Mini PCI Wireless LAN/Modem Card

User's Manual

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About This User's Manual

This manual was written for two models:

- Mini PCI Wireless LAN Card
- Mini PCI Wireless LAN and 56K Modem Card

For brevity, throughout this manual **Wireless LAN/Modem Card** is used to indicate both models. If your Mini PCI model does not come with Modem functionality, ignore the modem-related descriptions in this manual. Also, the following terms/abbreviations are used interchangeably:

- Access Point-AP
- Wireless LAN-WLAN
- Ethernet network-LAN-network

This User's Manual contains information on how to install and configure your Mini PCI Wireless LAN/Modem Card. From now on, we will guide you through the correct configuration steps to get your device up and run.

Chapter 1 Introduction

Depending on your Mini PCI Card model, your device may not come with Modem functionality.

This Wireless LAN/Modem Card provides two types of connectivity on one miniscule card: conventional modem connectivity and Wireless LAN connectivity. The card puts the IEEE 802.11b WLAN standard and V.92 Modem technology into one integrated circuit (IC) to work in PCs, laptops and handheld devices. It effectively eliminates the need for add-in cards for the end-users to remain connected to their corporate WLAN or the Internet.

Wireless LAN Card Features

On the WLAN side, the card uses 2.4 GHz Direct Sequence Spread Spectrum (DSSS) technology, adaptively adjusting its data rate from 11 Mbps to 5.5/2.0/1.0 Mbps as the signal strength warrants. Encryption at 64 or 128-bit levels is provided. Both Peer-to-Peer (Ad-Hoc) and Access Pont (Infrastructure) mode are supported. In addition, its IEEE 802.11b standard compliance ensures interoperability with other 802.11b compliant wireless LAN (WLAN) products.

Modem Card Features

On the Modem side, the FAX/Data modem gives your PC the ability to send and receive FAX messages over the telephone line like a standard FAX machine. It also allows your PC to communicate with other personal computers, terminals or BBS's (Bulletin Board Systems) through the data modem functions.

The communication software, which should be used, depends on the kind of machine that you are going to communicate with. If you are going to call a FAX machine then you must use the Fax software. If the machine that you are going to communicate with is a modem then you must use a data modem communications software.

Data mode capabilities
- ITU-T V.92: 56000-28000 bits/s
- ITU-T V.90: 56000-28000 bits/s
- ITU-T V.34: 33600-2400 bits/s
- V.44, V.42, V.42bis and MNP Class 5 data compression
- V.32terbo, V.32bis and fallbacks
- High compression throughput due to parallel access directly to the host PC.

FAX mode capabilities
- ITU-T V.253 class 1 FAX
- ITU-T V.34: 33600-2400 bits/s (TCM)
- ITU-T V.17: 14400 bits/s, 12000 bits/s, 7200 bits/s (TCM)

- ITU-T V.29: 9600 bits/s, 7200 bits/s (QAM)
- ITU-T V.27ter : 4800 bits/s, 2400 bits/s (DPSK)
- ITU-T V.21 Channel 2:300 bits/s (FSK)

Wireless LAN Basics

This section conations some Wireless LAN basics to help you better understand how the product works together to create a wireless network.

Local Area Network (LAN)

Simply put, a LAN is a network that exists in a relatively limited area. A network is two or more computers connected together sharing files and peripheral devices such as printers.

The Wireless LAN Card allows you to interact with other computers without having to run cables normally associated with networks. This lets you move your computer around while staying connected to your network.

There are two ways to use the Wireless LAN Card. One way is to connect directly to one or more Wireless LAN Card equipped computers, forming an Ad Hoc wireless network. The second way is to connect to an Access Point that gives you access to an existing wired LAN, forming an Infrastructure wireless network.

Ad Hoc Network

The Ad Hoc network offers peer to peer connections between workstations, allowing communication between computers within range that have an 802.11b DSSS compatible PC card installed. A wireless Ad Hoc network can also access a wired LAN's TCP/IP service (such as e-mail and the Internet) by using a TCP/IP software router on an Ethernet equipped PowerBook or notebook.

Infrastructure Network

The infrastructure network uses an access point (or several access points) as a gateway, linking the wireless network to a wired LAN. As a result, portable workstations or desktops on your wireless network have access to all of the features of your wired LAN including e-mail, Internet access, network printers and files server.

Roaming

Multiple Access Points can be installed to extend the wireless service coverage area for seamless wireless access. Within an extended service area, all Access Points and wireless clients must have the same Service Set Identity (SSID). Roaming among different Access Points is controlled automatically to maintain the wireless connectivity at all times.

Chapter 2 Installing the Driver and Utility Software

As the Wireless LAN/Modem Card is an embedded solution, your notebook is probably shipped with its driver and software properly installed. If this is the case, ignore this chapter and proceed with configuration steps in next chapter.

In case you need to install the driver and software for any reason, follow the instructions described in this chapter.

System Requirements

To use the Wireless LAN/Modem Card, your computer must meet the following minimum requirements:

- Windows 98[®]/Me[®]/2000[®]/XP[®]
- 128MBytes of RAM, additional memory recommended

Installing Wireless LAN/Modem Driver and Software

To allow the Wireless LAN/Modem Card to operate on your host computer, proper driver installation is required. The provided Utility software is a Windows program that helps you configure and monitor your Wireless LAN/Modem Card. For your convenience, driver installation will be automatically processed while you install the utility software. Simply proceed as follows:

If your operation system has not been installed with Wireless LAN/Modem Card, the Windows Plug-and-Play capability will automatically detect the new device(s) and display the wizard requesting for drivers. If your model supports Modem function, both Wireless LAN Card and Modem Card will be detected. Click **Cancel** to bypass the wizard screen(s) and then:

1. Insert the provided Software Utility CD into your CD-ROM drive. Locate and double-click the file **Setup.exe** from the Software Utility CD. When the welcome screen pops up, click **Next**.
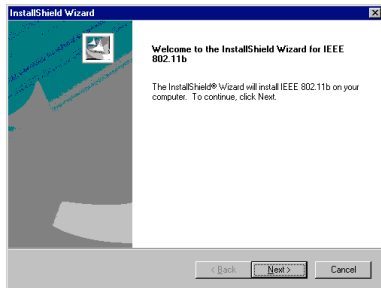
Depending on your operating system, following situation may occur:

- For Windows 2000: If you are prompted with one or a couple of **Digital Signature not Found** alarm messages, just click **Yes** to continue with the installation.

- For Windows XP: When **Found New Hardware Wizard** appears, have **Install the software automatically** selected and follow the on-screen instructions to proceed. If compatibility message appears, just click **Continue Anyway**.

2.   Click **Finish** and follow system prompts to complete the installation.

Now you are done with the driver and software installation procedure. Select **Start** > **Programs** > **Askey > IEEE 802.11b**. You should be able to see the **PRISM Wireless Settings** utility icon appearing on the system tray. You may proceed to next chapter to configure or fine-tune your Wireless LAN Card settings.

If you are going to configure countries for your Modem Card, refer to "Chapter 4 Country Selection for Mini PCI Modem Card" on page 27.

Note: If you need to set up the TCP/IP properties for your Wireless LAN Card, refer to "Appendix C Setting Up TCP/IP" on page 79 for details.

Chapter 3 Configuring Wireless LAN Card Settings

PART 1. Using Prism Utility Program

Wireless LAN Card Monitor Icon

If the utility is not launched, manually start the monitor by selecting **Start** > **Programs > Askey** > **IEEE 802.11b**. or double-clicking **PRISM Settings** icon in the Control Panel.

The Wireless LAN Card uses **PRISM Wireless Settings** utility for both configuration and monitoring. Whenever you start Windows, the utility is launched automatically with its icon loaded on the system tray, located near the clock on the task bar. Right-clicking the icon displays the context menu as shown opposite:
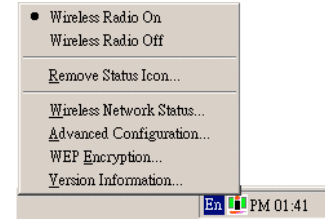
Wireless Radio On/Off options allow you to send or stop sending radio signals. Stop sending radio signals will terminate your wireless connection. Clicking **Remove Status Icon** will unload the icon from the system tray.

The color of the wireless icon changes to indicate your wireless connection quality. Possible icon graphics and procedures to take are described in the table below:

Color	Radio Connection Quality
Green	Excellent or good connection
	If "X" is placed over the icon, it may due to your WEP encryption doesn't match your target Access Point/Wireless Station and data frame error occurs. Check your WEP settings.
Yellow	Marginal connection. The radio signal is weak. Move your device closer to your target Access Point or Wireless Station.
Red	Poor connection or no radio connection.
	No radio connection may due to you are out of range of the wireless network or the SSID can not be found. Move your device closer to your target Access Point/Wireless Station or verify your SSID settings.
	If "X" is placed over the icon, radio signal is disabled.

While connected, you can place your cursor over the icon to see the pop-up text that gives link quality information about the current WLAN connection.
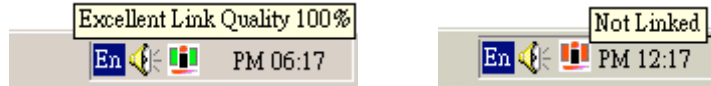
PRISM Wireless Settings Utility

You can access the **PRISM Wireless Settings** utility by any of the following methods:

- Double-click the utility icon on the system tray
- Right-click the icon and select **Wireless Network Status…** (or any item in the same group) from its context menu.
- From the Windows **Start** menu, click **Programs, ASKEY** and then **IEEE 802.11b**.

The **PRISM Wireless Settings** utility screen pops up with four available tabs: **Status**, **Configuration, Encryption** and **About**. Please see the appropriate section which describes each tab item.

Note: For Windows XP users, your **PRISM Wireless Settings** utility may include only two tabs. Refer to "PART 2. Using Windows XP Configuration Utility " for more information on restore the PRISM Wireless Settings utility.

Status

Status function allows you to view the current status of your Wireless LAN Card.

State: Indicates current status of your WLAN card, such as scanning or authenticating. If your WLAN card is connected to an Access Point or Wireless LAN Card, it displays the MAC address of the Access Point /Wireless Station you are associated with.

Current Tx Rate: Indicates the transmit speed currently in use.

Current Channel: The channel currently in use.

Throughput (bytes/sec): Displays the instantaneous Tx and Rx throughput rate for each poll period.

Link Quality: Use percentages and progress indicators to indicate your Wireless LAN Card's link quality. The Link Quality categories are defined as follows:

Link Quality	Range (%)
Poor	0-29
Fair	30-59
Good	60-89
Excellent	90-100

Signal Strength: Displayed as percentages using active progress indicators that change as the network radio signal fluctuates.

Note: If you are in Peer-to-Peer mode, the **Signal Strength** and **Link Quality** fields are not applicable. Both fields are dimmed.

Enable/Disable Radio: The button allows you to enable/disable radio operation. If you disable the radio transmission, your WLAN card stops sending radio signals and you are disconnected to the wireless network. In the mean time, the Status filed displays Radio Off.

Rescan: Allows you to immediately rescan the radio channel searching for available Access Point/Wireless Station.
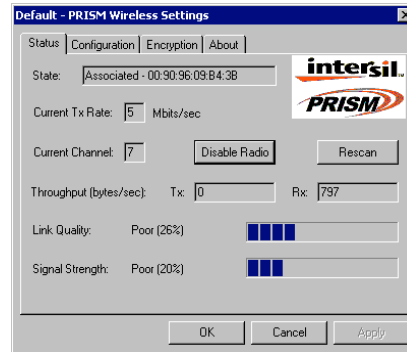
Figure 3-1 PRISM Wireless Settings Utility – Status Tab

Configuration

Profile Name: The profile feature allows you to save the current wireless settings to the WLAN card. You can save multiple profiles for different network environment and easily retrieve the required one as needed.

In the **Profile Name** filed, enter a proper name to identify this network setting. After you finish all the settings on this tab, click the **Apply** button.

To restore the required configuration, just click the drop-down menu to retrieve the preferred profile. The current profile is indicated by the heading of the utility, e.g., "Default - PRISM Wireless Settings" or "Office - PRISM Wireless Settings".

Network Name: Also known as Service Set ID (SSID), it is the name of the Wireless LAN group you want to participate in. All wireless clients must use the same network name in order to communicate with each other.

Notice that under Access Point type, if the special SSID name "Any" is used, your Wireless LAN Card will connect to the first compatible and "open" Access Point within the connection range. It allows your Wireless LAN Card to wander across networks with different SSID.

Network Type: You can connect your WLAN card to a network in one of the following two ways:

Peer-to-Peer (Ad Hoc Mode)	Connecting to other Wireless LAN Card equipped computers, forming a wireless network.
Access Point (Infrastructure Mode)	Connecting to a wired/wireless network through an Access Point.

Peer-to-Peer Channel: Select the operating radio channel used to communicate with another WLAN card. This field is not applicable if you are using Access Point (Infrastructure) network type. Instead, the Wireless LAN Card will automatically scan for the right channel at which the Access Point operates.

Transmit Rate: Select the speed (bit rate) that will be used for transmitting wireless data. Owing to the RF modulation characteristics, the 1 Mbps operation speed sustains a longer working range than 2 Mbps and like wise. Select the proper operation speed that best meets your throughput and working range requirement.

Defaults: This button allows you to restore default settings.
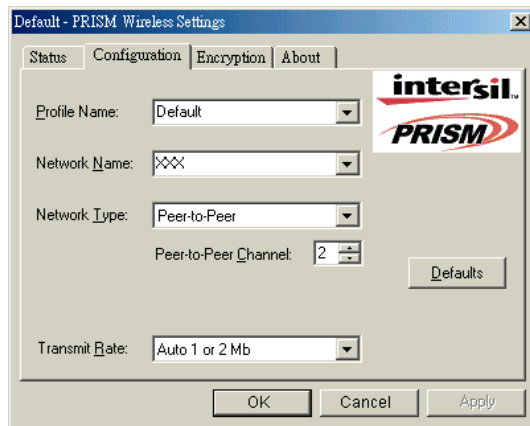
Figure 3-2 Peer-to-Peer Type Configuration
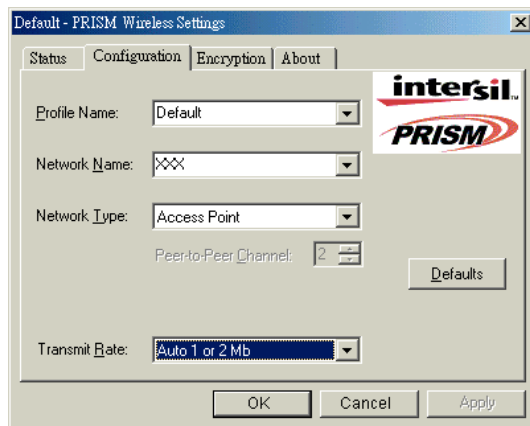
Figure 3-3 Access Point Type Configuration

Encryption

Encryption technology is used to enhance wireless media security. Your encryption settings must match those used by the Access Points or Wireless Stations (Peer-to-Peer mode) in your network, or your computer will be unable to communicate with others of your network.

If you are not to use encryption, select **Disabled** from the **Encryption** drop-down menu. To enable encryption, do the following:

1. Select the **Encryption** tab from the **Wireless Settings** utility.

2. Select your encryption type from **64 bit** or **128 bit**. The higher the bit number, the greater the complexity and the security of the encryption.

3. You can generate your WEP encryption keys by manually entering keys or using passphrase. In either case, you should write down your WEP keys which may be needed for other wireless devices. Here are the instructions for each method:

    Create Keys Manually

    For flexibility, you can enter the WEP keys in either **Alphanumeric** or **Hexadecimal** format. Enable the preferred format and then enter the key values in the **Key 1-4** fields. Note that you need to enter all the four keys. The four keys, including the one selected as **WEB Key to use**, are used to decrypt the data you receive.

When using **Hexadecimal** format, only digits 0-9 and letters a-f, A-F are allowed. Valid key length for each encryption type is as below:

	Alphanumeric Format	Hexadecimal Format
64 bit	5 alphanumeric characters	10 hexadecimal digits
128 bit	13 alphanumeric characters	26 hexadecimal digits

Create Keys with Passphrase

To create keys by using passphrase, enter a text string with a maximum of 26 alphanumeric characters in the **Passphrase** field.

4. In the **Use WEB Key** box, select one of the four keys to encrypt the data you are going to transmit.

5. To have the new settings take effect, click **Apply**.
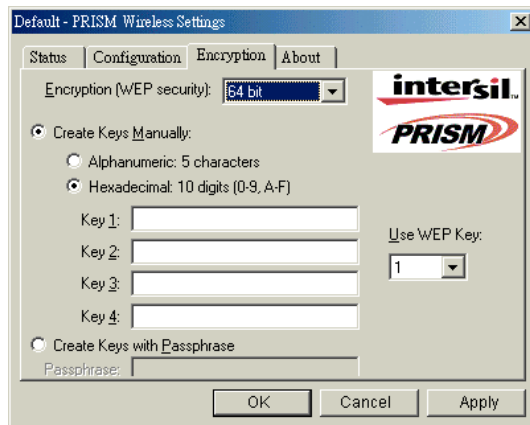
Figure 3-4 PRISM Wireless Settings Utility – Encryption Tab

About

About tab displays the basic information about the device, including the Network Driver, Configuration Utility and NIC Firmware
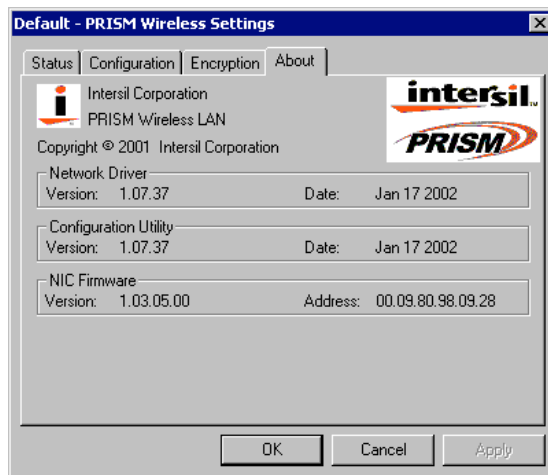
Figure 3-5 PRISM Wireless Settings Utility – Version Tab

PART 2. Using Windows XP Configuration Utility

Windows XP operating system includes **Wireless Network Connection** utility for wireless configuration and monitoring. You can choose to configure your wireless network via either the **PRISM Wireless Settings** utility as described in preceding section, or Windows XP-included wireless utility. This section only provides the essential instructions on using Windows XP wireless utility to get your wireless network established. For more information please refer to Windows XP on-line help.

Notice that only one configuration method can be used and Window XP utility is the default configuration tool. In this situation, when you open the **PRISM Wireless Settings** utility, only **Status** and **About** tabs are available.

If you are going to use the **PRISM Wireless Settings** utility, you should disable Windows XP wireless utility as follows:

Double-click the wireless icon on system tray and click **Advanced** button. On the **Wireless Networks** tab, uncheck the **Use Windows to configure my wireless network settings** box and click **OK**. This will restore your **PRISM Wireless Settings** utility with configuration tabs.

Connecting to an Access Point or Wireless LAN Card

To connect to an existing Access Point/Wireless LAN Card (Peer-to-Peer mode), do the following:

1. Right-click the **Wireless Connection** icon on the system tray and select **View Available Wireless Networks** from the context menu.
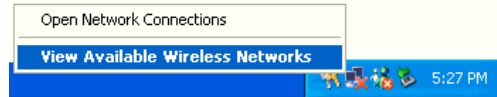
    Note: Depending on whether your wireless network is established, the context menu may come with different items.

2. When the **Connect to Wireless Network** window pops up, you will see all the Access Points or Wireless LAN Cards (Peer-to-Peer mode) that are available in the air. Select the wireless network you want to connect to .
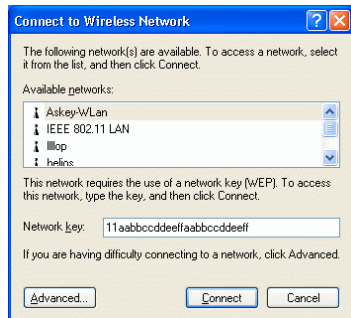
Figure 3-6 Windows XP – Connect to Wireless Network

3.   If the target Access Point/Wireless LAN Card (Peer-to-Peer mode) has been set with WEP key, you must enter the same WEP key in the **Network key** field. Otherwise, this field is dimmed and you do not need to set up the WEP key.

4.   Click **Connect**, then you will join the target network and this dialog window will disappear. When your wireless connection is established, the connection icon appears as below:

24
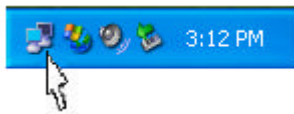
Viewing Wireless Connection Status

After you successfully connect to the Access Point or Wireless LAN Card (Peer-to-Peer mode), double-click the icon on the system tray again. This will open the **Wireless Network Connection Status** window where you can see the general data of the Wireless LAN Card, such as Status, Duration, Speed and Signal Strength, etc.
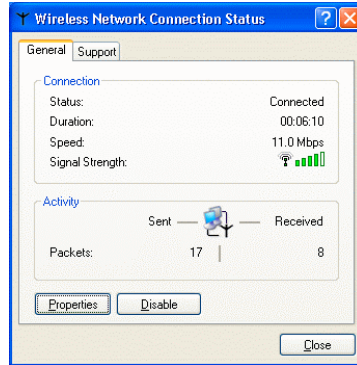
Figure 3-7 Windows XP – Connection Status

Chapter 4 Country Selection for Mini PCI Modem Card

After modem driver installation, you may need to configure countries upon different telecommunication laws/regulations. Ignore this chapter if your Mini PCI Card does not support modem functions.

For Windows 98/Me

1. Double-click the **Modems** icon under **Control Panel**. Under **General** tab, highlight **Lucent Technologies Soft Modem AMR** and then click **Dialing Properties**.

2. Select the country you locate from **I am in this country/region** list, then click **Apply** and **OK**.

For Windows 2000/XP

1. Double-click the **Phone and Modem Options** icon under **Control Panel**. Under **Dialing Rules** tab, highlight the location from which you are dialing and then click **Edit**.

2. Select the country you locate from the **Country/region** list, then click **Apply** and **OK**.

Chapter 5 Removing Wireless LAN/Modem Card Software

Should you need to uninstall the Wireless LAN Card utility software or modem software for any reason, please proceed as follows. If your model supports 56K Modem function, both Wireless LAN and Modem software are installed on your system. Removing either one of them will not effect the operation of the other.

Removing Wireless LAN Card Software

For Windows 98/Me

1. Double-click the **Add/Remove Programs** icon under **Control Panel**.
2. Select **IEEE 802.11b** from the list and click **Add/Remove**.
3. Click **OK** to remove the components.
4. Click **Finish** and follow system prompts to complete uninstallation.

For Windows 2000/XP

1. Double-click the **Add/Remove Programs** (or **Add or Remove Programs** for Windows XP) icon under Control Panel.

2. Highlight **IEEE 802.11b** from the list and then click **Change/Remove**.

3. When confirm message appears, click **OK** to remove the components.

4. Click **Finish** and follow system prompts to complete uninstallation.

Removing Mini PCI Modem Software

For Windows 98/Me

1. Double-click the **Add/Remove Programs** icon under **Control Panel**.

2. Select **Lucent Technologies Soft Modem AMR** from the list and click **Add/Remove**.

3. When warning message appears, click **Yes** to remove the components.

4. When prompted to restart your computer, select **Yes**.

For Windows 2000/XP

1. Double-click the **Add/Remove Programs** (or **Add or Remove Programs** for Windows XP) icon under **Control Panel**.

2. Highlight **Lucent Technologies Soft Modem AMR** from the list and then click **Change/Remove**.

3. When warning message appears, click **Yes** to remove the components.

4. When prompted to restart your computer, select **Yes**.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

A/—Repeat Last Command

A—Answer

Bn—Communication Standard Setting

B0   Selects CCITT V.22 mode when the modem is at 1200 bits/s.

B1   Selects Bell 212A when the modem is at 1200 bits/s (default).

B2   Unselects V.23 reverse channel (same as B3).

B3   Unselects V.23 reverse channel (same as B2).

B15   Selects V.21 when the modem is at 300 bits/s.

B16   Selects Bell 103J when the modem is at 300 bits/s (default).

Cn—Carrier Control

C0   Transmit carrier always off (not supported).

C1   Normal transmit carrier switching (default).

Dn—Dial

En—Echo Command

E0   Disables echo command.

E1   Enables echo command (default).

Fn—On-Line Data Character Echo Command

F0   On-line data character echo enabled (not supported by LU97).

F1   On-line data character echo disabled.

Hn—Hook Control

H0   LU97 goes on-hook (default).

H1   LU97 goes off-hook.

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6.1 Basic AT Command

In—Request ID Information

I0, I3   Returns modem identity string and driver version number.

I1   Returns OK.

I2   Returns OK.

I4   Returns firmware version for the data pump.

I5   Returns the board/firmware ID and country ID in hexadecimal.

I6, I10 Returns OK for compatibility.

I7   Hardware version.

I8   Codec version.

I9   Returns country ID in English.

I11   Displays connection information as described below.

Ln—Speaker Volume

L0   Low volume.

L1   Low volume.

L2   Medium volume (default).

L3   High volume.

Mn—Speaker Control

M0   Speaker is off.

M1   Speaker is on until the modem detects the carrier signal (default).

M2   Speaker is always on when the modem is off-hook.

M3   Speaker is on until the carrier is detected, except when dialing.

Nn—Modulation Handshake

N0   When originating or answering, this is for handshake only at the communication standard specified by register S37 and the Bn command.

N1   When originating or answering, begin the handshake only at the communication standard specified by S37 and the Bn command. During handshake, fallback to a lower speed may occur (default).

Chapter 6 Commands Reference

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This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

On—Return to On-Line Data Mode

O0   Instructs LU97 to exit on-line command mode and return to data mode.

O1   Issues a retrain before returning to on-line data mode.

O3   Issues a rate renegotiation before returning to on-line data mode.

Pn—Select Pulse Dialing

Qn—Result Code Control

Q0   Enables result codes (default).

Q1   Disables result codes.

T—Select Tone Dialing

Vn—DCE Response Format

V0   Displays result codes as digits.

V1   Displays result codes as text (default).

Wn—Result Code Option

W0   CONNECT result code reports DTE receive speed. Disables protocol result codes.

W1   CONNECT result code reports DTE receive speed. Enables protocol result codes.

W2   CONNECT result code reports DCE receive speed. Enables protocol result codes (default).

Xn— Extended Result Codes Control

Yn—Long-Space Disconnect

Y0   Disables long-space disconnect (default).

Y1   Enables long-space disconnect (not supported).

Zn—Reset and Recall Stored Profile

Z0   Reset and restore stored profile.

Z1   Reset and restore stored profile.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Z2　　Reset and restore stored profile.

&Bn—V.32 Auto Retrain

&B0　Disable V.32 auto retrain (not supported).

&B1　Enable V.32 auto retrain (default).

&Cn—Data Carrier Detect (DCD) Control

&C0　The state of the carrier from the remote modem is ignored. DCD remains on at all times.

&C1 DCD turns on when the remote modem's carrier signal is detected and off when the carrier signal is not detected (default).

&Dn—Data Terminal Ready (DTR) Control

&D0 Ignore the true status of DTR and treats it as always on. This should be used only if the computer does not provide DTR to the modem.

&D1 If the DTR signal is not detected while in on-line data mode, the modem enters command mode, issues the OK result code, and remains connected.

&D2 If the DTR signal is not detected while in on-line data mode, the modem disconnects (default).

&D3 Reset modem on the on-to-off DTR transition.

&Fn—Restore Factory Default Configuration

&F0 Restores factory default configuration.

&Gn—V.22bis Guard Tone Control

&G0 Disables guard tone (default).

&G1 Selects 550 Hz guard tone.

&G2 Selects 1800 Hz guard tone.

&Jn—Auxiliary Relay Option

&J0 The auxiliary relay is never closed (default).

Chapter 6 Commands Reference

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This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

&J1   Not supported.

&Kn—Local Flow Control Selection

&K0   Disables flow control.

&K1, &K2 Reserved.

&K3   Enables RTS/CTS (hardware) flow control (default).

&K4   Enables XON/XOFF flow control.

&Mn—Asynchronous Communications Mode

&M0 Asynchronous mode (default).

&M1, &M2, &M3, &M4 Reserved.

&Pn—Pulse Dial Make-to-Break Ratio Selection

&P0   Selects 39%—61% make/break ratio at 10 pulses per second.

&P1   Selects 33%—67% make/break ratio at 10 pulses per second (default).

&P2   Selects 33%—67% make/break ratio at 20 pulses per second.

&Qn—Asynchronous Communications Mode

&Q0   Asynchronous mode, buffered. Same as \N0.

&Q5   Error control mode, buffered (default). Same as \N3.

&Q6   Asynchronous mode, buffered. Same as \N0.

&Q8   MNP error control mode. If an MNP error control protocol is not established, the modem will fall back according to the current user setting in register S36.

&Q9   V.42 or MNP error control mode. If neither error control protocol is established, the modem will fall back according to the current user setting in register S36.

&Sn—Data Set Ready (DSR) Option

&S0   DSR is always on (default).

&S1   DSR comes on after establishing a connection and goes off when the connection ends.

&Tn—Self-Test Commands

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

&T0   Abort. Terminates the test in progress.

&T1   Initializes local analog loopback, V.56 Loop 3. If a connection exist when this command is issued, the modem hangs up. LU97 displays the **Connect nnn** message at the start of the test.

&T3   Local digital loopback test, V.54 Loop2. If no connection exists, LU97 returns ERROR.

&T6   Request a remote digital loop back, V.54 Loop 2 without self test. If no connection exists, LU97 returns ERROR. The **Connect nnn** message is displayed.

&Vn— Display Current Configuration

&Wn—Store Current Configuration

&W0 Stores the current configuration as profile 0.

&W1 Stores the current configuration as profile 1.

&Yn—Select Stored Profile for Hard Reset

&Y0 Select stored profile 0 on power-up.

&Y1 Select stored profile 1 on power-up.

&Zn=x—Store Telephone Number

\An—Select Maximum MNP Block Size

\A0   64 characters.

\A1   128 characters.

\A2   192 characters.

\A3   256 characters (default).

\Bn—Send Break

\Gn—Modem Port Flow Control

\G0   LU97 processes XON/XOFF flow control characters locally (default).

\G1   LU97 passes XON/XOFF flow control characters.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

\Jn—Adjust Bits/s Rate Control

\J0   Buffer mode. Error control is set or disabled with the \Nn command (default).

\J1   Forces the maximum DCE rate to the DTE rate.

\Kn—Set Break Control

When Modem Is Operating in Data Transfer Mode

\K0, \K2, K4 Enter on-line command mode. No break is sent to the remote modem.

\K1   Clear data buffers and send a break to the remote modem.

\K3   Send a break to the remote modem immediately.

\K5   Send a nondestructive, nonexpedited break to the remote modem (default).

When Modem Is On-Line Command State During Data Connection

\K0, \K1   Clear data buffers and send a break to the remote modem.

\K2, \K3   Send a break to the remote modem immediately.

\K4, \K5   Send a break to the remote modem in sequence with data (default).

When Break Is Received During Connection

\K0, \K1   Clear data buffers and send a break to the DTE.

\K2, \K3   Send a break to the DTE immediately.

\K4, \K5   Send a break to the DTE in sequence with received data (default).

\Nn—Select Error Control Mode

\N0   Buffer mode. No error control (same as &Q6).

\N1   Direct mode.

\N2   MNP or disconnect mode. The modem attempts to connect using MNP 2—4 error control procedures. If this fails, the modem disconnects. This is also known as MNP reliable mode.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

\N3   V.42, MNP, or buffered (default). LU97 attempts to connect in V.42 error control mode. If this fails, it will attempt to connect in MNP mode. If this also fails, LU97 connects in buffer mode and continues operation.

\N4   V.42 or disconnect. The modem attempts to connect in V.42 error control mode. If this fails, the modem disconnects.

\N5   V.42, MNP, or buffered (same as \N3).

\N7   V.42, MNP, or buffered (same as \N3).

\Qn—Local Flow Control Selection

\Q0   Disable flow control (same as &K0).

\Q1   XON/XOFF software flow control (same as &K4).

\Q2   CTS-only flow control. This is not supported and the response is ERROR.

\Q3   RTS/CTS to DTE (same as &K3) (default).

\Rn—Ring Indicator Signal Off After Answer

\R0   Ring indicator signal is off after the telephone call is answered.

\Tn—Inactivity Timer

\T0   Inactivity timer disabled (default).

\T1—\T255 Specifies the length of time in minutes that the modem will wait before disconnecting when no data is sent or received.

\Vn—Protocol Result Code

\V0   Disables protocol result code appended to DCE speed.

\V1   Enables protocol result code appended to DCE speed (default).

\V2   Enables protocol result code appended to DCE speed (same as \V1).

%B—View Numbers in Blacklist

%Cn—Data Compression Control

%C0 V.42bis/ MNP 5 disabled. No data compression.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

%C3   V.42bis/ MNP 5 enabled. Data compression enabled (default).

%En—Auto Fallback/Fallforward Control

%E0   Disable fallback/fallforward.

%E1   Enable fallback and disable fallforward.

%E2   Enable fallback/fallforward (default).

-Cn—Data Calling Tone

-C0   Disabled (default).

-C1   Enabled.

-V90—Enable/Disable V.90 Settings

-V90=X Controls the downstream rate.

-V90=0 Disables V.90.

-V90=1 Enables V.90 auto rate (default).

-V90?   Displays the current value.

-V90=? Shows the range of X (0, 1).

6.2 Result Codes

The AT command handler responds to commands from the caller and to activity on the line via result codes.

Two forms of each result code are available. The long-form, or verbose, response is given when V1 is selected, and the short-form, data-like numeric response is given when V0 is selected. The long-form code is preceded and terminated by the sequence <CR> <LF>. The short-form is also terminated by <CR>, but it has no preceding sequence. If result codes are suppressed, nothing is returned to the caller.

Result Code	Numeric Code	Description
OK	0	Acknowledges the execution of a command line.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Result Code	Numeric Code	Description
CONNECT	1	Modem connected to line.
RING	2	Incoming ring signal has been detected.
NO CARRIER	3	Modem lost carrier signal, does not detect carrier signal, or does not detect answer tone.
ERROR	4	Invalid command.
CONNECT 1200 EC*	5	Connection at 1200 bits/s.
NO DIALTONE	6	No dial tone detected.

Result Code	Numeric Code	Description
BUSY	7	Busy signal detected.
NO ANSWER	8	Remote end never answered.
CONNECT 2400 EC*	10	Connection at 2400 bits/s.
CONNECT 4800 EC*	11	Connection at 4800 bits/s.
CONNECT 9600 EC*	12	Connection at 9600 bits/s.
CONNECT 14400 EC*	13	Connection at 14400 bits/s.
CONNECT 19200 EC*	14	Connection at 19200 bits/s.
CONNECT 7200 EC*	24	Connection at 7200 bits/s.
CONNECT 12000 EC*	25	Connection at 12000 bits/s.
CONNECT 16800 EC*	86	Connection at 16800bits/s.
CONNECT 300 EC*	40	Connection at 300 bits/s.
CONNECT 21600 EC*	55	Connection at 21600 bits/s.
CONNECT 24000 EC*	56	Connection at 24000 bits/s.
CONNECT 26400 EC*	57	Connection at 26400 bits/s.
CONNECT 28800 EC*	58	Connection at 28800 bits/s.
CONNECT 31200 EC*	59	Connection at 31200 bits/s.
CONNECT 33600 EC*	60	Connection at 33600 bits/s.
CONNECT 38400 EC*	28	Connection at 38400 bits/s (DTE rate).

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Result Code	Numeric Code	Description
CONNECT 57600 EC*	18	Connection at 57600 bits/s (DTE rate).
CONNECT 115200 EC*	87	Connection at 115200 bits/s (DTE rate).
DELAYED	88	Delay is in effect for the dialed number.
BLACKLISTED	89	Dialed number is blacklisted.
BLACKLIST FULL	90	Blacklist is full.
CONNECT 32000 EC*	70	Connection at 32000 bits/s (K56flex mode) or V.90.

Result Code	Numeric Code	Description
CONNECT 34000 EC*	71	Connection at 34000 bits/s (K56flex mode).
CONNECT 36000 EC*	72	Connection at 36000 bits/s (K56flex mode) or V.90.
CONNECT 38000 EC*	73	Connection at 38000 bits/s (K56flex mode).
CONNECT 40000 EC*	74	Connection at 40000 bits/s (K56flex mode) or V.90.
CONNECT 42000 EC*	75	Connection at 42000 bits/s (K56flex mode).
CONNECT 44000 EC*	76	Connection at 44000 bits/s (K56flex mode) or V.90.
CONNECT 46000 EC*	77	Connection at 46000 bits/s (K56flex mode).
CONNECT 48000 EC*	78	Connection at 48000 bits/s (K56flex mode) or V.90.
CONNECT 50000 EC*	79	Connection at 50000 bits/s (K56flex mode).
CONNECT 52000 EC*	80	Connection at 52000 bits/s (K56flex mode) or V.90.
CONNECT 54000 EC*	81	Connection at 54000 bits/s (K56flex mode).
CONNECT 56000 EC*	82	Connection at 56000 bits/s (K56flex mode).
CONNECT 28000 EC*	100	Connection at 28000bits/s (V.90 mode).
CONNECT 29333 EC*	101	Connection at 29333 bits/s (V.90 mode).
CONNECT 30666 EC*	102	Connection at 30666 bits/s (V.90 mode).
CONNECT 33333 EC*	103	Connection at 33333bits/s (V.90 mode).
CONNECT 34666 EC*	104	Connection at 34666 bits/s (V.90 mode).
CONNECT 37333 EC*	105	Connection at 37333 bits/s (V.90 mode).

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Result Code	Numeric Code	Description
CONNECT 38666 EC*	106	Connection at 38666 bits/s (V.90 mode).
CONNECT 41333 EC*	107	Connection at 41333 bits/s (V.90 mode).
CONNECT 42666 EC*	108	Connection at 42666 bits/s (V.90 mode).
CONNECT 45333 EC*	109	Connection at 45333 bits/s (V.90 mode).
CONNECT 46666 EC*	110	Connection at 46666 bits/s (V.90 mode).
CONNECT 49333 EC*	111	Connection at 49333 bits/s (V.90 mode).

Result Code	Numeric Code	Description
CONNECT 50666 EC*	112	Connection at 50666 bits/s (V.90 mode).
CONNECT 53333 EC*	113	Connection at 53333 bits/s (V.90 mode).
CONNECT 54666 EC*	114	Connection at 54666 bits/s (V.90 mode).

* EC only appears when the extended result codes configuration option is enabled. EC is replaced by one of the following symbols, depending on the error control method used:

- V42bis—V.42 error control and V.42bis data compression.
- V42—V.42 error control only.
- MNP 5— MNP class 4 error control and MNP class 5 data compression.
- MNP 4— MNP class 4 error control only.
- NoEC—no error control protocol.

6.3 S-Registers

The following table provides a summary of the S-registers.

Register	Description	Range	Base Unit	Default*
S0	Auto-answering number.	0—255	rings	0 †
S1	Ring counter.	0—255	rings	0

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Register	Description	Range	Base Unit	Default*
S2	AT escape character (user defined)	0—255	ASCII	43(2Bh)
S3	Carriage return character.	0—127	ASCII	13(0Dh)
S4	Line feed character.	0—127	ASCII	10(0Ah)
S5	Back space character.	0—255	ASCII	8(08h)
S6	Time for dial tone.	3—255	s	3 †
S7	Wait time for carrier.	1—255	s	50 †

Register	Description	Range	Base Unit	Default*
S8	Pause time for dial delay modifier.	0—255	s	2 †
S9	Reserved.	—	—	—
S10	Reserved.	—	—	—
S11	DTMF tone duration.	50—255	ms	95 †
S12	Escape guard time.	0—255	20 ms	50
S14	General bit-mapped options status: command echo, quiet mode, result codes, tone/pulse.	—	—	138(10001010b)
S20	Sync underrun fill character.	0—255	—	0
S21	V.24/general bit-mapped options status: DTR behavior, DCD behavior.	—	—	48(00110000b)
S22	Speaker/results bit-mapped options status:speaker volume, speaker control, limit result codes, pulse dial make/break ratio.	—	—	70(01000110b)
S23	General bit-mapped options status: guard tone type, busy cycles, bell mode permitted flag, ABCD dialing permitted.	—	—	54(00110101b)
S27	General bit-mapped options status: V.90 upstream at 3429 Hz, remote digital loop-back request handling, bell compatibility mode, maximum DCE speed.	—	—	73(01001001b)

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Register	Description	Range	Base Unit	Default*
S28	General bit-mapped options status: pulse dialing, mode selection.	—	—	160(10100000b)
S29	Flash dial modifier time.	0—255	10 ms	70
S30	Inactivity timer.	0—255	10 s	0
S32	Xon character.	0—255	ASCII	17 (11h)
S33	Xoff character.	0—255	ASCII	19 (13h)
S35	Reserved.	—	—	—

Register	Description	Range	Base Unit	Default*
S36	LAPM failure control.	—	—	7
S37	Line connection speed.	—	—	0
S42	Reserved.	—	—	—
S43	Reserved.	—	—	—
S48	V.42 Negotiation Control	—	—	7
S53	General bit-mapped options: Calling tone flag, off-hook restrictions, blind dial pause, dial modifier validation, pulse and dial tone in same dial string.	—	—	47
S54	Blind dialing delay	2—255	—	2
S56	General bit-mapped options.	—	—	0
S63	Fault break Length	0—254	10ms	30
S90	Reserved.	—	—	—
S91	PSTN transmit attenuation level.	6—25	-dB	10
S92	FAX transmit attenuation level.	6—25	dB	10
S93	DTMF transmit attenuation level.	5—25	dB	6
S94	DTMF transmit attenuation level for high DTMF group.	0—25	dB	0

*. Values presented in decimal except were noted.

†. Values are country-specific.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

6.4 Fax Command

The soft modem supports FAX commands conforming to EIA standard 578. These commands are given here with short descriptions; complete explanations are given in the standard, available from the Electronic Industries Association.

+FCLASS?—Service Class Indication

+FCLASS=?—Service Class Capabilities

+FCLASS=n—Service Class Selection

+FCLASS=0 Select data mode. (Default.)

+FCLASS=1 Select FAX Class 1

+FTS=n—Transmission Silence

+FRS=n—Receive Silence

+FTM=n—Transmit FAX Data with n Carrier

Command	Modulation	Speed
+FTM=3	V.21 channel 2	300 bits/s.
+FTM=24	V.27ter.	2400 bits/s.
+FTM=48	V.27ter.	4800 bits/s.
+FTM=72	V.29.	7200 bits/s.
+FTM=96	V.29.	9600 bits/s.
+FTM=73	V.17	7200 bits/s.
+FTM=74	V.17 (short train).	7200 bits/s.
+FTM=97	V.17.	9600 bits/s.
+FTM=98	V.17 (short train).	9600 bits/s.
+FTM=121	V.17.	12000 bits/s.
+FTM=122	V.17 (short train).	12000 bits/s.
+FTM=145	V.17.	14400 bits/s.
+FTM=146	V.17 (short train).	14400 bits/s.

+FRM=n—Receive Data

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Command	Modulation	Speed
+FRM=3	V.21 channel 2	300 bits/s.
+FRM=24	V.27ter.	2400 bits/s.
+FRM=48	V.27ter.	4800 bits/s.
+FRM=72	V.29.	7200 bits/s.
+FRM=96	V.29.	9600 bits/s.
+FRM=73	V.17.	7200 bits/s.
+FRM=74	V.17 (short train).	7200 bits/s.
+FRM=97	V.17.	9600 bits/s.
+FRM=98	V.17 (short train).	9600 bits/s.
+FRM=121	V.17. 12000 bits/s.	

+FRM=122	V.17 (short train).	12000 bits/s.
+FRM=145	V.17.	14400 bits/s.
+FRM=146	V.17 (short train).	14400 bits/s.

+FTH=n—Transmit HDLC Data with n Carrier

Command	Modulation	Speed
+FTH=3	V.21 Channel 2.	300 bits/s.
+FTH=24	V.27ter.	2400 bits/s.
+FTH=48	V.27ter.	4800 bits/s.
+FTH=72	V.29.	7200 bits/s.
+FTH=96	V.29.	9600 bits/s.
+FTH=73	V.17.	7200 bits/s.
+FTH=74	V.17 (short train).	7200 bits/s.
+FTH=97	V.17.	9600 bits/s.
+FTH=98	V.17 (short train).	9600 bits/s.
+FTH=121	V.17.	12000 bits/s.
+FTH=122	V.17 (short train).	12000 bits/s.
+FTH=145	V.17.	14400 bits/s.
+FTH=146	V.17 (short train).	14400 bits/s.

+FRH=n—Receive HDLC Data with n Carrier

Command	Modulation	Speed
+FRH=3	V.21 Channel 2.	300 bits/s.
+FRH=24	V.27ter.	2400 bits/s.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

+FRH=48	V.27ter.	4800 bits/s.
+FRH=72	V.29.	7200 bits/s.
+FRH=96	V.29.	9600 bits/s.
+FRH=73	V.17.	7200 bits/s.
+FRH=74	V.17 (short train).	7200 bits/s.
+FRH=97	V.17.	9600 bits/s.
+FRH=98	V.17 (short train).	9600 bits/s.
+FRH=121	V.17.	12000 bits/s.
+FRH=122	V.17 (short train).	12000 bits/s.
+FRH=145	V.17.	14400 bits/s.
+FRH=146	V.17 (short train).	14400 bits/s.

+FPR=n—Select FAX Port Rate

DTE Command	DCE Action	Description
+FPR=0	Execute +IPR=0.	Select automatic rate detection.
+FPR=1	Execute +IPR=2400.	Set DTE-DCE to 2400 bits/s.
+FPR=2	Execute +IPR=4800.	Set DTE-DCE to 4800 bits/s.
+FPR=4	Execute +IPR=9600.	Set DTE-DCE to 9600 bits/s.
+FPR=8	Execute +IPR=19200.	Set DTE-DCE to 19200 bits/s.
+FPR=10	Execute +IPR=38400.	Set DTE-DCE to 38400 bits/s.
+FPR=18	Execute +IPR=57600.	Set DTE-DCE to 57600 bits/s.
+FPR=? (if all values listed above are supported)	Report (0, 1, 2, 4, 8, 10, 18)	DCE supports 2400 bits/s, 4800 bits/s, 9600 bits/s, 19200 bits/s, 38400 bits/s, and 57600 bits/s.
+FPR? (if +IPF=0)	Report 0.	DTE-DCE rate is automatically detected.
+FPR? (if +IFC=2400)	Report 1.	DTE-DCE rate is 2400 bits/s.
+FPR? (if +IFC=4800)	Report 2.	DTE-DCE rate is 4800 bits/s.
+FPR? (if +IFC=9600)	Report 4.	DTE-DCE rate is 9600 bits/s.
+FPR? (if +IFC=19200	Report 8.	DTE-DCE rate is 19200 bits/s.
+FPR? (if +IFC=38400)	Report 10.	DTE-DCE rate is 38400 bits/s.
+FPR? (if +IFC=57600)	Report 18.	DTE-DCE rate is 57600 bits/s.
+FPR? (all other +IPR setting)	Report 255.	Indicates invalid setting.

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

+FAA=n—Adaptive Answer

+FAA=0   The DCE will answer only as a Class 1 FAX device. No automatic switching of service class will occur based on the calling device type.

+FAA=1   The DCE can answer and automatically determine whether to answer as a facsimile DCE or as a data modem.

+FMI—Manufacturer Identification

+FMM—Product Identification

+FMR—Version/Revision Information

Chapter 7 Troubleshooting

For Wireless LAN Card

Radio Interference

You may be able to eliminate any interference by trying the following:

- Increase the distance between the wireless computers and the device causing the radio interference.
- Plug the computer equipped with the Wireless LAN Card into an outlet on a different branch circuit from that used by the affecting device.
- Consult the dealer or an experienced radio technician for help.
- Keep the computer with the Wireless LAN Card away from the microwave oven and large metal objects.

Cannot Connect to Another Wireless LAN Card

If you cannot make a connection to another Wireless LAN Card from your computer, it could be due to one of the following reasons:

- Incorrect SSID. Make sure the SSID is the same for all computers that have a Wireless LAN Card.
- Changes are not being recognized by your computer. Restart your computer.
- If in Peer-To-Peer mode, make sure the **Log on to Windows NT domain** check box is not selected in the **Client for Microsoft Networks Properties** dialog box in the **Network Configuration** tab.
- Incorrect IP Address or Subnet Mask. Check these settings in the **TCP/IP Properties** dialog box in the **Network Configuration** tab.

Poor Link Quality

If the Link Quality display stays in the Poor range, it could be due to one of the following reasons:

- Radio interference.
- Distance between Wireless LAN Card and Access Point is too far. Decrease the distance between the Wireless LAN Card and Access Point (or another card).

Chapter 6 Commands Reference

Ignore this chapter if your Mini PCI Card does not support modem functions.

This chapter provides the AT command set for the Soft Modem chip set. Some of the commands described within may not apply to your soft modem, depending on the build options included in a license. The default values stated are typical for a full-featured Soft Modem and may be different in reduced configurations.

6.1 Basic AT Command

Cannot Connect to Access Point

If you cannot make a connection to the Access Point, it could be due to one of the following reasons:

- Make sure the Wireless LAN Card and Access Point have no physical connection problems.
- Make sure the SSID for the Wireless LAN Card is the same as the Access Point.
- Make sure the privacy type is the same as that of Access Point. Also, make sure the Default Key is the same for both computers.

For Modem Card

No Response From Your Modem

- Make sure that you have chosen the appropriate COM port for your modem and which does not conflict with other ports in your PC system.
- Check if there is any other interface cards in your computer that use the same COM port as your modem. If so, you must set your modem to another COM port.

Your Modem Does Not Connect After It Has Dialed a Phone Number

- The phone line may be too noisy or the telephone cord may be poor. Try the line with a regular phone. Also, the remote modem may not recognize your modem's baud rate.

Can't Transmit After Connecting to the Remote Modem

- Check the communication parameters of the remote modem, then configure your software to the same number of data bits, stop bit and parity.

Appendix A Limited Warranty

Wireless LAN/Modem Card Hardware

The seller warrants to the end user ("Customer") that this hardware product will be free from defects in workmanship and materials, under normal use and service, for 1 year from the date of purchase from the seller or its authorized reseller. The seller's sole obligation under this express warranty shall be, at the seller's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, The seller may, in its sole discretion, refund to the Customer the purchase price paid for the defective product. All products that are replaced will become the property of the seller. Replacement products may be new or reconditioned.

Wireless LAN/Modem Software

The seller warrants to Customer that each software program licensed from it , except as noted below, will perform in substantial conformance to its program specifications, for a period of 1 year from the date of purchase from the seller or its authorized reseller. The seller warrants the media containing software against failure during the warranty period. No updates are provided. The seller's sole obligation under this express warranty shall be, at the seller's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable seller published specifications. Customer assumes responsibility for the selection of the appropriate application programs and associated reference materials. The seller makes no warranty or representation that its software products will meet Customer's requirements or work in combination with any hardware or software applications products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the seller software product documentation or specifications as being compatible, the seller will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a defect in the third party's product or from use of the software product not in accordance with the seller's published specifications or user manual.

Appendix B Regulatory Compliance

FCC Part 15 Declaration of Conformity (DoC)

This device complies with the requirements of FCC Part 15 rules. The operation is subject to the following two conditions:

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

FCC Rules and Regulations - Part 15

Warning: This device has been tested and found to comply with the limits for a Class B 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 residential 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.

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 and 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.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Caution:

To assure continued compliance, (example – use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Appendix C Setting Up TCP/IP

This section contains instructions for configuring the TCP/IP protocol of the Wireless LAN Card. The IP address policy depends on your wireless network. You should configure your TCP/IP protocol as instructed by your network administrator.

1. On the taskbar, select **Start** > **Settings** > **Control Panel**, double-click the **Network** icon.

2. Click the **Configuration** tab of the **Network** dialog box.

3. In the network components list, select the TCP/IP protocol of your Wireless LAN Card, e.g., **TCP/IP ->Intersil PRISM Wireless LAN PCI Card**, and then click **Properties**.

For correct IP address information for your wireless LAN installation, contact your network administrator.

For more information on IP addresses, see the Network Working Group Specification RFC 1918 on the Internet.

4. On the **IP Address** tab, choose one of the methods as required:

    Option A: Click **Specify an IP address**.

    In the **IP Address** box, enter a valid four-component IP address, either a public or private one as required. If private IP address is used, the following three blocks of IP addresses are available for private networks:

    10. 0 . 0. 0 — 10.255.255.255

    172. 16. 0. 0 — 172. 31.255.255

    192.168. 0. 0 — 192.168.255.255

    In the **Subnet Mask** box, enter a valid four-component IP address.
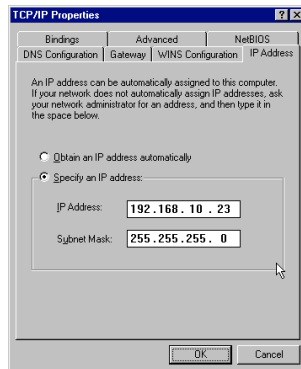
Option B: Select **Obtain an IP address automatically**.

An IP address will be automatically assigned to your computer.
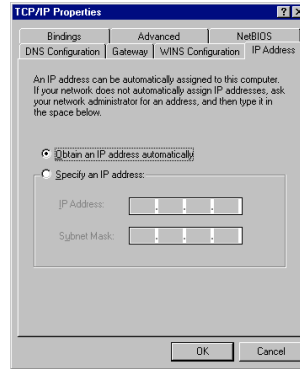
5. Click **OK** to return to **Network** dialog box and click **OK** again to finish configuration. If your TCP/IP properties have been modified, you will be prompted to restart your computer. Click **Yes** to have new settings take effect.

Appendix D Specification

* Specifications are subject to change with notice.

Mini PCI Wireless LAN Card

Host interface	Mini-PCI Spec. V1.0
Form factor	Mini-PCI type IIIB
Wireless Chipset	Intersil Prism 2.5 chipset (ISL3874A+HFA3783+ISL3685+ISL3984)
Operation voltage	+3.3V
Frequency Range	2.4GHz – 2.4835GHz
Channels Numbers	1 11 channels for US 1 13 channels for Europe 1 13 or 14 channels for Japan
Channel spacing	5MHz
Modulation Technique	Direct Sequence Spread Spectrum(CCK,DQPSK,DBPSK)
Spreading	11-chip Barker sequence
Media Access Protocol	CSMA/CA(Collision Avoidance) with ACK
Transfer data rate	11Mbps, 5.5Mbps, 2Mbps, 1Mbps, auto-rating

Transmitter output power	14dbm			
Receiver sensitivity (FER <8%)	-84 dbm for 11 Mbps			
Antenna type	Internal diversity with connectors			
Frame Error Rate (FER)	Less than 8%			
Security	64Bit WEP encryption, optional 128Bit RC4			
Available Range (in meters)	*11 Mbps*	*5.5Mbps*	*2Mbps*	*1Mbps*
Open Space	300m	450m	600m	650m
Semi Open Space	60m	80m	100m	120m
Closed Space	35m	45m	60m	60m
Power Consumption	Continuous TX mode : 320 mA Standby mode : 200mA Power saving mode : 125mA			
Operation Temperature Range	0 55			
Storage Temperature Range	-20 75			
OS Compatibility	Windows 98, 2000, ME, XP			
Standards	IEEE 802.11b			

Mini PCI Wireless LAN and Modem Card

A. Wireless Specification

Host interface	Mini-PCI Spec. V1.0
Form factor	Mini-PCI type IIIA
Wireless Chipset	Intersil Prism 2.5 chipset (ISL3874A+HFA3783+ISL3685+ISL3984)
Operation voltage	3.3V
Frequency Range	2.4GHz – 2.4835GHz
Channels Numbers	1 11 channels for US 1 13 channels for Europe 1 13 or 14 channels for Japan
Channel spacing	5MHz
Modulation Technique	Direct Sequence Spread Spectrum(CCK,DQPSK,DBPSK)
Spreading	11-chip Barker sequence
Media Access Protocol	CSMA/CA(Collision Avoidance) with ACK
Transfer data rate	11Mbps, 5.5Mbps, 2Mbps, 1Mbps, auto-rating
Transmitter output power	14dbm
Receiver sensitivity (FER <8%)	-80dbm for 11 Mbps
Antenna type	Internal diversity with connectors
Frame Error Rate (FER)	Less than 8%
Security	64Bit WEP encryption, optional 128Bit RC4

Available Range (in meters)	*11 Mbps*	*5.5Mbps*	*2Mbps*	*1Mbps*
Open Space	300m	450m	600m	650m
Semi Open Space	60m	80m	100m	120m
Closed Space	35m	45m	60m	60m
Power Consumption	Continuous TX mode : 380 mA Standby mode : 230mA Power saving mode : 130mA			
Operation Temperature Range	0　55			
Storage Temperature Range	-20　75			
OS Compatibility	Windows 98, 2000, ME, XP			
Standards	IEEE 802.11b			

B. Data/Fax Modem Specification

Operation	Full-duplex or half duplex in Data mode. Asynchronous operation. Auto dial/answer. Manual originate/answer
System Interface	Mini-PCI Rev1.0 Type IIIA AC-Link Support
Modem Chipset	Agere Scorpio (CSP1037 + CSP1037B)
Fax mode	Fax modem send and receive rates up to 14400bps ITU-T V.17,V.29,V.27ter,and V.21 channel 2

	EIA/TIA 578 Class 1 FAX		
Dialing Type	Tone or Pulse dialing.		
Call Progress Monitor	Dial tone, Busy tone.		
Flow Control	XON / XOFF or RTS / CTS		
Telephone Line Interface	2pin JAE (FI-S2P-HF) connector connect to RJ-11phone jack to PSTN line.		
Receive Sensitivity	*FCC/DOC*	*JAPAN*	*CTR21*
	-30 ±2 dBm	-30 ±2 dBm	-30 ±2 dBm
Transmit Level	*FCC/DOC*	*JAPAN*	*CTR21*
	< -12 dBm	-17± 2dBm	-15± 2dBm
DTMF Signal Level(dBm)	*FCC/DOC*	*JAPAN*	*CTR21*
	Hi.G = -8 ± 1 dBm Lo.G= -10 ± 1dBm	Hi.G = -8 ± 1 dBm Lo.G= -10 ± 1dBm	Hi.G = -7 ± 2 dBm Lo.G= -9 ± 2dBm
M/B RATIO	*FCC/DOC*	*JAPAN*	*CTR21*
	39/61±5% 10±1PPS	40/60±5% 10±1PPS 20±1.6PPS	40/60±5% 10±1PPS
RETURN LOSS	*FCC/DOC*	*JAPAN*	*CTR21*
	300Hz ~ 3400Hz >15 dB	300Hz ~ 3400Hz >15 dB	200Hz ~ 300Hz > 6 dB 300Hz ~ 3400Hz >8 dB

Communication Standard	Compliant with FCC,DOC,JATE,CTR21, and other PTTs				
DTMF Tone Frequency	High Group Frequency(HZ)		Low Group Frequency (HZ)		
			697	770	852	941
		1209	1	4	7	*
		1336	2	5	8	0
		1447	3	6	9	#
		1633	A	B	C	D

Glossary

10BaseT   An IEEE standard (802.3) for operating 10 Mbps Ethernet networks (LANs) with twisted pair cabling and a wiring hub.

Access Point   An internetworking 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 network composed solely of stations within mutual communication range of each other (no Access Point connected).

BSS   *Basic Service Se*t. A set of stations controlled by a single coordination function.

Channel   A medium used to pass protocol data units that can be used simultaneously in the same volume of space by other channels of the same physical layer, with an acceptably low frame error ratio due to mutual interference.

Encapsulated   An Ethernet address mode that treats the entire Ethernet packet as a whole and places it inside an 802.11 frame along with a new header.

ESS *Extended Service Se*t. A set of one or more interconnected Basic Service Sets (BSSs) and integrated Local Area Networks (LANs) can be configured as an Extended Service Set.

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

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

IEEE 802.11 The 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. IEEE standards ensure interoperability between systems of the same type.

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 Protoco*l. The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination. IP corresponds to the network layer in the ISO/OSI model.

IP Address   An IP address is a 32-bit number that identifies each sender or receiver of information 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.

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

NAT   *Network Address Translatio*n. The translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network. One network is designated the internal network and the other is the external. The internal network then appears as one entity to the outside world.

Radio Frequency	*R*F, 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 giga hertz (GHz) is one Billion-Hertz. The standard U.S. 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 2.4GHz.
SSID	*Service Set I*D. A group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.
Subnet Mask	A value that defines whether your computer communicates only within your LAN or communicates outside of your LAN, where it is routed out to the rest of the Internet. A Subnet Mask that has the same first three components (for example, 255.255.255.0) is the routing pattern for a Class C address.
TCP	*Transmission Control Protoco*l. The standard transport level protocol that provides the full duplex, stream service on which many applications' protocols depend. TCP allows a process on 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.
WEP	*Wired Equivalent Privac*y. The optional cryptographic confidentiality algorithm specified by 802.11. The algorithm is being used to provide data confidentiality that is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy..