MESH
N E T W O R K S

mēa
WMC6300

Wireless Modem Card

User's Guide

(Windows 2000)

Version 1.1

Foreword

This document describes in detail the confidential and proprietary technology of MeshNetworks' mēa™ Architecture.   MeshNetworks products and technology are protected by US and international patent and patent pending technology. This document represents the current mēa design; the contents are subject to change at any time at the discretion of MeshNetworks, Inc.

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Introduction

Thank you for purchasing the **WMC6300** Wireless Modem Card. Please install the mēa Application Software and Drivers before inserting the Wireless Modem Card in your system. To get started proceed to the *Installing the Software* section of this document.

mēa is a wireless communication system capable of supporting high data rate mobile communication at vehicular speeds. The mēa system is designed to allow standard client hosts with a PCMCIA interface to have a mobile broadband Ethernet connection. The mēa system works transparently to the client host in a manner similar to an Ethernet connection. mēa 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.   MeshLAN WMC6300 Wireless Modem Card

The mēa 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 practice. This document provides detailed installation and configuration instructions for use when installing the mēa WMC6300 Wireless Modem Card and its Software.

System Requirements

General System Requirements

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

- Intel based Laptop or Notebook PC running the Microsoft Windows 2000 operating systems
- 5 MB of available hard disk storage
- Keyboard
- Mouse
- CD-ROM drive or DVD drive
- Available Type II PCMCIA card slot in the Host device

What's in the Box

Each mēa WMC6300 Wireless Modem Card is a full-featured wireless networking interface. The following is a list of the items provided with each WMC6300 card:

- mēa WMC6300 Wireless Modem Card

- 2.4 GHz Antenna with a 12 inch cable and MMCX connector

- Antenna Clip with adhesive backing

- mēa WMC6300 Software and Documentation CD

Figure 2.   What's in the Box

The mēa CD contains an on-line version of the mēa WMC6300 User's Guide in Adobe PDF format. If required, the CD also contains an installation executable to load the Adobe Acrobat Reader software.

Note: For best results, the mēa WMC6300 software should be installed before you insert the mēa WMC6300 card into the device.

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 4.
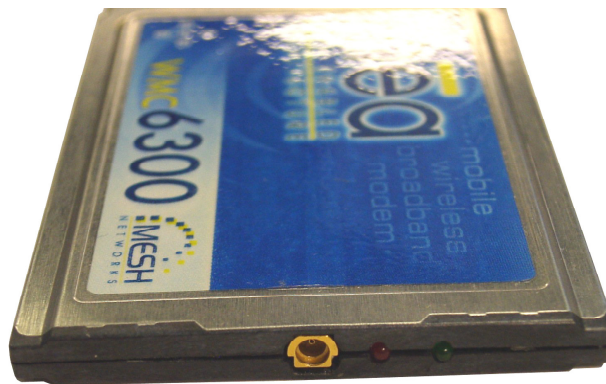
Antenna Connection Point   Transmit and Receive
                                                    LED Indicators

Figure 3.   WMC6300 Antenna Port and LED Indicators

Installing the Software

Installing mēa *Software (Windows 2000 Clients Only)*

Note: Install the mēa Software before inserting the WMC6300 card.

Complete the following procedure to install the mēa Software:

1. Insert the mēa Software Installation CD into the computers' CDROM drive.

2. The mēa Setup program will be displayed as shown in Figure 4.

   Note: If the installation program does not start automatically, open the Windows **Start** menu, click on **Run**, and then type **d:setup.exe** (where **d** is the letter of the CD-ROM drive) and click the "**OK**" button.

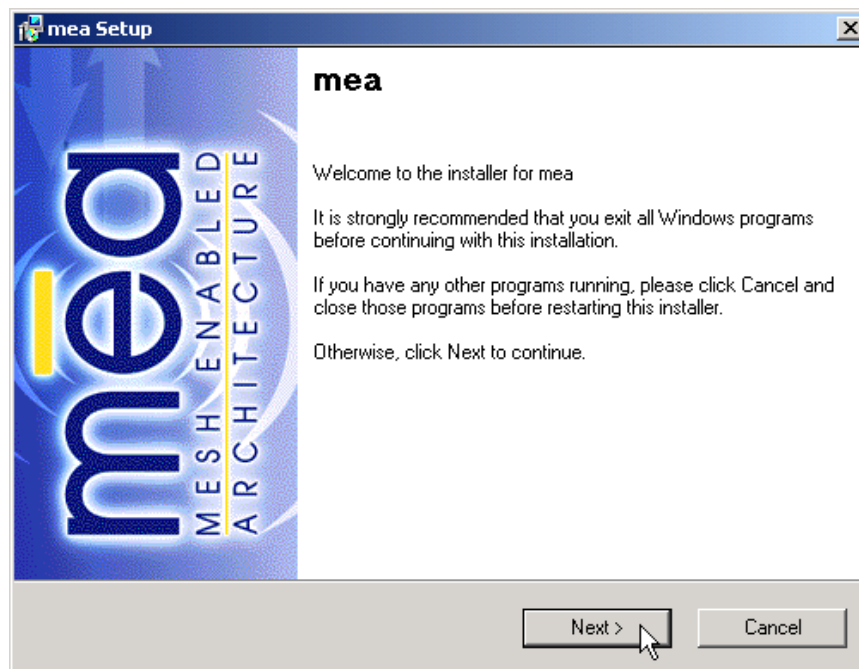3. Click the "**Next**" button to continue the installation process.

Figure 4. mēa **Installation Welcome Window**

4. The "License Agreement" window will be displayed. Please review the End User License Agreement. Use the scroll bar located at the right side of the window to display the complete text message.
Note: If you do not agree with the terms of the license agreement, click on "**Cancel**" and the installation will be terminated.

5. To continue with the installation process, click on the "**YES**" button as shown in Figure 5 and then click on "**Next**" to continue the installation.

Figure 5.   Agree with License Agreement Window

6. The "Startup Options" window will be displayed as shown in Figure 6. The user can modify the default installation configuration by checking or un-checking the boxes on this installation window. Click on "**Next**" to continue the installation process.
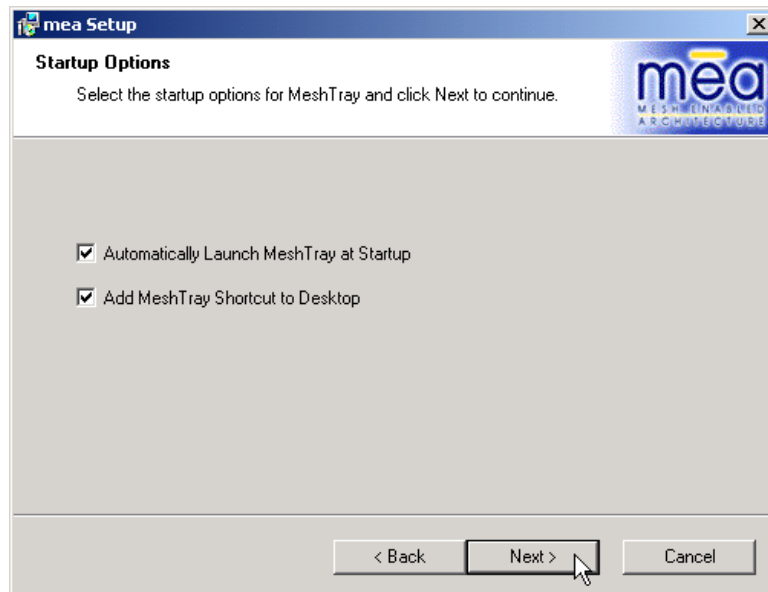
Figure 6.   Ready to Install Window

7. The "Ready to Install mēa Window" will be displayed as shown in Figure 7. This window displays the Install Folder location and the Shortcut Folder name that will be used to install the mēa software. Click on "**Next**" to proceed with the installation process.
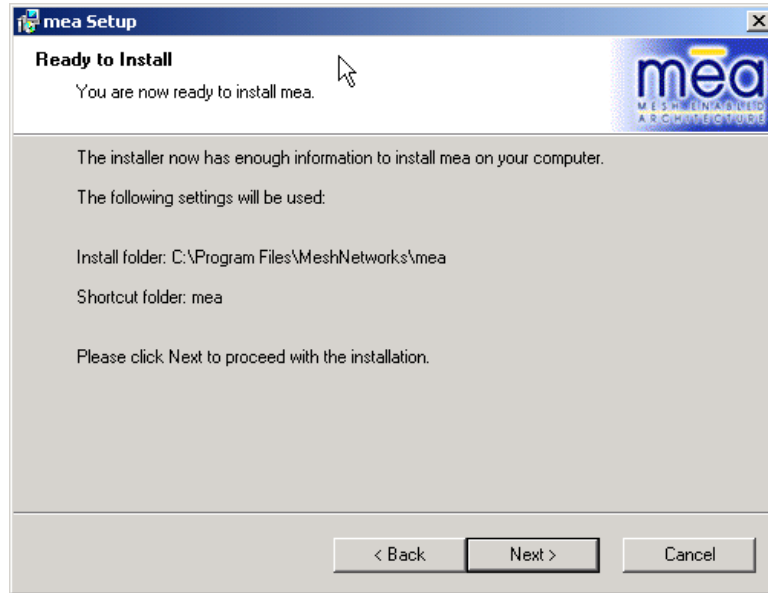
Figure 7.   Ready to Install mēa Window

8. During the installation process, the "Performing Setup Actions" window displays a status bar that indicates the progress of the installation. When the file transfer is complete, a window will be displayed as shown in Figure 8 that allows the user to view the "ReadMe" file for late breaking release information. It also allows the user to immediately run MeshTray. Click on "**Next**" to proceed with the installation process.

Figure 8.   Select Options Window

9. If selected, the "ReadMe" file will be displayed. Review the contents of the file and then close the dialog window by clicking on the "**X**" located in the upper-right corner of the window.

10. The "mēa Installed Successfully" dialog window will appear as shown in Figure 9. Click on "**Finish**" to complete the installation process.

Figure 9.   Finished Popup Window

MeshNetworks

Configuring the DNS Address

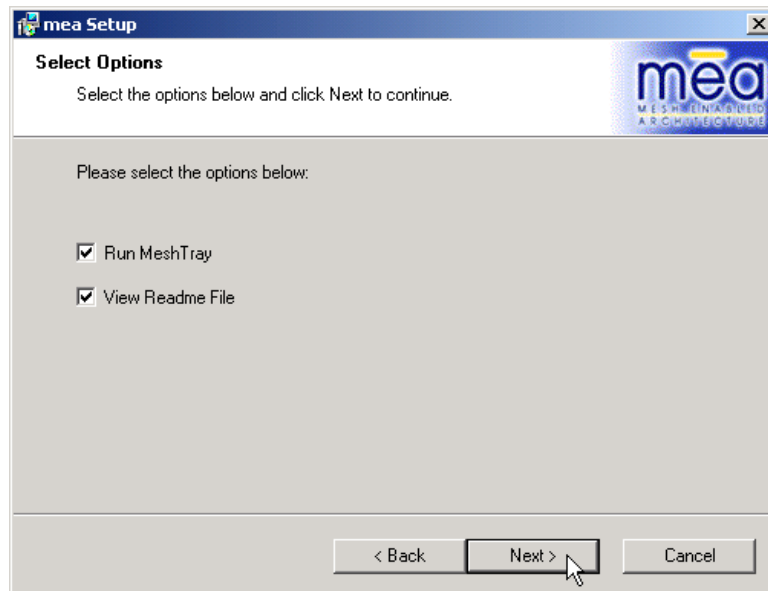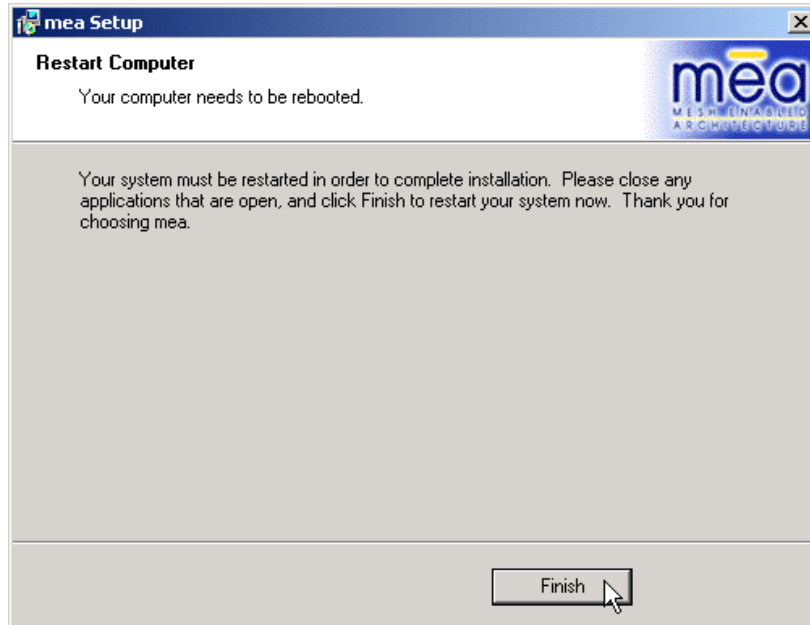The Network Operator must supply the DNS IP address for an Internet connection. This address must be manually configured in order for web URLs such as **www.meshnetworks.com** to be resolved. Complete the following procedure to configure the address:

1. Click on Start/Settings/Network and Dial-up Connections/Local Area Connection

2. Right click on the Local Area Connection Corresponding to the Wireless Modem Card and select "Properties" from the pop up menu.

3. Highlight "Internet Protocol (TCP/IP)" in the Components window.

4. Click on the "Properties" button.

5. Click on the "Advanced" button.

6. Click on the "DNS" tab

7. Click on the DNS "Add" button.

8. Enter the "DNS Server IP Address" provided by the network administrator and then click the "Add" button.

9. Click the "OK" button to close the Advanced TCP/IP Settings windows.

10. Click the "OK" button to close the Internet Protocol (TCP/IP) Properties windows.

11. Click the "OK" button to close the Local Area Connection Properties windows.

12. Click the "Close" button to close the Local Area Connection Status window.

This configuration should remain in the Windows 2000 host.

Connect the Antenna Assembly (Laptop Computer)

Complete the following procedure to connect the Antenna Assembly to the WMC6300, for use in a standard laptop computer.

Warning

This unit is not FCC certified for use in a PDA.

Always eject card when not in use.

1. Locate the Antenna (Part Number **MEA-Antenna12**) 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

2. Locate the Antenna Clip shown in Figure 11 and remove the paper that protects the adhesive backing.
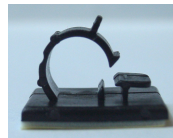
Figure 11.   Antenna Clip

3. Attach the Antenna Clip to the back of the laptop computer display approximately 1 inch from the top corner of the display as shown in Figure 12. Ensure that the location selected for the Antenna Clip will reach the WMC6300 with the provided cable length.

   Note: The antenna operational position must be greater than 8 inches or 20 cm from the bottom of the case and such that the Antenna is vertically orientated when the laptop is in use.

Figure 12.   Mounting the Antenna Clip

4. Insert the Antenna into the Antenna Clip as shown in Figure 13. The Antenna Clip must be closed to secure the Antenna.

    The Antenna Clip can be opened to remove the Antenna and WMC6300 card when not in use. If the Antenna Clip becomes unusable due to adhesive failure or damage, additional Antenna Clips are available through MeshNetworks by ordering Part Number **MEA-AntennaClip**.

Note: In some computers the PCMCIA card slot may be located near the front of the computer, and a longer Antenna cable may be required. If the supplied Antenna cannot be installed correctly because the cable is too short, contact MeshNetworks for additional information or order MeshNetworks Part Number **MEA-Antenna24**.

Warning
Never use the WMC6300 with the Antenna removed from the Clip.
Never use the WMC6300 with the Antenna disconnected from the Card.
Never use the WMC6300 with the display in the closed position.

Antenna
Installed
Correctly

CAUTION
FCC regulations require the antenna's
operational position be greater than
20 cm from the human body.
SEE USER MANUAL FOR FCC EXPOSURE REQUIREMENTS
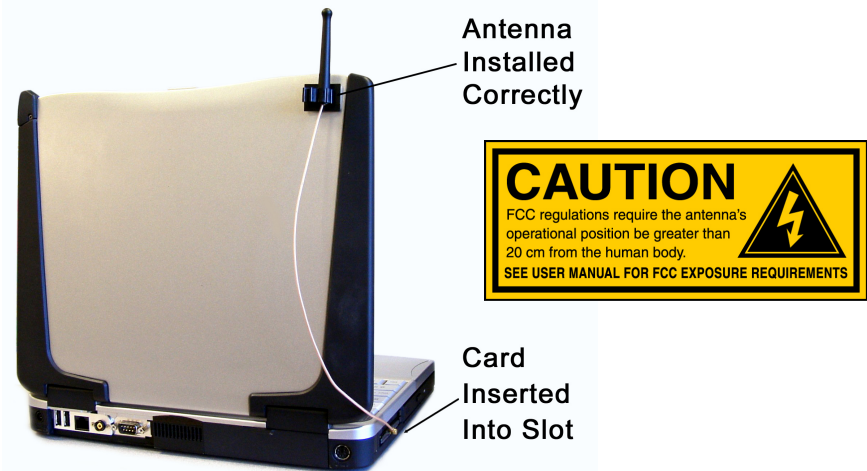
Card
Inserted
Into Slot

Figure 13.   Insert the Antenna into the Clip

Connect the Magnetic Antenna Assembly (Optional)

Complete the following procedure to install the Magnetic Mount Antenna on the rooftop of a vehicle. (The cable length of the Antenna is approximately 12-feet.)

1. Attach the Magnetic Antenna to the metal rooftop of the vehicle so that the antenna is in a vertical orientation.

    Caution: The base of the antenna contains a powerful magnet that secures the antenna to the rooftop. Use care when attaching the antenna

2. Route the remaining 12-foot cable, as required to arrive at the Host Computer.

Warning

**FCC regulations require that the antenna's operational
position must be greater than 20 cm from the human body.**

Never use the WMC6300 with the Antenna removed from the rooftop.

Never use the WMC6300 with the Antenna disconnected from the Card.

3. Insert the Antenna Cable Connector into the WMC6300 antenna port as shown in Figure 14. **Note:** The connector will "snap" into place when fully inserted.
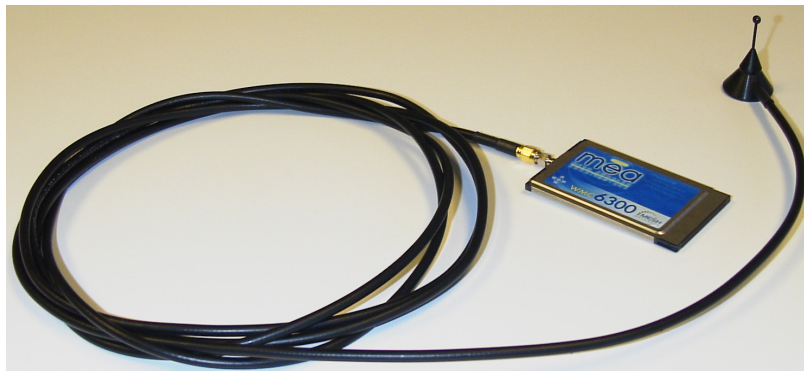
Figure 14.   Attach Magnetic Mount Antenna to the WMC6300

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 computer. 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 15.

   CAUTION - Never force the card into the slot.

Figure 15.   Installing the WMC6300 Wireless Modem Card

Warning
This unit is not FCC certified for use in a PDA.

Removing the WMC6300 Wireless Modem Card

The WMC6300 should be ejected using the following procedure to ensure that power to the card is disabled prior to removal.

<div align="center">

Warning
Always eject card when not in use.

</div>

1. Click on the Unplug or Eject Hardware icon in the system task bar.
2. Select "**Stop mea PC Card**" from the popup menu as shown in Figure 16.

Figure 16.   Eject the Hardware

3. Wait for a message that indicates that the device may be safely removed from the system as shown in Figure 17.

Figure 17.   Safe to Remove the WMC6300 Card

4. Remove the WMC6300 from the PCMCIA slot with the Antenna attached to the WMC6300 as shown in Figure 18.

Figure 18.   Removing the WMC6300 from the PCMCIA slot

5. Remove the Antenna from the Antenna Clip and store the WMC6300 with the Antenna attached for future use. The Antenna Clip remains attached to the computer.

Note: Should the Antenna Clip become unusable or if additional Antenna Clips are required, the Antenna Clips are available by ordering MeshNetworks Part Number **MEA–AntennaClip**.

Uninstalling Application Software

Complete the following procedure to "Uninstall" the mēa Ad Hoc Routing Software:

1. From the Start menu, select **Program Files**→mēa→**Uninstall** mēa.
    Note: The mēa software can also be uninstalled using "Add/Remove Programs" located in the Control Panel.

2. The Uninstall program will ask, "Are you sure you want to remove MeshNetworks Software…" as shown in Figure 19. Click on "**Yes**" to continue.
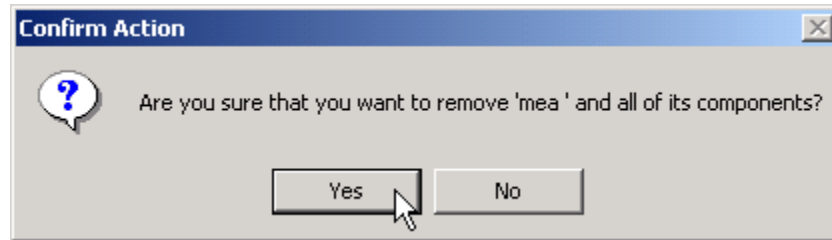

Figure 19.   Confirm Uninstall

3. The "Removing Programs From Your Computer" window will be displayed while the mēa software is uninstalled as shown in Figure 20. When the Uninstalling Software Process is complete, click on the "**Close**" button.
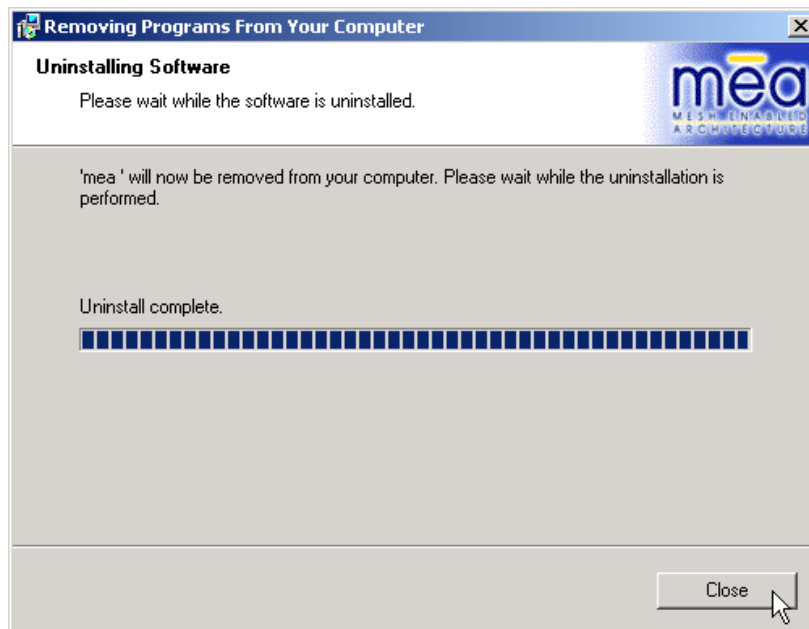

Figure 20.   Removing Programs From Your Computer Window

Overview of MeshNetworks' MeshTray

MeshTray™

MeshTray is a status application that reports vital and statistical information about the mēa card. Because MeshTray is a "tray" application, it stays in the desktop system status tray when it is minimized as shown in Figure 21 and Figure 22. The MeshTray icon changes to indication of the state of the wireless interface. In Figure 21 the MeshTray icon is in an inactive or disconnected state.

Inactive MeshTray Icon

Figure 21.   Inactive MeshTray Icon

The MeshTray icon shown in Figure 22 is currently associated with an AP400. The MeshTray icon displays the Link Strength to the associated IAP as color-coded bars. (More bars indicate greater Link Quality.)

MeshTray Icon

Figure 22.   MeshTray Link Strength Indicator

Clicking on the MeshTray icon restores the application to a property sheet interface as shown in Figure 23.

MeshTray Status

When the utility is launched, MeshTray displays useful system information such as a description of the device, the MAC address of the node, the IP address of the currently associated IAP, and the type of device (i.e., Subscriber Device, Wireless Router or IAP). The Driver and Firmware version and the IAP Address are also displayed.
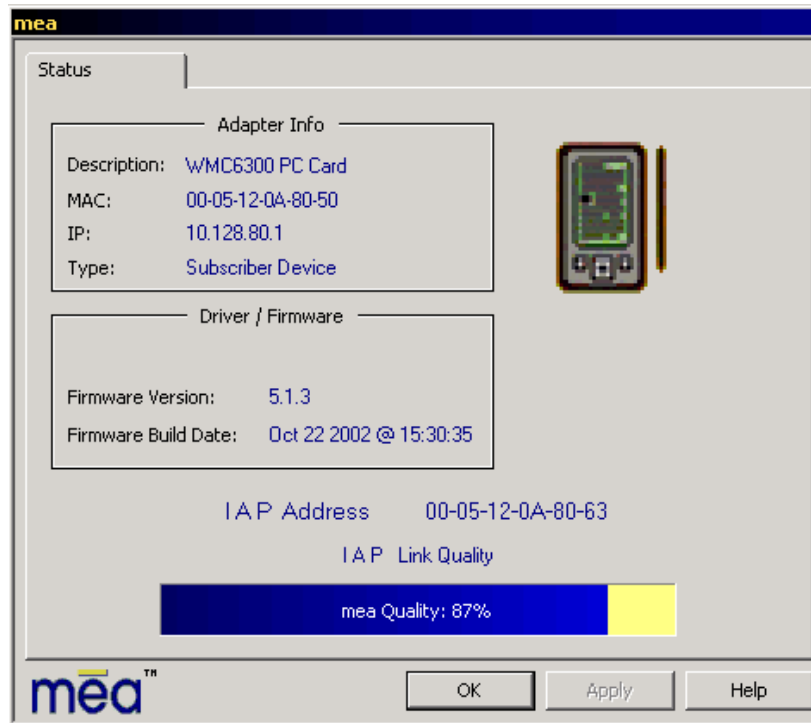
Figure 23.   MeshTray Status Page

Starting MeshTray

During the software installation process, a MeshTray shortcut icon is installed on the users' desktop. To start the MeshTray application, double-click on the MeshTray icon.

Terminating MeshTray

If desired, the MeshTray application may be terminated by positioning the curser over the MeshTray icon that is located in the Toolbar. Then, right-click on the MeshTray icon and select "Exit" as shown in Figure 24. The task is terminated and the icon is removed until the application is started again from the Start menu.

Figure 24.   Exit MeshTray

Customer Service Information

For information about solving difficulties in setting up your mea WMC6300, please see the Frequently Asked Questions in the support page at **http://www.meshnetworks.com/**.

If you have read this document, reviewed the FAQ, and made every effort to resolve installation or operation issues and require assistance, please contact your mēa WMC6300 supplier.
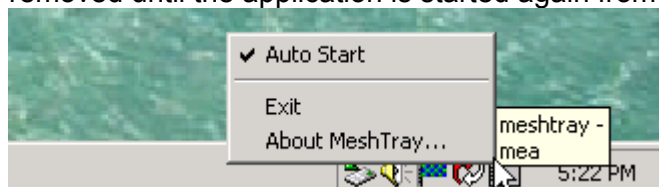
License and Warranty Information

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EXPORT COMPLIANCE

You agree and certify that the Product will be utilized only in the United States of America or in compliance with 22CFR125.4(b)(9).

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This License Agreement & Limited Warranty will be governed by the laws of the state of Florida, U.S.A., and by the laws of the United States, excluding their conflicts of laws principles. Both the Uniform Computer Information Transactions Act and the United Nations Convention on Contracts for the International Sale of Goods are hereby excluded in their entirety from application to this License Agreement & Limited Warranty.

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 A 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. This equipment should be installed and operated with a minimum distance of 20 cm between the antenna and your body.

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

Safety Information for the mēa *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' mēa 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 mēa 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.

- Antenna use:

  - In order to comply with FCC RF exposure limits, dipole antennas should be located at a minimum distance of 7.9 inches (20 cm) or more from the body of all persons.

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. Such modifications could void the user's authority.