

# **Spectrum24 Plus Pack**

## **Users Guide**

70E-20709-03  
Revision A  
June 2000

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U.S. Patent No.

4,387,297; 4,460,120; 4,496,831; 4,593,186; 4,603,262; 4,607,156; 4,652,750; 4,673,805; 4,736,095; 4,758,717; 4,816,660; 4,845,350; 4,896,026; 4,897,532; 4,923,281; 4,933,538; 4,992,717; 5,015,833; 5,017,765; 5,021,641; 5,029,183; 5,047,617; 5,103,461; 5,113,445; 5,130,520; 5,140,144; 5,142,550; 5,149,950; 5,157,687; 5,168,148; 5,168,149; 5,180,904; 5,216,232; 5,229,591; 5,230,088; 5,235,167; 5,243,655; 5,247,162; 5,250,791; 5,250,792; 5,260,553; 5,262,627; 5,262,628; 5,266,787; 5,278,398; 5,280,162; 5,280,163; 5,280,164; 5,280,498; 5,304,786; 5,304,788; 5,306,900; 5,321,246; 5,324,924; 5,337,361; 5,367,151; 5,373,148; 5,378,882; 5,396,053; 5,396,055; 5,399,846; 5,408,081; 5,410,139; 5,410,140; 5,412,198; 5,418,812; 5,420,411; 5,436,440; 5,444,231; 5,449,891; 5,449,893; 5,468,949; 5,471,042; 5,478,998; 5,479,000; 5,479,002; 5,479,441; 5,504,322; 5,519,577; 5,528,621; 5,532,469; 5,543,610; 5,545,889; 5,552,592; 5,557,093; 5,578,810; 5,581,070; 5,589,679; 5,589,680; 5,608,202; 5,612,531; 5,619,028; 5,627,359; 5,637,852; 5,664,229; 5,668,803; 5,675,139; 5,693,929; 5,698,835; 5,705,800; 5,714,746; 5,723,851; 5,734,152; 5,734,153; 5,742,043; 5,745,794; 5,754,587; 5,762,516; 5,763,863; 5,767,500; 5,789,728; 5,789,731; 5,808,287; 5,811,785; 5,811,787; 5,815,811; 5,821,519; 5,821,520; 5,823,812; 5,828,050; 5,850,078; 5,861,615; 5,874,720; 5,875,415; 5,900,617; 5,902,989; 5,907,146; 5,912,450; 5,914,478; 5,917,173; 5,920,059; 5,923,025; 5,929,420; 5,945,658; 5,945,659; 5,946,194; 5,959,285; 6,002,918; D305,885; D341,584; D344,501; D359,483; D362,453; D363,700; D363,918; D370,478; D383,124; D391,250; D405,077; D406,581; D414,171; D414,172; D419,548

Invention No. 55,358; 62,539; 69,060; 69,187 (Taiwan); No. 1,601,796; 1,907,875; 1,955,269 (Japan); European Patent 367,299; 414,281; 367,300; 367,298; UK 2,072,832; France 81/03938; Italy 1,138,713

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# About This Document

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## Reference Documents

This reference guide refers to the following documents:

Part Number	Document Title
70E-20688-03	Spectrum24 AP-4121 Access Point Product Reference Guide
70E-20706-03	Spectrum24 Wireless LAN Adapter Models LA-4121 PC Card and LA-4123 PCI Adapter Product Reference Guide

## Conventions

Keystrokes are indicated as follows:

ENTER	identifies a key.
FUNC, CTRL, C	identifies a key sequence. Press and release each key in turn.
Press A+B	press the indicated keys simultaneously.
Hold A+B	press and hold the indicated keys while performing or waiting for another function. Used in combination with another keystroke.

Typeface conventions used include.

<angles>	indicates mandatory parameters in a given syntax.
[brackets]	for command line, indicates available parameters; in configuration files brackets act as separators for options.
GUI Screen text	indicates the name of a control in a GUI-based application.
<i>Italics</i>	indicates the first time a term is used, a book title, variables, and menu titles.
'single quotes'	indicates the exact setting for a parameter.
Screen	indicates monitor screen dialog. Also indicates user input. A screen is the hardware device on which data appears. A display is data arranged on a screen.
Terminal	indicates text shown on a radio terminal screen.
<a href="#">URL</a>	indicates Uniform Resource Locator.

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This document uses the following for certain conditions or types of information:



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Indicates tips or special requirements.

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Indicates conditions that can cause equipment damage or data loss.

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Indicates a potentially dangerous condition or procedure that only Symbol-trained personnel should attempt to correct or perform.

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# Installing the Spectrum24 Plus Pack

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The Symbol Technologies Spectrum24 Plus Pack utility suite now supports Spectrum24 LA-41XX Network Interface Cards (NICs) operating in a Spectrum24 network. Install the *Spectrum24 Plus Pack* utilities (NICTT, NICInfo, NICUpdate, AP Discovery and My Wireless LAN Places) from the installation CDROM as a bundled tool suite.



---

The Spectrum24 Plus Pack utilities support Windows 95, 98, NT 4.0. and Windows 2000.

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Use the *Network Interface Card Task Tray* (NICTT) utility for NIC signal quality and power management status. NICTT automatically starts on the system task tray each time the system is booted.

Use the *Network Interface Card Information* (NICInfo) utility to obtain detailed NIC diagnostic and statistical information without rebooting.

Use the *Network Interface Card Update* (NICUpdate) utility for upgrading the firmware in the Spectrum24 WLAN adapter.

Use the *Access Point Discovery* (AP Discovery) utility to view the properties of neighboring access points within the Spectrum24 network.

Use the *My Wireless LAN Places* (My WLAN Places) utility to create a profile of WLAN adapter network address and device information that can be downloaded by system administrators to selected WLAN adapters.

To install the Spectrum24 Plus Pack from a CDROM:

1. Insert the installation CDROM in the computer CD drive.
2. Click **Start** and select **Run**.
3. Enter `x:\pluspack\setup.exe`  
Where `x` represents the letter assigned to the CD drive.
4. Click **OK**.
5. Complete the installation by following the instructions displayed by the Windows operating system.
6. Restart the computer when prompted by the Windows operating system.  
If the PC Card or adapter is installed, NICTT appears in the system task tray when the system reboots.

# Network Interface Card Task Tray Applet (NICTT)

---

NICTT provides signal, transmission quality and power management status for a Spectrum24 WLAN NIC. NICTT contains two different NIC status-checking tools. The taskbar tray icons convey real-time signal strength and service quality information. The NICTT property pages display driver and firmware revision data, power management information and NIC transmission and signal quality statistics.

NICTT starts automatically and appears in the task tray when the system boots.

To start NICTT manually:

1. Click the **Start** button and select **Programs**.
2. Click **Symbol Wireless** and select **Spectrum24 Plus Pack**.
3. Click on **NICTT** to launch the utility.

NICTT displays on the system task tray.

Right click the NICTT icon in the task tray to display the NICTT menu. Select one of the following menu items:

- **Spectrum24 WLAN Adapter Status**
- **About Adapter Status**
- **Exit Spectrum24 Adapter Status.**

Selecting **Exit Spectrum24 Adapter Status** removes NICTT from the task tray.



---

To prevent NICTT from launching and displaying in the task tray, press and hold the Shift key when the computer boots.

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## NICTT Task Tray Icons

NICTT task tray icons display NIC signal strength.

**ICON**

**Status**



Excellent signal strength (Green Bar)



Very good signal strength



Good signal strength



Fair signal strength



Poor signal strength



Out-of-network range



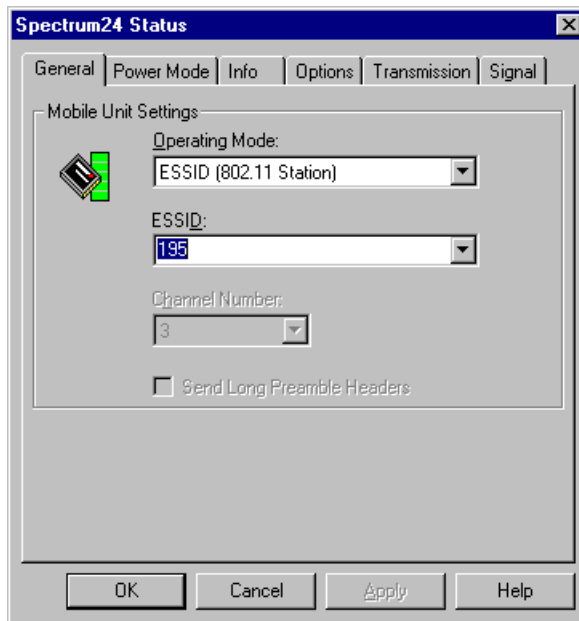
Adapter not found

## NICTT Property Pages

The NICTT property pages contain wireless network and service quality information.

### General Properties

Use the **General** properties page to set the operational mode and ESSID used by the NIC.



Note

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The operating mode and ESSID set for the NIC in NICTT override the operating mode and ESSID settings in NCPA and NICInfo.

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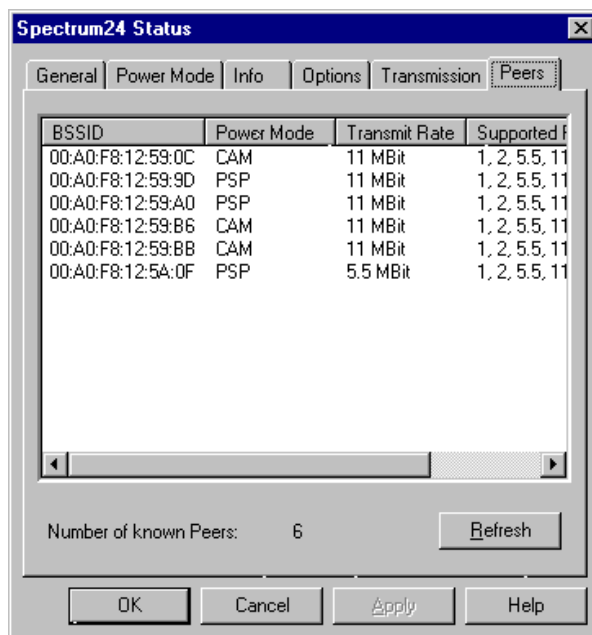
Use the **Operating Mode** pull-down menu to select one of the following operating modes for the NIC:

**ESS (802.11 Station)** - Select **ESS (802.11 Station)** to enable the MU to transmit and receive data with an access point. The **Channel Number** field and the **Send Long Preamble Headers** checkbox are disabled when the NIC is in ESS mode. ESS is the MU default mode.

**Pseudo IBSS (Proprietary Ad Hoc)** - Select **Pseudo IBSS** when the highest throughput is required in an IBSS network for testing MUs. Pseudo IBSS does not support PSP MUs and does not use beacons or authentication. Use the **Channel Number** field to enter the channel for the network. Each MU is required to be on the same channel. Pseudo IBSS is not recommended as a normal operational mode or for MUs operating on battery power. When Pseudo IBSS is selected the **Signal** or **Peers** property page is no longer available.

**IBSS (802.11 Ad Hoc)** - Select **IBSS (802.11 Ad Hoc)** to enable MUs to form their own local network where NICs communicate peer-to-peer without access points using the MU ESSID. Use IBSS to create networks where needed within established cells. In IBSS, MUs take turns generating beacons and handling probe responses. The NIC starting the IBSS network (the first station transmitting a beacon) sets the channel in the **Channel Number** field.

When **IBSS (802.11 Ad Hoc)** is selected, the NICTT **Signal** property page turns into the **Peers** property page. Select **Peers** to view the BSSID or MAC addresses of the other MUs in the network, their operating mode (PSP or CAM), their transmit rate, their supported data rate and the length of time MUs have been out of the IBSS network. Click **Refresh** to update the **Peers** property page to the latest IBSS network performance and MU membership data.



Enter a NIC ESSID in the **802.11 ESSID** field. The ESSID is the 802.11 Extended Service Set Identifier. The ESSID is a 32-character (maximum) string identifying the wireless local area network. The ESSID assigned to the NIC is required to match the access point ESSID for the NIC to communicate with the access point.

## 2.2.2 Power Mode

Use the **Power Mode** property page to control NIC power settings. A Spectrum24 WLAN adapter has two power consumption modes, Continuous Access Mode (CAM) and Power Save Poll (PSP) mode. Selecting CAM yields the best performance but uses the most power. CAM is the preferred mode for systems running on AC power.

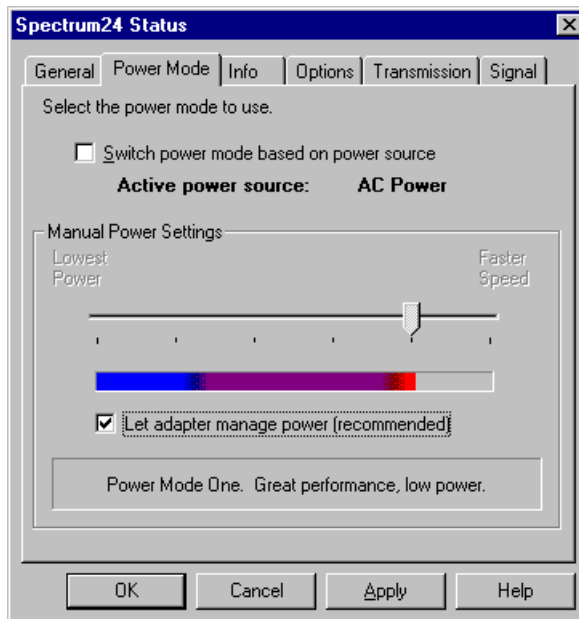
Uncheck the **Let adapter manage power** checkbox and use the sliding scale in the **Manual Power Settings** field to select a PSP performance index (1 to 5) suited to the intended operation of the NIC. Selecting PSP saves significant amounts of power over CAM. PSP is the preferred mode for systems running on battery power.



Note

PCI adapters do not support PSP mode. Control over PSP options become disabled when using a PCI Adapter. The *Switch power mode* feature is unavailable in Windows NT 4.0.

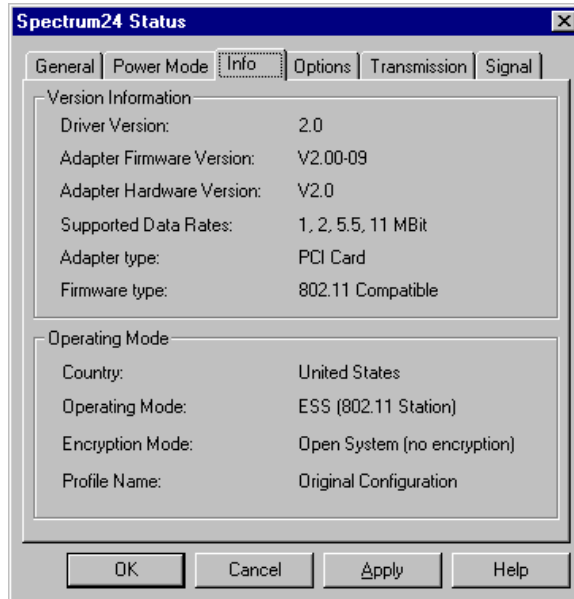
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### 2.2.3 Info

Use the **Info** property page to view NIC version and operating mode information.

Use the **Version Information** field to view the NIC driver version, adapter firmware version, supported data rate, adapter type and firmware type.



Use the **Operating Mode** field to view the NIC operating country, operating mode (ESS, IBSS or Pseudo IBSS) Encryption mode and the profile name created for the NIC using the My Wireless LAN Places utility.



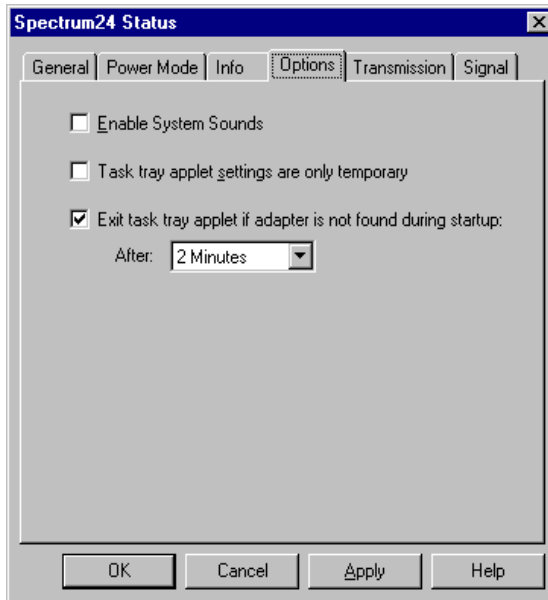
Note

The operating mode set for the NIC in NICTT overrides the operating mode settings made in NCPA and NICInfo.

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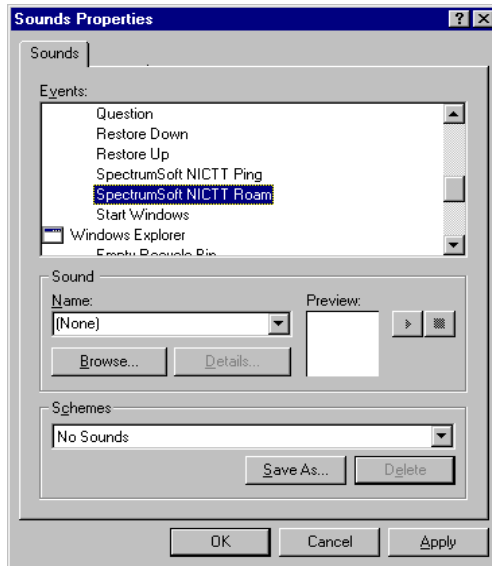
### 2.3.4 Options

Enable or disable NICTT system sounds within the **Options** properties page. NICTT uses standard wave-table sounds supplied by the Windows operating system. NICTT initiates an audible signal each time it detects the host computer roaming between Spectrum24 APs. This tone is important if the user did not want the MU to roam to another AP. NICTT initiates an audible signal each time it completes a ping to a host computer.



Users can change NICTT wave file values using the Windows *Control Panel* -> *Sounds* applet. Two entries exist for NICTT:

- SpectrumSoft NICTT Ping
- SpectrumSoft NICTT Roam.



Select a wave file in the Sounds window for the NICTT audible response tone. The standard wave files shipped with NICTT have the following format:

SSxxxxn.wav

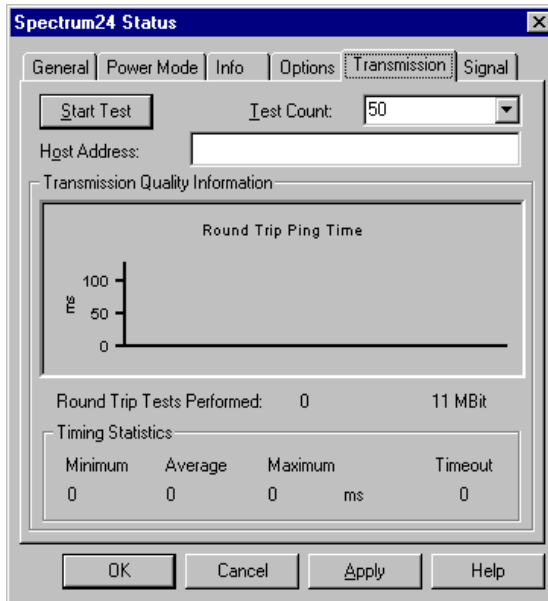
Where xxxx is either ping or roam and n is the numeric identity of the file.

Values saved to the Windows registry are used by the NIC when the computer starts. Select **Task tray applet settings are only temporary** from the **Options** property page to enter only NICTT temporary values. Temporary values apply to each NICTT property page and last until the system is restarted or the values are changed. If the checkbox is not selected, any value entered is saved and used by the NIC after the system is restarted.

Select the **Exit task tray applet if adapter is not found during startup** checkbox and use the pull-down **After** menu to specify the amount of time (1 to 5 minutes) NICTT waits for the adapter to be located in the network before exiting.

## 2.2.5 Transmission

Use the **Transmission** property page to perform data transmission tests and display a real-time graph of the tests. The transmission quality test also displays a text-based description of the transmission quality. Transmission quality tests use an ICMP ping to test data transmission between an MU and AP. The transmission quality indication is important in determining if the MU should associate with a different AP to optimize its transmission capabilities or if the MU is properly located to communicate with that AP.



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The Transmission Quality test requires the TCP/IP protocol.

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## 2.2.6 Signal

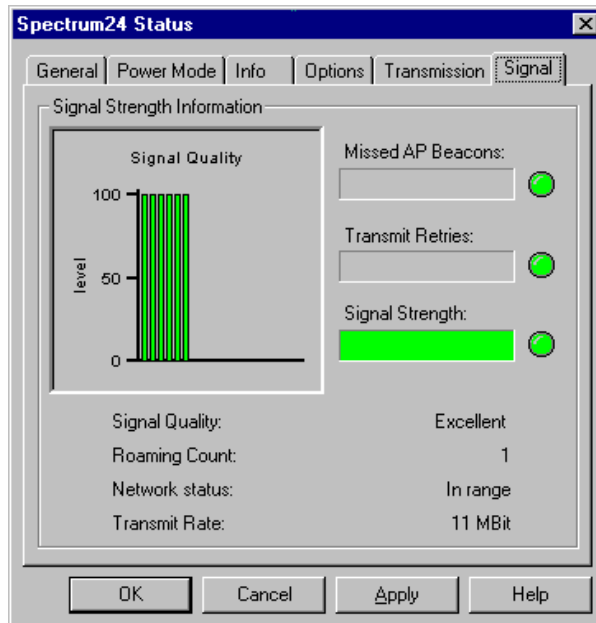
Use the **Signal** property page to display a real-time graph of the signal quality received by the NIC. It also displays a description of the signal quality. The **Signal** property page assists users in determining the quality of the signal from the MU to the AP, and if an association with a different AP is needed to increase signal strength. Any signal quality indication below good should be an indicator to associate with a different AP.



Note

The **Signal** property page does not display in NICTT if **IBSS** or **Pseudo IBSS** are selected as the operating modes in the **General** property page.

Use the **Missed AP Beacons** graph to view the amount of beacons (uniform system packets broadcast by the AP to keep the network synchronized) missed by the receiving MU. The fewer missed beacons the stronger the signal.



Use the **Transmit Retries** graph to view the number of data packets retransmitted by the MU. The fewer transmit retries the stronger the signal.

Use the **Signal** graph to view the RSSI (Relative Signal Strength Indicator) of the signal transmitted from the access point to the receiving MU. Use this information to determine if the signal is strong enough to maintain the current access point association or if an association with a different access point would increase signal strength.

# Network Interface Card Info (NICInfo) Utility

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Use the Network Interface Card Information (NICInfo) utility to view and configure a Spectrum24 NIC. NICInfo provides adapter status, mobile unit (MU) configuration settings, power management configuration settings, NIC diagnostic information, NIC event logging options and MU transmit/receive statistics.

Users select property pages from the items listed in the tree on the left side of the NICInfo window. NIC signal quality appears on the bottom left-hand side of each property page. The signal quality function matches that displayed by NICTT.



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If the computer monitor is set to 640 x 480, NICInfo does not display properly. Set the computer monitor to 800 x 600 for optimal resolution.

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To start NICInfo manually:

1. Click the **Start** button and select **Programs**.
2. Click **Symbol Wireless** and select **Spectrum24 Plus Pack**.
3. Select **NICInfo** to launch the utility.

## 3.1 NICInfo Icons

The NICInfo icons appear on the bottom left-hand side of each property page. NICInfo icons match the NICTT Task Tray icons described in the previous section and provide the same functionality.

## 3.2 NICInfo Property Pages

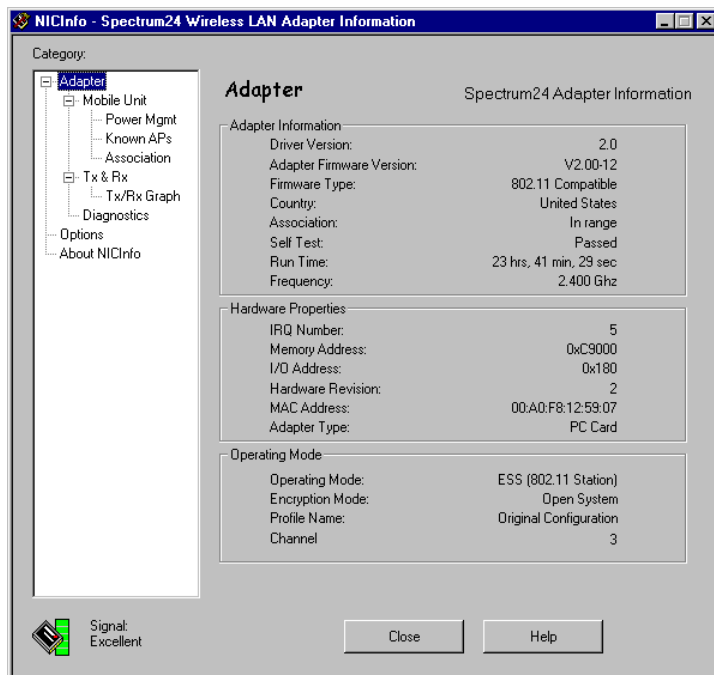
NICInfo contains property pages dedicated to displaying and configuring NIC settings and information.

### 3.2.1 Adapter

Use the **Adapter** property page to display driver software and hardware information. The **Adapter** page is read only with no user configurable fields.

The **Adapter Information** field displays the driver version, NIC Firmware version and type, country, association status, self-test status, run time and frequency.

The **Hardware Properties** field displays the IRQ number, memory address, I/O address, hardware revision, MAC address and adapter type.

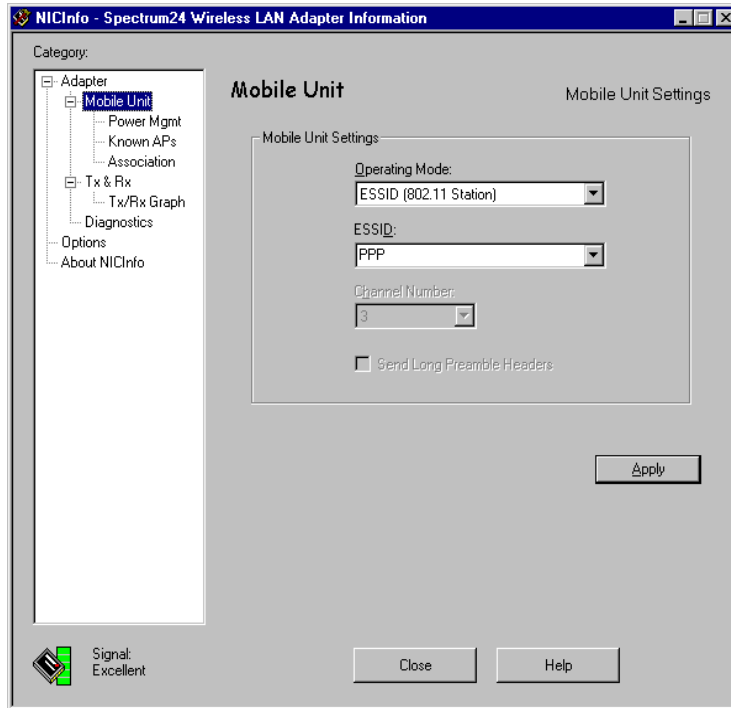


The **Operating Mode** field displays operating mode (ESS, IBSS or Pseudo IBSS) set in the **Mobile Unit** page, the Encryption mode and profile name set using the **My Wireless LAN Places** utility and the Channel number.

The operating mode set in NICTT overrides the operating mode set in NICInfo and NCPA.

### 3.2.2 Mobile Unit

Use the **Mobile Unit** property page to set the NIC operating mode and ESSID.



Note

The operating mode and ESSID set for the NIC in NICTT override the operating mode and ESSID settings in NICInfo and NCPA.

Use the **Operating Mode** pull-down menu to select one of the following operating modes for the NIC:

**ESS (802.11 Station)** - Select **ESS (802.11 Station)** to enable the NIC to transmit and receive data with an access point. The **Channel Number** field and the **Send Long Preamble Headers** checkbox are disabled when the NIC is in ESS mode. ESS is the MU default mode.

**Pseudo IBSS (Proprietary Ad Hoc)** - Select **Pseudo IBSS** when the highest throughput is required in an IBSS network for testing MU throughput. Pseudo IBSS does not support PSP MUs and does not use beacons or authentication. Use the **Channel Number** field to enter the channel for the network. Each MU is required to be on the same channel. Pseudo IBSS is not recommended as a normal operational mode or for MUs operating on battery power.

**IBSS (802.11 Ad Hoc)** - Select **IBSS (802.11 Ad Hoc)** to enable MUs to form their own local network where NICs communicate peer-to-peer without access points. Use IBSS to create networks where needed within established cells. In IBSS, MUs take turns generating beacons and handling probe responses. The NIC starting the IBSS network (the first station transmitting a beacon) sets the channel in the **Channel Number** field. If a single MU is sending every beacon, there are no other MUs in the IBSS network and at least one additional MU is needed to communicate peer-to-peer.

Enter a NIC ESSID in the **802.11 ESSID** field. The ESSID is the 802.11 Extended Service Set Identifier. The ESSID is a 32-character (maximum) string identifying the wireless local area network. The ESSID assigned to the NIC is required to match the access point ESSID for the NIC to communicate with the access point.

Click **Apply** to implement the operating mode and ESSID.

### 3.2.3 Power Management

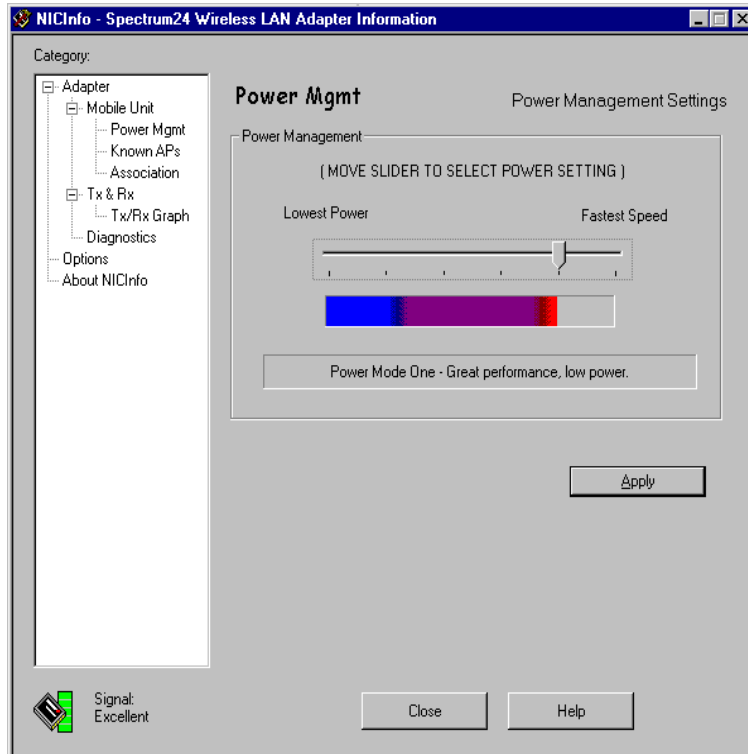
Use the **Power Mgmt** property page to display and adjust NIC power consumption settings. Users control the PSP performance index (1 to 5) in NICInfo by adjusting a sliding scale. A display below the slider describes the selected performance power level and its rating. Users requiring fast performance can adjust the slider accordingly.



Note

CAM is not recommended for devices operating on battery power.

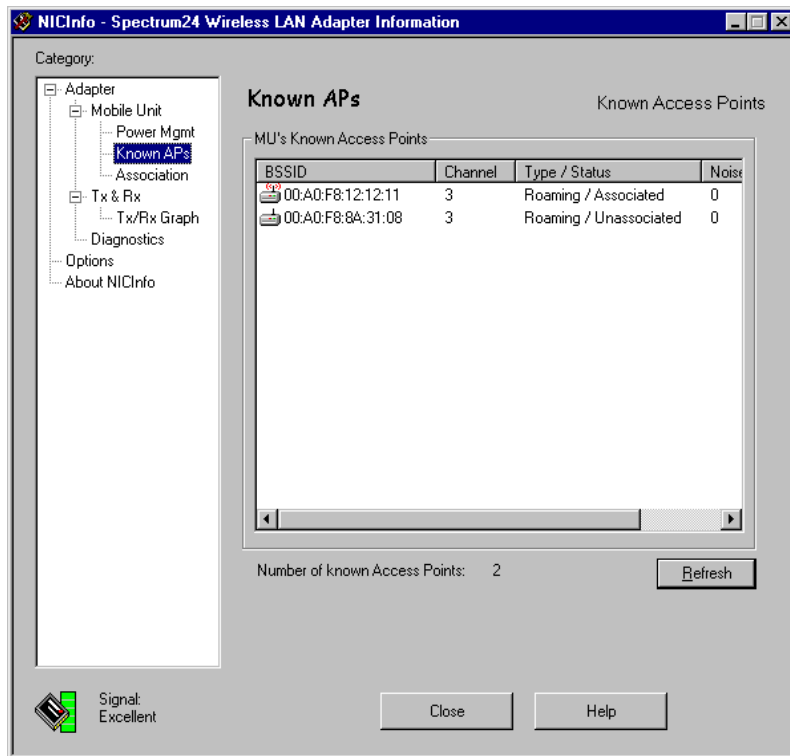
PSP mode does not have the performance of CAM, but reduces battery consumption. Click **Apply** to put the selected power setting into effect.



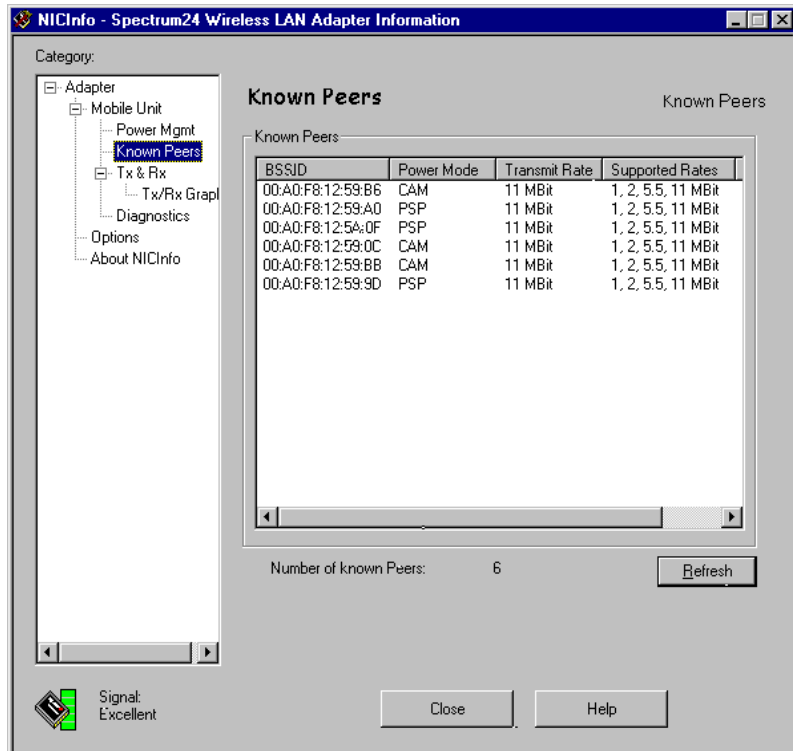
### 3.2.4 Known Access Points or Known Peers

Use the **Known APs** property page to view the APs with the same ESSID as the NIC within the Spectrum24 network. View the BSSID, direct sequence channel and Type/Status of each available AP.

Click **Refresh** to display the list of the Known Access Points. The **Known Access Points** property page is read only with no user configurable data fields.



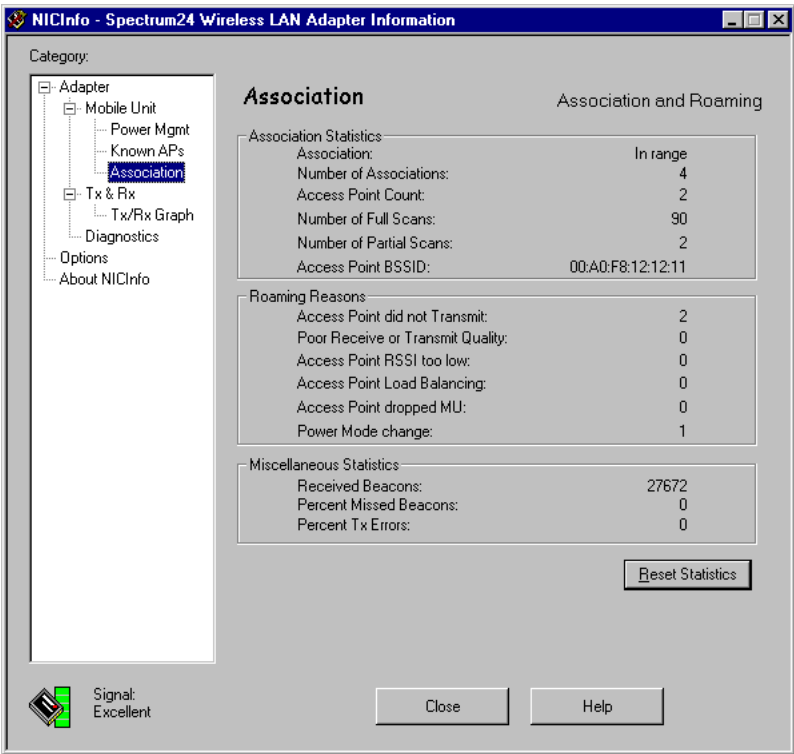
When IBSS (802.11 Ad Hoc) is selected as the operating mode, the **Known APs** property page turns into the **Known Peers** property page.



Use the **Known Peers** property page to view the BSSID or MAC addresses of the other MUs in the network, their power mode (PSP or CAM), their transmit rate and the length of a time an MU has been out of the IBSS network. Click **Refresh** to update the **Known Peers** property page to the latest IBSS network performance and membership data.

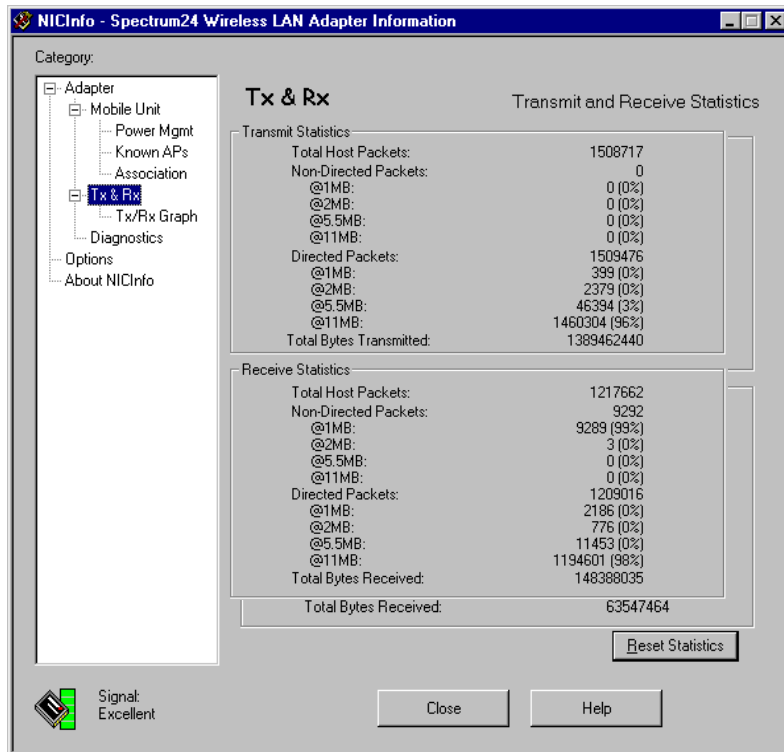
### 3.2.5 Association

Use the **Association** property page to display the NIC association state, AP association statistics and access point scan information. Access point roaming counts and statistics also display. The values on this page update as they occur. Click **Reset Statistics** to clear the statistic counters and begin collecting new data. The information in the **Association** property page is read only with no user configurable data fields.



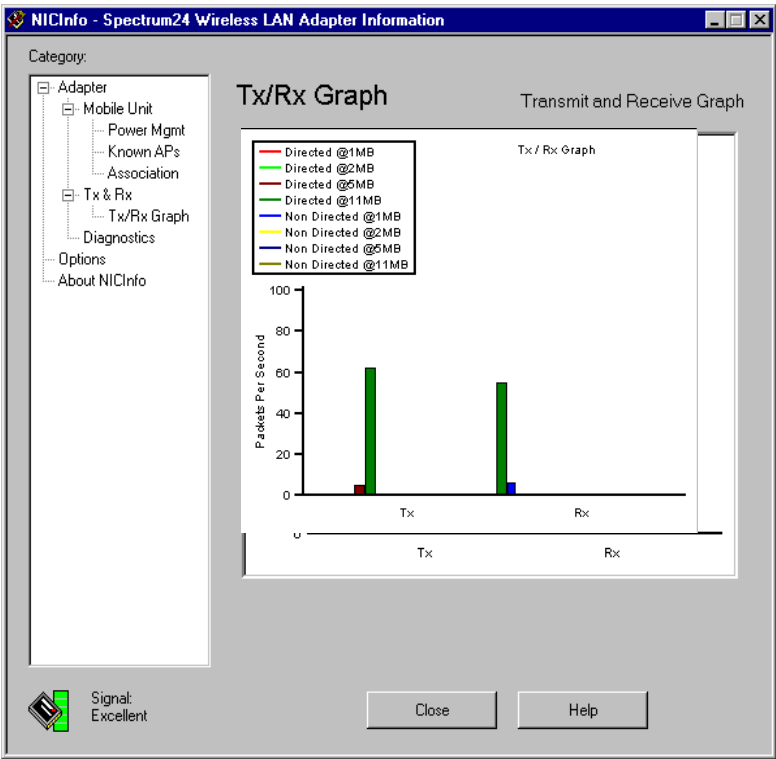
### 3.2.6 Transmit and Receive Statistics

Select the **Transmit and Receive Statistics** property page to display statistics for directed and nondirected packets and byte counts for both transmission and reception. Directed and nondirected packet statistics display for each data rate supported (1 Mbps, 2 Mbps, 5.5 Mbps and 11 Mbps). Use these statistics to determine if selecting a different data rates would result in improved NIC performance. The values on this page update in real-time. Click **Reset Statistics** to clear the statistic counters and begin collecting new data.



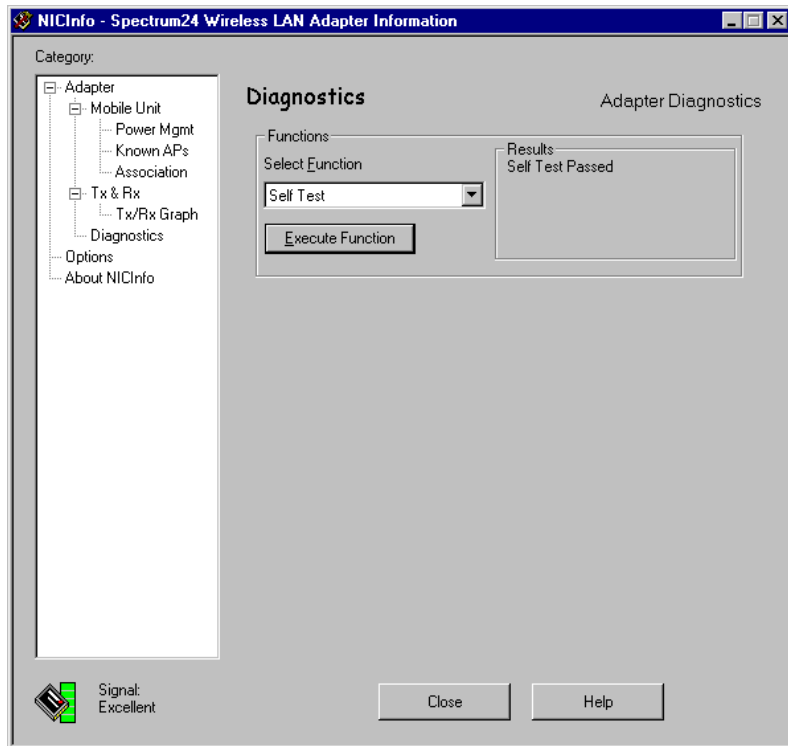
## Transmit and Receive Graph

The Tx/Rx (transmit and receive) graph displays the packet per second throughput of the NIC. Colored bars display directed and nondirected packet throughput for each data rate supported (1 Mbps, 2 Mbps, 5.5 Mbps and 11 Mbps). Use these statistics to determine if selecting a different data rate would result in improved NIC performance. The graph is updated every second.



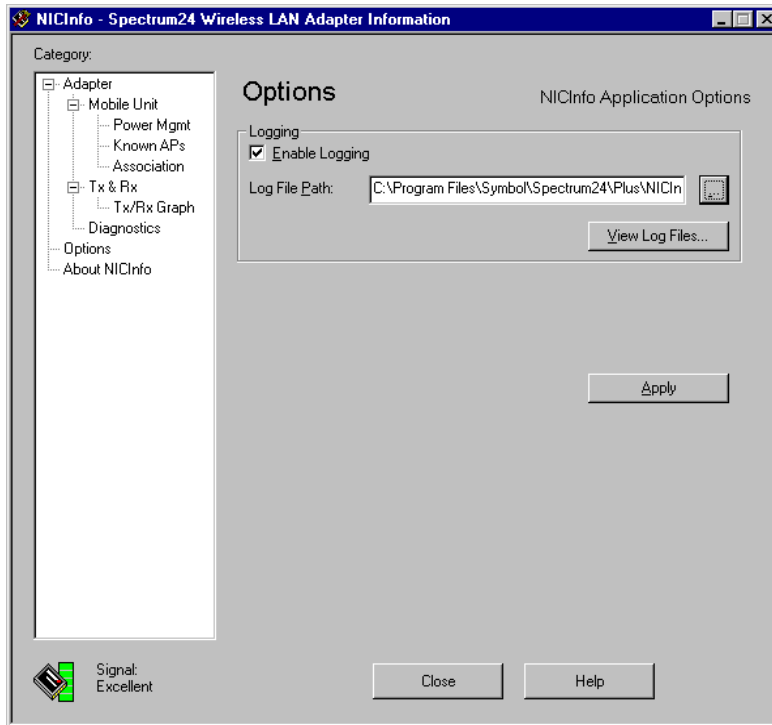
### 3.2.7 Adapter Diagnostics

Use the **Adapter Diagnostics** property page to execute tests assessing NIC functionality. The user can perform a self-test or reset the NIC by selecting a diagnostic from the **Select Function** pull-down menu. Click the **Execute Function** button to initiate the test.



### 3.2.8 Options

Select the **Options** property page to enable or disable NICInfo logging capabilities. When NICInfo gathers WLAN adapter statistics, NICInfo can save the information to a log file. Log files are saved in HTML format. If users run NICInfo after midnight, the log file closes and a new log file is automatically created for the next day. Click **View Log Files** to view the log file contents using a default browser.



## Network Interface Card Update (NICUpdate) Utility

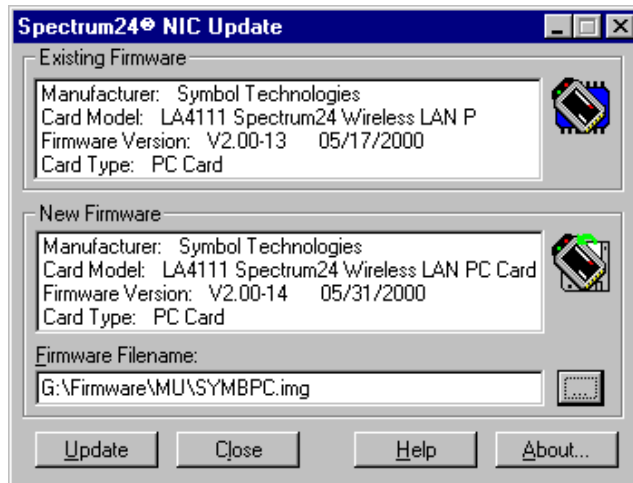
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Symbol Technologies periodically releases NIC firmware to provide improved performance over existing firmware. Use the Network Interface Card Update (NICUpdate) utility to upgrade the firmware in a Spectrum24 Network wireless LAN adapter.

To start NICUpdate manually:

1. Click the **Start** button and select **Programs**.
2. Click **Symbol Wireless** and select **Spectrum24 Plus Pack**.
3. Select **NICUpdate** to launch the utility.

NICUpdate upgrades the firmware in a Spectrum24 NIC by specifying a firmware file for the adapter used in the system.



NICUpdate displays existing firmware information in the **Existing Firmware** field. Select a firmware file then click **Update**. The results display in the **New Firmware** field.

The NICUpdate dialog box provides the following options:

Existing Firmware	The <b>Existing Firmware</b> field displays the firmware manufacturer, model number, firmware version and serial number of the NIC firmware. The <b>Existing Firmware</b> field is read only with no user configurable parameters.
New Firmware	Use the <b>New Firmware</b> window to view the version number and date of the selected firmware file.
Firmware Filename	Click the <b>Firmware Filename</b> ellipsis (...) button to browse for a valid firmware file for the adapter.
Update	Starts the Update process. A warning to close open applications appears. Users can cancel the Update process at this point. A message displays advising users that the Update process has started. A subsequent message displays whether the Update was successful. A message advising the user to reboot follows a successful Update.
Close	Click <b>Close</b> to exit the NICUpdate program.
Help	Click the <b>Help</b> button to display an online help page describing NICUpdate functionality.
About	Click the <b>About</b> button to display a window describing NICUpdate revision information.

## Chapter 5 **Access Point Discovery (AP Discovery)**

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Use the Access Point Discovery (AP Discovery) utility to view the properties of neighboring access points. Select an access point and use AP Discovery to configure the access point system name, ESSID, IP address and Gateway.

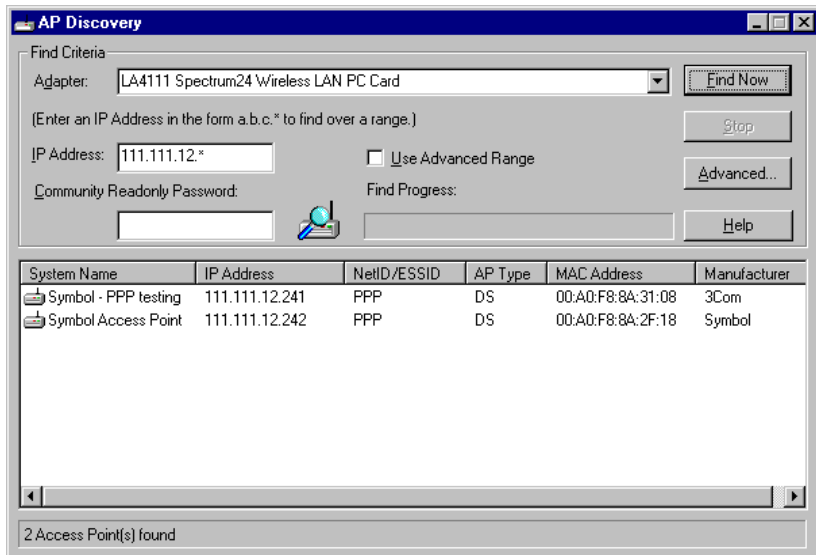
The AP Discovery utility is useful for selecting access point search criteria and conducting a search. Once a number of access points have been found meeting the search criteria, an access point can be selected and its properties displayed. The properties of the selected access point can be configured, the access point can be grouped with a different set of access points or the access point can be used to communicate with an access point not part of the original search.

To start AP Discovery:

1. Click the **Start** button and select **Programs**.
2. Click **Symbol Wireless** and select **Spectrum24 Plus Pack**.
3. Select **AP Discovery** to launch the utility.

## 5.1 Finding Spectrum24 Access Points

The **AP Discovery** dialog box displays when the utility is started.



Use the pull-down **Adapter** combobox to select the wired or wireless WLAN adapter to be used as the target MU for an access point search.

Enter a partial IP address in the **IP Address** edit field. Enter an IP address that is at least three character fields in length (157.235.92.). AP Discovery searches for access points with an IP address within 250 characters of the partial IP address entered. The partial IP address should correspond to the IP address range of access points grouped in a specific location of the building (retail, sales, manufacturing).

The partial IP address entered in the **IP Address** field has a password created by the system administrator to prevent unauthorized users from accessing configuration information for the group of access points the partial IP address represents. Enter the password in the **Community Readonly Password** field.

Select the **Find Now** button to display data for each wired or wireless access point located by AP Discovery. The **Find Progress** status bar displays the progress of the access point search. The number of access points located is displayed in the bottom left-hand corner of the **Symbol AP Discovery** dialog box.

Once the access points are located, the **AP Discovery** dialog box displays the user assigned system name (name of the access point), the Net\_ID or ESSID and the manufacturer.

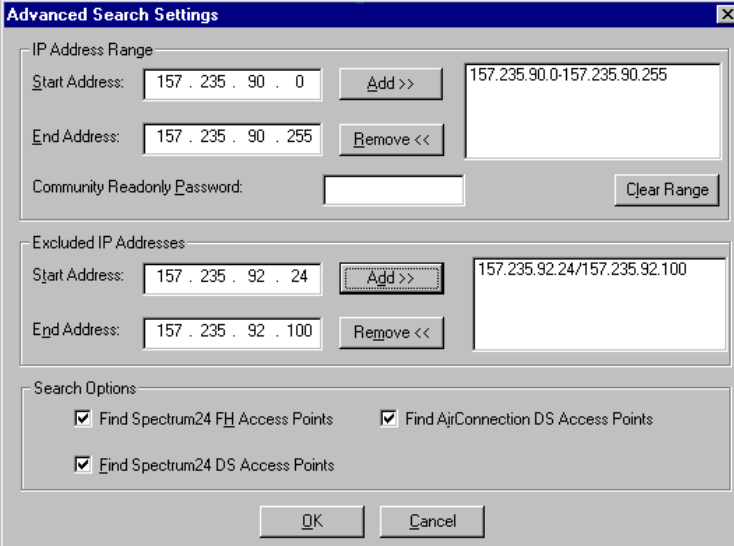
Click the **Advanced** button to specify a specific range of access point search parameters. Once an advanced search range is specified, that range can be used by selecting the **Use Advanced Range** checkbox and clicking **Find Now**.

### 5.1.1 Conducting an Advanced Search

Click the **Advanced** button within the AP Discovery dialog box to display the **Advanced Search Settings** dialog box.

Use the **IP Address Range** field to set an access point IP address search range. The search range could be confined to the access points within the sales or manufacturing areas of a building or broad enough to include the access points within the entire building. This information is helpful in determining if access points within a certain area of a building require a different configuration. Click **Clear Range** to clear the search range.

Click **Add** to include the selected range of IP addresses into a list of IP address ranges that can be selected again or click **Remove** to remove the range of excluded access point IP addresses from the list.



The **Advanced Search Settings** dialog box is divided into three main sections. The top section, **IP Address Range**, contains fields for **Start Address** (157 . 235 . 90 . 0) and **End Address** (157 . 235 . 90 . 255), with **Add >>** and **Remove <<** buttons. A text box on the right displays the range 157.235.90.0-157.235.90.255. Below these is a **Community Readonly Password** field and a **Clear Range** button. The middle section, **Excluded IP Addresses**, has **Start Address** (157 . 235 . 92 . 24) and **End Address** (157 . 235 . 92 . 100) fields, with **Add >>** and **Remove <<** buttons. A text box on the right shows 157.235.92.24/157.235.92.100. The bottom section, **Search Options**, includes three checked checkboxes: **Find Spectrum24 FH Access Points**, **Find AirConnection DS Access Points**, and **Find Spectrum24 DS Access Points**. At the bottom are **OK** and **Cancel** buttons.

Use the **Excluded IP Addresses** field to enter an IP address range to be excluded from the access point search. If there are access points within an area of the building (finance, marketing) that are not subject to the search or possible configuration, then that range of access point IP addresses should be entered in the **Excluded IP Addresses** field.

Click **Add** to exclude the selected range of IP addresses from the search or click **Remove** to add the range of excluded access point IP addresses back into the search range.

Use the **Search Options** field to specify the particular access points to be used as the targets in the search.



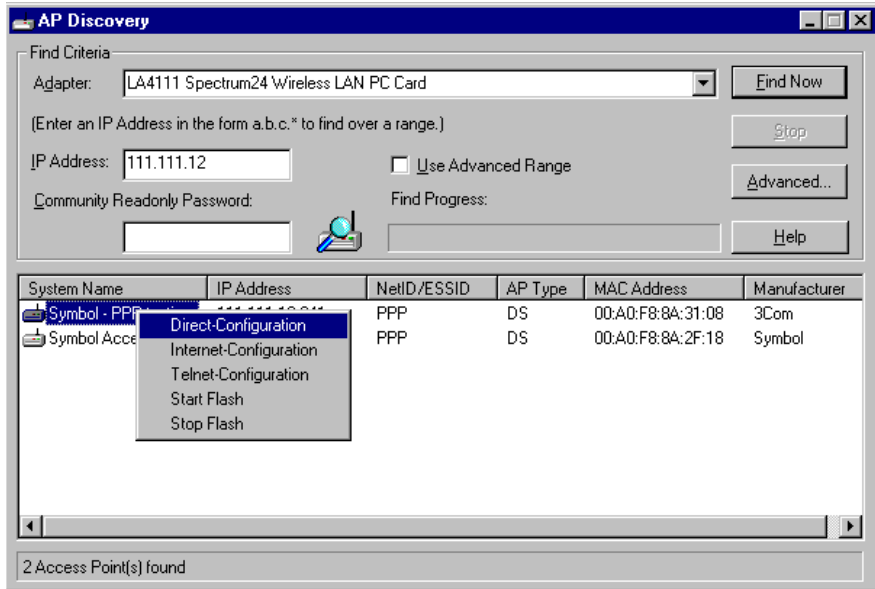
A frequency-hopping mobile unit cannot associate with a direct-sequence access point and a direct-sequence mobile unit cannot associate with a frequency-hopping access point. AP Discovery allows users to configure some operational parameters of the access points found in a search, but does not enable frequency-hopping mobile units to communicate with direct-sequence access points or direct-sequence mobile units to communicate with frequency-hopping access points.

---

Click **OK** to save the access point search parameters specified within the **Advanced Search Settings** dialog box. From the **AP Discovery** dialog box, select the **Use Advanced Range** checkbox and click **Find Now** to conduct a search using the advanced search parameters.

## 5.2 Selecting and Configuring an Access Point

Use the list of access points displayed in the **AP Discovery** dialog box to select and configure an individual access point.



Right-click on an access point to display an access point configuration menu with the following options:

- Direct Configuration
- Internet Configuration
- Telnet Configuration
- Start Flash
- Stop Flash

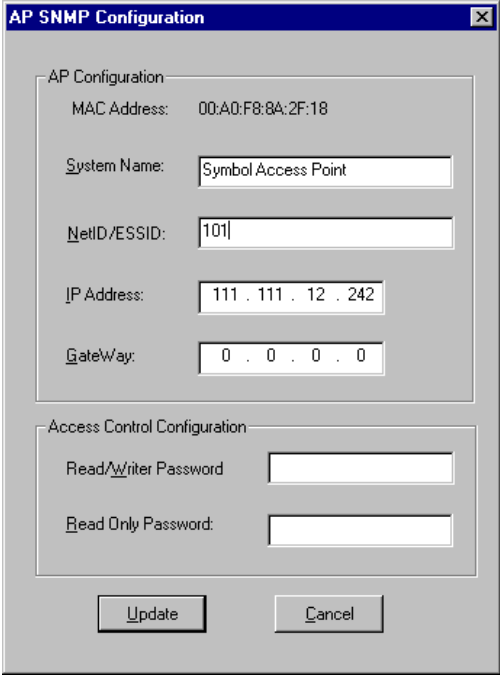
If one of these configuration options is grayed out, it is unavailable for the selected access point.

## 5.2.1 Direct Configuration

Use the **Direct Configuration** option to gain access to the access point UI (User Interface).

Right-click on an access point and select **Direct Configuration** to display the **AP SNMP Configuration** dialog box if the selected access point is operating through SNMP.

Use the **AP SNMP Configuration** dialog box to change the access point system name, ESSID (Net\_ID), IP address and gateway.



The image shows a screenshot of the 'AP SNMP Configuration' dialog box. It has a title bar with the text 'AP SNMP Configuration' and a close button. The dialog is divided into two main sections: 'AP Configuration' and 'Access Control Configuration'. In the 'AP Configuration' section, there are five fields: 'MAC Address' (displaying '00:A0:F8:8A:2F:18'), 'System Name' (displaying 'Symbol Access Point'), 'NetID/ESSID' (displaying '101'), 'IP Address' (displaying '111 . 111 . 12 . 242'), and 'GateWay' (displaying '0 . 0 . 0 . 0'). The 'Access Control Configuration' section contains two empty text boxes labeled 'Read/Writer Password' and 'Read Only Password'. At the bottom of the dialog are two buttons: 'Update' and 'Cancel'.



Note

The MAC Address field of the **AP SNMP Configuration** dialog box is read only and cannot be modified.

Use the access point **System Name** field to name the access point by its location (manufacturing, retail, engineering) or to give the access point a name that distinguishes it from other access points in its location.

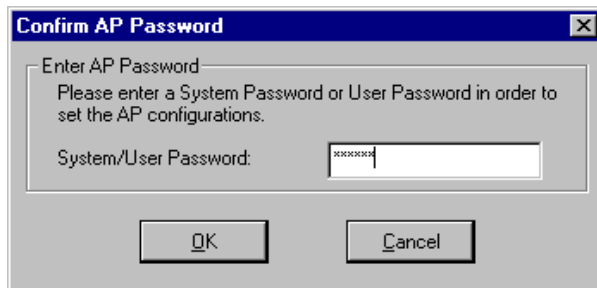
Use the **NetID/ESSID** field to change the Extended Service Set (ESS) ID or to give the access point a nickname. A nickname can be helpful in instances where the access point is located at a personal workstation, since the nickname serves as an indicator of the access point location.

Use the **IP Address** field to change the IP address of the access point to group the access point with a different set of access points or to change the IP address if it is conflicting with other devices operating in the area.

If the access point is intended to transmit to a different network segment a gateway (router) address is required. Enter the address in **Gateway** field.

The **Access Control Configuration** section of the **AP SNMP Configuration** dialog box contains two fields for confirming administrator or user privilege passwords. These passwords are assigned in the System Configuration and Change System Parameters screens of the access point. Use the **Read/Writer Password** field to enter the access point read and write privilege password. This password is required if the access point configuration has been modified. Use the **Read Only Password** field to enter the access point read privilege password. Leave these two password fields empty if no changes have been made to the access point configuration.

Click **Update** to commit the changes to the access point configuration. When changes are made to the access point configuration the **Confirm AP Password** dialog box displays.

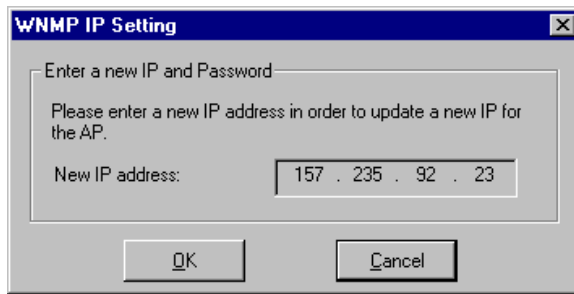


Enter a password and click **OK** to commit the changes made in the **AP SNMP Configuration** dialog box



System/User passwords are case-sensitive and do not exceed 13-characters.

If an access point is selected for direct configuration from the **AP Discovery** dialog and it operating through WNMP, the **WNMP IP Setting** dialog box displays.

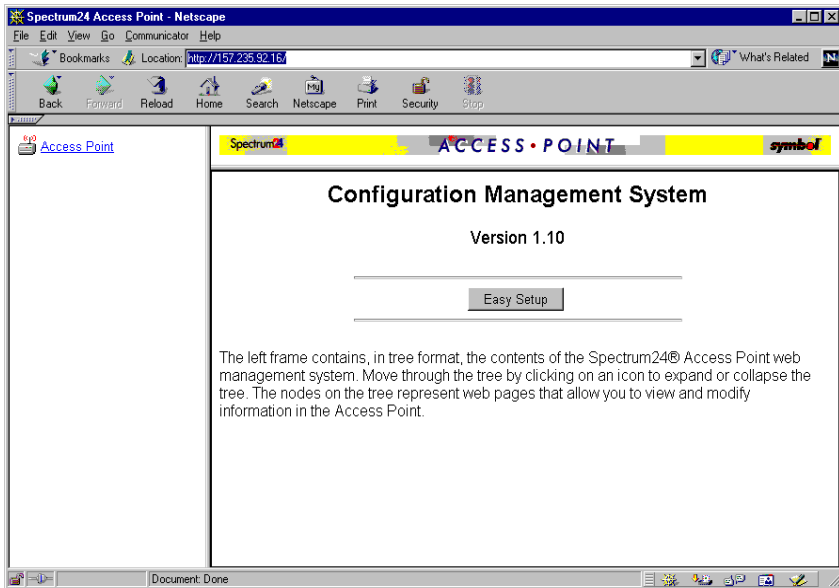


Use the **New IP Address** field to change the IP address of the access point to group the access point with a different set of access points or to change the IP address if it is conflicting with other devices operating in the area. Click **OK** to implement the new access point IP address. No other access point parameters can be configured using AP Discovery when the access point is operating through WNMP.

## 5.2.2 Internet Configuration

Use the **Internet Configuration** option to gain access to the access point UI through a Web browser.

Right-click on an access point and select **Internet Configuration** (if enabled) to display the **Spectrum24 Access Point Configuration Management System** page.



Access the different pages using the nodes located in the left frame of the page. Refer to the online help file (the **Help** button is located in the top right-hand corner of the page) for Web page navigation, page contents and parameter use.

### 5.2.3 Telnet Configuration

Use the Telnet Configuration option to gain access to the access point UI through a dial-up connection.

Right-click on an access point and select **Telnet Configuration** (if enabled) to display a Telnet login password screen. Enter the Telnet login case-sensitive password.

Press the ESC key to display the access point main menu. Use the main menu options to view statistics and set the access point system configuration.

### 5.2.4 Flashing an Access Point

Right-click on an access point and select **Start Flash** to flash the LEDs on the selected access point. Use the **Start Flash** function to locate an access point and determine if its location is appropriate for the mobile units it supports. Select **Stop Flash** to stop the flashing on the access point LEDs and return them to their normal operational state.



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The **Start Flash** function can only be used on one access point at a time.

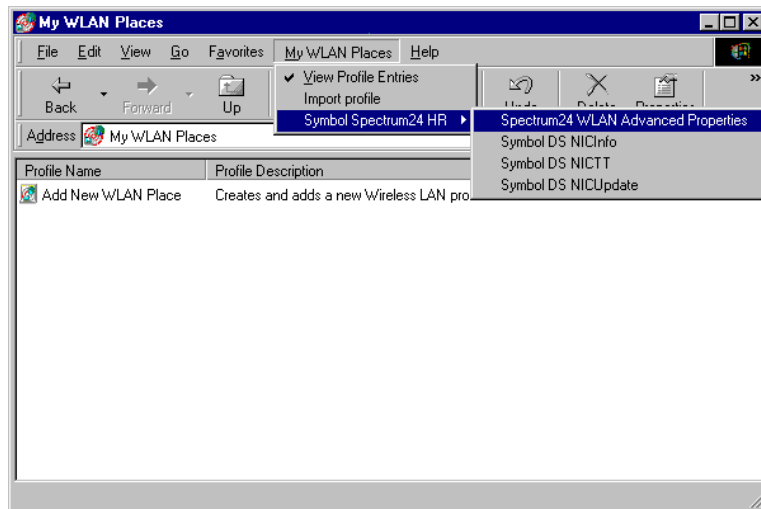
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Use the My Wireless LAN Places (My WLAN Places) utility to create a profile of WLAN adapter network address and device information that can be downloaded by system administrators to selected WLAN adapters.

Use a completed profile as a set of WLAN adapter operational settings that can be used in different locations with the MU to connect to a Spectrum24 network. Once created, WLAN profiles display in the My WLAN Places program window for use as necessary in the various Spectrum24 networks existing throughout the workplace or home office environment.

Use the **My WLAN Places** pull-down menu to select one or all of the Spectrum24 Plus Pack utilities as necessary to determine the settings to be used with the WLAN adapter using the My WLAN Places utility.



Note

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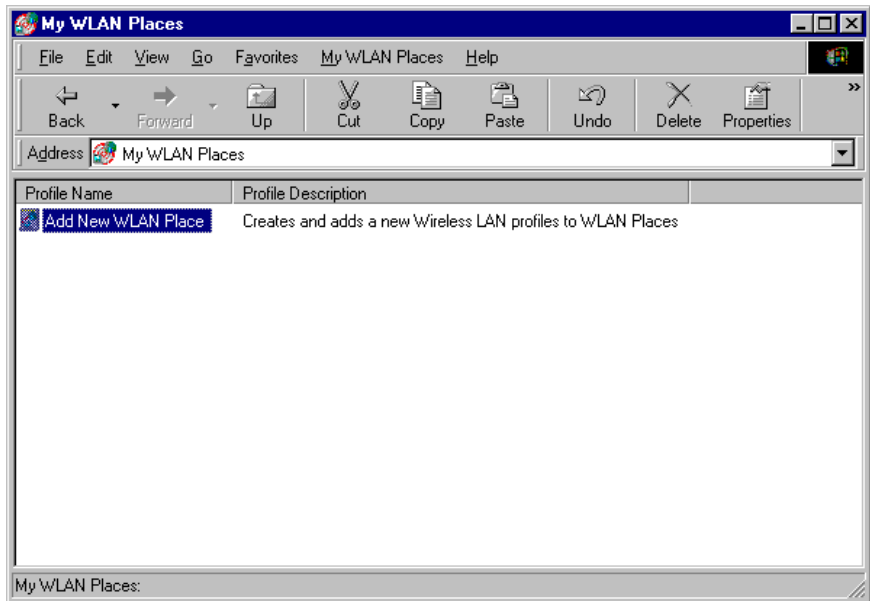
The WLAN adapter settings entered in NCPA and NICTT override the settings used in MY WLAN Places. Do not enter different settings in My WLAN Places.

---

To start WLAN Places:

1. Double-click on **My Computer** from the Windows desktop.
2. Select the **My WLAN Places** icon from the group of icons displayed.

The **My WLAN Places** program window displays.



3. Use this program window to create a new profile or edit the properties of an existing profile.

## 6.1 Creating a New Profile

A WLAN adapter profile is the unique network address and device information that is downloaded by the system administrator to selected WLAN adapters to support the coverage area of a Spectrum24 access point.

To create a new profile:

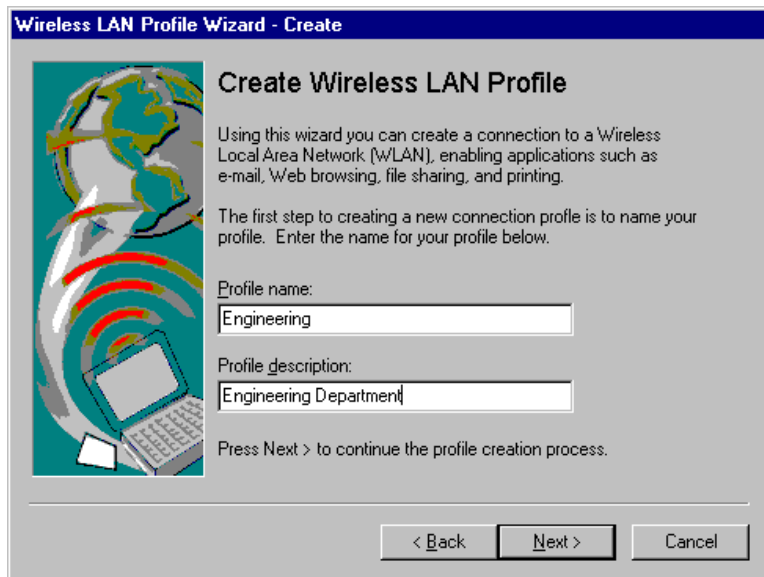
1. Select **Add New WLAN Place** from the **MY WLAN Place** program window.

The **Welcome** dialog box displays.



2. From the Welcome dialog box click Next.

The Wireless LAN Profile Wizard - Create dialog box displays.



**Wireless LAN Profile Wizard - Create**

**Create Wireless LAN Profile**

Using this wizard you can create a connection to a Wireless Local Area Network (WLAN), enabling applications such as e-mail, Web browsing, file sharing, and printing.

The first step to creating a new connection profile is to name your profile. Enter the name for your profile below.

Profile name:

Profile description:

Press Next > to continue the profile creation process.

< Back   Next >   Cancel

3. Type a name for the new profile in the **Profile name** field.

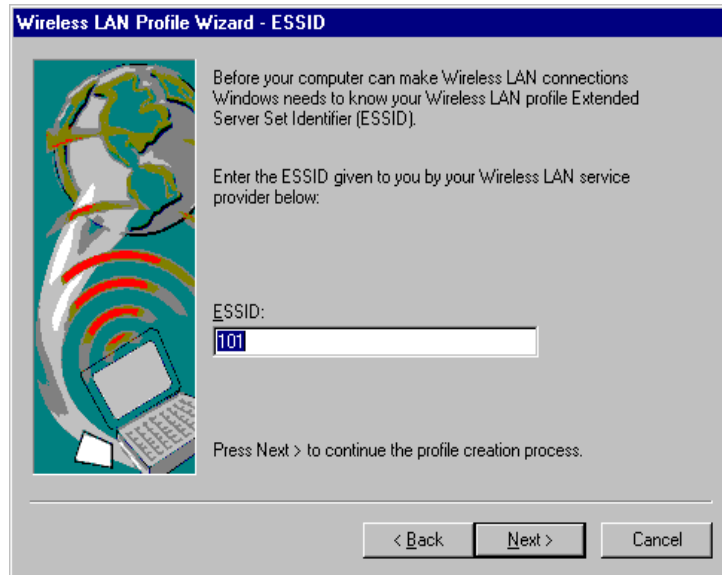
The name of the profile can be up to 128 characters and contain any printable characters.

4. Enter a description of the profile in the **Profile description** field.

The profile description enables the user to keep the profile name short while providing additional information on what the profile entails.

5. Click **Next** to continue in the creation of the profile, click **Back** to return to the **Welcome** dialog box or click **Cancel** to close the profile wizard and cancel the creation of the new profile.

When **Next** is clicked, the **Wireless LAN Profile Wizard - ESSID** dialog box displays.



6. Enter an ESSID in the ESSID field.

The ESSID should be the same as the access point(s) that the MUs support once the profile is installed. The ESSID can be from 0 to 32 characters in length.



Note

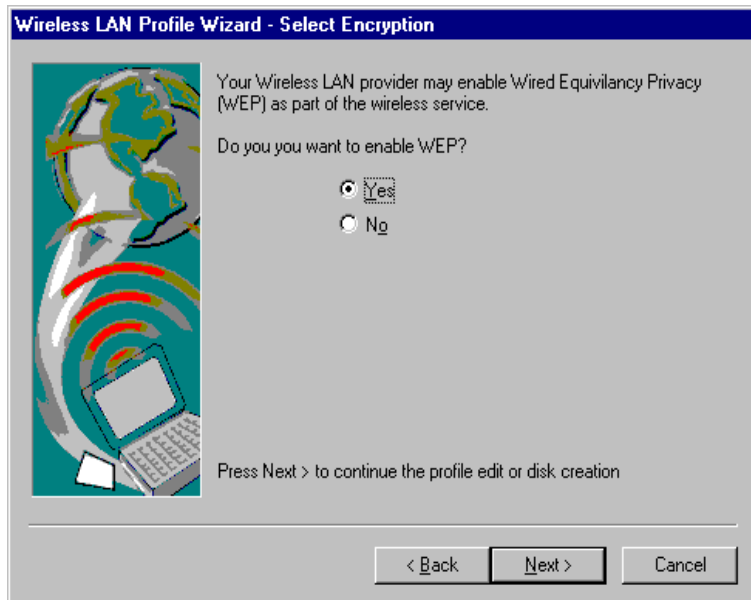
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If the ESSID cannot be determined, 101 can be used as a default ESSID value.

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- Click **Next** to continue in the creation of the profile, click **Back** to return to the **Wireless LAN Profile Wizard - Create** dialog box or click **Cancel** to close the profile wizard and cancel the creation of the new profile.

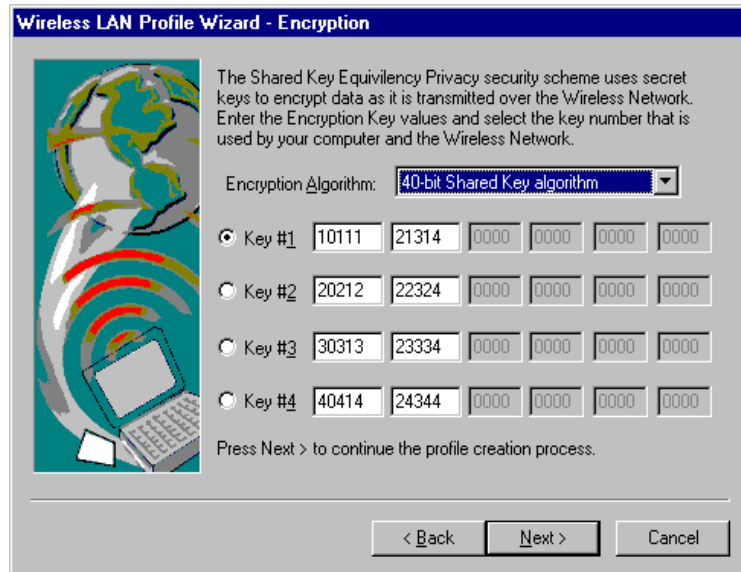
When **Next** is clicked, the **Wireless LAN Profile Wizard - Select Encryption** dialog box displays.



The **Wireless LAN Profile Wizard - Select Encryption** dialog box prompts the user whether or not the target WLAN adapter(s) uses Wireless Equivalency Privacy (WEP). The absence of a physical connection makes wireless links vulnerable to information theft. WEP is an efficient method of preventing data theft and improving security.

- Select **Yes** to display the **Wireless LAN Profile Wizard - Encryption** dialog box. Select **No** to provide no Encryption for the data transmitted between access point and MU.
- Click **Next** to continue with the creation of the profile, click **Back** to return to the **Wireless LAN Profile Wizard - ESSID** dialog box or click **Cancel** to close the profile wizard and cancel the creation of the new profile.

If Yes is selected and Next is clicked, the Wireless LAN Profile Wizard - Encryption dialog box displays. If No is selected and Next is clicked, the Wireless LAN Profile Wizard - Password dialog box displays.



10. Use the Encryption Algorithm pull-down menu to select the 40-bit or 128-bit Encryption algorithm to be used with profile.

When 40-bit Encryption is selected, the user is required to enter a 10 Hex digit password. The password can be entered by spreading the 10 Hex digit password between the two fields provided per Encryption key.



Note

128-bit Encryption is subject to export restrictions. An access code could be required in the NCPA Encryption property page to enable 128-bit Encryption. Ensure 128-bit Encryption is enabled in NCPA before setting Encryption to 128-bit in My Wireless LAN Places.

When 128-bit Encryption is selected, the user is required to enter a 26 Hex digit password. The password can be entered by spreading the 26 Hex digit password between the six fields provided per Encryption key.

If **Open System** is selected, data packets are transmitted between the access point and MU with no encryption.

11. Click **Next** to continue with the creation of the profile, click **Back** to return to the **Wireless LAN Profile Wizard - Select Encryption** dialog box or click **Cancel** to close the profile wizard and cancel the creation of the new profile.

When **Next** is clicked, the **Wireless LAN Profile Wizard - Password** dialog box displays. The **Wireless LAN Profile Wizard - Password** dialog box provides the user with the option of creating a password to protect the data within the profile.

The image shows a Windows-style dialog box titled "Wireless LAN Profile Wizard - Password". On the left is a graphic of a globe with a laptop and signal waves. The main text area contains the following: "Your system uses Encryption to protect your data. It is recommended that you password protect your profile so others cannot view the system encryption keys." followed by the question "Do you want to password protect your profile?". There are two radio buttons: "Yes" (which is selected) and "No". Below these are two text input fields labeled "Password:" and "Confirm Password:", both containing a series of asterisks. At the bottom, there is a line of text: "Press Next > to continue the profile creation process." and three buttons: "< Back", "Next >", and "Cancel".

**Wireless LAN Profile Wizard - Password**

Your system uses Encryption to protect your data. It is recommended that you password protect your profile so others cannot view the system encryption keys.

Do you want to password protect your profile?

☒ Yes

☐ No

Password:

Confirm Password:

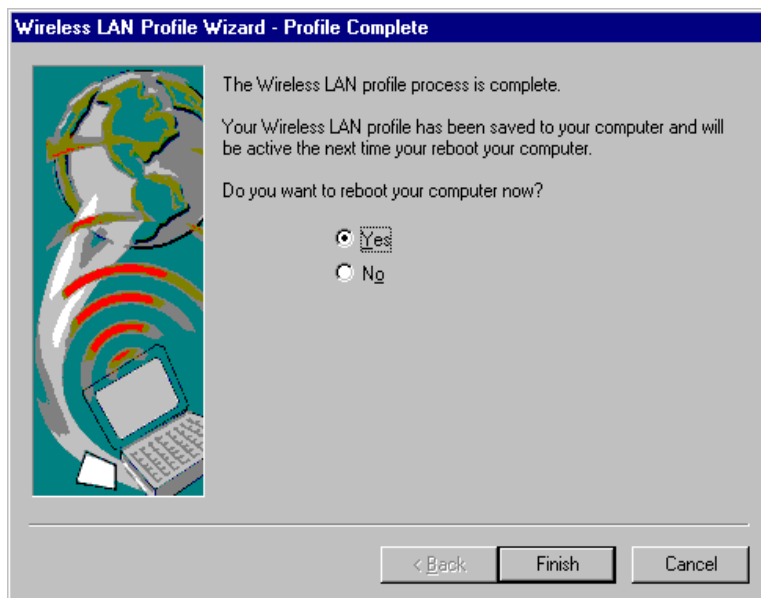
Press Next > to continue the profile creation process.

< Back    Next >    Cancel

12. Click **Yes** to create a password for the profile. Click **No** if a password is not needed for the profile.  
If no password is required, click **Next** to complete the profile.
13. Enter a password in the **Password** field.
14. Enter an identical password in the **Confirm Password** field.
15. Click **Next** to continue with the creation of the profile, click **Back** to return to the **Wireless LAN Profile Wizard - Encryption** dialog box or click

Cancel to close the profile wizard and cancel the creation of the new profile.

When Next is clicked, the Wireless LAN Profile Wizard - Profile Complete dialog box displays.



16. Select Yes to reboot the computer and complete the profile creation process.

Click Finish to restart the computer and implement the new profile, click Back to return to the Wireless LAN Profile Wizard - Password dialog box or click Cancel to close the profile wizard and cancel the creation of the new profile.

## 6.2 Working with Existing Profiles

Existing WLAN profiles can be edited, renamed and deleted using the WLAN Places utility.

### 6.2.1 Editing an Existing Profile

WLAN adapter profiles can be edited by selecting property pages from the Wireless LAN Profile Properties dialog box.

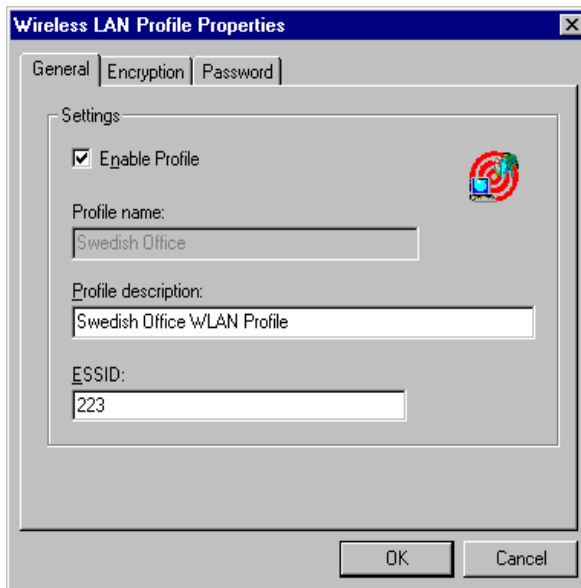
To edit an existing profile:

1. Select the profile to be edited from the MY WLAN Places program window.

If a password was created for the profile the **Enter Password** dialog box displays.

2. Enter the password assigned to that profile and click **OK**.

The **Wireless LAN Profile Properties** dialog box appears with the **General** property page displayed.



3. Edit the **Profile name**, **Profile description** and **ESSID** fields as needed.
4. Select the **Encryption** and **Password** property pages as necessary to edit the profile settings.
5. Click **OK** to save the changes to the profile. Click **Close** to exit.

## 6.2.2 Deleting or Renaming an Existing Profile

Profiles with identical filenames cannot exist. Users have the option of deleting or renaming an existing profile.

To delete or rename a profile:

1. Select the profile from the MY WLAN Places program window.
2. Right-click on the profile to display a pull-down menu with profile configuration options.
3. Select **Rename Profile** and type the new profile name.

To delete the profile, select **Delete Profile** from the pull-down menu.



A deleted WLAN adapter profile does not go into the Recycle Bin and cannot be retrieved.

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## Appendix A

# Customer Support

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Symbol Technologies provides its customers with prompt and accurate customer support. Use the Symbol Support Center as the primary contact for any technical problem, question or support issue involving Symbol products.

If the Symbol Customer Support specialists cannot solve a problem, access to all technical disciplines within Symbol becomes available for further assistance and support. Symbol Customer Support responds to calls by email, telephone or fax within the time limits set forth in individual contractual agreements.

When contacting Symbol Customer Support, please provide the following information:

- serial number of unit
- model number or product name
- software type and version number.

## North American Contacts

Inside North America, contact Symbol by:

- Symbol Technologies, Inc.  
One Symbol Plaza  
Holtsville, New York 11742-1300  
Telephone: 1-516-738-2400/1-800-SCAN 234  
Fax: 1-516-738-5990
- Symbol Support Center:
  - telephone: 1-800-653-5350
  - fax: (516) 563-5410
  - Email: [support@symbol.com](mailto:support@symbol.com)

## International Contacts

Outside North America, contact Symbol by:

- Symbol Technologies Technical Support  
12 Oaklands Park  
Berkshire, RG41 2FD, United Kingdom  
Tel: 011-44-118-945-7000 or 1-516-738-2400  
ext. 6213

## Symbol Developer Program Web Site

- <http://sdp.symbol.com>

## Additional Information

Obtain additional information by contacting Symbol at:

- 1-800-722-6234, inside North America
- +1-516-738-5200, in/outside North America
- <http://www.symbol.com>

## Appendix B

# Regulatory Compliance

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To comply with U.S. and international regulatory requirements, the following information has been included. The document applies to the complete line of Symbol products. Some of the labels shown, and statements applicable to other devices might not apply to all products.

## Radio Frequency Interference Requirements

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient 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 which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Radio Frequency Interference Requirements - Canada

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

## CE Marking & European Union Compliance



Products intended for sale within the European Union are marked with the CEMark which indicates compliance to applicable Directives and European Normes (EN), as follows. Amendments to these Directives or ENs are included: Normes (EN), as follows.

### Applicable Directives:

- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC

### Applicable Standards:

- EN 55 022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information technology Equipment
- EN 50 082-1 - Electromagnetic Compatibility - Generic Immunity Standard, Part 1: Residential, commercial, Light Industry
- IEC 801.2 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 2: Electrostatic Discharge Requirements
- IEC 801.3 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 3: Radiated Electromagnetic Field Requirements
- IEC 801.4 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 4: Electrical Fast Transients Requirements
- EN 60 950 + Amd 1 + Amd 2 - Safety of Information Technology Equipment Including Electrical Business Equipment
- EN 60 825-1 (EN 60 825) - Safety of Devices Containing Lasers

## RF Devices

Symbol's RF products are designed to be compliant with the rules and regulations in the locations into which they are sold and will be labeled as required. The majority of Symbol's RF devices are type approved and do not require the user to obtain license or authorization before using the equipment. Any changes or modifications to Symbol Technologies equipment not expressly approved by Symbol Technologies could void the user's authority to operate the equipment.

## Telephone Devices (Modems)

### United States

If this product contains an internal modem it is compliant with Part 68 of the Federal Communications Commission Rules and Regulations and there will be a label on the product showing the FCC ID Number and the REN, Ringer Equivalence Number. The REN is used to determine the quantity of devices which maybe connected to the telephone line. Excessive RENs on the telephone line may result in the device not ringing in response to an incoming call. In most but not all areas, the sum of the RENs should not exceed 5.0. To be certain of the number of devices that may be connected to the line, as determined by the total number of RENs, contact the telephone company to determine the maximum REN for the calling area.

If the modem causes harm to the telephone network, the telephone company will notify you in advance; however, if advance notice is not practical, you will be notified as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the modem. If this happens the telephone company will provide advance notice so you may make any necessary modifications to maintain uninterrupted service.

## Canada

If this product contains an internal modem it is compliant with CS-03 of Industry Canada and there will be a Canadian certification number (CANADA: \_\_\_\_\_ ) on a label on the outside of the product. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single-line, individual service maybe extended by means of a certified convector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

User should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



User should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

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The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop which is used by the device, to prevent overloading. The termination of a loop may consist of any combination of devices, subject only to the requirement that the total of the Load Numbers of all devices not exceed 100.

The Load Number is located on a label on the product.

Contact your local Symbol Technologies, Inc., representative for service and support;

Symbol Technologies, Inc.,  
Canadian Sales and Service  
2540 Matheson Boulevard East  
Mississauga, Ontario  
Canada L4W 4Z2  
Phone - 905 629 7226

## Laser Devices

Symbol products using lasers comply with US 21CFR1040.10, Subchapter J and IEC825/EN 60 825 (or IEC825-1/EN 60 825-1, depending on the date of manufacture). The laser classification is marked one of the labels on the product.

Class 1 Laser devices are not considered to be hazardous when used for their intended purpose. The following statement is required to comply with US and international regulations:



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Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous visible or invisible laser light exposure.

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Class 2 laser scanners use a low power, visible light diode. As with any very bright light source, such as the sun, the user should avoid staring directly into the light beam. Momentary exposure to a Class 2 laser is not known to be harmful.

