

Mobile WiMAX PCMCIA Card User Guide

User Guide

Mobile WiMAX PCMCIA Card

IEEE 802.16e 2.5/3.5 GHz WiMAX PCMCIA Card

WM8931BE
WM8921BE
E062007-CS-R01
149xxxxxxxx

Compliances

Federal Communication Commission Interference Statement

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 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

This device complies with Part 15 of the FCC Rules. 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 Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE: FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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

SAR compliance has been established in typical laptop computer(s) with CardBus slot, and product could be used in typical laptop computer with CardBus slot. Other application like handheld PC or similar device has not been verified and may not compliance with related RF exposure rule and such use shall be prohibited.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

EC Conformance Declaration

Marking by the above symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards:

- EN 60950-1 (IEC 60950-1) - Product Safety
- EN 301 489-1, EN 301 489-4 - EMC requirements for radio equipment
- EN 50392 - Country specific SAR requirements

This device is intended for use in all European Community countries:

About This Guide

Purpose

This guide details the hardware features of the PCMCIA Card, including its physical and performance-related characteristics, and how to install the device and use its configuration software.

Audience

This guide is for PC users with a working knowledge of computers. You should be familiar with Windows operating system concepts.

Conventions

The following conventions are used throughout this guide to show information:

Note: Emphasizes important information or calls your attention to related features or instructions.

Caution: Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

Warning: Alerts you to a potential hazard that could cause personal injury.

Related Publications

The following publication gives basic information on how to install and use the PCMCIA Card:

Quick Start Guide

Also, as part of the PCMCIA Card's software, there is online help that describes all configuration related features.

Revision History

This section summarizes the changes in each revision of this guide.

June 2007 Revision

This is the first revision of this guide.

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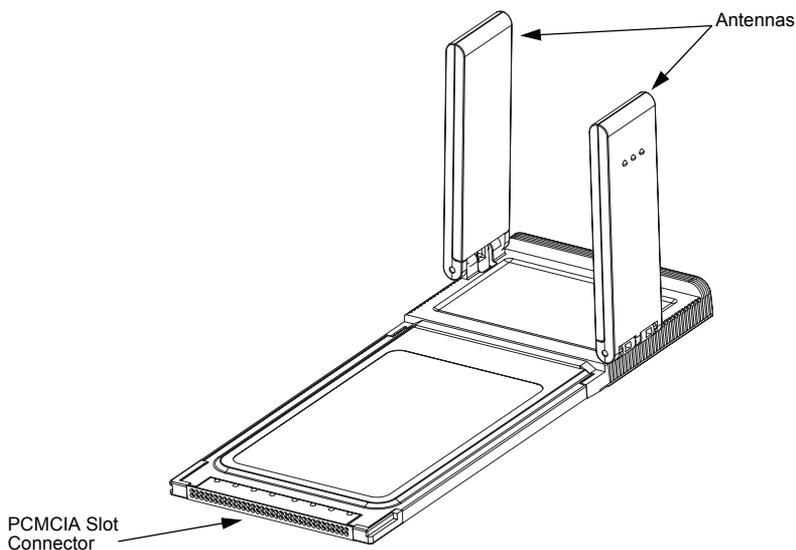
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Chapter 1: Introduction

The Mobile WiMAX PCMCIA Card is a network adapter that enables a notebook PC to connect to a service provider's 2.5 or 3.5 GHz mobile WiMAX network.

The PCMCIA card plugs directly into a compatible card slot and includes its own driver and configuration software for Windows XP and Windows Vista. The card includes two folding antennas that can be adjusted for best signal reception. When connected to a WiMAX base station, the card is capable of providing a maximum download data rate of 4 Mbps and an upload rate of 1.5 Mbps.



Features

- Provides a maximum download data rate of 4 Mbps and an upload rate of 1.5 Mbps
- Easy installation with a user-friendly interface for configuration
- Working range up to 5 km (3 miles) from base station
- Scalable Orthogonal Frequency Division Multiple Access (OFDMA) wireless technology provides a robust, interference-resistant connection
- Driver support for Windows XP with Service Pack 2 (SP2) and Windows Vista
- Strong network security with PKMv2, EAP-TLS, and EAP-TTLS support

System Requirements

Before you install the Wireless PC Card, check your system for the following:

- A notebook PC with a PCMCIA Type II slot
- Windows XP with Service Pack 2 or Windows Vista
- An account with a WiMAX (IEEE 802.16e) service provider operating a mobile service in the licensed 2.5 and 3.5 GHz bands

Package Checklist

The Wireless PC Card package includes:

- Mobile WiMAX PCMCIA Card
- Driver and utility CD (includes this User Guide)
- Quick Start Guide Flyer
- Safety notice

Please inform your dealer if there are any incorrect, missing, or damaged parts. If possible, retain the carton, including the original packing materials, in case there is a need to return the product.

Hardware Description

The WiMAX PCMCIA Card is fully compliant with the specifications defined in IEEE 802.16e-2005 WAVE 1. It can be installed in any notebook PC with a Type II PCMCIA-compatible slot. The notebook PC must be running Windows XP with Service Pack 2 or Windows Vista.

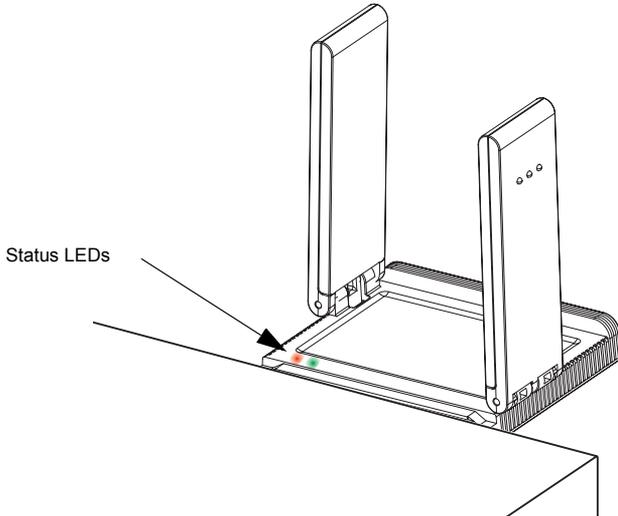
Antennas

The WiMAX PCMCIA Card includes two fold-out antennas for wireless communications. The antennas operate in a Maximal-Ratio Combining (MRC) mode when receiving, helping to avoid multipath fading effects. When transmitting, the card only uses one antenna.

LED Indicators

The WiMAX PCMCIA Card includes two status LED indicators. The indicators are visible through the card's black plastic case when it is inserted into a PCMCIA slot.

The LEDs are described in the following figure and table.



LED	Status	Description
Red	On	The card is correctly installed in a PCMCIA slot and is receiving power.
Green	On	The card has a valid link with a WiMAX base station.

Chapter 2: Installation

Warning: Network cards are sensitive to static electricity. To protect the card, always touch the metal chassis of your computer or the ground to equalize the static charges, before handling the card.

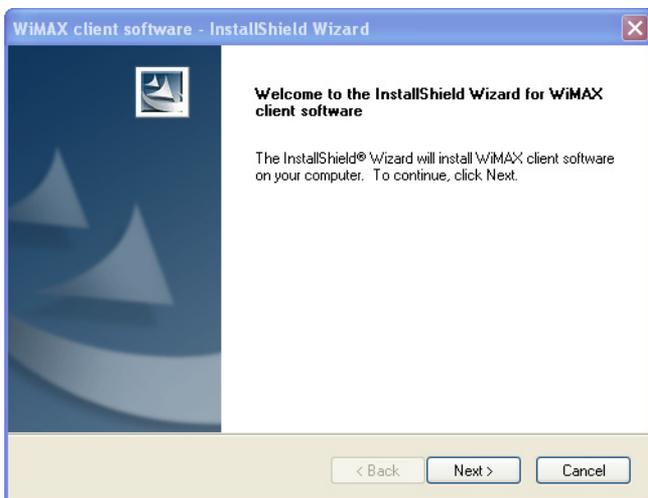
To install the card's driver and utilities for Windows XP or Windows Vista, the card must be either first inserted in an available PCMCIA slot, or inserted during the set-up procedure. When you first insert the card in a slot, the Windows "Found New Hardware" dialog box displays. Just click Cancel.

Note: If you encounter problems installing the PCMCIA card, see "Troubleshooting" on page A-1.

To set up the card's Windows driver and utilities, follow these steps:

1. Turn on your notebook and wait until the Windows system has completely started.
2. Load the driver and utility CD that comes with the package. The install program should start automatically.

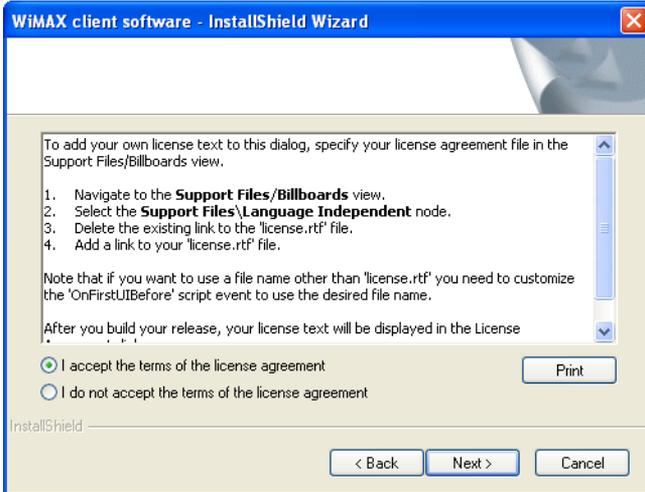
If the install program does not start automatically, open the folder that displays the CD's contents and find the file "WinemaCM_Install.exe" in the root directory. Double click the file to start the install program.



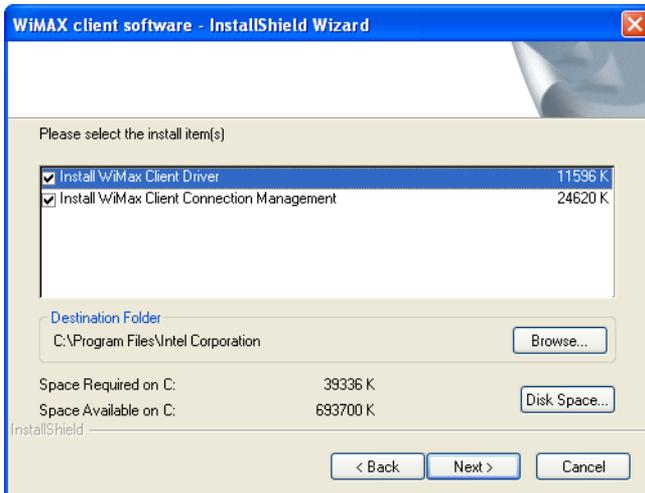
3. Click Next to continue the installation.

Installation

4. Select the “I accept the terms of the license agreement” radio button, then click Next.



5. Select the software and utilities you want to install. Be sure both the WiMAX Client Driver and WiMAX Client Connection Management are selected. Confirm the installation location before clicking Next.



6. If the following message is displayed, you need to insert the WiMAX card in an available PCMCIA slot on the PC. (Note that this message will not display if you already inserted the card in a slot before starting this set-up procedure.)



Find an available PCMCIA slot in your notebook and with the card's 68-pin connector facing the slot, slide the card completely into the slot. When the card is inserted correctly, the green LED on the card turns on (see page 1-3).

Click OK to continue the installation.

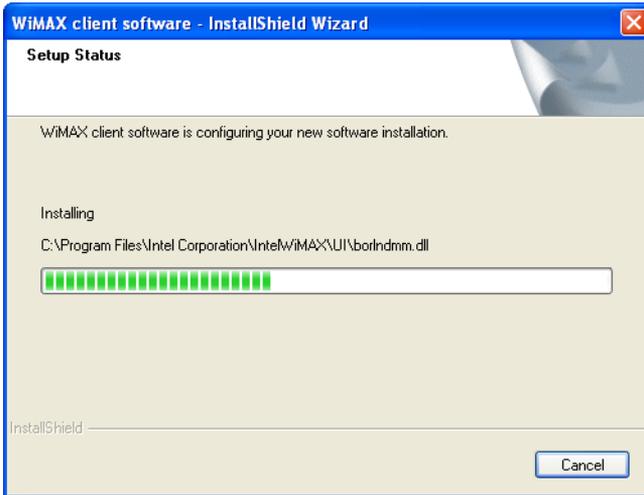
Note: If the Windows "Found New Hardware" dialog box displays, click Cancel.

7. When the following warning message concerning Windows Logo testing is displayed, click the "Continue Anyway" button.

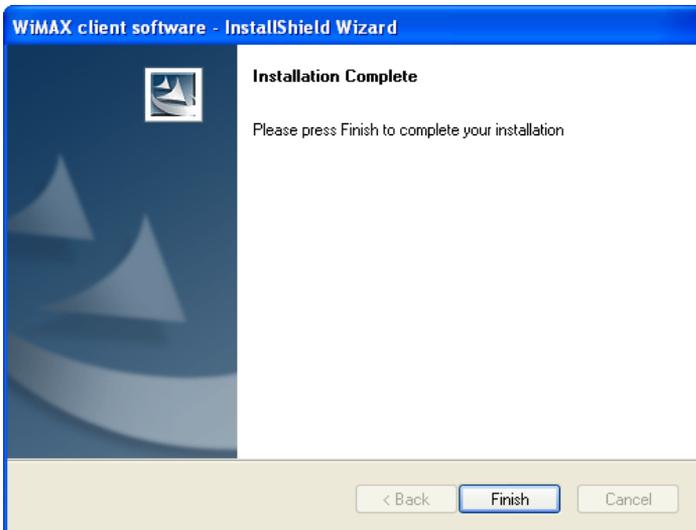


Installation

8. Wait for the software installation procedure to complete.



9. When the "Installation Complete" message displays, click Finish.

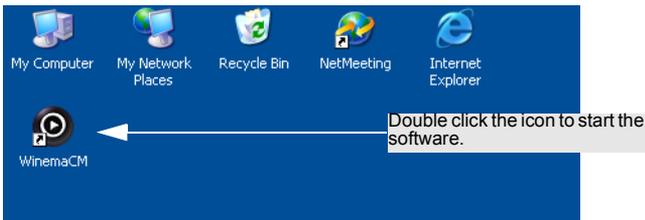


Chapter 3: Quick Setup

This section shows how to quickly configure the Mobile WiMAX PCMCIA Card and connect to your WiMAX service provider.

Starting the WiMAX Connection Manager

After the driver and utility software installation, a shortcut icon “WinemaCM” appears on the Windows XP or Windows Vista desktop. Double-click on the icon to start the Winema Connection Manager, or find the WinemaCM entry in the Windows Start menu.



Alternatively, just insert the PCMCIA Card into a slot and the WinemaCM utility starts automatically.

The WinemaCM main screen is shown below.

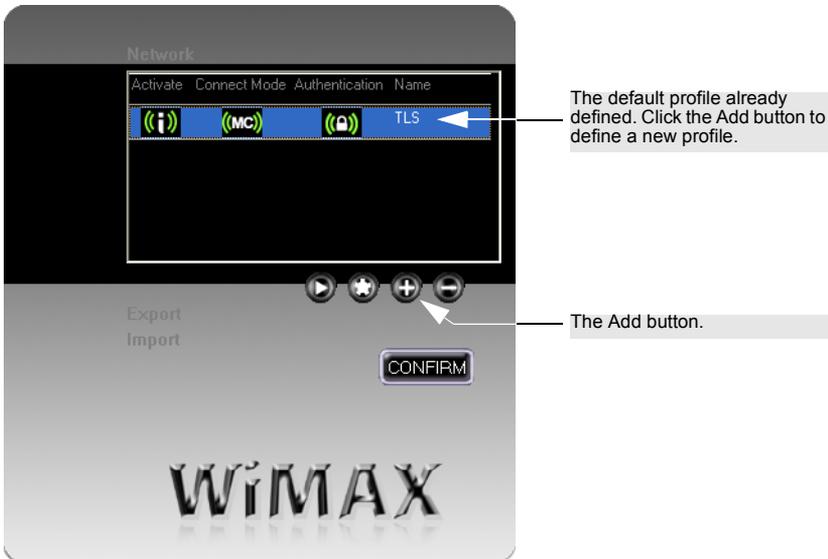


Setting a Profile

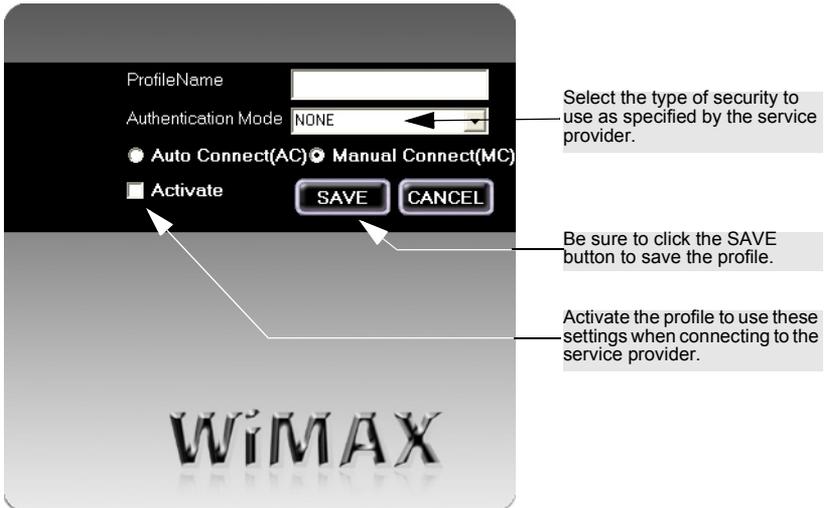
Before connecting to your WiMAX service provider, you need to configure a “Profile” that defines the service providers security settings. There is one default profile named “TLS” already configured.

Follow these steps:

1. From the WinemaCM main screen, click the PROFILE button.



2. From the PROFILE screen, click the Add button.



3. In the Add PROFILE screen, define a name to identify the profile, select Auto or Manual Connect, then set the Authentication Mode specified by the service provider.

Check the Activate checkbox to use the defined profile, then click the SAVE button.

Note: Once you save the profile, the Connection Manager will remember the last configuration.

Quick Setup

4. The PROFILE screen displays the new profile. Click the Confirm button to close this Window.



Note: If your service provider supplies a defined profile in a file, use the Import button to import the file instead of configuring the profile details manually.

Connecting to a WiMAX Service

When you have set up a profile, you are ready to connect to the service provider's WiMAX network.

Follow these steps:

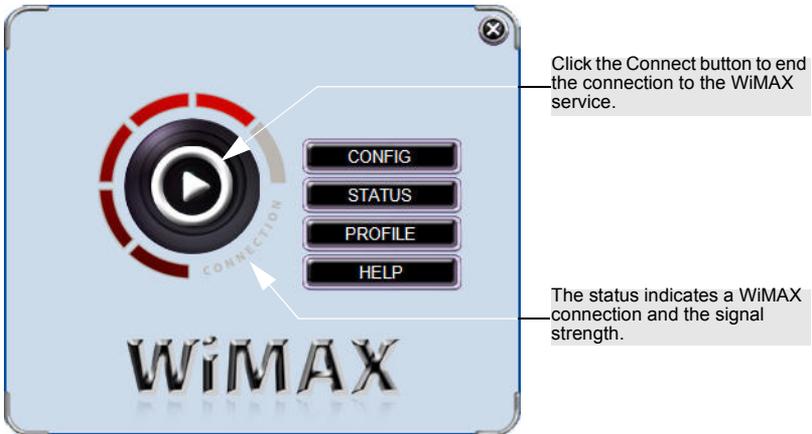
1. Insert the PCMCIA card into the PC's slot. The WinemaCM software starts automatically.

Note: If WinemaCM does not start automatically, remove the card and reinsert it again. If the problem continues, reinstall WinemaCM or contact your local service support center.

2. From the WinemaCM main screen, click the Connect button.
(Note that this step is not necessary if the active profile is set to Auto Connect.)



3. Wait for the status to indicate "CONNECTION" in the WinemaCM main screen.



4. When you have finished your WiMAX network session, click the Connect button to end the session, or just pull the PCMCIA card out of the slot.

Note: If you encounter problems installing the PCMCIA card or connecting to the WiMAX network, see "Troubleshooting" on page A-1.

Chapter 4: Configuration

The WinemaCM software provides all the tools to manage and monitor your WiMAX connection. After initial installation, the software starts automatically every time you insert the Mobile WiMAX PCMCIA Card.

The WinemaCM software has four main components:

- **Main Screen** — Starts and ends a connection, and displays connection status.
- **Software Configuration** — Settings for WinemaCM features.
- **Profile Configuration** — Configures and activates connection profiles.
- **Status Information** — Current connection details, IP settings, software information, and software upgrade.

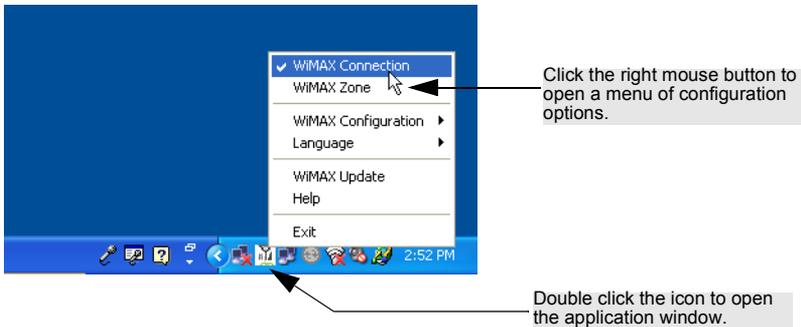
Using WinemaCM

There are several methods of starting the WinemaCM software other than by inserting the Mobile WiMAX PCMCIA Card.

From a shortcut icon on the Windows XP or Windows Vista desktop:

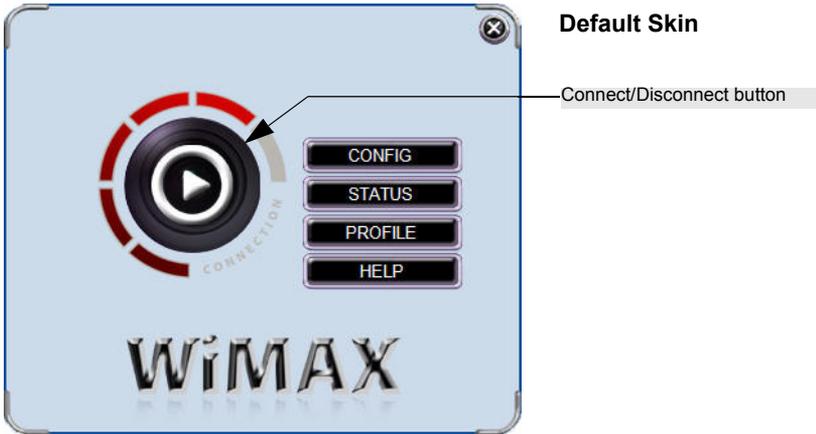


From an icon on the Windows XP Taskbar:



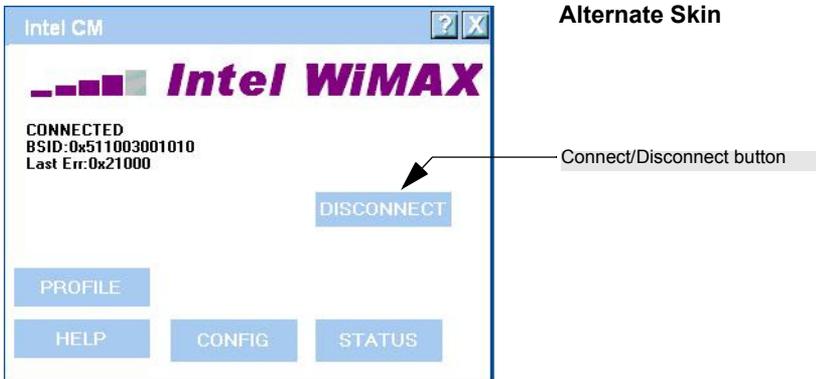
Configuration

The WinemaCM software has two display options, or “skins,” to choose from. The main screens for the two skins are shown below.



Default Skin

Connect/Disconnect button



Alternate Skin

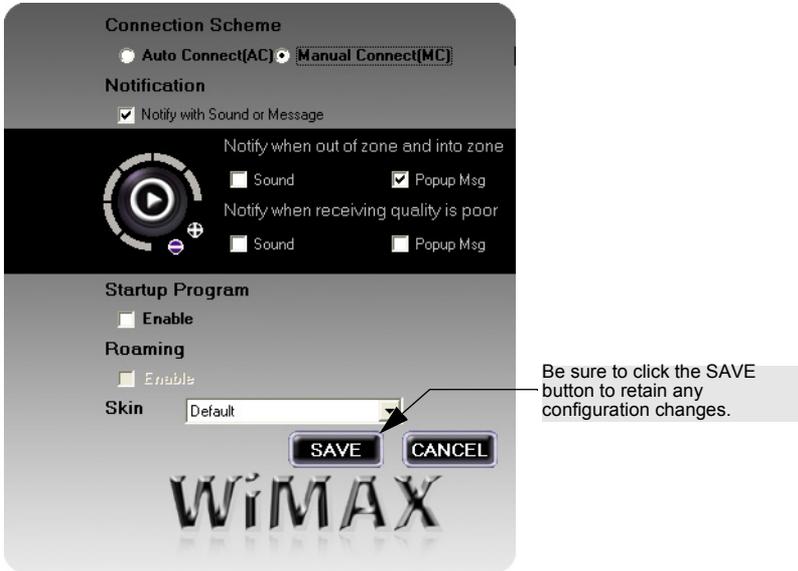
Connect/Disconnect button

Other than the display style, there are no function differences between the Default Skin and the Alternate Skin. You can select the skin type from the Config screen.

This manual describes the WinemaCM software for the Default Skin.

The Config Screen

From the WinemaCM main screen, click the CONFIG button to open the Config screen. The settings available from this screen control various features of the software. These settings are described below:



- **Connection Scheme** — Sets the software to automatically connect to a WiMAX service or to connect only when the user clicks the Connect button.

Note: The Connection Mode set in a profile has a higher priority and overrides the Connection Scheme setting on this screen.

- **Notification** — Enables notifications to tell the user when the receive signal is poor and if the user moves outside the WiMAX coverage zone.
- **Startup Program** — Sets the WinemaCM software to start when Windows XP or Windows Vista starts.
- **Roaming** — *Roaming is not supported by the current software.*
- **Skin** — Selects the display type for the WinemaCM software.

Note: Be sure to always click the SAVE button to apply your changes.

Notification Settings

When Notifications are enabled on the Config screen, the settings for notification events is displayed.

The zone notification either makes a sound or displays a pop-up message everytime the user moves into or out of a WiMAX service zone.

The signal quality notification either makes a sound or displays a pop-up message everytime the WiMAX signal level falls below the defined threshold.

To set the signal quality threshold, click the plus or minus buttons on the Connect button icon. The signal quality threshold is indicated by red colored segments on the signal strength display.



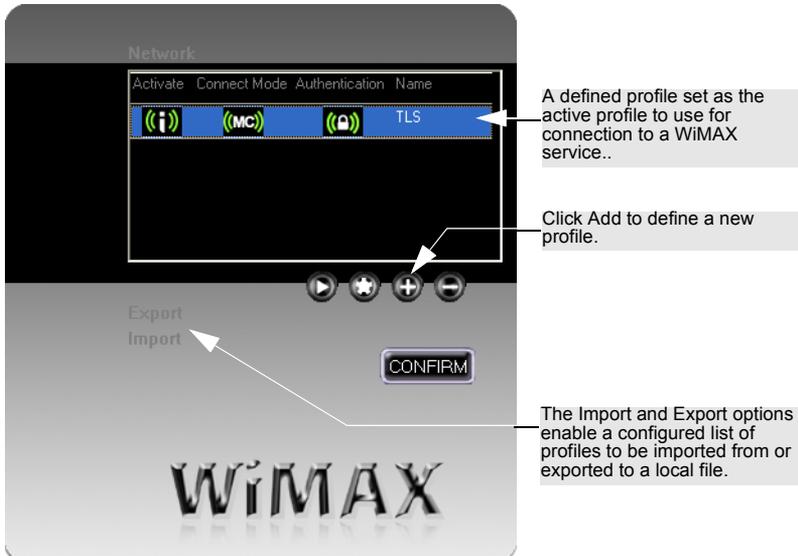
Click the plus and minus buttons to set the signal quality threshold.

The Profile Screen

From the WinemaCM main screen, click the PROFILE button to open the Profile screen. This screen enables one or more connection profiles to be configured, one of which is set as the “active” profile. Each profile can define different security settings and connection options that can be applied for different service providers.

There is one default profile named “TLS” already configured.

The Profile screen is described below.



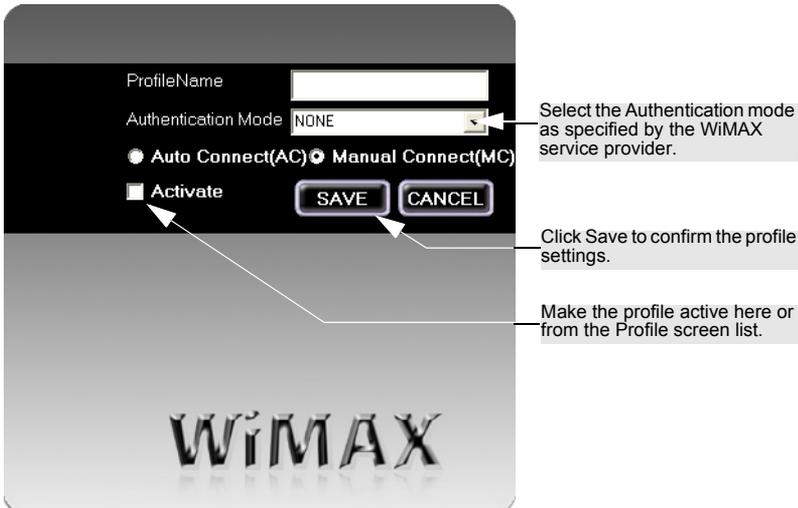
- **The Profile List** — The list of defined profiles. The four columns describe the following properties of the profile:
 - **Activate:** Indicates if the profile is set as the active profile to be used to connect to the WiMAX service provider.
 - **Connect Mode:** Indicates if the profile is set to connect automatically.
 - **Authentication:** Indicates if some form of security has been configured for the profile.
 - **Name:** A descriptive name that identifies the profile in the list.
- **Add (+)** — Adds a new profile to the list.
- **Modify (*)** — Changes properties for the selected profile in the list.
- **Delete (-)** — Removes the selected profile from the list.

Configuration

- **Activate (>)** — Sets the selected profile as the active profile to be used to connect to the WiMAX service provider.
- **Import** — Imports a profile list from a file.
- **Export** — Exports a profile list to a file.

Profile Settings

From the Profile screen, click on the Add button to create a new profile, or click on the Modify button to change settings for the selected profile. Both the Add and Modify buttons open the Profile Settings window, which is described below.



- **Profile Name** — A descriptive name that identifies the profile in the list.
- **Authentication Mode** — The type of security used to connect to the WiMAX service. (See “Authentication Settings” on page 4-7 for more information.)
 - **NONE:** No security is used to connect to the WiMAX network.
 - **TLS:** Transport Layer Security (TLS) uses public key certificates issued by a trusted certificate authority to provide mutual authentication for the connection. A certificate file needs to be stored locally on the client.
 - **TTLS_MSCHAPV2:** Tunneled Transport Layer Security (TTLS) with the Microsoft Challenge-Handshake Authentication Protocol version 2 (MSCHAPv2) uses a public key certificate on the network side to establish a secure connection, or “tunnel,” to the client. Authentication is then completed using a user name and password. You must enter the user name and password as specified by the service provider.

- **Auto Connect** — The profile is used to automatically connect to the WiMAX service.
- **Manual Connect** — The profile is only used to connect to the WiMAX service when the Connect button is clicked.
- **Activate** — Sets the profile as the active profile that is used to connect to the WiMAX service. Only one profile can be active at one time.

Authentication Settings

There are currently two security options available to authenticate and encrypt a connection between a client and the WiMAX network. This section provides more information on setting up these options.

TLS Settings

If your service provider specifies TLS security for your WiMAX connection, a public key certificate file should be provided for installation on the client.



The certificate file can be stored anywhere on the client PC. However, the location of the file must be specified by editing the path entry in the Windows registry.

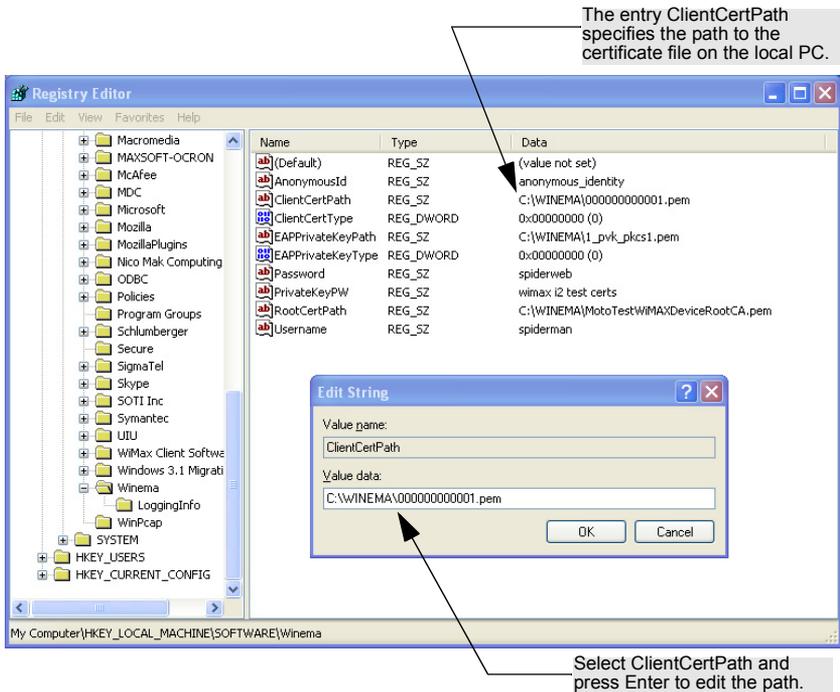
To specify the path in the Windows registry, follow these steps:

1. From the Windows Start menu, select Run, then enter "regedit" to open the Registry Editor.
2. Find the registry entry "HKEY_LOCAL_MACHINE\SOFTWARE\Winema."
3. Locate the entries "ClientCertPath," "EAPPrivateKeyPath," and "RootCertPath."

Configuration

Note: The EAPPrivateKey also needs to be updated. Be sure the EAPPrivateKey type and Client certificate type are set to the correct values and that the RootCertPath is specified.

4. Press Enter to edit each entry. Specify the full path to each file, including the file name. Make sure that the files are in the locations specified. Click OK.



5. Locate the entries "AnonymousId" and "PrivateKeyPW" and specify the values, then click OK

TTLS_MSCHAPV2 Settings

If your service provider specifies TTLS-MSCHAPv2 security for your WiMAX connection, a user name and password should be provided for entry on the client.

ProfileName: TTLS Connect

Authentication Mode: TTLS_MSCHAPV2

Username: spiderman

PassWord: *

PassWord Again: *

Auto Connect(AC) Manual Connect(MC)

Activate

SAVE CANCEL

WiMAX

TTLS_MSCHAPV2 security requires a user name and password to be entered locally on the client.

Be sure to enter the user name and password exactly as specified by the service provider. The password must be confirmed by entering it twice. Then click Save to save the profile.

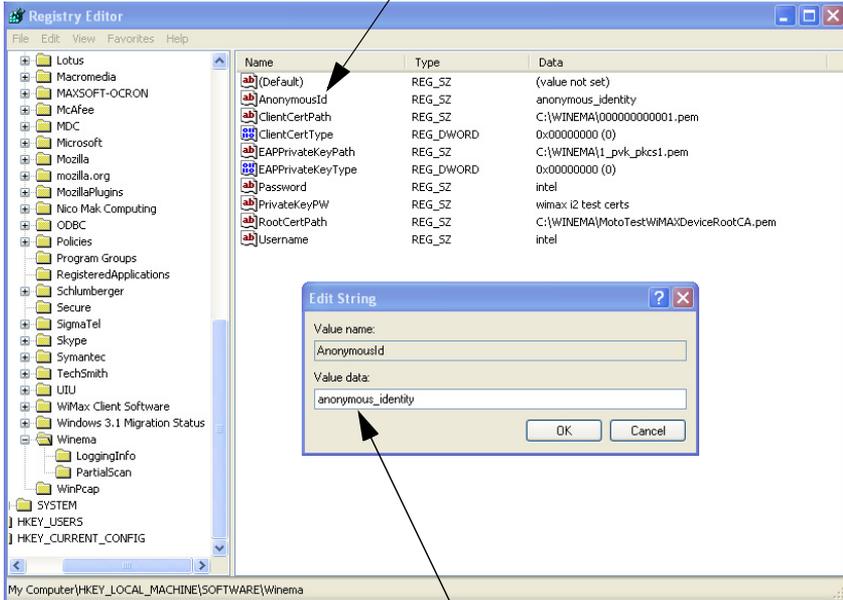
The AnonymousId setting in the Windows registry must also be set for the authentication server.

To specify AnonymousId setting in the Windows registry, follow these steps:

1. From the Windows Start menu, select Run, then enter "regedit" to open the Registry Editor.
2. Find the registry entry "HKEY_LOCAL_MACHINE\SOFTWARE\Winema."
3. Locate the entry "AnonymousId."
4. Press Enter to edit the entry. Click OK.

Configuration

Select AnonymousId and press Enter to edit the value.



Set the value as required for the authentication server.

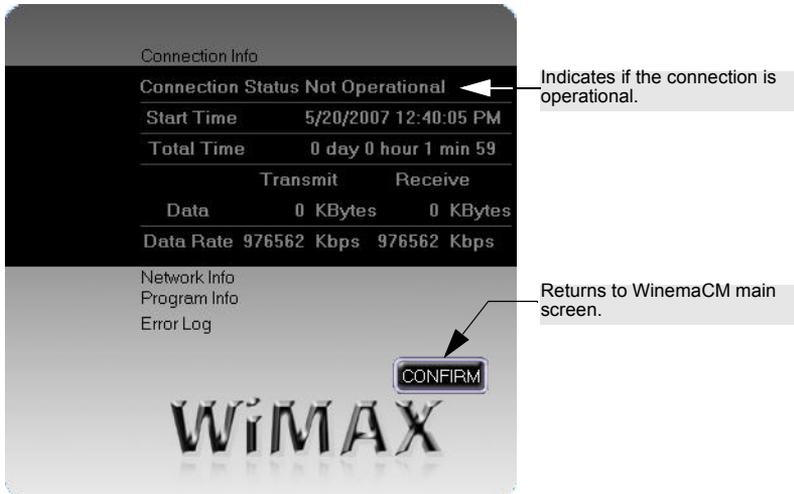
Note: When the Root Certificate Path (RootCertPath) is specified, the root certificate authority (RootCA) is verified. Be sure that the RootCA exists at the specified location. When the RootCertPath is set to "NULL," verification is skipped.

The Status Screen

The Status screen provides current connection information. The software information screen also enables updated software to be downloaded.

Connection Info

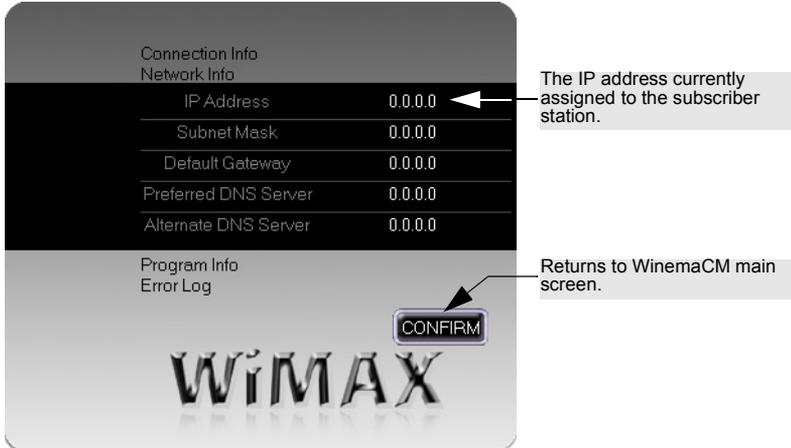
The Connection Info screen displays basic information about the WiMAX connection. The displayed items are described below:



- **Connection Status** — Displays “Operational” when the WiMAX connection is valid and “Not Operational” when there is no connection.
- **Start Time** — The date and time when the connection was established.
- **Total Time** — The total time since the connection was established.
- **Data** — The total amount of data in Kbytes that have been transmitted and received.
- **Data Rate** — The current rate in Kbps at which data is being transmitted and received.

Network Info

The Network Info screen displays the current Internet Protocol (IP) settings as assigned to the subscriber station by the service provider. The displayed items are described below:

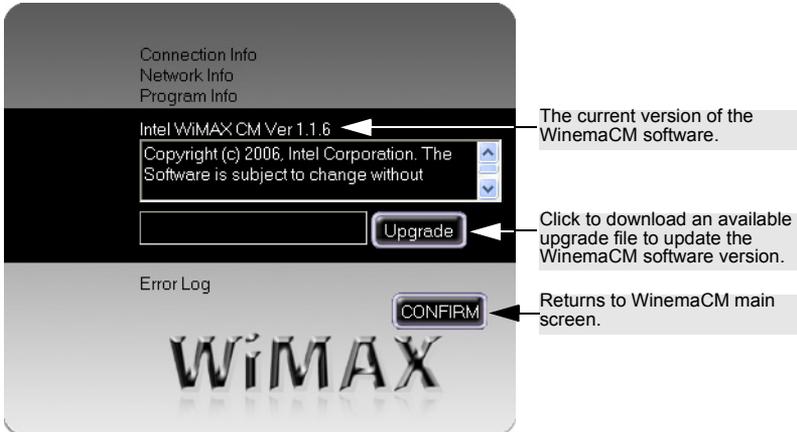


- **IP Address** — The IP address assigned to the subscriber station by the service provider. Valid IP addresses consist of four decimal numbers, 0 to 255, separated by periods.
- **Subnet Mask** — The IP subnet mask specified by the service provider. The mask identifies the host address bits used for routing to other subnets.
- **Default Gateway** — The gateway router IP address specified by the service provider. The default gateway is the IP address of the router that is used if the requested destination address is not within the local subnet.
- **Preferred DNS Server** — IP address of the primary Domain Name server specified by the service provider. A DNS server maps numerical IP addresses to domain names and can be used to identify network hosts by familiar names instead of IP addresses.
- **Alternate DNS Server** — IP address of a secondary Domain Name server.

Program Info

The Program Info screen displays information about the WinemaCM software and provides a facility to download an upgrade software file.

The displayed items are described below:



Software Upgrade

Click the “Upgrade” button to download an installation file that upgrades the WinemaCM software. If a new version of software is available, the upgrade file will be downloaded to the PC. The progress of the download is displayed on the screen next to the Upgrade button.

Once the upgrade installation file is downloaded, run the file to update the WinemaCM software.

Note: If you need to uninstall the WinemaCM software, see “Uninstalling the WinemaCM Software” on page A-2.

How to Modify the Upgrade Server Location

The upgrade server location is specified as a web address in the Windows registry.

To change the upgrade server web address in the Windows registry, follow these steps:

1. From the Windows Start menu, select Run, then enter “regedit” to open the Registry Editor.
2. Find the registry entry “HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\WiMAX.”
3. Locate the entry “Upgrade URL” and press Enter to edit the web address.

Configuration

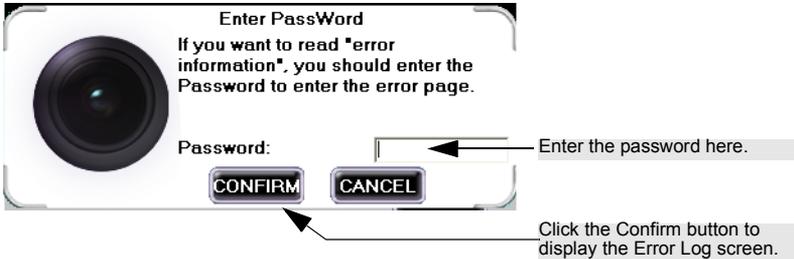
Name	Type	Data
(ab) (Default)	REG_SZ	(value not set)
(ab) AdapterMatchStr	REG_SZ	Broadcom
(f) AuthMode	REG_DWORD	0x00000000 (0)
(f) ConnectMode	REG_DWORD	0x00000001 (1)
(f) DefaultSkin	REG_DWORD	0x00000000 (0)
(f) DeviceCheckGUID	REG_BINARY	44 89 49 ad 2f 76 d0 11 8d cb 00 c0 4f c3 35 8c
(ab) DeviceCheckStr	REG_SZ	PCMCIA#Beceem
(f) DisplayErrorPage	REG_DWORD	0x00000001 (1)
(ab) ErrPagePassword	REG_SZ	1234
(f) NotifyOutZone	REG_DWORD	0x00000000 (0)
(f) NotifyOutZonePopup	REG_DWORD	0x00000000 (0)
(f) NotifyOutZoneSound	REG_DWORD	0x00000000 (0)
(f) NotifySignalBelow	REG_DWORD	0x00000000 (0)
(f) NotifySignalBelowLevel	REG_DWORD	0x00000000 (0)
(f) NotifySignalBelowPopup	REG_DWORD	0x00000000 (0)
(f) NotifySignalBelowSound	REG_DWORD	0x00000000 (0)
(f) PartialScan	REG_DWORD	0x00000001 (1)
(f) Roaming	REG_DWORD	0x00000000 (0)
(f) RoamingType	REG_DWORD	0x00000000 (0)
(ab) SkinName	REG_SZ	IntelSkin
(ab) SW_FileName	REG_SZ	WinemaCM_Install_1.1.4.exe
(ab) SW_VersionFileName	REG_SZ	SW_ver.bin
(f) SyncBandwidth	REG_DWORD	0x00002710 (10000)
(ab) SyncBSID	REG_SZ	7 l l l l
(f) SyncCenterFreq	REG_DWORD	0x00266bf0 (2518000)
(f) SyncPreambleId	REG_DWORD	0x00000008 (8)
(ab) Upgrade URL	REG_SZ	http://upgrade.intel.com

Select UpgradeURL and press Enter to edit the web address.

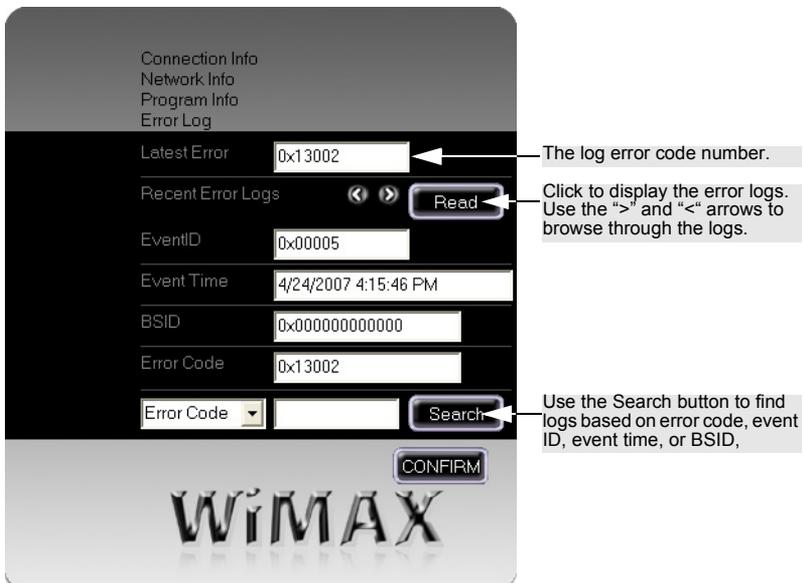
Error Log

The Error Log screen requires a password to access the displayed information. The error logs can help the service provider troubleshoot problems with the WiMAX connection.

Enter the password as specified by the service provider. The default password is "1234."



The displayed items are described below:



- **Latest Error** — The error code number of the latest log entry.
- **Recent Error Logs** — Click the Read button to display the first log entry, then use the arrow buttons to browse through other log entries.
- **Event ID** — The number that identifies the error log entry.

Configuration

- **Event Time** — The time the error log entry occurred.
- **BSID** — The identifier number of the WiMAX base station with which the subscriber station is connected.
- **Error Code** — The error code number of the log entry.
- **Search** — Enables the user to search for specific log entries based on error code, event ID, event time, or BSID. Select the search key from the pull-down list, specify the log detail to search for, then click the Search button.

How to Modify the Error Log Password

The Error Log access password is specified in the Windows registry.

To change the Error Log access password in the Windows registry, follow these steps:

1. From the Windows Start menu, select Run, then enter “regedit” to open the Registry Editor.
2. Find the registry entry “HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\WiMAX.”
3. Locate the entry “ErrPagePassword” and press Enter to edit the value.

Name	Type	Data
(Default)	REG_SZ	(value not set)
AdapterMatchStr	REG_SZ	Broadcom
AuthMode	REG_DWORD	0x00000000 (0)
ConnectMode	REG_DWORD	0x00000001 (1)
DefaultSkin	REG_DWORD	0x00000000 (0)
DeviceCheckGUID	REG_BINARY	44 89 49 ad 2f 76 d0 11 8d cb 00 c0 4f c3 35 8c
DeviceCheckStr	REG_SZ	PCMCIA#Beceem
DisplayErrorPage	REG_DWORD	0x00000001 (1)
ErrPagePassword	REG_SZ	1234
NotifyOutZone	REG_DWORD	0x00000000 (0)
NotifyOutZonePopup	REG_DWORD	0x00000000 (0)
NotifyOutZoneSound	REG_DWORD	0x00000000 (0)
NotifySignalBelow	REG_DWORD	0x00000000 (0)
NotifySignalBelowLevel	REG_DWORD	0x00000000 (0)
NotifySignalBelowPopup	REG_DWORD	0x00000000 (0)
NotifySignalBelowSound	REG_DWORD	0x00000000 (0)
PartialScan	REG_DWORD	0x00000001 (1)
Roaming	REG_DWORD	0x00000000 (0)
RoamingType	REG_DWORD	0x00000000 (0)
SkinName	REG_SZ	IntelSkin
SW_FileName	REG_SZ	WinemaCM_Install_1.1.4.exe
SW_VersionFileName	REG_SZ	SW_ver.bin
SyncBandwidth	REG_DWORD	0x00002710 (10000)
SyncBSID	REG_SZ	7 1111
SyncCenterFreq	REG_DWORD	0x00266bf0 (2518000)
SyncPreambleId	REG_DWORD	0x00000008 (8)
Upgrade URL	REG_SZ	http://upgrade.intel.com

Select ErrPagePassword and press Enter to edit the value.

Appendix A: Troubleshooting

Diagnosing LED Indicators

Troubleshooting Chart		
LED Status	Probable Cause	Action
Red LED is Off	The PCMCIA card is not receiving power	<ul style="list-style-type: none">• Remove the PCMCIA card and reinsert it in the slot. Be sure the card is securely seated in the slot.• Try the card in another PCMCIA slot. If this also fails, test your PC with another card that is known to operate correctly.• Check the PCMCIA card and slot connectors for any physical damage.• Try the card in another PC's slot that is known to operate correctly.• If you cannot resolve the problem, contact your local dealer for assistance.
Green LED is Off	The PCMCIA card cannot detect a WiMAX base station	<ul style="list-style-type: none">• Verify the area covered by your service provider.• Move to a location closer to the WiMAX base station.

Network Connection Problems

If you cannot access the Internet from the PC, check the following:

- Make sure the WinemaCM software and driver is correctly installed on your system. If necessary, try uninstalling and reinstalling the software.
- If you cannot access the Internet, be sure your Windows system is correctly configured for TCP/IP. The IP settings should be set to "obtain an IP address automatically."
- You may have moved out of the service area of the WiMAX base station. The WinemaCM main screen should indicate that there is no connection. Call the service provider for service coverage information.
- The service provider's profile may not be configured correctly. Check that the Authentication Mode settings are correct.
- If you cannot resolve the problem, check the error logs from the WinemaCM Status screen and contact your service provider. See "WinemaCM Error IDs" on page A-3 for more information.

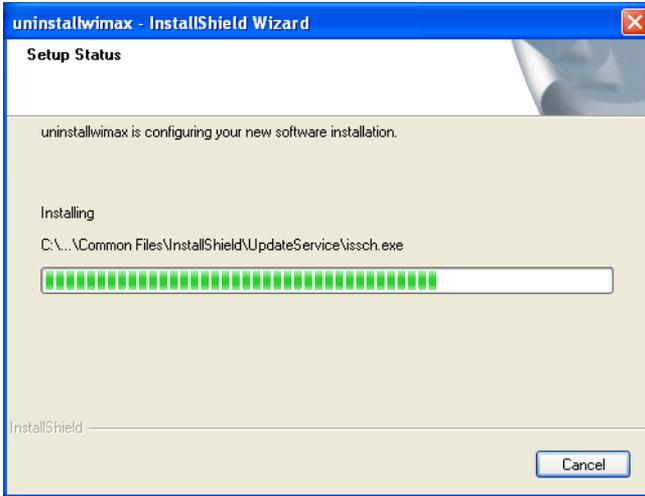
Uninstalling the WinemaCM Software

If you are having problems with the WiMAX PCMCIA card or the WinemaCM software, you may need to uninstall the card driver and software from the system.

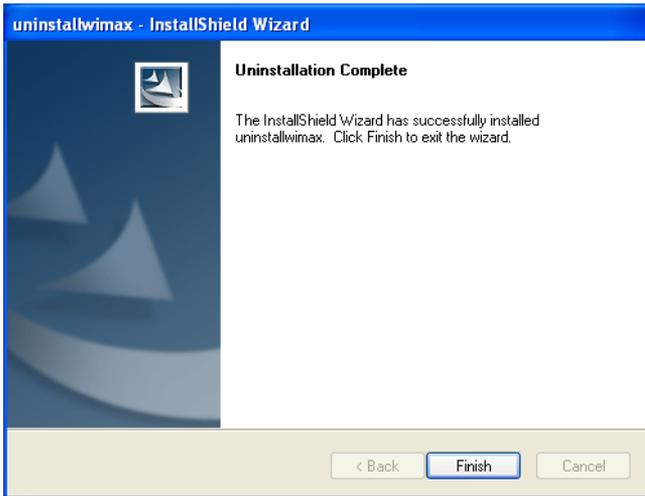
Follow these steps:

1. From the Windows Start menu, find the WinemaCM uninstall option. Click to start the uninstall process.

The uninstall process starts automatically.



- When the uninstall is complete, click Finish to exit.



WinemaCM Error IDs

The WinemaCM software records error numbers in a log when certain conditions are encountered. From the Status screen you can access the Error Logs by entering a password. The error ID numbers can help the WiMAX service provider troubleshoot problems.

The WinemaCM error IDs are listed here for reference. Be sure to take note of displayed error numbers when contacting your service provider for assistance.

WinemaCM Error IDs		
Error ID	Cause	Description
0x11000	Sync failure	MS cannot find the BS. Or there are no valid maps or DCD/UCD from the BS.
0x11001	Ranging failure	Ranging procedure with the BS failed.
0x11003	Authentication failure	Security authentication failed by supplicant.
0x11004	SBC failure	Basic capability negotiation with the BS failed.
0x11005	PKM failure	Security authentication failed.
0x11006	Registration failure	Registration with the BS failed.
0x13002	Timeout	No response from Beceem after timer has timed out.
0x14000	Signal low	The RSSI is smaller than MIN_RSSI_DBM.
0x18000	Wrong password	The wrong password has been entered.

WinemaCM Error IDs		
Error ID	Cause	Description
0x19000	Open device retry	The device cannot be opened.
0x20000	Other failure	Other failures that are not listed.

Appendix B: Specifications

Host Interface

PCMCIA Type II, 33 MHz, 16-bit interface, 3.3 volt

Antennas

Built-in dual dipole antennas

Transmit: Single antenna

Receive: Two antennas using Maximal-Ratio Combining (MRC)

Gain: 3.03dBi (2.5GHz), 2.47dBi (2.6GHz), 3.60dBi (2.7GHz)

Pattern: Omnidirectional

Impedance: 50 Ohm

LED Indicators

Power, Link/Activity

Power Consumption

Transmit: 3.3 W maximum

Receive: 2.3 W maximum

Physical Size

132 x 57.5 x 13.1 mm (5.2 x 2.26 x 0.52 in.)

Weight

43.5 g (1.5 oz)

Operating Frequency

2.496–2.69 GHz and 3.4–3.6 GHz

Support for Full Scan and Partial Scan

OFDMA Modulation

Scaleable OFDMA employing Time-Division Duplex (TDD) mechanism

Deploys both distributed and adjacent subcarrier permutation scheme

Fast Fourier Transform (FFT) Size: 512 and 1024 points (depending on bandwidth)

Modulation Scheme

PRBS subcarrier randomization

Contains pilot, preamble, and ranging modulation

Modulation and Coding Types

Down Link

QPSK 1/2 CTC & CC

QPSK 3/4 CTC & CC

16 QAM 1/2 CTC & CC

16 QAM 3/4 CTC & CC

64 QAM 1/2 CTC & CC

64 QAM 2/3 CTC & CC

64 QAM 3/4 CTC & CC

64 QAM 5/6 CTC & CC

Up Link

QPSK 1/2 CTC & CC

Specifications

QPSK 3/4 CTC & CC
16 QAM 1/2 CTC & CC
16 QAM 3/4 CTC & CC

Bandwidth Allocation

System bandwidth: 5 MHz, 7 MHz, or 10 MHz (depending on model)
Frame length: 5 msec

Maximum Throughput

Up link: > 1.5 Mbps
Down link: > 4 Mbps

Transmit Power Level

Maximum Power class less than +23 dBm

Receive Sensitivity

Preamble power on one channel
QPSK 1/2 CTC: -83 dBm
16-QAM 3/4 CTC: -74 dBm
64-QAM 1/2 CTC: -73 dBm

Temperature

Operating: 0 to 60 °C (32 to 140 °F)
Storage: -40 to 70 °C (-40 to 158 °F)

Humidity

20% to 85% (non-condensing)

Emissions Compliance

US:CFR 47 Part 15 Class B
Europe: EN301 489-1/-4, EN 61000-4-2

Radio Signal Certification

US: CFR 47 Part 27, Subpart M, Broadband Radio Service and Educational Broadband Service in the 2500-2690MHz.
Europe: EN 301 489-1/-4, EN302 326-1/-2/-3

Specific Absorption Rate (SAR)

US: OET Bulletin 65 (Supplement C)
Europe: EN 50392

Safety

IEC 60950-1 (CB)

Standards

IEEE 802.16e-2005 WAVE 1

Software Drivers

Windows XP SP2 and Windows Vista
NDIS 5.0 PnP ETH 802.3 device driver specification
WHQL certified

Appendix C: Configuration File

The WiMAX PCMCIA card sets some of its initial start-up parameters from a script text file "FirmwareCfg.txt." This file can be modified using any text editing tool.

After any modifications to the text file, perform these steps:

1. Run the program "parsecfg.exe" from the directory containing the FirmwareCfg.txt file. This creates a file named "macxvi.cfg."
2. You can check the contents of the macxvi.cfg file by running the program "readcfg.exe."

The following is a listing of the FirmwareCfg.txt file.

```
# Configuration File Name: FirmwareCfg.txt
# Wibro Config File
#
# Version 1 - Creation
# Version 2 - Major revision - Created the current structure
# Version 3 - Renaming to HARQ structure to 'General'. HARQ will be
# reintroduced later.
# Version 4 - Added enabling of Tx Power Report from config file
# Version 5 - Added enabling of Random FA selection
# Version 7 - Added the firmware config option
# version 8 - Added the config option for 8.75/10 MHz bandwidth
# version 9 - Added the config option for ShutDown Timer
#           - Removed changes in Version 8
# Version 10 - Merged versions 8 and 9
#
# Version 11 - EncrSupport & NumOfSAId added
# Version 12 - Radio and PHY Parameters added
# version 13 - options for testing cqich, rang etc
# Dont Change this! Version number used
# to manage the usage of config file
Config File Version = 15

# Scanning Parameters

# Make center frequency as x to enable scanning
# Or use (examples): 2336, 2345, 2354, 2367.5, 2385.5

Center Frequency = x
Band A Scan = 0
Band B Scan = 0
Band C Scan = 0

# QoS Params
Rtps Enable = 0
nRtps Enable = 0
eRtps Enable = 0
Ugs Enable = 0

# HO Params
Handoff Enable = 1
HandoffThreshold = 0
HO Reserved1 = 0
```

Configuration File

```
HO Reserved2 = 0
HO Reserved3 = 0
HO Reserved4 = 0

# Power Control
OL Power Control Enable = 1
OffsetSS = 0
UL AMC - Tx Power Report = 1

PC Reserved2 = 0
PC Reserved3 = 0
PC Reserved4 = 0

# Security Parameters
PKMv2 Enable = 1

PKM Reserved1 = 0
PKM Reserved2 = 0
PKM Reserved3 = 0
PKM Reserved4 = 0

# IDLE Mode Parameters
IdleMode Enable = 0
Idle Mode timer = 120 # seconds
IDLE Reserved1 = 0
IDLE Reserved2 = 0
IDLE Reserved3 = 0
IDLE Reserved4 = 0

# ARQ Parameters
ARQ Enable = 1
ArqType = 0 #0, 1, 2, 3
ARQ Reserved1 = 0
ARQ Reserved2 = 0
ARQ Reserved3 = 0
ARQ Reserved4 = 0

# General MAC Parameters
MacParameter = 0 # 1- 0xfeff 0- 0xffff

# 0 => UL PRBS encoded to 0.
# 1 => PRBS based on frame number
UL PRBS = 1

Random FA Select = 0

Harq Enable = 1

Compressed Map Enable = 1

# Debug Parameters
Default DIUC = 2
# (0-15 bits) EEPROM offset :512 or (0x200) , (16-31 bits) EEPROM Size :
4096(0x1000)
EEPROM Start = 0x10000200

Customize = 0x00000200

FirmwareOptions = 0x00
```

```
# Bit 0 - 1 disable linkdown and skip auth during resync
# Bit 0 - 0 enable linkdown notification and authentication during resync

#Should be in Hz i.e. 8750000, 10000000
Bandwidth = 0

# Shutdown Timer in number of frames (5 ms)
ShutDown Timer Value = 0x7fffffff
EncrSupport = 1

#Number of SAID supported
NumOfSAId = 1

# Radio Parameter
# e.g 0x0000ccbba
# cc = [15:8] Board Type
# b = [7:4] Band Select (3->2.5 to 2.7G; 4->3.4 to 3.6G )
# a = [3:0] Set to 4
RadioParameter = 0x00000032

# PHY Parameter

# PhyParameter1 e.g. 0xcccbbbaa
# cccc = [31:16] 80 * Value of TTG in us
# bb = [15:8] Number of DL symbols
# aa = [7:0] Number of UL symbols
# Special value of 0xFFFFFFFF indicates use of embedded logic
PhyParameter1 = 0xFFFFFFFF
PhyParameter2 = 0x0
PhyParameter3 = 0x0

#some test options - valid only if eval and test data tranfer are enabled
#in eval mode only; lower 16bits = basic cid for testing;
#then bit 16 is test cqich,bit 17 test init rang; bit 18 test periodic rang
and bit 19 is test harq ack/nack
m_u32TestOptions = 0

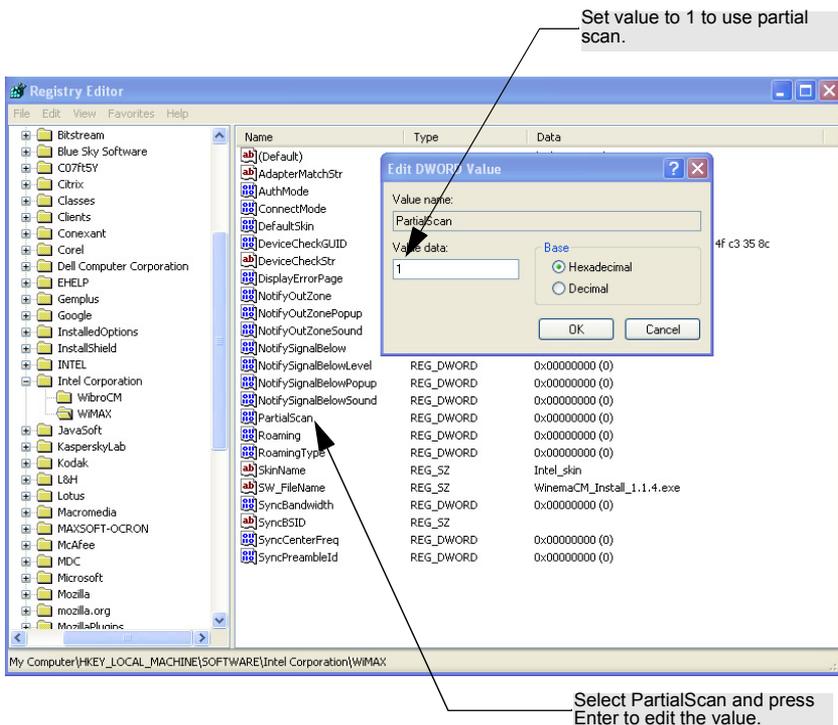
# Max MAC Data Per Frame to be sent in REG-REQ
MaxMACDataperDLFrame = 15
MaxMACDataperULFrame = 4
```


Appendix D: Using Partial Scan

The section shows how to set up the WiMAX PCMCIA Card to use partial scan.

Follow these steps:

1. Change the following parameters in the Configuration file:
Center Frequency = 0
PhyParameter2 = 0x1
See Appendix C for details on the Configuration file.
2. Find the registry entry “HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\WiMAX” and set the PartialScan value to 1. (The value 0 means do not use partial scan.)



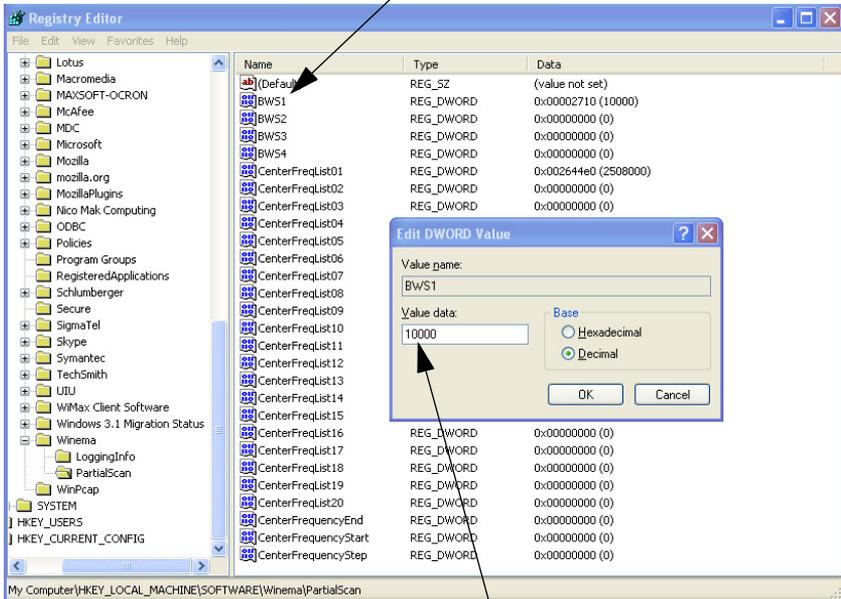
3. Add the Bandwidths you want to scan to the following registry entries:
HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\BWS1
HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\BWS2
HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\BWS3

Using Partial Scan

HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\BWS4

The maximum number of bandwidths supported is four. If you do not want to scan a bandwidth, set the value to 0.

Select BWS1 to BWS4 and press Enter to edit the value.



Sets the bandwidth to scan..

4. Add the center frequencies you want to scan to the following registry entries:

HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\
CenterFreqList01

HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\
CenterFreqList02

CenterFreqList03
CenterFreqList04

.....
HKEY_LOCAL_MACHINE\SOFTWARE\Winema\ParticalScan\
CenterFreqList20

The maximum number of center frequencies supported is 20. If you do not want to scan a center frequency, set the value to 0.

Select CenterFreqList01 to CenterFreqList20 and press Enter to edit the value.

My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Winema\PartialScan

Name	Type	Data
(Default)	REG_SZ	(value not set)
BW51	REG_DWORD	0x00002710 (10000)
BW52	REG_DWORD	0x00000000 (0)
BW53	REG_DWORD	0x00000000 (0)
BW54	REG_DWORD	0x00000000 (0)
CenterFreqList01	REG_DWORD	0x002644e0 (2508000)
CenterFreqList02	REG_DWORD	0x00000000 (0)
CenterFreqList03	REG_DWORD	0x00000000 (0)
CenterFreqList04	REG_DWORD	0x00000000 (0)
CenterFreqList05	REG_DWORD	0x00000000 (0)
CenterFreqList06	REG_DWORD	0x00000000 (0)
CenterFreqList07	REG_DWORD	0x00000000 (0)
CenterFreqList08	REG_DWORD	0x00000000 (0)
CenterFreqList09	REG_DWORD	0x00000000 (0)
CenterFreqList10	REG_DWORD	0x00000000 (0)
CenterFreqList11	REG_DWORD	0x00000000 (0)
CenterFreqList12	REG_DWORD	0x00000000 (0)
CenterFreqList13	REG_DWORD	0x00000000 (0)
CenterFreqList14	REG_DWORD	0x00000000 (0)
CenterFreqList15	REG_DWORD	0x00000000 (0)
CenterFreqList16	REG_DWORD	0x00000000 (0)
CenterFreqList17	REG_DWORD	0x00000000 (0)
CenterFreqList18	REG_DWORD	0x00000000 (0)
CenterFreqList19	REG_DWORD	0x00000000 (0)
CenterFreqList20	REG_DWORD	0x00000000 (0)
CenterFrequencyEnd	REG_DWORD	0x00000000 (0)
CenterFrequencyStart	REG_DWORD	0x00000000 (0)
CenterFrequencyStep	REG_DWORD	0x00000000 (0)

Value name: CenterFreqList01

Value data: 2508000

Base: Hexadecimal Decimal

OK Cancel

Sets the center frequency to scan.

5. Run WinemaCM.

Appendix E: Registry Settings

This section lists the Windows Registry settings for WinemaCM.

[HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\WiMAX]		
Name	Type	Description
DefaultSkin	Dword	Whether current skin is default skin. (1:default skin, 0:not default skin)
SkinName	String	The name of current skin. (default skin:"default", Otherwise:skin name in skin.dat
ConnectMode	DWord	0: auto connectionn, 1: manual connection
NotifyOutZone	Dword	0: close, 1:start
NotifyOutZoneSound	Dword	0: close, 1:start
NotifyOutZonePopup	Dword	0: close, 1:start
NotifySignalBelow	Dword	0: close, 1:start
NotifySignalBelowSound	Dword	0: close, 1:start
NotifySignalBelowPopup	Dword	0: close, 1:start
NotifySignalBelowLevel	Dword	0 ~ 6
Roaming	Dword	Always 0. Because Beceem doesn't support roaming.
RoamingType	Dword	Always 0. Because Beceem doesn't support roaming.
DisplayErrorPage	Dword	0: hide, 1: display (In current design, we will always show error page.)
DeviceCheckStr	String	"Beceem". The string is used to search the network adapter.
DeviceCheckGUID	Binary	Used to check whether the device's broadcast event are "GUID_NDIS_LAN_CLASS" class
SW_FileName	String	File name of installation package (for example: WinemaCM_Install_1.1.4.exe)
SW_VersionFileName	String	File name of the software verion file (for example: SW_ver.bin)
Upgrade URL	String	The URL of upgrade server (for example: http://upgrade.intel.com)
AdapterMatchStr	String	"Beceem". The string is used to search the network adapter.
PartialScan	Dword	0: Do not use partial scan, 1: Use partial scan
RoamingFilter	String	The strings are used to filter BSIDs searched in partial scan procedure. For example, we want to filter BSIDs with "0x0102" and "0x020304". The value of string will be "0x0102;0x020304."

Registry Settings

[HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\WiMAX]		
Name	Type	Description
SyncCenterFreq	Dword	The center frequency is used to sync-up when we use partial scan procedure
SyncBandwidth	Dword	The bandwidth is used to sync-up when we use partial scan procedure
SyncPreambleId	Dword	The preamble ID is used to sync-up when we use partial scan procedure
SyncBSID	String	The BSID is used to sync-up when we use partial scan procedure

[HKEY_LOCAL_MACHINE\SOFTWARE\Winema]		
Name	Type	Description
Username	String	User name for TTLS MS-ChapV2
Password	String	Password for TTLS MS-ChapV2
ClientCertPath	String	Client certificate path
ClientCertType	Dword	Client certificate type. 0:PEM; 1:DER
EAPPrivateKeyPath	String	Private key path
EAPPrivateKeyType	Dword	Private key type. 0:PEM; 1:DER
PrivateKeyPW	String	Private key password
AnonymousId	String	Anonymous Identification string
RootCertPath	String	CA certificate path

[HKEY_LOCAL_MACHINE\SOFTWARE\Winema\PartialScan]		
Name	Type	Description
BWS1 ~ BWS4	DWord	Bandwidth specified for partial scan
CenterFreqList01 ~ CenterFreqList20	DWord	Center frequency specified for partial scan

[HKEY_LOCAL_MACHINE\SOFTWARE\Winema\LoggingInfo]		
Name	Type	Description
Software\Winema\LoggingInfo\	Dword	Output debug messages for supplicant.dll. 1: output debug message 0: close debug messages

[HKEY_LOCAL_MACHINE\SYSTEM\ControlSet002\Services\Tcpip\Parameters]		
Name	Type	Description
TCPWindowSize	Dword	Setting for TCP window size

WM8931BE
WM8921BE
E062007-CS-R01
149xxxxxxxx