WMC6300
Wireless Modem Card
User's Guide

Pocket PC 2002
and
Pocket PC 2003

Version 3.0.78

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Foreword

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Table of Contents

INTRODUCTION **1**

System Requirements **1**

General System Requirements 1

What's in the Box **2**

FCC Approved Antennas for WMC6300 ..... **2**

WMC6300 External Connections and Lights **3**

INSTALLING THE WMC6300 WIRELESS MODEM CARD **4**

Installing MEA Software **4**

Connect the Antenna Assembly **8**

Disconnecting a Pigtail Antenna Assembly ..... Error! Bookmark not defined.

Connect the Magnetic Antenna Assembly (Optional Equipment) Error! Bookmark not defined.

Insert the WMC6300 Wireless Modem Card **8**

Uninstalling Application Software **11**

OVERVIEW OF THE MESHTRAY APPLICATION **13**

MeshTray **13**

Starting MeshTray **15**

MeshTray Status Tab **15**

MeshTray Configuration Tab **16**

Priority 17

Addressing Scheme for Unified Modes of Operation 18

MeshTray Geo-Position Tab (Optional) **21**

MeshTray Routing Tab (Optional) **23**

Routing Icons 23

Terminating MeshTray **25**

TROUBLESHOOTING 26

Multiple Insertions of the WMC6300 Card 26

CUSTOMER SERVICE INFORMATION 27

LICENSE AND WARRANTY INFORMATION 28

REGULATORY INFORMATION 33

FCC Information 33

FCC RF Radiation Exposure Statement 33

Safety Information for the MEA WMC6300 34

SAFETY CERTIFICATION 35

CE Mark Certification 35

List of Figures

Figure 1. WMC6300 Wireless Modem Card....1
Figure 2. WMC6300 Antenna Port and LED Indicators....3
Figure 3. ActiveSync Window....4
Figure 4. MEA Installation Welcome Dialog Box....5
Figure 5. Agree with License Agreement Dialog Box....6
Figure 6. Start Installation Dialog Box....6
Figure 7. Installing Applications Dialog Box....7
Figure 8. Download Complete Dialog Box....7
Figure 9. Installation Complete Dialog Box....7
Figure 10. Attach Antenna to the WMC6300....8
Figure 11. Disconnecting Cables/Antennas from WMC6300 Cards ... Error! Bookmark not defined.
Figure 12. Magnetic Mount Antenna Attached to the WMC630.... Error! Bookmark not defined.
Figure 13. Installing the WMC6300 Wireless Modem Card....9
Figure 14. Start Dialog box....9
Figure 15. MeshTray Icon....10
Figure 16. System Tab....11
Figure 17. Remove Programs Dialog box....12
Figure 18. Confirm Uninstall....13
Figure 19. Inactive MeshTray Icon....13
Figure 20. MeshTray Link Strength Indicator....14
Figure 21. No Neighbors Ad-Hoc Peer-to-Peer Icon....14
Figure 22. Active Ad-Hoc Peer-to-Peer Icon....14
Figure 23. MeshTray Status Tab....15
Figure 24. MeshTray Configuration Tab (1)....16
Figure 25. Priority Setting Drop-Down Menu....17

Figure 26. Network Addressing Scheme Drop-Down Menu 18

Figure 27. MeshTray Configuration Tab (2) 20

Figure 28. MeshTray Geo Position Tab 21

Figure 29. MeshTray Geo Position Spherical Coordinates 22

Figure 30. MeshTray Routing Tab 23

Introduction

Thank you for purchasing the Wireless Modem Card. If you wish to skip this introduction and begin the installation, go directly to the *Installing the WMC6300 Wireless Modem Card* section of this document.

MEA is a wireless communication system capable of supporting high data rate mobile communication at vehicular speeds. The MEA system is designed to allow standard client hosts with a PCMCIA interface to have a mobile broadband Ethernet connection. The MEA system works transparently to the client host in a manner similar to an Ethernet connection. MEA provides Internet Protocol based data and location services. Its geo-location accuracy and availability is better than ±10 meters within 1 second. It is capable of supporting subscribers traveling up to 100 miles per hour.

Figure 1. WMC6300 Wireless Modem Card

The MEA system provides a secure and reliable transport for the client host. The client host may still require configuration and authentication before it will be allowed to access services on the core network. Access to the core network is controlled by the network administrator according to current operating practices. This document provides detailed installation and configuration instructions for installing the MEA WMC6300 Wireless Modem Card and supporting software.

System Requirements

General System Requirements

For best results, ensure the computers meet the following minimum requirements:

- This software is compatible with the HP iPAQ 3650, HP iPAQ 3870 and HP iPAQ 3955 running the Microsoft Pocket PC 2002 operating system and the HP iPAQ 5555 running the Microsoft Pocket PC 2003 operating systems with an available Type II PCMCIA slot.
- Intel based laptop computer running the Microsoft Windows 2000 or Windows XP operating system, with the following:
  - Keyboard
  - Mouse
  - CD-ROM drive or DVD drive
  - ActiveSync utility program installed

- Cable to connect the PC and the PDA

What's in the Box

The following is a list of the items provided:

- MEA WMC6300 Wireless Modem Card
- Antenna
- MEA WMC6300 Software and Documentation CD

FCC Approved Antennas for WMC6300

Manufacturer	**Part Number**	**Gain**	**Usage**
Centurion	MAF94057	2 dBi	PDA

WMC6300 External Connections and Lights

The WMC6300 Wireless Modem Card is designed for insertion into an industry-standard Type II PCMCIA card slot located in a Host device. The WMC6300 has an antenna port to connect the external antenna and two LED Indicators. The Red LED is the transmit indicator and the Green LED is the receive indicator as shown in Figure 2.

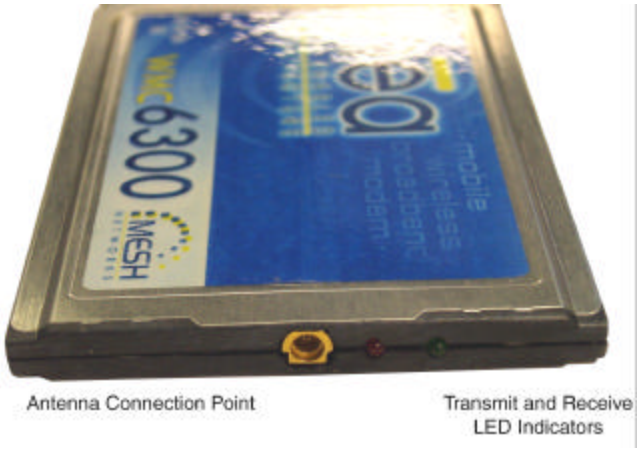

Figure 2. WMC6300 Antenna Port and LED Indicators

Installing the WMC6300 Wireless Modem Card

Installing MEA Software

Please install the MEA Software before you insert the WMC6300 card. Complete the following procedure to install the MEA software:

1. Connect the PC to the PDA with the cable supplied by the PDA manufacturer. Initiate an ActiveSync session between the computer and the PDA. Note: Refer to the PDA manufacturer's documentation for connection and operational instructions.

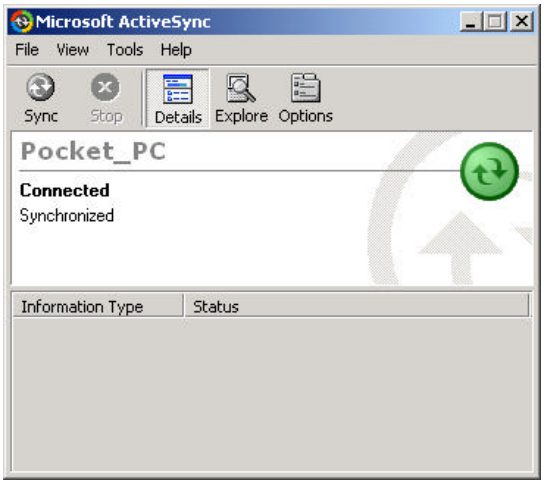

Figure 3. ActiveSync Window

2. Insert the MEA WMC6300 Software and Documentation for Pocket PC CD into the PC's CD-ROM drive.
3. On the PC, navigate to the CD-ROM drive using *My Computer*.

   For the HP IPAQ Model 3650 running the Microsoft Pocket PC 2002 operating system, navigate to *d:\\software\PPC2002\iPAQ_36xx* and double click on *MEA_PPC_36xxSetup.exe* to start the software installation process.

   For the HP IPAQ Models 3870 or 3955 running the Microsoft Pocket PC 2002 operating system, navigate to *d:\\software\PPC2002\iPAQ_others* and double click on *MEA_PPC_OthersSetup.exe* to start the software installation process.

   For iPAQ Model 5555 running the Microsoft Pocket PC 2002 operating system, navigate to *d:\\software\PPC2003* and double click on *MEA_PPC2003_Setup.exe* to start the software installation process.

4. The MEA *Welcome* installation dialog box will be displayed as shown in Figure 4. Click on the **Next** button to continue the software installation process.

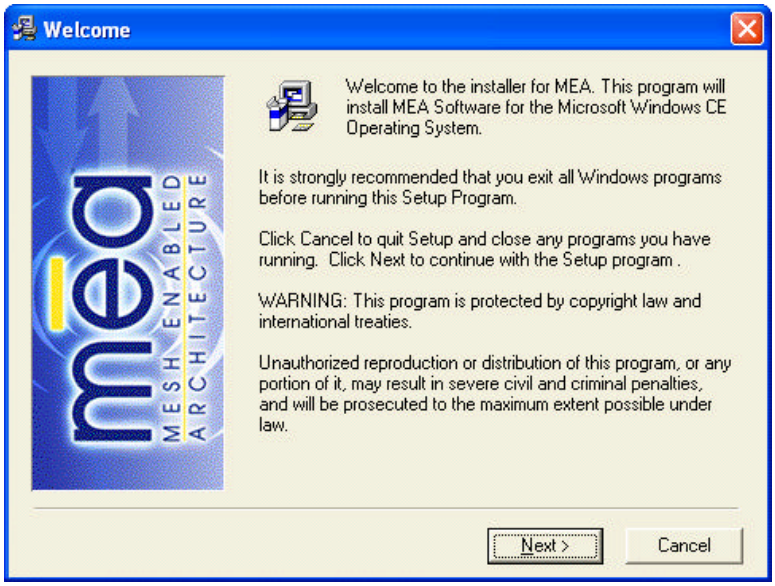

Figure 4. MEA Installation Welcome Dialog Box

5. The *License Agreement* dialog box will be displayed as shown in Figure 5. Please review the *End User License Agreement*. Use the scroll bar located at the right side of the dialog box to display the complete text message.

Note: If you do not agree with the terms of the license agreement, click on **No** and the installation will be terminated.

6. To continue with the installation process, click on the **Yes** button as shown in Figure 5.

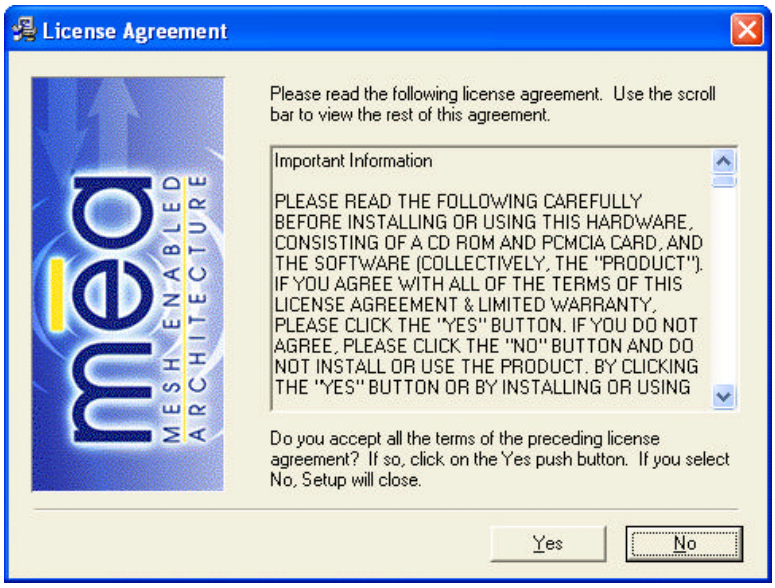

Figure 5. Agree with License Agreement Dialog Box

7. The *Start Installation* dialog box will be displayed as shown in Figure 6. Verify that you have an active connection to the PDA, and then click on **Next** to continue.

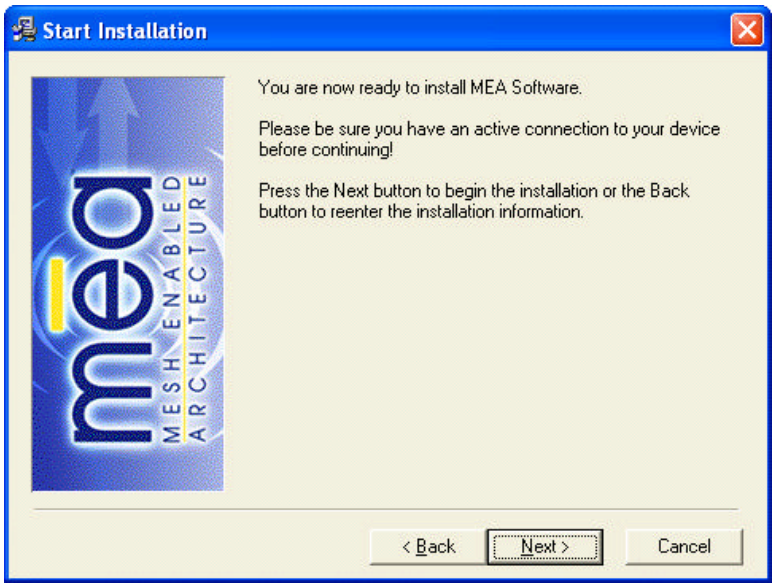

Figure 6. Start Installation Dialog Box

8. The Install Program will connect to your Pocket PC device to complete the installation.

9. A dialog box as shown in Figure 7 will be displayed asking permission to install the drivers to the default directory. Select the **Yes** button to continue the process.

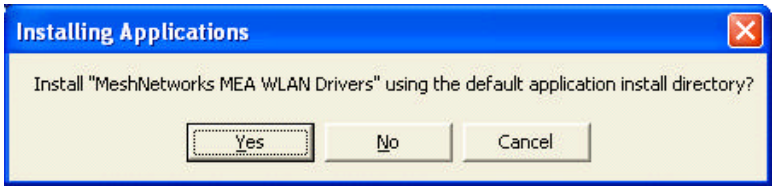

Figure 7. Installing Applications Dialog Box

10. The Installer will now move all of the necessary files onto the Pocket PC device The installation will then display a dialog box as shown in Figure 8 asking you to verify that there are no additional steps required on the Pocket PC. None are required. Select the "**OK**" button.

Figure 8. Download Complete Dialog Box

11. The *Installation Complete* dialog will be displayed as shown in Figure 9. Click on the **Finish** button to complete the procedure.

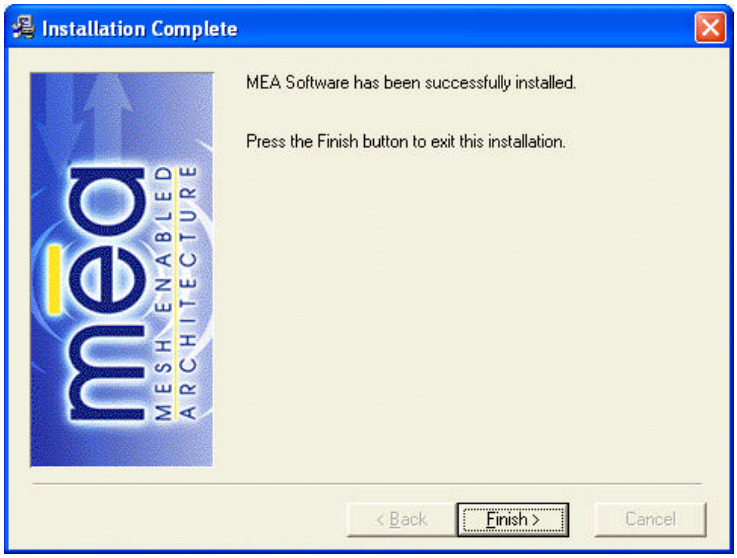

Figure 9. Installation Complete Dialog Box

12. Reboot the PDA.

Connect the Antenna Assembly

Complete the following procedure to connect the Antenna Assembly (Knuckle or Pigtail type) to the WMC6300 for use in a standard laptop computer.

WARNING
Always eject card when not in use.

1. Locate the Antenna and insert the connector into the WMC6300 antenna port as shown in Figure 10.

Note: The connector will snap into place when fully inserted.

Figure 10. Attach Antenna to the WMC6300

Warning
Use only FCC approved antenna.
Use of other antennas is prohibited and violates FCC regulations.
Never use the WMC6300 with the Antenna disconnected from the Card.

Insert the WMC6300 Wireless Modem Card

Complete the following procedure to install the WMC6300 Wireless Modem Card in the computer.

1. Locate an available Type II PCMCIA card slot in the PDA. If necessary, remove the slot dust cover from the slot.

2. To ensure the correct orientation of the card, insert the WMC6300 Wireless Modem Card into the computer's PCMCIA card slot with the label side up as shown in Figure 11.

WARNING: Never force the card into the slot.

Figure 11. Installing the WMC6300 Wireless Modem Card

NOTE: **For Pocket PC 2002, continue with Step 3.**

For Pocket PC 2003, proceed to *Step 6*.

3. When the MEA WMC6300 card is detected, a *Start* dialog box is displayed as shown in Figure 12. The *Use server-assigned IP address* radio button should be selected. Click on the **OK** button located in the upper right corner of the dialog box.

Figure 12. Start Dialog box

4. A MeshTray icon will be displayed on the screen of the Pocket PC. If the MeshTray Icon does not appear in the screen, go to Start → MEA Config and this will launch a MeshTray icon. A green icon indicates successful connection to the network.

Figure 13. MeshTray Icon

5. MeshTray executes automatically whenever the WMC6300 card is inserted into a Pocket PC device.

NOTE: If MeshTray does not automatically execute go to Start → Programs → MeshTray and this will launch a MeshTray icon. Refer to section *Overview of the MeshTray Application* for more information on MeshTray.

6. **For Pocket PC 2003**, MeshTray will not execute automatically. You must launch MeshTray from the Window Start menu by selecting Start → Programs → MeshTray. A meshTray icon will be displayed on the screenof the Pocket PC. A green icon indicates successful connection to the network.

Uninstalling Application Software

Complete the following procedure to uninstall the MEA Software:

1. From the PDA desktop, select the *System* tab.

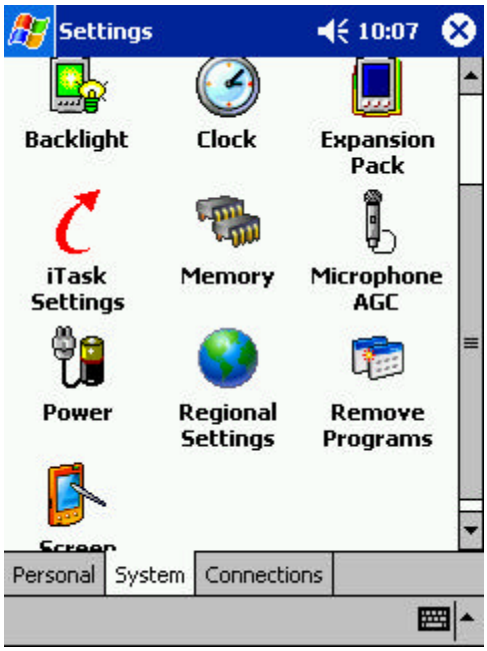

Figure 14. System Tab

2. Select *Remove Programs* on the *System* tab.

Figure 15. Remove Programs Dialog box

3. Highlight **MeshNetworks MEA WLAN Drivers** from the list of programs and click on **Remove**.
4. Remove Programs will ask, "…*Are you sure you want to remove it?*" as shown in Figure 16. Click on **Yes** to remove the program.

Figure 16. Confirm Uninstall

Overview of the MeshTray Application

MeshTray

MeshTray is a status application that reports vital and statistical information about the MEA card. Because MeshTray is a *tray* application, it stays in the desktop system status tray when it is minimized as shown in the figures below. The MeshTray icon changes to indicate the state of the wireless interface. In Figure 17 the MeshTray icon is in an inactive or disconnected state.

Figure 17. Inactive MeshTray Icon

The MeshTray icon shown in Figure 18 is currently associated with an Infrastructure Device. The MeshTray icon displays the Link Strength to the associated IAP as color-coded bars. (More bars indicate greater Link Quality.)

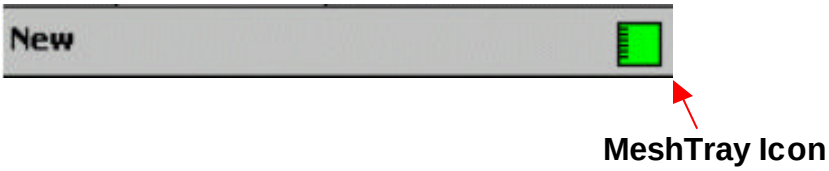

Figure 18. MeshTray Link Strength Indicator

In Figure 19, the MeshTray Icon is in Ad-Hoc Peer-to-Peer mode without neighbors.

Figure 19. No Neighbors Ad-Hoc Peer-to-Peer Icon

The MeshTray icon in Figure 20 has a green background that indicates that there is at least one other device participating in the Ad-Hoc Peer-to-Peer network.

Figure 20. Active Ad-Hoc Peer-to-Peer Icon

Starting MeshTray

MeshTray will automatically start whenever a WMC6300 is inserted into the Pocket PC device. If MeshTray has been stopped and needs to be restarted, double-click on the MeshTray icon on the desktop. Also, if MeshTray has been minimized, clicking on the MeshTray icon in the system tray restores the application to a property sheet interface as shown in Figure 21.

MeshTray Status Tab

When the utility is launched, MeshTray displays useful system information such as a description of the device, the MAC and IP address of the node, and the type of device (i.e., Subscriber Device). The Firmware version and build date are also displayed. When in infrastructure mode, the status tab also displays the associated IAP MAC address and the link quality to that IAP.

.

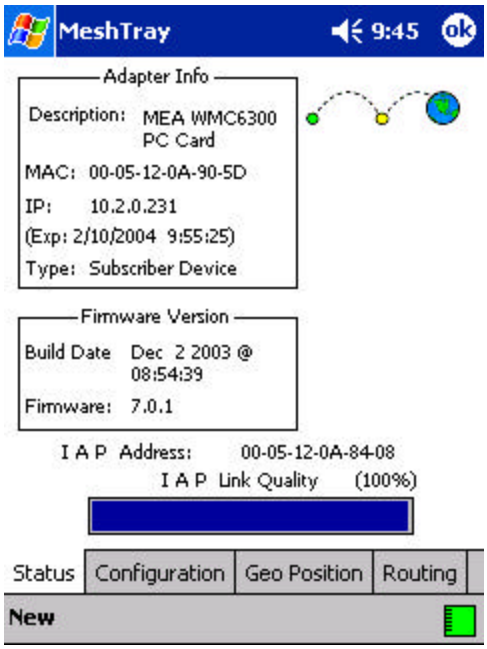

Figure 21. MeshTray Status Tab

MeshTray Configuration Tab

The Configuration Tab has a drop down selection that allows the user to select it's mode of operation; Infrastructure or Ad-Hoc Peer-to-Peer. Infrastructure mode allows the user to use equipment deployed by the network operator to access the Internet. Peer-to-Peer mode allows users to communicate among themselves without accessing a wired network.

If Geo-Position has been enabled on the WMC6300, the Geo-Position option will be selectable and the user may configure the reporting interval as shown in Figure 22. Otherwise, the Geo-Position box will be grayed out as shown in Figure 25. Likewise, if Enhanced Geo has been enabled on the WMC6300, an additional checkbox will appear to allow the user to select that mode. Refer to the section on the Geo Position Tab for additional information.

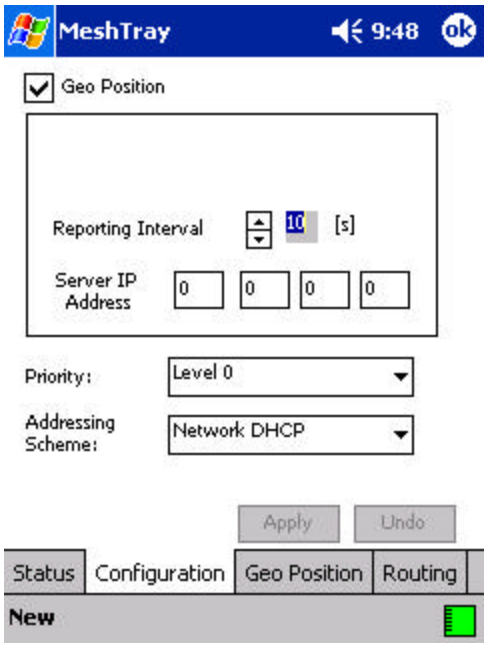

Figure 22. MeshTray Configuration Tab (1)

Priority

The User Priority service can be provisioned on a per node basis for use with tiered service and emergency access systems. This priority feature is unique to the MEA network and only exists between endpoints within the MEA network or between a MEA network node and the ingress/egress node on the mea network.

Nodes outside of the MEA Core LAN cannot request a particular priority for transmitted or received traffic. Any traffic into the mea network needing prioritization must be prioritized at the ingress access point or router. Any traffic out of the MEA network will lose its priority assignment at the egress.

MEA wireless traffic will carry priorities attached to each packet. The MeshAPI can be used to tune the default priority of the local node.

There is also an optional *Emergency* mode for use by special applications. The priority for use in emergency mode is separately provisioned and must be explicitly enabled per node by the network operator.

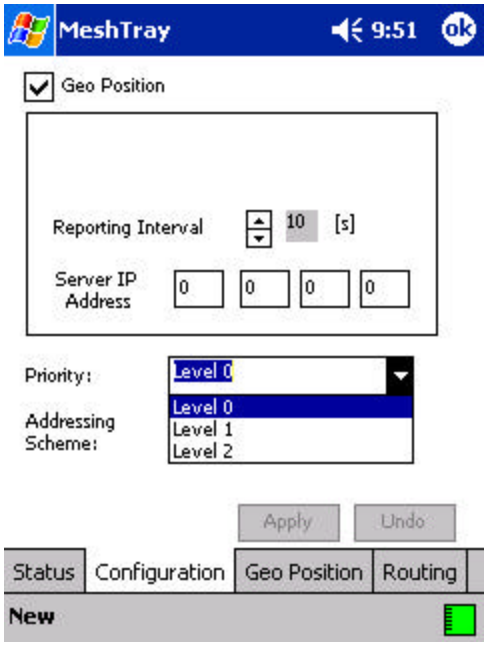

Figure 23. Priority Setting Drop-Down Menu

Addressing Scheme for Unified Modes of Operation

With MEARelease 3.0, the concept of modes has been replaced by a Unified Modes of operation addressing scheme. The concept of unified modes of operation centers on the current state of network communication: Associated State and Unassociated State. There are three addressing schemes which allow the IT manager increased flexibility in deployment.

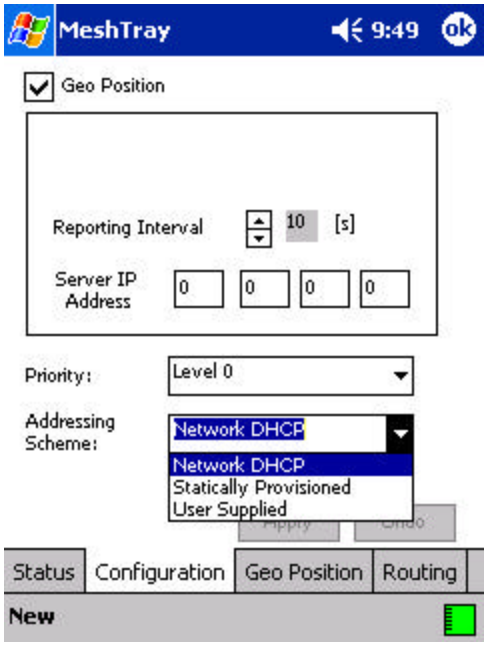

Figure 24. Network Addressing Scheme Drop-Down Menu

Network DHCP Scheme

Operation under the Network DHCP scheme is similar to that of Release 2 in *Infrastructure Mode*. The primary difference is users are now allowed to temporarily wander outside of the network infrastructure without losing connectivity.

Network DCHP requires that the user's host device be configured to request an address from a DHCP server and the inclusion of a DHCP server in the core network configuration to answer these requests. With Network DHCP selected, the network device will forward any DHCP requests to the core network once it becomes associated and establishes communications with the infrastructure.

The server may be configured by the operator to hand out temporary or static leases. The user must associate and acquire an address from the network before establishing communications. Once a lease has been granted, the address may be *dragged* out of network coverage for the remainder of the lease or, if a static lease was granted, until the next power cycle. If the lease expires or the user cycles power while outside of network coverage, the user will again lose the ability to communicate.

This scheme is best for a larger, closely managed network of subscribers who don't need to communicate or communicate only briefly outside of network coverage.

Statically Provisioned Scheme

Operation under the Statically Provisioned scheme is similar to that of Release 2 in *Peer-to-Peer Mode*. The primary difference is that addresses are configured by the network operator rather than *hashed* from the MAC address. This serves to eliminate the 10.x.x.x limitation on the network range.

When operating under the Statically Provisioned scheme, the network device will accept DHCP requests from the user's host and internally generate responses to grant the host an IP address and assign any other provisioned options.

This scheme requires that the host be configured to request an address from a DHCP server but does *not* require a DHCP server on the core network.

It should be noted that a DHCP server can still exist on the network to hand out addresses to other nodes using the Network DHCP Scheme as long as the server's address range does not conflict with addresses assigned to devices using the Statically Provisioned or User Supplied Schemes.

The granted IP addresses granted by the server and options are configurable per-device using MeshManager. The internally generated DHCP messages will assign the host a static lease to the provisioned address, which may be freely used to communicate while associated or unassociated.

The operator must ensure that the provisioned addresses are routable and do not conflict with any other addresses in use. The operator is free to provision any option ordinarily provisioned by a DHCP server (subnet mask, DNS, etc.) through programming of the appropriate fields in each device using MeshManager.

This scheme is ideal for a managed network of users who regularly need to communicate inside and outside of network coverage or for a network lacking a DHCP server.

User Supplied Scheme

Operating under the User Supplied scheme, the user's host device is configured to use a *fixed*

IP address and subnet mask. The user is responsible for configuring options that would otherwise be configured by a DHCP server.

Furthermore, it is up to the user to ensure that the assigned address is routable on the core network (if core network access is needed) and that it does not conflict with other addresses in use. This is analogous to and carries the same caveats as plugging an Ethernet card into a LAN and manually assigning it an address.

The user is free to communicate while associated or unassociated. This scheme is ideal for small, unmanaged networks lacking a DHCP server.

All of these schemes may be assigned per device, either by the user or by the network manager. The network manager can also limit the user-selectable schemes or force a specific scheme. Devices in each of these schemes can interoperate and communicate with each other, so long as the assigned addresses do not conflict and are mutually routable.

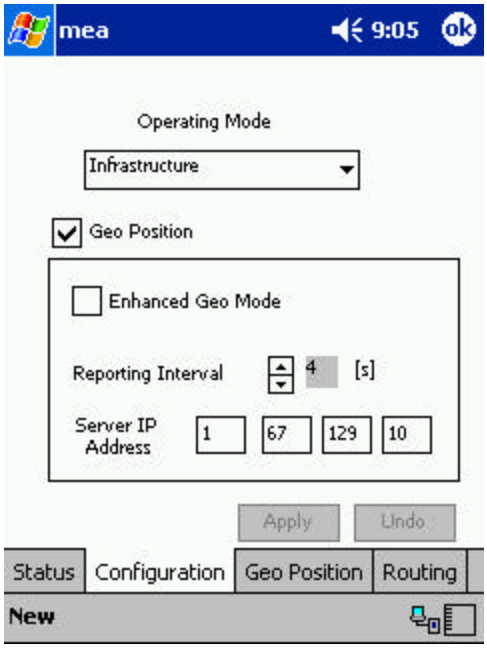

Figure 25. MeshTray Configuration Tab (2)

MeshTray Geo-Position Tab (Optional)

If your WMC6300 has been licensed for Geo-Location, an optional tab will be displayed in MeshTray as shown in Figure 26. This tab will display the users location via longitude, latitude, and altitude.

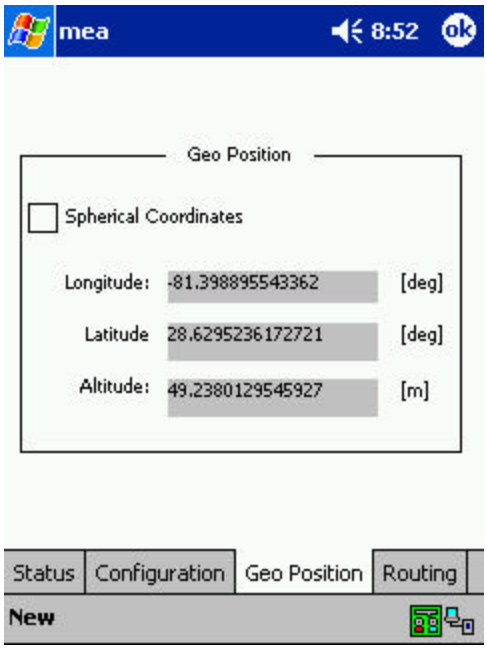

Figure 26. MeshTray Geo Position Tab

Optionally, the user may select to have the location reported in spherical coordinates, which will be displayed as shown in Figure 27.

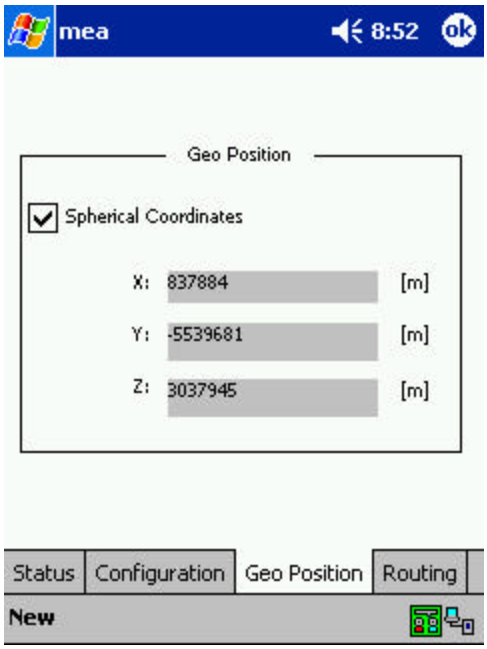

Figure 27. MeshTray Geo Position Spherical Coordinates

MeshTray Routing Tab (Optional)

If your WMC6300 has been licensed to display routing information, an optional tab will be displayed in MeshTray as shown in Figure 28. The Routing Table displays the end nodes that the WMC6300 is currently in communication with. The Neighbor Table displays the adjacent nodes that the WMC6300 may route through, depending on the desired end node.

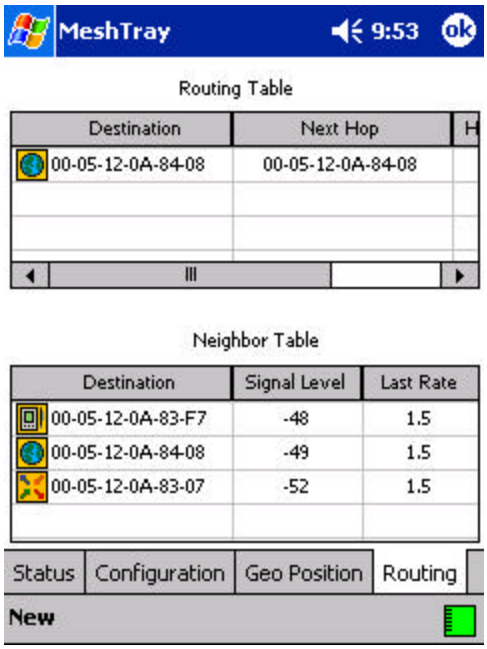

Figure 28. MeshTray Routing Tab

Routing Icons

Icon	Description
Root	The Root icon represents the device being monitored. The graphical representation of the network topology is drawn from this device's perspective. All links radiate out from the Root.
Unknown	The Unknown icon is a MEA device in the network that is being used to provide a route to another wireless device in the network.

Icon	Description
Subscriber Device (SD)	The Computer icon represents a Subscriber Device using a MEA WMC6300 Wireless Modem Card in the network.
Wireless Router	The Arrow icon represents a MWR6300 Wireless Router in the MEA network. The MWR6300 is an infrastructure device dedicated to routing data.
IAP	The Globe icons represent an IAP6300 Intelligent Access Point in the MEA network. A MEA IAP6300 Intelligent Access Point is an infrastructure device that allows access to the wired network.
Enhanced Wireless Router	The Enhanced Wireless Router (EWR) icon represents either anEWR or a PWR. An EWR//PWR is not a locally attached device and therefore cannot be viewed directly by MeshView. However, MeshView can connect to an EWR/PWR remotely to display its network topology. This functionality requires a remote server to be running on the EWR.
Vehicle Mounted Modem	The Vehicle Mounted Modem (VMM) icon represents a wireless modem that has been designed for permanent in-vehicle mounting. A VMM is not a locally attached device and therefore cannot be viewed directly by MeshView. However, MeshView can connect to a VMM remotely to display its network topology. This functionality requires a remote server to be running on the VMM.

Terminating MeshTray

The MeshTray application may be terminated from the system tray. To terminate the application, position the curser over the MeshTray icon and double-click on the icon. If MeshTray is currently minimized, it will be expanded, and a second double-click will be required. Select the **Exit** button. The MeshTray application is terminated and the icon is removed from the system tray until the application is started again from the Start menu or from the MeshTray shortcut icon.

Troubleshooting

The following documents issues that you may encounter when using the WMC6300 in your PDA.

Multiple Insertions of the WMC6300 Card

Repeated ejection and insertion of the WMC6300 card may result in the PDA being unable to launch MeshTray correctly. If this occurs, perform a soft reboot of the PDA.

WARNING

Use care when performing this action. If the reboot switch is held down for more than 3 seconds, the PDA will reset to factory settings, and all user-loaded software will be deleted.

Customer Service Information

If you have read this document and made every effort to resolve installation or operation issues yourself and still require help, please contact MeshNetworks Customer Support using the following contact information:

MeshNetworks, Inc.
Attention: Customer Support
PO Box 948133
Maitland, Florida 32794-8133

Hours of Operation

Monday through Friday	**8:00 AM – 5:00 PM (Eastern Standard Time)**
Technical Support:	**(800) 311 – 3365 (USA)**
	(407) 659 – 5300
e-mail	**measupport@meshnetworks.com**

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Regulatory Information

FCC Information

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.

Federal Communications Commission (FCC) 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 commercial installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the WMC6300 and radio or television receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the supplier of the WMC6300 or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement

1. **CAUTION:** This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.
2. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Although this device complies with the FCC RF Exposure limits in multiple configurations of the antenna, we suggest that the antenna be positioned away from the body when transmitting in order to minimize the level of RF Exposure.

Safety Information for the MEA WMC6300

The Federal Communications Commission (FCC) with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. MeshNetworks' MEA products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio according to the instructions found in this manual and the hardware and software guides on the MEA CD will result in user exposure that is substantially below the FCC recommended limits.

- Do not touch or move the antenna(s) while the unit is transmitting or receiving.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; otherwise, the radio may be damaged.

WARNING

Use the antenna supplied by MeshNetworks.
Use of other antennas is prohibited may violate FCC regulations.

NOTE: The manufacturer is not responsible for any unauthorized modifications to this equipment. Unauthorized modifications could void user's authority to operate device.

Safety Certification

3041788

- Conforms to UL STD ANSI/UL 60950 3rd Edition
- Certified to CAN/CSA C22.2 NO. 60950-00
- Equipment shall be suitable for use in Air pressure: 86kPa to106kPa

CE Mark Certification

The CE mark is the official marking required by the European Community for all Electric and Electronic equipment that will be sold, or put into service for the first time, anywhere in the European community. It proves to the buyer or user that this product fulfills all essential safety and environmental requirements as they are defined in the European Directives.
MeshNetworks Products are covered under the following product certification Europe:

ETSI EN 300 328 V 141 (2003-04)

Products covered - IAP6300, EWR6300 , WMC6300, and MWR6300

ETSI EN 301 489-1 (2002-08) and 301 489-17

Products covered - IAP6300, EWR6300 , WMC6300, and MWR6300

EN 55022:1998 and EN 55024:1998

Products covered - IAP6300, EWR6300 , WMC6300, and MWR6300

CENELEC EN 50360 and EN50371 – Specific Absorption Test - SAR

Products covered - WMC6300

The following countries are currently covered under the CE Mark:

Austria, Belgium, Demark, Finland, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, UK

CE Marking on the product will grant access to the European Economic Area (EEA). Some countries may require a declaration of conformity, please check with your MeshNetworks sales team for details.

The following is an example of the CE Marking on a product label:

The alert symbol indicates that MeshNetwork's products are ***not*** certified to operate in France. Outdoor use in France is restricted to 10mW EIRP for band 2454 - 2483.5 MHz.