MOTOROLA

Mobile Workstation 800 Series
Model F5207A, F5217A

Central Processor Unit (CPU) Box

Owner's Manual

6802976C60-O

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Using this Manual

Before using this manual and products it describes, be sure to read the Safety instructions in Appendix A, the Warranty information in Appendix B and the FCC information in Appendix C.

Who Should Use this Manual

This manual is intended for staff who operate the Mobile Workstation 800 (MW800) and need to configure, upgrade or maintain its CPU box. This manual assumes the reader is familiar with the MW800 and basic Windows operations. If this is not the case, be sure to read the MW800 User's Guide and documentation that came with your version of Windows.

For documentation of supplied software applications, refer to the help file attached to each application.

Manual Introduction

The MW800 mobile workstation consists of three separate interconnected components: CPU box, Display and Keyboard. This manual only deals with the CPU box, which is also referred to as either *device* or *CPU* in this manual. This manual is organized as follows:

- ***Section 1*** provides an overview.
- ***Section 2*** provides a description of basic operations.
- ***Section 3*** describes various parameters that define CPU configuration when you turn on your computer.
- ***Section 4*** describes a variety of software tools that Motorola provides with the CPU box.
- ***Section 5*** explains software upgrade procedures.
- ***Section 6*** provides a view of recovery techniques and ways to reinstall the complete Windows operating system, device drivers, and applications similar to original factory setting.
- ***Section 7*** describes how to get assistance from Motorola.

The *Appendixes* contain:

- ***Appendix A:*** Safety instructions
- ***Appendix B:*** Warranty information
- ***Appendix C:*** FCC information
- ***Appendix D:*** Specifications
- ***Appendix E:*** CPU Features
- ***Appendix F:*** Auxiliary port
- ***Appendix G:*** Approved accessories and options

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- ***Appendix M:*** Acronyms and Abbreviations

Related Manuals

This manual describes the MW800 CPU box and provides basic operating instructions. Please note that although this manual refers to hardware and software components supplied with this product, it does not provide full component description. For additional information refer to the following documents:

- Mobile Workstation 800 Series, User's Guide - 6802976C65
- Mobile Workstation 800 Series, Owner's Manual for Display - 6802976C75
- Mobile Workstation 800 Series, Installation Manual - 6802967C20

For documentation on software applications supplied with this product, refer to the help file attached to each application. This manual is designed to supplement the on-line help or on-line context-sensitive help installed with every software component. Please review this information to ensure proper use of the product.

Also, if you need to be able to change the configuration of your device, refer to

- Mobile Workstation 800 Series,
  Maintenance Programming Software, User's Manual - 6802976C70

For additional information visit the MW800 home page http://www.motorola.com.

Conventions Used in This Manual

Throughout this publication, you will notice the use of danger and caution marks. These notations are used to emphasize that safety hazards exist, and care must be taken. Do not proceed beyond a **DANGER** or **CAUTION** until the indicated conditions are fully understood and met.

The following conventions are used throughout this manual:

Italics	Used for emphasis and for new terms.
Bold	Used to indicate keyboard keys or application buttons.
Program -> **Motorola** -> **MW800 CPU**-> **CPU Manager**	Used to designate the location and name of a menu function. For example, **Program** -> **Motorola** -> **MW800 CPU**-> **CPU Manager** launch CPU Manager program.

Note:	Indicates an operational procedure, practice, or condition to which you should pay special attention.
CAUTION:	Alerts you of conditions, which can result in loss or corruption of data, or damage to device.
DANGER:	Indicates a potentially hazardous situation, which, if not avoided, may result in injury. It may also be used to alert against unsafe practices and property-damage-only accident hazards.

Section 1: Getting Started

What is the CPU Box?

The Motorola Mobile Workstation 800 (further MW800) series is Motorola's highest-performing and most rugged data communication and computing solution. It is specifically designed for the harsh conditions of the mobile environment--areas not suitable for conventional notebook or desktop computers. Refer to *Appendix D* for detailed specifications.

The MW800 CPU Box is available in two models:

- *F5207A - Mobile Workstation*
  A multipurpose mobile data terminal, which can support the simultaneous operation of two independent users, each using different display and keyboard. Among its many interfaces, this model contains video and audio inputs.

- *F5217A - Mobile Gateway*
  A multipurpose mobile data terminal with capability to provide seamless mobility across a number of dissimilar public and private data networks. This device has three distinct Ethernet ports and provides dead reckoning intelligence on data coming from the GPS receiver.

This manual covers both CPU models, which share many of the same hardware, software and mechanical aspects. A summary of differences is shown in *Appendix I*.

The CPU box provides a wide range of internal and external interfaces (USB 2.0, Ethernet, RS-232, Firewire) for connection to variety of peripherals. A PC Card slot situated at the front panel extends the CPU box's capabilities with PCMCIA-based devices. Digital video capabilities allow capturing videos from a standard composite or digital VCR. *Appendix E* gives details about the CPU box's features.

An auxiliary port provides interface to vehicle ignition sensor, four TTL level I/O ports, car battery voltage and 5VDC power outputs, etc. Refer to *Appendix F* for the Auxiliary port description.

Using custom-designed cables, the CPU can be connected to the MW800 display or any standard LCD, CRT or Flat Screen display. A list of approved accessories and options can be found in *Appendix G*.

F5207A CPU can support the simultaneous operation of two independent users, each using different display and keyboard. Refer to *Appendix K* for details.

Section 2: Basic Operations

This section describes the following operations:

- Power On
- Power Off
- Standby
- Wake Up
- Reset

Power On

This chapter describes methods to power on the CPU box in normal and extreme conditions.

NOTE: Prior to powering on the CPU, ensure that the main power switch on the rear CPU panel is in the ON position.

Normal operation

The CPU box can be turned on either from the vehicle ignition switch or by the power button located on the front panel.

- If the CPU box power is connected directly to the battery (and not through the ignition switch) and configured to be turned on/off only by the power button (see section 3, **Ignition boot up preference** setting is NONE), press the Power button on the front panel of the CPU box.

- If the CPU box power is connected through the ignition and configured to be turned on/off by both the ignition switch and the power button (see section 3, **Ignition boot up preference** setting is POWER ON), insert the car key into the ignition switch and rotate it to ACC position or press the Power button on the front panel of the CPU box.

- If the CPU box power is connected through the ignition and configured to be turned on/off only from the ignition switch (see section 3, **Ignition boot up preference** setting is POWER BUTTON LOCK), insert the car key into the ignition switch and rotate it to ACC position.

When the CPU is turned on, the pre-installed Operating System will be automatically loaded. This process takes some time; please wait until this process is completed before using the computer.

Low Temperature Conditions

The device supports working hard disk conditions even if it's turned off. When the ambient temperature drops below the low hard disk operational limit, an internal heater will automatically adjust and maintain the working conditions (see **Hard disk heating when device is off** parameter in section 3) for pre-defined time.

- If the CPU is turned on when **Hard disk heating when device is off** time-out has not expired yet and the hard disk temperature is within the operating range, the CPU will boot up immediately.

- If the CPU is turned on when **Hard disk heating when device is off** time-out occurs and the hard disk temperature is below the low hard disk operational limit, the CPU will activate the internal heater and will boot up only when the hard disk temperature returns to the operating range. The heating process takes some time that can be optimized (see **Heater optimization** parameter in section 3); please wait until this process is completed.

NOTE: If the power source is a 9VDC car battery (see **Power source** parameter in section 3), the device will not power up when the temperature range is below the low operational limit.

High Temperature Conditions

The device will be turned on only if an ambient temperature does not exceed the high operational limit.

NOTE: In extreme conditions, the overall performance of the device (including boot up time and sustained operations) may be degraded. It will return to normal when the ambient temperature returns to the operating range.

CAUTION: If overheating, do not turn on the device until it cools down.

Discharged Vehicle Battery

If the power source is a 13.8VDC car battery (see **Power source** parameter in section 3), the device will normally power up when the voltage level exceeds 10.3VDC.

If the power source is a 9VDC car battery (see **Power source** parameter in section 3), the device will normally power up when the voltage level exceeds 9VDC.

Shut Down

This chapter describes methods to power off the CPU box in normal and extreme conditions.

Normal Operation

The CPU box can be turned off either by the vehicle ignition switch or by the power button located on the front panel. The CPU box can also be turned off with the Windows Shut Down process. Remember to save important information before turning the device off.

- If the CPU box is connected via the ignition and configured to be powered off by the ignition switch (see section 3, **Ignition shut down preference** setting is SHUTDOWN), rotate the car key it to OFF position. The device will automatically shut the Windows down when the **Ignition shutdown time-out** expires and power is off.

  NOTE: A Windows pop-up dialog will warn you about power off from the ignition switch. You can cancel this operation up until the **Ignition shutdown time-out** has expired.

- If the CPU box is not connected via the ignition and configured to power off only by the power button (see section 3, **Ignition shut down preference** setting is NONE), briefly press the Power button. The device will shut Windows down and power off.

- If the system does not respond, you can turn the device off by pressing and holding the power button for 6 seconds or more. To permit this option, **Critical turn off** parameter (see Section 3) setting should be ENABLE.

  CAUTION: This method of hardware power off may damage your hard disk.

Extreme Shut Down

Certain extreme events may cause you device to power off, including ambient temperature outside the operating limits or discharged car battery.

Selecting desired notifications in the Agent Notification tab of the CPU Manager application (see Section 4) provides a notice if an extreme event should occur. In this case you should immediately save your data.

- *Internal temperature drops below the low operational limit*.
  If during operation the ambient temperature exceeds the operating temperature range or internal temperature drops below the low operational limit for any reason, the CPU processor eventually powers off. A message "**CPU temperature is low. The system will shutdown in 3 minutes. Please save your work**" will warn you about this event.

  CAUTION: If extremely low temperature is the reason for the shut down, do not turn on the device until it heats up.

- *Internal temperature exceeds the high operational limit.*
  If during operation the ambient temperature exceeds the operating temperature range or internal temperature exceeds the high operational limit for any reason, the CPU processor gradually slows down, and eventually powers off. A message "**CPU temperature is high. The system will shutdown in 3 minutes. Please save your work**" will warn you about this event.

  CAUTION: If overheating is a reason for the shut down, do not turn on the device until it cools down.

- *Vehicle battery is discharged.*
  If, during normal operation, the battery voltage drops below 10.5VDC the device will provide Low Battery indication (the MW800 display power indicator blinks yellow).
  A message "**Vehicle Battery is Low. The system will shutdown in 3 minutes. Please save your work**" will warn you about this event.
  If the voltage continues to drop, the device automatically powers off at 8.5VDC.

- *Drops in car battery voltage.*
  If battery voltage drops below the 8.8V limit for 20 seconds or more, the device will execute critical shut off and power itself off.

Power Management

This chapter describes low-power mode (standby) and resume normal operating mode. In low-power state, the CPU enters a power-saving mode, turns off the display backlight and slows down the CPU speed; the internal radios remain powered on. To resume normal operation, touch the display panel or press any display function key.

Standby

The CPU box can enter low-power state (standby) either manually or automatically when System Standby time-out occurs. The CPU will enter Standby mode via the following methods:

- Press the Standby button on the right side of the MW800 display.
- Press on the Power button. The CPU can be configured to enter Standby mode when you press the Power button. For details about this option, refer to the help file attached to Power Options (**Start** -> **Settings** -> **Control Panel -> Power Options**).
- The device can be configured to automatically enter a low-power state when System standby time-out occurs. For details about this option, refer to the help file attached to Power Options (**Start** -> **Settings** -> **Control Panel -> Power Options**).

Resume

If the device is in Standby mode, the following methods will resume it:

- Ring Indicator from a serial port
- USB bus activity
- An input from the keyboard
- Changing a touch pad position
- A contact to the touch panel of the MW800 display
- Pressing the Emergency key of the MW800 display
- Pressing the Function key of the MW800 display
- LAN (Wake on LAN message)
- Power button (if configured)

If the CPU box configuration allows wake up from a serial port (see section 3, **Radio ring indicator (RI)** setting is ENABLE, **System ring indicator (RI) mask** setting is DISABLE), the CPU will resume when a device connected to a serial port activates the RI line.

A USB device can wake the CPU out of standby if its setting specifies the operating system to do so. To enable this feature, **Allow this device to bring the computer out of standby** option **(Power Management tab** in **Properties)** should be selected. For details about this option, refer to the help file attached to the Properties of the device.

A Network (Ethernet) device can resume the CPU from standby if its setting specifies the operating system to do so. To enable this feature, **Allow this device to bring the computer out of standby** option **(Power Management tab** in **Properties)** should be selected. For details about this option, refer to the help file attached to the Properties of the device.

Pressing of the Power button will bring the computer out of standby if its setting specifies the operating system to do so. For details about this option, refer to the help file attached to Power Options (**Start** -> **Settings** -> **Control Panel -> Power Options**).

Resetting

You may have to reset the CPU when an error occurs and the program you are using locks up. Be aware that the system may have been processing data when it locked up. If you are sure the system operation has stopped and you cannot use the '*Restart*' function of the operating system, reset your device. Be aware that resetting will cause unsaved data to be lost.

To reset the device, press the <**Ctrl+Alt+Del**> keys, and select the *Restart* option from the Windows shut down screen.

CAUTION: If the system does not respond, you can turn the device off by pressing and holding the power button for 6 seconds or more. Be aware, this method of hardware power off may damage your hard disk.

Section 3: CPU Configuration

The CPU has a protected memory area to store the configuration parameters accessed when you turn it on. That binary-format data contains basic information about CPU capabilities including general settings, power-up, power-off modes, etc.
This chapter describes the various configuration parameters that can be selected and modified as required.

CPU Configuration Parameters

Power source
Provides capability to select a power source: either 13.8VDC or 9VDC car batteries. Factory setting is 13.8VDC.
NOTE: if 9VDC battery is selected, power loss compensation during engine cranking will be not supported.

Turn-off command from display
Normally, when the MW800 display encounters a hardware problem, it can turn the CPU off. This parameter enables or disables this feature. Factory setting is ENABLE.

Critical turn off
Normally, if the system does not respond, you can turn the device off by pressing and holding the power button for 6 seconds or more. This parameter enables or disables this feature. Factory setting is ENABLE.

Power button preference
Normally, you can turn the device on and off by pressing the power button. This parameter enables or disables this feature. Factory setting is ENABLE.
NOTE: If you disable this feature, only the ignition switch can turn the device on. Make sure, that **Ignition boot up preference** setting is POWER ON.

Ignition boot up preference
Selects desired CPU action when turning the ignition switch on. The following options are available:

- **NONE** Ignore turning the ignition switch on.
- **POWER ON** Boot up the device if it's powered off; ignore if it's already powered on.
- **POWER BUTTON LOCK** Block the Power Button until you turn on the ignition switch.

Factory setting is POWER ON.

Ignition shut down preference
Selects desired CPU action when turning the ignition switch off. The following options are available:

- **NONE** Ignore turning the ignition switch off.
- **SHUTDOWN** Shut the device down when the ignition switch is turned off. If this option is selected, set **Ignition shutdown time-out**, which specifies the period to elapse between turning off the ignition switch and the CPU shutting down.

Factory setting is NONE.

Ignition shutdown timer
Selects the amount of time to elapse between turning the ignition switch off and CPU shutting down. This parameter may vary from 0 to 127 seconds or minutes. Factory setting is 3 minutes.

WLAN adapter switch
Turns internal mini-PCI wireless LAN adapter on and off. Factory setting is ON.

Radio status on power up
Selects the initial state of the internal WAN (GPRS, iDEN or Private DataTAC) radio. Factory setting is ON.

Main radio power switch
The internal radio is connected to or disconnected from a power source. This parameter turns the radio power switch on and off. Factory setting is ON.

GPO0 state on power up
Defines initial state of the general-purpose GPO0 output at the auxiliary connection. Factory setting is OFF.

GPO1 state on power up
Defines initial state of the general-purpose GPO1 output at the auxiliary connection. Factory setting is OFF.

Auxiliary 5V output
Enables or disables 5VDC output at the auxiliary connection. Factory setting is ENABLE.

Auxiliary 12V output
Enables or disables the car battery voltage output at the auxiliary connection. Factory setting is ENABLE.

GPS state on power up

Selects initial mode of a GPS receiver if your CPU is fitted with the internal Trimble GPS unit. Factory setting is OFF.

GPS mode
This parameter is pertinent if your CPU is fitted with the internal Trimble GPS device. It selects the standard protocol used by GPS receiver to transmit data. The NMEA and TSIP/TAIP options are available. Factory setting is TSIP/TAIP for F5207A and NMEA for F5217A.

Radio ring indicator (RI)
Enables or disables wake-up from the RI line of the serial COM3 port. Factory setting is ENABLE.

System ring indicator (RI) mask
Masks Ring Indicator from any serial port. When masking is disabled, RI from any serial port will wake up the device. Factory setting is DISABLE.
Note: for serial COM3 port, see also **Radio ring indicator (RI)** parameter.

iDEN programming mode
This parameter is pertinent if the device is fitted with an internal iDEN modem. It turns on or off a special programming mode of the iDEN modem. Factory setting is OFF.

SB9600 mode
This parameter is pertinent if the device is fitted with an internal iDEN modem and allows a data in SB9600 format to be encapsulated. Factory setting is ON.

Heater optimization
The CPU has internal hard disk heater, which allows operating in low temperatures. This parameter optimizes automatic heating, based on the ambient temperature in your area. Factory setting is 0°F.

Hard disk heating when device is off
An internal automatic hard drive heater allows the CPU to operate properly in low temperatures. When the device is turned off, an automatic heater will maintain the hard drive temperature within the operating range for a certain period of time set by this parameter. The period range is 0 to 16 hours. Factory setting is 16 hours.

CPU serial number
This read-only field shows the CPU serial number.

Refer to *Appendix H* for factory setting of the CPU configuration parameters.

BIOS Setup

The BIOS is a program stored on a Flash chip on the motherboard with a default configuration that starts when you turn on the CPU.

The device provides a BIOS Setup Utility that enables the selection and modification of different BIOS setup parameters. Note that incorrect BIOS changes can prevent the device from working. Factory BIOS setting can be found in *Appendix J*.

CPU Configuration Change

This chapter describes software tools and the most common methods to change CPU configuration.

Maintenance Programming Software

The Maintenance Programming Software enables modification of the configuration that starts when you turn the CPU on. Use the MPS context-sensitive on-line help information for assistance in configuring the device.

How to Modify Configuration Parameters

To modify the configuration parameters perform the following:

- Double-click on the MPS icon; main MPS window appears on the screen.

Figure 1. Main MPS Window

- Click on Codeplug Editor

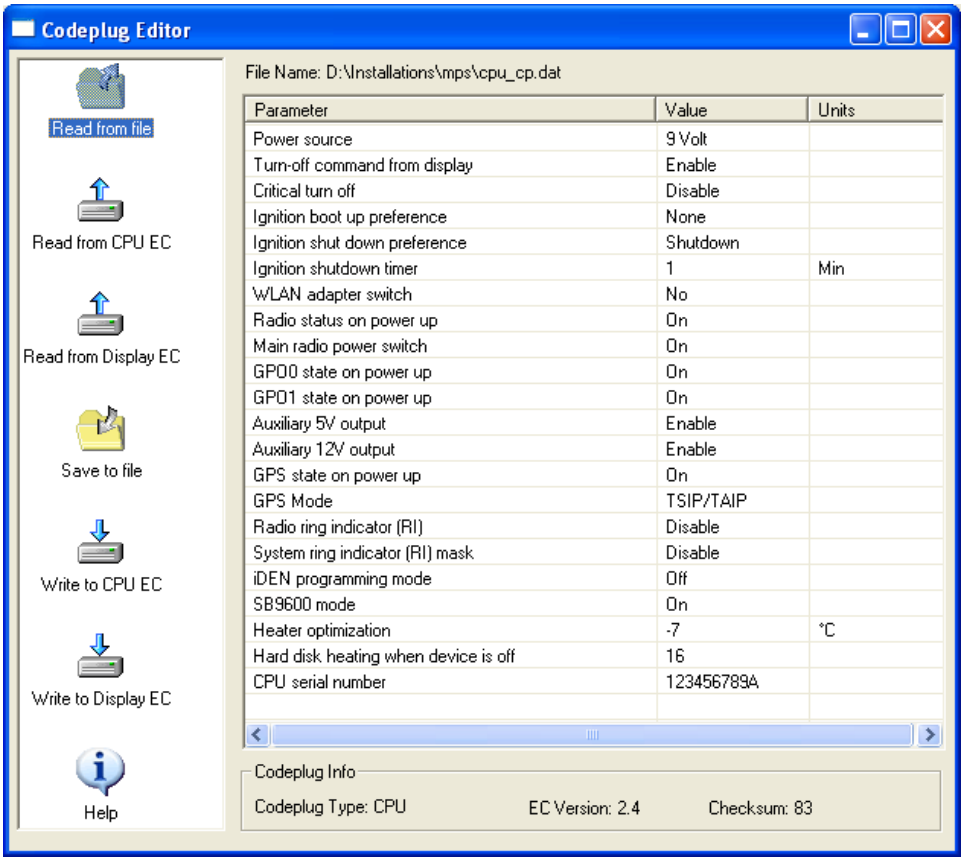

Figure 2. Codeplug Editor

To modify configuration parameters use the MPS tool as the following:

- Click on **Read from CPU** to read the codeplug parameters. If your device is successfully read, you will see CPU parameters.
- Click on **Save to file** to backup the original codeplug data.
- Modify a parameter per your selection.
- Click on **Write to CPU** to program the device.
- If the device is successfully programmed, the following message appears.

CAUTION: Incorrect configuration can make the device inoperable. Please, make sure to acquire the appropriate codeplug. Always make a backup copy in case an error is made during the update.

Note: For details refer to Maintenance Programming Software User's Manual.

Section 4: CPU Software

This manual assumes that you are familiar with basic Windows operations. If this is not the case, be sure to read the documentation that came with your version of Windows before you proceed. This chapter contains the information about unique CPU software and firmware components.

For documentation of supplied software applications, refer to the help file attached to each application.

CPU Manager

This software application provides basic information about the CPU unit and selection of desired notifications in extreme conditions. To run CPU Manager, click MW800 CPU Manager icon from the Start menu.

This application provides the following:

- **Versions** General information about CPU hardware, embedded firmware and CPU software versions

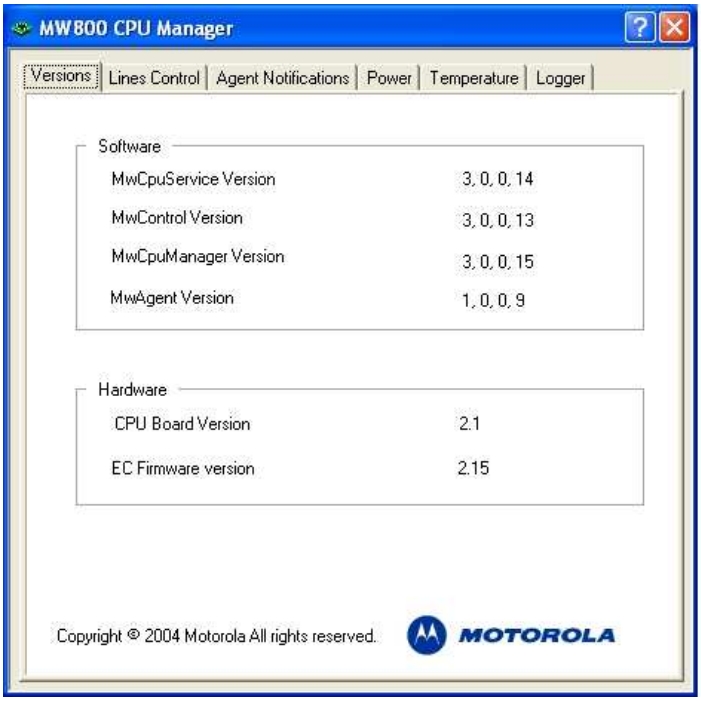

Figure 3. CPU Manager, Version Tab

- **Lines Control** The status of GPI lines, manual control of GPO lines, power on and off internal WWAN and WLAN radios and GPS device

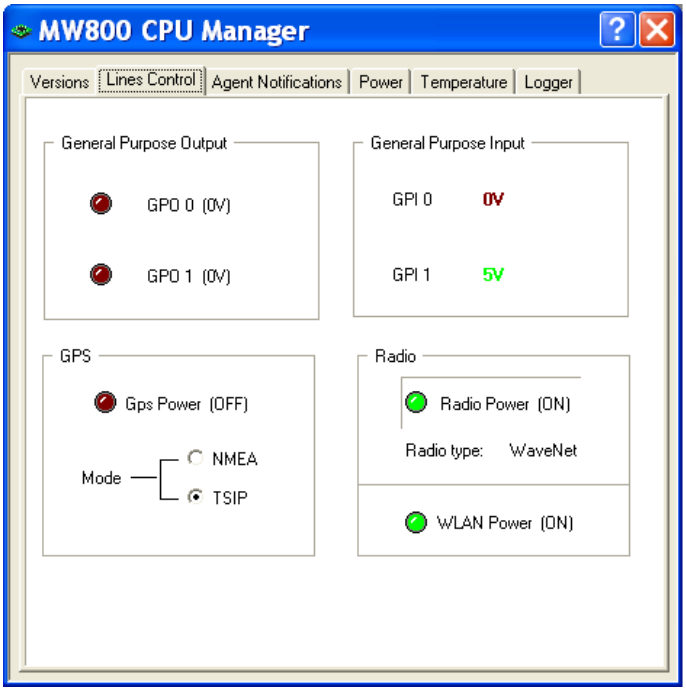

Figure 4. CPU Manager, Lines Control Tab

- **Power** The CPU current consumption and a voltage level of the car battery

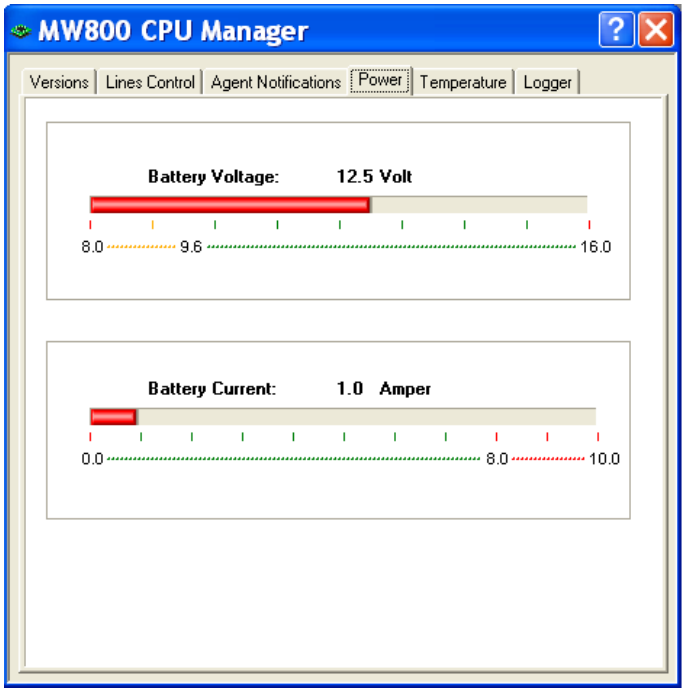

Figure 5. CPU Manager, Power Tab

- **Temperature** Real time internal temperatures

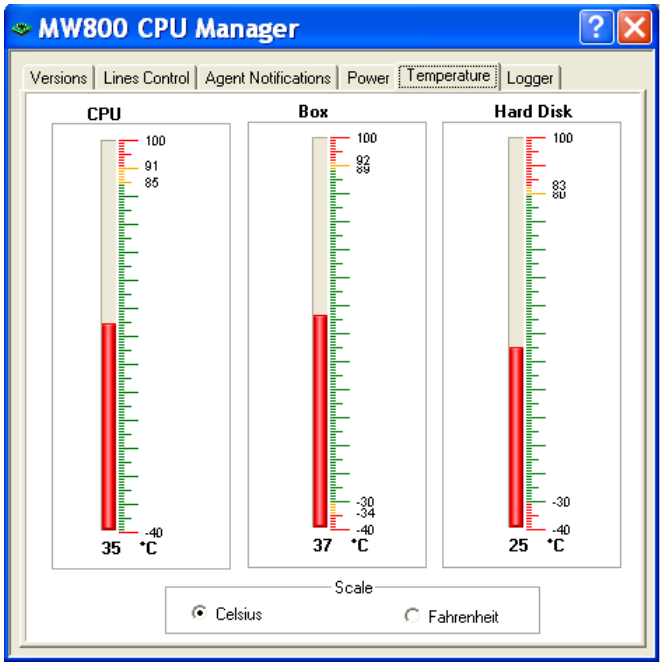

Figure 6. CPU Manager, Temperature Tab

- **Agent Notifications** Alerts if a corresponding event occurs. The following notifications are available:

  - ◊ **Temperature** - when CPU temperature exceeds either limit of the valid range.
  - ◊ **Low battery** - when the battery voltage drops below 10.5VDC.
  - ◊ **Ignition** - when you turn off the ignition switch.
  - ◊ **Current Notifications** - when CPU box experiences over-current of hard drive heater, firewire device or PC card.

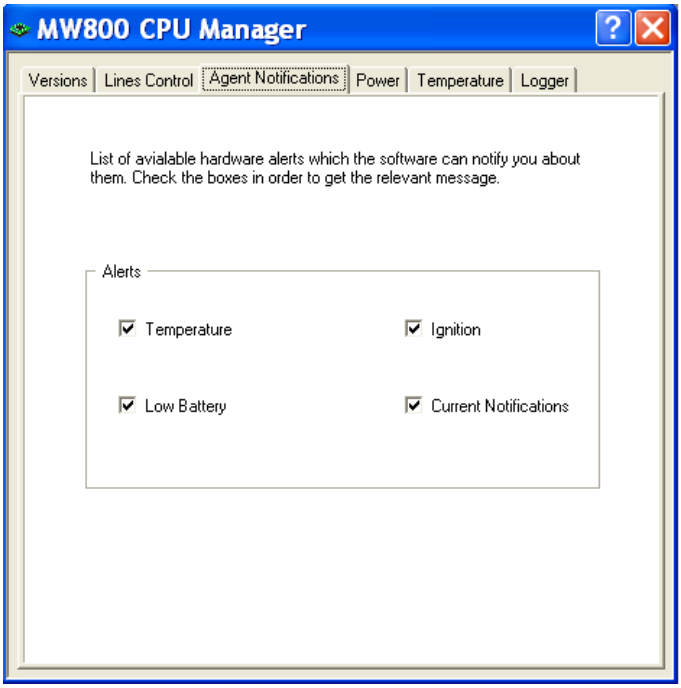

Figure 7. CPU Manager, Notifications Tab

- **Logger** Troubleshooting tool allowing documentation of extreme events into a log file

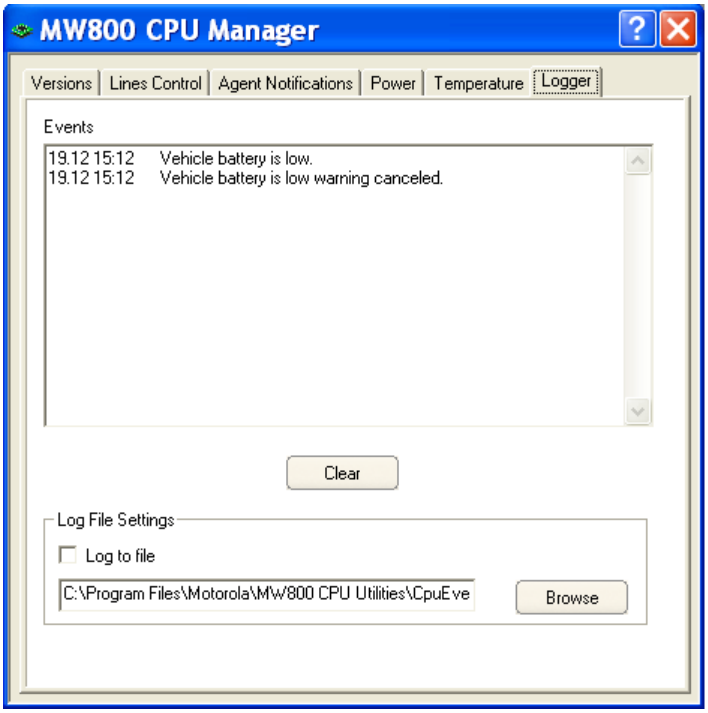

Figure 8. CPU Manager, Logger Tab

MW800 Display Utilities

This application provides the following capabilities:

- **Calibration Tool** calibrates the touch screen interface to the display monitor
- **ExtraKey Application** configures the MW800 display functional buttons for other Windows applications
- **MW Display Tester** troubleshoots several display problems
- **Volume Bar** sets of the current volume level

Calibration

Sometimes there is a need to calibrate the touch panel attached to the display monitor, i.e. to adjust the pushed position of the panel and its display position of the monitor. Even if the touch panel has same dimensions as the display monitor, there may be minor variations between corresponding data points due to resistance variance of each panel.
When you use touch panel module for the first time, or, when there is discrepancy between the touched and displayed positions, calibration is required. This needs to be done only once, whereupon the calibration data is stored. The CPU will automatically calculate the touched position on display monitor.

This adjustment may be executed with the MW800 Display Calibration Tool.

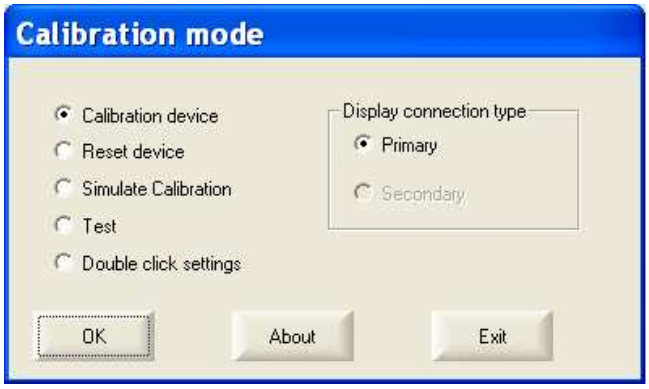

Figure 9. Calibration Window

This utility performs the following:

- **Calibrate Device** calibrates the touch screen and saves calibration data
- **Reset Device** nullifies calibration parameters in the MW800 display codeplug
- **Simulate Calibration** simulates calibration of the touch screen without saving calibration
- **Test** briefly tests of the touch screen after calibration

- **Double-Click Setting** calibrates the double-click on the touch screen

ExtraKey Application

The ExtraKey Application allows display function keys to be configured for other Windows applications. It allows the function key to operate like the standard keyboard hotkey, launch any application (like Notepad or Calculator) or blank the display. ExtraKey application's desktop toolbar is situated on one of the edges of the screen (default - the bottom edge).

You can customize the Extrakey using Configuration window, launched either from the Control Panel, or by left-clicking the ExtraKey tray icon and choosing **Configuration** in the pop-up menu.

Each display function key can be mapped either to a hot key (such as Ctrl + X, F1 etc.), to a file (as a shortcut), or to the display switch:

Figure 10. ExtraKey Configuration

How to set a shortcut to the hot key

- Choose **Hot Key** in the **Map to** drop-list.
- Move the cursor to **Press new hotkey** field and right-click once to activate it.
- Press the desired key on the keyboard. Field **Name** defines how the Extrakey Bar button will be named (this is optional).

How to set a shortcut to the application

- Choose **File** in the **Map to** drop-list.
- Enter the full path name of the file to be opened or click the button to browse. Field **Name** defines how the Extrakey Bar button will be named (this is optional).

How to set a shortcut to the display switch

- Choose **Display switch** in the **Map to** drop-list.
- Field **Name** defines how the Extrakey Bar button will be named (this is optional).

The ExtraKey Application on-line help provides context-sensitive information. Please, read this information to ensure proper operation of the device.

Display Tester

This tool is simple test application for troubleshooting certain display features. This tool is for display diagnostics purposes, only.

Volume Bar

This application sets the volume level. The Volume window allows color modifications and pops-up on every volume change. If your display unit includes the BlueTooth feature, this application also allows commutation of audio stream to the BlueTooth device.

Section 5: Software/Firmware Upgrade

Software upgrades keep your computer up-to-date. All software components, utilities and applications described in this chapter are PC-based, running under Windows 2000 and Windows XP operating systems on the MW800 series or compatible platform.

The MW800 Support CD-ROM part No. FVN5413A is an auto-run software package. Use this kit when you installing or updating unique software and firmware components in your device.

Description/Tutorial

Insert the MW800 Support CD into the CD drive. The Main Menu screen automatically appears as shown:

Figure 11. Support Kit, Main Menu

To perform the desired action, click on the particular option and follow the on-screen instructions to continue and complete the process.

OS and Drivers

Insert the Support Kit into the CD-ROM drive and click on the **OS and Drivers** button. The MW800 Support kit provides automatic upgrading of the following OS components and drivers:

- **Chipset Installation** Updates the Windows *.INF files in your device. The INF files inform the operating system how to properly configure the chipset for specific functionality, such as USB and core PCI.
- **Extreme Graphics** Updates or install the Extreme Graphics video driver. The Extreme Graphics offers advanced features that support the latest 3D, 2D, and video-playback applications targeted for all users.
- **Embedded Graphics** Updates or install the Embedded video driver. The Embedded video driver provides capability to work with the secondary RGB display.
- **LAN** Updates the LAN driver in your device.
- **WLAN** Updates or install WLAN driver for the Intel® PRO/Wireless 2100 Network Connection wireless network adapter.
- **Sound driver** Updates the sound driver in your device.
- **Video Capture** Updates Conexant video capturing driver.
- **Windows SP** Updates Windows XP Service Pack 2 and Windows 2000 Service Pack 4 (accordingly to the installed Operation System).

Firmware Updates

Insert the Support Kit into the CD-ROM drive and click on the **Firmware Updates** button. The MW800 Support Kit provides automatic upgrading of the following unique firmware components:

- **BIOS** Updates the BIOS in your device.
- **CPU** Updates CPU Embedded Controller firmware
- **12'1' Display** Updates the embedded controller firmware in the 12.1' display
- **8.4' Display** Updates the embedded controller firmware in the 8.4' display
- **MPS** Launches Maintenance Programming Software to enable the MW800 field configuration by modifying CPU and Display internal parameters.
- **PRM240** Updates PRM240 (internal DataTAC modem) firmware

Manual BIOS Update

For manual BIOS update, launch the WinPhlash tool from the Support Kit. You can perform two procedures with WinPhlash:

- Backup your current BIOS.

- Write new BIOS to the mainboard.

CAUTION: Writing new BIOS to the flash chip is a very sensitive procedure, improper BIOS upgrade could make the device inoperable.
Note: Always back up your current BIOS. If something goes wrong, the previous one can always be restored.

If upgrading of the BIOS is required, carry out the following steps:

- Close all other programs.
- Go to Program menu and click WinPhlash to execute the program. Main window will appear on the screen.
- Select the procedure you want to perform:
  - Backup the existing BIOS and flash a new BIOS with new settings
  - Backup the existing BIOS Only.
- Specify the name of the backup file for the existing BIOS in the first edit field or use the Browse button to find the file.
- Specify the name of the new BIOS file in the second edit field or use the **Browse** button to find the file.
- Press the **Flash BIOS** (or **Backup Now**) button. A message displays asking for confirmation to continue. You can continue or cancel.
- Press **OK** on the confirmation box to start the procedures you selected.
- Reboot your device when the procedure is completed.

Note, do not interrupt the program before task completes.

Embedded CPU Firmware

For manual CPU firmware update, launch the MPS and then the EC Loader tool. This tool provides the ability to program a S-Record file to EC memory flash. The EC Loader allows downloading the firmware into the device only if the firmware is compatible with the type of embedded CPU controller. In case of an incompatibility, the loader reports an error and prevents user errors, such as improper file download.

Set programming and connection settings as shown:

- Select serial **COM4** (F5207A) or **COM5** (F5217A) port for communication with embedded controller.
- Select **Internal** connection type.
- Select **CPU** firmware target.
- Select a file to be downloaded into embedded controller.
- Select **Overwrite Codeplug** if you want to replace the configuration parameters in your device with factory default. Otherwise, keep it unselected.

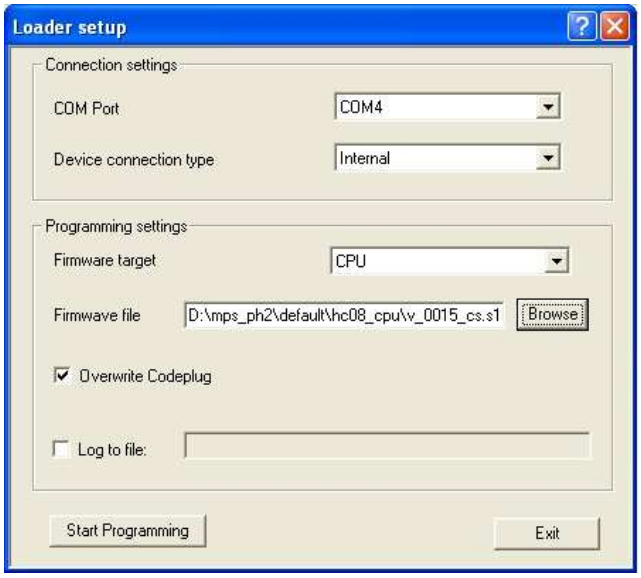

Figure 12. EC Loader Setup

- Click on **Start Programming** button to begin programming. EC Programming dialog appears; the progress bar will show programming status.

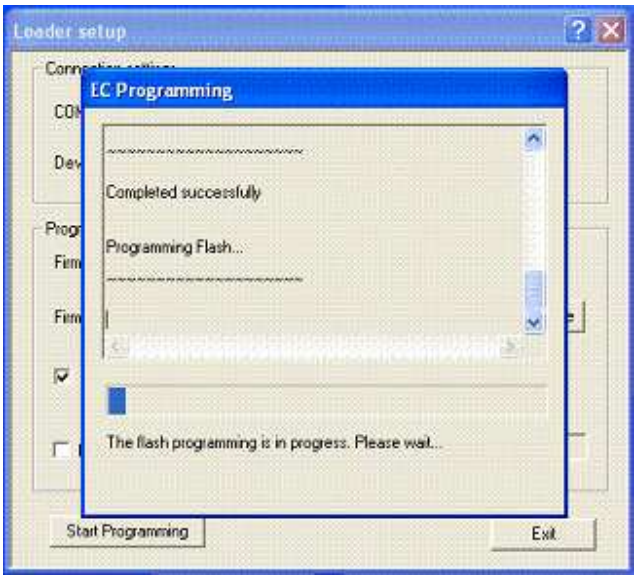

Figure 13. EC Loader Programming

- Wait for completion of programming process. When completed **EC Flash Programming has passed successfully** will appear.

Figure 14. Successful Programming

Applications

Insert the Support Kit into the CD-ROM drive and click on the **Applications** button. The MW800 Support kit provides automatic upgrading of the following applications and utilities:

- **CPU Manager** Updates the CPU Manager application providing basic information about the CPU unit and selection of desired notifications in extreme conditions
- **Display Utilities** Updates Display utilities to extend the display capabilities
- **vRCH** Installs or updates the vRCH application. This software application communicates with the radio unit and provides a GUI interface of the radio control head, allowing full control of the radio via the display touch panel.
- **Bluetooth Package** Installs or updates the BluePC™ Bluetooth stack driver solution to enable a wireless connection between the MW800 and other Bluetooth devices.
- **WM Capture** Installs or updates the Windows Media (WM) Capture 9 Series tool allowing video content authors to capture uncompressed AVI files with up to 24-bit resolution and sampling rates up to 192 KHz.
- **Windows Media Player** Installs or updates the Windows Media® Play9 Series to provide audio and video playback for Windows and the Web.
- **Microsoft Directx9** Installs or updates the DirectX suite of multimedia

application programming interfaces (API's) built into Microsoft Windows operating systems.

NOTE: Microsoft WM Capture Tool, Windows Media Player 9 and Microsoft DirectX 9.0c are available only for Windows 2000.

Manual CPU Manager Update

You can manually update the CPU Manager in your device as follows:

- Remove the current version of CPU Manager.
  Go to **Control Panel** -> **Add and Remove Programs**, select **MW800 CPU Manager** and click **Change/Remove** button.
- Install the current version of CPU Manager.
  Double click on the icon of new version of MW800 CPU Manager and follow on-screen instructions.

Manual Display Utilities Update

You can manually update the Display Utilities in your device as follows:

- Remove the current version of MW800 Display utilities.
  Go to **Control Panel** -> **Add and Remove Programs**, select **MW800 Display Utilities** and click **Change/Remove** button.
- Install the new version of MW800 Display utilities.
  Double click on the icon of new version of MW800 Display Utilities and follow on-screen instructions.

Section 6: Recovery of pre-installed software

This section provides a view of general maintenance and recovery techniques.

Motorola provides a recovery CD with your computer that allows reinstallation of the complete Windows operating system, device drivers, applications, and parameters similar to the default factory settings.

CAUTION: Personal settings, additional applications and data will be lost during recovery procedure.

If you need to recover applications, configurations, data, or other settings, you have other non-destructive recovery options.

Recovering settings and system files

If you have experienced intermittent problems that came after new software installation or some change in device configuration, you can revert to previous working settings and undo harmful changes on your device.

If you are using Windows 2000, you can fix the problem by using the ConfigSafe program. To access ConfigSafe program click **Start** -> **Programs** -> **ConfigSafe** -> **ConfigSafe**.

In Windows XP, System Restore tool might fix the problem and revert the system settings and registry entries to an earlier state. To access System Restore tools click **Start** -> **All Programs** -> **Accessories** -> **System Tools** -> **System Restore**

Recovering applications

If you have reinstalled system files and your personal settings, but a software application or device driver that you have installed on your device is not working correctly, recovering the application might resolve problems.

To remove a program in Windows XP, do the following:

- Click **Start** -> **Control Panel** -> **Add or Remove Programs.**
- Find a program you want to remove and then click **Change/Remove.**
- Follow on-screen instructions.

To remove a program in Windows 2000, do the following:

- Click **Start** -> **Settings** -> **Control Panel** -> **Add or Remove Programs.**
- Find a program you want to remove and then click **Change/Remove.**
- Follow on-screen instructions.

To reinstall a program, from the **Add/Remove Programs** Properties window, click **Install**, and then follow the instructions on the screen.

Recovering the hard disk to factory contents from recovery CD (only for Windows 2000)

If your hard disk data is completely damaged and none of above procedures helps, you can recover the hard disk software image similar to the initial factory install with the recovery CD.

To recover the hard disk, do the following:

- Turn the CPU off.
- Connect USB CD-ROM drive to your device
- Insert recovery CD into USB CD-ROM drive
- Turn on your computer.
- Watch the display carefully. When the M-logo is displayed, press the **F2** button to enter BIOS setup.
- Make your CD-ROM drive a bootable device as follows: Set the first boot priority for USB device and exit from BIOS setting with configuration save and reboot.
- Follow the instructions on the screen:
  - Press the '**Y**' key when "Copy disk image from CD to hard disk. Continue?" appears on the screen.
  - Type the word "**agree**" and press **Enter** when "This will erase all data... type agree to confirm this action" appears on the screen.
- Wait until copying is finished.
- Disconnect the USB device from the MW800 and reboot again

When the recovery process finishes, your computer will restart with the pre-installed operating system, drivers, and software. If automatic restart is not performed, restart the system by pressing **Ctrl + Alt + Del** or by turning the computer off and then on.

Hard Drive Replacement

Replace the hard disk only if it needs to be repaired (if none of the aforementioned procedures are effective). Understand that the hard disk bay connector was not designed for frequent connections and could be damaged through improper use.

Section 7: Getting Assistance from Motorola

For your convenience, the Motorola Web site provides up-to-date information about the MW800.

The address for MW800 home page is http:/www.motorola.com.

This site includes general information about the device, as well as answers to questions regarding operational issues with the MW800. The site also provides the following:

- Recent software / application updates
- Updated embedded firmware for your computer
- The latest device drivers

Appendix A: Safety Instructions

DANGER:
Reduce the risk of fire or electric shock by following basic safety instructions:

- Do not use your device during electrical storms.
- Do not connect or disconnect cables while you device is turned on.
- Protect your device from liquids. Keep your device away from water.
- Do not use any power cord where input or output pins show signs of corrosion or overheating.
- Be sure that all power cord connections are securely plugged into receptacles.
- Never coil a power cord.
- Always route a power cord and communication cables so they will not be damaged.

DANGER:
To avoid shock hazard, disconnect the power cable and all communication cables opening the device.

DANGER:
Electric current in power and communication cables is hazardous. To prevent shock hazard, follow the installation methods recommended in the Installation Manual.

DANGER:
An improperly grounded device is hazardous. To prevent shock hazard, follow the installation methods recommended in the Installation Manual.

CAUTION:
The device dissipates heat during normal operation. When the device is operating, do not allow it to contact any part of your body for an extended period of time – it could cause discomfort.

CAUTION:
The device generates heat when on. Never block or cover ventilations slots and fans.

CAUTION:
The device is sensitive to uncontrolled shut down. Never turn off the device by turning off the power supply or by disconnection of the power cable.

CAUTION:
Hard drive performance and lifetime could be shortened if the device is not used for long period of time. Do not leave the device unused for more than 3 months.

CAUTION:

If you opened the device to add or upgrade a memory card or Mini PCI card or any other component, do not use your device until you have re-assembled the entire unit. Never use the device when cover(s) is open.

CAUTION:
The CMOS battery can degrade when your device is not used for a long period of time. Leaving a battery in a discharged state could shorten a lifetime of the battery.

CAUTION:
The device automatically shuts down when the internal temperature exceeds the upper limit of the valid range. Under this condition, do not turn the device on until it cools down.

CAUTION:
Avoid inserting any card into PC card slots at an angle – it could damage connectors in the device.

CAUTION: Normally, if the system does not respond, you can turn the device off by pressing and holding the power button for 6 seconds or more. Be aware, this method of hardware power off may damage the hard disk.

CAUTION: Do not insert or remove a PC card when the MW800 is in Standby mode. Before you insert or remove a card, make sure that you exit all software applications that access the card.

CAUTION: When replacing a device, verify that it is hot swappable. Otherwise, turn off your device prior to replacement.

CAUTION: An incorrect configuration can make your device inoperable. Please, make sure to acquire the appropriate codeplug. Always make a backup copy in case you have made an error during the update.

Appendix B: Warranty Information

EPS – 34440- B

This warranty applies within the fifty (50) United States, the District of Columbia and Canada.

LIMITED WARRANTY
MOTOROLA COMMUNICATION PRODUCTS

If the affected product is being purchased pursuant to a written Communications System Agreement signed by Motorola, the warranty contained in that written agreement will apply. Otherwise, the following warranty applies.

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

Motorola Inc. or, if applicable, Motorola Canada Limited ("Motorola") warrants the Motorola manufactured radio communications product, including original equipment crystal devices and channel elements ("Product"), against material defects in material and workmanship under normal use and service for a period of One (1) Year from the date of shipment. Motorola, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it with the same or equivalent Product (using new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided purchaser notifies Motorola according to the terms of this warranty. Repaired or replaced Product is warranted for the balance of the original applicable warranty period. All replaced parts of the Product shall become the property of Motorola.

This express limited warranty is extended by Motorola to the original end user purchaser purchasing the Product for purposes of leasing or for commercial, industrial, or governmental use only, and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by Motorola. Motorola assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of Motorola.

Unless made in a separate written agreement between Motorola and the original end user purchaser, Motorola does not warrant the installation, maintenance or service of the Product. Motorola cannot be responsible in any way for any ancillary equipment not furnished by Motorola, which is attached to or used in connection with the Product, or for operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. Because each system, which may use the Product, is unique, Motorola disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

II. GENERAL PROVISIONS:

This warranty sets forth the full extent of Motorola's responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at Motorola's option, is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR

DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

III. HOW TO GET WARRANTY SERVICE:

Purchaser must notify Motorola's representative or call Motorola's Customer Response Center at 1-800-247-2346 within the applicable warranty period for information regarding warranty service.

IV. WHAT THIS WARRANTY DOES NOT COVER:

A) Defects or damage resulting from use of the Product in other than its normal and customary manner.

B) Defects or damage from misuse, accident, water, or neglect.

C) Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.

D) Breakage or damage to antennas unless caused directly by defects in material workmanship.

E) A Product subjected to unauthorized Product modifications, disassemblies or repairs (including, without limitation, the addition to the Product of non-Motorola supplied equipment) which adversely affect performance of the Product or interfere with Motorola's normal warranty inspection and testing of the Product to verify any warranty claim.

F) Product, which has had the serial number removed or made illegible.

G) Batteries (they carry their own separate limited warranty).

H) Freight costs to the repair depot.

I) A Product, which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with Motorola's published specifications or with the FCC type acceptance labeling in effect for the Product at the time the Product was initially distributed from Motorola.

J) Scratches or other cosmetic damage to Product surfaces that do not affect the operation of the Product.

K) That the software in the Product will meet the purchaser's requirements or that the operation of the software will be uninterrupted or error-free.

L) Normal and customary wear and tear.

M) Non-Motorola manufactured equipment unless bearing a Motorola Part Number in the form of an alphanumeric number (i.e., TDE6030B).

V. GOVERNING LAW

In the case of a Product sold in the United States and Canada, this Warranty is governed by the laws of the State of Illinois and the Province of Ontario, respectively.

VI. PATENT AND SOFTWARE PROVISIONS:

Motorola will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or its parts infringe a United

States patent, and Motorola will pay those costs and damages finally awarded against the end user purchaser in any such suit which are attributable to any such claim, but such defense and payments are conditioned on the following:
A) that Motorola will be notified promptly in writing by such purchaser of any notice of such claim;
B) that Motorola will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and
C) should the Product or its parts become, or in Motorola's opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit Motorola, at its option and expense, either to procure for such purchaser the right to continue using the Product or its parts or to replace or modify the same so that it becomes non-infringing or to grant such purchaser a credit for the Product or its parts as depreciated and accept its return. The depreciation will be an equal amount per year over the lifetime of the Product or its parts as established by Motorola. Motorola will have no liability with respect to any claim of patent infringement which is based upon the combination of the Product or its parts furnished hereunder with software, apparatus or devices not furnished by Motorola, nor will Motorola have any liability for the use of ancillary equipment or software not furnished by Motorola which is attached to or used in connection with the Product. The foregoing states the entire liability of Motorola with respect to infringement of patents by the Product or any of its parts thereof.
Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted Motorola software such as the exclusive rights to reproduce in copies and distribute copies of such Motorola software. Motorola software may be used only in the Product in which the software was originally embodied and such software in such Product may not be replaced, copied, distributed, modified in any way, or used to produce any derivative thereof. No other use including, without limitation, alteration, modification, reproduction, distribution, or reverse engineering of such Motorola software or exercise of rights in such Motorola software is permitted. No license is granted by implication, estoppel or otherwise under Motorola patent rights or copyrights.

Appendix C: FCC Information

CAUTION: Changes or modifications made in the CPU box or Display, not expressly approved by Motorola, will void the user's authority to operate the equipment

EPS – 48759 – O **FCC INTERFERENCE WARNING**

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:

NOTE: This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 90 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

For detailed product safety and RF exposure for mobile stations with two-way radios installed in vehicles, refer to Electromagnetic Emission (EME) safety leaflet, Motorola publication number 68P02967C16.

FCC Compliance Notice

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:

NOTE: This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 90 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

This device complies with Part 90 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

For detailed product safety and RF exposure for mobile workstations, with two-way radios, installed in vehicles, refer to Electromagnetic Emission (EME) safety leaflet, Motorola publication number 68P02967C16.

Appendix D: Environment Specifications

- Storage temperature: -40° to 158° F (-40° to +70° C)
- Operating temperature: -22° to 158° F (-30° to +70° C)
- Humidity: 90 to 95% Relative humidity at 50° C for 8 hours
- Shock: 20g peak 1/2 sine wave @ 11ms, 30 impacts
- Vibration: Per TIA/EIA 603 Paragraph 3.3.4 and MIL-STD-810F method 514.5, Category I
- Drip: Per MIL-STD-810F method 506.4 Procedure III
- Dust: Blowing 5 hours in dust (140 mesh silica flour), laden atmosphere dust agitation time is for 2 seconds every 15 minutes
- Salt Fog: 8 hours, 5% Sodium Chloride at 35°C, after exposure, per MIL-STD-810F 505.4, Procedure I
- Flammability: Per UL94-HB
- Solar Radiation: 7 cycles of 24 hours with no functional degradation per MIL-STD-810F, 505.4, Procedure I
- Shock Crash Hazard: 75 g, 6 ms per MIL-STD-810F method 516.5, Procedure V

Note: UL certification is available only to +50°C, though continued operations are available above this limit.

Appendix E: CPU Features

Specifications

Size

- Width: 7.75” (19.7 cm)
- Depth: 9.45” (24.0 cm)
- Height: 2.74” (6.95 cm)

Weight

- CPU: 7.7 pounds (3.5 Kg)

Power source

- Vehicle battery, negative ground.
- Voltage Input Variation 13.8 VDC ± 20% with no loss of functionality.
- Power loss compensation during engine cranking in standard 13.8 VDC battery system.
- Current consumption at 13.8 VDC:
  - Maximal 3A
  - Typical 1.5A
  - Standby 0.4 A
  - Power off 0.05 A
- Capability to support 9 VDC vehicle battery.
- Vehicle ignition switch sensing.
- Electrical Transients meet ISO7637-1 standard.
- Car battery (1A maximum) and 5 VDC (1A maximum) power outputs to peripherals from AUX port.

Features

Operating System:

- Windows XP Pro or Windows 2000.

Basic Processor (see Appendix G for additional options):

- Intel Pentium M #715 1.5 GHz processor.

Memory (see Appendix G for additional options):

- Double data rate (DDR) synchronous expandable dynamic random access memory (DRAM) 256 MB.

Mass Storage (see Appendix G for additional options):

- Hard disk 40 GB, 5400 rpm with three-dimensional shock absorbers.

Keyboard

- 85-key USB keyboard
- Access to all the key functions of a full size keyboard
- Touch pad and right and left mouse buttons.
- Backlight control with seven illumination levels
- Backlight duration control

Display

- Two sizes (12.1" and 8.4"), three models (12.1" XGA high brightness& SVGA standard brightness, 8.4" SVGA standard brightness)
- Color display using TFT technology
- Tempered glass covered by a protective film
- Internal heater, backlight operation in low temperatures.
- LED indicators for alarm reports and the workstation status.
- Two speakers on the front of the display panel (one speaker in 8.4" model)
- Two USB 1.1 connectors (second USB port is optional in 8.4")
- 8 function soft-key buttons (6 in 8.4")
- Volume, brightness, standby and backlight control buttons
- On-Screen Display
- Emergency button
- Workstation power button

Video controller

- Integrated 2D or 3D graphic and multimedia accelerator.

External CPU Interfaces

- 2 USB 2.0 connectors
- PC card slot (Type II)
- SIM card slot
- RJ45 Ethernet connector
- RS-232 DB9 connector
- Microphone jack
- Stereo headphone jack
- Firewire (IEEE1394) port
- Composite video input (PAL or NTSC)
- External RGB display connectors (Display 1)
- External RGB or DVI display connector (Display 2) (Primary & Secondary functionality is configured by OS)

Internal Interfaces

- Mini-PCI

Auxiliary Port

- Ignition Sense
- 4 TTL level I/O ports (two inputs and two outputs)
- Car battery and 5VDC power outputs (1A max)
- Standard USB 2.0 port (F5207A only)
- Vehicle speed and direction inputs (F5217A only)

Appendix F: Auxiliary Port Layout

NOTE: The auxiliary port provides the car battery and 5VDC outputs (1A each) to peripherals. Be aware, that power supply from these outputs is cut off in case of the workstation overheating.

Table 1. F5207A AUX Port

Wire Color	Pin #	Signal/Function	Direction	Description
Black	1	USB-AUXPOS	I/O	USB
Brown	2	USB-AUXNEG	I/O	USB
Red	3	VBUS-AUX	OUT	USB
Orange	4	GND		
Yellow	5	LINE-OUT-R	OUT	SPEAKER
Black	6	LINE-OUT-L	OUT	SPEAKER
Brown	7	SPDIF	I/O	DIGTAL AUDIO
Green	8	IGNITION	IN	
Blue	9	BOOTBLOCK#	IN	
Violet	10	PROG-ENTER-AUX	IN	
Gray	11	GND		
Red	12	MICNEG	OUT	AUDIO
Orange	13	VREF-MIC	OUT	AUDIO
Yellow	14	V12-OUT	OUT	Car battery
Green	15	V12-OUT	OUT	Car battery
White	16	GPI0	IN	GPIO
Pink	17	GPI1	IN	GPIO
Light Green	18	GPO0	OUT	GPIO
Black/White	19	GPO1	OUT	GPIO
Brown/White	20	1W	I/O	
Red/White	21	DSC-EN		RADIO
Orange/White	22	DSC-UPLINK		RADIO
Green/White	23	DSC-DOWNLINK		RADIO
Blue/White	24	GND		
Blue	25	V5-OUT	OUT	5VDC
Violet	26	V5-OUT	OUT	5VDC

Table 2. F5217A AUX Port

Wire Color	Pin #	Signal/Function	Direction	Description
Black	1	SPEED+	IN	Vehicle data
Brown	2	SPEED-	IN	Vehicle data
Red	3	FWD+	IN	Vehicle data
Orange	4	FWD+	IN	Vehicle data
Yellow	5	GND		

Black	6	GND		
Brown	7	GND		
Green	8	IGNITION	IN	
Blue	9	BOOTBLOCK#	IN	
Violet	10	PROG-ENTER-AUX	IN	
Gray	11	GND		
Red	12	GND	OUT	
Orange	13	GND	OUT	
Yellow	14	V12-OUT	OUT	Car battery
Green	15	V12-OUT	OUT	Car battery
White	16	GPI0	IN	GPIO
Pink	17	GPI1	IN	GPIO
Light Green	18	GPO0	OUT	GPIO
Black/White	19	GPO1	OUT	GPIO
Brown/White	20	1W	I/O	
Red/White	21	DSC-EN		RADIO
Orange/White	22	DSC-UPLINK		RADIO
Green/White	23	DSC-DOWNLINK		RADIO
Blue/White	24	GND		
Blue	25	V5-OUT	OUT	5VDC
Violet	26	V5-OUT	OUT	5VDC

Appendix G: Approved Accessories/Options

Table 3. Options

Description	Nomenclature
Processor	
1.5GHZ PENTIUM-M PROCESSOR, 2MB CACHE	VA00258
1.8GHZ PENTIUM-M PROCESSOR, 2MB CACHE	VA00261
1.3GHZ CELERON-M PROCESSOR	VA00262
Operating Systems	
WIN 2000 OS, MW800, US W/IMAGE CD	V691
WINDOWS XP PRO OS MW 800 US	VA00038
Memory	
256MB DDRAM	VA00041
512MB DDRAM	VA00042
1GB, DDRAM	VA00256
Color Display	
COLOR DISPLAY 12.1" SVGA 350NIT. TOUCH SCREEN	VA00043
COLOR DISPLAY 12.1" XGA 1200NIT. TOUCH SCREEN	VA00044
COLOR DISPLAY 8.4" SVGA 350NIT, TOUCH SCREN	V739
Cables for 12.1" (Primary) Display	
1.6FT (0.5M) DISPLAY-CPU	V306
4.5FT (1.4M) DISPLAY-CPU	V591
9.6FT (2.9M) DISPLAY-CPU	V75
12FT(3.6M) DISPLAY-CPU	V65
17FT (5.2M) DISPLAY-CPU	V648
Cables for 8.4" (Primary) Display	
12FT(3.6M) CPU TO 8.4" DISPLAY	VA00073
16FT(5.0M) CPU TO 8.4" DISPLAY	VA00074
Additional Interface Cables	
1.6FT(0.5M) STD PC TO MW800 DISPLAY	VA00046
1.6FT(0.5M) MW800 TO STD SCREEN	V649
FILTER LINE CABLE, CE, MW800	V259
Drives	
2GB FLASH DISK	VA00068
Internal Radio	
IDEN DATA RADIO (INTERNAL), NEXTEL	VA00001
GPRS, 1W 900/1800MHZ,EUROPE	VA00252
WLAN (802.11B) RADIO MODULE	VA00024
PRIVATE DATATAC, 2W, 800MHZ	VA00048
Keyboard	
KEYBOARD, USB, BACKLIT, US, MW800	VA00045
Mounting	
MOUNTING TRUNNION, CPU	V056
Radio Unit Only	
PRIVATE DATATAC RADIO, 35W, 800MHZ, VRM850	VA00057
PRIVATE DATATAC RADIO, 15W, 800MHZ, VRM850	VA00058

GPS Receiver	
INTERNAL GPS RECIEVER	V145
Speakers	
EXTERNAL SPEAKER, MW 800	V147
Miscellaneous	
BLUETOOTH COMMUNICATION	VA00017

Table 4. Accessories

Description	Nomenclature
Display	
COLOR DISPLAY 12.1" SVGA 350NIT. TOUCH SCREEN	FLN3157
COLOR DISPLAY 12.1" XGA 1200NIT. TOUCH SCREEN	FLN3167
COLOR DISPLAY. 12.1" SVGA 350NIT W/BT, TOUCH SCREEN	FLN3168
COLOR DISPLAY. 12.1" XGA 1200NIT W/BT, TOUCH SCREEN	FLN3169
COLOR DISPLAY 8.4" SVGA 350NIT, TOUCH SCREEN	FLN3221
Cables for 12.1" (Primary) Display	
1.6FT(0.5M) DISPLAY-CPU CABLE	FKN8131
4.5FT(1.4M) DISPLAY-CPU CABLE	FKN8068
9.6FT (2.9M) DISPLAY-CPU CABLE	FKN8069
12FT (3.6M) DISPLAY-CPU CABLE	FKN8143
17FT (5.2M) DISPLAY-CPU CABLE	FKN8070
Cables for 8.4" (Primary) Display	
11.5FT(3.5M) CPU TO 8.4" DISPLAY	FKN8216
16FT(5.0M) CPU TO 8.4" DISPLAY	FKN8217
Additional Interface Cables	
LINE OUT CABLE ADAPTOR, MW800	FKN8081
1.6FT(0.5M) MW800 TO STANDARD SCREEN CABLE	FKN8144
1.6FT(0.5M) STD PC TO MW800 DISPLAY CBL	FKN8090
15AMP POWER CBL	FKN4711
FILTER LINE CABLE, CE, MW800	FKN8179
EXT. SPEAKER CABLE ADAPTOR	FKN8186
KEYBOARD EXTENDER CABLE, USB 6FT	FKN8201
MODS ADAPTER CABLE	FKN8215
Drives	
USB FLOPPY DISK DRIVE	DDN6871
HARDWARE H.D 40GB	FHN6480
ML850 RM8 KIT DVD COMBO DRIVE	DDN7541
Keyboard	
KEYBOARD, USB, BACKLIT, US, MW800	FLN9890
Microphones	
MICROPHONE EXTERNAL MW 800	FLN2957
Mounting Kits	
MOUNTING TRUNNION	FHN6388
MOUNT, IN DASH SINGLE DIN, 8.4" DISPLAY	FLN3303
BALL JOINT CRADLE W/BASE & VESA PLATE, 8.4" DISPLAY	FLN3304

Speaker	
EXTERNAL SPEAKER	FHN1669
Converter	
CONVERTER, USB TO 4 RS232	FLN2955

Appendix H: CPU Factory Default Setting

WLAN adapter	- ON
Power source	- 13.8V
Turn-off command from display	- ENABLE.
Critical turn off	- ENABLE
Power button presence	- ENABLE
Ignition boot up preference	- POWER ON
Ignition shut down preference	- NONE
Ignition shutdown timer	- 3 min
Heater optimization	- 0ºF
Radio status on power up	- ON
Main radio power switch	- ON
Radio ring indicator (RI)	- ENABLE
System ring indicator (RI) mask	- DISABLE
IDEN programming mode	- OFF
SB9600 mode	- OFF
GPO0 state on power up	- OFF
GPO1 state on power up	- OFF
GPS state on power up	- OFF
GPS mode	- TSIP (Trimble GPS receiver) - NMEA (u-Blox GPS receiver)
Auxiliary 5V output	- ENABLE
Auxiliary 12V output	- ENABLE
Hard disk maintenance when device is off	- 16 hours

Appendix I: Differences between F5207A and F5217A

Table 5. Differences between F5207A and F5217A

Feature	F5207A	F5217A
Rear Panel		
Serial connectors	One serial COM1 port	Two serial (COM1 and COM4) ports
Ethernet connectors	One 10/100 Mbit/s Ethernet ports	Three independent 10/100 Mbit/s Ethernet ports
USB connector	Two USB 2.0 ports	Three USB 2.0 ports
Firewire connectors	1 Firewire® port (IEEE1394 standard)	Not supported
Display 2 connector	Carries DVI for flat screen interface; also carries RGB, USB and audio to the screen with additional cable adapters (optional).	Not supported
AUX connector	Provide additional USB 2.0 port	Provides vehicle speed and direction inputs.
Internal Interface		
Embedded Controller	Connected via serial COM4 port	Connected via serial COM5 port
Internal Devices		
GPS	Integrated Trimble GPS module (optional)	Integrated Trimble GPS module or Integrated ANTARIS GPS module with Dead-Reckoning intelligence

Appendix J: BIOS Factory Default Settings

Main Screen
System Time
System Date

Primary Master:	400008MB
Type:	Auto, LBA format
32 Bit I/O	ENABLED
Primary Slave:	NONE
Boot-time diagnostics screen:	DISABLED
Summary screen:	DISABLED

BIOS Version
System Memory
Extended Memory

Security

Supervisor password is:	CLEAR
User password is:	CLEAR
Set supervisor password:	hit Enter and type your supervisor password
Set user password:	not available
Diskette access:	SUPERVISOR
Fixed disk boot sector:	NORMAL
Password on boot:	DISABLED
Virus check reminder:	DISABLED
System backup reminder:	DISABLED

Appendix K: Operating 2 Displays (F5207A only)

The F5207A CPU box allows attaching two monitors. Factory MW800 system software image for Windows XP and Windows 2000 includes installed Intel's Extreme Graphics video driver. This driver supports the RGB display as the primary and the DVI display as the secondary monitor.
At the same time the MW800 system software image for Windows XP and Windows 2000 include Intel's Embedded video driver in the Driver folder at the disk D. If you need using the RGB display as the primary and the secondary monitors, please do the following:

- Open **Embedded Driver** folder at the disk D.
- Double-click on **Setup**.
- Follow to on-screen instructions until the installation is completed.

Extreme Graphics

- Click the **Start** menu and select **Control Panel**. Click **Appearance and Themes** and click the **Display** icon.
- In the **Display Properties**, select **Settings** and then click **Advanced**.
- Select the **Intel® Extreme Graphics** and then click **Graphics Properties**

Graphics Controller Properties will be open as shown next:

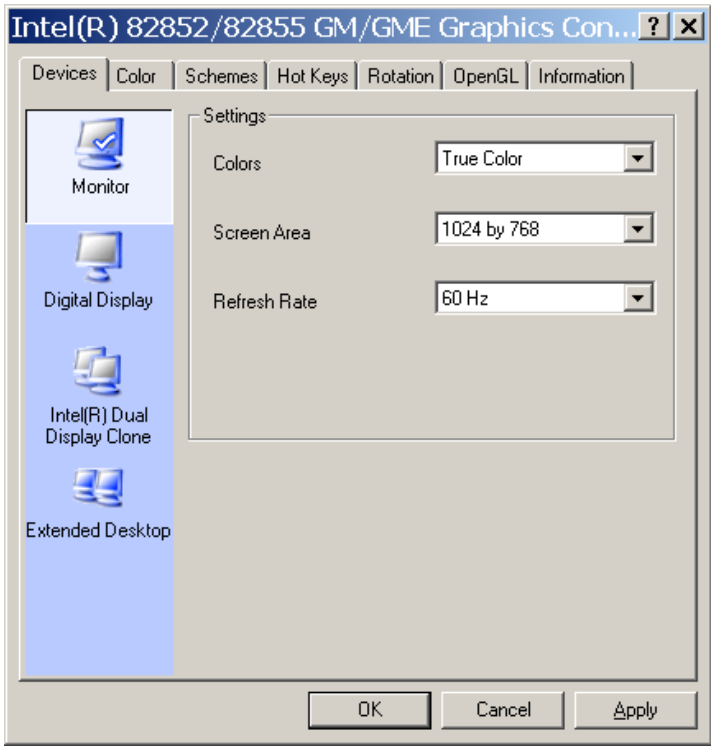

Figure 15. Graphics Controller Properties (Extreme Driver)

Choose desired graphics mode by selecting the appropriate icon and then by selecting either the OK or Apply button. The following is available:

- **Monitor** Primary display only
- **Digital Display** Secondary display only
- **Intel® Dual Display** Two displays with the same content.
- **Extended Display** Multi-monitor allowing a large Windows desktop that spans two displays and creates more screen real estate than a single display provides. Applications can be moved from one monitor to another, or can be on more than one monitor simultaneously.

See the Intel Extreme Graphics Driver User's Guide for more information.

Embedded Driver

- Click the **Start** menu and select **Control Panel**. Click **Appearance and Themes** and click the **Display** icon.
- In the **Display Properties** select **Settings**.

Display Properties will be open as shown next:

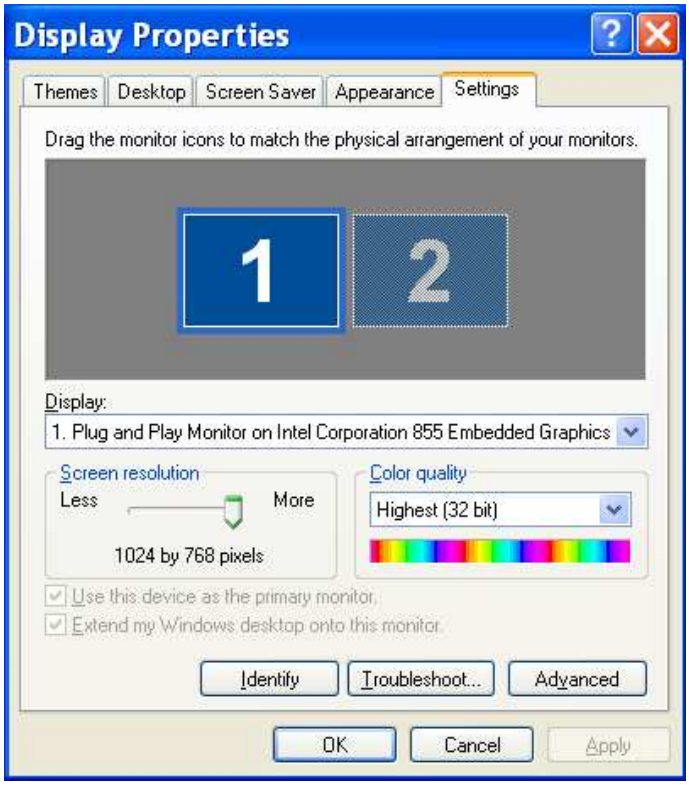

Figure 16. Display Properties (Embedded Driver)

If you have more than one monitor installed, right-click a monitor icon, and click Identify to see a number appear on the monitor corresponding to the icon you clicked. You can extend your display to allow a large Windows desktop that spans two displays as the following:

- Drag the second monitor icon.
- Check **Extend my Windows desktop onto this monitor** and the click the **Apply** or **OK** button.

Applications can be moved from one monitor to another, or can be on more than one monitor simultaneously.

To configure the second monitor graphics mode click **Advanced** to open the Properties dialog box for the monitor and video adapter.

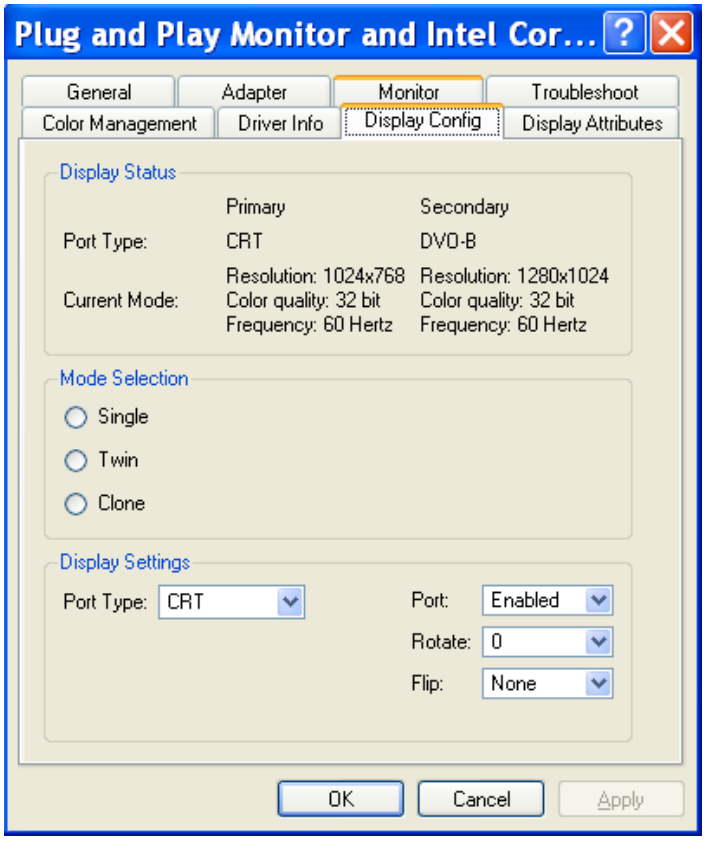

Figure 17. Graphics Controller Properties (Embedded Driver)

Choose desired graphics mode by selecting the appropriate icon and then by selecting either the **OK** or **Apply** button. The following is available:

- **Single** Primary display only.
- **Twin** Two displays with the same content and are driven by same set of timings. Both displays should support the same resolution and refresh rate.

See the Intel Embedded Graphics Driver User's Guide for more information.

NOTES:

- It is recommended to disable touch screen of the secondary display in the **Device Manager -> Mouse folders -> HID mouse**.
- The Bluetooth module must be installed in the primary display.
- During the boot up (a time between powering the MW800 on and the operating system start) boot process will be seen on the primary display.

- Both displays should be set to the same resolution.

Appendix L: Troubleshooting

Many problems can be solved without outside assistance by following the troubleshooting procedures provided via online help or in the device documentation, operating system and software applications. Most software applications contain troubleshooting procedures and explanation of error information. If you suspect a software issue, refer to the operating system or application troubleshooting guides.

NOTE: This manual does not cover operating system. Please, refer to Microsoft Windows XP Professional or Windows 2000 documentation.

This chapter contains helpful hints to follow when you encounter any problem. If a problem persists after you follow the instructions in this chapter, contact your system administrator for help.

The following table describes error messages that warn you about conditions that might prevent normal operation.

Table 6. Error Messages About Abnormal Conditions

Message	Do the following
Vehicle Battery is Low. The system will shutdown in 3 minutes.	The car battery voltage is below of the low operational limit. Please save your work before shutting down
MW800 CPU temperature is high. The system will shutdown in 3 minutes.	The internal temperature is higher than the valid limit. Please save your work before shutting down. Never turn on the device until it cools down to normal operating temperature.
Warning condition is over	Cancel Warning
MW800 CPU temperature is low. The system will shutdown in 3 minutes.	The internal temperature is below of the valid limit. Please save your work before shutting down. Never turn on the device until it heats up to normal operating temperature.
PC Card error was detected. Please remove the PC Card device and than press OK.	Card Bus over-current is discovered. Please remove the PC Card device and than press OK
MW800 hard drive heater may be malfunctioned.	Heater over-current is discovered. Please, contact your system administrator.
Over current is detected in device connected to Firewire port.	The MW800 cannot work with this Firewire device. Please, disconnect the device.

The MW800 display provides the following indication about failure conditions.

Table 7. Failure Indications

Indication	What's the problem
Power LED is off	Check the plug and the power cord.
Power LED is steady yellow	Vehicle battery is low (9.4 to 10.3 VDC) during workstation power up.
Temperature LED blinks red	Display temperature is extremely high during power on
Communication LED is steady blue	CPU box to display USB power problem, or display in programming mode. Check the plugs and CPU cable.

Communication LED is steady yellow	CPU box fails to communicate with display. Check the plugs and CPU cable.
Communication LED is steady purple	CPU box to display USB power and communication problem. Check the plugs and CPU cable.
Link LED is yellow & green	NO valid input signal from CPU box. Check the plugs and CPU cable.

The following table describes CPU failures without a user notification.

Table 8. Failures Without Notification

Problem	Do the following
Cannot turn the device off, the system does not respond	Turn off the device by pressing and holding the power button for 6 seconds or more. Use either CPU or display power buttons. If the device is still not responding, turn off and on the main power switch on the rear side of the CPU unit.

Appendix M: Acronyms and Abbreviations

The following acronyms and abbreviations are used in this document:

BIOS	**B**asic **I**nput **O**utput **S**ystem
CD	**C**ompact **D**isk
CDMA	**C**ode **D**ivision **M**ultiple **A**ccess
CMOS	**C**onfiguration **M**emory **O**perating **S**ystem
COM	**Com**munication
COTS	**C**ommercial **O**f-**T**he-**S**helf
CPU	**C**entral **P**rocessor **U**nit
CRT	**C**athode **R**ay **T**ube
DDR	**D**ouble **D**ata **R**ate
DRAM	**D**ynamic **R**andom **A**ccess **M**emory
DVI	**D**igital **V**ideo **I**nterface
EME	**E**lectromagnetic **E**mission
FAQ	**F**requently **A**sked **Q**uestions
FCC	**F**ederal **C**ommunications **C**ommission
GB	**G**iga**b**yte
GHz	**G**iga**h**ert**z**
GPI	**G**eneral **P**urpose **I**nput
GPO	**G**eneral **P**urpose **O**utput
GPRS	**G**eneral **P**acket **R**adio **S**ervice
GPS	**G**lobal **P**ositioning **S**ystem
iDEN	**I**ntegrated **D**igital **E**nhanced **N**etwork
IEEE	**I**nstitute of **E**lectrical and **E**lectronic **E**ngineers
I/O	**I**nput/**O**utput
LAN	**L**ocal **A**rea **N**etwork
LCD	**L**iquid **C**rystal **D**isplay
MPS	**M**aintenance **P**rogramming **S**oftware
MW	**M**obile **W**orkstation
NIT	**N**ear **I**nfrared **T**ransmission
NMEA	**N**ational **M**arine **E**lectronics **A**ssociation
NTCS	**N**ational **T**elevision **S**ystem **C**ommittee
OS	**O**perating **S**ystem
OSD	**O**n-**S**creen **D**isplay
PAL	**P**hase **A**lternation **L**ine
PC	**P**ersonal **C**ard
PCI	**P**eripheral **C**omponent **I**nterconnect
PWR	**P**o**wer**
RF	**R**adio **F**requency
RI	**R**ing **I**ndicator
SIM	**S**ubscriber **I**dentity **M**odule
SVGA	**S**uper **V**ideo **G**raphics **A**rray
TAIP	**T**rimble **A**dvance **I**nterface **P**rotocol
TFT	**T**hin **F**ilm **T**ransistor

TSIP	**T**rimble **S**tandard **I**nterface **P**rotocol
TTL	**T**ransistor-**T**ransistor **L**ogic
UHF	**U**ltra **H**igh **F**requency
UL	**U**nderwriters **L**aboratories
USB	**U**niversal **S**erial **B**us
VCR	**V**ideo**c**assette **R**ecorder
VDC	**V**olts **D**irect **C**urrent
WWAN	**W**ireless **W**ide **A**rea **N**etwork
WLAN	**W**ireless **L**ocal **A**rea **N**etwork
XGA	e**X**tended **V**ideo Graphics **A**rray