User Guide

Wireless Access Point

WA840G

MOTOROLA

intelligence everywhere™

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. THE UNIT MUST NOT BE EXPOSED TO DRIPPING OR SPLASHING. DO NOT PLACE OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ON THE UNIT.

CAUTION: TO ENSURE REGULATORY COMPLIANCE, USE ONLY THE PROVIDED POWER AND INTERFACE CABLES.

CAUTION: DO NOT OPEN THE UNIT. DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE INSTALLATION AND TROUBLESHOOTING INSTRUCTIONS. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

This device must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Postpone router installation until there is no risk of thunderstorm or lightning activity in the area.

Do not overload outlets or extension cords, as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in a shock or fire hazard.

Route 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 where they are attached to plugs and convenience receptacles, and examine the point where they exit from the product.

Place this equipment in a location that is close enough to an electrical outlet to accommodate the length of the power cord.

Place this equipment on a stable surface.

When using this device, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- Read all of the instructions {listed here and/or in the user manual} before you operate this equipment. Give particular attention to all safety precautions. Retain the instructions for future reference.
- Comply with all warning and caution statements in the instructions. Observe all warning and caution symbols that are affixed to this equipment.
- Comply with all instructions that accompany this equipment.
- Avoid using this product during an electrical storm. There may be a risk of electric shock from lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet, and disconnect the cable system. This will prevent damage to the product due to lightning and power surges.
- Operate this product only from the type of power source indicated on the product's marking label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
- Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

It is recommended that the customer install an AC surge protector in the AC outlet to which this device is connected. This is to avoid damaging the equipment by local lightning strikes and other electrical surges.

Different types of cord sets may be used for connections to the main supply circuit. Use only a main line cord that complies with all applicable product safety requirements of the country of use.

Installation of this product must be in accordance with national wiring codes.

Place unit to allow for easy access when disconnecting the power cord/adapter of the device from the AC wall outlet.

Wipe the unit with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.

This product was qualified under test conditions that included the use of the supplied cables between system components. To be in compliance with regulations, the user must use these cables and install them properly. Connect the unit to a grounding type AC wall outlet using the power adapter supplied with the unit.

Do not cover the device, or block the airflow to the device with any other objects. Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.

Installation must at all times conform to local regulations.

FCC Compliance Class B Digital Device

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 environment. 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 one 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.

CAUTION: Changes or modifications not expressly approved by Motorola for compliance could void the user's authority to operate the equipment.

Canadian Compliance

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Cet appareil numérique de la classe B respects toutes les exigences du Règlement sur le matériel brouilleur du Canada.

FCC Declaration of Conformity

Motorola, Inc., Broadband Communications Sector, 101 Tournament Drive, Horsham, PA 19044, 1-215-323-1000, declares under sole responsibility that the WR850G, WE800G, WA840G, and BR700 comply with 47 CFR Parts 2 and 15 of the FCC Rules as a Class B digital device. This device complies with Part 15 of FCC Rules. Operation of the device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

Motorola reserves the right to revise this publication and to make changes in content from time to time without obligation on the part of Motorola to provide notification of such revision or change. Motorola provides this guide without warranty of any kind, either implied or expressed, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Motorola may make improvements or changes in the product(s) described in this manual at any time.

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Section 1:Overview

Congratulations on purchasing the Motorola Wireless Access Point WA840G.

With the WA840G, you can network with everyone in your home or small office — wirelessly. The centerpiece of a user-friendly wireless network, the WA840G is a capable of providing data rates up to 54 Mbps, which is nearly 5 times faster than 802.11b networking.

Using the WA840G, you can effortlessly share files, pictures, peripherals, printers and more with everyone else on the network. By connecting a broadband modem (cable, DSL or other) and a router, you can also share a single high speed Internet connection. That's everyone online, all at the same time.

Because the access point is built with both the popular 802.11b wireless standard and the new nearly 5-times-faster 802.11g standard, your access point provides you the ultimate in flexibility and speed. With Wi-Fi® Protected Access (WPA) included, your wireless connections are robust and secure, giving you the security to communicate without fear that your signal might be compromised.

Upgradeable firmware keeps the access point's control software up-to-date. The WA840G captures the latest technology in a package that will stay current for many years, protect your home network, and provide you with easy home network management.

Wireless Access Point WA840G

Your wireless access point offers these great features:

Wireless Connectivity

Connects your PC to your wireless network and allows you to communicate unfettered. Using the 802.11g and 802.11b wireless communication standards will ensure compliance with current and future standards.

Secure Transmission

Protection against Internet intruders is crucial. The access point supports single session encryption when communicating with just the client, and it also supports network encryption when communicating with surrounding wireless networks.

The access point supports Wi-Fi Protected Access (WPA) and Media Access Control (MAC) filtering protocols, giving you the choice to share your Internet connection with only those you designate.

Your Motorola Wireless Access Point WA840G connects and protects you. Built-in security coupled with upgradeable firmware ensures your access point will work for you for years to come.

A Word about Data Rates: Data rate is the speed at which individual bits of data flow through a channel. It is not the same speed at which entire files are uploaded or downloaded. These speeds will vary, and are often less than the maximum data rate. Upload and download speeds are affected by several factors including, but not limited to: the capacity of and the services offered by your cable operator or broadband service provider, channel capacity, network traffic, computer equipment, type of server, number of connections to server, and availability of Internet router(s).

Features

- CD-ROM based Installation Assistant for easy installation
- Web-based configuration of features using any web browser
- Compatibility with both 802.11g and 802.11b standards
- Wireless security using WPA, 802.1X Authentication, Temporal Key Integrity Protocol (TKIP), and Advanced Encryption Standard (AES)
- Wireless Distribution System (WDS) mode supporting peer-to-peer communication with other WA840G or WR850G devices
- Firmware upgrade to stay current with latest specification
- Easily extend your home network in the office or other places, for example, at tradeshows

Understanding Your User Guide

The User Guide is divided into the following sections:

Overview
Describes the access point and its functions, the technology used, and the recommended methods for positioning the access point.

Installation
It is assumed that you will use the Installation Wizard on the CD-ROM to setup your access point. If not, refer to this section for instructions on getting your access point up and running.

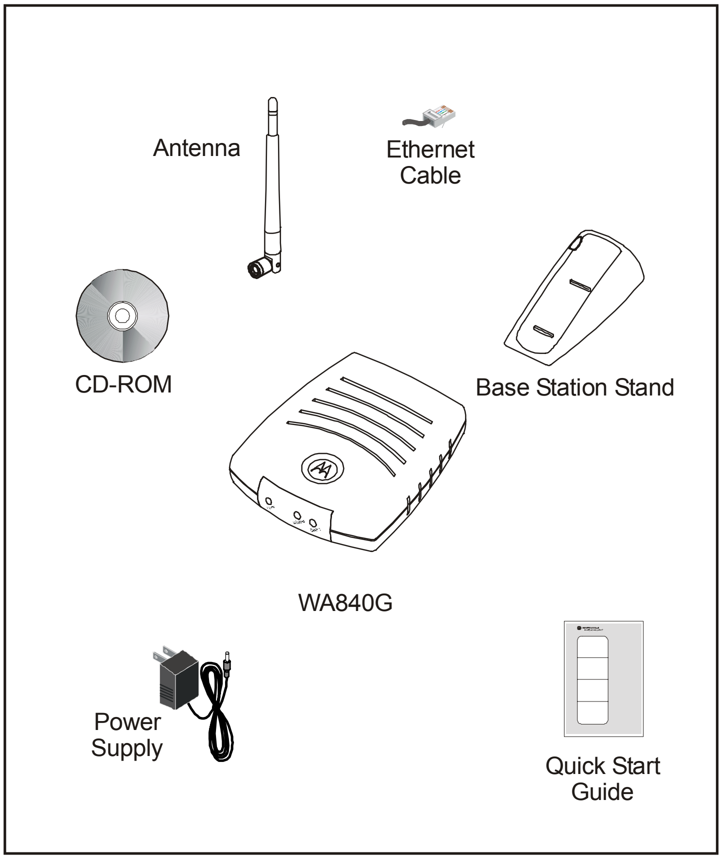
After you have completed this section, your access point will be active and ready to work.

Configuration
Describes the Configuration Utility that manages your access point.

Glossary
List of terms and acronyms.

Box Contents

Your box contains the following:



Wireless Connections

Before installing your wireless access point, please take a few minutes to review the wireless networking functions described in this section.

Access Point

Generally, access points wirelessly connect networks together, such as your network with the Internet. Or, by configuring multiple clients such as laptops, each using their own access point, you are able to create your own private wireless Ad-Hoc network.

LAN

Local Area Network. A local area network provides a full-time, high-bandwidth connection over a limited area such as a home, building, or campus. Ethernet is the most widely used LAN standard.

TCP/IP

Transmission Control Protocol/Internet Protocol (TCP/IP) comprises the backbone of the Internet. IP moves packets of data between nodes while TCP verifies delivery from client to server. The device you hook up to your wireless access point will identify itself with an IP address so that the network will know where to retrieve and deposit requested information.

Static IP Address

A static IP address is a fixed address that is assigned manually to a device on the network. Static IP addresses must be unique and cannot be shared, therefore they are used in situations where the address should never change, like print servers or PC servers.

Dynamic IP Address

A dynamic IP address is a temporary IP number, dynamically or randomly generated by a DHCP server. The address lasts only as long as the server allots, usually in the space of a day or two. When the IP address expires, the client is automatically reassigned a new IP address, ensuring smooth communication.

Positioning Your Access Point

To achieve the best wireless performance, review these guidelines before deciding where to place your access point:

- Placing your base station in the physical center of your network is the best location because the antenna sends out the signal in all directions.
- Placing the access point in a higher location, such as on top of a cabinet, helps to disperse the signal cleanly, especially to receiving locations on upper stories.
- If possible, position your access point so there is a direct line of sight between the access point and your other home network devices.
- Avoid placing the access point next to large solid objects like computer cases, monitors, walls, fireplaces, etc. This helps the signal penetrate more cleanly.
- Other wireless devices like televisions, radios, microwaves and 2.4 GHz cordless telephones can interfere with the signal. Keep devices away from the access point.
- Mirrors, especially silver-coated, can reduce transmission performance.

Wireless Range

The following describes different scenarios for the expected range of the coverage area of the access point. This table is only a guide and coverage varies due to local conditions.

Data Rate	Open Area	Closed Area
54 Mbps	Up to 100 ft (30m)	Up to 60 ft (18m)
11 Mbps	Up to 900 feet (275 m)	Up to 160 feet (49 m)
5.5 Mbps	Up to 1300 feet (396 m)	Up to 200 feet (61 m)
2 or 1 Mbps	Up to 1500 feet (457 m)	Up to 300 feet (91 m)

Technical Specifications

Your wireless access point uses a radio transmission technology defined by the Institute of Electrical and Electronics Engineers (IEEE) called 802.11 or Wi-Fi (Wireless Fidelity). This standard is subdivided into distinct categories of speed and the frequency spectrum used, designated by the lower case letter after the standard. For example, your access point supports both the ‘b’ and ‘g’ specifications. The 802.11b specification transmits data rates up to 11 Mbps while the 802.11g specification transmits data rates up to 54 Mbps. These are theoretical speeds so your performance may vary. The radio waves radiate out in a donut-shaped pattern. The waves travel through walls and floors, but transmission power and distance are affected. The theoretical distance limit is 1,000 feet (305 meters), but actual throughput and distance varies.

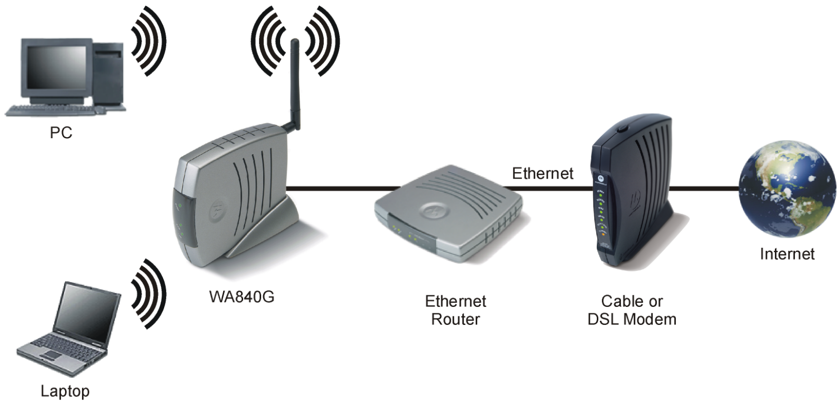
Both standards operate in the 2.4 GHz range, meaning other electrical appliance also might interfere with the access point – televisions, radios, microwave ovens, and 2.4 GHz cordless telephones. Thus positioning your access point where it encounters the least interference gains the greatest benefit to maintaining a quality connection.

Type of Networks

Your access point can be used in several ways. The following examples illustrate the flexibility of your WA840G. Some examples require additional hardware.

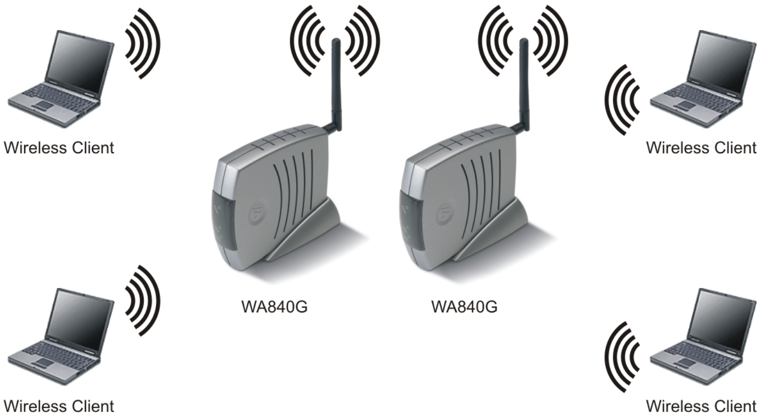
Access Point Mode

In this mode, the WA840G connects wireless clients to a wired Ethernet network. This example shows the most likely use for the access point, because it shares an Internet connection with your laptop or other wireless client.



WDS Access Point Mode

In this mode, the WA840G wirelessly connects its wireless clients to other access points.



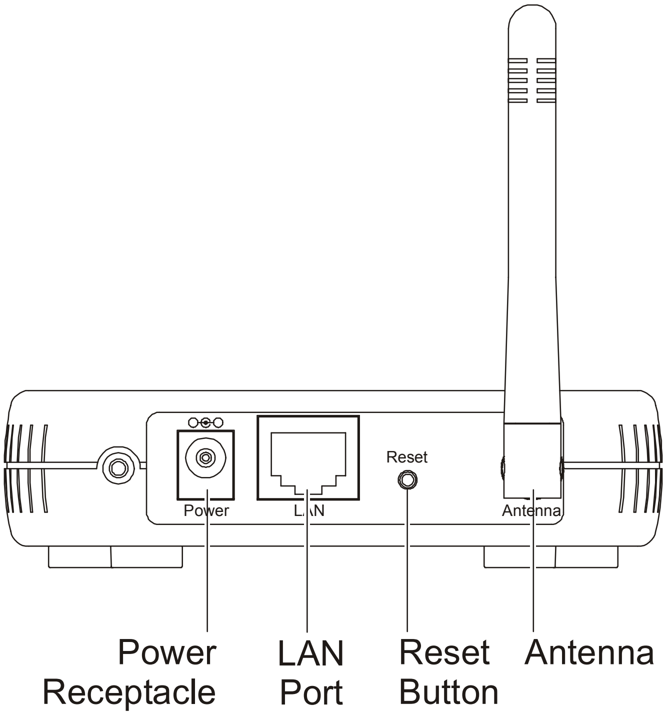
Access Point Physical Description

The following sections describe the physical characteristics of your access point.

For instructions on installing your access point, see Section 2: Installation.

Back of Access Point

The following illustration shows the WA840G back panel:

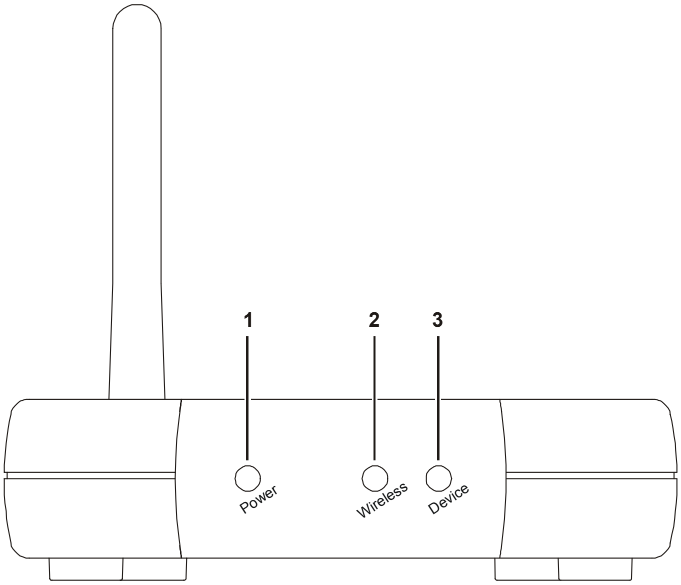


Feature	Description
Power Receptacle	The receptacle where you plug in the power adapter.
LAN Port	This port connects your access point to the Internet, your LAN network, or PC using an Ethernet cable. This allows communication between the devices. The LAN port supports either 10BASE-T or 100BASE-T transmission speeds as well as straight-through and Crossover Ethernet cables.

Feature	Description
Reset Button	Resets your access point or resets the access point to the default login settings. If the access point experiences trouble connecting to the Internet, briefly press and release the **Reset** button to reset the access point. This retains the access points configuration information. To reset the access point to the factory defaults, while the access point is powered, press and hold the **Reset** button for more than 5 seconds. This clears the access point’s user settings, including User ID, Password, IP Address, and Subnet Mask. To re-configure the access point, see Section 3: Configuration.
Antenna	The antenna used for wireless connections. You are able to rotate and tilt the antenna to gain the best signal reception.

Front of Access Point

The following illustration shows the WA840G front panel:



The access point LEDs indicate its operational status.

LED Description

The underlined items represent network activity.

LED	Condition	Color	Status
1 Power	ON	**Green**	The device is powered on and operating normally.
	Blinking	**Green**	Firmware update is in progress.
	Blinking/ON	**Red**	The power LED turns RED as soon as the reset button is depressed. If the reset button is held down for more than 5 seconds, the LED starts to blink during which the access point's default user name, password and IP address will be restored. The LED then turns OFF until the reset button is released. The power LED blinks RED if the firmware is corrupted indicating the firmware needs to be restored.
2 Wireless	OFF	**None**	No mobile station or access point has been associated with this device.
	ON	**Red**	The wireless interface has been disabled by the firmware.
	ON/Blinking	**Green**	802.11b/802.11g connection exists in this wireless domain/active traffic present.
3 Device	OFF	**None**	No external Ethernet device has been attached and detected. The Ethernet link is down.
	ON/Blinking	**Amber**	10BaseT link detected/active traffic present.
	ON/Blinking	**Green**	100BaseT link detected/active traffic present.

Section 2:Installation

To get your network up and running:

- Set up your hardware.
- Insert the CD-ROM for Software Setup. Follow the prompts.

If you prefer to set up the access point's software manually, refer to the Manual Software Setup found in this section.

The following sections provide detailed instructions for completing these tasks.

Hardware Setup

Hardware setup includes:

- Antenna Installation: verifying the antenna is connected to the access point.
- Physical Installation: where you physically place your access point.
- Electrical Connection: how to power your access point.

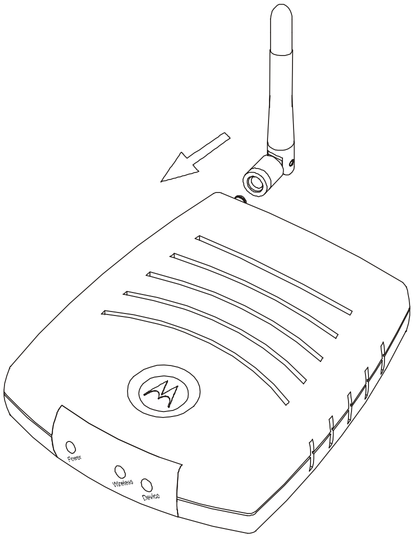
Antenna Installation

When shipped, the antenna is connected to the access point. If for some reason you need to detach and reattach the antenna to the main access point:

1 Locate the antenna threaded knob on the back of the access point.

2 To remove the antenna, unscrew the antenna connector counter-clockwise

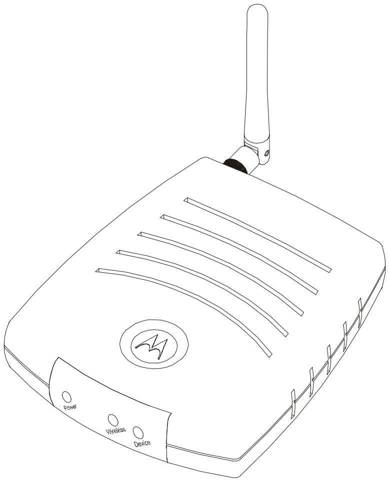
3 To reattach the antenna, screw the antenna connector clockwise on to the threaded knob until firmly seated. Do not overtighten.



Access Point Physical Installation

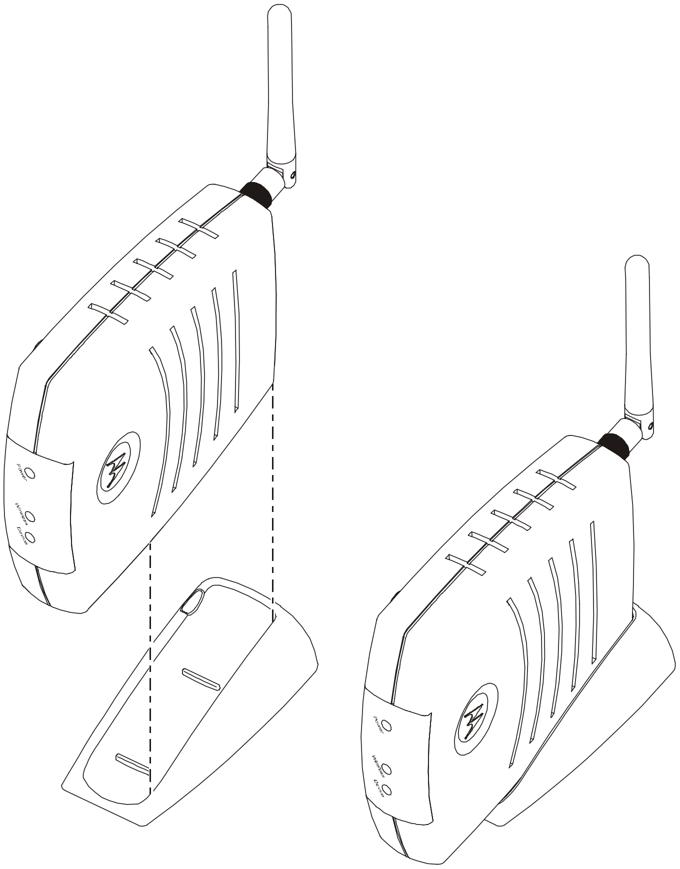
You can install the access point horizontally or vertically. The access point can also be mounted on a wall.

Horizontal Installation



1 Place the access point in the desired location and follow the procedures below for connecting and configuring the access point.

Vertical Installation



1 Insert the access point into the supplied base. Ensure that the antenna’s location is on top. The access point’s foot slides snugly into the base to keep the access point stable.

2 Follow the installation procedures for connecting and configuring the access point.

Wall Mount Installation

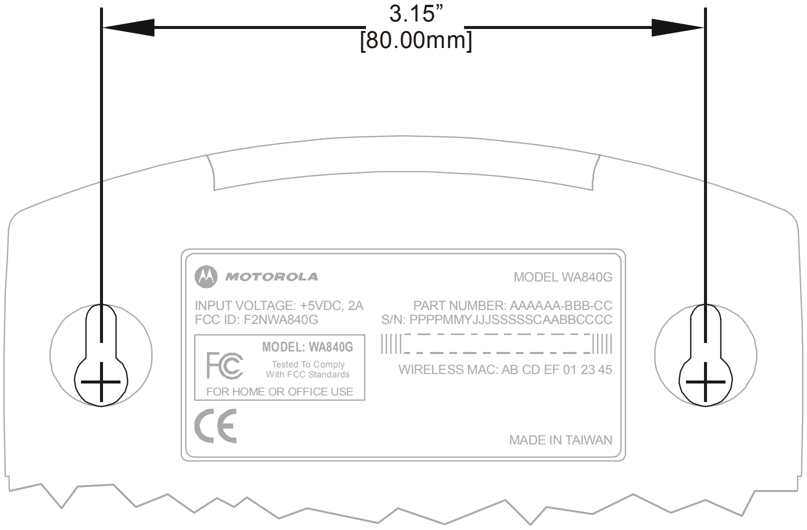
If you mount the access point on the wall, you must:

- Position the access point as specified by the local or national codes governing residential or business communications services.
- Follow all local standards for installing a network interface unit/network interface device (NIU/NID).

If possible, mount the access point to concrete, masonry, a wooden stud, or other solid wall material. Use anchors when necessary; for example, if you must mount the access point on drywall.

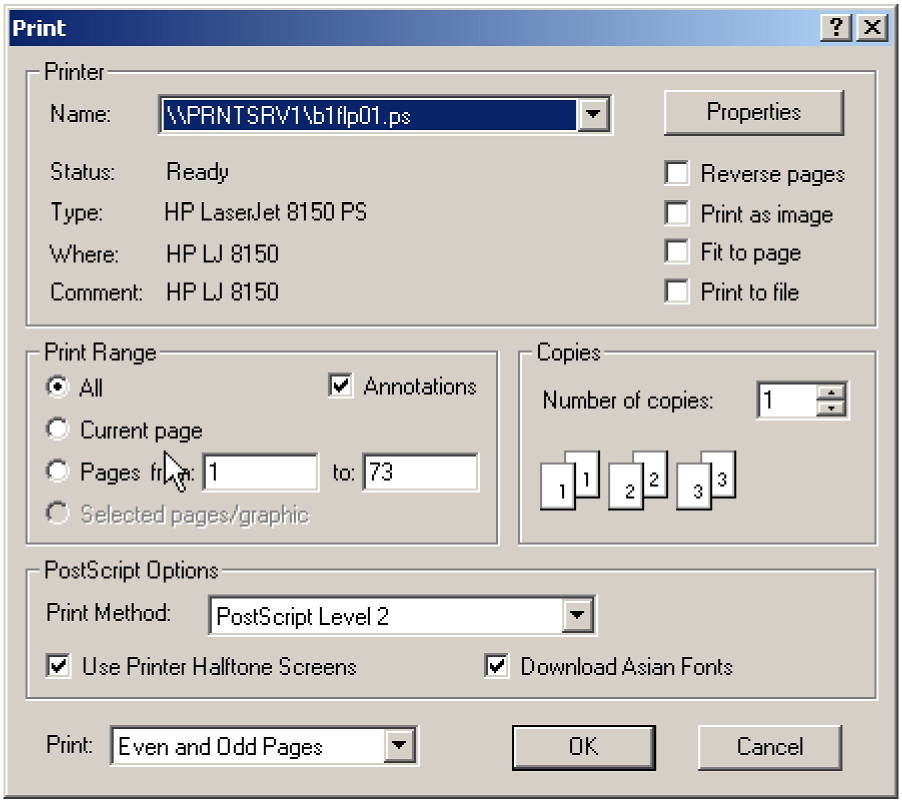
To mount your access point on the wall:

1 Print the Wall Mounting Template shown on this page:



The illustration is drawn at a one-to-one scale, which means that when printed, it provides the exact dimensions required to mount the access point.

2 Click the **Print** icon or choose **Print** from the File menu to display the Print dialog box:



Print

Printer

Name: \\PRNTSRV1\b1flp01.ps

Status: Ready

Type: HP LaserJet 8150 PS

Where: HP LJ 8150

Comment: HP LJ 8150

□ Reverse pages

□ Print as image

□ Fit to page

□ Print to file

Print Range

● All ☑ Annotations

○ Current page

○ Pages from: 1 to: 73

○ Selected pages/graphic

Copies

Number of copies: 1

PostScript Options

Print Method: PostScript Level 2

☑ Use Printer Halftone Screens ☑ Download Asian Fonts

Print: Even and Odd Pages

In both the *Pages from* and *to* fields, enter the page number on which the Wall Mounting Template appears.

Be sure you print the template at 100% scale and that Fit to page is not checked in the Print dialog box.

3 Click **OK**.

4 Measure the printed template with a ruler to ensure that it is the correct size.

5 Use a center punch to mark the center of the holes on the wall.

6 On the wall, locate the marks for the mounting holes you just made.

WARNING!

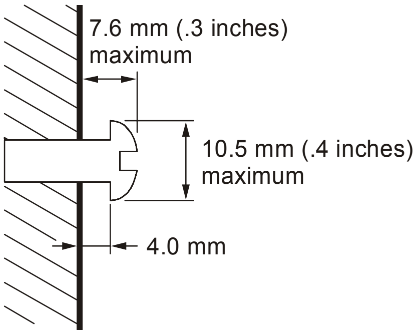
Before drilling holes, check the structure for potential damage to water, gas, or electric lines.

7 Drill the holes to a depth of at least 3.8 cm (1½ inches).

8 If necessary, seat an anchor in each hole. Use M5 x 38 mm (#10-16 x 1½ inch) screws with a flat underside and maximum screw head diameter of 10.5 mm to mount the access point.

9 Using a screwdriver, turn each screw until part of it protrudes from the wall, as shown:

- There must be 4.0 mm (.16 inches) between the wall and the underside of the screw head.
- The maximum distance from the wall to the top of the screw head is 7.6 mm (.3 in).



10 Remove the front two plastic feet, nearest to the LED panel, from the bottom of the access point to uncover the keyholes.

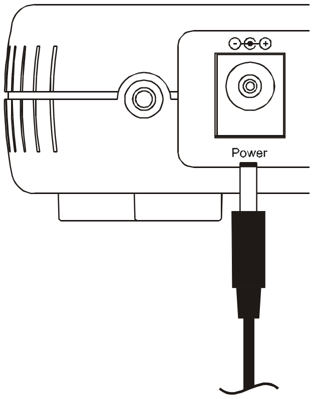
11 Place the access point so the keyholes are above the mounting screws.

12 Slide the access point down until it stops against the top of the keyhole opening.

13 Follow the installation procedures for connecting and configuring the access point.

Electrical Connection to Access Point

Your access point does not have an On/Off power switch and therefore will only be powered on by plugging in the power adapter. Use only the original power adapter supplied with your access point.



To power supply

1. Connect the power adapter to the access point's **Power** port, found on the back of the access point.
2. Plug the power adapter into a grounded and surge-protected power outlet.

   The Power LED on the front panel lights green when connected properly.

Easy Software Setup

Run the Installation Wizard program from the supplied CD-ROM to quickly set up your network. Once your network is up and running, refer to Section 3: Configuration for advanced configuration.

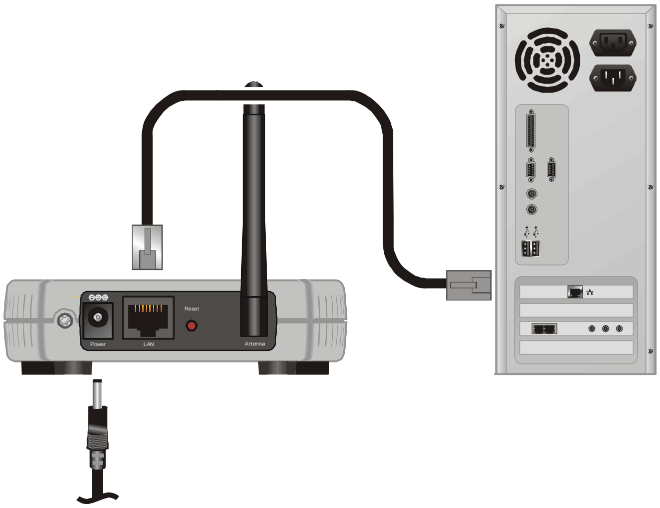
Manual Software Setup

If you'd prefer to manually set up your network, use this section to configure it. This section details the physical connection of the access point to your network as well as the configuration needed by your PC.

To set up your wireless network:

- Physically connect and power on the access point
- Configure your PCs
- Enter Wireless Security settings

Wired Connection to Access Point



If you are connecting your PC with an Ethernet cable to the access point, your PC must be installed first with an Ethernet adapter.

You need one Ethernet cable for this procedure, to connect the PC to the access point.

1. Using the supplied Ethernet cable, connect one end of the cable to your PC's Ethernet adapter and the other end to the **LAN** port on the access point.
2. To configure the initial settings of the access point, please see Configure your Computers.

Wireless Connection to Access Point

WARNING!

When first configuring your access point, it is recommended that use an Ethernet cable. Performing the INITIAL configuration using a wireless connection is not secure and is not recommended.

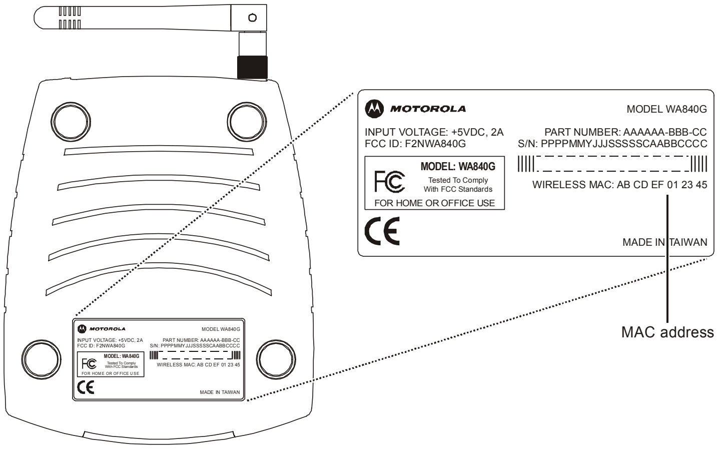
After you have finished the initial configuration of the access point, your connection will be secure and you can safely use either a wired or wireless connection.

Reset
Power
LAN
Antenna

If you are connecting your client wirelessly to the access point, you can use the Motorola WPCI810G, a wireless PCI card for your desktop PC. If you have a laptop, the Motorola WN825G wireless PC card provides access.

The WN825G and WPCI810G are not supported under Windows 95, 98, or NT. Windows 98SE, ME, 2000, and XP are supported.

1 To connect the PC to the access point through a wireless connection, ensure the PC's wireless adapter SSID (Service Set Identifier) is set the access point's SSID.



2 The default setting is **motorola** appended with the last 3 characters of the Wireless MAC address (an example SSID: **motorola 345**) and that no encryption and authentication are enabled.

3 To configure the initial settings of the access point, please see Configure your Computers.

Configure Your Computers

For initial configuration, you need to configure the PC’s network setting to specify a static IP address for the computer that is going to communicate with the access point.

After initial configuration:

If…	**Then…**
Using DHCP	Reconfigure the PC’s settings to ***Obtain An IP Address Automatically***.
Not using DHCP	Continue to use the Static IP settings.

This section includes information on configuring computers with the following operating systems:

- Windows® 98SE
- Windows ME®
- Windows® 2000
- Windows XP™

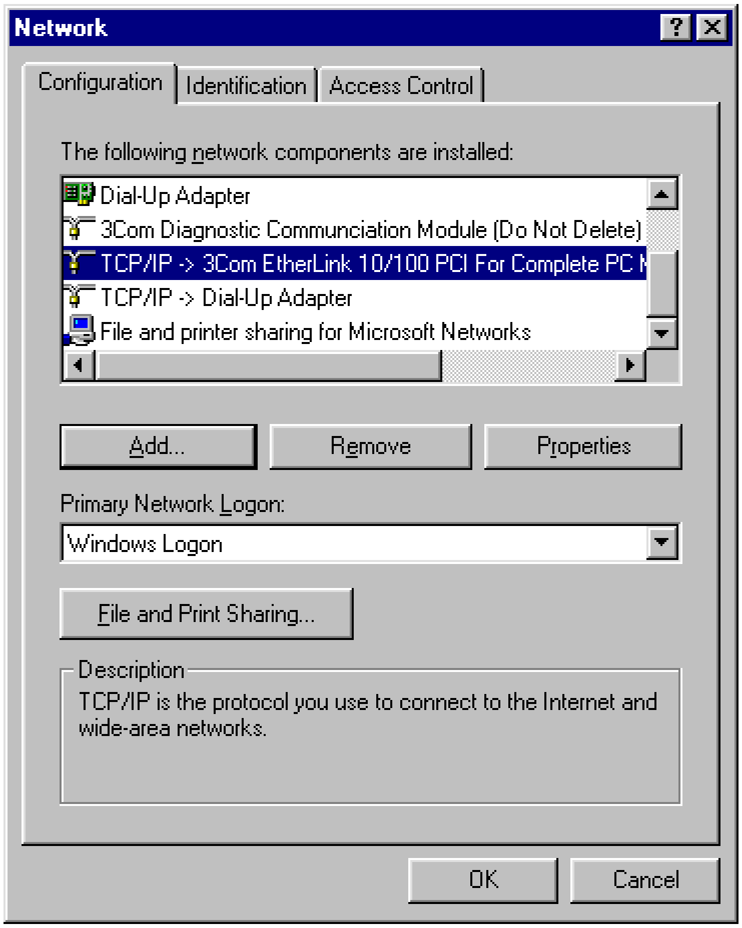
Determine the operating system for each computer you will include in your wireless network and follow the steps to configure the network settings for that PC.

Configuring Windows 98SE and ME

1 Click **Start**.

2 Select **Settings** > **Control Panel**.

3 Double-click **Network**. The Network window is displayed:



The following network components are installed:

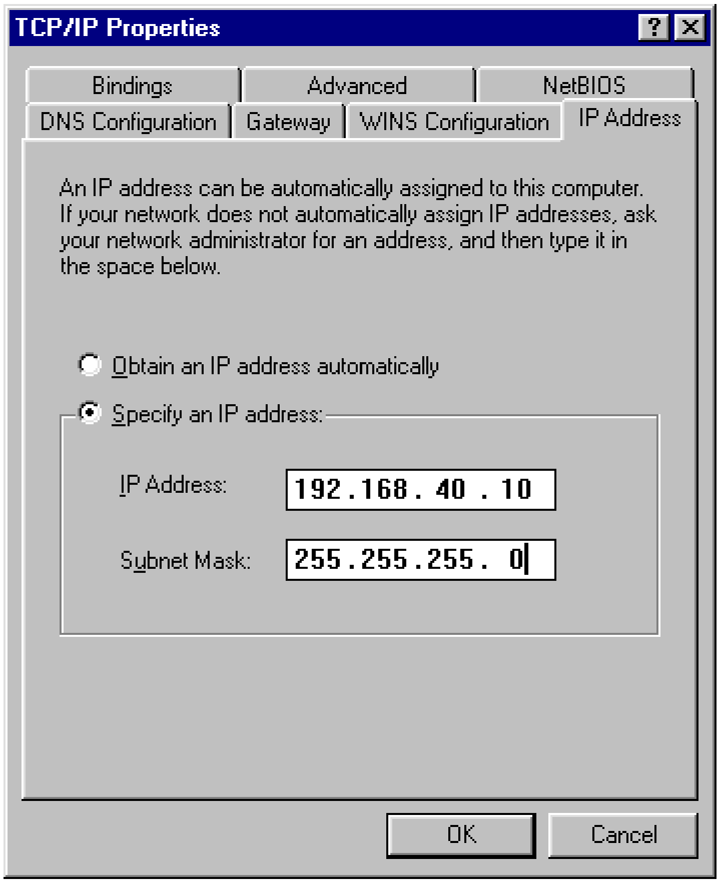
- Dial-Up Adapter
- 3Com Diagnostic Communciation Module (Do Not Delete)
- TCP/IP -> 3Com EtherLink 10/100 PCI For Complete PC M
- TCP/IP -> Dial-Up Adapter
- File and printer sharing for Microsoft Networks

Primary Network Logon: Windows Logon

Description
TCP/IP is the protocol you use to connect to the Internet and wide-area networks.

4 On the Configuration tab, select the ***TCP/IP*** line the for the appropriate Ethernet adapter on your PC. There may be multiple adapters installed – choose only the one that is configured for your adapter. In the example above, a 3Com Ethernet adapter card is installed and is the appropriate choice.

5 Click **Properties**. The TCP/IP Properties window is displayed:



TCP/IP Properties

An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.

○ Obtain an IP address automatically

● Specify an IP address:

IP Address: 192.168. 40 . 10

Subnet Mask: 255.255.255. 0

6 Click the **IP Address** tab.

7 Enter **192.168.40.10** in the IP Address field.

8 Enter **255.255.255.0** in the Subnet Mask field.

9 Click **OK**.

10 Click the **Gateway** tab and confirm that the *Installed Gateway* field is blank.

11 Click **OK** twice. Windows may ask for the Windows Installation disk. First check to see if the installation files are installed at c:\windows\options\cabs. Otherwise, load your Windows CD and follow the prompts.

12 Restart your computer to save your settings.

13 Proceed to the *Configure Your Wireless Settings* section to set up the security settings.

Configuring Windows 2000

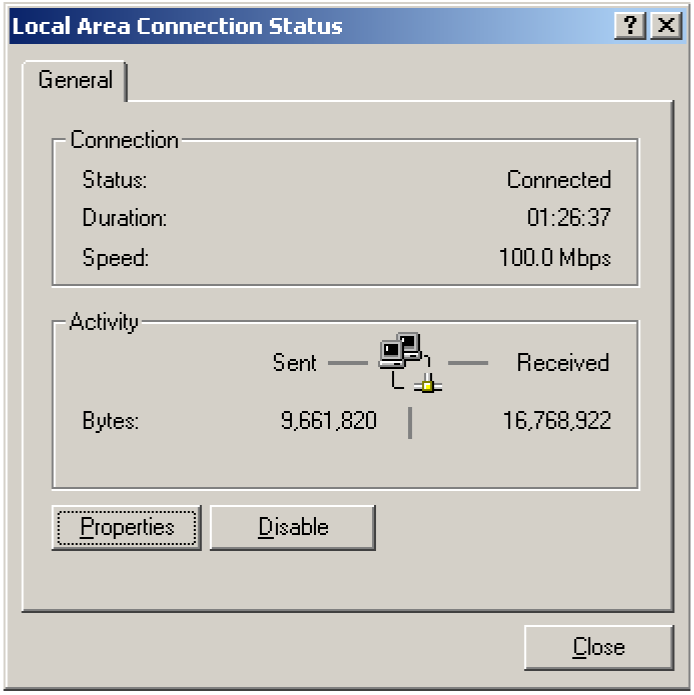
1 Click **Start**.

2 Select **Settings**.

3 Select **Control Panel**.

4 Double-click **Network and Dial-Up Connections**.

5 Double-click **Local Area Connection**.



Connection

Status: Connected

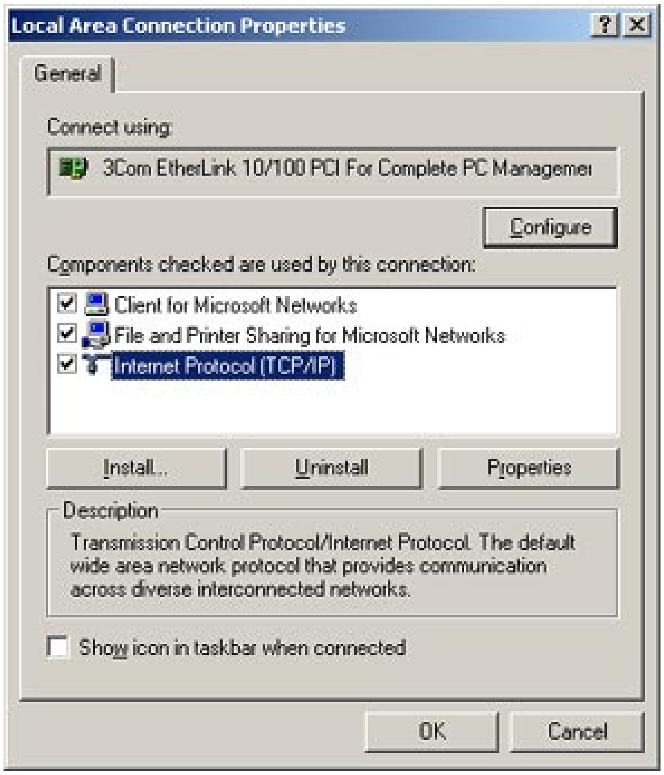
Duration: 01:26:37

Speed: 100.0 Mbps

Activity

	Sent	Received
Bytes:	9,661,820	16,768,922

6 Click **Properties**.



Local Area Connection Properties

General

Connect using:

3Com EtherLink 10/100 PCI For Complete PC Managemer

Components checked are used by this connection:

☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ Internet Protocol (TCP/IP)

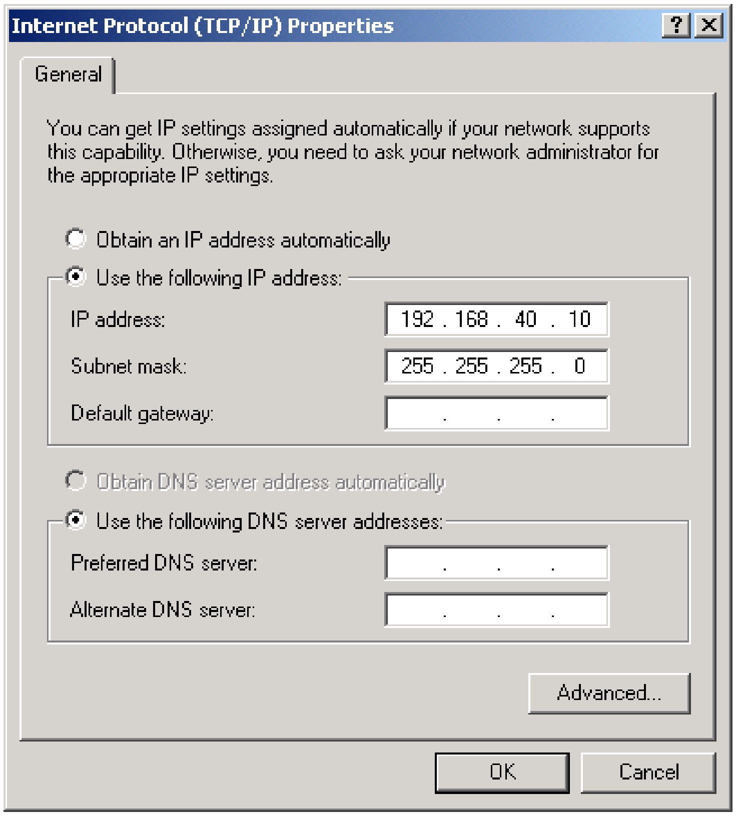
Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

☐ Show icon in taskbar when connected

7 Ensure the box next to ***Internet Protocol (TCP/IP)*** is selected.

8 Click to highlight **Internet Protocol (TCP/IP)** and click **Properties**.



Internal Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 40 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

9 Enter **192.168.40.10** in the IP Address field.

10 Enter **255.255.255.0** in the Subnet Mask field.

11 Click **OK** twice.

12 Restart your computer to save your settings.

13 Proceed to the *Configure Your Wireless Settings* section to set up the security settings.

Configuring Windows XP

This configuration assumes you have retained the default interface for Windows XP. If you are running the 'Classic' interface, please follow the instructions for Windows 2000.

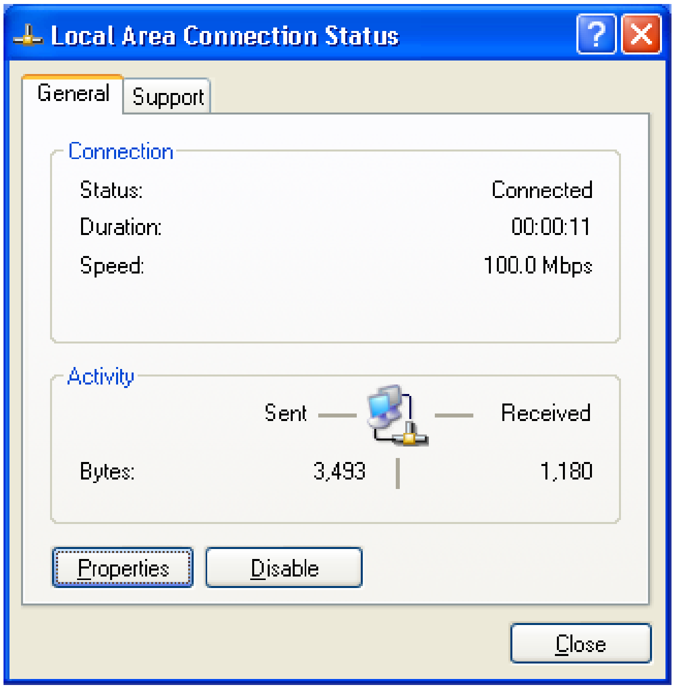
1 Click **Start**.

2 Select **Settings**.

3 Select **Control Panel**.

4 Double-click **Network and Dial-Up Connections**.

5 Double-click **Local Area Connection**. The Local Area Connection Status window appears:



Local Area Connection Status

Connection

Status: Connected

Duration: 00:00:11

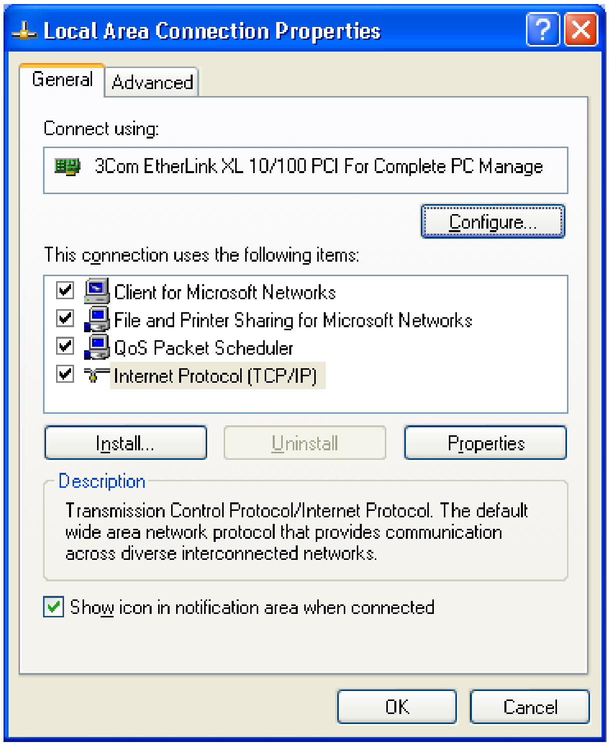
Speed: 100.0 Mbps

Activity

Sent — Received

Bytes: 3,493 | 1,180

6 Click **Properties**.



Local Area Connection Properties

General | Advanced

Connect using:

3Com EtherLink XL 10/100 PCI For Complete PC Manage

Configure...

This connection uses the following items:

☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol (TCP/IP)

Install... | Uninstall | Properties

Description

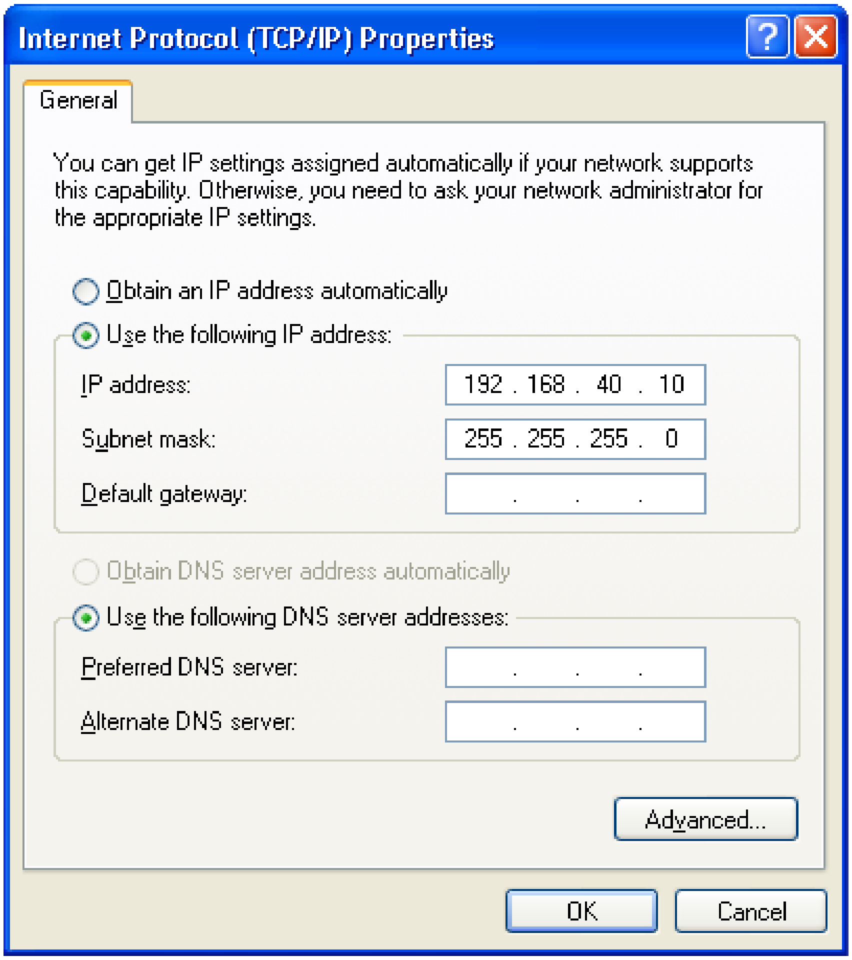
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

☑ Show icon in notification area when connected

OK | Cancel

7 Ensure the box next to *Internet Protocol (TCP/IP)* is selected.

8 Click to highlight **Internet Protocol (TCP/IP)** and click **Properties**.



Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 40 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

9 Enter **192.168.40.10** in the IP Address field.

10 Enter **255.255.255.0** in the Subnet Mask field.

11 Click **OK** twice.

12 Restart your computer to save your settings.

13 Proceed to the *Configure Your Wireless Settings* section to set up the security settings.

Configure Your Wireless Security Settings

Before your access point can communicate securely with your computer, you must configure your wireless security settings. Failure to configure these settings properly could compromise your network to wireless hackers.

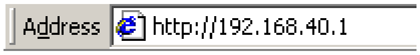
Logging In

WARNING!

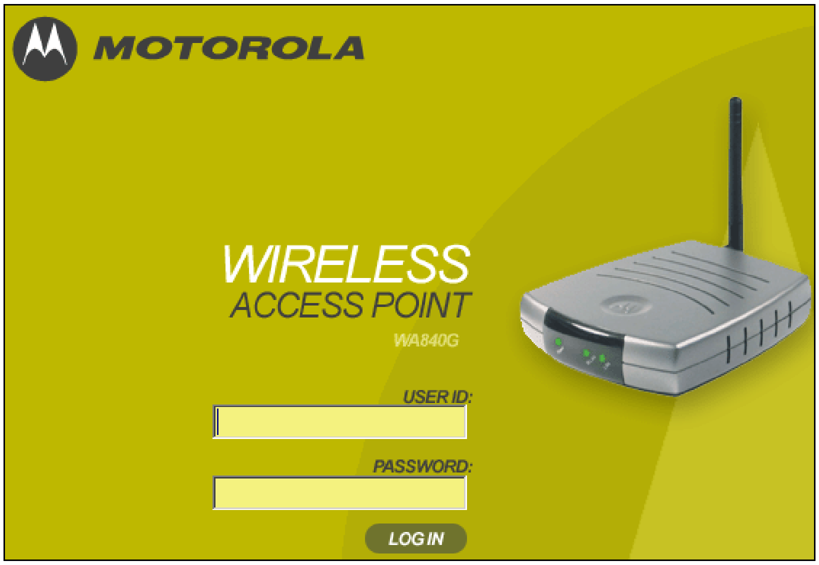
When first configuring your access point, it is recommended that you use an Ethernet cable. Performing the INITIAL configuration using a wireless connection is not secure and is not recommended.

After you have finished the initial configuration of the access point, your connection will be secure and you can safely use either a wired or wireless connection.

1 Once the access point is connected, open your web browser. In the URL field, enter **http://192.168.40.1** (the access point's default IP address) and press **Enter**.


Address http://192.168.40.1

The login screen is displayed:



2 Enter the ***User ID***. The default factory setting is *admin*.

3 Enter the ***Password***. The default factory setting is *motorola*.

Once you have logged in, for security reasons, you should change the User ID and Password. See Wireless Security Setup.

4 Click **Log In** to enter the access point's Web-based Configuration Utility.

Wireless Security Setup

To set up the correct security protocols for your access point:

1 Select **Control Panel** > **Device Security**.

2 In the Change User ID field, enter in your ***User ID***. Create an ID that contains multiple case-sensitive characters as well as numbers. It cannot be longer than 64 characters.

3 In the Change User Password field, enter your ***Login Password***. Create a password that contains multiple case-sensitive characters as well as numbers and symbols like "_ +)". It cannot be longer than 64 characters.

4 Re-enter your Password.

5 Click **Apply**.

6 Once the settings have been accepted, click **Restart** and log back into the Configuration Utility using your new User ID and Password.

7 Select to **Wireless** > **Basic.**

8 Change the ***SSID*** to a user-friendly name and click **Apply**.

9 Navigate to **Wireless** > **Security**.

10 Select **WPA-PSK** from the ESS Authentication options.

11 Select **TKIP** from Encryption Status options.

12 Enter a new ***Pass Phrase*** in the Pass Phrase field. The Pass Phrase must be between 8 and 63 characters.

13 Enter your ***Pass Phrase*** again in the Pass Phrase Confirm field. Remember this Pass Phrase so that you can enter the same phrase for the Motorola client devices on your wireless LAN.

14 Click **Apply** and then click **Restart**. Your wireless security configuration is now complete.

Section 3:Configuration

Use the information in this section to modify the access point's settings. For example you can customize features for your home network, change settings such as your user name or password, or view the status of the network.

The screenshots seen here are intended for reference only; your version of firmware may differ slightly.

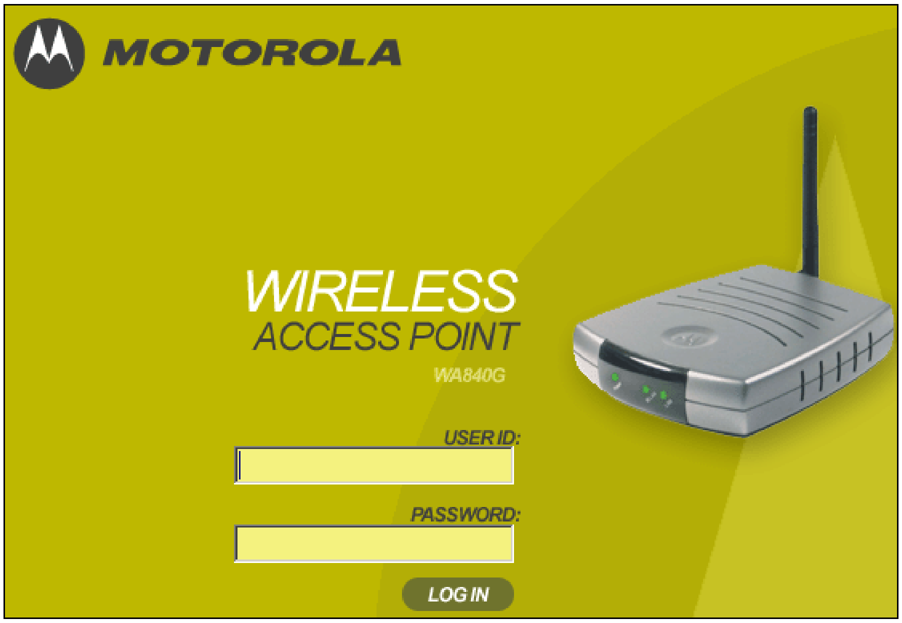
Using the Web-Based Configuration Utility

Logging In

1 Once the access point is connected, open your web browser. In the URL field, enter **http://192.168.40.1** (the access point's default IP address) and press the **Enter** key.

Address http://192.168.40.1

The login screen appears.



2 Enter the ***User ID***. The default factory setting is *admin*.

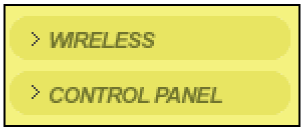
3 Enter the ***Password***. The default factory setting is *motorola*.

After you have logged in, for security reasons you should change the User ID and Password. See below.

4 Click **Log In** to enter the access point's Configuration Utility.

Navigation

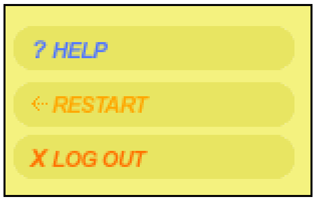
Each of the following subsections describe the components of the access point's *Configuration Utility*, which is accessible from a web browser. These sections include:



To navigate, click on a major section and then the associated subsection. For example, to adjust the User Login ID, click **CONTROL PANEL** on the left, then **DEVICE SECURITY** tab at top on the right. The Web-based Configuration Utility uses Javascript. Your web browser's Javascript needs to be enabled.

Help, Restart, and Logout

Click on the appropriate command to execute the action.



Help Accesses Help.

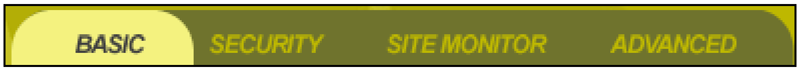
Restart Restarts your session with the Configuration Utility. When Restart flashes, the change you have made requires that you restart the unit.

For convenience, it is recommended that you finish all of your configuration changes and then restart the unit.

Logout Logs out of the access point's Configuration Utility.

Configuring Wireless Network Settings

The Wireless Network screens allow you to adjust settings for your wireless connection:



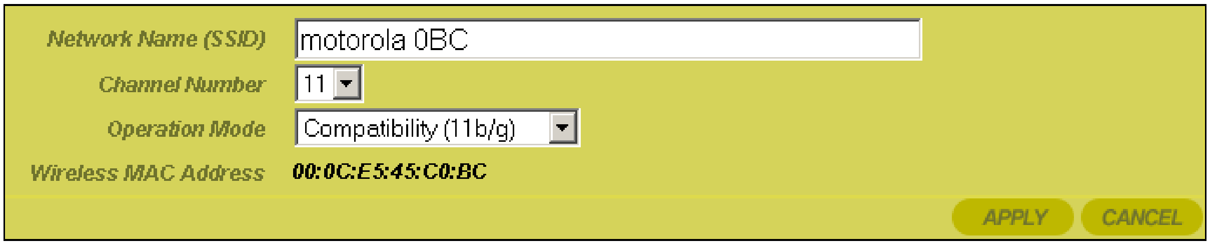
- Basic
- Security
- Site Monitor
- Advanced

Basic Wireless Configuration

The Wireless – Basic screen allows you to set up your Service Set Identifier (SSID) parameters for your network. The SSID is the name of your network that is shared among all the devices in a wireless network.

Although your access point has a default SSID, it is recommended that you change it to a name that is easy for you to remember.

To access the screen, click **Wireless** > **Basic**.



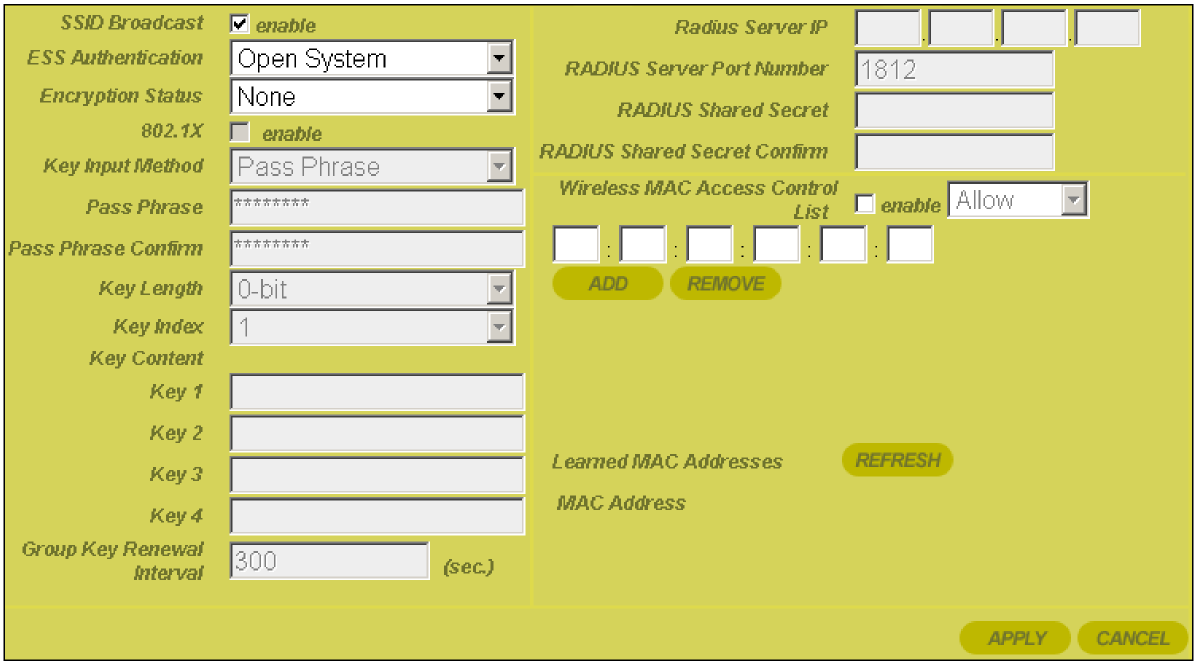
Network Name (SSID)	motorola 0BC
Channel Number	11
Operation Mode	Compatibility (11b/g)
Wireless MAC Address	00:0C:E5:45:C0:BC

Field or Button	Description
Network Name (SSID)	Enter a name of no more than 32 alphanumeric characters. This SSID must be entered on every wireless device on your wireless network to communicate back to the router. The default SSID is *motorola XXX,* where XXX are the last 3 characters of your Wireless MAC address, found on the label on the bottom of the unit.

Field or Button	**Description**
Channel Number	Identifies the channel on which the access point communicates. Each wireless client must use the same channel to enable communication. If changed wirelessly, once you restart the access point, you will lose your wireless connection. Change the wireless device's channel to the new channel to log back into the access point. The default is Channel 11.
Operation Mode	Enables you to select the type of transmission protocol your wireless network uses. The options are: ▪ Compatibility (802.11b/g) – default setting ▪ Performance (802.11g only) ▪ Legacy (802.11b only)
Wireless MAC Address	Displays the MAC address of the unit.
Apply	Click to save your settings.
Cancel	Click to cancel any changes.

Configuring Wireless Security Settings

The Wireless Security screen allows you to configure wireless security settings. To access the screen, click **Wireless** > **Security**.



SSID Broadcast ☑ enable
ESS Authentication: Open System
Encryption Status: None
802.1X □ enable
Key Input Method: Pass Phrase
Pass Phrase: *********
Pass Phrase Confirm: *********
Key Length: 0-bit
Key Index: 1
Key Content
Key 1
Key 2
Key 3
Key 4
Group Key Renewal Interval: 300 (sec.)

Radius Server IP
RADIUS Server Port Number: 1812
RADIUS Shared Secret
RADIUS Shared Secret Confirm
Wireless MAC Access Control List □ enable Allow
Learned MAC Addresses
MAC Address

Field	Description
SSID Broadcast	*Service Set Identifier (SSID)*. Broadcasts the SSID of the access point to devices on your network. This enables wireless clients, such as a laptop, to receive the access point's SSID. If you don't want the SSID to be broadcast, disable this feature. The default is enabled.

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>ESS Authentication</td><td><i>Extended Service Set (ESS</i>). Authentication establishes either an open or secure verification of communication with an access point. This setting does not encrypt your wireless transmission.
The options are:
<table>
<tr><td>Open System</td><td>No authentication is used. Default setting.</td></tr>
<tr><td>Pre-Shared Key (PSK)</td><td>The Pre-Shared Key (PSK) authentication method is used.</td></tr>
<tr><td>WPA</td><td>Wi-Fi® Protected Access (WPA) authentication (802.1X) is used with an EAP type.</td></tr>
<tr><td>WPA-PSK</td><td>WPA authentication (802.1X) is used with a pre-shared key.</td></tr>
</table>
WPA-PSK is recommended for home users not using a RADIUS server.</td></tr>
</table>

Field	Description
Encryption Status	Determines the type of security encryption algorithms used for the Key. This security setting encrypts your wireless transmission. ▪ None, WEP64, and WEP128 are available only when Open System or Pre-Shared KEY (PSK) is selected in the ESS Authentication field. ▪ TKIP and AES are available only when WPA and WPA-PSK are selected in the ESS Authentication field. The options are: None — No security. Default setting. WEP64 — Wired Equivalent Privacy - 64-bit strength (provides 4 Keys) WEP128 — Wired Equivalent Privacy - 128-bit strength (provides 2 Keys) TKIP — Temporal Key Integrity Protocol AES — Advanced Encryption Standard *TKIP is recommended for home users. If available, AES provides stronger encryption.*
802.1X mode	Can only be enabled when the ESS Authorization is set to Open or PSK and either WEP64 or WEP128 is selected (see the Encryption Status field). During the Authentication process, the server verifies the identity of the client attempting to connect to the network. When WPA-PSK is selected in the ESS Authentication field, this option is automatically selected. If not already enabled, select to activate this feature. When enabled, Dynamic Key generation occurs, meaning a key is automatically generated when the client requests one.

Field	**Description**
Key Input Method	Available if PSK and/or WEP is selected. The options are: ▪ Pass Phrase – default setting ▪ Hexadecimal ▪ ASCII If you select either Pass Phrase or Hexadecimal, in Key Content, the format of the Key appears in a hexadecimal format. *If you are using other non-Motorola wireless products and a security algorithm other than WPA-PSK, you must enter your WEP keys manually in either ASCII or hexadecimal format for the non-Motorola wireless products.*
Pass Phrase	Enter the Pass Phrase to be used for Key encryption. Keep a record of this Pass Phrase so you can enter the same phrase for the Motorola client devices on your wireless LAN. You will use this Pass Phrase when using WPA security with your client devices. Pass Phrase must be between 8 and 63 characters. The default pass phrase is *motorola*.
Key Length	The option selected determines the strength of the key. This field is only available when ESS Authentication is set PSK and the Encryption Status is set to None. There are two options: ▪ 128-bit ▪ 64-bit.

Field	**Description**
Key Index	Use the drop-down list here to select one of the Key Content fields below (Key 1, Key 2, etc). A maximum of four different Keys (1, 2, 3, or 4) are available, the number of keys is determined by what is selected in the ESS Authentication and Encryption Status field. *The Key selected here must match the Key in the client. For example, if you select Key 1 here you have to select Key 1 for the client.* The default is 1.
Key Content Key 1 Key 2 Key 3 Key 4	Enter Key content in these fields. The Key Content format is selected in the Key Input Method field. For the key content, the phrase is auto-generated by the password entered in the Pass Phrase field. For non-Motorola clients, you will use these Keys (and not Pass Phrase) when using WEP for security. The Key will not automatically fill in until you have clicked **Apply**. If you have selected Hexadecimal or ASCII formatting (in the Key Input Method field), you can then enter your own Hexadecimal or ASCII keys. To enter keys manually, you must have WEP64 or WEP128 selected in the Encryption Status field. ▪ For WEP64 keys, 5 case sensitive ASCII characters are allowed or 10 hexadecimal characters (using only characters 0-9 and A-F) ▪ For WEP128 keys, 13 case sensitive ASCII characters are allowed or 26 hexadecimal characters (using only characters 0-9 and A-F) *If entering a key manually, don't leave a key field blank or enter all 0's. These are not secure keys.*

Field	Description
Group Key Renewal Interval	This is the number of seconds that pass until your access point sends out a new group key and is only available if WPA or 802.1X are selected. The default is 300 seconds.
RADIUS Server IP RADIUS Server Port Number	Enter the RADIUS Server IP and Port number. RADIUS is an authentication and accounting system to verify users. To display these fields, either of the following conditions need to exist: ▪ Open System is selected, along with either WEP64 or WEP128, and 802.1X is enabled ▪ WPA is selected and TKIP or AES is selected. The default RADIUS Port Number is 1812.
RADIUS Shared Secret RADIUS Shared Secret Confirmation	Type and re-type the RADIUS password in these fields.

Field **Description**

Wireless MAC Access Control List

Enables you to control which device accesses your wireless network based upon their MAC address. The default is disabled. The options are:

Enable Select to enable/disable the MAC Access Control List (ACL). When disabled, the MAC ACL is not active and any wireless station is allowed to communicate with the wireless access point.

Allow Allows only the wireless devices in the ACL to communicate with the wireless access point.

Deny Denies wireless devices in the ACL from communicating with the wireless access point.

To add a MAC address to the ACL:

1 Check **enable**.

2 Select **Allow** or **Deny** from the drop-down list.

3 Enter a ***MAC Address*** or use one of the ***Learned MAC Addresses***. To use one of the Learned MAC addresses, click the address number. The number automatically appears in the Wireless MAC Address Control List.
To alter a MAC address, remove and replace with the updated address.

4 Click **Add** to enter the address into the ACL.

5 Click **Apply** to save.

To delete a MAC address from the ACL:

1 Click the MAC address you wish to delete. Once activated, the field will change color.

2 Click **REMOVE** to clear the address.

3 Click **APPLY** to save.

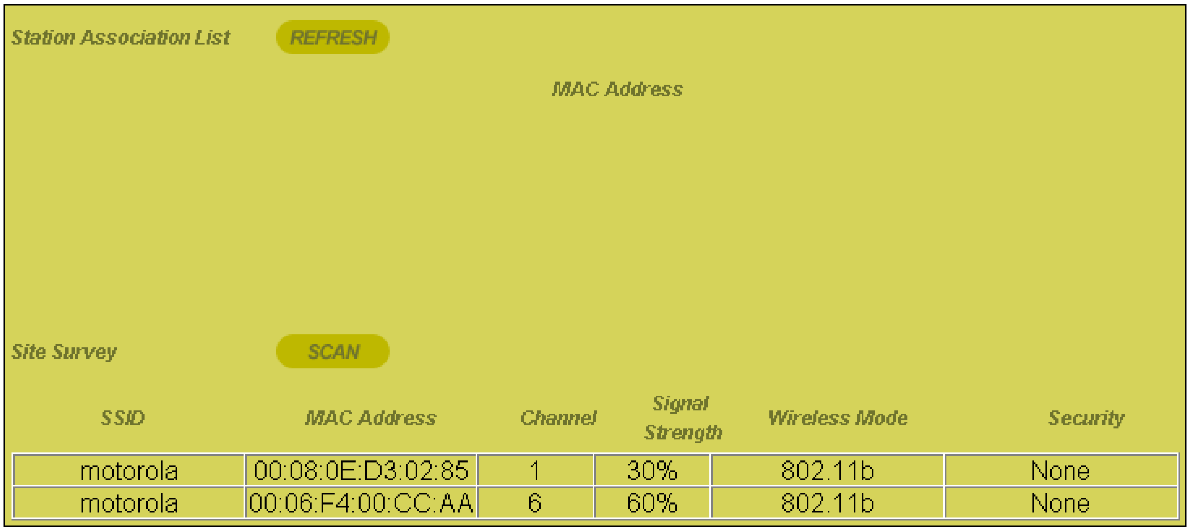
Field	Description
Learned MAC Addresses	Displays the MAC addresses (wireless devices only) the access point has already recorded. ▪ If you wish to use one of the displayed MAC addresses, click the address number. The number automatically appears in the Wireless MAC Address Control List. ▪ Click **Refresh** to search for additional MAC addresses.
Apply	Click to save your settings.
Cancel	Click to cancel any changes.

Monitoring Wireless Access Points

The Site Monitor screen displays information about wireless access points and stations:

Station Association List	Identifies only those stations that are connected to your wireless access point.
Site Survey	Displays information about other access points in the area.

To access the screen, click **Wireless** > **Site Monitor**.



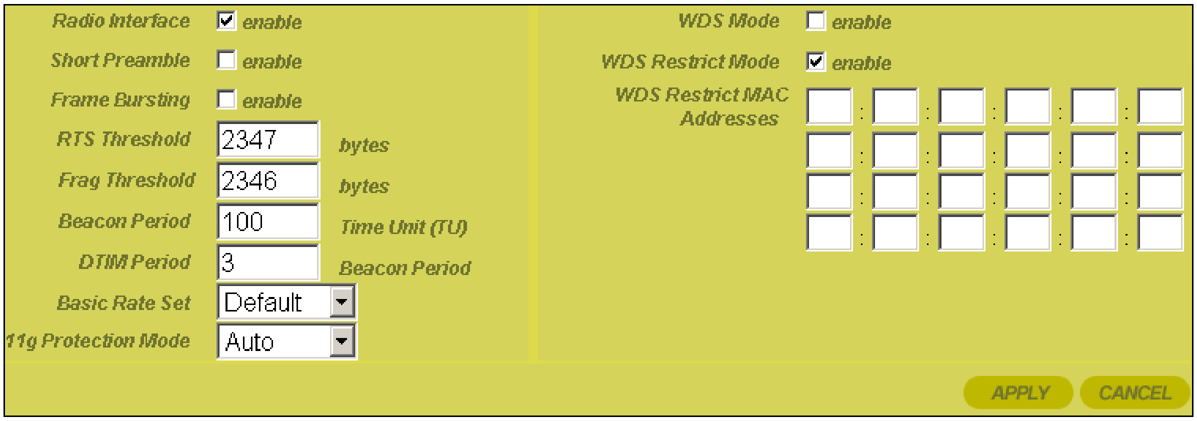
SSID	MAC Address	Channel	Signal Strength	Wireless Mode	Security
motorola	00:08:0E:D3:02:85	1	30%	802.11b	None
motorola	00:06:F4:00:CC:AA	6	60%	802.11b	None

Field	Description
Station Association List	
Refresh	Click to refresh the Station Association List.
MAC Address	Displays the MAC address of clients found on the LAN.
Host Name	Displays the name of the device attached.
Site Survey	
Scan	Click to search for more access points or clients.
SSID	Displays the SSID of the device found.
MAC Address	Displays the MAC address of the device found.
Channel	Displays the channel upon which the device is broadcasting.
Signal Strength	Displays the Signal Strength of the device found.
Wireless Mode	Displays which protocol is used, 802.11b or 802.11g.
Security	Displays the security protocol used.

Advanced Wireless Configuration

The Wireless-Advanced screen allows you to turn your wireless network off and on and adjust wireless parameters. Generally, these settings should remain at their default values.

To access the screen, click **Wireless** > **Advanced**.



Radio Interface ☑ enable
Short Preamble □ enable
Frame Bursting □ enable
RTS Threshold 2347 bytes
Frag Threshold 2346 bytes
Beacon Period 100 Time Unit (TU)
DTIM Period 3 Beacon Period
Basic Rate Set Default
11g Protection Mode Auto

WDS Mode □ enable
WDS Restrict Mode ☑ enable
WDS Restrict MAC Addresses

Field	Description
Radio Interface	Allows you to turn on and off the wireless feature. The default is enabled.
Short Preamble	Improves the efficiency of a network's throughput when transmitting and receiving data. Motorola recommends that you enable this feature. The default is disabled.
Frame Bursting	Allows you to send more frames (collection of packets) within a given time period, which enhances network efficiency and reduces overhead. This feature works with other Motorola products to increase performance throughput. Motorola recommends that you enable this feature. The default is disabled.

Field	**Description**
RTS Threshold	Allows you to modify the RTS threshold, which is the packet size at which an access point issues a request to send (RTS). The range is 0 to 2347 bytes. The default is 2347.
Fragmentation Threshold	Allows you to set the size at which packets are fragmented and transmitted a piece at a time instead of all at once. The setting must be within the range of 256 to 2346 bytes. The default is 2346.
Beacon Period	Allows you to set the time units for the beacon period. A *beacon* is a packet broadcast by the access point to keep the network synchronized. You are able to set the Beacon Period value from 1 to 65535 in Time Units (TU). The default is 100. Since changes to the Beacon Period and Delivery Traffic Indicator Maps (DTIM) settings may affect wireless performance, it is best to use the default settings.
DTIM Period	Allows you to set the Delivery Traffic Indicator Maps (DTIM) period value from 1 to 255 in multiples of Beacon Periods. The default is 3. Since changes to the Beacon Period and Delivery Traffic Indicator Maps (DTIM) settings may affect wireless performance, it is best to use the default settings.

Field	Description
Basic Rate Set	Allows you to set the transmission rate. The access point broadcasts different transmission rates so clients know which transmission rate to use to join the network. The options are: **1 to 2 Mbps** The slowest speed available. **Default** Ensures compatibility with 802.11b or 802.11g devices **All** Ensures compatibility with all devices.
11g Protection Mode	Ensures that your wireless access point does not interfere with neighbor networks. 802.11g networks cause collisions on 802.11b networks, so the Protection Mode forces the 802.11g network to negotiate around the 802.11b network. The options are: **Disable** 802.11g Protection Mode is never used. **Auto** 802.11g Protection Mode is used if either an 802.11b client joins the network or the access point detects an 802.11b network on the same channel. Default setting.
WDS Mode	Enables WDS mode, which allows you to share and expand your network with other wireless access points. The WDS fields, WDS Restrict Mode and WDS Restrict MAC address become active once WDS is enabled. Set up the access point's with the same Wireless SSID and security settings. When WDS mode is enabled, any access point, if configured to your access point's settings, can connect to your network. The default is disabled.

Field	Description
WDS Restrict Mode	Protects your network by assigning access to only the access points you designate. Assign the access points' MAC addresses in the WDS Restrict MAC Addresses fields. The default is enabled.
WDS Restrict MAC Addresses	To activate these fields, WDS Restrict Mode must be enabled. ▪ Enter up to four wireless MAC addresses ▪ To edit an entry, highlight the number and change ▪ To delete a number, delete each field
Apply	Click to save your settings.
Cancel	Click to cancel any changes.

Configuring Control Panel Settings

The Control Panel screens enable administrative maintenance for your access point, such as changing your login User ID/Password, updating your firmware, or backing up your configuration.

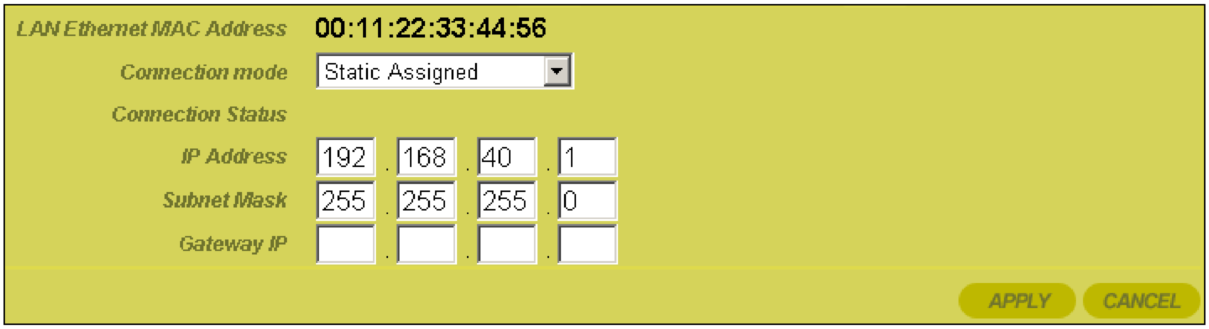
The following screens are available in Control Panel:

- Network Address
- Device Security
- Firmware Update
- Configuration Data

Configuring Network Address

This screen allows you to change your Connection Mode and IP settings.

To access the screen, click **Control Panel** > **Network Access**.



LAN Ethernet MAC Address 00:11:22:33:44:56

Connection mode Static Assigned

Connection Status

IP Address 192 . 168 . 40 . 1

Subnet Mask 255 . 255 . 255 . 0

Gateway IP . . .

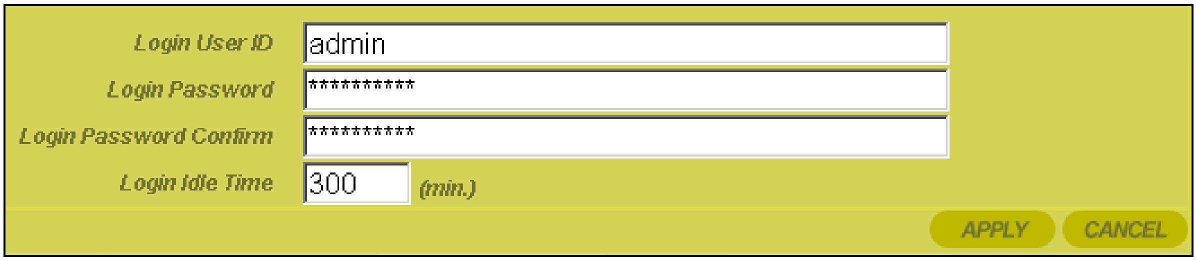
Field	Description
LAN Ethernet MAC Address	Displays the unit's Ethernet MAC address.
Connection Mode	The access point supports two connection modes for acquiring its own IP configuration settings: ▪ DHCP ▪ Static Assigned Select the appropriate connection mode for your network.
Connection Status	Provides current information about the connection status of the access point.
IP Address	Displays the access point's IP Address used to connect to your network. If DHCP is selected, this is the IP Address that your access point is currently using to access the Internet. If using Static Assigned, enter the IP Address here.

Field	Description
Subnet Mask	Displays the access point's Subnet Mask address used to connect to your network. If DHCP is selected, this is the Subnet Mask Address that your access point is currently using to access the Internet. If using Static Assigned, enter the Subnet Mask Address here.
Gateway IP	Displays the access point's Gateway IP Address used to connect to your network. If DHCP is selected, this is the Gateway IP Address that your access point is currently using to access the Internet. If using Static Assigned, enter the Gateway IP Address here.
Apply	Click to save your settings.
Cancel	Click to cancel any changes.

Configuring Device Security

This screen allows you to change your User ID and Password and adjust the inactivity time.

To access the screen, click **Control Panel** > **Device Security**.



Login User ID	admin
Login Password	***********
Login Password Confirm	***********
Login Idle Time	300 (min.)

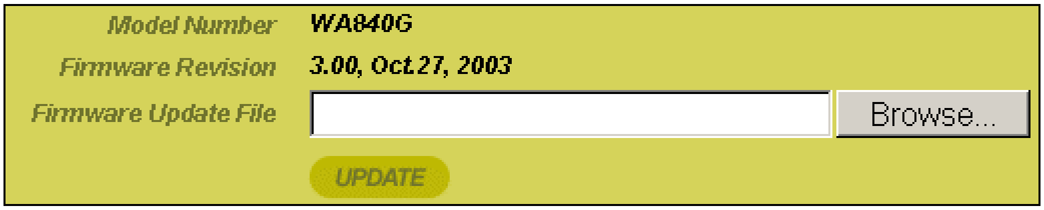
Field	Description
Login User ID	Changes the User ID used for logging into the access point's Configuration Utility. It cannot be longer than 63 bytes. A blank user name is not allowed. The default is *admin*.

Field	Description
Login Password Login Password Confirm	Use this option to change the Password used to log into the access point's web based utility. It cannot be longer than 63 bytes. A blank password is not allowed. The default is *motorola*.
Login Idle Time	Sets the amount of idle time (no actions occur) that elapses before the access point automatically logs you off. The default is 10 minutes.
Apply	Click to save your settings.
Cancel	Click to cancel any changes.

Updating Firmware

The Firmware Update screen allows you to update your access point's firmware, the mechanism that controls your access points hardware.

To check for a firmware update, access this website www.motorola.com/broadband/networking.



Model Number WA840G

Firmware Revision 3.00, Oct 27, 2003

Firmware Update File

To update the firmware:

1 Download the latest firmware file to your computer from the Motorola website.

2 Click **Control Panel** > **Firmware Update** to access the Firmware Update screen.

3 To locate the file you downloaded, type the path to the file or click **Browse** and navigate to it.

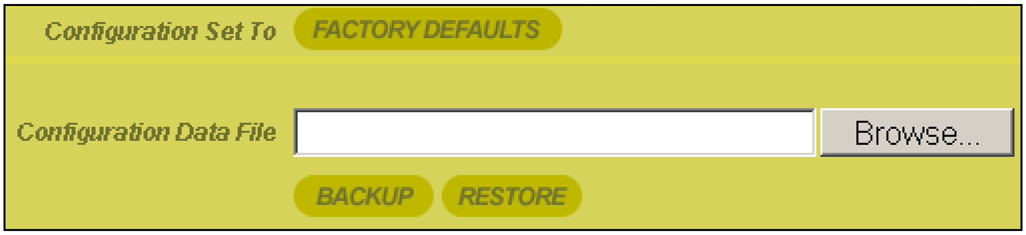
4 Click **UPDATE** to update the access point with the selected firmware file. The access point will inform you that you successfully updated the unit.

5 Follow the prompts to restart.

Saving and Restoring Configuration Settings

The Configuration Data screen allows you to save and restore your access point’s configuration settings. You are also able to reset the access point to its factory default settings.

To access the screen, click **Control Panel** > **Configuration Data**.



To reset the access point to its original configuration; click **FACTORY DEFAULTS**.

To backup your settings:

1 Click **BACKUP**.

2 From the pop up window, choose the destination for the file.

3 Enter a descriptive file name.

To restore your settings:

1 Locate the Configuration file on your computer by entering the path to the file or click **Browse** and navigate to it.

2 Click **RESTORE** to reapply the saved settings with the selected file.

Section 4:Troubleshooting

This section details possible solutions to common problems that may occur in using the access point.

Contact

If you are unable to locate a solution here, please access our website at www.motorola.com/broadband/networking for the latest information. You can also reach us 7 days a week, 24 hours a day at 1-877-466-8646.

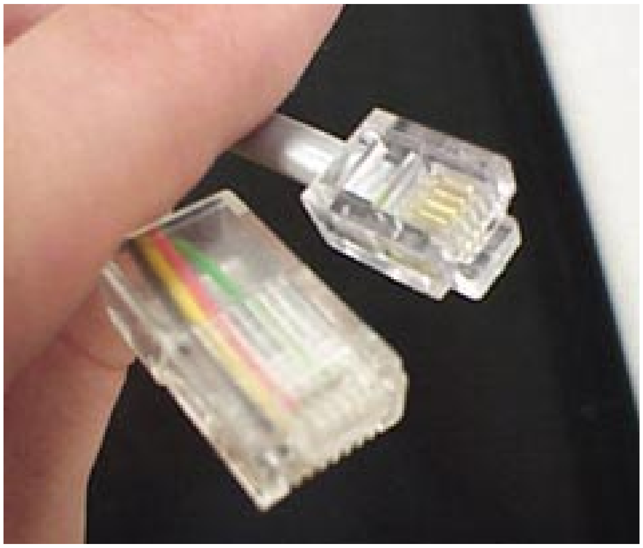
Hardware Solutions

My computer is experiencing difficulty connecting to the wireless network.

- Ensure that your access point is powered on and that the Wireless LED is lit.
- Ensure that your wireless adapter (PCI card, Notebook or Ethernet adapter) is installed correctly and is active.
- Ensure that your wireless adapter's radio signal is enabled. Review your adapter's documentation for further instructions.
- Ensure that your wireless adapter for your PC and the access point have the same security settings that will allow your computer to access the wireless network. For details on adjusting your security settings, see Wireless Security Settings in Section 3: Configuration.
- Ensure that your access point is within range of your router or is not behind an obstruction. For example, metal structures will interfere with the signal, as will 2.4 GHz cordless phones, and microwaves.
- Ensure that your antenna is connected and that your router's antenna is also connected.

My computer is experiencing difficulty in connecting to the access point.

- Ensure that all of your cable connections are firmly connected. This includes the cables from the wall to your modem, between the router and modem, and, if available, from the access point to your PC.
- Ensure that your LEDs are not lit Red or not at all. For further information about LED descriptions, see Section 1: Overview.
- Ensure that you are using Ethernet cables and not telephone cables between the router and modem or router and PC, or if available, access point and PC. Ethernet cables use a wider RJ-45 style plug using 8 wires where telephone style plugs use the smaller RJ-11 style plug using 4 to 6 wires.



The plug on the left is RJ-45; the plug on the right is RJ-11 – use only RJ-45.

- Ensure that your Ethernet adapter is enabled. To check the status of your adapter, click the monitor icon in the System Tray at the bottom right of your screen.

  You can also check the status of your Ethernet adaptor by selecting **Control Panel > Network and Dial-Up Connections**.

Software Solutions

I would like to see if my Internet connection is live.

Use the *ping* command to test the connection. Before attempting, ensure that **Obtain an IP address automatically** has been selected in the computer's settings and that you have an IP address assigned. Refer to Configure Your Computers in Section 2: Configuration, for further details.

1. Open a command prompt by clicking **Start** and **Run**.
2. For Windows 98 and ME, in the Open field, type **command** and press **Enter** or **OK**.

   For Windows 2000 and XP, type **cmd**. Or, navigate using your **Start** button to **Programs**>**Accessories**>**Command Prompt**.
3. In the Command window, type **ipconfig**.
   - You should see an IP address for your network adapter:

```
Ethernet Adapter Local Area Connection:

Connection-specific DNS Suffix.: Example.example.example.com.

IP Address. . . . . . . . . . . . : 192.168.40.10

Subnet Mask . . . . . . . . . . . : 255.255.255.0

Default Gateway . . . . . . . . . : 192.168.40.1
```

4. In the *Command* window, type **ping** followed by the ***access point's IP address*** and press **Enter**. For example type: **ping 192.168.40.10**.

   There is a good possibility that the Default Gateway's IP address is the access point's IP address. You can verify the access point's IP address on the Control Panel > Network Access screen.
   - If you receive a reply (the first word will be *Reply…*), then your computer is connected to the access point. Proceed to *Step 5*.
   - If you do NOT receive a reply, repeat steps 1 – 4 on a different computer to verify that the first computer is not the cause of the problem.
5. In the *Command* window, type **ping** followed by your ***ISP's default gateway*** and press **Enter**. For example type: **ping 216.109.125.72**.

- If you receive a reply (For example: *Reply from 216.109.125.72…*), then your connection to the Internet is live.

  You can verify the ISP's IP address at the Gateway IP field on the Control Panel > Network Access screen.
- If you do NOT receive a reply, repeat steps 1 – 5 on a different computer to verify that the first computer is not the cause of the problem.

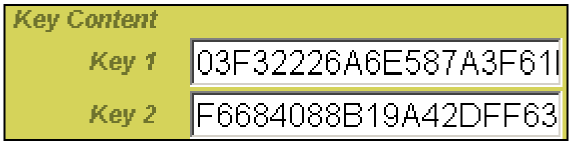
6 If you cannot determine your ISP's default gateway, ping www.yahoo.com or another known web location.

I cannot access the Configuration Utility for the access point.

- Verify your Ethernet connection to the access point.
- Verify that the IP address of the PC being used to configure the access point is on the same network as the access point's configuration IP address.
- The IP address of your network adapter must be on the same network and not a duplicate of any others on the network (for example: 192.168.40.10 and using a subnet mask of 255.255.255.0 can be used to login to the access point's default IP address of 192.168.40.1). To adjust the IP address for your PC, refer to Configure Your Computers in Section 2: Configuration.
- Verify that you can ping the access point on this IP address.
  - In the *Command* window, type **ping** and your access point's default ***IP address*** and press **Enter**. For example type: **ping 192.168.40.1**
  - If you have changed the factory configured default IP address of the access point, you will need to set your network adapter accordingly.
- Verify you are entering the correct URL in the browser. The default is http://192.168.40.1. If you think you have changed the IP address used to configure the access point and cannot remember it, you must reset the unit back to factory defaults. To do this, press and hold the reset button for more the 5 seconds. This clears the access point's user settings, including User ID, Password, IP Address, and Subnet mask.
- After the access point is reset to factory default, re-verify the Ethernet connectivity and IP address issues.
- Verify you are using the latest version of IE or Netscape. IE 5.2 and below are not supported.

What if Pass Phrase isn’t supported? What do I enter for my security?

Some wireless cards do not support Pass Phrase or Motorola’s Pass Phrase algorithm, which means you have to enter the entire Key Content found in the appropriate Key field.

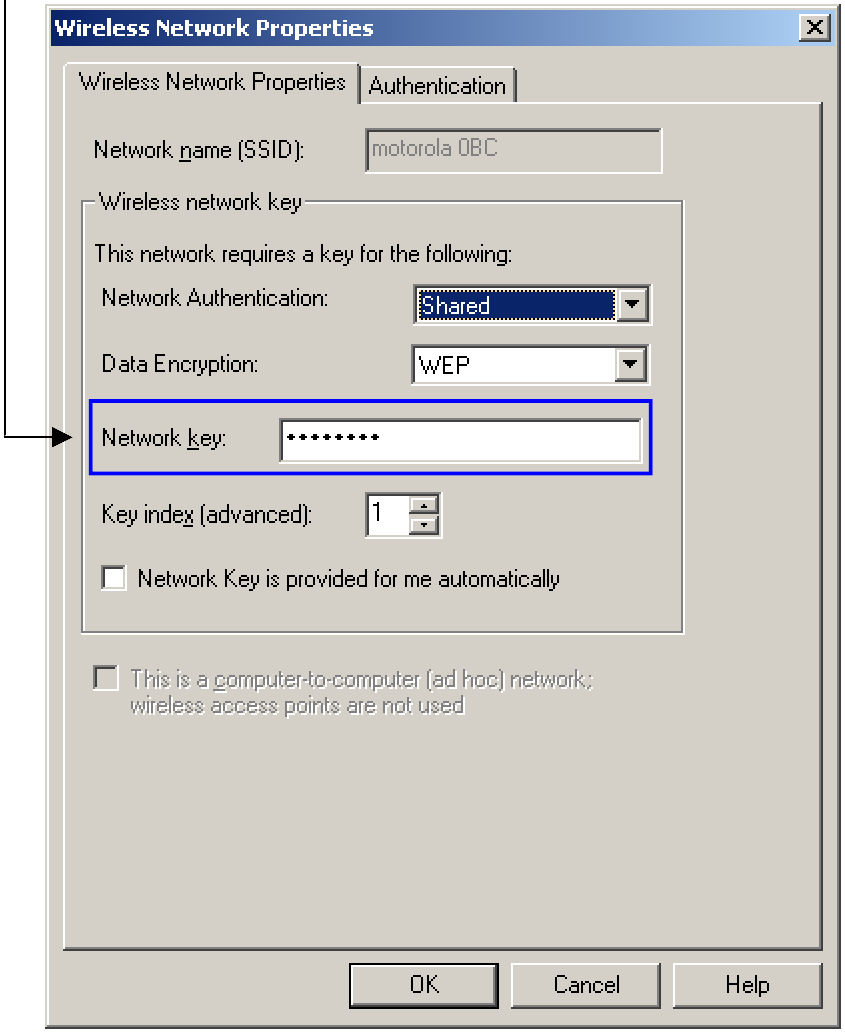


Key Content

Key 1: 03F32226A6E587A3F61l

Key 2: F6684088B19A42DFF63

So, using the WEP example from above if using Key 1, you would enter 03F32226A…etc. into the **Network Key** field of the example Network Adapter, seen below. Ensure that the Key index matches what is selected on the wireless network.



Wireless Network Properties

Network name (SSID): motorola 0BC

Wireless network key

This network requires a key for the following:

Network Authentication: Shared

Data Encryption: WEP

Network key: •••••••••

Key index (advanced): 1

□ Network Key is provided for me automatically

□ This is a computer-to-computer (ad hoc) network; wireless access points are not used

I cannot browse past the first screen of the Configuration Utility.

Sometimes, especially when upgrading, some leftover files may be in your Internet Cache. Flush your cache and restart your unit to fix: From Internet Explorer’s menu, select **Tools** > **Options** and click **Delete Files** to clear you cache.

Section 5:Glossary

A

Access Point (AP)

A device that provides wireless LAN connectivity to wireless clients (stations).

Adapter

A device or card that connects a computer, printer, or other peripheral device to the network or to some other device. A wireless adapter connects a computer to the wireless LAN.

Address translation

See *NAT*.

Ad-Hoc Network

A temporary local area network connecting AP clients together, usually just for the duration of the communication session. The clients communicate directly to each other and not through an established, such as through a router. Also known as: IBSS (Independent Basic Service Set).

ASCII

The American Standard Code for Information Interchange refers to alphanumeric data for processing and communication compatibility among various devices; normally used for asynchronous transmission.

B

Bandwidth

The transmission capacity of a medium in terms of a range of frequencies. Greater bandwidth indicates the ability to transmit more data over a given period of time.

bps

Bits Per Second

Broadband

A communications medium that can transmit a relatively large amount of data in a given time period.

BSS

Basic Service Set. A configuration of Access Points that communicate with each other without resorting any infrastructure. Also known as Ad-Hoc networks. Also see *ESS*.

C

Client

In a client/server architecture, a client is a computer that requests files or services such as file transfer, remote login, or printing from the server. On an IEEE 802.11b/g wireless LAN, a client is any host that can communicate with the access point. Also called a CPE. A wireless client is also called a “station.” Also see *server.*

Coaxial Cable

A type of cable consisting of a center wire surrounded by insulation and a grounded shield of braided wire. The shield minimizes electrical and radio frequency interference. Coaxial cable has high bandwidth and can support transmission over long distances.

CPE

Customer Premise Equipment: typically computers, printers, etc, that are connected to the gateway at the subscriber location. CPE can be provided by the subscriber or the cable service provider. Also called a client.

Crossover Cable

A crossover cable is a cable that is used to interconnect two computers by "crossing over" (reversing) their respective pin contacts. A crossover cable is sometimes known as a null modem.

D

Default Gateway

A routing device that forwards traffic not destined to a station within the local subnet.

DHCP

A Dynamic Host Configuration Protocol server dynamically assigns IP addresses to client hosts on an IP network. DHCP eliminates the need to manually assign static IP addresses by “leasing” an IP address and subnet mask to each client. It enables the automatic reuse of unused IP addresses.

DMZ

De**M**ilitarized **Z**one. This service opens one IP address to the Internet, usually for online gaming, and acts as a buffer between the Internet and your network.

DNS

The Domain Name System is the Internet system for converting domain names (like www.motorola.com) to IP addresses. A DNS server contains a table matching domain names such as Internetname.com to IP addresses such as 192.169.9.1. When you access the world-wide web, a DNS server translates the URL displayed on the browser to the destination website IP address. The DNS lookup table is a distributed Internet database; no one DNS server lists all domain name to IP address matches.

Domain Name

A unique name, such as motorola.com, that maps to an IP address. Domain names are typically much easier to remember than are IP addresses. See *DNS.*

Download

To copy a file from one computer to another. You can use the Internet to download files from a server to a computer.

Driver

Software that enables a computer to interact with a network or other device. For example, there are drivers for printers, monitors, graphics adapters, modems, Ethernet, USB, HPNA, and many others.

DSL

Digital Subscriber Line

DSSS

Direct-Sequence Spread Spectrum. DSSS is a transmission technology used in WLAN transmissions where a data signal at the sending station is combined with a higher data rate bit sequence, or chipping code, that divides the user data according to a spreading ratio. The chipping code is a redundant bit pattern for each bit that is transmitted, which increases the signal's resistance to interference. If one or more bits in the pattern are damaged during transmission, the original data can be recovered due to the redundancy of the transmission.

Dynamic IP Address

An IP address that is temporarily leased to a host by a DHCP server. The opposite of *Static IP Address*.

E

ESS

An Extended Service Set (ESS) is a set of two or more BSSs that form a single subnetwork. See also *BSS*.

Ethernet

The most widely used LAN type, also known as IEEE 802.3. The most common Ethernet networks are 10Base-T, which provide transmission speeds up to 10 Mbps, usually over unshielded, twisted-pair wire terminated with RJ-45 connectors. Fast Ethernet (100Base-T) provides speeds up to 100 Mbps. “Base” means “baseband technology” and “T” means “twisted pair cable.”’

Each Ethernet port has a physical address called the MAC address. Also see *MAC address*.

Event

A message generated by a device to inform an operator or the network management system that something has occurred.

F

Firmware

Code written onto read-only memory (ROM) or programmable read-only memory (PROM). Once firmware has been written onto the ROM or PROM, it is retained even when the device is turned off. Firmware is upgradeable.

FTP

File Transfer Protocol is a standard Internet protocol for exchanging files between computers. FTP is commonly used to download programs and other files to a computer from web pages on Internet servers.

G

Gateway

A device that enables communication between networks using different protocols. See also *router*.

GUI

Graphical User Interface

H

Hexadecimal

A base-sixteen numbering system that uses sixteen sequential numbers (0 to 9 and the letters A to F) as base units before adding a new position. On computers, hexadecimal is a convenient way to express binary numbers.

Host

In IP, a host is any computer supporting end-user applications or services with full two-way network access. Each host has a unique host number that combined with the network number forms its IP address.

Host also can mean:

- A computer running a web server that serves pages for one or more web sites belonging to organization(s) or individuals
- A company that provides this service
- In IBM environments, a mainframe computer

I

ICMP

Internet Control Message Protocol is a protocol used for error, problem, and informational messages sent between IP hosts and gateways. ICMP messages are processed by the IP software and are not usually apparent to the end-user.

IEEE

The Institute of Electrical and Electronics Engineers, Inc. (http://www.ieee.org) is an organization that produces standards, technical papers, and symposiums for the electrical and electronic industries and is accredited by ANSI. 802.11b and 802.11g are examples of standards they have produced.

Internet

A worldwide collection of interconnected networks using TCP/IP.

IP

Internet Protocol is a set of standards that enable different types of computers to communicate with one another and exchange data through the Internet. IP provides the appearance of a single, seamless communication system and makes the Internet a virtual network.

IP Address

A unique 32-bit value that identifies each host on a TCP/IP network. TCP/IP networks route messages based on the destination IP address.

For a Class C network, the first 24 bits are the network address and the final 8 bits are the host address; in dotted-decimal format it appears “network.network.network.host.”

ISDN

Integrated Services Digital Network

ISP

Internet Service Provider

L

LAN

Local Area Network. A local area network provides a full-time, high-bandwidth connection over a limited area such as a home, building, or campus. Ethernet is the most widely used LAN standard.

M

MAC Address

The Media Access Control address is a unique, 48-bit value permanently saved in the ROM at the factory to identify each Ethernet network device. It is expressed as a sequence of 12 hexadecimal digits printed on the unit’s label. You need to provide the MAC Address to the cable service provider. Also called an Ethernet address, physical address, hardware address, or NIC address.

MB

One megabyte; equals 1,024 x 1,024 bytes, 1,024 kilobytes, or about 64 million bits.

Mbps

Million bits per second (megabits per second). A rate of data transfer.

MTU

The Maximum Transmission Unit is the largest amount of data that can be transmitted in one discrete message on a given physical network. The MTU places an upper bound on the size of a message that can be transferred by the network in a single frame. Messages exceeding the MTU must be fragmented before transmission, and reassembled at the destination.

Multicast

A data transmission sent from one sender to multiple receivers. See also broadcast and unicast.

N

NAT

Network Address Translation is an Internet standard for a LAN to use one set of IP addresses for internal traffic and a second set of IP addresses for external traffic. NAT provides some security because the IP addresses of LAN computers are invisible on the Internet.

Network

Two or more computers connected to communicate with each other. Networks have traditionally been connected using some kind of wiring.

NIC

A Network Interface Card converts computer data to serial data in a packet format that it sends over the LAN. A NIC is installed in an expansion slot or can be built-in. Every Ethernet NIC has a MAC address permanently saved in its ROM.

P

Packet

The unit of data that is routed between the sender and destination on the Internet or other packet-switched network.

PCMCIA

The Personal Computer Memory Card International Association sets international standards for connecting peripherals to portable computers. Laptop computers typically have a PCMCIA slot that can hold one or two PC Cards to provide features such as Ethernet connectivity.

PING

A network utility that tests host reachability by sending a small packet to the host and waiting for a reply. If you PING a computer IP address and receive a reply, you know the computer is reachable over the network. It also stands for “Packet InterNet Groper.”

Port Triggering

A mechanism that allows incoming communication with specified applications.

PPP

Point-to-Point Protocol is used to transport other protocols, typically for simple links over serial lines. It is most commonly used to access the Internet with a dial-up modem.

PPPoE

Point-to-Point Protocol over Ethernet. Used by many DSL Internet Service Providers for broadband connection.

PPTP

Point-to-Point Tunneling Protocol encapsulates other protocols. It is a new technology to create VPNs developed jointly by several vendors.

Private IP Address

An IP address assigned to a computer on a LAN by the DHCP server for a specified lease time. Private IP addresses are invisible to devices on the Internet. See also *Public IP Address*.

Protocol

A formal set of rules and conventions for exchanging data. Different computer types (for example PC, UNIX, or mainframe) can communicate if they support common protocols.

Public IP Address

The IP address assigned to the router or AP by the service provider. A public IP address is visible to devices on the Internet. See also *Private IP Address*.

R

RJ-11

The most common type of connector for household or office phones.

RJ-45

An 8-pin modular connector; the most common connector type for 10Base-T or 100Base-T Ethernet networks.

Roaming

The ability to transfer your wireless session from one AP to another AP seamlessly.

ROM

Read-Only Memory.

Router

On IP networks, a device connecting at least two networks, which may or may not be similar. A router is typically located at a gateway between networks. A router operates on OSI network layer 3. It filters packets based on the IP address, examining the source and destination IP addresses to determine the best route on which to forward them.

A router is often included as part of a network switch. A router can also be implemented as software on a computer.

Routing Table

A table listing available routes that is used by a router to determine the best route for a packet.

RTS

Request To Send.

S

Server

In a client/server architecture, a dedicated computer that supplies files or services such as file transfer, remote login, or printing to clients. Also see *client.*

Service Provider

A company providing Internet connection services to subscribers.

SMTP

Simple Mail Transfer Protocol is a standard Internet protocol for transferring e-mail.

Static IP Address

An IP address that is permanently assigned to a host. Normally, a static IP address must be assigned manually. The opposite of *Dynamic IP Address*.

Station

IEEE 802.11b term for wireless client.

Subscriber

A user who accesses television, data, or other services from a service provider.

Subnet Mask

A methodology that determines what the router will examine for the destination of an IP address. A router delivers packets using the network address.

Switch

On an Ethernet network, a switch filters frames based on the MAC address, in a manner similar to a bridge. A switch is more advanced because it can connect more than two segments.

T

TCP

Transmission Control Protocol on OSI transport layer four, provides reliable transport over the network for data transmitted using IP (network layer three). It is an end-to-end protocol defining rules and procedures for data exchange between hosts on top of connectionless IP. TCP uses a timer to track outstanding packets, checks error in incoming packets, and retransmits packets if requested.

TCP/IP

The Transmission Control Protocol/Internet Protocol suite provides standards and rules for data communication between networks on the Internet. It is the worldwide Internetworking standard and the basic communications protocol of the Internet.

Tunnel

To place packets inside other packets to send over a network. The protocol of the enclosing packet is understood by each endpoint, or tunnel interface, where the packet enters and exits the network. VPNs rely on tunneling to create a secure network.

Tunneling requires the following protocol types:

- A carrier protocol, such as TCP, used by the network that the data travels over
- An encapsulating protocol, such as IPSec, L2F, L2TP, or PPTP, that is wrapped around the original data
- A passenger protocol, such as IP, for the original data

U

UDP

User Datagram Protocol. A method used along with the IP to send data in the form of message units (datagram) between network devices over a LAN or WAN.

Unicast

A point-to-point data transmission sent from one sender to one receiver. This the normal way you access websites. See also *multicast*.

USB

Universal Serial Bus is a computer interface for add-on devices such as printers, scanners, mice, modems, or keyboards. USB 1.1 supports data transfer rates of 12 Mbps and plug-and-play installation. You can connect up to 127 devices to a single USB port. USB 2.0 supports data rates of 480 Mbps.

V

VoIP

Voice over Internet Protocol is a method to exchange voice, fax, and other information over the Internet. Voice and fax have traditionally been carried over traditional telephone lines of the Public Switched Telephone Network (PSTN) using a dedicated circuit for each line. VoIP enables calls to travel as discrete data packets on shared lines. VoIP is an important part of the convergence of computers, telephones, and television into a single integrated information network.

VPN

A virtual private network is a private network that uses “virtual” connections (tunnels) routed over a public network (usually the Internet) to provide a secure and fast connection; usually to users working remotely at home or in small branch offices. A VPN connection provides security and performance similar to a dedicated link (for example, a leased line), but at much lower cost.

W

WAN

A wide-area network provides a connection over a large geographic area, such as a country or the whole world. The bandwidth depends on need and cost, but is usually much lower than for a LAN.

WAP

Wireless Access Point or Wireless Access Protocol. See also *Access Point*.

WEP

Wired Equivalent Privacy encryption protects the privacy of data transmitted over a wireless LAN. WEP uses keys to encrypt and decrypt transmitted data. The access point must authenticate a client before it can transfer data to another client. WEP is part of IEEE 802.11b.

Wi-Fi®

Wireless fidelity (pronounced why'-fy) brand name applied to products supporting IEEE 802.11b/g.

WLAN

Wireless LAN.

WPA

Wi-Fi Protected Access. A security regimen developed by IEEE for protection of data on a WLAN.

WWW

World Wide Web. An interface to the Internet that you use to navigate and hyperlink to information.

Visit our website at:
www.motorola.com/broadband

MOTOROLA

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MGBI