



GPRS for Voicestream User's Manual



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Safety and Regulatory Notices

SAFETY WARNING

This product is not to be used in any environment where radio frequency equipment is prohibited or restricted in its use. This includes aircraft/airports, hospitals, and other sensitive electronic areas. To ensure that your modem is deactivated you should remove it from your computer under the above conditions.

SAFETY WARNING

Under extended operation the Merlin for GPRS modem will generate a noticeable amount of heat. Like all PC Cards, the modem generates heat during normal operations and is also heated by the host computer. For this reason it is recommended that you allow the modem to cool down after extensive operation so that it is cool to the touch when you remove it from your computer.

REGULATORY NOTICES

Federal Communications Commission Radio Frequency Interference Statement

This equipment has been certified to comply within the limits of 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 residential situations. This equipment generates, uses, and can radiate radio frequency energy, and, if not properly installed and used in accordance with the instructions, may cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off. You are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the television, radio or cordless telephone.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for additional suggestions.

FCC guidelines state that the antenna should be more than 17 mm (0.7 ") from all persons.

FCC ID: NBZNRM-G2000



Purpose

This main window is intended to allow the user, during normal operation, to immediately and definitively determine the state of the modem. This will allow the user to confirm the modem is in the expected state or trigger the user to take action to change the state of the modem as required. Any fields that are only required for diagnostics or troubleshooting will be found deeper in the application to avoid creating an overly complex main interface.

The purpose of this document is to provide detailed information regarding the appearance and operation of the user interface for the GPRS Modem Manager application developed for Windows 95, 98, NT, ME, and 2000. The Software Engineering group will attempt to meet the specifications outlined in this document when developing the application.

Overview

The GPRS Modem Manager application provides the user with both control over the modem's operation and feedback about the status of the modem. The basic information and controls needed during day-to-day operation will be quickly and easily accessible. Less frequently used functionality will still be easy to access but should not get in the way or obstruct the user's view of essential status information.

The main window will be split into two sections, one that provides information about and control over the modem's connection to the network, and another section that displays other necessary status information. The second section will have two views, which the user will be able to switch between using the button provided. The first, basic view will provide the minimal amount of status information required by the user. This view is provided to help keep the application simple, but also to keep its dimensions small for users who wish to leave the GPRS Modem Manager program open all the time. The second, detailed view will display the fields that a more advanced user may find useful. Whenever the application is re-launched, the most recently used view will be displayed.

Mouse-Over

When the user leaves the cursor over the icon, a small tool tip type window will be displayed showing the connection status.

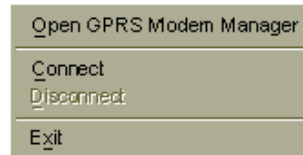
Registered, home network

The possible strings to display for the connection status are listed in a later section.



Right-Click

For a DUN connection, right-clicking on the icon will open the following menu.



For a NIC connection, right-clicking on the icon will open this menu.



The operation of the menu commands is detailed in the table below.

Command	Implementation
Open Modem Manager	When selected, the GPRS Modem Manager's main window is opened with the most recently used view displayed. This command can be accessed by using Alt+o.
Connect	When selected, the modem attempts to initiate a data session. When a data session is already open, this command is disabled. This command is only displayed for a DUN connection. This command can be accessed by using Alt+c.
Disconnect	When selected, the modem closes the data session. When a data session is not open, this command is disabled. This command is only displayed for a DUN connection. This command can be accessed by using Alt+d.
Suspend	When selected, the data session is closed. When a data session is open, this command is disabled.
Resume	When selected, the modem attempts to resume the data session that was previously closed. When a data session is already established, this command is disabled. This command is only provided for a NIC connection. This command is accessed by using Alt+r.
Exit	When selected, an open connection is closed and the GPRS Modem Manager application closes, removing the tray icon and main window. This command can be accessed using Alt+x



Shortcut and Accelerator Keys

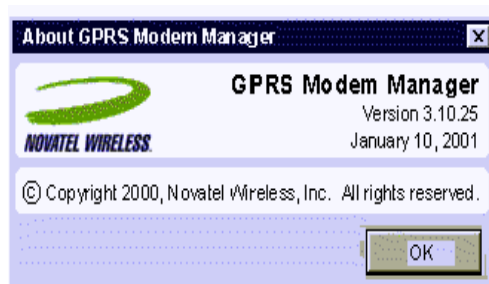
Because most of the commands available in the menu will not be used very often, there will be no shortcut keys provided beyond the standard Windows keys, which include the *F1* key to open the on-line help. This will avoid any conflict with international keyboard layouts.

Accelerator keys will be provided as detailed in the previous two tables. These keys will need to be adjusted when localizing the software but this is a fairly simple task.

The Modem Manager Components

About GPRS Modem Manager Dialog Box

The *About GPRS Modem Manager* dialog box displays information regarding the GPRS Modem Manager application itself, including copyright and trademark information and the software version. Also, the Novatel Wireless logo and an *OK* button, which closes the dialog box, should be included. This dialog box must be closed for the main GPRS Modem Manager window become active.



The fields on page 6 should be displayed.



Field/Control Label	Implementation
-	Simple text field, right justified, containing the software name.
Version	Simple text field, right justified, containing the version number of the software.
-	Simple text field, right justified, containing the date of the software build.
OK	Button that closes the dialog box, making the main window active. Always enabled.
-	Simple text field containing all copyright information. When applicable, the width of the window should be set so that this field takes up the complete width of the panel.

Basic View

The basic view shows both the registration status and the signal strength. For a DUN connection, a *Disconnect* or *Connect* button is provided and for a NIC connection, the *Suspend* or *Resume* button replaces it. For both a DUN and NIC connection, another button is included to allow the user to switch the interface to the detailed view.

For a DUN connection, the main window will look similar to that below.



For a NIC connection, the following display will be used.



For both connection types, when the mouse moves over the link area, a drop shadow will appear to indicate to the user that the text and rounded rectangles to the left and right can be clicked.





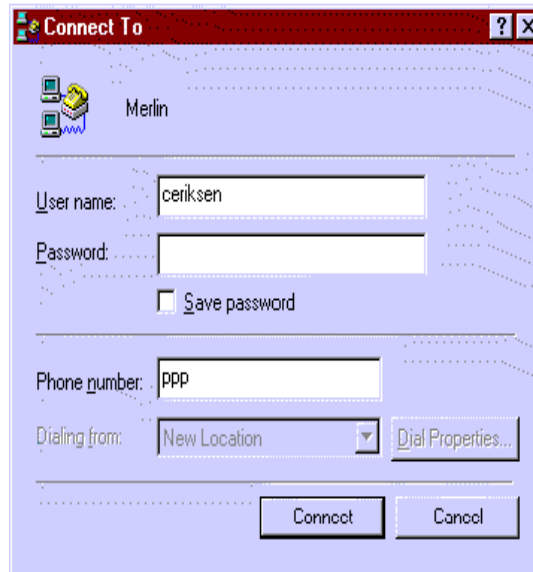
The implementation of the fields and controls in the basic view is explained below.

<i>Field/Control Label</i>	<i>Implementation</i>
-	A simple text field displaying one of the strings listed in a later section.
Signal Strength	<p>A five-bar indicator in which the number of black-filled bars indicates the signal strength.</p> <p>The value of each bar is TBD.</p> <p>If there is no service available, this field will be disabled.</p> <p>When disabled, the field label will remain but the field itself will be empty.</p>
Disconnect/Connect	<p>This button is only displayed for a DUN connection.</p> <p>Context-sensitive button that is labeled <i>Disconnect</i> and allows the user to close an established data session. If the modem has been detected but no session is open, this button is labeled <i>Connect</i> and allows the user to initiate a data session.</p> <p>If the modem has not been detected, this control is disabled.</p> <p>The button should be the same width as the ▼ button.</p>
Suspend/Resume	<p>This button is only provided for a NIC connection.</p> <p>Context-sensitive button that is labeled <i>Suspend</i> and allows the user to close an open data session. If the modem has been detected and the data session has been closed, it is labeled <i>Resume</i> and allows the user to restart the session.</p> <p>If the modem has not been detected, this control is disabled.</p> <p>The button should be the same width as the ▼ button.</p>
▼	<p>Button that allows the user to switch to the detailed view, upon which the button label will change to an upward pointing arrow (see <i>Detailed View</i> section).</p> <p>The button should be the same width as the <i>Disconnect/Connect</i> or <i>Suspend/Resume</i> button.</p> <p>This button will always be enabled.</p>
-	<p>Link to the Novatel Wireless web site.</p> <p>When clicked, a new window of the default browser will open with the main page of the Novatel Wireless web site displayed.</p> <p>As mentioned above, this section of the window will change when the mouse passes over it.</p> <p>This control is always enabled.</p>



Connect To Dialog Box

This is the standard dial-up networking connection box provided by Windows. Depending on the version of Windows and the connection settings, it will look somewhat similar to that shown below.



Connecting Using GPRS Modem Manager

The user can attempt to connect to the network by opening GPRS Modem Manager. If the *Automatically connect when GPRS Modem Manager is launched* option is enabled, the modem will automatically attempt to connect. If this option is not enabled, the user will need to use either the *Connect* command in either the main menu or tray icon menu or the *Connect* button. Depending on the type of service available and the network preference, the appropriate dialog boxes will be displayed as described below.

If the user has selected *Prefer to use GPRS* or *Prefer to use GSM*, the modem will attempt to connect to the preferred network first and only the *Connect To* dialog box will be displayed. If the connection attempt is not successful, and the user has enabled the *Prompt if selected network is not available* option, the appropriate confirmation dialog box from either section 0 or 0 will be displayed before the second *Connect To* dialog box, asking if the user wishes to connect to the other network. If this option is disabled, the *Connect To* dialog box will automatically be displayed for the other network.

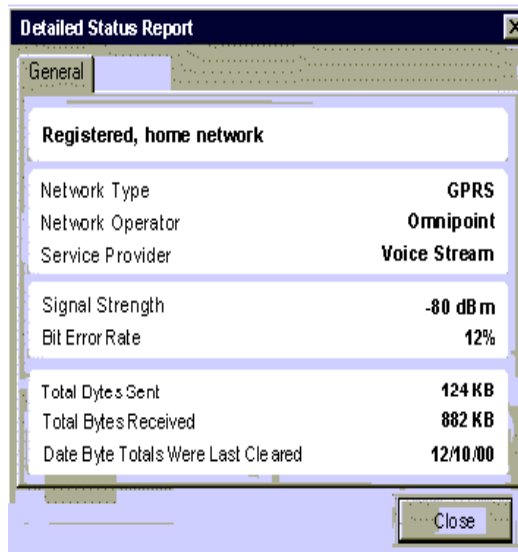
If the user has selected *Use GPRS Only* or *Use GSM Only*, the modem will attempt to connect to the preferred network first and only the *Connect To* dialog box will be displayed. If the connection attempt is not successful, and the user has enabled the *Prompt if selected network is not available* option, the appropriate confirmation dialog box from either section 0 or 0 will be displayed before the second *Connect To* dialog box, asking if the user wishes to connect to the



other network. If this option is disabled, the user will not be prompted and the modem will not try to connect to the other network.

Detailed Status Report Dialog Box

The *Detailed Status Report* dialog box displays all the fields necessary for troubleshooting any problems. Its intent is to provide users with the information Technical Support would require. This dialog box can remain open while the main GPRS Modem Manager window is active.



The table on page 10 describes the fields to be displayed in this dialog box.



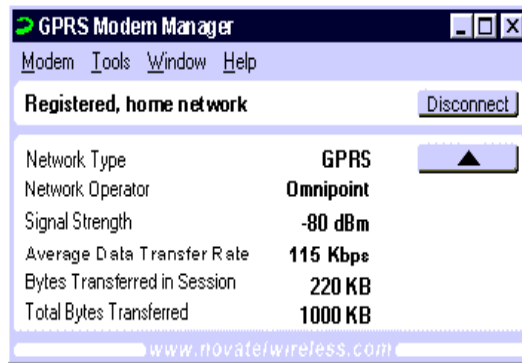
<i>Field/Control Label</i>	<i>Implementation</i>
-	Simple text field displaying one of the strings listed in a later section.
Network Type	Simple text field displaying one of the string listed in a later section.
Network Operator	Simple text field displaying the name of the network operator provided by the modem.
Service Provider	Simple text field displaying the service provider.
Signal Strength	Simple text field displaying the signal strength.
Bit Error Rate	Simple text field displaying the current bit error rate.
Total Bytes Sent	Simple text field displaying the kilobytes sent since the byte totals were last cleared. Serves as an indicator that the modem is transmitting data.
Total Bytes Received	Simple text field displaying the kilobytes received since the byte totals were last cleared. Serves as an indicator that the modem is receiving data.
Data Byte Totals Were Last Cleared	Simple text field displaying the data the byte totals were last cleared using the <i>Clear Byte Totals</i> command in the <i>Tools</i> menu.
Close	Button that, when selected, closes the <i>Detailed Status Report</i> dialog. This button is always enabled.

If any other tabs are created, each tab will be accessible using Alt with a character from the tab name. For example, Alt+g would select the *General* tab.

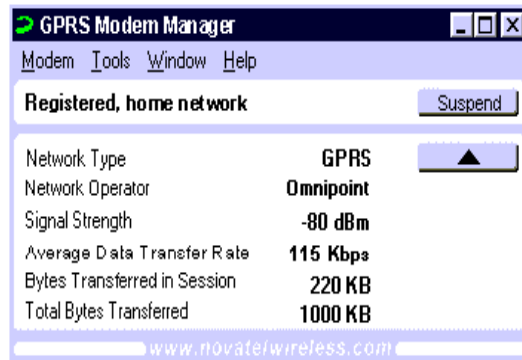
Detailed View

The detailed view retains the same connection status section as the basic view, but the second section is expanded to show more information.

As for the basic view, for a DUN connection the *Disconnect/Connect* button is displayed.



For an NIC connection, the *Disconnect/Connect* button is replaced with a *Suspend/Resume* button.



Also, the link changes slightly when the mouse moves over it in the same way as for the basic view.



The table on page 12 provides a description of each of the fields included in this view.



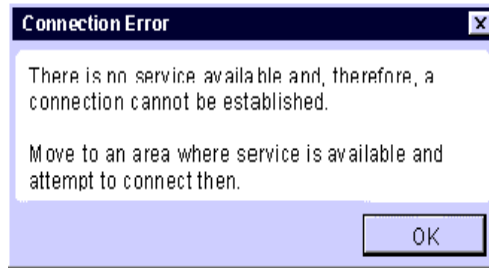
<i>Field/Control Label</i>	<i>Implementation</i>
-	A simple text field displaying one of the strings listed in a later section.
Network Type	A simple text field displaying one of the strings listed in a later section. This field will only be enabled when the modem is attempting to register, roaming, or registered. Otherwise, it will be disabled.
Network Operator	A simple text field displaying the network operator. This field will only be enabled when the modem is attempting to register, roaming, or registered. Otherwise, it will be disabled.
Signal Strength	A simple text field displaying the current signal strength in dBm. If there is no service available, this field will be disabled.
Average Data Transfer Rate	A simple text field displaying the average rate in Kbps. If the modem is not transferring data, this field will be disabled.
Bytes Transferred in Session	A simple text field displaying the bytes transferred in the current session in KB.
Total Bytes Transferred	A simple text field displaying the total number of bytes transferred since the total was last cleared in KB.
Disconnect/Connect	This button is only provided for a DUN connection. Context-sensitive button that is labeled <i>Disconnect</i> and allows the user to close an open data session and, if the modem has been detected, is labeled <i>Connect</i> and allows the user to initiate a data session when one is not already established. If the modem has not been detected, this control is disabled. The button should be the same width as the ▲ button.
Suspend/Resume	This button is only provided for a NIC connection. Context-sensitive button that is labeled <i>Suspend</i> and allows the user to close an open data session. If the modem has been detected and the data session is closed, it is labeled <i>Resume</i> and allows the user to restart the session. If the modem has not been detected, this control is disabled. The button should be the same width as the ▲ button.
▲	Button that allows the user to switch to the basic view, upon which the button label will change to the downward pointing arrow (see <i>Basic View</i> section). The button should be the same width as the <i>Disconnect/Connect</i> or <i>Suspend/Resume</i> button. This button will always be enabled.
-	Link to the Novatel Wireless web site.

When any of the text fields are disabled, the field label will remain but the field itself will be empty.

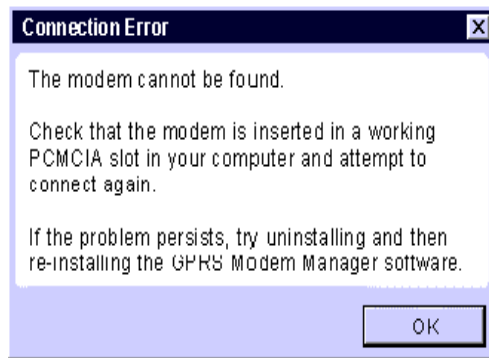


Error Messages

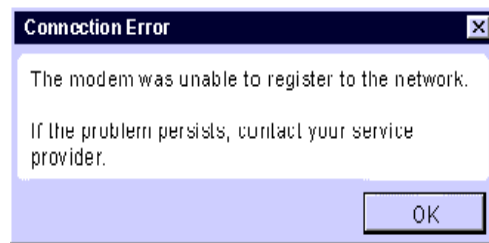
When the connection attempt fails because there is no service available, the following error message is provided.



If the user attempts to connect and the modem cannot be detected, the following error will be displayed.

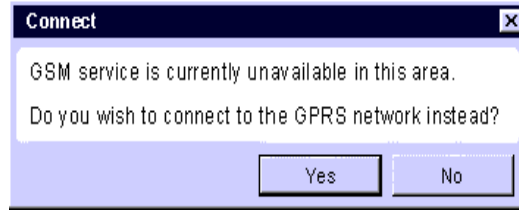


If the attempt to register was unsuccessful for other reasons, the message below will be provided.



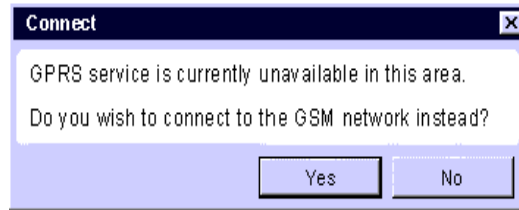
GPRS Connect Confirmation Dialog Box

This dialog box indicates to the user that GSM service is unavailable and asks them whether they wish to connect to the GPRS network instead.



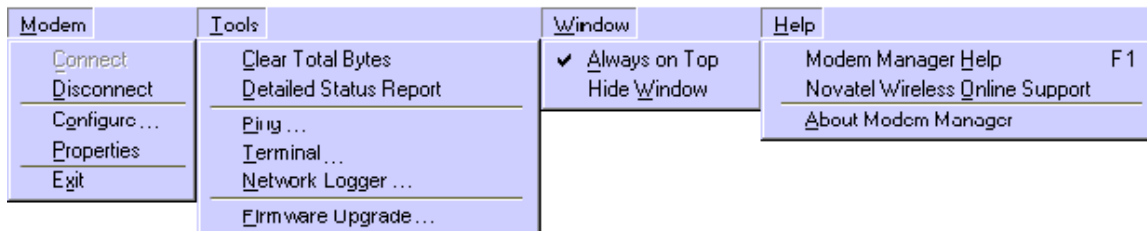
GSM Connect Confirmation Dialog Box

This dialog box indicates to the user that GPRS service is unavailable and asks them whether they wish to connect to the GSM network instead.

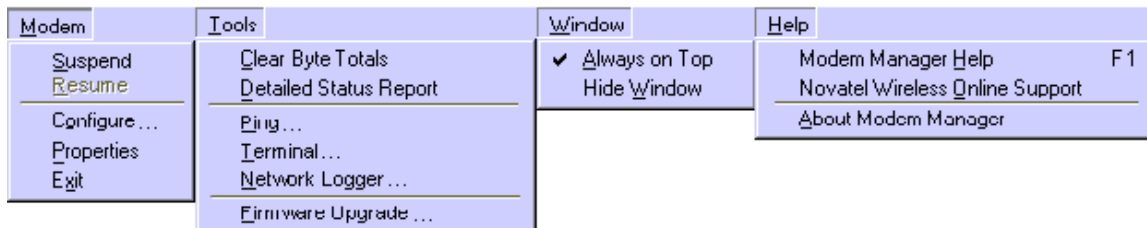


Menu Bar

The menu bar will be as follows for a DUN connection.



For a NIC connection, the menu bar will be as shown below.



A description of the intent of each menu is given in the table below.



<i>Menu</i>	<i>Description</i>
Modem	<p>All commands that directly manipulate or query the modem and are used on a daily basis.</p> <p>Similar to the <i>File</i> menu in a word processor.</p> <p>This menu can be accessed using the accelerator Alt+m.</p>
Tools	<p>All commands that manipulate or query the modem in order to diagnose a problem or test out the modem and/or its connection.</p> <p>This menu can be accessed using the accelerator Alt+t.</p>
Window	<p>All commands that involve the placement of the GPRS Modem Manager window on the desktop.</p> <p>This menu can be accessed using the accelerator Alt+w.</p>
Help	<p>All commands that involve information about the GPRS Modem Manager application including the online-help.</p> <p>This menu can be accessed using the accelerator Alt+h.</p>

The operation of commands in the menu bar is detailed in the tables on page 16.



<i>Menu</i>	<i>Command</i>	<i>Implementation</i>
Modem	Connect	<p>When selected, the modem attempts to initiate a data session.</p> <p>When a data session is already established, this command is disabled.</p> <p>This command is only provided for a DUN connection.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+c.</p>
	Disconnect	<p>When selected, the modem closes the data session.</p> <p>When a data session is not open, this command is disabled.</p> <p>This command is only provided for a DUN connection.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+d.</p>
	Suspend	<p>When selected, the data session is closed.</p> <p>When a data session is not open, this command is disabled.</p> <p>This command is only provided for a NIC connection.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+s.</p>
	Resume	<p>When selected, the modem attempts to resume the data session that was previously closed.</p> <p>When a data session is already established, this command is disabled.</p> <p>This command is only provided for a NIC connection.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+r.</p>
	Configure...	<p>When selected, opens the <i>Modem Configuration</i> dialog box, which is described in a later section.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+o.</p>



	Properties	<p>When selected, opens the <i>Modem Properties</i> dialog box, which is described in a later section.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+p.</p>
	Exit	<p>When selected, an open connection is closed and the GPRS Modem Manager application closes completely, removing the tray icon and main window from sight.</p> <p>Always enabled.</p> <p>This command can be accessed from within the <i>Modem</i> menu using the accelerator Alt+x.</p>



<i>Menu</i>	<i>Command</i>	<i>Implementation</i>
Tools	Clear Byte Totals	<p>When selected, the <i>Total Bytes Transferred</i>, <i>Total Bytes Received</i>, and <i>Total Bytes Sent</i> fields are cleared to 0 and the value for <i>Date Byte Totals Were Last Cleared</i> is set to the current date.</p> <p>This will always be enabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+c.</p>
	Detailed Status Report	<p>When selected, the <i>Detailed Status Report</i> dialog box will be opened, which is described in a later section.</p> <p>This will always be enabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+d.</p>
	Ping...	<p>When selected, the <i>Ping</i> utility will be opened.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+p.</p>
	Terminal...	<p>When selected, the <i>Terminal</i> utility will be opened.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+t.</p>
	Network Logger...	<p>When selected, the <i>Network Logger</i> utility will be opened.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+n.</p>
	Firmware Upgrade...	<p>When selected, the <i>Firmware Upgrade</i> utility will be opened.</p> <p>When the modem cannot be detected, this command is disabled.</p> <p>This command can be accessed from within the <i>Tools</i> menu using the accelerator Alt+f.</p>



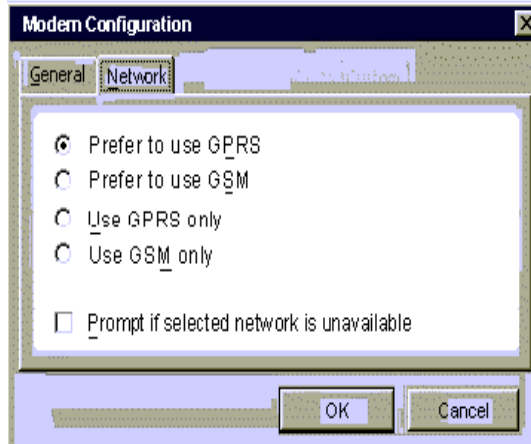
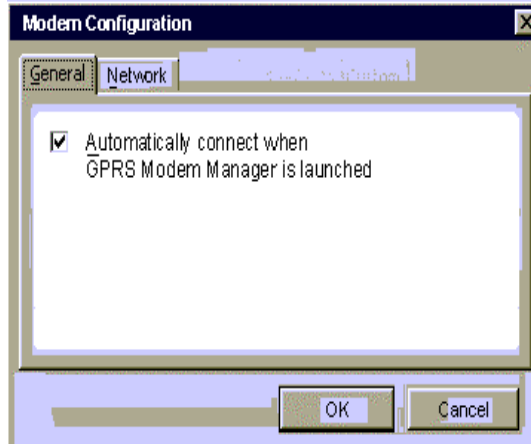
<i>Menu</i>	<i>Command</i>	<i>Implementation</i>
Window	Always on Top	<p>A check mark beside the text will indicate whether or not this option is selected.</p> <p>When selected, the window will always be displayed in front of any other active applications.</p> <p>When not selected, the window will be covered when other applications are made active.</p> <p>This command is always enabled.</p> <p>This command can be accessed from within the <i>Window</i> menu using the accelerator Alt+a.</p>
	Hide Window	<p>When selected, the main GPRS Modem Manager window is closed but the tray icon remains.</p> <p>The modem's network connection is not altered.</p> <p>This command is always enabled.</p> <p>This command can be accessed from within the <i>Window</i> menu using the accelerator Alt+w.</p>

<i>Menu</i>	<i>Command</i>	<i>Implementation</i>
Help	GPRS Modem Manager Help	<p>When selected, the online, context-sensitive GPRS Modem Manager help is launched.</p> <p>This command is always enabled.</p> <p>This command can be accessed from within the <i>Help</i> menu using the accelerator Alt+h.</p>
	Novatel Wireless Online Support	<p>Opens a new window of the default web browser to the support section of the Novatel Wireless website.</p> <p>This command is always enabled.</p> <p>This command can be accessed from within the <i>Help</i> menu using the accelerator Alt+o.</p>
	About GPRS Modem Manager	<p>Opens the <i>About GPRS Modem Manager</i> dialog box, which is described in a later section.</p> <p>This command is always enabled.</p> <p>This menu item can be accessed from within the <i>Help</i> menu using the accelerator Alt+a.</p>



Modem Configuration Dialog Box

The *Modem Configuration* dialog box displays fields that the user can change in order to configure and customize the modem. It will not include any fields that involve the operation of data sessions that are controlled separately by the OS. Multiple tabs are used to organize the fields. At the bottom of the window, the standard *OK* and *Cancel* buttons will be provided.



The table below explains the fields provided in this dialog box.

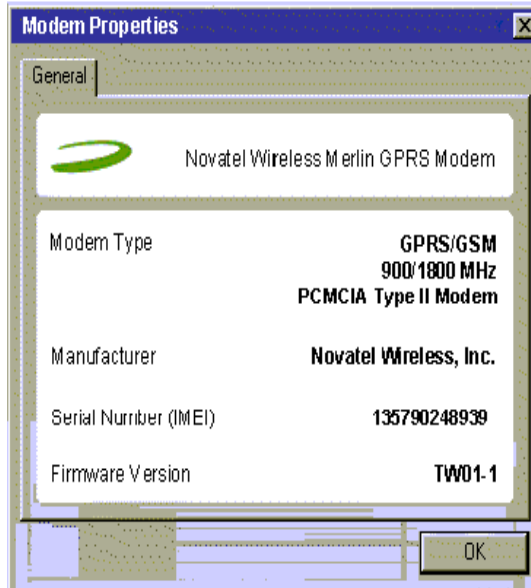


<i>Field/Control Label</i>	<i>Implementation</i>
Automatically connect...	<p>Checkbox that, when enabled, indicates that the modem will automatically attempt to connect when GPRS Modem Manager is launched.</p> <p>The default value upon installation is enabled.</p> <p>This option is always available.</p> <p>This command can be accessed by using Alt+a.</p>
-	<p>Set of radio buttons that specify which type of network the user would like to connect to. Default upon installation is <i>Prefer to use GPRS</i>.</p> <p>These radio buttons are always available.</p> <p>This command can be accessed by using Alt with the letter underlined in the image above for each item.</p>
Prompt if selected...	<p>Checkbox that, when selected, indicates that the user should be prompted if their selected network is unavailable.</p> <p>The default value upon installation is disabled or not selected.</p> <p>This option is always available.</p> <p>This command can be accessed by using Alt+p.</p>
Cancel	<p>Button that, when selected, does not save any changes to the configuration. The <i>Modem Configuration</i> dialog box closes and the main GPRS Modem Manager window becomes active.</p> <p>This button is always enabled.</p>
OK	<p>Button that, when selected, saves any changes to the configuration. The <i>Modem Configuration</i> dialog box closes and the main GPRS Modem Manager window becomes active.</p> <p>This button is always enabled.</p>

The *General* and *Network* tabs can be accessed using Alt+g and Alt+n, respectively.

Modem Properties Dialog Box

The *Modem Properties* dialog box displays the fields listed in the table below in a *General* tab. The dialog box must be closed before the main GPRS Modem Manager window can be made active.



The table below describes the implementation of each of the fields shown above.

<i>Field/Control Label</i>	<i>Implementation</i>
-	Simple text field displaying the <i>Modem Friendly Name</i> as described in the <i>Consistency & Naming Conventions Requirements Document</i> .
Modem Type	Simple text field displaying the type of modem. The modem type will be determined by querying the modem. The value returned may need to be formatted.
Manufacturer	Simple text field displaying the manufacturer of the modem. The manufacturer will be determined by querying the modem.
Serial Number (IMEI)	Simple text field displaying the serial number of the modem as provided by querying the modem.
Firmware Version	Simple text field displaying the version of the firmware currently installed in the modem as provided by querying the modem.
OK	Button that, when selected, closes <i>Modem Properties</i> dialog box and the main GPRS Modem Manager window becomes active. This button is always enabled.

Title Bar

The title bar will show the name *GPRS Modem Manager* to the left of the green Novatel Wireless “swoosh”, with the traditional buttons to close, minimize, and maximize the window.







Clicking the close button will close the main window but will not alter the connection and the tray icon will remain.

Tray Icon

When GPRS Modem Manager is first launched, the main window will be displayed. However, at any time, the GPRS Modem Manager can be hidden or minimized to a tray icon that will provide basic status information to the user. Depending on the status of the modem, the icon will change as outlined in the following table.

<i>Status</i>	<i>Icon Shown</i>
Modem not inserted or not detected OR Modem detected but no data session has been established, either because the user has not chosen to connect yet or there is an error	
Modem detected and a data session is currently established	

If only the tray icon is open and the main window has been closed, the user can open the main window again by re-launching the application using the entry in the *Start* menu.

User Interaction During Connection

In order to illustrate how the user will interface with the software when a successful connection attempt occurs, the following sections are provided.

Connecting Using Dial-Up Networking Connection Icons

The user can also attempt to connect without using GPRS Modem Manager by clicking the DUN icons created when the software is installed. One will be for GSM service and the other for GPRS. In this case, all user feedback will be provided by the Windows dial-up networking utilities.



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