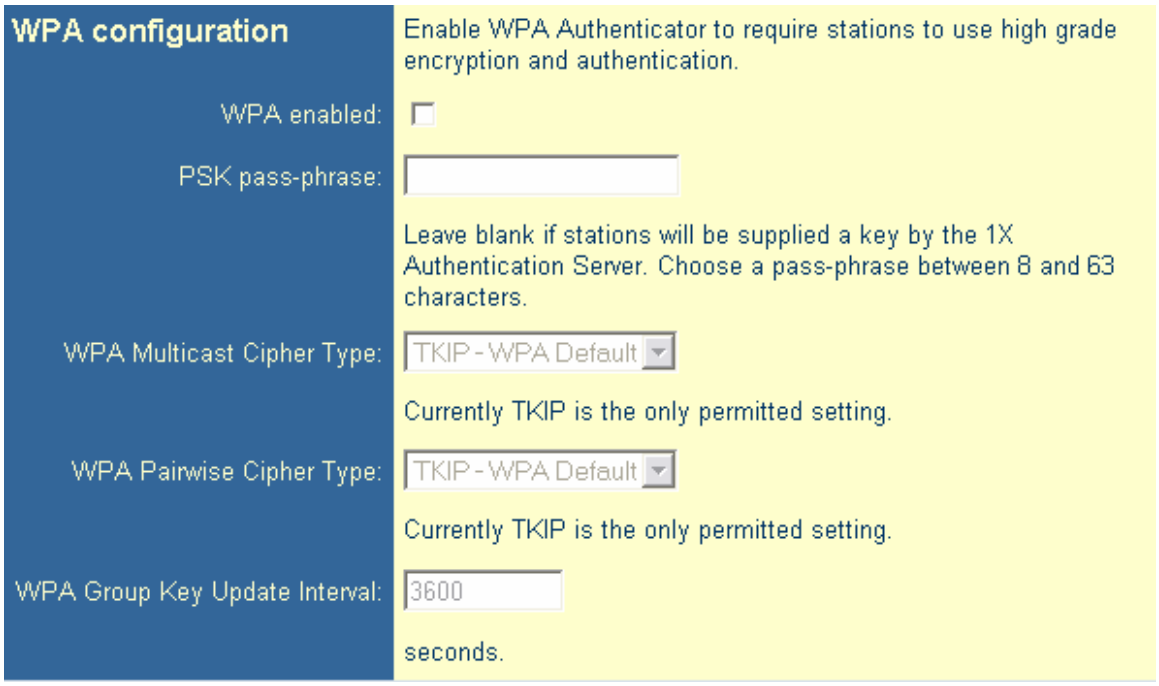
RTS Threshold: Set the RTS (Request to Send) frame length. You may configure the access point to initiate an RTS frame. If the packet size is smaller than the preset RTS threshold size, the RTS/CTS mechanism will NOT be enabled.
The access point sends Request to Send (RTS) frames to a particular receiving station to negotiate the sending of a data frame. After receiving an RTS, the station sends a CTS (Clear to Send) frame to acknowledge the right of the sending station to send data frames. The access points contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this "Hidden Node Problem."

Fragmentation Threshold: If the packet size is smaller than the preset Fragment size, the packet will not be segmented. Fragmentation of the PDUs (Package Data Unit) can increase the reliability of transmissions because it increases the probability of a successful transmission due to smaller frame size. If there is significant interference present, or collisions due to high network utilization, try setting the fragment size to send smaller fragments. This will enable the retransmission of smaller frames much faster. However, it is more efficient to set the fragment size larger if very little or no interference is present because it requires overhead to send multiple frames.

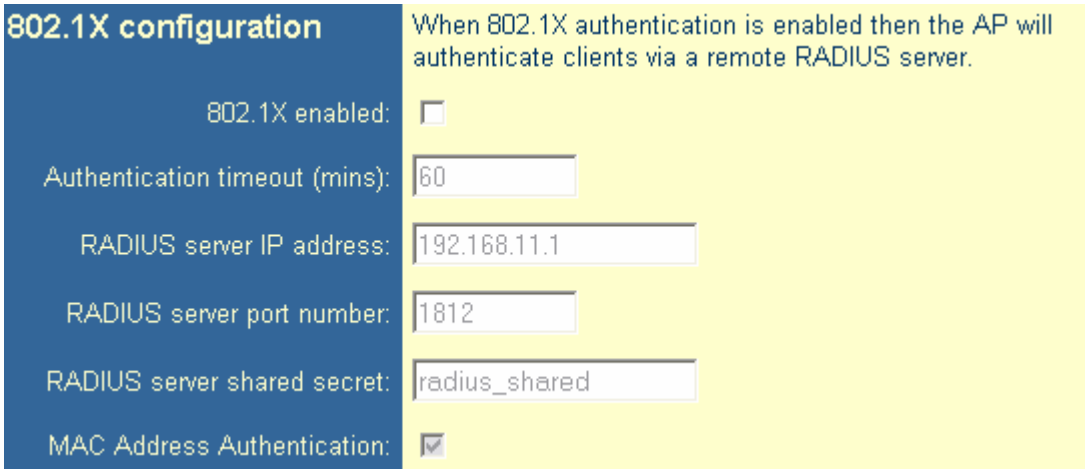
Beacon Interval: Set the interval value of beacon between synchronized frames. These synchronous frames also contain indication of frames that need to transmit to the power-saved stations.

DTIM: Set the Delivery Traffic Indication Message (DTIM) interval value. The DTIM indicates how often the MAC layer forwards multicast traffic. This parameter is necessary to accommodate stations using Power Save mode. In order to maximize the utilization of channels, broadcast data is not transmitted every beacon for stations in Power Save mode. These power-saved stations must wake up to receive broadcast data at the DTIM interval. The DTIM is the interval between two synchronous frames with broadcast information. If you set the value to 2, the access point will save all multicast frames for the BSS and forward them after every second beacon. Having smaller DTIM intervals delivers multicast frames in a more timely manner, causing stations in Power Save mode to wake up more often and drain power faster. Having higher DTIM values, though, delays the transmission of multicast frames.

Go to Wireless | Security to configure wireless security. Please click the [WPA enabled] checkbox and enter your desired pre-shared key (PSK) if you want to enable Wi-Fi Protected Access (WPA) security on your wireless LAN. You can also set the "WPA Group Key Update Interval" value. This specifies how often the wireless encryption keys are dynamically changed and clients re-authenticate.

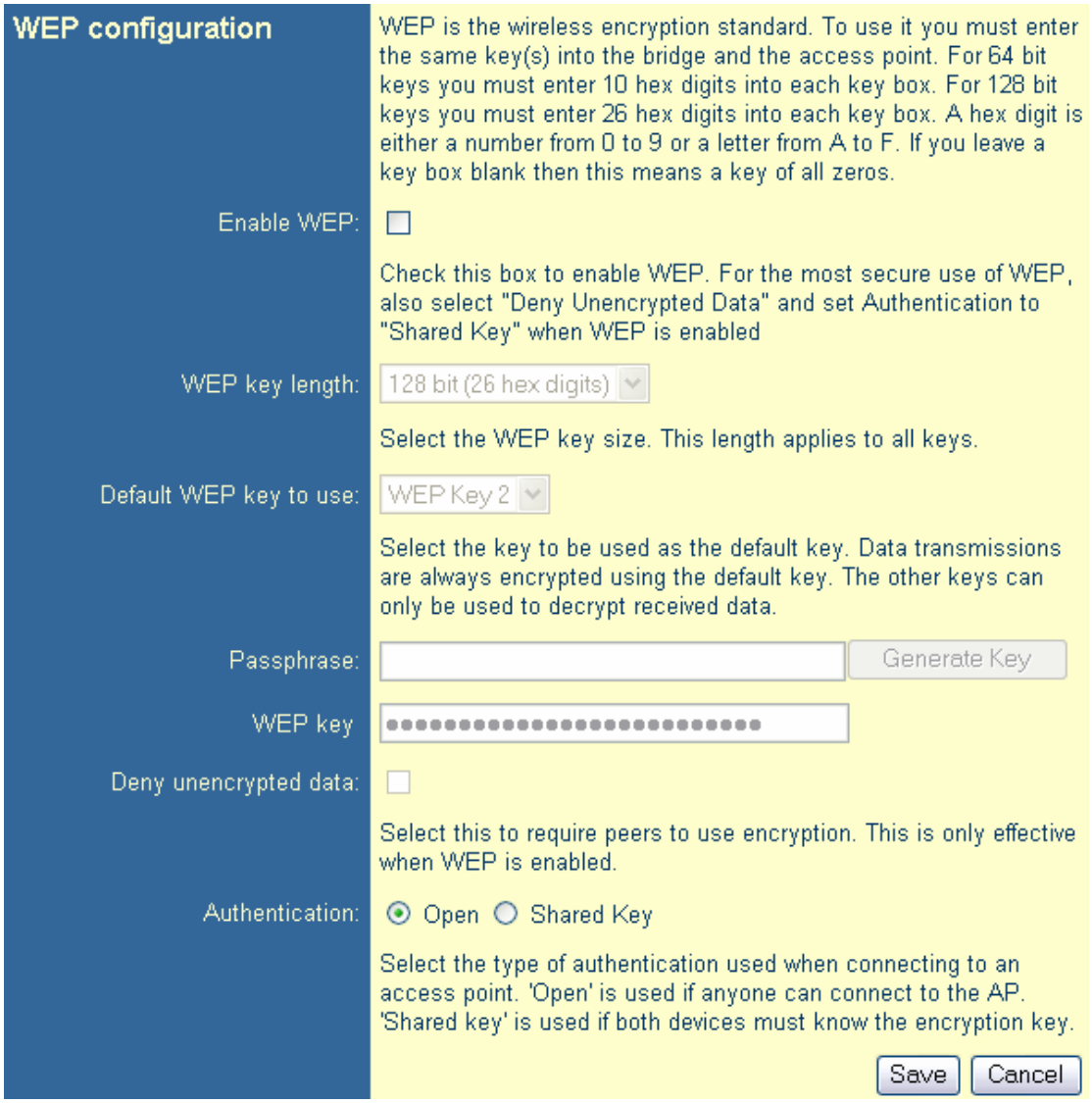


If you have a RADIUS server on your network, you can configure the SMC2870W to use it for the purpose of authenticating clients to your wireless LAN. Simply click the [802.1x enabled] checkbox and enter your settings:



Please click the [Enable WEP] checkbox if you want to enable Wired Equivalent Privacy (WEP) security on your wireless LAN. Then enter your desired key length and default WEP key. You can use the Passphrase function to automatically generate a WEP key or you can enter the full 10-digit (64-bit WEP) or 26-digit (128-bit WEP) manually in the "WEP key" field. Select your "Authentication" method and press [Save].

Note: A passphrase can contain up to 32 alphanumeric characters.

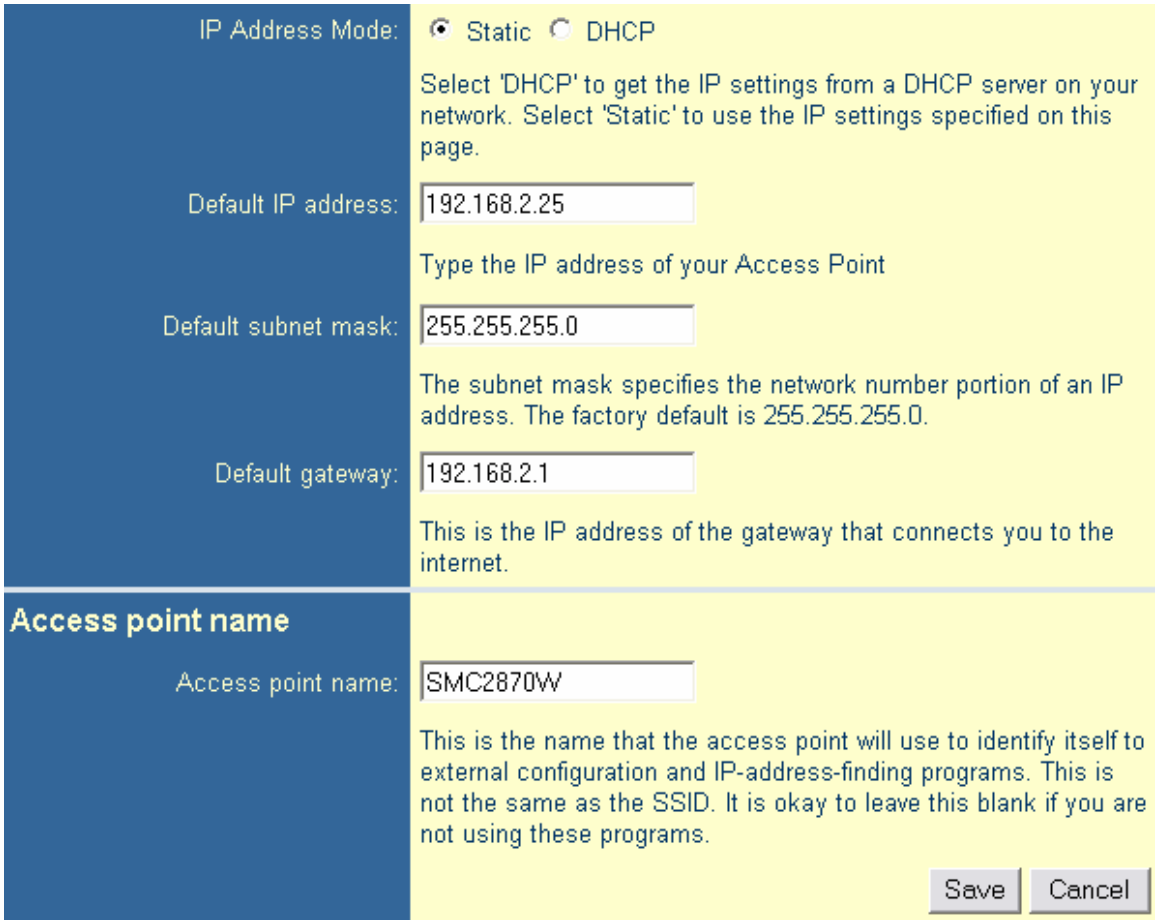


When setting up WEP without using the Passphrase function, only Hexadecimal characters (range: 0~9 and A~F) can be used. When encryption is set to 64-bit, a maximum of 10 Hex characters can be entered in the Key field. When encryption is set to 128-bit, a maximum of 26 Hex characters can be used.

Go to System | IP Settings to change additional advanced settings. (Note: If you are not sure how to use a particular setting or what it means, please review the Terminology section before continuing. Any erroneous changes made here may cause unwanted results.)

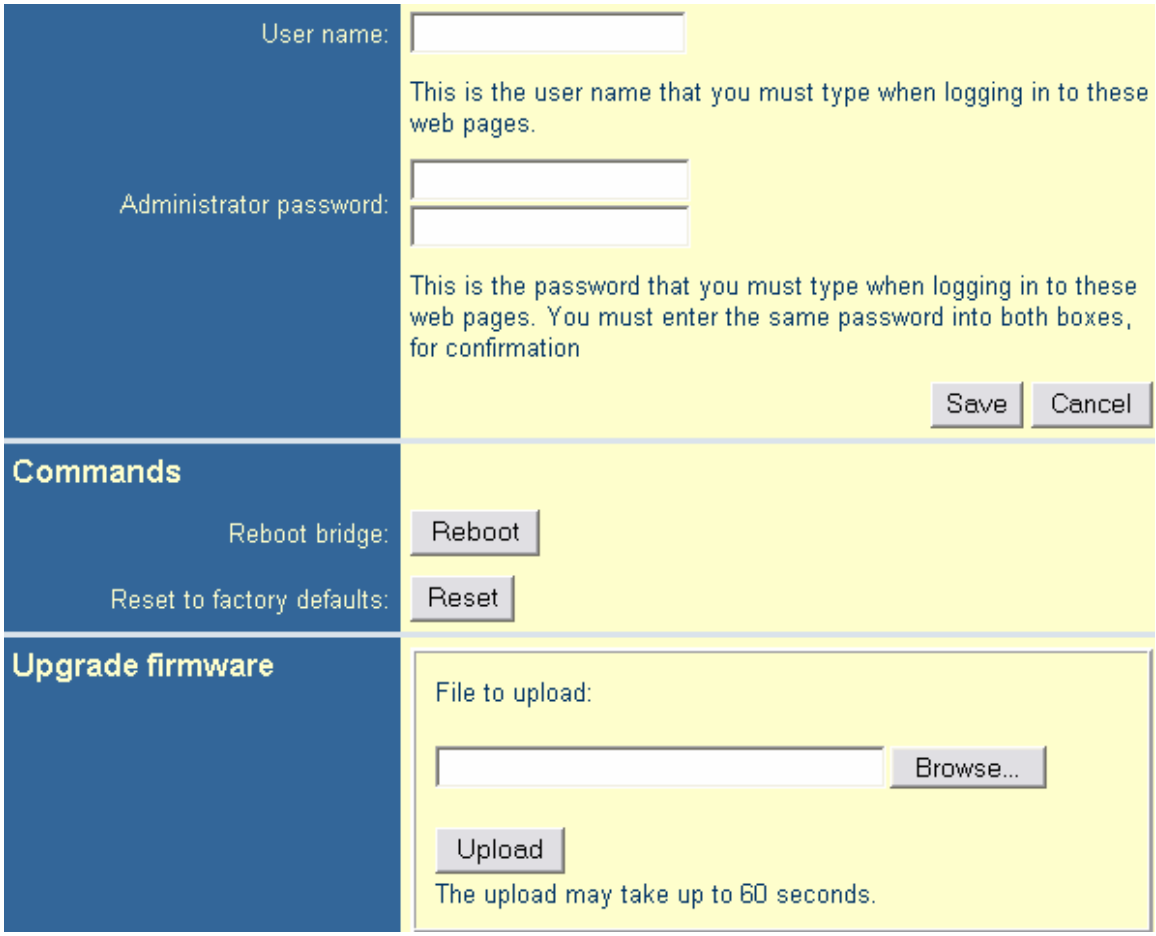
In the top portion, you can configure the unit with a static IP or set it up to use Dynamic Host Configuration Protocol (DHCP). Note: If you want to use DHCP, you must first make sure that you have a DHCP Server on your network ready to distribute additional IP Addresses.

In the Access Point name section, you can change the name of a particular SMC2870W device. This is very useful if you have more than one SMC2870W on your network.



Change the username and/or password used to log into the SMC2870W here. It is a good idea to write down your username and password if you decide to change it. If you forget this information in the future, you will need to reset the SMC2870W to defaults.

In the Commands section, you can reboot your SMC2870W or reset it to defaults.



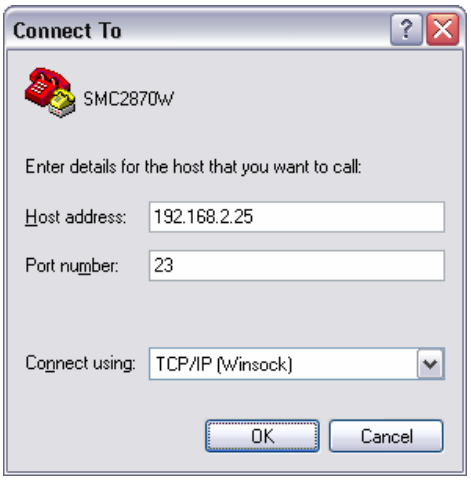
As we add functionality and future enhancements are made, firmware updates will be posted to SMC's website. After downloading the firmware, you need to update the SMC2870W via the web interface under this Upgrade Firmware section. Simply click the [Browse] button to locate and select the new firmware and then press [Upload].

11 | Advanced Telnet Configuration

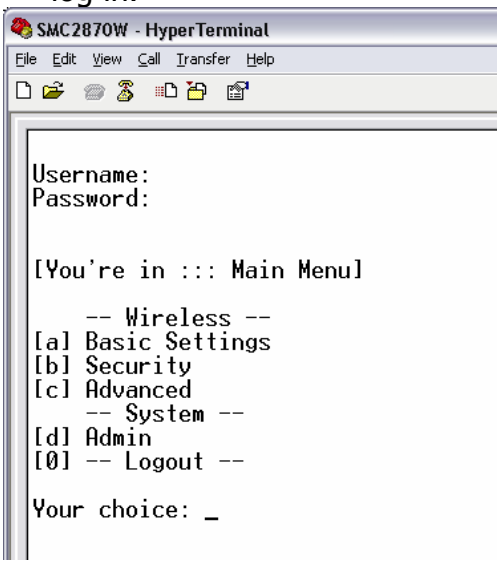
In addition to an EZ Installation Wizard and a Web-based Management Utility, SMC Networks also gives you the ability to manage the SMC2870W via Telnet.

All of the settings that are available via the Web-based Management are also made available in the Telnet session. You can use the standard Telnet or Hyperterminal programs built into Windows to manage the SMC2870W. The setup below was done with Hyperterminal:

1) Open Hyperterminal (if you do not have this program on your PC, you can install it using your original Windows CD)
2) Choose [Connect using:] TCP/IP (Winsock), enter your SMC2870W's IP address and use 23 as the Port number. Press [OK]



3) You will be asked to enter your Username and Password before you can log in.



4) You are now successfully logged into you SMC2870W and able to change settings. Note: Remember that any erroneous changes here can cause unwanted operation and results.

12 | Maximum Distance Table

Important Notice

Maximum distances posted below are actual tested distance thresholds. However, there are many variables such as barrier composition and construction, as well as local environmental interference that may impact your actual distances and cause you to experience distance thresholds far lower than those posted below. If you have any questions or comments regarding the features or performance of this product, or if you would like information regarding our full line of wireless products, visit us at www.smc.com, or call us toll-free at 800.SMC.4YOU. SMC Networks stands behind every product sold with a 30-day satisfaction guarantee and a limited-lifetime warranty.

802.11g Wireless Distance Table								
Environmental Condition	**Speed and Distance Ranges**							
	54	48	36	24	18	12	9	6
Outdoors: A line-of-sight environment with no interference or obstruction between the Access Point and users.	25 m (82 ft)	30 m (99 ft)	38 m (125 ft)	70 m (230 ft)	110 m (361 ft)	150 m (492 ft)	220 m (722 ft)	320 m (1050 ft)
Indoors: A typical office or home environment with floor to ceiling obstructions between the Access Point and users.	10 m (33 ft)	13 m (43 ft)	20 m (66 ft)	28 m (92 ft)	36 m (118 ft)	42 m (138 ft)	50 m (164 ft)	60 m (197 ft)

802.11b Wireless Distance Table				
Environmental Condition	**Speed and Distance Ranges**			
	11 Mbps	5.5 Mbps	2 Mbps	1 Mbps
Outdoors: A line-of-sight environment with no interference or obstruction between the Access Point and users.	220 m (722 ft)	340 m (1115 ft)	420 m (1378 ft)	520 m (1706 ft)
Indoors: A typical office or home environment with floor to ceiling obstructions between the Access Point and users.	50 m (164 ft)	65 m (213 ft)	80 m (263 ft)	90 m (296 ft)

13 | Troubleshooting

1) My PC won't communicate with a PC or printer connected to the EZ Connect™ g Wireless Ethernet Bridge.
    - Perform the following steps:
        a) Verify if the PC or printer connected to the Wireless Ethernet Bridge is on the same wireless network by checking the IP configuration.
        b) Verify if the SSID and other settings are the same for all devices connected to the same wireless network.
        c) If the wireless LAN settings are correct, verify all the devices are on the same IP network.

Check the Ethernet crossover cable and make sure it is properly connected and that the LINK/ACT LED is lit. If this LED is not lit, confirm you are using a crossover Ethernet cable.

2) I cannot get my Ethernet-equipped device online through the EZ Connect™ g Wireless Ethernet Bridge
    - Perform the following steps:
        a) If using DHCP, verify that the DHCP server has two available IP addresses – one for the SMC2870W and one for your Ethernet-equipped device
        b) If you have MAC Filtering/Access Control enabled on your Access Point, you must put the MAC Address of your SMC2870W into your AP's list of allowed clients. You can get the SMC2870W's MAC Address from the System Info page
        c) Verify that the LINK/ACT LED is lit. If this LED is not lit, confirm you are using a crossover Ethernet cable

3) I cannot access the web based management.
        a) Make sure that you have a network adapter installed on the PC so you can access the web based management
        b) Verify that you are on the same IP network as your SMC2870W. (See Section 9 for instructions)

14 | Technical Specification

Standards:
IEEE 802.11b / IEEE 802.11g

Wireless Data Rates (With Automatic Fall-back):
802.11b = 1/2/5.5/11 Mbps
802.11g = 6/9/12/18/24/36/48/54 Mbps

Data Modulation Techniques:
802.11b (DSSS) = BPSK, QPSK, CCK
802.11g (OFDM) = BPSK, QPSK, 16-QAM, 64-QAM

Operating Range:
Up to 1,700 ft

Radio Signal Type:
Direct Sequence Spread Spectrum (DSSS)
Orthogonal Frequency Division Multiplexing (OFDM)

Media Access Protocol:
CSMA/CA (Collision Avoidance) with ACK architecture 32-bit MAC

Security:
64/128-bit Wired Equivalent Privacy (WEP)
Temporal Key Integrity Protocol (TKIP)
802.1x
WPA (WiFi Protected Access)

LED:
Power
Wireless Transmit/Receive
Wired Transmit/Receive

Channel Support:
US/Canada - 1-11
Europe - 1-13
Japan – 1-14

RF Output Power:
17dBm +/- 1dBm

Antenna Type:
Two External Dipole

Dimensions:
6.3 x 1.2 x 4.7 in

Compliance:
USA: FCC Part 15 subpart C and Class B
Europe: ETSI 300.328/301-489-17
Industry Canada
IDA (Singapore)

Operating System Support (EZ Install Wizard):
Windows 98SE/Me/2000/XP

Temperature Range:
Operating temperature: -20C to 40C (-4F to 104F)
Storage temperature: -25C to 70C (-13F to 158F)
Humidity: 10 to 90% (non-condensing)

Receive Sensitivity:
802.11b
8% FER@1Mbps≦-91dBm
8% FER@2Mbps≦-88dBm
8% FER@5.5Mbps≦-85dBm
8% FER@11Mbps≦-83dBm

802.11g
10% PER@6Mbps≦-88dBm
10% PER@9Mbps≦-87dBm
10% PER@12Mbps≦-84dBm
10% PER@18Mbps≦-82dBm
10% PER@24Mbps≦-79dBm
10% PER@36Mbps≦-75dBm
10% PER@48Mbps≦-69dBm
10% PER@54Mbps≦-68dBm

15 | Terminology

10BaseT - Physical Layer Specification for Twisted-Pair Ethernet using Unshielded Twisted Pair wire at 10Mbps. This is the most popular type of LAN cable used today because it is very cheap and easy to install. It uses RJ-45 connectors and has a cable length span of up to 100 meters. There are two versions, STP (Shielded Twisted Pair) which is more expensive and UTP (Unshielded Twisted Pair), the most popular cable. These cables come in 5 different categories. However, only 3 are normally used in LANs, Category 3, 4 and 5. CAT 3 TP (Twisted Pair) cable has a network data transfer rate of up to 10Mbps. CAT 4 TP cable has a network data transfer rate of up to 16Mbps. CAT 5 TP cable has a network data transfer rate of up to 100Mbps.

Access Point - A device that is able to receive wireless signals and transmit them to the wired network, and vice versa - thereby creating a connection between the wireless and wired networks.

Ad Hoc - An ad hoc wireless LAN is a group of computers, each with LAN adapters, connected as an independent wireless LAN.

Adapter - A device used to connect end-user nodes to the network; each contains an interface to a specific type of computer or system bus, e.g. EISA, ISA, PCI, PCMCIA, CardBus, etc.

Auto-Negotiation - A signaling method that allows each node to define its operational mode (e.g., 10/100 Mbps and half/full duplex) and to detect the operational mode of the adjacent node.

Backbone - The core infrastructure of a network. The portion of the network that transports information from one central location to another central location where it is unloaded onto a local system.

Base Station - In mobile telecommunications, a base station is the central radio transmitter/receiver that maintains communications with the mobile radiotelephone sets within its range. In cellular and personal communications applications, each cell or micro-cell has its own base station; each base station in turn is interconnected with other cells' bases.

BSS - BSS stands for "Basic Service Set". It is an Access Point and all the LAN PCs that are associated with it.

CSMA/CA - Carrier Sense Multiple Access with Collision Avoidance

DHCP - Dynamic Host Configuration Protocol. This protocol automatically configures the TCP/IP settings of every computer on your home network.

DNS - DNS stands for Domain Name System, which allows Internet host computers to have a domain name (such as www.smc.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of host computers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing " www.smc.com" into your Internet browser), the user is sent to the proper IP address. The DNS server address used by the computers on your home network is the location of the DNS server your ISP has assigned.

DSL - DSL stands for Digital Subscriber Line. A DSL modem uses your existing phone lines to transmit data at high speeds.

EAP - (Extensible Authentication Protocol) This is a mode of conversation between a Supplicant and an Authentication Server. Access Points or proxy servers do not take part in the conversation. Their role is simply to forward EAP messages between the parties performing the authentication. The EAP messages are transported between a wireless station and an 802.1X Authenticator using EAPOL. The EAP messages are sent between an 802.1X Authenticator and the Authentication Server using RADIUS. The EAP framework supports the definition of EAP-Type Authentication Methods. Today, the major EAP-Type Authentication Methods include EAP-MD5, EAP-TLS, EAP-TTLS, EAP-PEAP, and Cisco's EAP-LEAP.

EAP-MD5 - This is the most basic EAP-Type, which must be supported by all implementations of EAP. It is not a strong authentication method and does not support dynamic WEP keys.

EAP-LEAP - (Lightweight Extensible Authentication Protocol) It is the type primarily used on Cisco WLAN access points. LEAP provides security during credential exchange, encrypts using dynamic WEP keys, and supports mutual authentication.

EAP-TLS - (Transport Layer Security) This uses the TLS handshake as the basis for authentication. TLS performs authentication by exchanging digital certificates. The server sends a certificate to the client and only after validating the server's certificate does the client present a client certificate.

EAP-TTLS - (Tunneled TLS) This mode an advantage over EAP-TLS that it only requires a certificate at the Authentication Server.

Ethernet - A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10 million bits per second (Mbps).

ESS - ESS (ESS-ID, SSID) stands for "Extended Service Set". More than one BSS is configured to become an Extended Service Set. LAN mobile users can roam between different BSSs in an ESS (ESS-ID, SSID).

Fast Ethernet NIC - Network interface card that is in compliance with the IEEE 802.3u standard. This card functions at the media access control (MAC) layer, using carrier sense multiple access with collision detection (CSMA/CD).

Fixed IP – (see Static IP)

Full-Duplex - Transmitting and receiving data simultaneously. In pure digital networks, this is achieved with two pairs of wires. In analog networks, or digital networks using carriers, it is achieved by dividing the bandwidth of the line into two frequencies, one for sending, one for receiving.

Hub - Central connection device for shared media in a star topology. It may add nothing to the transmission (passive hub) or may contain electronics that regenerate signals to boost strength as well as monitor activity (active/intelligent hub). Hubs may be added to bus topologies; for example, a hub can turn an Ethernet network into a star topology to improve troubleshooting.

IP Address - IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, that identifies an single, unique Internet computer host. Example: 192.34.45.8.

ISP - Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

LAN - A communications network that serves users within a confined geographical area. It is made up of servers, workstations, a network operating system and a communications link. Servers are high-speed machines that hold programs and data shared by network users. The workstations (clients) are the users' personal computers, which perform stand-alone processing and access the network servers as required.

Diskless and floppy-only workstations are sometimes used, which retrieve all software and data from the server. Increasingly, "thin client" network computers (NCs) and Windows terminals are also used. A printer can be attached locally to a workstation or to a server and be shared by network users. Small LANs can allow certain workstations to function as a server, allowing users access to data

on another user's machine. These peer-to-peer networks are often simpler to install and manage, but dedicated servers provide better performance and can handle higher transaction volume. Multiple servers are used in large networks.

MAC Address - MAC (Media Access Control) A MAC address is the hardware address of a device connected to a network.

MDI / MDI-X - Medium Dependent Interface - Also called an "uplink port," it is a port on a network hub or switch used to connect to other hubs or switches without requiring a crossover cable. The MDI port does not cross the transmit and receive lines, which is done by the regular ports (MDI-X ports) that connect to end stations. The MDI port connects to the MDI-X port on the other device. There are typically one or two ports on a device that can be toggled between MDI (not crossed) and MDI-X (crossed).
Medium Dependent Interface – X (crossed) - A port on a network hub or switch that crosses the transmit lines coming in to the receive lines going out.

NAT – (Network Address Translation) This process allows all of the computers on your home network to use one IP address. The NAT capability of the Barricade, allows you to access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP. Network Address Translation can be used to give multiple users access to the Internet with a single user account, or to map the local address for an IP server (such as Web or FTP) to a public address. This secures your network from direct attack by hackers, and provides more flexible management by allowing you to change internal IP addresses without affecting outside access to your network. NAT must be enabled to provide multi-user access to the Internet or to use the Virtual Server function.

Packet Binary Convulational Code(tm) (PBCC) - A modulation technique developed by Texas Instruments Inc. (TI) that offers data rates of up to 22Mbit/s and is fully backward compatible with existing 802.11b wireless networks.

PCI - Peripheral Component Interconnect - Local bus for PCs from Intel that provides a high-speed data path between the CPU and up to 10 peripherals (video, disk, network, etc.). The PCI bus runs at 33MHz, supports 32-bit and 64-bit data paths, and bus mastering.

PPPoE - Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a method of secure data transmission originally created for dial-up connections. PPPoE is for Ethernet connections.

Roaming - A function that allows your to move through a particular domain without losing network connectivity.

Static IP - If your Service Provider has assigned a fixed IP address; enter the assigned IP address, subnet mask and the gateway address provided by your service provider.

Subnet Mask - A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet.

TKIP - (Temporal Key Integrity Protocol) The TKIP process begins with a 128-bit "temporal key" which is shared among clients and access points. Then it combines the temporal key with the client's MAC address and adds a 16-octet initialization vector to create the key that will encrypt the data. This procedure ensures that each station uses different key streams to encrypt the data.

TCP/IP - Transmission Control Protocol/Internet Protocol. This is the standard protocol for data transmission over the Internet.

TCP - Transmission Control Protocol - TCP and UDP (User Datagram Protocol) are the two transport protocols in TCP/IP. TCP ensures that a message is sent accurately and in its entirety. However, for real-time voice and video, there is really no time or reason to correct errors, and UDP is used instead.

UDP - User Datagram Protocol - A protocol within the TCP/IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

Wi-Fi Protected Access (WPA) – Wi-Fi Protected Access (WPA) is a set of interoperable security improvements that greatly increase the level of data encryption and authentication for existing and future wireless LAN systems. It solves several issues with the widely used WEP standard.

Wired Equivalent Privacy (WEP) - “Wired Equivalent Privacy” is based on the use of 64-bit or 128-bit keys and the popular RC4 encryption algorithm. Wireless devices without a valid WEP key will be excluded from network traffic.

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