



Navini
NETWORKS®

Ripwave® MX PC Card (PMX)

User Guide

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Proprietary

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Safety

To optimize safety and expedite installation and service, read this document thoroughly. Follow all warnings, cautions, and instructions marked on the equipment and included in this document.

To aid in the prevention of injury and damage to property, cautionary symbols have been placed in this document to alert the reader to known potentially hazardous situations, or hazards to equipment or procedures. The symbols are placed before the information to which they apply. However, any situation that involves heavy equipment and electricity can become hazardous, and caution and safety should be practiced at all times when installing, servicing, or operating the equipment.



Caution Symbol - possible equipment or property damage.



Warning Symbol - could cause personal injury or otherwise be hazardous to your health

Navini Networks, Inc., expressly requires that when using Navini electronic equipment always follow the basic safety precautions to reduce the risk of electrical shock, fire, and injury to people and/or property.

1. Follow all warnings and instructions that come with the equipment.
2. Do not use the equipment while you are in a bathtub, shower, pool, or spa. Exposure of the equipment to water could cause severe electrical shock or serious damage to the equipment.
3. Do not allow any type of liquid to come in contact with the equipment. Unplug the equipment from the power source before cleaning. Use a damp cloth for cleaning. Do not use any soaps or liquid cleaners.
4. Follow all airport and FAA regulations when using the equipment on or near aircraft.
5. Do not use the PMX near medical equipment, life support equipment, or any equipment that may be susceptible to any form of radio interference. In such areas, the PMX must be powered off.
6. The driver or operator of any vehicle should not operate the PMX while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of the vehicle.
7. Do not disassemble the equipment. Removing covers exposes dangerous voltages or other risks and also voids the warranty. Incorrect reassembly can cause equipment damage or electrical shock. Only an authorized repair technician should service this product.
8. Do not expose the equipment to extreme hot or cold temperatures.
9. Do not use the equipment under the following conditions:
 - When the equipment has been exposed to water or moisture.
 - When the equipment has been damaged.
 - When the equipment does not operate properly or shows a distinct change in performance.



Regulatory Information

This Ripwave MX PC Card (PMX) has been tested with a typical laptop computer with a side loading PCMCIA bay. This PMX must not be co-located or operated in conjunction with any antenna (other than the one furnished by Navini and included in the package) or transmitter. Use of this device in any other configuration may exceed the FCC, ETSI, or other regulatory bodies RF Exposure compliance limit.

If this equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, the user should try to correct the interference by one or more of the following measures:

- 1) Reorient or relocate the receiving antenna,
- 2) Increase the separation between the equipment and the receiver,
- 3) Consult the dealer or an experienced radio technician for additional suggestions.

FCC guidelines stipulate that the antenna should be more than 2.5 cm (1") from bystanders and 1.2 cm (0.472") from the user. When in use, the antenna should be pointed vertically upward. When using the Desktop Antenna with the PMX, a minimum distance of 20 centimeters (8 inches) is required from the user or bystander.

This product conforms with the Australian Standard for Human Exposure to Radiation at a distance of 2.5 cm. Closer contact; such as touching the aerial will result in radiation in excess of safe limits.

SAR, or Specific Absorption Rate, is the measurement for the rate at which electromagnetic energy is absorbed by the human body during exposure. The FCC states the body SAR limit is 1.6 W/kg. The highest reported SAR value for the PMX card is 0.73 W/kg.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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:

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

Introduction

Congratulations! Your Ripwave MX PC Card (PMX) is a user-friendly, easy-to-install device that helps you connect wirelessly to the Internet using the PCMCIA port on your laptop computer. The PMX can work with today's MC-SCDMA technology and the OFDM-based 802.16e technology that Navini is trialing this year. The PMX provides complete broadband Internet access to residential and small or home office users without the necessity of professional hardware installation.

The PMX provides portable Internet service. A computer with the PMX Card can be moved from room-to-room, location-to-location, or even city-to-city as long as there is coverage and appropriate reception in the area. This manual will guide you through the simple process of installing the PMX and its monitoring software.

Package Inventory

Please verify the contents of your PMX Card package. Your package should contain the following:

- PMX Card
- PMX Quick Installation Guide
- Installation CD that includes the Navini Diagnostics (NavDiag) monitoring software, the PC drivers*, and the PMX User's Guide

*The PC drivers are in two folders, one for Windows® Vista Operating Systems and one for Windows 2000 and Windows XP Operating Systems. When you insert the Card, per the installation instructions, the PC will detect the new drivers and automatically select the correct one.

WinVista Drivers: netnpcc_vista.inf
 netnpcc_vista.sys



Win2K-XP Drivers: netnpcc.inf
 netnpcc.sys



If you do not find all of these items in your package, notify your supplier.

PMX Models

The PMX model indicates the frequency in which the PMX will operate (for example, 3.4 GHz). The frequency number appears on the PMX's label. These are described in the table below.

Model	Model Number	Frequency Range	Operating Band
2.3 GHz	2305-2360 PMX	2305-2360 MHz	International Only
2.5-2.6 GHz	2.5-2.6 PMX	2500-2686 MHz	EBS
3.4 GHz	3410-3525 PMX	3410-3525 MHz	WLL
3.5 GHz	3475-3600 PMX	3475-3600 MHz	WLL

Minimum Computing Requirements

(See, also, Addendum 2)

The following table lists the minimum requirements your computer must meet before using the PMX Card.

Operating System (OS)*:	Windows 2000, Windows XP, or Windows Vista-32bits. It is assumed the latest Windows service pack is installed on the Operating System. Note: The PMX is not supported on MacIntosh or Linux/Unix systems.
CPU:	Pentium level or higher
RAM:	32 MB or the OS minimum, whichever is greater
Hard Drive:	85 MB free disk space for the optional Navini Diagnostics* monitoring software
Monitor:	256 colors, 800 x 600 resolution

* If you are going to upgrade your Operating System after loading the Navini Diagnostics software, you must first uninstall Navini Diagnostics prior to upgrading the OS. Otherwise, the PMX will continue to operate, but the Navini Diagnostics will not work. See Uninstall instructions in this Guide.

Physical Characteristics

The PMX Card fits into a standard Type II PCMCIA slot. A 68-pin connector on the end of the card connects it to the laptop.



Two inverted-F antennas reside inside the PMX. All models also have an external antenna.

Following is a picture of the external antenna in the upright position. To raise the antenna to its upright position, raise the antenna counterclockwise. Do not turn the antenna beyond its upright position.





PMX Features



- ▶ Simple plug-and-play installation
- ▶ Indicator light showing power on and synchronization with a Base Station
- ▶ Currently configured to use MC-SCDMA wireless technology
- ▶ Future models will run the OFDMA wireless technology
- ▶ OFDMA mode will meet IEEE 802.16e air interface standards
- ▶ Portable
- ▶ Works in Non Line of Sight (NLOS) conditions, using Smart Beamforming technology
- ▶ Automated over-the-air software upgrades
- ▶ Manual procedure for the initial CDMA-to-WiMAX upgrade
- ▶ Optional accessory: Desktop Antenna

Installing the PMX

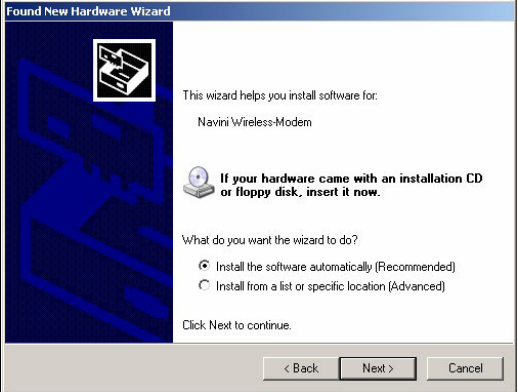
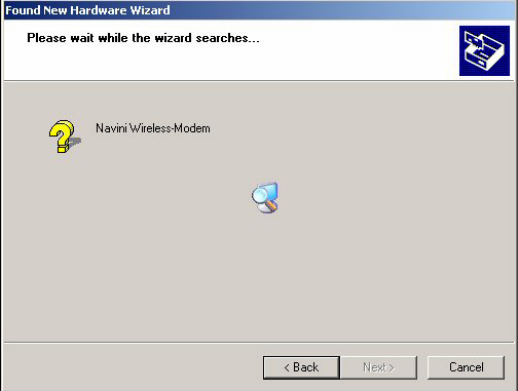

The following instructions explain how to install the PMX and its driver software on your computer. Please read all instructions before attempting the installation.

 **Note:** The laptop should be used preferably on a desk when the Card is installed. Using the laptop with the Card close to the body, such as on the lap, is undesirable.

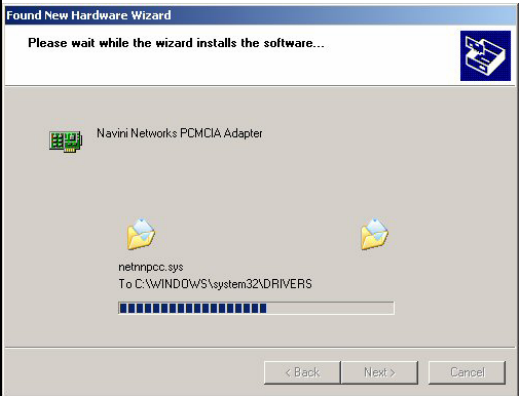


 **Note:** The screenshots shown in these instructions were taken from a laptop operating with Windows XP. If you have a Windows 2000 or Vista operating system, the screens you see may vary from the screens shown in the instructions.

Step	Action	Illustration
1.	Insert the Card into the Type II card slot on your computer. Be sure to insert the end that has the 68-pin connector into the card slot.	
2.	Raise the antenna to the upright position.	
3.	The Found New Hardware message appears indicating the PC sees the Card.	
4.	The Welcome to the Found New Hardware Wizard dialog box appears. Select “No, not this time” and click Next to continue.	

Installing the PMX,
continued

Step	Action	Illustration
5.	Insert the CD that came with the card in the CD-ROM drive. Click Next to continue.	
6.	The Wizard searches for the driver.	
7.	The Hardware Installation box appears. Click Continue Anyway to install the driver.	

Installing the PMX,
continued

Step	Action	Illustration
8.	The driver is installed.	
9.	After the files are copied, a Completing the Found New Hardware Wizard box appears indicating the driver installation is complete. Click Finish to close the Wizard.	
10.	A message is displayed indicating that the new hardware is installed and ready to use.	

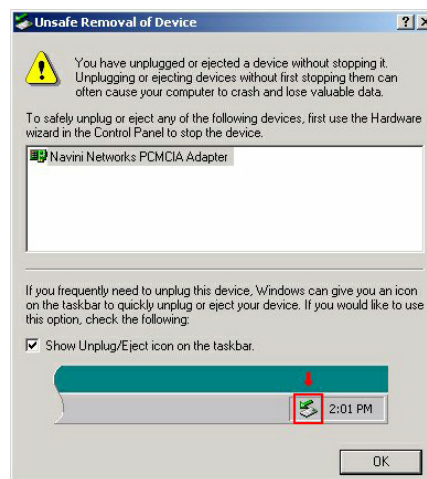
Accessing the Internet

Now that your PMX is installed and your computer is on, you should be able to access the Internet (that is, assuming you have signed up with a Service Provider). To access the Internet, open the web browser that is installed on your computer, (for example, Netscape, Internet Explorer, etc.).

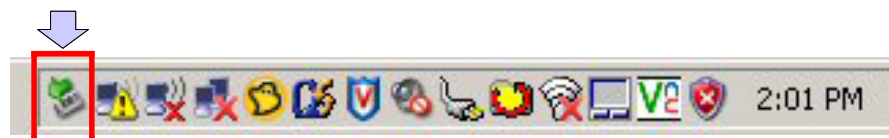
Removing the PMX

Before you store your PMX in a computer case, you should remove the Card from the PC. Also, turn the antenna to its original down position. Leaving the Card in the PC or the antenna in the upright position while storing the PC in a computer case may damage the card or the antenna.

To properly remove the PMX from your computer, you must first stop the driver software. If you do not stop the driver software first, the following box may appear:



To safely remove the PMX, click on the icon indicated in the following illustration. Depending on your computer's setup, this icon is probably located in the lower right-hand corner of your computer.



Indicator Light

An indicator light on the top of the PMX's black encasement provides information about the PMX's operation. When the light blinks, the PMX is trying to synchronize with a Base Station (BTS). When the light is solid, the PMX has acquired synchronization with a Base Station.

Indicator Light





Troubleshooting


If you experience difficulties with your Internet connection after you have installed the PMX driver software, please review the [Minimum Computing Requirements](#) and [Addendum 2](#). Ensure your computer meets those requirements. Also, review the installation procedures and ensure all steps were completed properly. If you are still experiencing difficulties, troubleshoot using the Navini Diagnostics (NavDiag) monitoring software or contact your Service Provider.

Installing Navini Diagnostics (NavDiag)

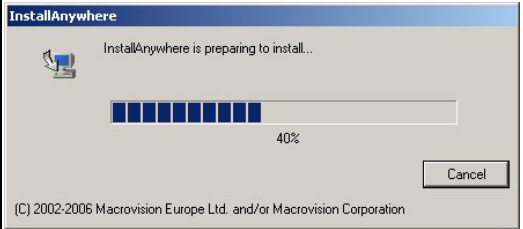
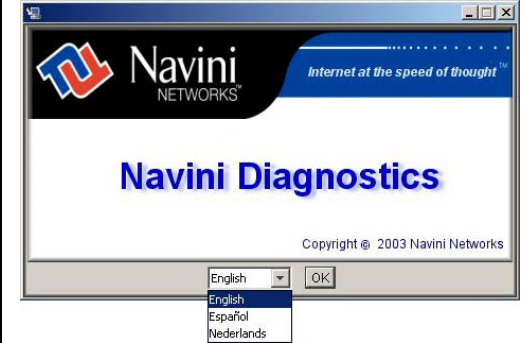
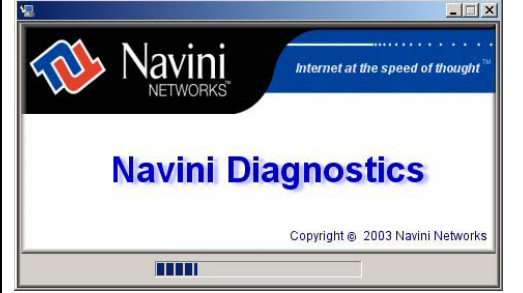
The NavDiag software assists you in solving connection problems and provides other valuable information. This software is provided on the Installation CD that came in your Card package. This section explains how to install this software.

 **Note:** To install NavDiag on a Windows 2000, you must have administrative privileges. To check your account privileges, open your Control Panel. Double-click on the Users and Passwords symbol. You should see Administrator under the Users tab.


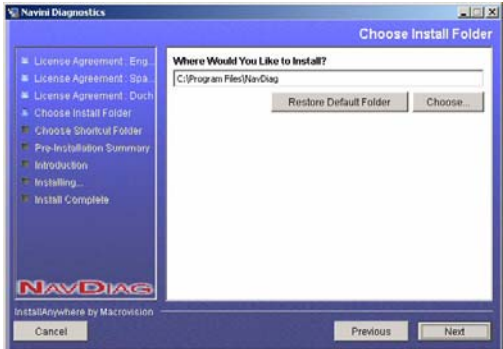

 **Note:** The screenshots shown in the instructions were taken from a laptop with Windows XP. If you have a Windows 2000 or Vista operating system, the screens you see may vary from the screens shown in the instructions.

Step	Action	Illustration
1.	Before installing the NavDiag software, shut down all programs, including anti-virus software programs.	
2.	Insert the Installation CD into the CD-ROM drive.	
3.	Open the CD by clicking on the My Computer icon. Double-click on the folder named NavDiag or Navini Diagnostics.	
4.	Double-click on the Windows folder, then on the file navdiag_windows.exe* . This will automatically start the installation of NavDiag.	<p style="text-align: center;">Example</p> 




Installing NavDiag,
continued

Step	Action	Illustration
5.	<p>The InstallAnywhere window appears. The progress bar indicates that InstallAnywhere has initialized.</p>	
6.	<p>The Navini Diagnostics Language screen appears* (see Note above). Select a language, and click OK to continue.</p> <p><i>Note:</i> NavDiag may automatically attempt to match the language set on your PC under Regional Options. The language selection affects how NavDiag displays its screens. If you receive an error message concerning the language, click OK and NavDiag will default to English. At this time, NavDiag supports three options:</p> <ol style="list-style-type: none"> 1. English (U.S.), 2. Español (Spain), and 3. Nederlands (Holland). 	
7.	<p>The progress bar indicates the files are being installed.</p>	

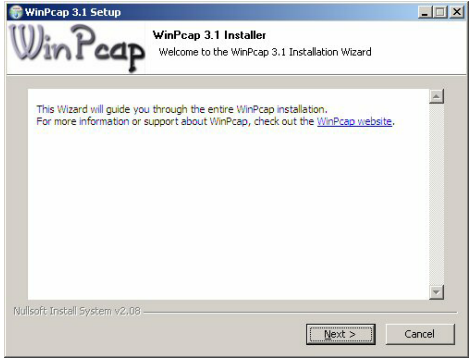
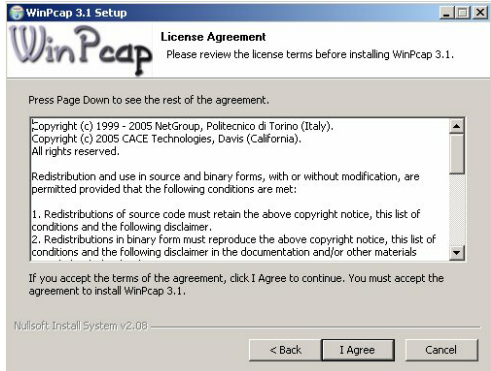
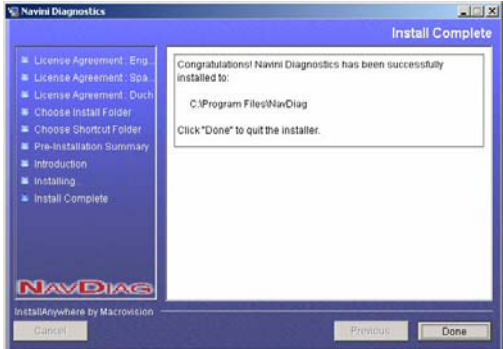
Installing NavDiag,
continued

Step	Action	Illustration
8.	<p>The License Agreement screen appears. Read the Licensing Agreement. Select the I Accept option, and click Next to continue.</p> <p>If the License Agreement is not accepted, you cannot install the software.</p>	
9.	<p>The Choose Install Folder screen appears. Enter the name of the folder where you wish to install the software. Click Next to continue.</p> <p>The default installation folder provided by the software is shown in the illustration.</p>	
10.	<p>The Choose Shortcut Folder screen appears. Accept the default and click Next to continue.</p>	

Installing NavDiag,
continued

Step	Action	Illustration
11.	<p>The Pre-Installation Summary screen appears. Review the contents for accuracy. Click Install to continue.</p> <p>For your installation and computer, this screen may have different information than what is shown in the illustration.</p>	
12.	<p>The Installing screen will change as the application files are loaded.</p>	
13.	<p>If the WinPcap program is already installed in your computer, go to step 16; otherwise, it will be installed now</p>	

Installing NavDiag,
continued

Step	Action	Illustration
14.	Continue with the installation of the WinPcap.	 <p>The screenshot shows the 'WinPcap 3.1 Setup' window. The title bar reads 'WinPcap 3.1 Setup'. The main window has a 'WinPcap' logo and the text 'WinPcap 3.1 Installer' and 'Welcome to the WinPcap 3.1 Installation Wizard'. Below this, a text box says: 'This Wizard will guide you through the entire WinPcap installation. For more information or support about WinPcap, check out the WinPcap website.' At the bottom, there are 'Next >' and 'Cancel' buttons.</p>
15.	You must agree to the License agreement to continue with the Install.	 <p>The screenshot shows the 'WinPcap 3.1 Setup' window with the 'License Agreement' screen. The title bar reads 'WinPcap 3.1 Setup'. The main window has a 'WinPcap' logo and the text 'License Agreement' and 'Please review the license terms before installing WinPcap 3.1.'. Below this, it says 'Press Page Down to see the rest of the agreement.' A scrollable text area contains the following text: 'Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy). Copyright (c) 2005 CACE Technologies, Davis (California). All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials...'. At the bottom, there are '< Back', 'I Agree', and 'Cancel' buttons.</p>
16.	At the Install Complete screen, click Done to close the window.	 <p>The screenshot shows the 'Navini Diagnostics' window with the 'Install Complete' screen. The title bar reads 'Navini Diagnostics'. The main window has a 'NAVDIAG' logo and the text 'Install Complete'. Below this, it says 'Congratulations! Navini Diagnostics has been successfully installed to: C:\Program Files\NavDiag'. Below this, it says 'Click "Done" to quit the installer.' At the bottom, there are 'Cancel', 'Previous', and 'Done' buttons.</p>

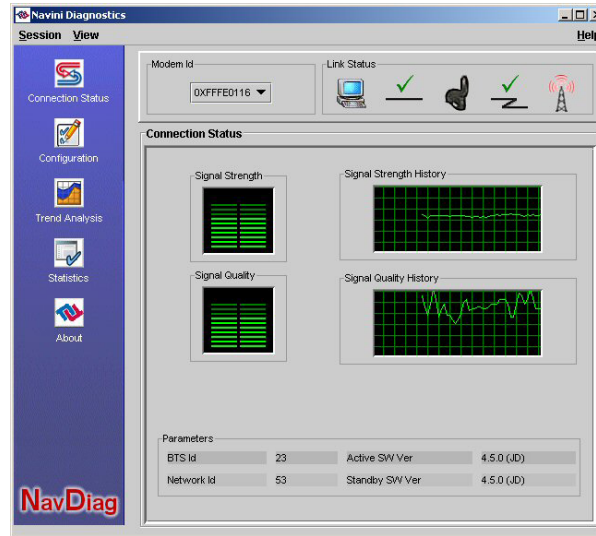
Troubleshooting Using Navini Diagnostics

To open the Navini Diagnostics software application, double-click on the Navini Diagnostics icon on your desktop.



Navini Diagnostics.lnk

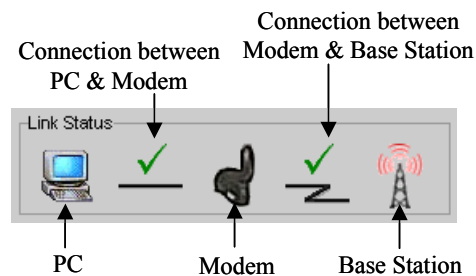
The Connection Status screen will open and display data if the Card is in use. The screen will refresh live data every second.



The following sections describe the various parts of the Connection Status screen.

The Icons

The icons that appear on the top right side of the screen represent the PC, the connection between the PC and the Modem, the Modem, the connection between the Modem and the Base Station, and the Base Station to which the Modem is communicating. Check marks over the connections indicate working connections.



The Icons, continued

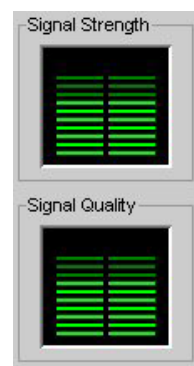
An “X” is positioned over the corresponding icon indicates the connection between the PC and the Modem or between the Modem and the Base Station is interrupted



If the connection between the PC and the Card or between the Card and the Base Station is interrupted, an “X” is positioned over the corresponding icon.

The Signal Strength and Signal Quality Bars

Signal Strength and Signal Quality are dynamic bar areas that indicate how well your Card is receiving signals from the Base Station.



In particular, the Signal Strength bar area graphically represents the strength of the synchronization signal your Modem is receiving from BTS. The strength of the signal is represented by a group of colored bars. The higher the pile of bars goes, the stronger the signal is. The color of the bars also gives an indication of the strength of the signal. Green lines indicate an excellent signal. Orange lines indicate a good signal while red lines indicate a weak signal.

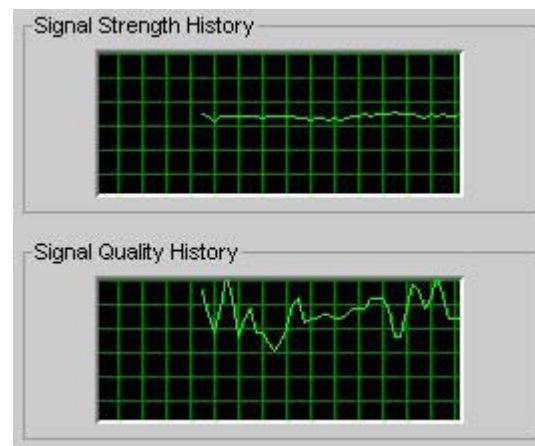
The Signal Quality bar area graphically represents the Signal-to-Noise Ratio (SNR) received by your Modem. Again, the quality of the signal is represented by a group of colored bars. The higher the pile of bars goes, the better the SNR of the signal. The color of the bars also gives an indication of the quality of the signal. Green lines indicate an excellent signal or an SNR greater than 21. Orange lines indicate a good signal or an SNR greater than or equal to 13 but less than or equal to 21. Red lines indicate a weak signal or an SNR less than 13.

How to Increase the Strength and Quality of the Signal

To increase the strength and quality of the signal, change the location of the PC in which the Card is inserted. Try moving it closer to a window, to a higher location, away from other wireless devices (microwave ovens, cordless phones), and away from metal objects (shelves, file cabinets). As you reposition your PC, watch the Signal Strength and Quality bars on the NavDiag screen. Place your PC in the location where you receive the most green signal strength and quality bars.

The History Graphs

The History graphs plot the change in signal strength and signal quality over time. The graphs cover the last minute and are updated every second. Read the graphs from right to left. The right side of the graph represents the most recent status of your Card.



The Parameters

At the bottom of the Connection Status screen are four parameters. These parameters are BTS ID, Network ID, Active SW Version, and Standby SW Version.

Parameters			
BTS Id	23	Active SW Ver	4.5.0 (JD)
Network Id	53	Standby SW Ver	4.5.0 (JD)

The BTS ID indicates the BTS to which the Card is currently synchronized. The Network ID indicates the network in which the Card is operating. Active SW Version and Standby SW Version

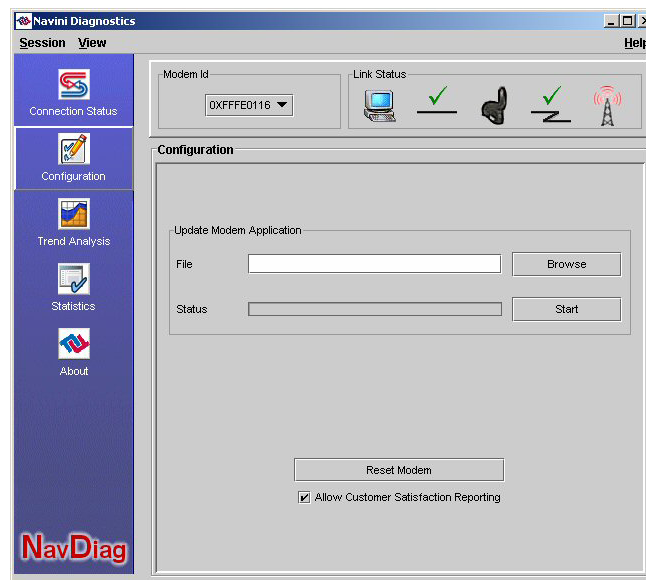
The Parameters, continued indicate the version number of the software currently loaded in the “active side” and “standby side” of the Card’s flash memory. The two letters in parenthesis following the release number indicate the type of software load. JD indicates Joint Detection while EN indicates Enhanced Nulling.

The Screen Option Buttons

On the left-hand side of the screen, there are five screen option buttons: Connection Status, Configuration, Trend Analysis, Statistics, and About. Each of these screens provides unique capabilities.

The Configuration Screen

The Configuration screen enables you to update your Card’s software if directed to do so by your Service Provider. To access the Configuration screen, press the Configuration button.



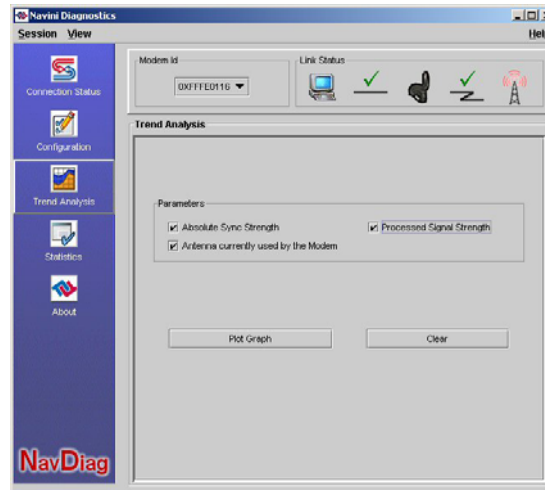
If you must update your Card’s software, your Service Provider will provide you with instructions regarding what to do.

The Trend Analysis Screen

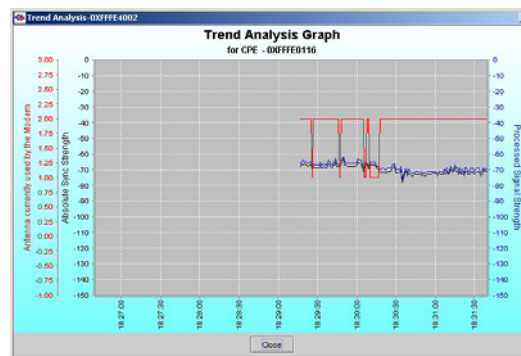
At the bottom of the screen is an Allow Customer Satisfaction Reporting box. This box currently is not supported on the Card.

The Trend Analysis screen lets you view Card parameters that evolve over time. With this screen, you can select up to three parameters to plot. To view the Trend Analysis screen, press the Trend Analysis button.

The Trend Analysis Screen, continued

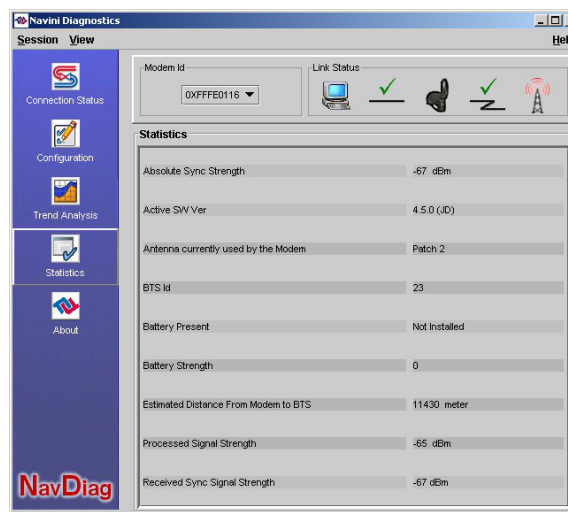


By selecting one or more parameters and then pressing the Plot Graph button, the following screen appears. This screen displays the value of the selected parameters over the last five minutes, updated once every second. The graphic scrolls from right to left.



The Statistics Screen

The Statistics screen lets you view the current value of selected parameters. These values are updated as they change over time. To view the Statistics screen, press the Statistics button.



The About Screen

The About screen provides vital information such as the version of the Navini Diagnostics software currently installed on your computer. It also provides a website address and telephone number where you can contact your Service Provider. To view the About screen, press the About button.



The Help Button

A Help button appears on the top right corner of all the NavDiag windows. The Help button gives you two options. The first option, On NavDiag, provides help text on the functionality of the NavDiag program. The second option, About NavDiag, is equivalent to clicking on the About icon.