# ASUS WLAN mini-PCI card

# WL-120

# User Manual

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|---|---|
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# Welcome

The ASUS WLAN mini-PCI card is designed to be fully compliant with the IEEE 802.11b wireless local area network (Wireless LAN) standard. The ASUS WLAN mini-PCI card comes with two antenna connectors, which are individually connected to the built-in antennas in your notebook. The two antennas allow your notebook to have the best communication when you are enjoying the wireless link.

# Verifying the TCP/IP Protocol

### Windows 98/Me

Right-click **My Network Place** on the desktop and select **properties.** Scroll down and look for "TCP/IP -> ASUS 802.11b Network Adapter". Make sure that the TCP/IP protocal parameters (IP adress, gateway, and subnet mask) are set correctly.

### Windows 2K/XP

Open the **Control Panel** through the **Start** menu. Double-click **Network Connection** icon. Right click " ASUS 802.11b Network Adapter" and select **Properties.** Look for "Internet Protocal (TCP/IP)". Make sure that the TCP/IP protocal parameters (IP adress, gateway, and subnet mask) are set correctly.

## Installing the WLAN mini-PCI card Utilities

After you have installed the WLAN mini-PCI card driver, you can install WLAN mini-PCI card utilities. Refer to the User's manual for detailed information.

1. Insert the ASUS WLAN mini-PCI card support CD and an autorun menu will appear. If your autorun is disabled, double click **SETUP.EXE** in the root directory of the support CD.
2. From the autorun menu, click Install **ASUS WLAN mini-PCI card Utilities.**
3. Follow the on-screen instructions to complete the installation.

**This device is intended only for OEM integrators under the following conditions:**

1. The antenna must be installed such that 20 cm is maintained between the antenna and users.
2. The transmitter module may not be co-located with any other transmitter or antenna.
3. For laptop installations, the antenna must be installed to ensure that the proper spacing is maintained in the event the device is used in held-on-lap positions (i.e. positioning of antennas must be placed in the upper portion of the LCD panel only to ensure 20 cm will be maintained if the user places the device on their lap for use).
   The card must cease to transmit with the lid shut to prevent transmission in portable operating conditions.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

**End Product Labeling**

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ADSL modems, and similar equipment). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: MSQPCCWL120".

**Manual Information for End Users:**
The end user must not have manual instructions to remove or install the device. The user manual for end users must include the following information in a prominent location

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

# Software Reference

## 1. Overview

The ASUS WLAN mini-PCI card software includes five groups of utilities.

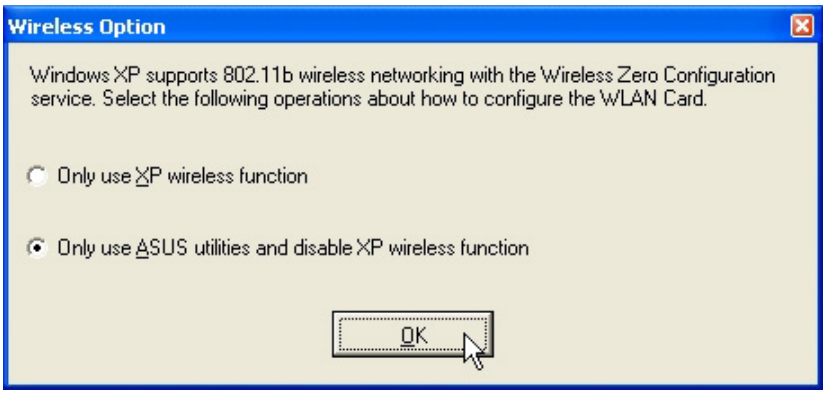
- **Control Center** – Makes it easy to launch applications and activate network location settings.
- **Wireless Settings** – Allows users to control the ASUS WLAN mini-PCI card.
- **Mobile Manager** – A convenient tool to setup and manage network location settings.
- **Site Monitor** – Measures the signal-to-noise (SNR) values of all wireless networks. This tool is used for determining the best placement of Access Points to provide the most efficient coverage in a wireless network.
- **Live Update** – Provides automatic driver and firmware update through the Internet.

## 2. Windows XP Wireless Options

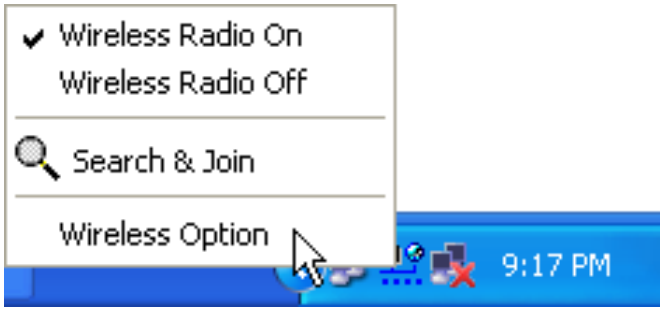
The wireless options shown below is only available for Windows XP. The first time you run the Control Center utility, it will automatically show. Select one of the radio buttons to decide your Windows XP wireless networking environment.

**Only use XP wireless function –** Only use Windows XP wireless network settings to configure the ASUS WLAN mini-PCI card.

**Only use ASUS utilities and disable XP wireless function –** Only use ASUS WALN mini-PCI card utilities to configure the ASUS mini-PCI card.




You can return to the Wireless Option setting at any time by left clicking the control center icon and choosing “Wireless Option”.



## 3. Control Center

Control Center is an application that makes it easy to launch applications and activate network location settings. Control Center starts automatically when the system boots. Whenever Control Center is running, you will see a Control Center icon displayed on the Windows taskbar.

### Starting the Control Center manually

- Click the Windows **Start** button, select **Programs**, select **ASUS Utility**, select **WLAN Card**, and click **ASUS WLAN Control Center**.

or

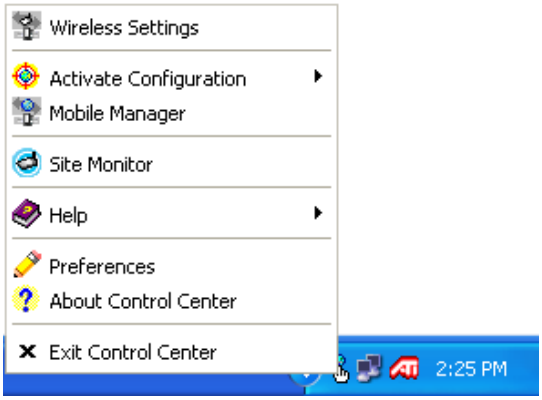
- Double click the **Control Center icon** on the desktop.

### Using the Control Center Taskbar

1. The Control Center Taskbar menu display the following information:
   - The link quality of the ASUS WLAN mini-PCI card (Excellent, Good, Fair, Poor, Not Linked)
   - Whether the ASUS WLAN mini-PCI card is connected to the Internet (Blue: Connected, Gray: Not Connected)

**Taskbar Icon and Status**

**Taskbar Left-Click Menu**




**Taskbar Right-Click Menu**

## Wireless Status Icons (on the taskbar)

**Excellent** link quality and **connected to Internet** (Infrastructure)

**Good** link quality and **connected to Internet** (Infrastructure)

**Fair** link quality and **connected to Internet** (Infrastructure)

**Poor** link quality and **connected to Internet** (Infrastructure)

**Not linked** but **connected to Internet** (Infrastructure)

**Excellent** link quality but **not connected to Internet** (Infrastructure)

**Good** link quality but **not connected to Internet** (Infrastructure)

**Fair** link quality but **not connected to Internet** (Infrastructure)

**Poor** link quality but **not connected to Internet** (Infrastructure)

**Not linked** and **not connected to Internet** (Infrastructure)

Linked (Ad Hoc)

Not Linked (Ad Hoc)

Connected to Internet

2. Right-clicking the taskbar icon shows the following menu:
   - **Wireless Settings** – Launches Wireless Settings application.
   - **Activate Configuration** – Allows you to set which profile to use.
   - **Mobile Manager** – Launches Mobile Manager application.
   - **AP Manager** – Launches AP Manager application installed with the Wireless LAN Utilities.
   - **Preferences** – Customizes the way the Control Center program behaves. You can create a Control Center shortcut on the desktop. You can also set whether Control Center starts up with Windows.
   - **Exit** – Closes the Control Center program.

3. Left-clicking the taskbar icon shows the following menu:
   - **Wireless Radio On** – Turns the wireless radio ON.
   - **Wireless Radio Off** – Turns the wireless radio OFF.
   - **Search and Join** – View the properties of available Access Points within range.
   - **Wireless Option** (Windows XP only) – Sets your Windows XP wireless networking environment.
4. Double-clicking the taskbar icon:
   - Launches the Wireless Settings application.

## 4. Wireless Settings

Wireless Settings is an application that allows you to control your ASUS WLAN mini-PCI card. Use Wireless Settings to View or Modify the configuration settings and monitor the operational status of your PC Card. Once Wireless Settings is launched, you can see the tabbed property sheet. This property sheet is composed of tabbed “pages”, each with its own group of feature-specific settings.

### Starting Wireless Settings

- Open the Windows **Control Panel**, and then double-click the icon **ASUS WLAN Card Settings** icon.

or

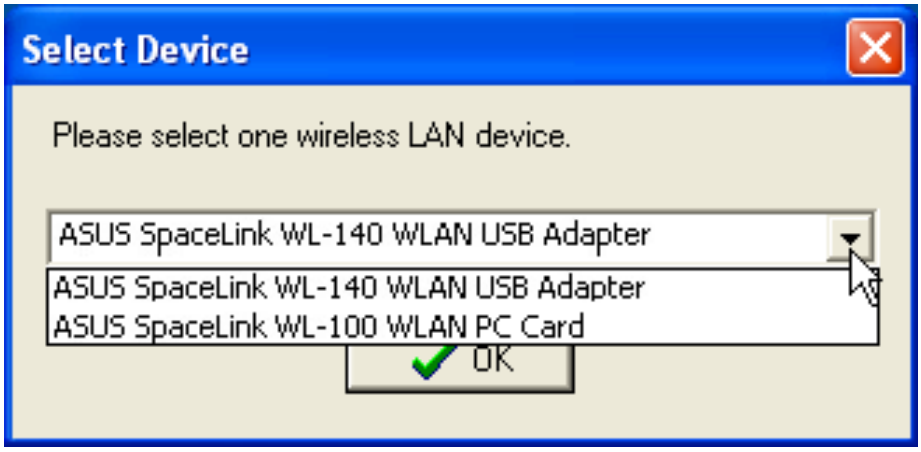
- Click the Windows **Start** button, select **Programs**, select **ASUS Utility**, select **WLAN Card**, and then click **Wireless Settings**.

or

- Click the **Control Center icon** on the Windows taskbar, a popup menu appears, and then click **Wireless Settings**.

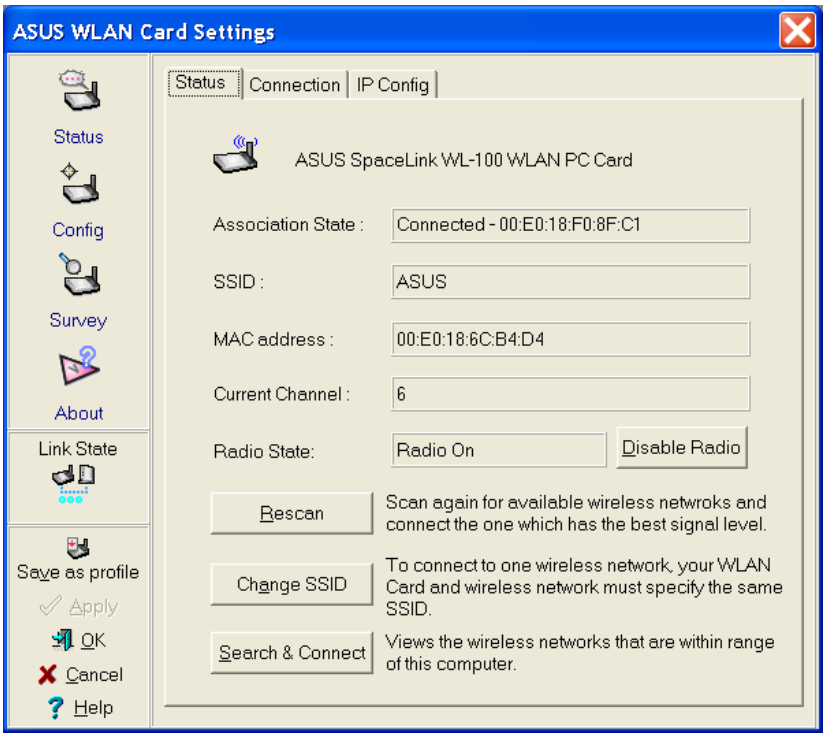
## More than one ASUS WLAN Card

If you have more than one ASUS WLAN Card. You will be given a device selection window when you launch the “Wireless Settings” utility.




## 4.1 Status - Status Tab

You can view the information about the ASUS WLAN mini-PCI card from the general menu. These fields are blank if the ASUS WLAN mini-PCI card does not exist.



### Association State

Shows the ASUS WLAN mini-PCI card association status as follows:

**Connected** – The station is now associated with one wireless LAN device. Also, indicates the MAC address of this device.

**Scanning...** – The station is now attempting to authenticate and associate with the desired Access Point.

**Disconnected** – If the link is connected and no beacon received, then the set adapter is no longer connected.

**INT_TEST_FAIL** – Interrupt test failed.

**NOT_AVAILABLE** – Cannot get PC Card status.

### SSID

Shows the SSID that the ASUS WLAN mini-PCI card is currently using.

### MAC address

Indicates the hardware address of the ASUS WLAN mini-PCI card. MAC address is a unique identifier for networking devices (typically written as twelve hexadecimal digits 0 through 9 and A through F, six hexadecimal numbers separated by colons, i.e. 00:01:24:F0:05:C0). This parameter is read-only and unique.

### Current Channel

Shows the radio channel that the ASUS WLAN mini-PCI card is currently using.

### Radio State

Shows whether the wireless radio is ON or OFF.

When the wireless radio is turned OFF, the following icon appears in the upper left of the “Settings” property page.

When the wireless radio is turned ON, the following icon appears in the upper left of the “Settings” property page.

### Button

**Enable Radio/Disable Radio** – You can click the Disable Radio button to turn OFF the wireless radio. When you click this button, the Radio State field indicates that the radio has been turned OFF and the remaining fields in this window display either a “0” or “Not Applicable”. Click this button again to turn the radio back ON.

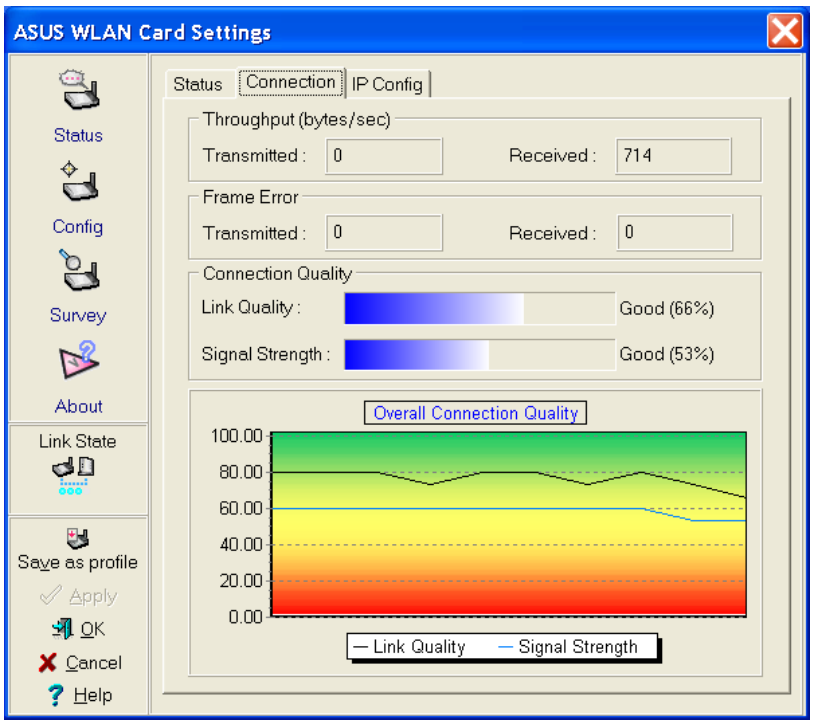
**Rescan** – Force the radio to rescan all available channels. If your link quality or signal strength is poor, rescanning can be used to push the radio OFF a weak Access Point and search for a better link with another Access Point. This function will take some time.

**Change SSID** – Click on this to set the SSID.

**Search & Connect** – Click on this to connect to an available network.

## 4.2 Status - Connection Tab

You can view the current link statistics about the ASUS WLAN mini-PCI card. These statistics are updated once per second and are valid only if the ASUS WLAN mini-PCI card exists.




### Throughput

**Transmitted** – The number of bytes in frames that were transmitted.
**Received** – The number of bytes in frames that were received.

### Frame Error

**Transmitted** – The number of frames that were not successfully transmitted.

**Received** – The number of frames that were not successfully received.

### Connection Quality

**Link Quality** – Reflects the quality level related to the Access Point the station is currently connected to. Ratings are: Excellent, Good, Fair, and Poor.

**Signal Strength** – Reflects the signal level related to the Access Point the station is currently connected to. Ratings are: Excellent, Good, Fair, and Poor.

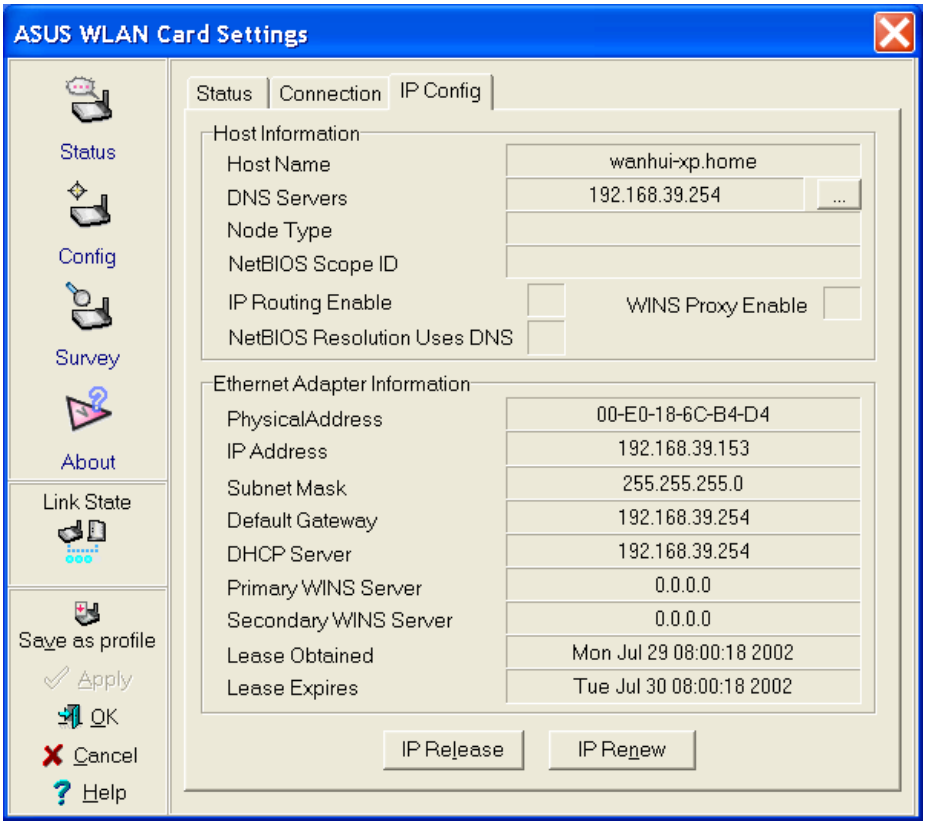
### Overall Connection Quality

Derives from the current “Link Quality” and the current “Signal Strength”. A graph displays a connection quality range between 0 and 100 percent.

## 4.3 Status - IP Config Tab

IP Config tab shows all the current network configuration information for the ASUS WLAN mini-PCI card. Use it to verify your network settings.

IP CONFIG will display all the current TCP/IP configuration values including the IP address, subnet mask, default gateway and Windows Internet Naming Service (WINS) and DNS configuration.




### Button

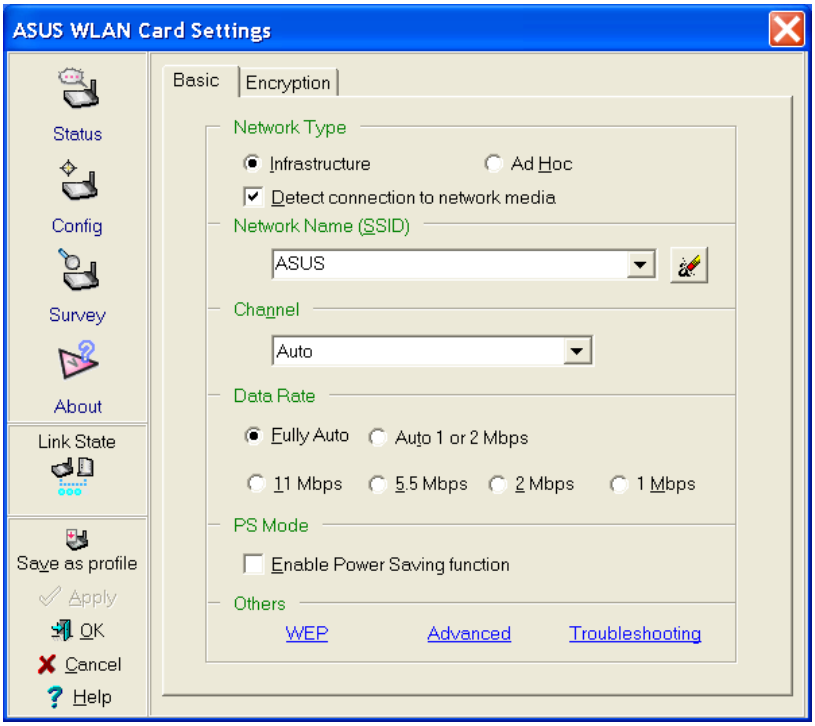
IP Release - Releases the DHCP IP address for the ASUS WLAN mini-PCI card.

IP Renew - Renews the DHCP IP address for the ASUS WLAN mini-PCI card.

NOTE : The IP Release and IP Renew buttons can only be used on the ASUS WLAN mini-PCI card that is configured with DHCP.

## 4.4 Config - Basic Tab

Lets you can change the ASUS WLAN mini-PCI card configurations without rebooting your computer.




### Network Type

**Infrastructure** – Select the Infrastructure mode to establish a connection with an Access Point. Your computer is able to access wireless LAN and wired LAN (Ethernet), via an associated access point. The Channel field turns to “Auto” when “Infrastructure” is selected.

**Ad Hoc** – Select the “Ad Hoc” mode to communicate directly with each other without using an Access Point. An “Ad Hoc” network is typically formed quickly and easily without pre-planning. For example, share meeting notes between networked computers in a meeting room.

## SSID

Use the SSID filed to configure the SSID for the ASUS WLAN mini-PCI card. You can enter a new SSID or select one from the drop-down list box. SSID stands for “Service Set Identifier”, which is a string used to identify a wireless LAN. You will only be able to connect Access Points which has the same SSID as the one you set. Use different SSIDs to segment the wireless LAN and increase security. SSIDs must all be printable characters and having a maximum of 32 case sensitive characters, such as “ Wireless LAN”.

**Set the SSID to “any” if you wish to allow your station to connect to any IEEE 802.11 Infrastructure Network it can find. When you set to “any”, “Scanning...” will begin and may take a long time. Use “Survey” to view all Access Points within range and their SSIDs.**

## Channel

Using the Channel field to select the radio channel for ASUS WLAN mini-PCI card. In an “infrastructure” network, your PC Card will automatically select the correct frequency channel required to communicate with an Access Point, this parameter will be fixed in “Auto” and cannot be changed. In an “Ad Hoc” network, you can decide the channel number for the ASUS WLAN mini-PCI card. Any ASUS WLAN mini-PCI card can communicate in the same network if each has the same frequency channel setting. The radio channels you may use depend on the regulations in your country. For United States (FCC) and Canada (IC), channels 1 to 11 are supported. For Europe (ETSI) except Spain and France, channels 1 to 13 are supported. For Spain channel 10 and 11 are supported. For France, channels 10 to 13 are supported. For operation in Japan (MKK), channels 1 to 14 are supported.

## Data Rate

**Fully Auto** – Automatic transmit data rate falls back to 1, 2, 5.5, or 11 megabits per second when necessary to maintain transfers with devices.

**Auto 1 or 2 Mbps** – The PC Card will adjust to the most suitable transmission rate. The transmit data rate is either 1 Mbps or 2 Mbps.

**11 Mbps** – Fix data rate to 11 megabits per second.

**5.5 Mbps** – Fix data rate to 5.5 megabits per second.

**2 Mbps** – Fix data rate to 2 megabits per second.

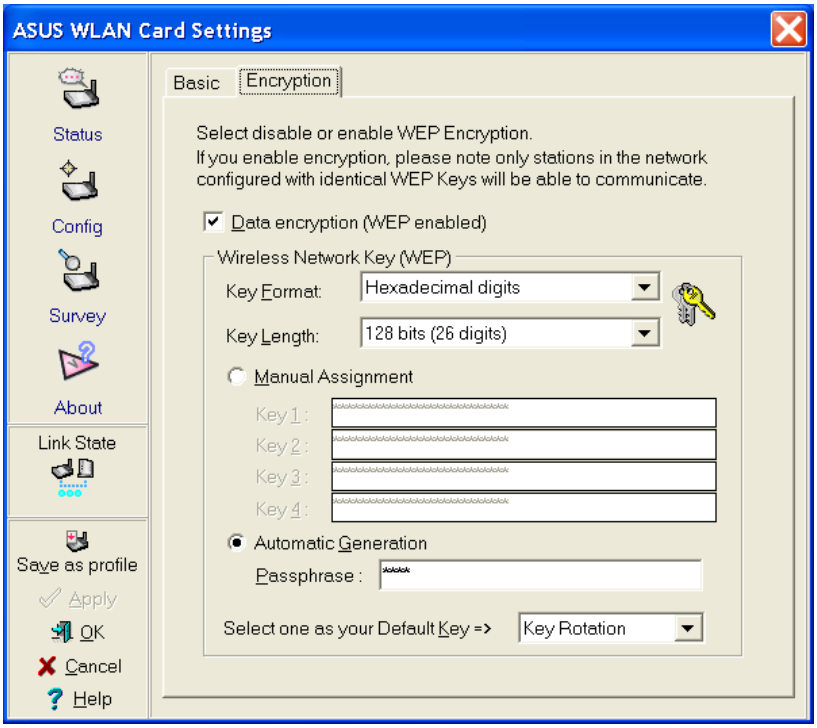
**1 Mbps** – Fix data rate to 1 megabits per second.

## Other

**WEP** - Click on this to show the "Encryption" page.
**Advanced** - Click on this to show the "Advanced" tab. In most cases, the default values do not have to be changed.
**Troubleshooting** - Click on this to show the "Troubleshooting" utility.

## 4.5 Config - Encryption Tab

Lets you configure the ASUS WLAN mini-PCI card encryption settings. For data confidentiality in a wireless environment, IEEE 802.11 specifies a Wired Equivalent Privacy (WEP) algorithm to offer transmission privacy similar to wired network. The WEP uses keys to encrypt transmitted data packets and decrypt received data packets. The encryption process can scramble frame bits to avoid disclosure to others.




### Data encryption (WEP enabled)

This option allows you to enable or disable the Wired Equivalent Privacy (WEP) function. If this check box is selected, a WEP Key is used to encrypt your data before it is transmitted over the air.

If you enable WEP encryption, you will only be able to communicate with wireless devices that use the same WEP keys.

### WEP Key

This option is enable only if you enable WEP Encryption. The WEP Key is a 64 bits (5 byte) or 128 bits (13 byte) Hexadecimal digits that is used to encrypt transmit data packets and decrypt received data packets.

### Key Format

You can enter the WEP Key as Hexadecimal digits (0~9, a~f, and A~F), or as ASCII characters, based on the state of the Key Format.

### Key Length

For 64 bits encryption, each Key contains exactly 10 hex digits, or 5 ASCII characters. For 128 bits encryption, each Key contains exactly 26 hex digits, or 13 ASCII characters.

### Two ways to assign WEP keys

**Manual Assignment** – When you click this button, the cursor appears in the field for Key 1. For 64-bit encryption, you are required to enter four WEP Keys. Each Key contains exactly 10 hex digits (0~9, a~f, and A~F). For 128-bit encryption, you are required to enter four WEP Keys. Each Key contains exactly 26 hex digits (0~9, a~f, and A~F).

**Automatic Generation** – Type a combination of up to 64 letters, numbers, or symbols in the Passphrase column, then the Wireless Settings Utility uses an algorithm to generate four WEP Keys for encryption.

**NOTE: This function eases users from having to remember their passwords and is compatible to some existing WLAN utilities, but this is not very secure. "Manual Assignment" is more secure.**

**Default Key** – The Default Key field lets you specify which of the four encryption keys you wish to use to transmit data on your wireless LAN. You can change the default key by clicking on the down arrow at the right of this field, selecting the number of the key you want to use, and then clicking the **Apply** button. As long as the Access Point or station with which you are communicating has the same key in the same position, you can use any of the keys as the default.

Click the **Apply** button to create your encryption keys. After you click the **Apply** button, the "Wireless Settings" utility uses asterisks to mask your keys.

**Click Apply to save and activate the new configurations.**

### 64/128bits versus 40/104bits

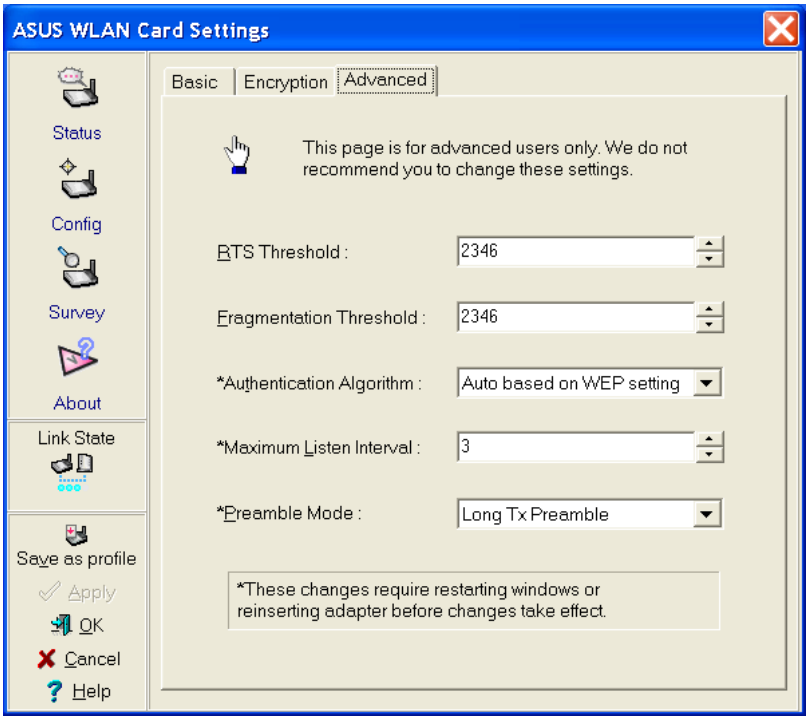
You may be confused about configuring WEP encryption, especially when using multiple wireless LAN products from different vendors. There are two levels of WEP Encryption: 64 bits and 128 bits.

First, 64 bit WEP and 40 bit WEP are the same encryption method and can interoperate in the wireless network. This lower level of WEP encryption uses a 40 bit (10 Hex character) as a “secret key” (set by user), and a 24 bit “Initialization Vector” (not under user control). This together makes 64 bits (40 + 24). Some vendors refer to this level of WEP as 40 bits and others refer to this as 64 bits. ASUS WLAN card products use the term 64 bits when referring to this *lower* level of encryption.

Second, 104 bit WEP and 128 bit WEP are the same encryption method and can interoperate in the wireless network. This higher level of WEP encryption uses a 104 bit (26 Hex character) as a “secret key” (set by user), and a 24 bit “Initialization Vector” (not under user control). This together makes 128 bits (104 + 24). Some vendors refer to this level of WEP as 104 bits and others refer to this as 128 bits. ASUS WLAN card products use the term 128 bits when referring to this *higher* level of encryption.

## 4.6 Config - Advanced Tab

Advanced tab provides some additional settings for the ASUS WLAN mini-PCI card. The “Advanced” tab is hidden until you click Advanced on the Config - Basic page.




**NOTE: This page is for advanced users. Do not change these settings if you do not fully understand these items.**

### RTS Threshold

Defines the size of packets that the station uses for RTS/CTS handshake boundary. Setting the minimum size packet too small causes RTS packets to be sent more often, adding excessive overhead to the network and decreasing network utilization. However, the more often RTS packets are sent, the more transmission collisions can be avoided. RTS threshold ranges from 0 to 2346 in 64 steps.

### Fragmentation Threshold

Define the number of bytes used for fragmentation boundary. If the length of the data unit exceedsthis parameter , it will be divided into smaller fragments for transmission. Each of the fragments is sent independently. If there is a significant interference present, set the fragment size smaller. Otherwise,set the fragment size lar ger. Because send multiple frames lead to overhead on the network.Fragmentation  Threshold ranged from 256 to 2432 steps 128.

### Authentication Algorithm

Because there is no precise bound in wireless LANs, it needs to be implemented in another mechanism to provide a higher level of security. That is where Authentication services come in. If a mutual authentication relationship has not been established between the ASUS WLAN mini-PCI card(s) and the Access Point(s), an association cannot be established.

**Auto based on WEP setting –** Switch the authentication mode based upon the ASUS WLAN mini-PCI card Client using WEP encryption or not.

**Open System –** A null authentication algorithm. A station can authenticate with any other station or Access Point and without checking any WEP Key, even if one exists.

**Share Key –** In a Share Key Authentication system, four-step exchange of frames is required to validate that the station is using the same WEP Key as the Access Point. Using this Authentication mechanism requires implementation of the WEP option.

### Maximum Listen Interval

This value is used to indicate how often a station will wake up to listen to beacon management frames. Listen intervals range from 0 to 77 in steps of 1.

### Preamble Mode

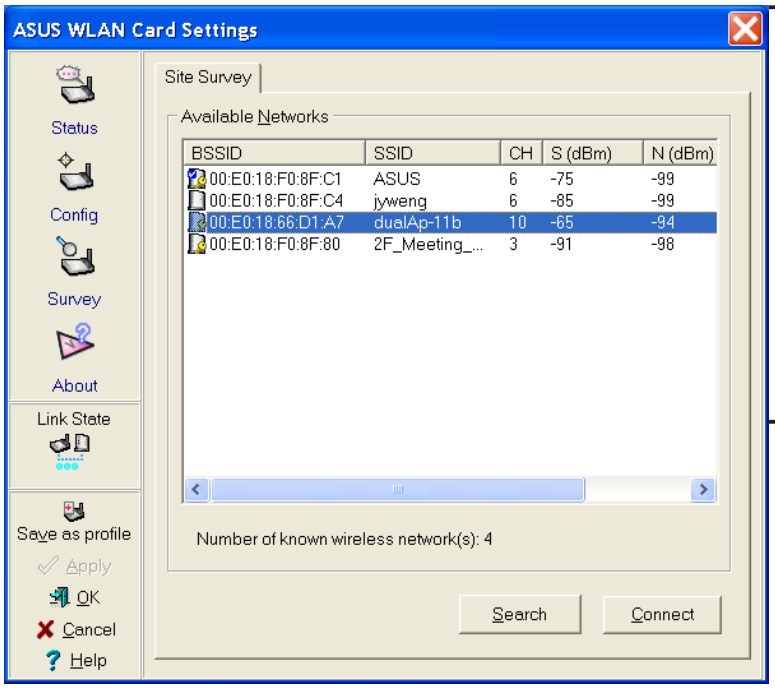
This parameter is used to control whether frames will transmit with the long or short preamble.

**Click Apply to save and activate the new configurations.**

## 4.7 Survey - Site Survey Tab

Use the Site Survey tab to view statistics on the wireless networks available to the ASUS WLAN mini-PCI card. The Site Survey tab is read-only with no user configurable data fields. Use the Site Survey tab to view the following network parameters.

- **BSSID** – View the IEEE MAC addresses of the available networks.
- **SSID** – View the SSID (service set identification) within available networks.
- **CH** – View the direct-sequence channel used by each network.
- **S (dBm)** – Signal field to view the strength of the signal transmitted by each network. This information is helpful in determining which network you should be associated to. The value is then normalized to a dBm value.
- **N (dBm)** – Noise field to view average noise level statistics and Relative Signal Strength Information (RSSI). This information is helpful in determining which network you should be associated to. The value is then normalized to a dBm value.
- **Type** – View wireless network status information, the value is either AP (infrastructure) or STA (Ad Hoc).
- **WEP** – View wireless network WEP encryption information, the value is either OFF (disable encryption) or ON (enable encryption).




**Some Access Points can disable broadcasting SSID to hide themselves from "Site Survey" or "Site Monitor" for added security but still allow you to join if you know their SSID.**

### Buttons

**Search** – Scan all available wireless networks and show the scan result in the "Available Network List".

**Connect** – To associate a network, select it from the "Available Network List" and click this button.

## 4.8 About - Version Info Tab

Click about to view version information. The version under the copyright is the utility version. The version information field includes driver, hardware, and firmware versions.

## 4.9 Link Status

ASUS WLAN mini-PCI card connection quality icon appears on the left of the ASUS WLAN Card Settings. Use the icon to view the current signal quality of the adapter.

Excellent Link Quality (Infrastructure)

Good Link Quality (Infrastructure)

Fair Link Quality (Infrastructure)

Poor Link Quality (Infrastructure)

Not linked (Infrastructure)

Linked (Ad Hoc)

Not Linked (Ad Hoc)

### To Exit Wireless Settings

To exit Wireless Settings, you can click **OK** or **Cancel**. This utility may be closed at any time and from any tab. If you did not save the configuration settings, you will be prompted to do so.

# 5. Mobile Manager

Mobile Manager is a convenient tool to setup and manage network location settings. Mobile Manager lets users configure multiple alternative configurations for different locations. You only need to set this once, and then easily switch configurations when you change your location.

## Starting Mobile Manager

- Click the Windows **Start** button, select **Programs**, select **ASUS Utility**, select WLAN Card, and then click **Mobile Manager**.

or

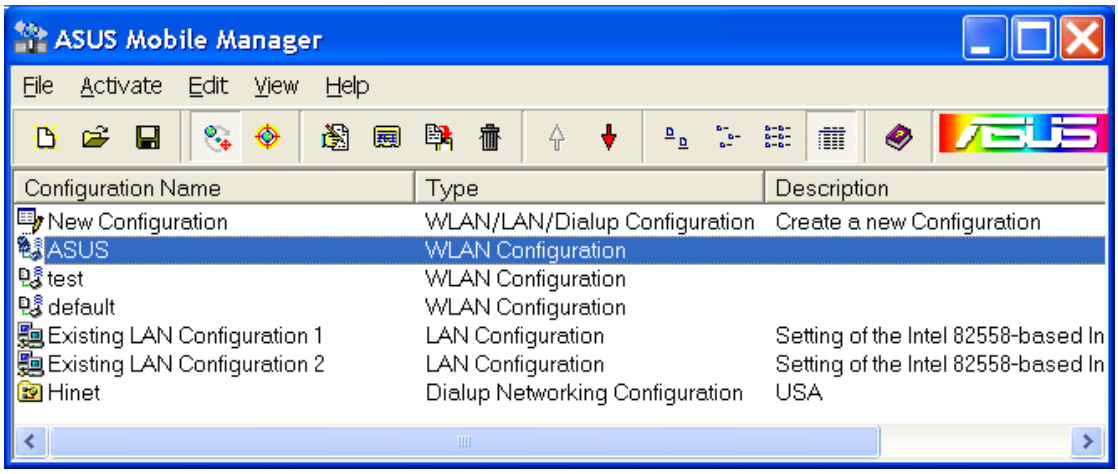
- Right-click the **Control Center** icon on the Windows taskbar and then click **Mobile Manager**.

## Using Mobile Manager - Quick Guide

1. The first time you launch the Mobile Manager utility, it will automatically generate configurations that stores the current settings of all installed network devices in your system.
2. Change the name of the configuration to a descriptive name like “Work-Meeting Room” or “Home-ADSL”.
3. On the **File** menu, click **New Configuration**, the New Configuration Wizard dialog appears. Follow the on-screen instructions to create your own location configurations.
4. After you have created your configurations, you can see them in the main window.
5. Select the configuration you want to use and then click **Mobilize Configuration** from the **Mobilize** pull-down menu. Your system will then switch to the network settings configured to your chosen selection.

## 5.1 Main Window

You can use the Mobile Manager utility main window to create a new configuration, edit a configuration or activate a configuration. The main window includes a menu bar, tool bar, and a list view for showing existing configurations.




### Using the pull-down menu and toolbar

The following topics show the commands available from the Mobile Manager pull-down menu and toolbar. If no configuration is selected, some commands will be grayed out and inaccessible. The toolbar contains buttons for many of the most commonly used commands in Mobile Manager. It allows quick access to some of the most useful features of Mobile Manager. The commands provided by the toolbar buttons are also available from the pull-down menu.

### File Menu

**New Configuration -** Select New Configuration in the File menu to open a New Configuration Wizard dialog. Use the New Configuration Wizard dialog to create a new configuration. See Using New Configuration Wizard for details on this command.

**Import Configuration -** Load a configuration from an INI File.

**Export Configuration -** Save the selected configuration (containing Wireless Settings, TCP/IP Settings, Network Settings, ...) to an INI File. The INI file can be placed on a floppy diskette and then imported by other computers using Mobile Manager. This can also be used as a backup feature for yourself.

**Exit -** Close the Mobile Manager utility.

## Mobilize Menu

**Auto Roaming** – If an association changes, it will automatically switch into a network configuration that you have made. If no associations have been made, it will automatically connect to a wireless network based on configurations that you specify.

**Activate Configuration** – Applies the configuration that you have selected from the list. You may be prompted to restart Windows depending on the required changes. Follow the instructions on the screen. Windows 2000 and XP usually do not require restarting your computer, but Windows 98 and ME usually will require a restart.

## Edit Menu

All these commands are also available from the context menu that appears when you right-click with a configuration in the Mobile Manager window.

**Edit Configuration -** Select Edit Configuration in the Edit menu to open an Edit Configuration dialog to edit selected configuration items. See “Using Edit Configuration” for details on this command.

**Rename** - Change the name of the selected configuration.

**Copy -** Duplicate the selected configuration.

**Delete -** Discard the selected configuration.

**Up -** Raises the position of the selected wireless netowork configuration in the preferred network list.

**Down -** Lowers the position of the selected wireless netowork configuration in the preferred network list.

## View Menu

**Large Icons -** Displays large icons for each configuration.

**Small Icons** - Displays small icons for each configuration.

**List -** Shows the configuration names in a list.

**Details -** The Detailed view expands this list to include information about the configurations. The information includes configuration name, type, and description.

## Help Menu

**Contents** - Displays the WinHelp contents window (the one you are reading now) for online Help.

**About Mobile Manager** - Displays the version number and copyright information for Mobile Manager. Click on the logo to connect to ASUS' website.

## 5.2 Using New Configuration Wizard

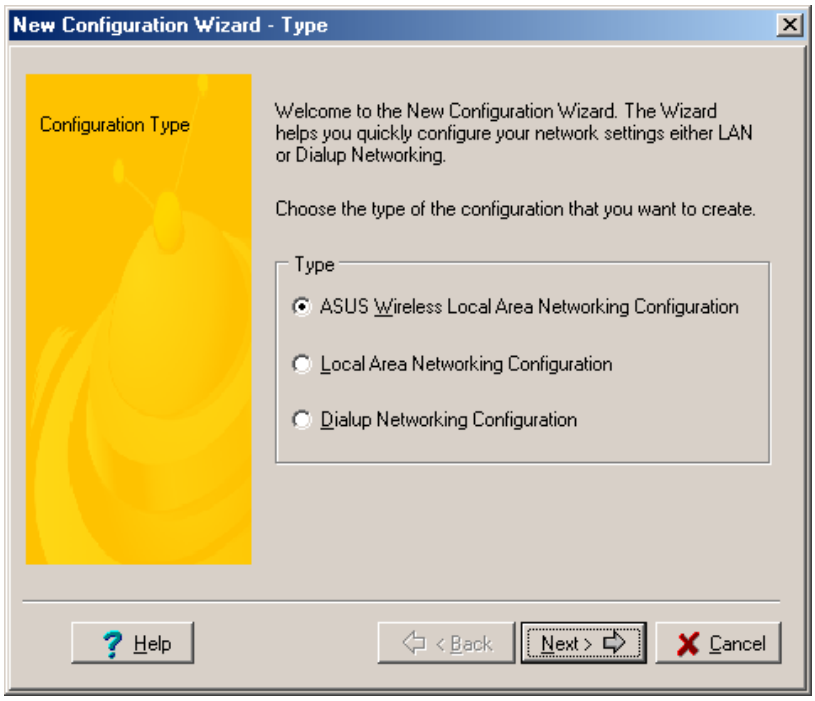
### Create a new configuration

Create a new configuration if you are in a specific location that does not have an existing configuration defined. Use the New Configuration Wizard to create a configuration in a few easy steps.

1. Do one of the following:
   - On the **File menu**, click **New Configuration**.

   or
   - Double-click **New Configuration** on the Main window.

   Then the New Configuration Wizard dialog starts.
2. Choose the type of configuration that you want to create and click **Next**.
   - **Wireless Local Area Network Configuration:** You must have an ASUS WLAN mini-PCI card installed in your PC.
   - **Wired Local Area Network Configuration:** You must have a NIC (LAN card) (other than ASUS WLAN mini-PCI card) installed in your PC.
   - **Dialup Networking Configuration:** You must have a modem installed in your PC.



3. Enter the name and description you want to use for this configuration in the Name and description field. And Click **Next**.
4. Follow the on-screen instructions, it will guide you through the process of specifying the settings in your configuration. The Wizard reads the current system settings (TCP/IP, NT Domain, Proxy, File, and Printer Sharing) and displays it. Depending on the configuration that you have created, you can set the following groups of settings:
   - Wireless settings (for Wireless Configuration)
   - Network settings (for Wireless/Wired Configuration)
   - TCP/IP settings (for Wireless/Wired Configuration)
   - Dialing settings (for Dialup Configuration)
   - Dialup Networking settings (for Dialup Configuration)
   - Internet settings (for Wireless/Wired/Dialup Configuration)
   - Sharing settings (for Wireless/Wired/Dialup Configuration)

   See “Using Edit Configuration” for detailed information on each.
5. Enter the appropriate information in the wizard. After specifying the appropriate information on each page, click **Next** to continue.
6. On the final window of the New Configuration Wizard, you will see a **Finish** button.
   - If you do not want to use this new configuration now, click **Finish** to save the new configuration. It will be shown in the Mobile Manager main window.

   or
   - If you want to use this new configuration now, click **Mobilize**.

## 5.3 Using Edit Configuration

### Edit an existing configuration

Edit a configuration if you want to view or change dialup or LAN settings.

- On the **Edit menu**, click **Edit Configuration**.

or

- Double-click one existing configuration on the Main window.

Then the Edit Configuration dialog starts.

The Edit Configuration dialog contains various settings, which you select by clicking the buttons at the left of the window. Each setting is described below.

## General settings

**Name** – This field is mandatory, and used for indicating the location from which you are dialing or connecting to the network. For example, if this is used for a meeting room at work, you can use a name like "Work-Meeting Room". If it is used for home on your ADSL, you can name like "Home-ADSL".

**Description** – This field is optional, you can use it to provide more details about this configuration.

## Network settings

Network settings include: "Identification" and "Microsoft Networking".

## Identification

**Computer name** – Give your computer a unique name of up to 15 characters. Thecomputer name is the name that others on your network will see your computer as. For complete compatibility, do not use spaces or symbols. It's generally the same as the DNS hostname, for example, "JohnDoe".

**Workgroup** – Type an existing workgroup name or create a new workgroup by typing a new name that contains up to 15 characters. Use it to identify your computer group that you belong to.

**Computer Description** – This information is displayed as a comment next to the computer name when the computer is seen in "Details" view (select from the Windows pull-down menu). Use it to describe your computer, for example, your name, or location.

## Microsoft Networking

**Logon validation** – Specify how Windows 9x clients connect to a Windows NT Server Domain at this location.Check *Log on to Windows NT domain* box if you are using a Windows NT Server in domain controller mode. And then enter the Window NT server domain name in *Window NT domain* field.

**Network logon options** – Specify how Windows 9x clients try to logon. Select *Quick logon* to wait until the shared network drives is actually used to attempt the login. Select *Logon and restore network connections* to logon to all shared network drives when the user logs into Windows.

## Wireless settings

### Network Type

**Infrastructure** – Select the Infrastructure mode to establish a connection with an Access Point.

**Ad Hoc** – Select the Ad Hoc mode to communicate directly with each other without using an Access Point.

### SSID

Using the SSID filed to configure the SSID setting for the ASUS WLAN mini-PCI card. SSID stands for Service Set Identifier, which is a string used to identify a wireless LAN. You will only be able to connect with an Access Point, which has the same SSID. Use different SSIDs to segment the wireless LAN and add security.

Note that the SSID must be all printable character string (case sensitivity) and up to 32 characters long, such as " WIRELESS LAN". Set the SSID to "any" if you wish to allow your station to connect to any IEEE 802.11 Infrastructure Network it can find.

### Channel

Using the Channel filed to select the radio channel for PC Card. In infrastructure network, your PC Card will automatically select the correct frequency channel required to communicate with an Access Point, this parameter will be fixed in "Auto" and can't change it. In an Ad Hoc Network, you can decide channel number for the PC Card to operate. PC Cards can communicate in the network if each has the same frequency channel setting.

### Data Rate

**Fully Auto** – Automatic transmit data rate fallback to 1, 2, 5.5, or 11 megabits per second for communication with other devices.

**Auto 1 or 2 Mbps** – The ASUS WLAN mini-PCI card will use the most suitable transmission rate of either 1 Mbps or 2 Mbps.

**11 Mbps** – Fix transmit data rate to 11 megabits per second.

**5.5 Mbps** – Fix transmit data rate to 5.5 megabits per second.

**2 Mbps** – Fix transmit data rate to 2 megabits per second.

**1 Mbps** – Fix transmit data rate to 1 megabits per second.

## WEP

Select disable or enable (64-bit or 128-bit) WEP encryption. The *WEP Key* is a 64-bit (5 byte) or 128-bit (13 byte) Hexadecimal digit that is used to encrypt transmit data packets and decrypt received data packets.

## TCP/IP settings

TCP/IP settings include five tabs: Device, IP Address, Gateway, DNS, and WINS.

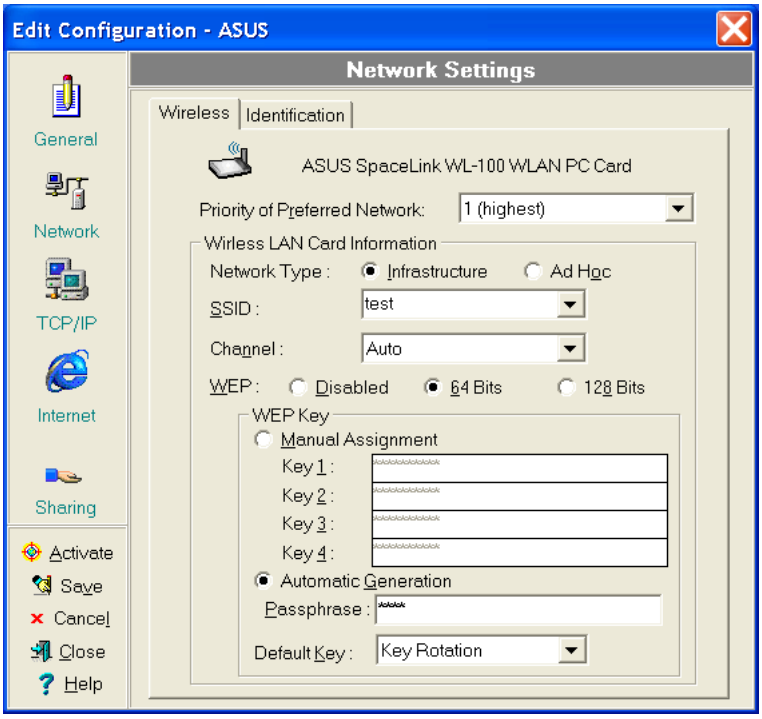
## Device

Choose the network adapter that you want to use for this configuration.

## IP Address

**Obtain an IP address from a DHCP server** – Dynamic host configuration protocol (DHCP) server assigns IP addresses automatically within a specified range to devices.

**Specify an IP address** – Ask your network administrator for the IP address and subnet mask that you should use. Type in the IP Address and Subnet Mask fields manually.



### Gateway

Specify the gateways. There can be more than one specified.Set up the primary gateway first.

**Add a gateway -** Type the IP address of the gateway in the **New Gateway** field and then click **Add**. The gateway you specified appears in the **Installed Gateways** list. Repeat to specify another gateways. The value in each field must be a number between 0 and 255. You can have up to eight IP addresses for gateways.

**Remove a gateway -** Select the gateway from the **Installed Gateways** list and click **Remove**.

### DNS

Select Enable or Disable DNS. If you enable DNS, fill the following parameters.

**Host** – Enter the name of your computer. That is used to identifier the computer on the Internet. The hostname is generally the same as the Microsoft networking computer name, for example, “S82000W”.

**Domain** – Enter the TCP/IP domain name for your network.The full domain name consists of one or more names that are separated by dots, for example, “asus.com”.

**DNS Server Search Order** – Specify the DNS Servers in the desired order to search for DNS information.

**Domain Suffix Search Order** – Add any domain suffixes that may be valid attached to the end of Internet domain name.

### WINS

Specify the WINS server. There can be more than one specified.Set up the primary WINS server first.

**Disable WINS Resolution** – Do not use WINS resolution.

**Enable WINS Resolution** – Use WINS resolution. Specify the IP addresses of the WINS servers in the desired search order. *Scope ID* is used when NetBIOS over TCP/IP is enabling on the workstations. If this protocol has been enabled, then every workstation group must have the same Scope ID for those computers to communicate within the group. The Scope ID is usually left blank.

**Use DHCP for WINS Resolution** – If a DHCP server is available that is configured to provide information on available WINS servers.

### Dialing settings

Specify how the call will be dialed. This is useful if you want to change the call to a calling card, use your computer from different locations, or add a dial prefix, country code, or area code automatically.

### Dialup Networking settings

Dialup Networking settings include four tabs: Device, Phone Number, Server Type, and TCP/IP.

### Device

Choose the modem you want to use by Dial-Up Networking to connect to another computer for this connection.

### Phone Number

Specify area code, telephone number, and country code for this connection. Clear the **Use area code and Dialing Properties** checkbox, if you want to ignore area code and dialing settings.

### Server Type

**Type of Dial-Up Server** – Select the server type for this connection.

### Advanced options

Select **Log on to network** checkbox to specify that Dial-Up Networking will attempt to log on to the network you are connecting to, using the user name and password you typed when you logged on to Windows.

Select **Enable software compression** checkbox to specify whether incoming or outgoing information is compressed before it is sent. This is useful to speed up the transfer of information. Compression occurs only if both computers are using compatible compression.

Select **Require encrypted password** checkbox to specify that only encrypted passwords can be sent to or accepted by your computer. This is useful if you need additional security for this connection. When type your password while dialing out, this setting will encrypt your password but the target computer must support encrypted passwords for your password to be understood.

**Allowed network protocols** – Specifies the network protocols that your computer can use.

Select **NetBEUI** protocol to connect to Windows NT, Windows for Workgroups, or LAN Manager servers.

Select **IPX/SPX Compatible** protocol to connect to Netware and Windows NT servers and Windows 98 computers.

Select **TCP/IP** protocol to connect to Internet and wide-area networks.

### TCP/IP

**Server assigned IP address** – Specifies whether Dialup Networking accepts an IP address from a ppp server. If the ppp server does not offer an IP address, the IP address specified for TCP/IP Dial-Up Adapter in the Network dialog box is used.

**Specify an IP address** – Provides a space for you to type the preferred IP address for this connection. Dial-Up Networking tries to use this address first.

**Server assigned name server addresses** – Specifies whether Dial-Up Networking accepts a DNS and WINS server addresses from a ppp server. If the ppp server does not offer DNS and WINS addresses, DNS and WINS server addresses specified for TCP/IP Dial-Up Adapter in the Network dialog box are used.

**Specify name server addresses** – Provides a space for you to type one or two DNS and WINS server addresses for this connection only. Dial-Up Networking tries to use these addresses first.

**Use IP header compression** – Specifies whether Dial-Up Networking uses IP header compression for this connection. IP header compression optimizes data transfer between computers.

**Use default gateway on remote network** – Specifies whether IP traffic is routed to the WAN connection by default.

### Internet settings

A proxy server acts as a security barrier between your internal network (Intranet) and the Internet, keeping other people on the Internet from gaining access to confidential information on your internal network or your computer.

**Disable Proxy Server** – Do not use proxy server.

**Enable Proxy Server** – Use the Proxy server to gain access to the Internet.

**Use the same proxy server for all protocols** – Specifies whether you want to use the same proxy server to gain access to the Internet using all protocols.

**Servers** – Provides spaces for you to type the address and port number of the proxy server you want to use to gain access to the Internet over HTTP, Secure, FTP, Gopher, and Socks protocol.

### Exceptions

**Do not use proxy server for address beginning with** – Provides a space for you to type the Web addresses that do not need to be accessed through the proxy server. If you want to connect to a computer on your Intranet, make sure you type its address in this box. You can use wild cards to match domain and host names or addresses, for example, "*.company.com", "192.72.111.*".

**Bypass proxy server for local addresses** – Specifies whether you want to use the proxy server for all local (Intranet) addresses. You might be able to gain access to local addresses easier and faster if you do not use the proxy server.

### Sharing settings

**I want to be able to give others access to my files** – Turn file sharing ON or OFF. File sharing enables people using other computers to read or modify files you share on your computer.

**I want to be able to allow others to print to my printer(s)** – Turn printer sharing ON or OFF. Printer sharing enables people using other computers to printer their files on your printers.

Click **Save** button to save all the changes you have made without closing the Edit Configuration dialog box.

Click **Cancel** button to close the Edit Configuration dialog box without saving any changes you have made.

Click **Close** button to close the Edit Configuration dialog box and save any changes that you have made.

# 6. Site Monitor

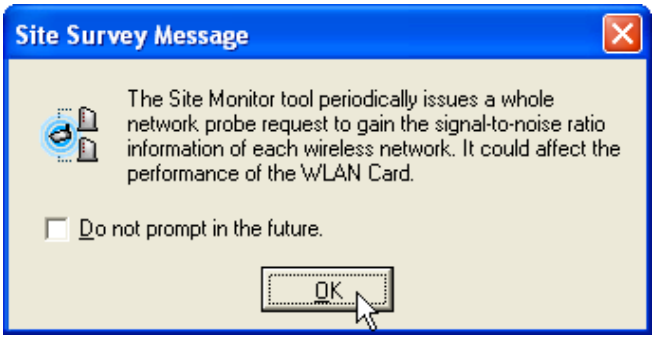
Site Monitor measures the signal-to-noise (SNR) values of all available wireless networks. This tool is used for determining the best placement of Access Points to provide the best coverage for a wireless network.

## 6.1 Starting Site Monitor

- Click the Windows **Start** button, select **Programs**, select **ASUS Utility**, select WLAN Card, and then click **Site Monitor**.

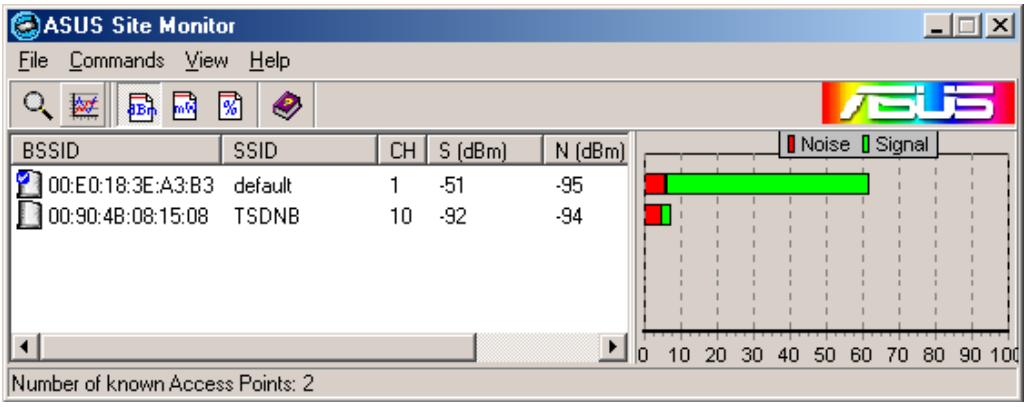
or

- Right-click the **Control Center** icon on the Windows taskbar and then click **Site Monitor**.




## 6.2 Main Screen

Measures the signal-to-noise (SNR) values of all available wireless networks.



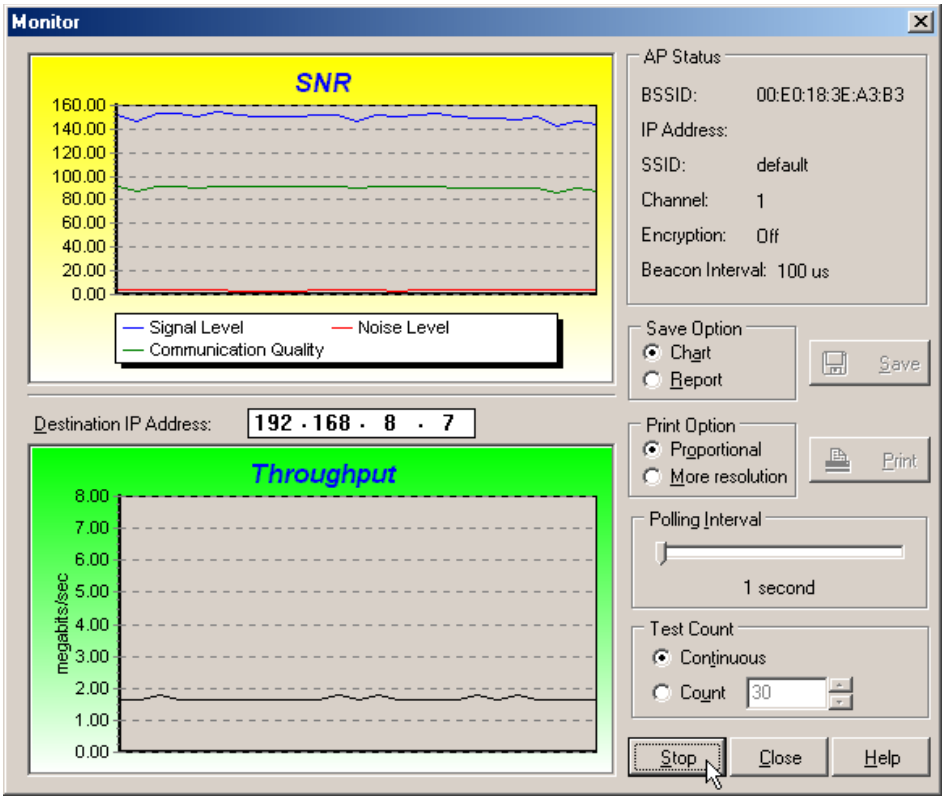

**Some Access Points can disable broadcasting SSID to hide themselves from "Site Survey" or "Site Monitor" for added security but still allow you to join if you know their SSID.**

## 6.3 Monitor

Directed link state test with one wireless network, including:

- SNR: This indicates the quality of communications within the current network. The communication quality is based on signal level and noise level measurements. In principle, the higher the SNR, the better your communications quality.
- Communication Quality: Specifies the Communication Quality of the Basic Service Set to which the station is currently connected to.
- Signal Level: Specifies the Average Signal Level of the Basic Service Set to which the station is currently connected to.
- Noise Level: Specifies the Average Noise Level of the Frequency Channel currently used for communications.
- Throughput: This sends a specified number of data packets to the remote host and calculates the average megabytes per second.

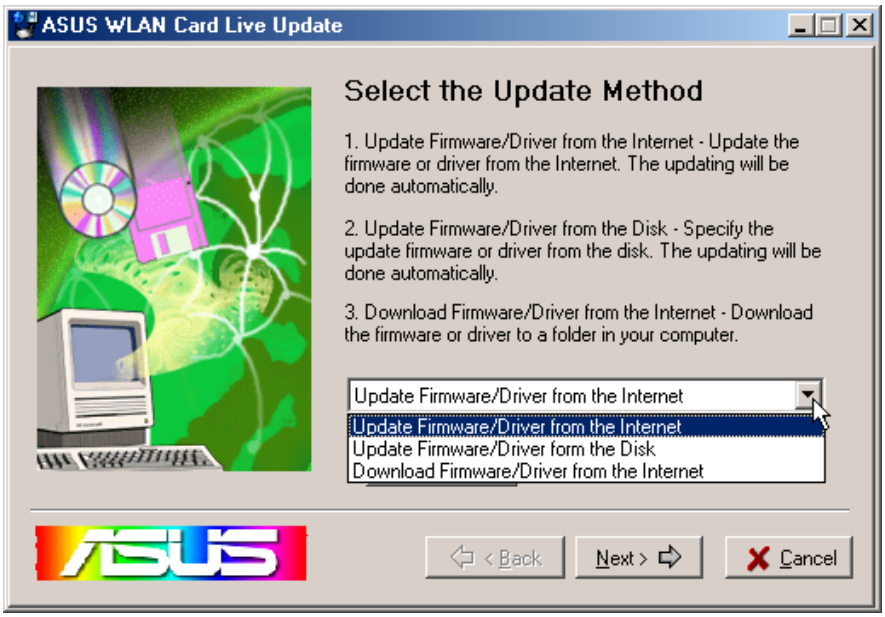
During the test, the Start button toggles to Stop. You can click **Start** button to begin the link test and click **Stop** button at any time to terminate the test.



## 7. Live Update

Live Update is a utility that allows you to update your ASUS WLAN mini-PCI card's firmware and drivers. The use of this utility assumes that you are properly connected to Internet through an Internet Service Provide (ISP).

1. Insert the ASUS WLAN mini-PCI card Support CD into your CD-ROM drive to bring up the autorun menu. If the autorun menu does not show, double-click the CD drive icon in My Computer or run Setup.exe in the root directory of your CD-ROM drive. When the Main menu appears, click **Run Live Update**.
2. Select an update method from the pull-down menu.

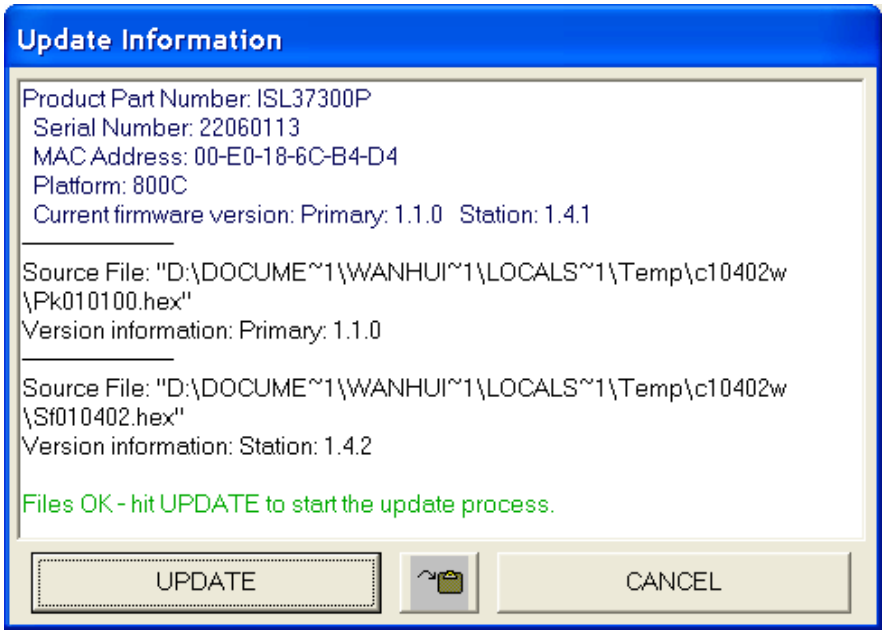


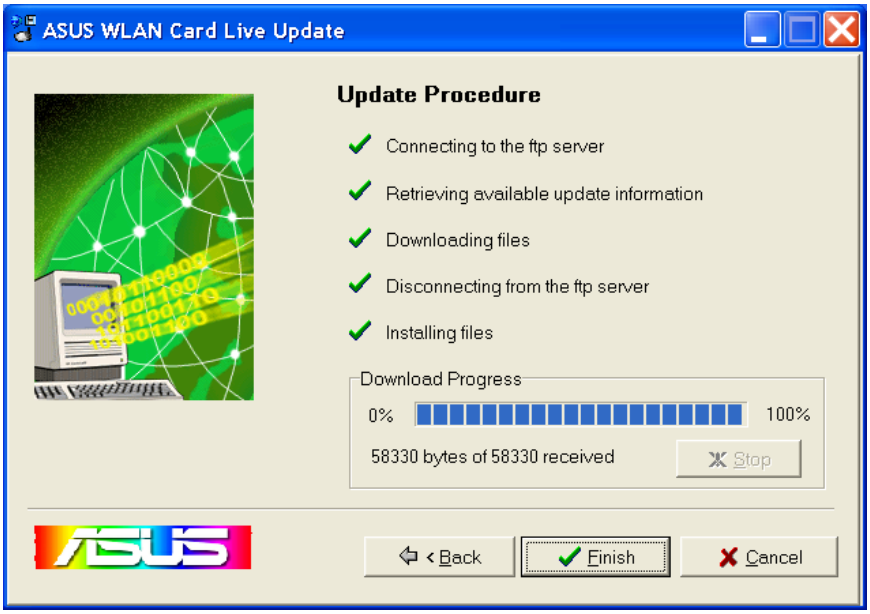

**Update Firmware/Driver from the Internet:** Lets you update the ASUS WLAN mini-PCI card's firmware or driver from the Internet. The updating (running the flash utility or the installation program) will be done automatically.

**Update Firmware/Driver from the Disk:** Lets you specify the update firmware or driver file from a disk. The updating (running the flash utility or the installation program) will be done automatically.

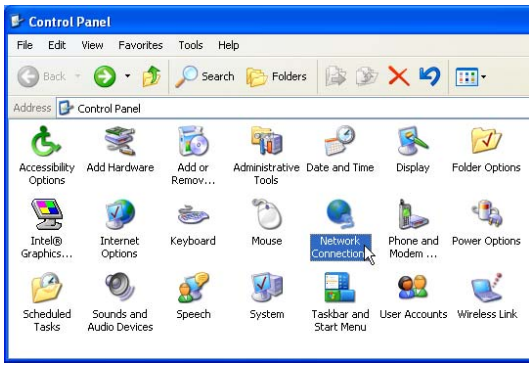
**Download Firmware/Driver from the Internet:** Lets you download the firmware or driver to a disk on your computer for manual updating later.

3. Follow any on-screen instructions or prompts to complete setup. If you already have the latest revision of your ASUS WLAN mini-PCI card's firmware files or driver files, Live Update reports that no update is necessary. When Live Update starts the firmware upgrade, a warning message will tell you that incorrect firmware upgrades may cause your ASUS WLAN mini-PCI card to malfunction. You can cancel the update process at this point. If you continue, a message will tell you that the update process has started. Do not turn OFF your computer until the upgrade has completed. The upgrade will take approximately 30 seconds. A subsequent message states whether the update was successful.

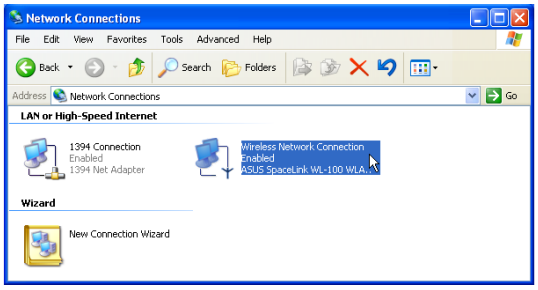


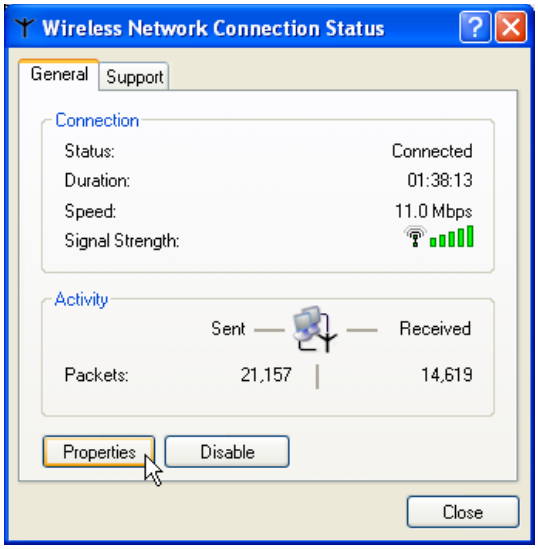
# 8. Windows XP Wireless Properties



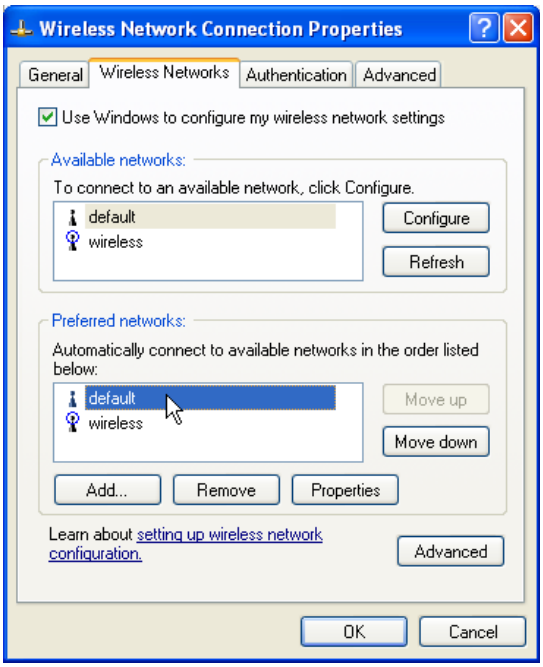

1. Double-click **System** icon in the Control Panel.




2. Double-click **ASUS 802.11b Network...**

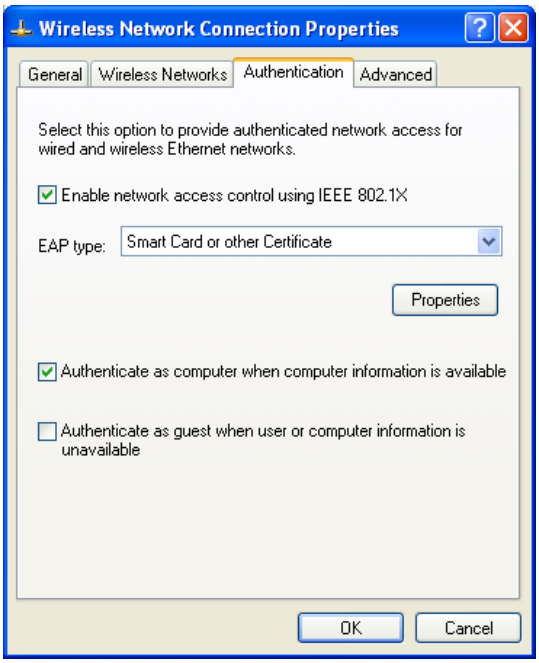



3. The “General” page will show status, duration, speed, and signal strength. Signal strength is represented by green bars with 5 bars meaning excellent signal and 1 bar meaning poor signal.

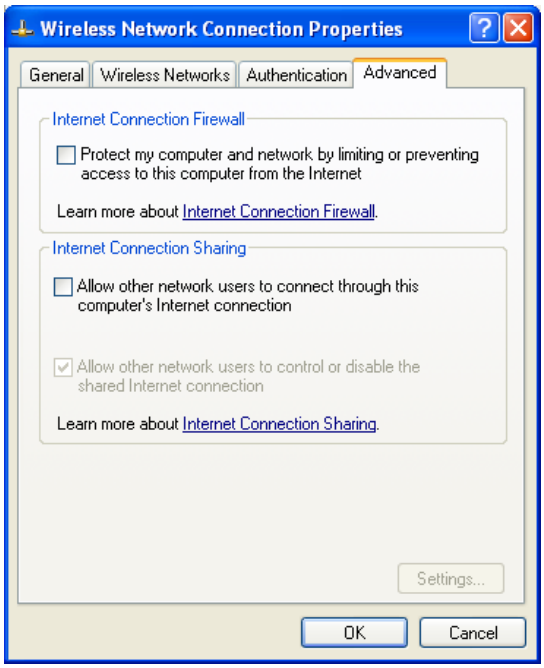



4. The “Wireless Networks” page will show Available networks and Preferred networks. Use the **Add** button to add the “SSID” of available networks and set the connection preference order with the **Move up** and **Move down** buttons. The radio tower with a signal icon identifies the currently connected access point.

# 8. Windows XP Wireless Properties (Cont.)




5. The “Authentication” page allows you to add security settings. Read Windows help for more information.




6. The “Advanced” page allows you to set firewall and sharing. Read Windows help for more information.

# Troubleshooting

The below troubleshooting guides provide answers to some of the more common problems, which you may encounter while installing or using ASUS WLAN mini-PCI card products. If you encounter difficulties that are not mentioned in this section, please contact ASUS Wireless LAN Technical Support.

### Verify if the mini-PCI Card is installed correctly.

When the ASUS WLAN mini-PCI card setup task is complete, you can verify if the driver has been setup properly. Right click **My Computer**, select **Properties**, and click the **Device Manager** tab. Then double-click the **Network adapters** icon; you should see “ASUS 802.11b Network Adapter” with an icon of expansion card. There should not be a “!” or “?” (problem) or “x” (disabled) symbol over this icon.

### There is a yellow exclamation mark or a yellow question mark in Device Manager in front of ASUS 802.11b Network Adapter.

To resolve the problem, you should update/reinstall the ASUS WLAN mini-PCI card driver. In “Device Manager”, right click **ASUS 802.11b Network Adapter**, select **Properties**, and select **Driver** tab. Click on **Update Driver** button, then follow the “Update Device Driver Wizard” to complete the driver installation.

In addition, you may be able to resolve this issue by reinstalling the driver. Choose **ASUS 802.11b Network Adapter**, click **Remove** button in “Device Manager”, and then run the **Add New Hardware Wizard** from the **Control Panel**.

### Cannot connect to any Access Points

Follow the procedure below to configure your ASUS WLAN mini-PCI card.

a. Verify that the “Network Type” is in “Infrastructure” mode.
b. Verify that the “SSID” of your ASUS 802.11b Network Adapter is set to “any” or set to the same “SSID” of an Access Point.
c. Verify that the “Encryption” type is the same as that of an Access Point. If you enabled “WEP” encryption, you must also set the same WEP Keys on both sides.

### Cannot connect to a Station (ASUS WLAN mini-PCI card)

Follow the procedure below to configure your ASUS WLAN mini-PCI card

a. Verify that the “Network Type” is in “Ad Hoc” mode.
b. Verify that the “SSID” of your ASUS 802.11b Network Adapter is set to “any” or set to the same “SSID” of the other station (or another ASUS 802.11b Network Adapter).
c. Verify that the “channel” of the ASUS 802.11b Network Adapter is “Auto” or set to the same “channel” of the other station (or another ASUS 802.11b Network Adapter).
d. Verify that the “Encryption” type is the same as the other station (or another ASUS 802.11b Network Adapter). If “WEP” encryption is enabled, you must set the same “WEP” Keys on both stations.

### Bad link quality or bad signal strength

There are two possible reasons. First is radio interference, keep the environment around the ASUS WLAN mini-PCI card away from microwave ovens and large metal objects. Second is the distance, decrease the distance between your ASUS WLAN mini-PCI card and the Access Point or station (or another ASUS WLAN mini-PCI card).

### The TCP/IP protocol did not bind to the WLAN mini-PCI Card.

This will occur when the computer already has six TCP/IP bindings in Windows 98 or ten bindings in Windows Me. These limits are imposed by the Microsoft operating system.

**Solution:** If your computer already has the maximum number of TCP/IP bindings, remove one of the network adapters from the Network configuration before installing the ASUS WLAN mini-PCI card driver.

### In Ad Hoc network mode, I have connected to a station but my ASUS WLAN mini-PCI card cannot get an IP address.

Windows Me/2K/XP contains the “Media Sensing” feature, which can detect a disconnect state on the media, it removes the bound protocols from that adapter until it has detected a link. But in Ad Hoc mode, it will erroneously detect the media as being disconnected.

**Solution:** (1) Run **Wireless Settings** (2) click **Config** (3) uncheck **Detect connection to network media** (4) click **Apply** (5) restart your computer

# Glossary

### Access Point (AP)

An networking device that seamlessly connects wired and wireless networks. Access Points combined with a distributed system support the creation of multiple radio cells that enable roaming throughout a facility.

### Ad Hoc

A wireless network composed solely of stations within mutual communication range of each other (no Access Point).

### Basic Service Area (BSS)

A set of stations controlled by a single coordination function.

### Channel

An instance of medium use for the purpose of passing protocol data units that may be used simultaneously, in the same volume of space, with other instances of medium use (on other channels) by other instances of the same physical layer, with an acceptably low frame error ratio due to mutual interference.

### Extended Service Set (ESS)

A set of one or more interconnected basic service set (BSSs) and integrated local area networks (LANs) can be configured as an Extended Service Set.

### Ethernet

The most widely used LAN access method, which is defined by the IEEE 802.3 standard. Ethernet is normally a shared media LAN meaning all devices on the network segment share total bandwidth. Ethernet networks operate at 10Mbps using CSMA/CD to run over 10-BaseT cables.

### Gateway

A network component that acts as an entrance to another network.

### IEEE 802.11

IEEE 802.xx is a set of specifications for LANs from the Institute of Electrical and Electronic Engineers (IEEE). Most wired networks conform to 802.3, the specification for CSMA/CD based Ethernet networks or 802.5, the specification for token ring networks. 802.11 defines the standard for wireless LANs encompassing three incompatible (non-interoperable) technologies: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), and Infrared. 802.11 specifies a carrier sense media access control and physical layer specifications for 1 and 2 Mbps wireless LANs.

### IEEE 802.11b

802.11b specifies a carrier sense media access control and physical layer specifications for 5.5 and 11 Mbps wireless LANs.

### Infrastructure

A wireless network centered about an access point. In this environment, the access point not only provides communication with the wired network but also mediates wireless network traffic in the immediate neighborhood.

### IP (Internet Protocol)

The TCP/IP standard protocol that defines the IP datagram as the unit of information passed across an Internet and provides the basis for connectionless packet delivery service. IP includes the ICMP control and error message protocol as an integral part. It provides the functional equivalent of ISO OSI Network Services.

### IP Address

An IP address is a 32-bit number that identifies each sender or receiver of information that is sent across the Internet. An IP address has two parts: the identifier of a particular network on the Internet and an identifier of the particular device (which can be a server or a workstation) within that network.

### ISM Bands (Industrial, Scientific, and Medicine Bands)

Radio frequency bands that the Federal Communications Commission (FCC) authorized for wireless LANs. The ISM bands are located at 902 MHz, 2.400 GHz, and 5.7 GHz.

### ISP (Internet Service Provider)

An organization that provides access to the Internet. Small ISPs provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.).

### LAN (Local Area Network)

A communications network that serves users within a defined geographical area. The benefits include the sharing of Internet access, files and equipment like printers and storage devices. Special network cabling (10 BaseT) is often used to connect the PCs together.

### NIC (Network Interface Card)

A network adapter inserted into a computer so that the computer can be connected to a network. It is responsible for converting data from stored in the computer to the form transmitted or received.

### Packet

A basic message unit for communication across a network. A packet usually includes routing information, data, and sometimes error detection information.

### PCMCIA (Personal Computer Memory Card International Association)

The Personal Computer Memory Card International Association (PCMCIA), develops standards for PC cards, formerly known as PCMCIA cards. These cards are available in three types, and are have about the same length and width as credit cards. However, the different width of the cards ranges in thickness from 3.3 mm (Type I) to 5.0 mm (Type II) to 10.5 mm (Type III). These cards can be used for various functions, including memory storage, landline modems and wireless modems.

### Radio Frequency (RF) Terms: GHz, MHz, Hz

The international unit for measuring frequency is Hertz (Hz), equivalent to the older unit of cycles per second. One megahertz (MHz) is one million Hertz. One gigahertz (GHz) is one billion Hertz. The standard US electrical power frequency is 60 Hz, the AM broadcast radio frequency band is 0.55-1.6 MHz, the FM broadcast radio frequency band is 88-108 MHz, and wireless 802.11 LANs operate at 2.4 GHz.

### SSID (Service Set ID)

SSID is a group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.

### Station

Any device containing IEEE 802.11 wireless medium access conformity.

### TCP (Transmission Control Protocol)

The standard transport level protocol that provides the full duplex, stream service on which many application protocols depend. TCP allows a process or one machine to send a stream of data to a process on another. Software implementing TCP usually resides in the operating system and uses the IP to transmit information across the network.

# Safety Statements

## Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

**WARNING! The use of a shielded-type power cord is required in order to meet FCC emission limits and to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. Use only shielded cables to connect I/O devices to this equipment. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.**

Reprinted from the Code of Federal Regulations #47, part 15.193, 1993. Washington DC: Office of the Federal Register, National Archives and Records Administration, U.S. Government Printing Office.

## Canadian Department of Communications

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.**

# Safety Statements

## MPE Safety Statement

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

## FCC Radio Frequency Exposure Statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65C and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247(b)(4) addressing RF Exposure from radio frequency devices. The radiation output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact with the antenna during normal operation is minimized.

**CAUTION: To maintain compliance with FCC's RF exposure guidelines established in the ANSI C95.1 standards, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.**

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

## Co-location Prohibition

This device must not be co-located or co-operated in conjunction with another antenna or transmitter from another device.