

MN-500 Base Station Configuration Guide

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Customizing the Microsoft Wireless Base Station (MN-500)

The Base Station Management Tool is a Web-based utility that you can use to manage network settings and customize security options on the Microsoft® Broadband Networking Wireless b-Base Station (MN-500).

You can establish many base station settings when you run the Setup Wizard. However, if you want to change a setting, such as your base station password, or if you have special network requirements (for example, if you want to establish a Web server on your network), you can use the Base Station Management Tool to configure the necessary settings.

If you do not run the Setup Wizard when you set up your network, you must use the Base Station Management Tool to configure your network settings.

This guide explains how to perform the following tasks:

- Open the Base Station Management Tool and view the current configuration of your base station.
- Configure the base station with the settings provided by your Internet service provider (ISP) so that your networked computers can connect to the Internet.
- Manage network time settings, base station password, and firmware upgrades.
- Create a backup file of the base station settings.
- Change the wireless channel and wireless network name (also known as Service Set Identifier, or SSID) for your network.
- Customize security features, such as media access control (MAC) filtering and wireless security (also known as Wired Equivalent Privacy, or WEP) settings.
- Change the base station configuration from routing mode to bridging mode.
- Limit access to the Internet or to particular applications on one or more of your networked computers by setting up client filtering.
- Set up the network to allow unrestricted access to the Internet from one computer by establishing a virtual demilitarized zone (DMZ).
- Configure port forwarding to run applications with special network requirements.

Opening the Base Station Management Tool

You can open the Base Station Management Tool from the Microsoft Broadband Network Utility or open it directly from a Web browser, such as Microsoft Internet Explorer 5 or later, or Netscape Navigator 4.7 or later. To use the Base Station Management Tool, you must have a Java-enabled browser installed on your computer.

To open the Base Station Management Tool

1. In the Broadband Network Utility, on the **Tools** menu, click **Base Station Management Tool**.

-or-

Open your Web browser, and then type the IP address of the base station in the address field. By default, this address is `http://192.168.2.1`. However, you can change this address in the Base Station Management Tool.

2. To log on, type the base station password that you created when you ran the Setup Wizard. The base station password is case sensitive. If you did not run the Setup Wizard, use the default base station password, **admin**.

If you do not remember the base station password that you set when you ran the Setup Wizard, you will need to restore the factory default settings on the base station and use the default base station password, **admin**. When you restore the original settings, you lose your ISP settings and must reconfigure these settings from the **Wide Area Network** page in the Base Station Management Tool.

For information about restoring factory default settings by using the Reset button on the base station, see "Restoring the Base Station" in Chapter 1 of your printed *User's Guide*.

Logging Off

It is important to log off the Base Station Management Tool after you have finished using it. Logging off protects the configuration of your base station so that unauthorized users cannot access and change your settings. Logging off also ensures that you can open the Base Station Management Tool from another computer if you need to. The Base Station Management Tool cannot be opened simultaneously on two different networked computers.

To log off the Base Station Management Tool

- On any page of the Base Station Management Tool, click **Log Off**.

Navigating the Base Station Management Tool

After you log on, the **Home** page of the Base Station Management Tool opens. You can use the menu in the left pane to navigate to the other pages of the Base Station Management Tool.

The screenshot shows the Base Station Management Tool interface in Microsoft Internet Explorer. The browser title is "Base Station Management Tool - Microsoft Internet Explorer". The page has a navigation menu on the left with options: Home, Management, Local Area Network, Wide Area Network, Wireless, and Security. The main content area is titled "Home" and includes a "Logout" link. Below the header, there is a "Wide Area Network (WAN) Settings - Dynamic" section with a "Help" link. This section displays the following information: Broadband connection: Disconnected; WAN IP address: 10.2.5.111; Subnet mask: 255.255.0.0; Default gateway: 0.0.0.0; Primary Domain Name System (DNS): 0.0.0.0; Secondary DNS: 0.0.0.0. There are "Release" and "Renew" buttons. Below this is the "Local Area Network (LAN) Settings" section, which displays: Local IP address: 192.168.2.1; Subnet mask: 255.255.255.0; DHCP server: Enabled; Firewall: Enabled. The "DHCP Client List" section shows a table of detected devices:

IP address	Host name	MAC address	
123.123.123.123	bunny_rabbit	00-50-04-9D-2F-7A	Release
123.123.123.124	Britney	00-50-04-9D-2F-7F	Release
123.123.123.125	Choryoth	00-50-04-9D-2F-71	Release

There is a "Release All" button below the table. At the bottom, the "Base Station Information" section displays: Runtime code version: v0.1; Boot code version: v0.1; LAN MAC address: 00-00-00-00-00-00; MAC address: 00-00-00-00-00-01; Serial number: 000000000000.

The following table lists the menu items in the Base Station Management Tool and describes the tasks that you can perform from the pages that those menu items open.

Menu Item	Tasks
Home	View current network settings and activity.
Management	Reset the base station, back up and restore base station settings, upgrade firmware, establish time settings, and change the base station password. For more information, see "Management Settings."
Local Area Network	Enable the Dynamic Host Configuration Protocol (DHCP) server on your base station and set the IP address range and lease time. For more information, see "Local Network Settings."
Wide Area Network	Specify and configure the type of Internet connection that your base station uses. For more information, see "Wide Area Network Settings."
Wireless	Set up or modify the connection between your base station and the wireless computers on your network. For more information, see "Wireless Settings."
Security	Configure a variety of specialized security functions, including: <ul style="list-style-type: none"> □ Firewall □ Wireless security (WEP) □ Port forwarding, including virtual servers and special applications □ Client filtering □ MAC filtering

You can also view the base station log from the Security section. For more information, see "Security Settings."

If you need help at any time, click the **Help** button available on each page of the Base Station Management Tool.

Configuring the Base Station

Typically, when you run the Setup Wizard, you establish the settings required for your base station to connect to the Internet. If you completed the Setup Wizard, you only need to use the Base Station Management Tool when you want to modify your network settings.

You must use the Base Station Management Tool to establish the initial settings if any of the following are true:

- You did not run the Setup Wizard when you connected your network hardware and installed the network software.
- You are trying to configure the base station from a computer running Microsoft Windows® 2000 or from a computer not running Windows (for example, a Macintosh).
- You want to set the base station to bridging mode to extend the capabilities of an existing wired or wireless network.

If any of these situations apply to you, you must initially configure the base station from the Base Station Management Tool. Before you configure the base station, you must connect it to a computer.

To connect the base station to a computer

1. Position the base station close to your modem and computer, and near the center of your intended network area.
2. Unplug your modem cable from the Ethernet port on the back of your computer. Leave the other end of the cable plugged in to the modem. Plug the cable into the port labeled **To Modem** on the back of the base station.
3. Plug one end of the blue Ethernet cable that came with your base station into the Ethernet port labeled **1** on the back of the base station and plug the other end into the Ethernet port on the back of your computer.
4. Plug one end of the power supply that came with your base station into the Power Port on the back of the base station, and plug the other end into an electrical outlet. The Power light on the front of the base station should illuminate.

To configure the base station from the Base Station Management Tool

1. Configure the TCP/IP properties of each computer that you want to connect to your network. For information about how to do this, see “Configure Network Computers” in this chapter.
2. On the computer connected to the base station, open your Web browser, and then type **192.168.2.1** in the address field.
3. In the logon box, type your password. The default password is **admin**.
4. On the **Management** menu, click **Change Password**, and then create a new base station password.
5. Click **Wide Area Network**. On the **Wide Area Network** page, select the type of Internet connection you have, and then enter the settings provided by your ISP. If you do not know the type of Internet connection you have, contact your ISP for assistance.
6. If you are replacing an existing base station, router, or gateway with the Microsoft base station, specify the MAC address of that device in the **MAC Address** box, and then click **Clone MAC Address**. Otherwise, specify the MAC address of the adapter that was connected to the modem in the **MAC Address** box, and then click **Clone MAC Address**. For more information, see “MAC Addresses.”
7. On the **Security** menu, click **Wireless Settings**, and then create your wireless security settings. For information about wireless security settings, see “Wireless Security (WEP)” in this chapter.
8. Turn on your broadband modem, and then check the status of the Broadband Connection on the **Home** page of the Base Station Management Tool. If the status is **Disconnected**, click **Renew** or **Connect**. If the status is still **Disconnected**, confirm the ISP settings with your ISP, and then try to configure the base station again.

Configure Network Computers

When you manually configure the base station, you must configure the TCP/IP properties of each computer that you connect to your network.

Before you configure the TCP/IP properties for each computer, you should establish the computer name and the workgroup name on each computer. Each computer name must be unique, while the workgroup name should be the same for all computers in the workgroup.

The procedure for establishing the computer and workgroup names on a computer varies depending on which version of Windows you are using. For information about how to establish these names, consult Windows Help or Broadband Network Utility Help.

To configure the TCP/IP properties of a computer running Windows 98, Windows 2000, or Windows Me

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon.
3. In the **Configuration** dialog box, select the TCP/IP protocol line that is associated with your network adapter.
4. Click the **Properties** button, click the **IP Address** tab, and then select **Obtain an IP address automatically**.
5. Click the **Gateway** tab and make sure that all fields are empty, and then click **OK**. When the **Network Properties** dialog box appears, click **OK** again.
6. If you are prompted to supply the original Windows installation files, insert your Windows CD-ROM into the CD-ROM drive, and then browse to the location of your CD-ROM drive.
7. When you are prompted to restart your computer, click **OK**.

To configure the TCP/IP properties of a computer running Windows XP

1. Click **Start**, click **Control Panel**, and then double-click **Network Connections**.
2. Double-click the icon for the connection you want to configure, and then in the **Connection Status** dialog box, click **Properties**.
3. On the **General** tab, under **This connection uses the following items**, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. Click **Obtain IP address automatically**, and then click **Obtain DNS server address automatically**.
5. Click **OK** to close the **TCP/IP Properties** dialog box, and then click **OK** to close the **Connection Properties** dialog box.

Using the Base Station as a Bridge

If you already have a functioning network in your home or office, you can use the base station to add wireless connectivity to your wired network or to extend the wireless range of an existing wireless network. This is called bridging because the base station acts as a bridge between two networks or segments of a network.

Before you change the base station to bridging mode, make sure that the following conditions are true:

- A device on your network, such as your modem, is providing router capabilities, or a device on your network is providing a Network Address Translation (NAT) service.
 - There is an existing DHCP server on your network
- or-
- Each device on your network uses a static (fixed) IP address.

To configure the base station as a bridge

- 1.** Connect the base station to a computer on your network. For information about how to do this, see “To connect the base station to a computer.”
- 2.** On the computer connected to the base station, open your Web browser, and then type **192.168.2.1** in the address field.
- 3.** In the logon box, type your password. The default password is **admin**.
- 4.** On the **Management** menu, click **Change Password**, and then create a new base station password.
- 5.** On the **Security** menu, click **Network Mode**.
- 6.** Select the **Bridging Mode** check box, and then click **Yes** to confirm your selection. When you switch from routing mode to bridging mode, the base station resets. While the reset is in progress, the power light on the base station blinks and then turns orange. When the light is solid green, the reset is complete.
- 7.** After the reset is complete, turn off the computer and the base station. Remove the cable from the base station **Ethernet** port and insert it into the **To Modem** port. Leave the other end of the cable connected to the **Ethernet** port of the computer.
- 8.** Turn on the base station and restart your computer.

Home Page

You can view current base station and Internet connection settings from the **Home** page of the Base Station Management Tool. The following sections describe these settings.

Wide Area Network

The wide area network (WAN) settings provide a summary of the Internet settings provided by your ISP. The settings that appear will vary depending on whether your ISP account provides a static (fixed) IP address, a dynamic Internet connection, or a Point-to-Point Protocol over Ethernet (PPPoE) connection. If your Internet connection is disabled, the WAN settings will be unavailable.

The following table describes the WAN settings and how to modify them.

Setting	Description	Notes
Broadband Connection	Appears as Connecting , Connected , Disconnecting , or Disconnected .	If the Base Station Management Tool shows that your broadband connection is disconnected when you expect it to be connected, try clicking Release and then Renew to change the base station IP address. If you have a PPPoE connection, try clicking Disconnect and then Connect . You can also try resetting the base station and your broadband modem. If you complete these steps and the Broadband Connection is still disconnected, contact your ISP for assistance.
WAN IP address	Shows the IP address provided by your ISP.	This is the external (public) IP address that connects your network to the Internet. If your ISP provides you an IP address dynamically (by using a DHCP server), this address may change periodically. You can click the Release button and then the Renew button to get a new IP address. Releasing your IP address is a good idea if you are having trouble accessing the Internet and you have determined that the computer is not the source of the problem. If renewing the IP address does not resolve the problem, contact your ISP for assistance.
Subnet mask	Your ISP establishes the WAN subnet mask.	If you are using a static Internet connection, you can change the subnet mask for your wide area network, but you should use the subnet mask provided by your ISP. The subnet mask does not appear when you are using a PPPoE Internet connection.
Default gateway	The IP address that the base station uses to send data from your network to the Internet.	The gateway setting is automatically generated when you have a dynamic or PPPoE connection. If you have a static (fixed) IP address, your ISP should provide the gateway setting, and you can enter the setting on the Wide Area Network page of the Base Station Management Tool. If you have a dynamic connection and your Gateway setting is blank, you should click Release and then Renew .
Primary Domain Name System (DNS) and Secondary DNS	Your ISP provides the DNS addresses.	In some cases, these settings may be automatically filled in. Otherwise, you can enter them on the Wide Area Network page of the Base Station Management Tool.

Local Area Network

The Local Area Network (LAN) settings relate to your local network—that is, how the base station is configured in relation to the devices on your network.

The following table describes the LAN settings and how to modify them.

Setting	Description	Notes
Local IP address	The default IP address of your base station is 192.168.2.1.	You can change the local IP address on the Local Area Network page of the Base Station Management Tool, but this is not recommended.
Subnet mask	The subnet mask for your local network is 255.255.255.0.	You cannot change the subnet mask of your LAN.
DHCP server	Appears as Enabled or Disabled .	You can change this setting on the Local Area Network page of the Base Station Management Tool.
Firewall	Appears as Enabled or Disabled .	You can change this setting in the Security section of the Base Station Management Tool.

DHCP Client List

When a DHCP server is enabled on a network, each device (also called a client, which can be a desktop computer, notebook computer, or another connected device) leases an IP address for a specified period of time. The DHCP client list shows all the clients that have an active lease on an IP address, including the IP address and MAC address of each client. The list includes any device with an active lease, even if that device is no longer actively connected to the network. A client is removed from the DHCP client list when its lease has expired. The network can support up to 253 clients at one time.

You can specify the IP address lease time from the **Local Area Network** page of the Base Station Management Tool. For information about how to do this, see “Local Network Settings.”

The DHCP client list is relevant to your network only if you have the DHCP server enabled on the base station. For information about how to enable or disable the DHCP server, see “DHCP Server.”

Base Station Information

You can view current network status in the Base Station Management Tool, under **Network Information**. The following table describes this network information.

Setting	Description	Notes
Runtime code version and Boot code version	These settings show the version numbers of your firmware.	When you check for firmware upgrades at www.microsoft.com/broadbandnetworking you should download the version on the Web only if it is later than the version shown here.
LAN MAC address	This is the MAC address of the base station.	For information about MAC addresses, see “MAC Addresses.”
MAC address	This is the MAC address that your ISP sees.	For information about MAC addresses, see “MAC Addresses.”
Serial number	This is the serial number of your base station.	If you need to call Product Support Services for assistance, you might need to provide the serial number.

Management Settings

When you want to change the settings related to the management of your base station (for example, resetting the base station, backing up or restoring settings, establishing time settings, or changing the password), use the **Management** menu in the Base Station Management Tool. The following sections describe how to perform management-related tasks.

Reset the Base Station

You can reset the base station when you experience any of the following problems:

- You have DHCP enabled on the base station, but the base station is not assigning IP addresses.
- The computers on the network are no longer able to connect to the Internet.
- The base station is not performing as expected.

When you reset the base station, you are forcing it to reinitialize and restart all of its functions. The base station settings will not change when you reset the base station.



Note You can also reset the base station by using the reset button on the base station itself. For more information about how to perform a hardware reset, see Chapter 1 of your printed *User's Guide*.

To reset the base station

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Reset**.
3. On the **Reset Base Station** page, click **Reset**. While the reset is in progress, the Power light on the base station blinks and then turns orange. When the light is solid green, the reset is complete.

If you want to open the Base Station Management Tool after the reset is complete, type your base station password on the **Logon** page. Do not attempt to log on until the reset is complete and the power light on the base station is solid green.

Restore Factory Default Settings

You can restore the base station to its factory default settings if absolutely necessary. When you restore factory default settings, you clear any special base station configurations that you have established. You will need to reconfigure your base station settings or restore these settings from a backup file.

You should restore the original factory default settings only under the following circumstances:

- You are experiencing serious problems with your base station, and resetting the base station does not fix the problem.
- You cannot remember your base station password.

If you cannot remember your base station password, you will not be able to open the Base Station Management Tool. In this situation, you must restore the factory default settings from the base station, and then use the default password **admin** to log on to the Base Station Management Tool and reconfigure your settings. For more information about how to restore factory default settings from the base station itself, see Chapter 1 of your printed *User's Guide*.

To restore factory default settings

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Back Up and Restore**.
3. Under **Restore Factory Default Settings**, click **Restore Settings**. While the original factory default settings are being restored, the power light on the base station blinks and then turns orange. When the light is solid green, the settings have been restored.

To open the Base Station Management Tool after the settings are restored, type **admin** as the password on the **Logon** page. Do not attempt to log on to the base station until the settings are restored and the Power light on the base station is solid green.

After you restore the factory default settings, you should navigate to each page of the Base Station Management Tool and reestablish the network settings you want, or restore the base station settings by using a backup file. For information about creating a backup file of your settings, see the following section.

Be sure to establish your unique base station password as soon as possible after restoring the factory default settings to prevent unauthorized users from logging on. For information about changing the base station password, see “Change the Base Station Password.”

Back Up Base Station Settings

You can create a backup file of all your base station settings from the Base Station Management Tool. The backup file can include settings that you established when you completed the Setup Wizard and the settings that you modified from the Base Station Management Tool.

It is a good idea to create a backup file after you have the base station set up and operating normally. If for some reason the base station malfunctions, you can restore the factory default settings to the base station, and then use the backup file to reconfigure your base station and resume normal operations.

It is recommended that you back up settings whenever you change settings, such as your base station password.

To back up base station settings

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Back Up and Restore**.
3. Click **Back Up Settings**.
4. If you receive a message asking you whether to open or save the file, click **Save**.
5. Type a name for the file that contains your base station settings (or use the default name Config.bin), browse to the folder or disk where you want to save the file, and then click **Save**.

Restore Base Station Settings from a Backup

If you have created a backup file of your base station settings, you can restore settings from the backup file at any time. This capability is particularly useful if the base station malfunctions and you must restore the factory default settings. Instead of manually reconfiguring each of your network settings from the Base Station Management Tool, you can restore all of your saved settings from the backup file.

To restore base station settings from a backup file

1. On the computer where you saved the backup file of your base station settings, open the Base Station Management Tool.
2. Type the current base station password. If you have just restored the factory default settings to the base station, the password will be **admin**.
3. On the **Management** menu, click **Back Up and Restore**.
4. Under **Restore Base Station Settings from a Backup**, type the path and name of the backup settings file, or click **Browse** to search for the file that contains your network settings.
5. Click **Restore Settings**. While the settings are being restored, the power light on the base station blinks and then turns orange. When the light is solid green, the settings have been restored.

If you want to open the Base Station Management Tool after the settings are restored, type your base station password on the **Logon** page. Do not attempt to log on until the settings are restored and the power light on the base station is solid green.

Upgrade Base Station Firmware

Occasionally, Microsoft may provide upgrades to the base station firmware to improve the performance of your base station. You can upgrade the firmware from the Base Station Management Tool.

You can perform a firmware upgrade from any of your network computers, but it is recommended that you use a computer with a wired (Ethernet) connection to the base station.

During an upgrade, all users connected to the network will lose network functionality.

To upgrade the base station firmware

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Upgrade Firmware**.
3. Follow the directions on the screen to upgrade your firmware. While the firmware is being saved to your base station, the power light on the base station blinks and then turns orange. When the light is solid green, the update is complete. If the upgrade fails, the power light will continue to blink slowly until you successfully upgrade the firmware. In this situation, you can try to upgrade the firmware again, or you can reset the base station.

If you want to open the Base Station Management Tool after a successful firmware update, type your base station password on the **Logon** page. Do not attempt to log on until the firmware upgrade is complete and the power light on the base station is solid green.

Certain programs do not allow pop-up windows from Web browsers. If you have one of these programs installed on your computer, you might experience problems when you click the **Microsoft Broadband Networking Web site** link on the **Upgrade Firmware** page. If you do experience problems, you can open the Microsoft Broadband Networking site by typing <http://www.microsoft.com/broadbandnetworking/> in the address field of your Web browser and browsing to the update page, or by turning off the software that prevents pop-up windows.

For information about how to upgrade network software and drivers from the Broadband Network Utility, see Broadband Network Utility Help.

Establish Base Station Time Zone

The base station uses the date and time for client filtering and to timestamp entries to the base station log.

The base station system clock is set to the Pacific time zone by default. You can change the base station time zone from the Base Station Management Tool.

To change the base station time zone

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Set Time**.
3. Under **Base Station Time Zone**, in the drop-down list box, click the time zone you want.
4. Select the **Adjust for daylight saving time** check box if you want the base station to adjust for daylight-saving time.
5. If you selected the **Adjust for daylight saving time** check box, type the date that you want daylight-saving time to start and the date that you want daylight-saving time to end. You must update these dates each year to correspond with daylight-saving time.
6. Click **Update Time Settings** to ensure that the changes that you made are saved.

Synchronize Time to Internet Time Server

The base station automatically attempts to synchronize with one of a set of Simple Network Time Protocol (SNTP) servers when it is connected to the Internet. If you want to synchronize the base station to a specific SNTP server, you can do so from the Base Station Management Tool. Before you can set the SNTP server, you must identify the IP address for the server that you want to use.

To locate an SNTP server

1. Open your Web browser, and go to your favorite search engine (for example, www.msn.com).
2. Type **Time synchronization on the Internet** as a search term.
3. Review the search results, and browse to the SNTP server site that you want to use.
4. Write down the IP address for the SNTP server that you have accessed.

To synchronize the base station with an SNTP server

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Set Time**.
3. Under **Synchronize Time to Internet Time Server**, type the IP address for the specific SNTP server that you want to use, and then click **Add**.
4. Repeat step 3 for any additional backup SNTP servers that you want to specify.

Change the Base Station Password

Access to the Base Station Management Tool is password protected to help ensure that only users who know the base station password can change your network configuration. If you ran the Setup Wizard, you were prompted to establish a password. This is your base station password. If you did not run the Setup Wizard, your default password is **admin**. You can change the base station password from the Base Station Management Tool.

It is a good idea to change your password every two to three months, or more frequently if you are concerned that an unauthorized person has administrative access to the base station.

If at any point you restore the factory default settings for the base station, the default password **admin** is also restored. You can use this password to access the base station, and then create a new password at the earliest opportunity.

When you change your base station password, be sure to update your backup file.

To change the base station password

1. Open the Base Station Management Tool, and then click **Management**.
2. On the Management menu, click **Change Password**.
3. In the **Current password** box, type your current password.
4. In the **New password** box, type a new password. Use a minimum of 6 characters, but no more than 16 characters. The base station password is case sensitive.
5. In the **Retype new password** box, retype the new password.
6. If you want, in the **Log out inactive user in** box, type a time interval. After the specified time interval elapses without activity, you will need to log on to the Base Station Management Tool again in order to view or change settings.
7. To save the new password, click **Apply**.

Be sure to store your password in a safe place. If you forget or misplace your password and cannot log on to the Base Station Management Tool, you can restore the base station to the factory default settings from the base station itself, and then use the default password **admin** to open the Base Station Management Tool. For more information about restoring factory default settings on the base station, see “Resetting the Base Station” in Chapter 1 of your printed *User’s Guide*.

Local Area Network Settings

You can configure settings for your local network on the **Local Area Network** page of the Base Station Management Tool. This configuration includes the following:

- Changing the IP address of your base station and viewing the subnet mask assigned to your local network.
- Enabling or disabling a DHCP server on the base station.
- Setting the IP address range and lease time for the DHCP server.
- Entering the local domain name for the DHCP server if necessary.

Before you configure your local network, take some time to learn about the options available. The following sections describe each of the local area network settings.

IP Address and Subnet Mask

The default IP address of your local network is 192.168.2.1. This address is reserved for private local networks; it is not visible to the Internet.

You do not need to change the IP address unless you have a specific reason to do so—for example, if your modem IP address overlaps with the base station IP address. If you want to change the IP address of your base station, be sure to change it to another non-routable (private) IP address.

The IP addresses assigned to the computers on your local network by the DHCP server are derived from the base station IP address. If you change the base station IP address, the DHCP IP address range will also change.

The subnet mask for your local network is 255.255.255.0. You cannot change the subnet mask assigned to your local network.

To modify the base station IP address

1. Open the Base Station Management Tool, and then click **Local Area Network**.
2. Type a new IP address for the base station.
3. To save the changes, click **Apply**.

DHCP Server

The base station DHCP server allocates IP addresses to the computers on your local network from a specific range of IP addresses. Each time a computer on your network requests an IP address, it receives one within the specified IP address range. Typically, the DHCP server will assign the same IP address to a client computer each time the client logs on to the network.

The base station provides a default IP address range for the DHCP server to use. If you want, you can select a specified IP address range when you enable the DHCP server.

To enable the DHCP server on the base station

1. Open the Base Station Management Tool, and then click **Local Area Network**.
2. If it is not already selected, select **Enabled** from the DHCP server list to enable the DHCP server on the base station.
3. If you do not want to use the IP address pool specified by the DHCP server, type a starting IP address and an ending IP address for the pool. Do not include the base station IP address in the IP address pool. For example, if you are using the default base station IP address (192.168.2.1), the address range must be between 192.168.2.2 and 192.168.2.254.
4. Select a lease time for the assigned IP addresses. The default time is two hours.
5. Type a local domain name if your ISP provided one for you.
6. To save your changes, click **Apply**.

Wide Area Network Settings

The WAN settings on your network depend on your ISP account. ISPs provide broadband customers with one of three different types of Internet connections:

- Dynamic
- Static
- PPPoE

The Setup Wizard helps you configure your Internet connection. If you did not run the Setup Wizard, the Broadband Networking Wireless Base Station selects a dynamic connection by default. If you have a static Internet connection or a PPPoE connection, you can change the WAN setting from the **Wide Area Network** page of the Base Station Management Tool.

You also have the option to disable your network Internet connection, if necessary. The following sections describe each type of Internet connection and how to configure your base station for that option.

Dynamic Internet Connection

If your ISP provides a DHCP server, you should select a dynamic Internet connection for the WAN. This connection enables your ISP to assign the IP address to your base station dynamically based on the IP addresses available in the ISP's subnet.

When you select a dynamic Internet connection, you might be required to enter the host name and the DNS addresses, if your ISP provided this information.

To establish a dynamic Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Dynamic**.
3. Specify a host name if your ISP provided one to you.
4. Specify a MAC address, and click **Clone MAC Address**, if necessary. For information about this option, see "MAC Addresses."
5. Specify the DNS primary and secondary addresses, if your ISP provided you with this information and it has not been obtained automatically.
6. To save the WAN settings, click **Apply**.

Static Internet Connection

If your ISP account provides a static (fixed) IP address, you should configure the WAN settings on your base station for a static Internet connection.

To establish a static Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Static**.
3. Under **Static Connection**, type the information provided by your ISP, including the IP address, subnet mask, default gateway IP address, and DNS addresses (if provided).
4. Specify a MAC address, and click **Clone MAC Address**, if necessary. For information about this option, see "MAC Addresses."
5. To save the WAN settings, click **Apply**.

PPPoE Internet Connection

If your ISP uses a PPPoE connection, you should configure the WAN settings on your base station for a PPPoE connection.

A PPPoE Internet connection functions like a dial-up connection in that your user name and password are passed to the ISP for authentication to establish an Internet connection. This interaction happens automatically when the base station is turned on.

Unlike a dial-up connection, a PPPoE Internet connection is persistent unless any of the following occurs: you disable the connection; the base station is turned off or loses power; or you specify a maximum idle time, and this time elapses.

To establish a PPPoE Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **PPPoE**.
3. Under **Point-to-Point Protocol over Ethernet (PPPoE)**, type your user name and password.
4. Type a service name if your ISP supplied it.
5. Type a maximum idle time, if your ISP instructs you to. You will be disconnected from the Internet if the time that you specify elapses without activity.
6. Type the DNS primary and secondary addresses, if your ISP provided you with this information.
7. Specify a MAC address, and click **Clone MAC Address**, if necessary. For information about this option, see "MAC Addresses."
8. To save the WAN settings, click **Apply**.

Disabled Connection

You can disable your Internet connection at any time. You might want to disable your Internet connection in the following situations:

- When you suspect that an unauthorized individual is accessing your network.
- When you want to limit your children's access to the Internet.
- When you want to limit the exposure of your local network to the WAN.

Disabling your Internet connection does not affect your Internet connection settings in any way. When you reestablish your connection, your original settings are intact.

To disable the Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Disabled**.
3. To disable your Internet connection, click **Apply**.

MAC Addresses

A MAC address is a unique numerical identifier for a hardware device, such as a base station or adapter. Your base station has two MAC addresses, one for the local area network and one for the wide area network. Each network adapter that you use also has a MAC address that is assigned at the time of manufacture and printed on the label.

Some ISPs record the MAC address of the adapter that you use when you first connect to the Internet. Depending on your ISP account, you might experience problems if you later use the base station's default MAC address to connect to the Internet.

One way to avoid this problem is to clone the MAC address of the adapter installed in the computer where you initially connected to the Internet. When you clone the adapter MAC address, it replaces the base station WAN MAC address, so that each device on your network, including the base station, appears to have that MAC address.

To clone a MAC address

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. In the **MAC address** box, type the MAC address of the adapter installed in the computer that is connected to your base station. The MAC address appears on the label on the underside of your adapter.
3. Click **Clone MAC address**.

It is a good idea to record the MAC address of the adapter that you clone, so that if you lose your settings or no longer have the adapter, you do not lose your ability to connect to the Internet.

Wireless Settings

You can enable or disable wireless access from the **Wireless** page of the Base Station Management Tool. When you enable wireless access, you must establish the following base station settings:

- Wireless network name (SSID)
- Wireless channel

It is likely that you already established the wireless network name (SSID) and wireless channel when you ran the Setup Wizard. If you did not run the Setup Wizard, or if for some reason you want to modify these settings, you must update the wireless network name (SSID) on all the devices that connect wirelessly to your network. For information about how to update the wireless network name and wireless channel on specific devices, see the Broadband Network Utility Help.

When you enable wireless access on your network, you should also enable wireless security (WEP) to prevent users of unauthorized wireless clients from joining your wireless network. For information about wireless security (WEP), see “Wireless Security (WEP)” in this chapter.

If you know the MAC addresses of all the wireless clients that you want to access your network, you can also use MAC filtering to prevent unauthorized access. For information about MAC filtering, see “MAC Filtering” in this chapter.

Wireless Network Name (SSID)

The wireless network name, also known as the Service Set Identifier (SSID), identifies your network. Because the network name is broadcast by the base station, any user of a wireless device that supports the Institute of Electrical and Electronics Engineers (IEEE) 802.11b or 802.11g standards could attempt to join your wireless network when that device is in range.

Wireless Channel

The wireless channel is a path through which signals flow to and from your network. If you are having difficulty sending or receiving information on a wireless client, try changing the wireless channel.

To enable wireless access

1. Open the Base Station Management Tool, and then click **Wireless**.
2. If you want to change the wireless channel, click a number in the **Wireless channel number** drop-down list box.
3. If you want to change the network name, type a new network name in the **Wireless network name (SSID)** box. The network name is case sensitive and cannot exceed 32 characters.
4. To apply these settings, click **Apply**.

Security Settings

The Broadband Networking Wireless Base Station is configured to protect your network from the most common hacker attacks and other security risks. If necessary, you can change the default base station settings or establish special services from the **Security** section of the Base Station Management Tool.

The following sections describe the security features of the base station and how to customize them.

Be aware that changing security settings might affect whether the computers on your LAN are able to connect to the LAN and Internet. You should not change the default security settings unless you are absolutely clear about your objective in doing so.

Wireless Security (WEP)

The Broadband Networking Wireless Base Station uses wireless security (WEP) to prevent unauthorized users from accessing data that is being transmitted over the network. From the Base Station Management Tool, you can:

- Enable wireless encryption.
- Change the network key or modify the encryption settings that you established in the Setup Wizard.
- Disable wireless encryption.

When data is encrypted, it is rendered unreadable by a network key—called a WEP key—before being transmitted between wireless nodes. The data is readable only by computers that have the network key to decrypt the data.

The WEP key that you establish is stored with all of your network settings on each networked computer so that data can be encrypted and decrypted as it is transmitted over the network. If you change the WEP key that the base station uses, you must ensure that each computer on your wireless network uses the same WEP key so that it can communicate with the base station. For information about how to change the WEP key on each computer, see the Broadband Network Utility Help.

When you enable wireless encryption, you can choose between 64-bit or 128-bit encryption. The number defines the strength of the data encryption. The higher the number, the more difficult the data is to decrypt.

After you select the wireless encryption strength, you can type the WEP keys. For 64-bit encryption, you can type up to four WEP keys, each of which consists of ten hexadecimal digits. For 128-bit encryption, you must type one WEP key that consists of 26 hexadecimal digits. A hexadecimal digit is a number or letter in the range 0–9 or A–F.

Although encryption may slow down the speed at which data is transmitting, you will not observe any noticeable changes to network behavior as a result of data encryption and decryption.

To enable wireless security

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Wireless Security**.
3. Click **Enable wireless security**.
4. In the **Encryption strength** drop-down list box, click **128-bit** or leave the default setting of **64-bit**.
5. Type an encryption key in the **Key** box.
6. To enable the wireless encryption, click **Apply**.
7. Update the WEP keys stored on each wireless device on your network.

You can update wireless encryption settings for each network device from the Broadband Network Utility. If you are using a non-Microsoft adapter, use the software installed with that adapter to update wireless encryption settings.

Firewall Settings

The Broadband Networking wireless Base Station provides a firewall to protect your network against malicious transmissions. Just as the name implies, a firewall acts as a barrier or buffer zone between your local network and the Internet. It checks data packets that are being transmitted to your network and discards any suspicious data.

The firewall is enabled by default, but you can choose to disable it from the Base Station Management Tool. Do not disable the firewall unless you have a good reason to do so.

To change the firewall settings

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Firewall Settings**.
3. Do one of the following:
 - To enable the firewall, select the **Enable the integrated firewall** check box.
 - To disable the firewall, clear the **Enable the integrated firewall** check box.
4. To save your changes, click **Apply**.

Block Ping Commands

You can configure the firewall to discard network ping commands. A ping command is like a short conversation between a device on the WAN and your base station. When a device on the WAN sends a ping command, the base station responds.

When you block ping commands, you are telling the base station not to respond to a ping initiated from the WAN. This security mechanism hides your network from hackers who might be pinging random IP addresses to see where they get a response. A response verifies your network location, and a hacker can then use this information to send malicious communications to your network.

In general, it is a good idea to discard ping commands sent from the WAN. The only circumstances in which blocking ping commands might present a problem are:

- When your ISP needs to ping your network to ensure that the connection is still valid.
- When you or another person needs to check your Internet connection from an external network. For example, you might want to do this to make sure that you can access your Web server.
- When you are playing games on the Internet, and other players need to verify your network location and connection speed.

To block ping commands

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security menu**, click **Firewall Settings**.
3. Select the **Discard pings** check box.
4. To save your changes, click **Apply**.

Network Mode

You have the option to use the base station for routing services or as a bridge between two networks. The Broadband Networking Wireless Base Station is set to routing mode by default.

When you change the base station to bridging mode, you disable network address translation (NAT), which is an important feature of your network. When NAT is enabled, you can use the single IP address supplied by your ISP to connect multiple computers to the Internet. Ordinarily, if you wanted to connect multiple computers, you would need to arrange additional addresses (for example, by purchasing additional accounts). NAT enables multiple clients to share a single connection to the Internet.

If you choose to use the base station as a bridge between two networks or segments of a network, make sure that another device on your network (such as a base station, gateway, or router) is providing NAT service. If you do not have a NAT service on your network, you should lease an IP address for each computer on your network. Be aware that each of these IP addresses will be exposed to the Internet.

To change the base station network mode

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security menu**, click **Network Mode**.
3. Select the **Bridging Mode** check box.
4. To save your changes, click **Apply**.

Port Forwarding

You can configure the ports on your base station to establish virtual servers or run applications with special network requirements on your network. This is called port forwarding. Port forwarding involves the configuration of data ports, which are logical programmatic elements. Do not confuse data ports with the physical ports on your base station.

To understand how port forwarding works, you must first understand ports and their role in data transmission.

About Ports

Information passes from the Internet to computers on your network across ports. In any network communication, there is an outbound (destination) port and an inbound (source) port. These ports are used in conjunction with the source and destination IP addresses to establish a connection between two networked computers.

There are many different types of data transmitted across a network, and certain types of data must pass out of certain ports. The data type is recognized by the protocol, or rules, that it follows. For example, the e-mail messages that you send might follow one type of protocol, whereas the games that you play might follow another protocol. Typically, the data protocol determines the ports to which the data is passed.

The Broadband Networking Wireless Base Station opens the ports for certain applications automatically when a client on your local network transmits data to the WAN. This enables transmission of some of the more common data sent to and from the Internet, such as e-mail messages and Web browser data.

To run applications with special network requirements or to establish a virtual server, however, you might need to change the port configuration on the base station. You can configure, or forward, ports from the Base Station Management Tool.

Application-Triggered Port Forwarding

Some applications, such as Internet games and videoconferencing, require multiple ports for data transmission. File Transfer Protocol (FTP) data, for example, is sent from your computer to one port and returns to another port. These multiple port transmissions might cause problems when the base station is set to routing mode so that NAT is enabled on your base station, because the NAT service anticipates that data sent to one port will return to the same port.

The Broadband Networking Wired Base Station has already been configured to accommodate some common application protocols that require multiple ports, including FTP, Simple Mail Transfer Protocol (SMTP), and Post Office Protocol 3 (POP3).

To configure port forwarding for other applications that require multiple ports, you must specify the outbound (destination) port to which data following a particular protocol will be sent, and the inbound (source) port or ports to which related data will return. Essentially, you are telling the base station how to direct traffic across the networks.

The inbound ports that you specify will open only when data is sent to the corresponding outbound port. These ports will close again after a certain amount of time has elapsed with no data sent to the inbound port.

You can set ranges of ports, multiple ports, and combinations of single and multiple ports for the inbound ports.

You can configure the base station to accommodate up to 50 applications. To identify the protocol that an application uses and the ports to which the data should be sent, see the documentation for that application.

To establish application-triggered port forwarding

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Port Forwarding**, and then click **Set up application-triggered port forwarding**.
3. In the **Description** box, type a description of the application that you want to enable.
4. In the **Outbound port** box, type the number of the outbound port. The outbound port should be one number from 0 through 65535. To determine which port the application uses, consult the documentation for the application.
5. In the **Trigger type** drop-down list box, click the trigger type. The trigger type should be specified in the documentation for the application.
6. In the **Inbound port(s)** box, type the inbound port. The inbound port can be a single port or a comma-separated list of ports or port ranges. For example, you could type **4-25**, or **243**, or **10, 24-50, 74**. You are limited to 256 characters.
7. In the **Public type** drop-down list box, click the public type. The public type should be specified in the documentation for the application.
8. Select the **Enable** check box.
9. To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

If an application does not function correctly after you enable multiple ports, check the documentation for the application to verify that you are enabling the correct ports to open. If you have set the correct ports to open and the application still does not function properly, you might need to establish a virtual demilitarized zone (DMZ) on one of the client computers on your network to run the application. For information about establishing a DMZ, see "Virtual Demilitarized Zone."

Persistent Port Forwarding

When you host a server on your network—for example, a Web or FTP server—you must configure the base station to perform persistent port forwarding.

Persistent port forwarding is similar to application-triggered port forwarding in that you are opening inbound ports to allow particular types of data or data requests to be sent from the Internet to one of the networked computers. The difference is that you are opening these inbound ports permanently, rather than configuring them to open only when there is data sent to an outbound port. In addition, you are directing the data sent to that port to a particular computer on your local network.

For example, if you set up a Web server on one of the computers on your network, you must direct unsolicited requests sent to Transmission Control Protocol (TCP) Port 80, which handles Hypertext Transfer Protocol (HTTP) or Web data, to that computer. An unsolicited request is any data communication that is not initiated by a computer on your local network.

Although not required, it is recommended that you have a static (fixed) IP address to host any type of server on your network.

To establish persistent port forwarding, you will need the following information:

- The IP address of the server computer on your local network. To determine the IP address assigned to the computer that you will use as a server, check the DHCP client list on the **Home** page of the Base Station Management Tool.
- The inbound and private port numbers and protocol that correspond to the type of data that your server handles.

Some of the common TCP inbound ports include:

- HTTP Port 80
- FTP Port 21
- Telnet Port 23
- POP3 Port 110

To configure persistent port forwarding

- 1.** Open the Base Station Management Tool, and then click **Security**.
- 2.** On the **Security** menu, click **Port Forwarding**, and then click **Set up persistent port forwarding**.
- 3.** In the **Description** box, type a description of the server field. (This step is optional.)
- 4.** In the **Inbound port** box, type the inbound port to which data packets sent from the Internet to the server will be passed. The inbound port can be a single port or a comma-separated list of ports or port ranges. For example, you could type **4-25**, or **243**, or **10, 24-50, 74**. You are limited to 256 characters.
- 5.** In the **Type** box, select the protocol (UDP or TCP) for the port.
- 6.** In the **Private IP address** box, type the private IP address of the client computer that is hosting the server.
- 7.** In the **Private port** boxes, type the private port on the server that the data will be sent to. To identify the private port number, consult the documentation for your server software.
- 8.** To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

Virtual Demilitarized Zone

In certain situations, you might want to set up a virtual demilitarized zone (DMZ) on one of the clients on your network. When you establish a DMZ, you essentially open all inbound ports and direct the base station to forward certain inbound data packets (those that are not in response to a transmission initiated by a LAN client and not handled through application-triggered or persistent port forwarding) to a particular computer on your LAN. This computer becomes the DMZ host.

A DMZ host is useful for experimenting with new games on the Internet or for setting up a server on your network before you know which ports to open for that server. A DMZ, however, should be used only in very specific and finite situations. The computer that hosts the DMZ is fully exposed to the Internet, and is thus susceptible to malicious attacks and unauthorized access.

Because the computer is a virtual DMZ behind the base station, as opposed to a real DMZ out on the Internet, it has access to the other computers on your LAN. If a hacker were to upload a virus to the virtual DMZ, the virus could spread to all the computers on your network.

Because the virtual DMZ that you establish is behind the base station NAT, the IP address for the DMZ is not public. This means that the DMZ can resolve most, but not all, connection problems.

To establish a virtual DMZ

- 1.** Open the Base Station Management Tool, and then click **Security**.
- 2.** On the **Security** menu, click **Virtual DMZ (Demilitarized Zone)**.
- 3.** Select the **Enable** check box.
- 4.** In the text box, type the IP address assigned to the computer that will host the virtual DMZ. To determine the IP address, see the DHCP client list on the **Home** page of the Base Station Management Tool.
- 5.** To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

MAC Filtering

You can increase the security on your network by using MAC filtering. MAC filtering enables you to control access to network resources, including your Internet connection and shared files and printers. You can configure the base station to permit or deny a client access to network resources based on the MAC address of the adapter that the client uses.

If you want to use MAC filtering, the first step is to enable connection control.

Connection Control

You can use connection control to control which wired clients will be able to connect to the base station and have access to the Internet and all network resources.

When a wired client cannot connect to the base station, it can communicate with other clients on the wired local network, but it cannot:

- Connect to the Internet.
- Communicate with wireless clients on the network.

To enable connection control

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **MAC Filtering**.
3. Select the **Enable connection control** check box.
4. If you do not want unspecified clients to connect to the base station, in the drop-down list box, click **Deny**. In this case, any client whose MAC address is not listed in the MAC Address table will not be able to connect to the base station or access the Internet.
5. If you clicked **Deny** in step 4, in the MAC Address table, specify the MAC address of any clients that you want to connect to the base station, and then select the **Allow Connection** check box.
6. To save your changes, click **Apply**.

When you enable connection control, be sure you do not prohibit your own computer from connecting to the base station. If you deny unspecified MAC addresses from connecting, type the MAC address of your adapter into the MAC Address table and select the **connection control** check box.

If you do block your own access to the base station, you must restore the factory default settings by using the reset button on the base station itself, and then reconfigure the base station. For information about how to do this, see "Resetting the Base Station" in Chapter 1 of your printed *User's Guide*.

For more information about MAC filtering options, see Broadband Network Utility Help.

Association Control

You can use association control to control which wireless clients can establish a wireless connection to the base station. Association control does not apply to wired clients, so if you have the Microsoft Ethernet Wired Base Station, association control is not available as an option.

To enable association control

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **MAC Filtering**.
3. Select the **Enable association control** check box.
4. If you do not want unspecified clients to associate with the base station, in the drop-down list box, click **Deny**. In this case, any client whose MAC address is not listed in the MAC Address table will not be able to associate with the base station or access the Internet.
5. If you clicked **Deny** in step 4, in the MAC Address table, specify the MAC address of any clients that you want to connect to the base station, and then select the **Allow Association** check box.
6. To save your changes, click **Apply**.

Client Filtering

You can use client filtering to control the Internet access of each client on your network. This feature is particularly useful if, for example, you want to restrict the time that your children spend surfing the Web.

To configure client filtering, you must have the following information:

- The private IP address assigned to the client computer. To determine the IP address assigned to the client computer, check the DHCP client list on the **Home** page of the Base Station Management Tool.
- The ports for the type of application data to which you want to control access.

For example, if you want to control Web browsing, specify TCP Port 80 on client 192.168.2.XX.

It is recommended that you assign static IP addresses to each of the client devices whose access to the Internet you want to control.

To enable client filtering

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Client Filtering**.
3. In the appropriate box, type the IP address of the client device whose access to the Internet you want to control.
4. In the **Outbound port(s)** boxes, type the outbound port protocol and port number for the data that you want to control.
5. In the appropriate boxes, specify the date and time range when you want to block access to this data. If you want to filter access on a particular day, for example, every Sunday, enter the same time and the same date for the start and end period. If you want to block access all the time, click **Always**.
6. Select the **Block** check box, and then click **Apply** to activate the client filtering.

Base Station Log

You can access the base station log for your network from the **Security** section of the Base Station Management Tool. This log records general base station activity and time stamps each log file entry. If you have any concerns about unusual activity on your network, review the base station log.

The base station log can maintain up to 127 lines of data. When the base station log reaches maximum capacity, the base station deletes the oldest log entries.

To view the base station log

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Base Station Log**.

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