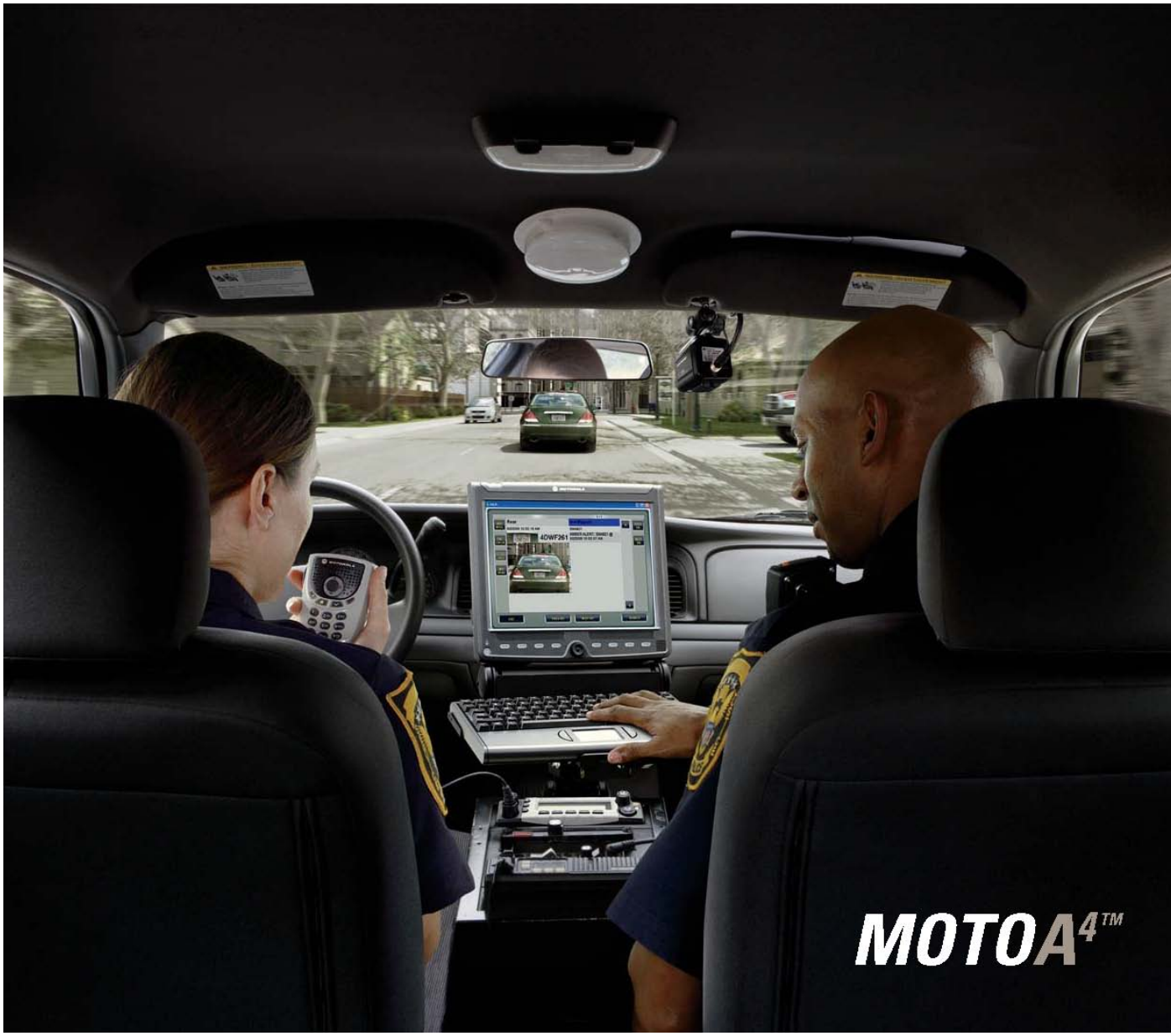
MW810 R1.2 Mobile Workstation

Model F5208A

Central Processor Unit Box Owner's Manual



Compatible with Windows®7

6802987C40-A

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Version: EDK_20071121-002
Description: EFI Developers Kit
Software Site: https://www.tianocore.org
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Compliance Notice for US

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 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.

Compliance Notice for Canada

The class B digital device complies with Canada ICES – 003.

Compliance Notice for European Union Countries

The device complies with the requirements of the EEC directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC art.5 with regard to 'Electromagnetic compatibility' and 73/23/EEC as amended by 93/68/EEC art.13 with regard to 'Safety'.

FCC Warning

To assure continued FCC compliance, the user must use grounded power supply cord and cables which are included with the equipment or specified. Unauthorized changes or modifications made in the CPU or Display, not expressly approved by Motorola, will void the user's authority to operate the equipment.

Contents

Using That Manual

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

Who Should Use that Manual

That manual is intended for staff who operate the MW810 R1.2 Mobile Workstation (herein MW810) and need to configure, upgrade or maintain its Central Processor Unit box, which is also referred to as either *device* or *CPU* in that manual. That manual assumes the reader is familiar with the MW810 and basic Windows operations. If this is not the case, be sure to read the MW810 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.

Introduction to Manual

The manual is organized as follows:

- ***Getting Started*** - an overview
- ***Taking a Look at the CPU*** - a brief functional description
- ***Connections*** - explanation of CPU connections
- ***Optional Internal Peripherals*** - a brief description of optional internal devices
- ***CPU Configuration*** - CPU configuration upon turning on
- ***Security & Password Protection*** - security and protection tips
- ***Basic Operations*** - basic operations
- ***CPU Software & Firmware*** - CPU software and firmware
- ***CPU Upgrade*** - upgrade of software and firmware components
- ***Recovery of Pre-installed SW*** - recovery techniques
- ***Getting Assistance*** - getting assistance from Motorola

The *Appendixes* contain:

- ***Appendix A*** - safety instructions
- ***Appendix B*** - warranty information
- ***Appendix C*** - CPU specifications
- ***Appendix D*** - BIOS factory settings
- ***Appendix E*** - troubleshooting information
- ***Appendix F*** - acronyms and abbreviations

Related Manuals

That manual describes the MW810 CPU and provides basic operating instructions. Please note that although that 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:

- Motorola MW810 Mobile Workstation, Installation Manual - 6802982C80
- Motorola MW810 Mobile Workstation, Service Manual - 6802982C70
- Motorola MW810 Mobile Workstation, User's Guide - 6802981C80

- Motorola MW810 Mobile Workstation, Display Owner's Guide - 6802982C85
- Motorola MW810 Mobile Workstation, Software Development Kit - 6802983C00

For documentation of software applications supplied with this product, refers to the help file attached to each application. That 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.

If you need to change the configuration of your device, refer to

- Motorola MW810 Mobile Workstation,
  Maintenance Programming Software, User's Manual - 6802982C95

Also, if you need to upgrade software and firmware supporting the CPU's functionality, refer to

- Motorola MW810 Mobile Workstation, Field Support Kit, User's Manual - 6802982C90

For additional information visit the MW810 home page http://www.motorola.com/mw810.

Conventions Used in That 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 that manual:

Italics	Used for emphasis and for new terms.
CAPITAL LETTERS	Used to designate configuration parameters and options.
Bold	Used to indicate keyboard keys or application buttons.
Program Motorola MW810 CPU CPU Manager	Used to designate the location and name of a menu function. For example, **Program Motorola MW810 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.

Getting Started

The Motorola MW810 Mobile Workstation (MW810) is a high-performance computing platform, optimized to deliver seamless mobility at highway speeds. Motorola's three-piece design allows flexible installation options, including choice and location of CPU configuration, display, and backlit keyboards.

- **Ruggedness**
  Operates with confidence in mobile environments and under stressful conditions.
- **Fixed-Mount System for Vehicles**
  Provides mobile connectivity and computing power for vehicle users. Internal GPS module options work with your applications to provide accurate vehicle location so you can manage your fleet and deploy resources more effectively.
- **Versatile Three-Piece Design**
  Allows for flexibility and ease of installation in space-limited vehicles. Individual components can be purchased separately.
- **High Performance Displays**
  Transmissive, high contrast display performs extremely well even in difficult lighting conditions. Display design enables shortcuts to the most important user functions.
- **Optimized for Wireless**.
  Expanded wireless networking capabilities, including new internal cellular modem options, for better access to information**.**

The Motorola MW810 offers a range of integrated radios and GPS options so the vehicle user can stay connected via one or more wireless networks. Optional expansion boards provide a wide range of I/O ports to support external radios, dual displays, and peripheral devices. The backlit keyboard and display options offer outstanding performance even in the most difficult lighting conditions.

What is the CPU?

The CPU is a high-performance computing platform for mission-critical applications with numerous computing, data storage, and communication capabilities. It is designed to be permanently mounted and serve at the center of a vehicle's computing and communications architecture. Key features of the CPU are:

- Windows 7 Professional Edition operating system
- 32- and 64-bit systems
- Microsoft Windows 7 Logo Certified
- Downgrade to Windows XP Professional operating system.
- The Intel Core 2 Duo processor
- Extendable system memory – 2 slots for DDR3 modules
- Removable hard or solid state disk drive
- A wide range of internal and external interfaces such as USB 2.0, Ethernet, RS-232, audio, analog video, PC Card
- Intel Wi-Fi Link 5300 network adapter.
- Optional network cards offering complete wireless data solutions based on Qualcomm's Gobi2000

- Optional built-in GPS receivers: with and without dead reckoning intelligence
- High definition audio
- Compliance with requirements for the TPM 1.2 specification
- Vehicle ignition sense
- Programmable general purpose inputs/outputs
- Simultaneous operation of two independent users, each using separate display and keyboard
- Custom-designed cables for connection to the MW810 display or to any standard CRT or LCD screen display (DVI and RGB interfaces)
- Rugged mechanical design

Getting the CPU Running

This section guides you through procedures to get the CPU ready for operation.

Unpacking

Unpack your shipment and check the contents to ensure that you have received all the specified items.

If your CPU is a part of the MW810 Mobile Workstation, refer to the Motorola MW810 Mobile Workstation User's Guide for a list of shipped items. If your CPU is shipped as stand-alone device, after unpacking the shipping carton, the following items should be found:

- CPU
- Power cord
- CPU-to-Display cable
- Operating System recovery DVD
- Field Support Kit CD with this *Owner's Guide*

The MW810 Field Support Kit CD is included in the delivery scope. You will find further information on the system, drivers, utilities, updates, manuals, etc. on this CD.

Inspect all the items. If any item is missing or damaged, notify your Motorola Customer Service representative immediately.

NOTE: Save the packing carton and anti-static plastic bag for storage and shipping. Both the shipping carton and the anti-static bags protect the display components from physical and electrostatic damage.

NOTE: Motorola may stop shipping MW810 Field Support Kit CD at any time and without notice. Instead of, Motorola will provide online access to the MW810 Field Support Kit CD content on the MW810 support web site.

Installation and Connecting to Car Battery

Please refer to the Motorola MW810 Mobile Workstation Installation Manual and strictly follow the installation procedure. Be aware that your device can be damaged if improperly installed.

Turning On the CPU for the First Time

Turn on the main power switch at the rear CPU panel and then press the power button. Your operating system is pre-installed on the hard disk or compact flash device - it will start the initial boot process.

CAUTION: When you turn the CPU on for the first time, the supplied software is installed and configured. You will be presented with a mini Setup Wizard during the initial boot process. This enables you to input the system's unique information, such a new computer name, administrator information and serial number. This process must not be interrupted – do not power off the CPU and follow the on-screen instructions until software installation and configuration is fully completed.

See below (in the CPU Configuration chapter) a variety of parameters that define functionality of the display when you turn it on. Modify configuration parameters if required.

NOTE: prior to use that manual, be sure your CPU relates to the MW810 R1.2 release. Open the **System Properties** tab (right click on **My Computer → Properties → General**) and verify a type of processor. The CPU box is belonging to the MW810 R1.2 release if processor's type is one of the following options:

- Intel® Core™2 Duo T9400, 2.53 GHz, or
- Intel® Core™2 Duo P8400, 2.26 GHz, or
- Intel® Celeron® M575

Taking a Look at the CPU

This chapter identifies the components of the display and provides a brief functional description.

Front View

POWER BUTTON — Turns the CPU power on and off. Be aware, a main power switch on the rear CPU panel must be switched on before using the POWER BUTTON.

PC and SIM CARD SLOT — A Personal Card (PCMCIA type II) slot enhances the CPU usefulness by accepting the connection of a variety of personal cards that can be used as storage devices, modems, etc.

NOTE: The card slot is completely sealed when the door is closed. Please select cards sized to fit within the closed door to ensure IP54 sealing. The covered channel is provided to allow exit by flexible antenna wires.

HARD DISK DRIVE — Removable mass storage device.

Rear-side Components

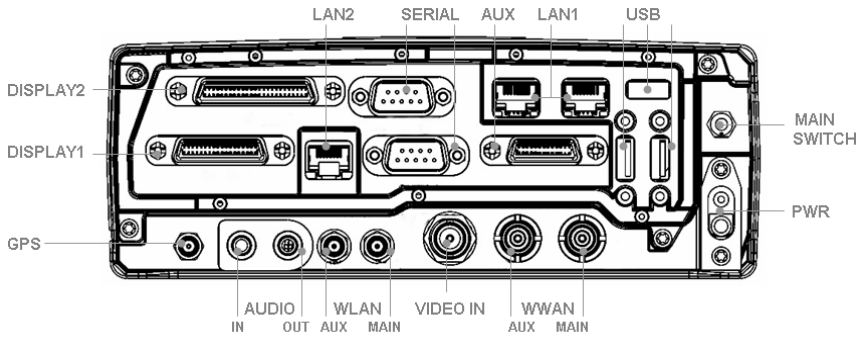
The MW810 offers multiple expansion board options, so you can add more ports for external modems, video cameras, or other vehicle peripherals as needed. Choose one (or none) as required.

I/O Expansion Board Options	CPU w/o Expansion (Option VA00383)	CPU with Router Expansion (Option VA00385)	CPU with Serial Expansion (Option VA00673)	CPU with Serial Expansion (Option VA00384)	CPU with ALPR Expansion (Option V00497AA)
RS232	1	2	2	4	1
USB 2.0	2	3	3	3	3
Ethernet LAN RJ45	1GbE (1000 BASE-T)	1GbE + 2 100 (10/100 BASE-T)	1GbE + 2 100 (10/100 BASE-T)	1GbE (1000 BASE-T)	2GbE + 1 100 (10/100 BASE-T)
Secondary DVI display	No	Yes	Yes	No	Yes
Video Input	No	1 standard composite video	No	No	4 ALPR camera inputs

	input port (PAL or NTSC)

NOTE: the above table shows expansion boards available at the MW810 launch; rear-panel configuration depends on optional expansion module included in your CPU.

A description of rear-panel connectors is shown below:



MAIN SWITCH Maintenance power switch. Use this switch to turn off the workstation during maintenance operations. In daily use, the switch should be kept in ON position.

PWR A connector for attaching the power cord from the vehicle's battery
CAUTION: Use a standard Motorola power cable with a 15-Amp fuse.

USB USB 2.0 port for connection of external USB accessories.

DISPLAY1 A connector for attaching the primary display cable. Carries RGB, USB and audio to the screen.

DISPLAY2 A connector for attaching the secondary display cable. Carries DVI-D, USB and audio to the screen.

LAN1 10/100 Base-T Ethernet LAN module for connecting the LAN cable or Ethernet device. Includes Link and Active indicators.

LAN2 1000 Base-T Ethernet LAN module for connecting the LAN cable or Ethernet device. Includes Link and Active indicators.

SERIAL A connector for attaching a serial device such as Motorola's VRM modems, printer, mouse, etc. The connection requires a COTS cable which is not supplied with the MW810.

AUX A connector for attaching vehicle ignition switch, General Purpose I/O's, additional USB port, 5VDC and car battery voltage outputs.

WWAN Connectors for attaching mini-UHF radio modem antenna with RX diversity.

GPS A connector for attaching GPS antenna to the internal GPS receiver.

WLAN	Connectors for attaching RF antenna (SMA) to the internal WLAN radio with RX diversity.
AUDIO IN	External Mono microphone jack for sound input and recording.
AUDIO OUT	For connecting headphones, external speakers with power amplifier or audio recording device.
VIDEO IN	Composite Video input for connecting external VCR or video camera.

Connections

CAUTION: Do not connect or disconnect any external device during the BIOS boot process or when the CPU is in power-saving mode.

USB Device

USB devices are hot-pluggable. This means you can connect and disconnect devices while your operating system is running. Using USB 2.0 ports you can connect external low, high, and full-speed USB clients. CPU USB 2.0 ports support transfer rates up to 480 MB/s.

To connect a USB device, simply plug the device cable to one of the USB ports. The devices you connect to the USB ports usually do not require installing a driver, as the required software is already included in the operating system. However, if the USB device requires its own software, please install it from the data carrier provided with the device.

NOTE: USB devices connected to the USB port should not consume more than 0.5A. Otherwise the system will not operate properly.

NOTE: Be aware USB devices connected to the USB port should be compliant with the operating system. Otherwise the system will not operate properly.

Ethernet Device

The internal 10/100/1000 Base-T Ethernet LAN modules allows you to connect your computer to a network. The LAN1 connections support data transfer rate up to 100 Mbps; the LAN2 connection supports data transfer rate up to 1000 Mbps.

To connect the CPU to the network, connect one end of the LAN cable to the RJ-45 connector on the CPU and the other end to the network hub. When the device is connected, the RJ-45 indicates as follows:

- Link Indicator - steady green when the system has an available connection to LAN
- Active Indicator - blinks green when the system is accessing the LAN

You can use Ethernet connections for communication with Ethernet devices such as network cards, access points, storage, etc.

Connecting the Display

The CPU graphics controller supports resolutions up to 1280 x 1024 and the simultaneous operation of two monitors, the analog RGB (DISPLAY1 connection) and digital DVI-D (DISPLAY2 connection). Execute the following instructions when you need to connect the external display to the CPU:

- Switch off the CPU and the display
- Connect the data cable of the display to the CPU's monitor connection
- First switch on the display and then the CPU

Use Motorola original integrated molded cables for connection to the MW810 display or to 3rd-party LCD, CRT or Flat Screen displays.

When two monitors are connected, the CPU graphics software provides the following graphics options:

- **Extended desktop**

  Extended desktop is a feature in a computer that allows a user to extend viewing capabilities by using two or more monitors at the same time. Extended desktop mode allows the user to display a single document or application across multiple monitors, or use each monitor to display a different document or application. It also allows the monitors to have independent resolutions, color depth, and refresh rates.

- **Clone Display**

  Clone display is a display configuration in which two displays can each have an independent set of timings. Clone is beneficial when using displays that support various resolutions and refresh rates.

- **Dual Display Twin**

  Twin display is a display configuration in which two displays are driven by the same set of timings. Both display devices should support those timings (resolution, refresh, etc).

NOTE: Graphic controller supports resolutions up to 1280x1024. If you use MW810 display, XGA resolution (1024 x 768) is recommended.

Storage Device

Your CPU is equipped with a removable hard or solid state disk drive. 2.5-inch hard disk drive with SATA interface, three-dimensional shock absorber and integrated control circuitry provides the most rugged solution for hard disk drives. The HD system comes with a built-in heater that automatically turns on at low temperature.

CAUTION: If the operating system is running from the HD or SSD, never try to remove or install the hard disk drive while the computer is powered on. Doing so can result in loss of data, and can damage the computer and the hard disk drive's sensitive circuitry.

External Audio Device

The audio subsystem includes digital audio and analog mixing functions required for recording and playing sound on your computer. Microsoft Windows Sound System supports internal microphone and capability to connect external audio devices.

NOTE: Motorola integrated molded cable for connecting to the MW810 display also incorporate the audio output to the display's loudspeaker.

Serial Device

The CPU has serial ports for connecting a variety of serial devices**.** The devices you connect to the Serial ports usually do not require installing a driver, as the required software is already included in the operating system. However, if the serial device requires its own software, please install it from the data carrier provided with the device.

Follow instructions below when you need to connect a serial device to the CPU:

- Switch the CPU off
- Connect the data cable of the serial device to the serial interface on the CPU
- Plug the serial device power cable into the grounded main outlet
- First switch the device on, then the CPU
- Install a driver (if required)

Video Input

The CPU has an analog video input port on the rear CPU panel for connecting a video capture device. To connect a video capture device, simply plug the device cable to the VIDEO IN input port.

Auxiliary Port

The AUX port provides four digital bits GPIO that may be configured either for input or output. The GPIO DIRECTION parameter in the CPU's codeplug defines a direction of specific GPIO line, the GPIO LEVEL codeplug parameter allows selecting the voltage level for specific GPO – 5VDC or car battery voltage is available options. In addition, you can define initial GPO state after power up via the GPIO STATE codeplug parameter.

NOTE: When a port is configured for input, the external voltage must be supplied to that port via 160 Ohm resistor to ensure proper operation.

CAUTION: When a port is configured for output, be aware not supply external voltage to that port may – it may damage the device.

The auxiliary port provides ignition sense connection to the MW810. See the MW810 installation manual for details.

This port can also be used to supply 5VDC 1A max and vehicle battery voltage out 1A max to external devices connected to the MW810 CPU.

Optional Internal Peripherals

CAUTION: You can upgrade your CPU by addition of internal networks cards, installing CF card or changing system memory. However, to avoid damage during the installation procedure, please ask authorized personnel for help. Refer to the MW810 Service Manual for description of the CPU internal modules and field-upgradeable components.

Wireless LAN

Depending on your model, the Intel Wi-Fi Link 5300 network adapter may be integrated in your CPU. This card is an embedded 802.11a/b/g/n PCI-e Mini Card network adapter operating in the 2.4GHz and 5GHz spectrum. The network adapter supports the latest wireless industry standards and can easily be connected to existing Ethernet networks. This means you can use the WLAN network adapter just as with a cable-connected Ethernet.

The Intel Wi-Fi Link 5300 network adapter operates in accordance with the IEEE 802.11 standard.

Key Features

- Dual-Band, Quad-Mode solution (802.11a/b/g/n) in the 2.4GHz and 5GHz spectrum
- Up to 450 Mbps of Bandwidth; in addition to enabling multiple applications to simultaneously access the network resulting in increased productivity
- Multiple Input Multiple Output (MIMO) Technology
- Support for antenna diversity to enable optimized WLAN performance for multi-antenna systems
- Industry-standard wireless LAN security support (802.1x, WEP 128- and 64-bit, WPA, WPA2, AES-CCMP 128 bit, LEAP, PEAP, TKIP)
- Compatible with Intel My WiFi Technology
- Compatible with Intel® PROSet WLAN management software

For additional information about the network adapter modem refer to Intel Wi-Fi Link 5300 network adapter manual.

Installation

Generally, the drivers and the tools are already preinstalled. If the drivers and the tools have not yet been installed, you can find the install package in the **C:\Drivers\WLAN** folder of the original MW810 operating system image or reinstall the WLAN software by using the MW810 Field Support Kit CD-ROM.

If it should be necessary to reinstall the WLAN software, refer to the MW810 Field Support Kit User's Manual for details.

NOTE: You may require administrator privileges to install software. Make sure you have the necessary rights.

Settings

Network adapter states upon turning on the CPU can be defined either in the CPU codeplug or the CPU registry.

- The WLAN parameter of the CPU codeplug specifies a state of WLAN network adapter after the CPU is turned on. Factory codeplug setting of the WLAN network adapter is ON.
- The MW810 Manager application allows selecting the state of the WLAN network adapter after operating system start. Factory registry setting of the WLAN network adapter is ON.

If the WLAN software is installed and the network adapter is powered on, the "Wireless LAN" radio icon appears in the lower right-hand corner on the toolbar of your Windows desktop (for Windows XP only). The background color of the 'wave' icon indicates the connection status. The following color code displays connection status:

- White: adapter searches for available wireless network: very poor connection quality or no connection
- Yellow: an available wireless network is found
- Green: adapter is connected to a wireless network. Green waves indicate connection status: the more waves mean the better quality of received signal.
- Red: There are no available wireless networks found. Intel PROSet/Wireless periodically scans for available networks
- Crossed out: adapter is off and does neither transmit nor receive

You can display the connection status by positioning the mouse pointer on the icon.

Wireless WAN

Depending on your model, your CPU may include an integrated WWAN solution based on Qualcomm's Gobi2000. That solution supports major RF bands around the world - all with one chipset. Gobi2000 solution makes it possible to procure and support one wireless device that works on multiple wireless networks. A list of supported wireless networks is shown next:

- EV-DO/EV-DO Rev. A 800MHz
- EV-DO/EV-DO Rev. A 1900 MHz
- HSDPA/HSUPA 800MHz
- HSDPA/HSUPA 850MHz
- HSDPA/HSUPA 900MHz
- HSDPA/HSUPA 1900MHz
- HSDPA/HSUPA 2100MHz
- GSM/GPRS/EDGE 850MHz
- GSM/GPRS/EDGE 900MHz
- GSM/GPRS/EDGE 1800MHz
- GSM/GPRS/EDGE 1900MHz

Key Features

- Support third generation (3G) digital cellular standards
- Technology/Bands
  - HSPA/UMTS – 800/850/900/1900/2100 MHz
  - Quad-band EDGE/GPRS/GSM – 850/900/1800/1900 MHz
  - Dual-band EV-DO/CDMA –800/1900 MHz
- Receive Diversity on all HSPA/UMTS/EV-DO/CDMA bands
- Data Speeds
  - HSDPA/HSUPA DL/UL – 7.2 Mbps/5.76 Mbps
  - WCDMA DL/UL – 384 kbps/384 kbps
  - GSM DL/UL – 14.4 kbps/14.4 kbps
  - GPRS DL/UL – 85.6 kbps/42.8 kbps
  - EDGE DL/UL – 236.8 kbps/118.4 kbps
  - EV-DO FL/RL – 3.1 Mbps/1.8 Mbps
  - CDMA 1xRTT FL/RL – 153 kbps/153 kbps
- WHQL-certified USB software driver architecture
- AT command interface
- Card vendor supplied SDK including Application Program Interface
- Standalone carrier certification

Installation

Generally, the drivers and the configuration utility are already preinstalled. If the drivers and the tools have not yet been installed, you can find the install package in the **C:\Drivers \Sierra** folder of the original MW810 operating system image or reinstall the CDMA software by using of the MW810 Field Support Kit CD.

If it should be necessary to reinstall the CDMA software, refer to the MW810 Field Support Kit User's Manual for details.

NOTE: You may require administrator privileges to install software. Make sure you have the necessary rights.

CAUTION: If you use an integrated WWAN radio, switching over to the Standby mode is not recommended as this may lead to an interruption in the network connection.

NOTE: For connection to the networks, you need establish a subscription with a service provider. Check with your service provider for a list of available wireless data services.

GPS Receiver

Optional GPS receiver may be integrated in your CPU. MW810 offers 2 GPS options: Trimble Lassen iQ module or u-blox SBR-LS module with the dead reckoning intelligence.

Trimble's Lassen iQ Module

Trimble's Lassen iQ module is 12-channel GPS module with ultra-low power consumption. The module features two GPS signal sensitivity modes: Standard and Enhanced. With Enhanced mode enabled, the module automatically switches to higher sensitivity when satellite signals are weak.

The Lassen iQ module operates using one of three protocols - TSIP, TAIP, or NMEA 0183.

- TSIP is a powerful binary packet protocol that allows maximum configuration control over the GPS receiver for optimum performance in any number of applications.
- TAIP is the Trimble ASCII interface protocol designed specifically for vehicle tracking applications. It is a bi-directional protocol using simple ASCII commands with the associated ASCII responses.
- NMEA 0183 is an industry standard protocol common to marine applications. NMEA provides direct compatibility with other NMEA-capable devices such as chart plotters, radars, etc. The Lassen iQ GPS module most NMEA messages for GPS navigation. NMEA messages and output rates can be user selected as required.

Key Features

- 12-channel simultaneous operation
- NMEA 0183, TSIP, TAIP protocols
- Dual sensitivity modes with automatic switching
- Aided GPS through TSIP
- Antenna open and short circuit detection and protection
- Two serial ports

Configuration

The Lassen iQ GPS receiver has two serial ports and can be configured for RTCM SC-104 input which is the GPS industry standard for differential correction data. The receive side of the port 2 is factory configured to accept RTCM data.

The factory default settings are:

- Port 1, TSIP bi-directional
- Port 2, NMEA 0183 OUT / RTCM SC-104 V2.1 IN

Trimble provides the iQ_Monitor and the GPSSK interface programs to monitor GPS performance and to assist system integrators in developing a software interface for the GPS module. Contact Trimble for further information.

Dead Reckoning Module

The Sensor-Based GPS Receiver containing the ANTARIS® GPS positioning engine provides accurate positioning in areas where GPS reception is blocked, for example in tunnels, city canyons, indoor and underground parking facilities, and as well as other difficult areas. Sensor-based GPS receiver supplements the GPS information with an incoming signal from a gyroscope and from odometer pulses to reconstruct the traveled route through long periods of GPS outages with aid of dead reckoning algorithms.

Key Features

- 16-channel GPS receiver
- Dead reckoning (DR) with enhanced Kalman filter
- Mixed GPS and DR operation, depending on availability and quality of GPS signal
- Fully automatic calibration
- Temperature compensation
- Based on the ANTARIS GPS technology
- Differential GPS (DGPS) support
- Active antenna support

- Active antenna supervisor for short and open circuit detection

The u-center GPS Evaluation Software provides a powerful tool for evaluation, performance analysis and configuration of u-blox GPS receivers. That software is not a part of the MW810 software installation, contact u-blox for further information.

Configuration

The dead reckoning module has two serial ports which support NMEA, UBX Binary, and RTCM protocols. The factory default settings are:

- Port 1, NMEA 0183
- Port 2, UBX Binary

Settings

The GPS receiver state upon turning on the CPU can be defined either in the CPU codeplug or the CPU registry.

- The GPS parameter of the CPU codeplug specifies a state of GPS receiver after the CPU is turned on. Factory codeplug setting of the GPS receiver is OFF.
- The MW810 Manager application allows selecting the state of the GPS receiver after operating system start. Factory registry setting of the GPS receiver is OFF.
- The GPS PORT parameter of the CPU codeplug selects a port in the GPS receiver which user application is connected to. Factory codeplug setting of the GPS port is PORT1.
- The MW810 Manager application allows selecting of the GPS port after operating system start. Factory registry setting of the GPS Port is PORT1.

NOTE: dead reckoning intelligence can be achieved only if vehicle speed (SPEED+ and SPEED-) and direction (FWD+, FWD-) inputs are connected to the CPU auxiliary port. See the MW810 installation manual for details.

System Memory

The CPU has two internal slots for DDR3 memory modules. You can upgrade system memory up to 4GB as follows:

- 1GB PC2-5300/667MHz in one DDR3 slot
- 2GB PC2-5300/667MHz in one DDR3 slot
- 2GB PC2-5300/667MHz in two DDR3 slots (1GB each)
- 4GB PC2-5300/667MHz in two DDR3 slots (2GB each)

CPU Configuration

The CPU stores its configuration in the *codeplug* and the *BIOS flash*. This section describes various configuration parameters that can be selected and modified if required.

CPU Codeplug

The CPU *codeplug* is a protected memory area to store the configuration parameters accessed when you turn on the device. That binary-format data contains basic information about CPU capabilities including power-up, power-off modes, a status of peripheral devices, etc.

Codeplug Configuration Parameters

PARAMETER	DESCRIPTION	AVAILABLE OPTIONS	FACTORY SETTING
POWER SOURCE	Specifies a kind of car battery the CPU is connected to.	9V, 12V, or 24V	12V
IGNITION BOOT PREFERENCES	Selects desired CPU reaction when the ignition switch is turned on.	NONE – Ignore turning the ignition switch on. POWER ON - Turn on if CPU is off; ignore if CPU is already on WAKEUP – Wake up CPU from standby mode; ignore if CPU is already active MIXED – Wake up if CPU is in standby mode; Turn on if CPU is off POWER BUTTON LOCK – Block the power button until you turn on the ignition switch	POWER ON
POWER BUTTON PREFERENCES	Selects desired method to turn the CPU off.	CPU POWER BUTTON - Turn on/off when pressure of the CPU power button. DISPLAY1 POWER BUTTON - Turn on/off when the primary display is turned off. DISPLAY2 POWER BUTTON - Turn on/off when the secondary display is turned off. SHUTDOWN WHILE IGNITION ON - Specifies whether computer takes an action when press the Power button while the Ignition switch is turned on.	ENABLE ENABLE ENABLE DISABLE
IGNITION SHUT DOWN PREFERENCES	Selects desired CPU reaction when the ignition switch is turned off.	NONE – Ignore turning the ignition switch off. SHUTDOWN - Turn off the CPU. STANDBY – Force standby mode.	SHUTDOWN

IGNITION SHUT DOWN TIMER	When IGNITION SHUT DOWN PREFERENCES = SHUTDOWN, selects the amount of time to elapse between turning the ignition switch off and CPU shutting down.	0 … 127 seconds or 0 … 127 minutes	3 minutes
CRITICAL TURN OFF	Enables or disables turning the device off by pressing and holding the power button for 6 seconds or more.	CPU DISPLAY1 DISPLAY2	ENABLE ENABLE ENABLE
WLAN	Specifies the state of the WLAN radio after CPU power up.	ON / OFF	ON
WWAN	Specifies the state of the WWAN radio (UMTS/CDMA/DataTAC) after CPU power up.	ON / OFF	ON
GPS	Specifies the state of the GPS receiver after CPU power up.	ON / OFF	OFF
HD MAINTENANCE TIME-OUT	Specifies a time of HD maintenance (keeping the HD temperature within the operating range for a certain period of time set by this parameter) while the CPU is off.	0 … 16 hours	12 hours
1W SUPPORT	Specifies whether the CPU support 1-wire interface with the display.	ENABLE / DISABLE	ENABLE
GPS PORT	Selects an input port of the GPS receiver.	PORT1 / PORT2	PORT1
WAKE-UP from INTERNAL WWAN RADIO	Enables or disables wake-up from the RI line of the serial COM3 port connected to internal PRM240 radio modem.	ENABLE / DISABLE	ENABLE
GPIO DIRECTION	Defines a direction of specific GPIO line.	GPIO1 – INPUT/OUTPUT GPIO2 – INPUT/OUTPUT GPIO3 – INPUT/OUTPUT GPIO4 – INPUT/OUTPUT	OUTPUT OUTPUT OUTPUT OUTPUT
GPIO STATE	Defines initial GPO state after power up.	GPO1 – ON/OFF GPO2 – ON/OFF GPO3 – ON/OFF GPO4 – ON/OFF	OFF OFF OFF OFF
GPIO LEVEL	Defines the voltage level for specific GPO.	GPO1 – 5V/CAR BATT GPO2 – 5V/CAR BATT GPO3 – 5V/CAR BATT GPO4 – 5V/CAR BATT	5V 5V 5V 5V
CAR BATTERY OUTPUT	Enables or disables the car battery voltage output at the auxiliary connector when the CPU is powered on.	ENABLE / DISABLE	ENABLE
CAR BATTERY CONTROL	Enables or disables the car battery voltage output at the auxiliary connector when the CPU is powered off.	ENABLE / DISABLE	DISABLE
5V OUTPUT	Enables or disables the 5VDC output at the auxiliary connector.	ENABLE / DISABLE	ENABLE
RELIABILITY MONITOR	Enables or disables monitoring of CPU reliability information.	ENABLE / DISABLE	ENABLE

CPU Configuration Change

This section describes the software configuration tool and the most common method to change the CPU configuration parameters.

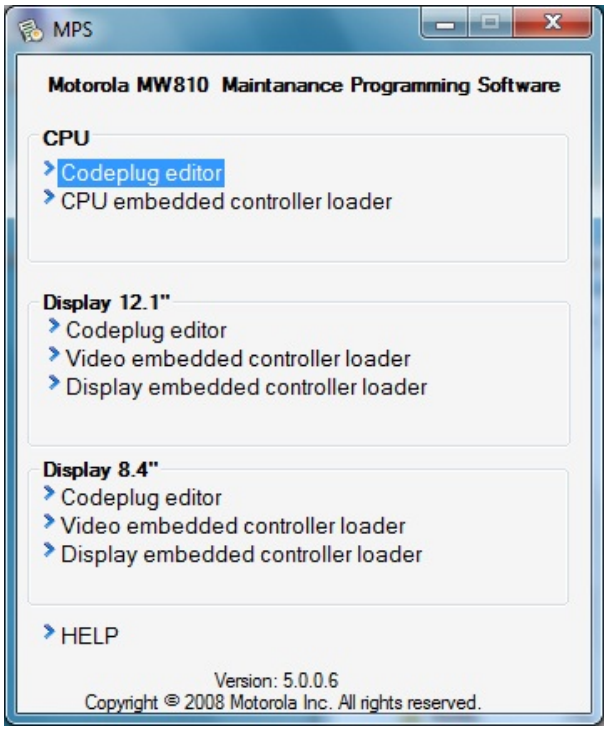
Maintenance Programming Software

The Maintenance Programming Software allows modifying display configuration that starts when you turn the display on. Use the MPS context-sensitive on-line help information for assistance in configuring the device.

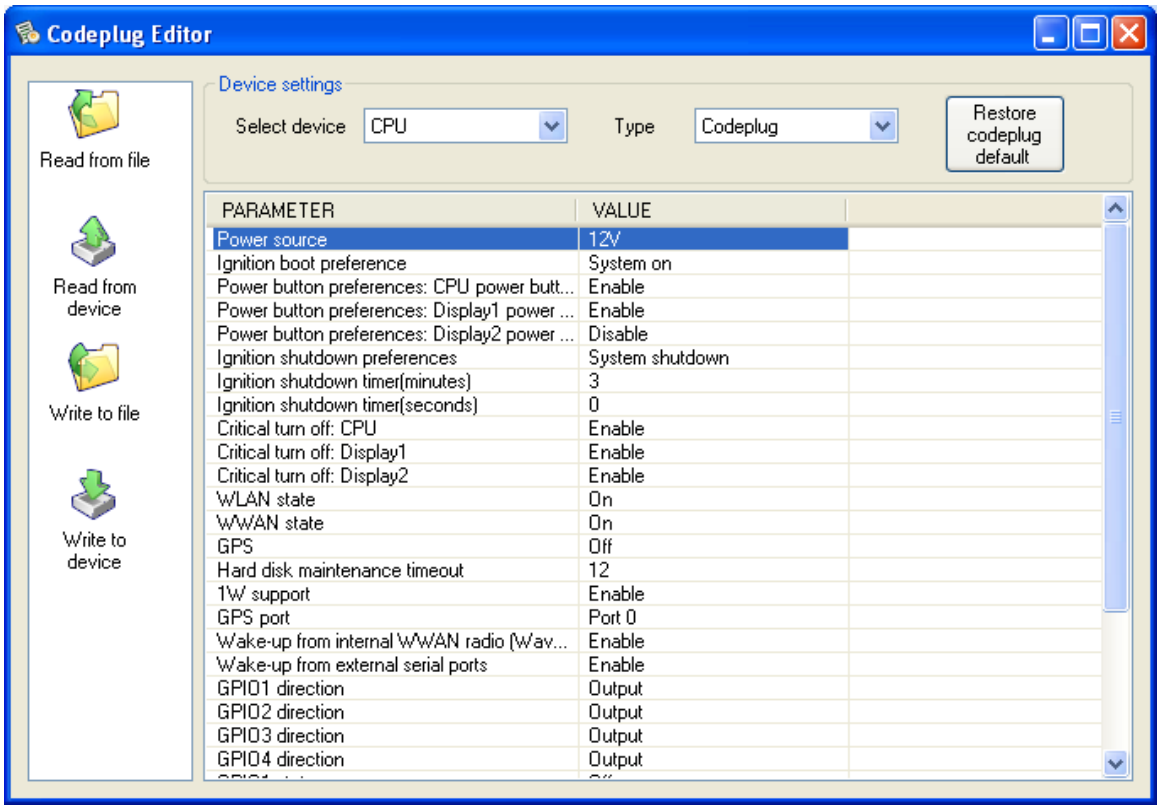
How to Modify Configuration Parameters

To modify the configuration parameters perform the following:

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



- Click on the Codeplug Editor icon



To modify configuration parameters use the MPS tool as shown next:

- Choice the CPU in the Select Device field
- Click on **Read from device** to read the codeplug parameters. If your device is successfully read, you will see a list of parameters.

  CAUTION: Incorrect configuration can make the device unworkable. Please, make sure to acquire the appropriate codeplug. Always make a backup copy in case you have made a mistake during the update.
- Click on **Save to File** to backup the original codeplug data.
- Modify a parameter per your selection.
- Click on **Write to device** to program the device and wait for a confirmation of successful programming completion.

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

BIOS Setup

The BIOS is a program stored on a Flash chip on the motherboard initializing the CPU prior to the start of the operating system. The BIOS parameters define the CPU system functions and the hardware configuration.

Settings in BIOS Setup

When you restart the CPU, the M-logo display briefly appears on the screen. To enter the BIOS Setup, press the **DEL** key when this display appears. If a password has been assigned, type the password and press the Enter key.

The BIOS Setup Utility that enables the selection and modification of different BIOS setup parameters and contains the menus as shown next:

- *Main:* for system information and time/date settings
- *Boot:* for configuring the boot sequence
- *Security:* for password and TCG settings functions
- *Recovery:* for system recovery settings
- *Exit:* to save and exit the BIOS Setup

NOTE: If you have forgotten the password, contact your system administrator.

Operating BIOS Setup

Available BIOS menus are shown at the top of the BIOS window. Use the and arrow keys to navigate between menu items.

Available menu parameters are shown in the left-hand window of the BIOS. The description of the individual settings is shown in the upper right-hand window of the BIOS. The description of the navigation through the BIOS and selecting the menu or parameter you wish to access to make changes is shown in the bottom right-hand window.

If you need to display help on the operation of BIOS Setup - press the **F1** key.

CAUTION: Refer to the Appendix D for factory setting of the BIOS parameters. You can change these settings which will take effect as soon as you save and quit the BIOS Setup. Be aware, incorrect BIOS configuration can make the device unworkable.

Boot from USB Mass Storage Device

Boot priorities in the BIOS setup appear as groups, there are groups of Hard Drives and Floppy Drives. The BIOS classifies USB mass storage device according to its size as follows:

- "Floppy Drive" is storage capacity is less than 512 MB
- "Hard Drive" if storage capacity is more than 512 MB

Configure the BIOS to support MW810 boot-up from a USB mass storage device as follows:

- Enter to BIOS menu and go to "Boot" screen
- If size of USB mass storage is less than 512 MB, go to "Boot Option #1"
- If size of USB mass storage is more than 512 MB, go to "Boot Options #5" and enter "Hard Drive BBS Priorities" option
- Select USB mass storage device to be the first boot option.
- Save changes and exit BIOS setup.

Put attention, if you remove USB device which is classified as "Hard Drive", then BIOS automatically will set boot priority to internal hard drive. Next time, when you plug-in USB device, you will have to set the boot priorities again.

Exiting BIOS Setup

To exit BIOS Setup, select the *Exit* menu from the menu bar. You can then decide which settings you want to save. The Exit menu offers the following options:

- **Save Changes and Exit -** Exit the BIOS setup after saving the changes
- **Discard Changes and Exit** - Exit the BIOS setup without saving of any the change
- **Save Changes -** Save changes done so far to any of setup options
- **Discard Changes -** Discard changes done so far to any of setup options

Mark the required option and activate it with the Enter key.

Security and Password Protection

Trusted Platform Module

The CPU firmware meets compliance requirements for the Trusted Platform Module (TPM) 1.2 specification. TPM 1.2 is an essential level of compliance for secure start of Windows XP or Windows 7 operating systems. When the TPM is enabled, the CPU will ensure that unauthorized code cannot invade a device in its boot process.

To use the TPM, you must be sure to activate the TPM in the BIOS Setup. The condition for this is that you have entered at least the administrator's password.

- Call BIOS Setup and select the Security menu
- Select the entry TRUSTED COMPUTING item and press the Enter key
- Select desired TPM STATE option

TPM is functional when TPM STATE = ENABLED. Disabled TPM is not able to execute commands that use the resources of a TPM. TPM is not able to load keys and perform other operations. Even if a disabled TPM has a TPM Owner, it is not able to execute normal TPM commands.

If you have activated the TPM, the menu item PENDING TPM OPERATION will schedule the TPM operations as follows:

- NONE - no operation is pending
- ENABLE TAKE OWNERSHIP - when TPM enabled but without an owner this command allows the ability to take ownership.
- DISABLE TAKE OWNERSHIP - when TPM enabled but without an owner this command disallows the ability to take ownership
- TPM CLEAR - return the TPM to factory defaults

When the TPM is activated, it initially takes control of the CPU during each start-up to check all hardware components and the BIOS Setup for trustworthiness. In the further course of operation, the TPM checks the operating system, certain drivers and applications. If a component does not have a valid certificate, the TPM refuses this component access to protected content.

For example, with the TPM activated, data can be generated which can only be read or run on this device.

Password Protection in BIOS Setup

You can prevent unauthorized opening of the BIOS Setup with both the administrator's and the user's password.

- If only the administrator password is set, then this only limits access to setup and is only asked for when entering the BIOS Setup
- If only the user's password is set, then this is a power on password and must be entered to boot or enter the BIOS Setup. In Setup the user will have administrator rights. Note the following before using the password protection for your data security in the BIOS Setup:

Please remember your passwords in either case, as you will not be able to access your BIOS Setup and/or your system any longer, if you forget both the user's and the administrator's passwords. Passwords are not covered by your warranty and a charge will be made for assistance.

Passwords can be up to eight characters long. You can use all alphanumeric characters and need not distinguish between uppercase and lowercase characters.

Set the supervisor and user password

To assign the administrator's password do as follows:

- Call the BIOS setup and select the Security menu
- Mark the *Administrator Password* field and press the Enter key
- Enter the password in the *Create new Password* field and press the Enter key
- Confirm the new password when it is requested
- Enter the password again and press the Enter key
- Exit the BIOS setup after saving the changes

To assign the user's password do as follows:

- Call BIOS setup and select the Security menu
- Mark the *User Password* field and proceed exactly as when configuring the supervisor password.
- Exit the BIOS setup after saving the changes

Changing administrator's or user's password

- Call the BIOS setup and select the Security menu
- When changing the password, proceed exactly as for password assignment
- You can only change the administrator's password when you have logged in with the administrator rights and the user's password when you have logged in with the user rights

Cancelling passwords

To cancel passwords proceed as follows:

- Call the BIOS setup and select the Security menu
- Mark the *Administrator Password* or the *User Password* field and press the Enter key
- With *Create New Password* you will then be asked to enter a password
- Press the Enter key twice
- Exit the BIOS setup after saving the changes

Basic Operations

This section describes the following display operations:

- Power On
- Power Off
- Power Management

NOTE: Proper CPU functionality can be achieved only if the MW810 CPU Control package is installed. This package is a part of the MW810 CPU software image. Refer to the CPU Software chapter in this document for details.

Power On

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

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

The POWER UP PREFERENCES parameter in the CPU's codeplug provides an option to turn on the CPU the power button:

- POWER BUTTON - Turn on pressure of the power button on CPU or Display units.

When POWER BUTTON = ENABLE, press the CPU or display power button – it will power the CPU on.

The IGNITION BOOT PREFERENCES parameter in the CPU's codeplug provides an option to turn on the CPU from the ignition switch:

- NONE - Ignore the ignition switch.
- POWER ON - Turn on if CPU is off; ignore if CPU is already on
- POWER BUTTON LOCK - Block the power button until you turn on the ignition switch
- WAKEUP - wake up CPU from standby mode; ignore if CPU is already active

When POWER ON or POWER BUTTON LOCK options are selected, insert the car key into the ignition switch and rotate it to ACC position - it will power the CPU on.

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.

CAUTION: If POWER BUTTON = DISABLE, only the ignition switch can turn the device on. Make sure, in that case IGNITION BOOT PREFERENCE setting is POWER ON or POWER BUTTON LOCK.

CAUTION: Extreme Temperature Conditions

The device is operational only within valid temperature range. When the ambient temperature is beyond the operational range or internal CPU temperatures are beyond the allowed thresholds, the device will indicate about operational failure and not power on.

CAUTION: Discharged Vehicle Battery

The device is operational when the car battery voltage is within valid range. The device will not power up when a level of the car battery voltage is below the *Low Battery Threshold* (refer to Appendix C for absolute value of the threshold).

Power Off

The device can be turned off either from the CPU or from the power button located on the display's front.

The POWER OFF PREFERENCES parameter provides four options to turn off the device: DISPLAY REQUEST, CPU POWER BUTTON, DISPLAY1 POWER BUTTON, and DISPLAY2 POWER BUTTON. You can select any of above options or use their combination.

- When CPU POWER BUTTON = ENABLE, pressure of the CPU power button will force power off.
- When DISPLAY1 POWER BUTTON = ENABLE, pressure of the power button on the primary display will force power off.
- When DISPLAY2 POWER BUTTON = ENABLE, pressure of the power button on the secondary display will force power off.
- When DISPLAY REQUEST = ENABLE, the device will automatically shut itself down when the CPU issues power off request.

Additional option to shut the device down is turning off the ignition switch. This option will work if setting of the IGNITION SHUT DOWN PREFERENCES parameter in the CPU's codeplug is SHUTDOWN. When using of this option, you can select the amount of time to elapse between turning the ignition switch off and CPU shutting down by means of the IGNITION SHUT DOWN TIMER parameter.

If the system does not respond, you can turn the device off by pressing and holding the CPU power button for 6 seconds or more. To permit this option, enable CRITICAL TURN OFF. Be aware, this uncontrolled hardware power off may damage CPU hard disk.

CAUTION: Extreme Shut Down

Some extreme events such as temperature below the low or above the high operating limit or discharged car battery might cause the device to power off.

- *Internal temperature is beyond the operational limit*.
  If during operation the internal temperature is close to the low or high operational limits, the display will provide the warning temperature indication. If during operation the internal temperature goes out of the operational limits, the display eventually powers off.
- *Vehicle battery is discharged.*
  If, during normal operation, the battery voltage drops below the *Low Battery Threshold*, the display will provide the low car battery indication. If the voltage continues to drop, the device automatically powers off at the *Critically Low Battery Limit*.
- *Drops in car battery voltage.*
  If battery voltage falls below the *Battery Cranking Threshold* for 20 seconds or more, the device will execute critical shut down and power itself off.

CAUTION:

The device automatically shuts down then the internal temperature exceeds the upper limit of the valid range. Never turn on the device until it cools down.

Power Scheme

The CPU in combination with the operating system allows reducing of the power consumption of your entire system. You can do this by selection of appropriate power scheme which will define the power usage by your computer. Available options are as follows:

- **Standby**
  On standby the CPU switches to a low-power mode where devices use less power. When you want to use the computer again, it comes out of standby quickly, and your desktop is restored exactly as you left it. In the standby mode the content of the main memory is saved by continuing to supply the main memory with power, while the processor, monitor, hard disk and other internal components are turned off.
- **Hibernation**
  Hibernate feature saves everything in memory on disk, turns off your monitor and hard disk, and then turns off your computer. When you restart your computer, your desktop is restored exactly as you left it. It takes longer to bring your computer out of hibernation than out of standby.
- **Monitor Off**
  In this state the CPU automatically turns off the monitor.
- **Hard Disk Off**
  In this state the CPU automatically turns off the hard disk.

Windows Power Options (**Start Settings Control Panel Power Options Power Schemes**) allows adjustment of the individual settings in a power scheme. You can specify the period of inactivity that you want to elapse before the CPU turns off the monitor/hard disk, or goes to Standby/Hibernate mode.

Standby

The CPU can initiate the standby manually or automatically after a period of inactivity that you may pre-define. The period of inactivity means not making any entry on your computer for a certain time.

Manual methods to enter Standby mode are as follows:

- Standby selection in the Shutdown Window of the operating system
- Power button pressure (if configured)
- Turning the ignition switch off (if configured)

For details about the power button, refer to the help file attached to Windows Power Options (**Start Settings Control Panel Power Options Advanced**). Default setting of the operating system does not allow Standby from the power button.

Turning the ignition switch off may force the CPU standby depending on setting of the IGNITION SHUT DOWN PREFERENCES parameter. If your intention is going to Standby when the ignition is off, permit that feature by enabling of the STANDBY option.

When the CPU is in Standby, it suspends all USB accessories connected to it. When you resume work, your notebook returns to the place at which you discontinued working.

Wake Up

The CPU wakes up on occurrence of one of events below:

- Wake up event from an USB HID device connected to the CPU
- Wake up event from an Ethernet device connected to the CPU
- Ring Indicator from the RS-232 port
- Power button pressure (if configured)
- Ignition switch (if configured)

Wake up event from USB HID device can resume the CPU out of standby if its setting specifies the operating system to come out of a low power state when there is USB or Ethernet activity. 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.

Default setting of the operating system allows resume from USB HID or Ethernet devices.

A device connected to 10/100/1000M Ethernet port can use both 'magic' and 'direct' packets for remote CPU wake up. To activate the remote wake up, check **Wake on Directed packet** or/and **Wake on Magic packet** in the device properties.

Pressure of the **Power** button will bring the computer out of standby if its setting specifies the operating system to come out of a low power state 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 Advanced**).

Default setting of the operating system does not allow resume from the power button.

Turning the ignition switch on may wake up the CPU depending on setting of the IGNITION BOOT PREFERENCES parameter. If your intention is going to Standby when the ignition is off, permit that feature by enabling of the STANBY option.

Power Management Tips

- Typically, you turn off the monitor or hard disk for a short period to conserve power. If you plan to be away from your computer for a while, put your computer on standby to place entire system in a low-power state.
- Put your computer in hibernation when you will be away from the computer for an extended time or overnight. When you restart the computer, your CPU is restored exactly as you left it.
- If you use an integrated UMTS/CDMA radio, switching over to the Standby mode is not recommended as this may lead to an interruption in the network connection.
- Do not switch the CPU off while it is in one of the energy-saving modes. When you are finished working - come out of a power-saving mode and then turn off as normal.
- If the CPU is in a power-saving mode:
    - Do not connect any external devices
    - Do not disconnect any external devices
    - Do not install or remove a PC- or Express card
    - Do not add or remove RAM

HD Heater

The CPU hard drive is equipped with the heater that allows the hard disk to work in low temperature. The CPU automatically controls the heater and turns it on and off depending on the temperature in the HDD compartment.

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 the CPU configuration section) for a 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 has been expired 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 - please wait until this process is completed.

CPU Software & Firmware

BIOS

The BIOS is the built-in firmware that initializes basic elements of the CPU module before operating system start and without accessing programs from a bootable storage device. Also, the BIOS communicates with the keyboard controller (Embedded Firmware) and place a standard interface layer between platform hardware and operating system.

The BIOS is built with the EFI technology and place a standard interface layer (ACPI) between platform hardware and operating system.

Key Features

The BIOS provides basic services as follows:

- Support 32- and 64-bit single and dual core CPU and Intel's Montevina platform
- Support OS: Windows XP, Windows 7
- Vendor identification for OPK installation
- WHQL-certified software architecture
- Multiple boot devices: HD or SSD, USB 2.0 mass storage device, PXE boot from Ethernet device, CD-ROM
- BIOS Recovery options: USB mass storage device; BIOS recovery process provides boot block method to recover in case of BIOS corruption
- The Video BIOS into the system BIOS image
- Re-flashing in DOS and in Windows
- BIOS setup
- TPM 1.2 support

Embedded Controller

The Embedded controller is the built-in firmware that provides basic services as follows:

- Implement power on/off sequence
- Measure internal temperatures in most critical points
- Implement thermal control algorithm allowing withstanding with -30°C…+70°C ambient temperature
- Implement fan control to allow cooling internal temperature down
- Control by GPIO lines
- Implement internal heater control to allow heating the device up when low ambient temperature
- Support the CPU configuration parameters

Operating System

CPU operating system is Windows XP or Windows 7 image customized for the CPU hardware. Software architecture of the CPU is WHQL-certified.

CPU Control Package

Proper CPU functionality can be achieved only if the MW810 CPU Control package is installed. This package is a part of the MW810 CPU software image.

The services package is a collection of Windows applications and services allowing the end user capability to utilize the CPU features. The list of these tools is shown next:

- *MWCPUDriver* - a driver providing an access to the CPU hardware.
- *MWCPUService* - service application to provide API to control and manage the CPU. It serves as an interface engine between the driver and applications.
- *MWCPUAgent* - provides notifications to the operating system about specific CPU events.
- *MWCPUManager* - GUI for internal CPU data notifications about extreme conditions; simple application for troubleshooting.

CPU Driver

MWCPUDriver is a WHQL-certified OS driver that provides for operating system an interface with the CPU hardware.

CPU Service

MWCPUService is a standard service application that starts automatically at startup, before user logs in and is running in the background all the time when the CPU is on.

MWCPUService acts as serial communication server and provides synchronized access for all applications (clients) that are using API. The service allows sharing of CPU resources between multiple applications.

MWCPUService provides for internal and 3rd-party applications API an access to unique CPU resources via the MWCPUDriver. In addition, it provides a mechanism to retrieve events from the CPU and deliver it to application clients. System events source can be one of the following: power button, thermal and battery control events.

CPU Manager

MWCPUManager receives, shows and logs events relating to CPU temperature and battery status. This software application provides basic information about the CPU and selection of desired notifications in extreme conditions. To run CPU Manager, click the MW810 CPU Manager icon from the Start menu.

This application provides as follows:

- **Versions**
  General information about CPU hardware, embedded firmware and software versions
- **Power**
  The CPU current consumption and a voltage level of the car battery
- **Lines Control**
  Turning on and off internal CPU peripheral devices; setting of GPIO state, level and direction
- **Temperature**
  Real time internal temperatures from internal CPU temperature sensors

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

  - *Internal temperature is beyond the operational limit*.
    If during operation the internal temperature is close to the low or high operational limits, the CPU will provide critical temperature indication. If during operation the internal temperature goes out of the operational limits, the CPU eventually powers off.
  - *Vehicle battery is discharged.*
    If, during normal operation, the battery voltage drops below the *Low Battery Threshold*, the CPU will provide low battery indication.
  - *Ignition Off*

    If the ignition switch is turned off, the CPU will provide appropriate indication.
  - *Drops in car battery voltage.*
    If battery voltage falls below the *Battery Cranking Threshold* for 20 seconds or more, the device will send the Cranking event to the CPU, execute critical shut down and power itself off.
  - *Over-current event*
    If during normal operation, the current drain exceeds the *Critical Current Drain Threshold*, the device will execute critical shut down and power itself off.
  - *Over-voltage protection*
    If during normal operation, a level of the car battery voltage exceeds the *Critically High Battery Threshold*, the device will execute critical shut down and power itself off.
- **Logger** - troubleshooting tool allowing documentation of extreme events.

NOTE: User privileges allow running the CPU Manager application in the read-only mode. To control the CPU lines and change agent notifications you will require administrator privileges. Make sure you have the necessary rights.

CPU Upgrade

Use the MW810 Field Support CD-ROM when you need to install or update unique software and firmware components. If the CPU does not have CD-ROM or DVD drive, connect USB CD drive.

Description/Tutorial

Insert MW810 Support Kit CD into CD drive. The Main Menu screen automatically appears as shown next:

For details, refer to MW810 Mobile Workstation, Field Support Kit, User's Manual - 6802982C90-A

The MW810 Support Kit allows updating of the following firmware and software CPU components:

- BIOS
- Embedded microcontroller
- Drivers
- CPU Control Package

Select desired firmware component and click on the appropriate button - the MW810 Field Support kit will automatically replace selected component.

Recovery of Pre-installed Software

If you have experienced problems that came after new software installation or the operating system cannot start you may need to recover from problems. This section provides a view of general maintenance and recovery techniques.

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

Disk Recovery in Windows XP

When the operating system cannot start or is damaged, the MW810 recovery solution enables to restore your system files from a hidden partition on your hard drive.

Available recovery options are shown next:

- **CheckDisk**
  This option checks the file system and file system metadata for errors. This utility will verify and repair (optionally) the integrity of the file system on any chosen volume.

  This utility checks the disk surface for unreadable or corrupted sectors and should the first step in troubleshooting a failing hard drive.
- **System Backup**
  This operation creates a customer copy of the operating system and save it in compressed form in the hidden partition on the hard drive. Later, this copy can be used for system recovery.
- **System Image Recovery**
  This operation returns your system disk to previously saved (either original factory-installed or customized) configuration. That operation replaces all the information, data, and files stored on the system partition

To complete a recovery operation, proceed as follows:

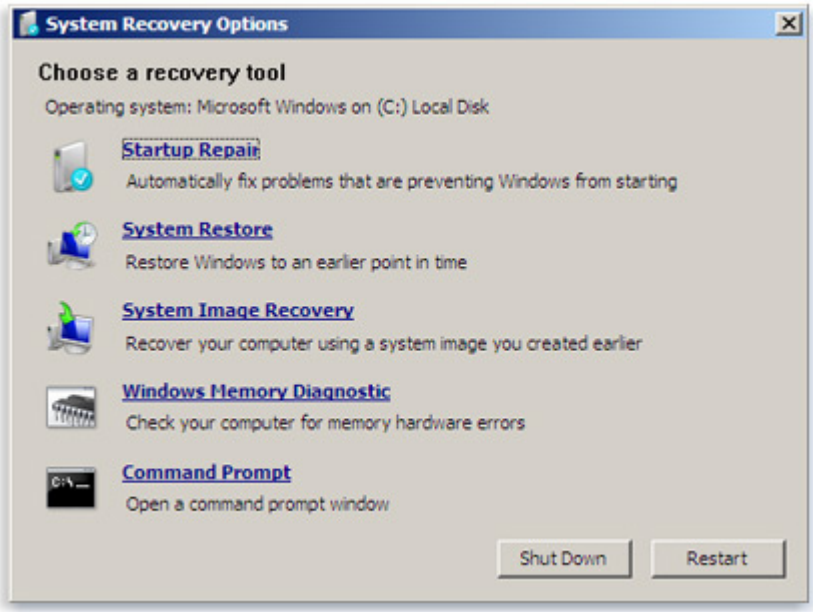
- Turn your CPU off
- Turn your CPU on by pressing the power button. When the M-logo appears, press the **DEL** button, enter the BIOS setup and enable the System Recovery Support feature. Save your changes and restart the CPU.
- When you restart the CPU, the M-logo display briefly appears on the screen. To enter the Recovery Setup, press the **F9** key when this display appears. If a password has been assigned, type the password and press the Enter key.
- When the Recovery Menu is displayed, select desired operation from the list.
- Follow the instructions on the screen
- Wait until the backup/recovery process is finished. Be aware that the duration of this process depends on a size of your CPU software image. Duration of the factory restore process is approximately 10 minutes.
- 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 from the CPU or the primary display power button.

CAUTION: Backup/Recovery process must not be interrupted – do not power off the CPU until software installation and configuration is fully completed.

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

Disk Recovery in Windows 7

The System Recovery Options menu contains several tools that can help you recover Windows from a serious error.



Windows 7 allows creation a system repair disc that contains the System Recovery Options menu. For more information, see Create a system repair disc.

- **Startup Repair**
  Fixes certain problems, such as missing or damaged system files that might prevent Windows from starting correctly.
- **System Image Recovery**
  This operation returns your system disk to previously saved (either original factory-installed or customized) configuration. That operation replaces all the information, data, and files stored on the system partition. You need to have created a system image beforehand to use this option.
- **System Restore**
  Restores your computer's system files to an earlier point in time without affecting your files, such as e-mail, documents, or photos.
  NOTE: If you use System Restore from the System Recovery Options menu, you cannot undo the restore operation. However, you can run System Restore again and choose a different restore point, if one exists
- **Windows Memory Diagnostic Tool**
  Scans your computer's memory for errors.
- **Command Prompt**
  Advanced users can use Command Prompt to perform recovery-related operations and also run other command line tools for diagnosing and troubleshooting problems.

Hard Drive Replacement

If your hard disk data is completely damaged and none of aforementioned procedures is effective - replace the hard disk.
Also you can install the operating system from supplied recovery DVD. Be aware, the installation from the recovery media may require further activation of the operating system.

Getting Assistance

For your convenience, the Motorola website provides up-to-date information about the MW810.

The Web address for the MW810 home page is www.motorola.com/MW810. This site includes general information about the device, as well as answers to questions regarding operational issues with the MW810.

For product-specific downloads search at https://compass.motorola.com/go/323749890. This site provides as follows:

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

Appendix A: Safety Instructions

DANGER: Only authorized personnel should repair the device. Unauthorized opening is dangerous. Refer to the MW810 Service Manual for details.

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

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

DANGER: The ON/OFF switch and power button do not disconnect the device from the line voltage. To completely disconnect the line voltage, remove the power cable from the power plug.

DANGER: To avoid shock hazard, disconnect power cord and all communication cables when you open the covers of your device.

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

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

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

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: The device automatically shuts down then the internal temperature exceeds the upper limit of the valid range. Never turn the device on until it cools down.

CAUTION: Wrong configuration can make your device unworkable. Please, make sure to acquire the appropriate codeplug. Always make a backup copy in case you have made a mistake during the update.

CAUTION: Do not use right- and left-side USB ports for permanent connections. Always disconnect USB accessories from these ports when driving.

CAUTION: Use original packaging when you transport your device.

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) Freight costs to the repair depot.

H) 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.

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

J) 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.

K) Normal and customary wear and tear.

L) 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.

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Repair Service Advantage (RSA) programs are available at additional cost, with options of 1-year RSA (covering year 4) and 2-year RSA (covering years 4 and 5).

The 3-year RSA option is no longer available.

All other warranty terms and conditions remain the same.

Appendix C: CPU Specifications

General

PARAMETER	DESCRIPTION
PROCESSOR (speed, L2 cache, FSB)	• Intel Core2 Duo T9400 (2.53 GHz, 6MB, 1066MHz) • Intel Core2 Duo T8400 (2.26 GHz, 3MB, 1066MHz) • Intel Celeron M575 (2GHz, 1MB, 667MHz)
SYSTEM MEMORY (PC rating, DDR3 speed)	• 1GB in one DDR3 SODIMM (PC3-8500S, 1066MHz) • 2GB in two DDR3 SODIMM (PC3-8500S, 1066MHz) • 4GB in two DDR3 SODIMM (PC3-8500S, 1066MHz)
CHIPSET	• Intel GM45 Express Chipset with GMCH GM45 and ICH9M
VIDEO CONTROLLER	• Intel Gen 5.0 integrated graphics engine with 533-MHz core render clock • Dual display support
PRELOADED OPERATING SYSTEM	• Windows XP Professional 32-bit • Windows 7 Professional 32- or 64-bit
MASS STORAGE	• Removable hard disk 120GB, 5400 rpm with three-dimensional shock absorber and heater • Solid State Disk
INTEGRATED INTERFACES	• RGB • DVI • USB 2.0 • 10/100/1000 T-based Ethernet • RS-232 • Analog video • Audio out • External microphone • Type I or II PC card
GPS	• Trimble Lassen iQ GPS Module • Dead reckoning module with the ANTARIS® GPS positioning engine
INTEGRATED COMMUNICATION DEVICE	• Intel® PRO/Wireless 5300ABGN network adapter • Gobi2000 Sierra Wireless PCI-e Mini Card. Supported networks: o EV-DO/EV-DO Rev. A 800MHz o EV-DO/EV-DO Rev. A 1900 MHz o HSDPA/HSUPA 800MHz o HSDPA/HSUPA 850MHz o HSDPA/HSUPA 900MHz o HSDPA/HSUPA 1900MHz o HSDPA/HSUPA 2100MHz o GSM/GPRS/EDGE 850MHz o GSM/GPRS/EDGE 900MHz o GSM/GPRS/EDGE 1800MHz o GSM/GPRS/EDGE 1900MHz

SECURITY & PROTECTION	• TPM 1.2
INCLUDED SOFTWARE	• Motorola CPU Manager suite • Motorola Display Manager suite • Rescue and Recovery
AUX PORT	• 4 programmable GPIO • Ignition sense • 12VDC battery voltage out (1A) and 5VDC out (1A) • Vehicle speed and direction inputs

Environmental Specifications

PARAMETER	DESCRIPTION
POWER SOURCE	• Vehicle 12V or 24V battery, negative ground, with power loss compensation during engine cranking • Vehicle 9V battery, negative ground, without power loss compensation during engine cranking
POWER SOURCE STABILITY	• 13.8 VDC ± 20% with no loss of functionality for 12V battery • 27.6 VDC ± 20% with no loss of functionality for 24V battery • 9 VDC ± 10% with no loss of functionality for 9V battery
CAR BATTERY PROTECTION	• Auto shut-down on low vehicle battery voltage to protect against excessive drain • Over-voltage and over-current protection
POWER CONSUMPTION	@ 13.8 VDC • Maximal 5A, Typical 1.5A, Standby 0.4A
ELECTRICAL TRANSIENTS	Operational Electrical Transients Per ISO7637 (CE).
SAFETY	Operational Safety Per UL 60950-1, EN60950-1
STORAGE CONDITIONS	Temperature: -40 to 158˚F (-40 to +70˚C)
OPERATING CONDITIONS	Temperature: -22 to 158˚F (-30 to +70˚C) with controlled brightness Humidity: 90 to 95% Relative humidity at 50˚C for 8 hours
THERMAL SHOCK	-40 to 158˚F (-40 to +70˚C)
MECHANICAL SHOCK	20G peak 1/2 sine wave @ 11ms, 30 impacts
VIBRATION	MIL-STD-810F Method 514.5 category 4 Fig. 514.5c-1 1 hour axis.
IP RATING FOR DUST/WATER	IP 54
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 per MIL-STD-810F 509.4, procedure I
FLAMMABILITY	UL94-V0
SOLAR RADIATION	7 cycles of 24 hours with no functional degradation per MIL-STD-810F, 505.4, Procedure I
IMPACT	Ball drop test 130gr. Steel ball from 0.5 m height.
SHOCK CRASH HAZARD	75G, 6 ms per MIL-STD-810F method 516.5, Procedure V
ALTERNATOR WHINE	Per Motorola's 12M05049A04
REVERSE POLARITY	Per Motorola's 12M05049A04

CRANKING	Per Motorola's 12M05049A04
ESD	Per Motorola's 12M05049A04 ESD Procedure
RADIATED IMMUNITY	20V/m EN 61000-4-3

Regulations

TEST	STANDARD
eMARK	Directive 72/245EC (94/95EC)
EMC IMMUNITY	• USA - EN301-489, receive full EMC certification relevant to mobile computing device • Canada - ICES003 (equivalent to FCC Part 15, Class B) • Europe – CE EN55024 • Australia - TBD
RADIATED EMISSION	• USA - FCC Part 15 class B, 90, 22, 24 • Canada - RSS210, RSS119, RSS 132, RSS133 • Europe – CE EN55022 • Australia - AS/NZS 3548
SAFETY	• USA - UL • Canada - UL • Europe - EN60950 • Australia - TBD
FCC ID's	• PRM240 Private DataTAC Radio ID: PQS-BM28001 • Sierra Wireless MC5725 ID: N7N-MC5725 • Sierra Wireless MC8775 ID: N7NMC8775 • Intel® PRO/Wireless 3945AGN ID: PD9WM3945AGN

CPU Thresholds

THRESHOLD	VALUE
Low Temperature Threshold	Equivalent to -25°C
High Temperature Threshold	Equivalent to +65°C
Critically Low Temperature Threshold	Equivalent to -30°C
Critically High Temperature Threshold	Equivalent to +70°C
Low Battery Threshold	9.5VDC
Critically Low Battery Threshold	7.0VDC
Critically High Battery Threshold	36VDC
Critical Current Drain Threshold	12A

Appendix B: BIOS Factory Settings

PARAMETER	DESCRIPTION	AVAILABLE OPTIONS	FACTORY SETTING
BOOT OPTION 1		USB HOTPLUG FDD / BUILT-IN EFI SHELL/ SATA	USB HOTPLUG FDD
BOOT OPTION 2		USB HOTPLUG FDD / BUILT-IN EFI SHELL/ SATA	BUILT-IN EFI SHELL
BOOT OPTION 3		USB HOTPLUG FDD / BUILT-IN EFI SHELL/ SATA	SATA
PXE BOOT		ENABLE/DISABLE	DISABLE

Appendix E: Troubleshooting Information

You can solve many problems without outside assistance by following the troubleshooting procedures that MW810 provides in the online help or in the documents that are provided with the device, operating system and software applications. Most software applications come with description containing troubleshooting procedures and explanation of error information. If you suspect a software issue, refer the information for the operating system or application programs.

NOTE: That manual does not cover operating system issues. For operation system directions, refer to Microsoft Windows XP Professional or Windows 7 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 the normal operation mode.

If you see	Do as follows
CPU is powered on but there is no screen image	• Make sure video cable is securely connected • Adjust brightness and/or contrast
Abnormal colors	• Check the video cable to be sure it's securely connected • Check colors using pattern generator (see the Display Adjustments chapter).
Temperature LED on the MW810 display is steady red.	The internal temperature is high. Please save your work before shutting down. Never turn on the device until it cools down to normal operating temperature.
Temperature LED on the MW810 display blinks red	Display temperature is out of operational range. Wait until temperature heats up / cools down to normal.
Over current is detected in device connected to USB port.	Please, disconnect the USB device – its current consuming is more than 0.5A.
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 F: Acronyms and Abbreviations

The following acronyms and abbreviations are used in this document:

3G	3rd Generation
AP	Access Point
API	Application Programming Interface
BIOS	Basic Input/Output System
CD	Compact Disk
CDMA	Code Division Multiple Access
CD-ROM	Compact Disk Read-Only Memory
CF	Compact Flash
COTS	Commercial Off-The-Shelf
CPU	Central Processor Unit
CRT	Cathode Ray Tube
DDC/CI	Display Data Channel Command Interface
DDR2	Double-Data-Rate two synchronous dynamic random access memory
DGPS	Differential GPS
DR	Dead Reckoning
DTE	Data Terminal Equipment
DVD	Digital Versatile Disc
DVI-D	Digital Visual Interface
EME	Electromagnetic Emission
EVDO	
FAQ	Frequently Asked Questions
FCC	Federal Communications Commission
GPIO	General Purpose Input/Output
GPO	General Purpose Output
GPS	Global Positioning System
HB	High Brightness
HD	Hard Disk
HDA	High Definition Audio
HDD	Hard Disk Drive
HID	Human Interface Device
HSPDA	Hιγη Σπεεδ Παχκετ Δοωνλινκ Αχχεσσ
IEEE	Ινστιτυτε οφ Ελεχτριχαλ ανδ Ελεχτρονιχσ Ενγινεερσ
I/O	Input / Output
IT	Ινφορματιον Τεχηνολογψ
LAN	Local Area Network
LCD	Liquid Crystal Display
LEAP	Lightweight Extensible Authentication Protocol
LED	Light-Emitting Diode
MPS	Maintenance Programming Software
ML	Mobile Laptop
MW	Mobile Workstation
NMEA	Νατιοναλ Μαριτιμε Ελεχτρονιχσ Ασσοχιατιον
OS	Operating System
PC	Personal Card
PEAP	Protected Extensible Authentication Protocol
PXE	Pre-Execution Environment

RD-LAP	Radio Data - Link Access Procedure
RGB	shorthand for Red, Green, Blue
RF	Radio Frequency
RI	Ring Indicator
RTCM	Radio Technical Commission for Maritime Service
RS-232	a standard for serial binary data interconnection
RX	Receive
SATA	Serial Advanced Technology Attachment standard
SB	Standard Brightness
SDK	Software Development Kit
SMS	Σηορτ Μεσσαγε Σερϖιχε
SODIMM	Small Outline Dual In-line Memory Module
SSID	Service Set Identifier
SVDO	PC to S-Video interface
TAIP	Trimble ASCII Interface Protocol
TKIP	Temporal Key Integrity Protocol
TPM	Trusted Platform Module
TSIP	Trimble Standard Interface Protocol
UMTS	Υνιϖερσαλ Μοβιλε Τελεχομμυνιχατιονσ Σψστεμ
USB	Universal Serial Bus
WEP	Wired Equivalent Privacy
WHQL	Windows Hardware Quality Lab
WLAN	Wireless Local Area Network
WPA	Wi-Fi Protected Access
WWAN	Wireless Wide Area Network
VoIP	Voice over Internet Protocol
VDC	Volts Direct Current
VESA	Video Electronics Standard Association
VRM	Vehicular Radio Modem
XGA	eXtended Video Graphics Array

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Inside the USA, Americas and Canada, call Motorola System Support Center at 1-800 221-7144
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