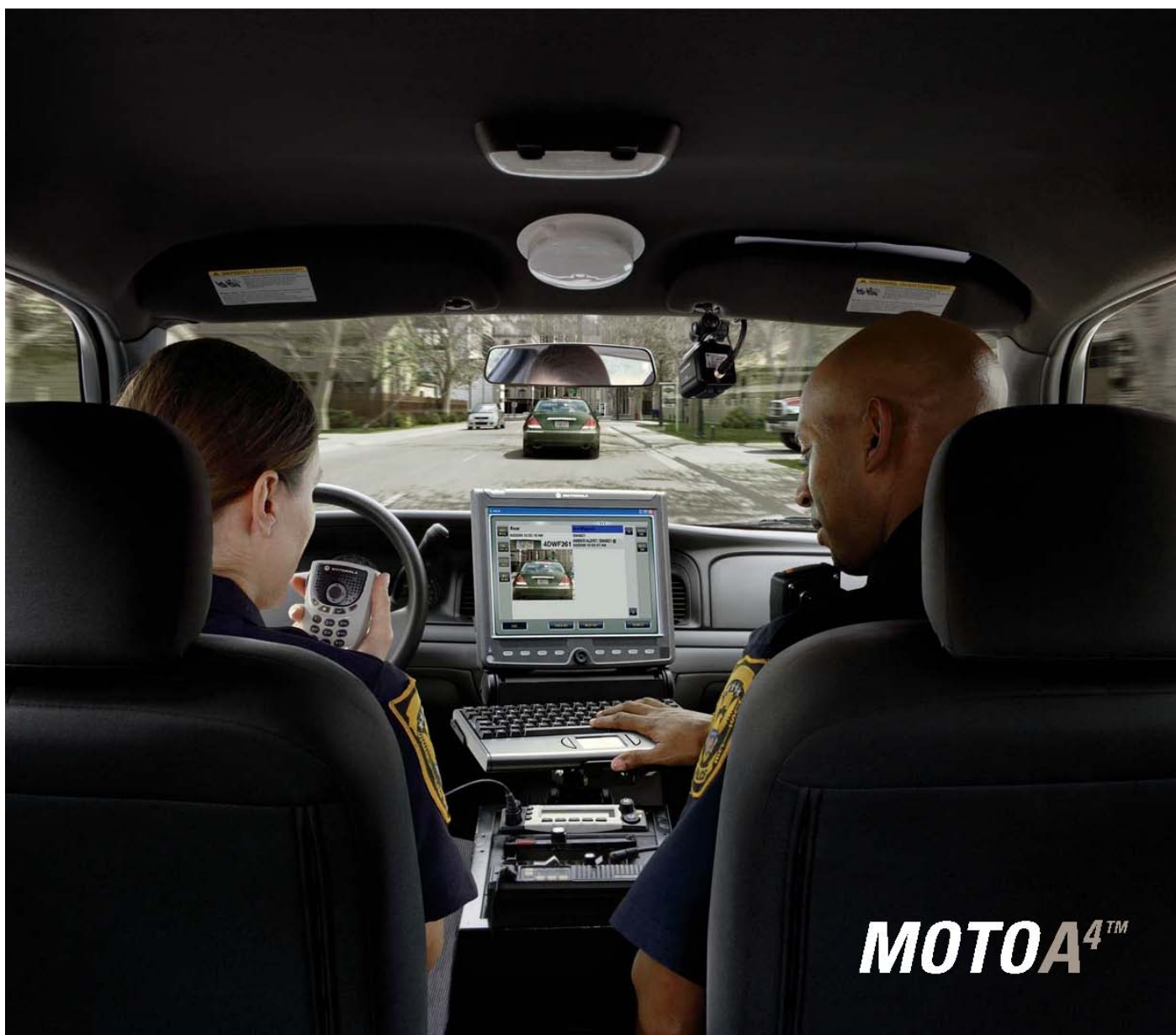




MW810 Mobile Workstation

Model F5208A
8.4" LCD Display
Owner's Guide



6802982C85-C

COMPUTER SOFTWARE COPYRIGHTS

The Motorola products described in this instruction manual may include copyrighted Motorola computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this instruction manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

COPYRIGHT

Copyright © 2010 Motorola Inc. All rights reserved. No part of this manual may be transmitted, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without the prior written permission of Motorola Inc.

TRADEMARKS

- MOTOROLA and the Stylized M Logo are registered in the U.S. Patent and Trademark Office.
- Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation.
- Broadcom is a registered trademark of Broadcom Incorporated.
- VESA is a registered trademark of the Video Electronics Standard Association.

All other trademarks, registered trademarks, product or service names are the property of their respective owners.

WARRANTY DISCLAIMER

Motorola may add, delete, change, or withdraw, in whole or in part, this document or software described in this document at any time and without notice. Such document modifications will be incorporated in new releases of this document on an intermittent basis. Motorola disclaims any responsibility for labor or material cost involved by persons outside the company as a result of using this document.

COMPLIANCE INFORMATION

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 This Manual | 7 |
| Who Should Use this Manual | 7 |
| Introduction to Manual | 7 |
| Related Manuals | 7 |
| Conventions Used in This Manual | 8 |
| Getting Started | 9 |
| What is the Display? | 9 |
| Getting the Display Running | 10 |
| Unpacking | 10 |
| Installation and Connecting to Car Battery | 10 |
| Turning On the Display for the First Time | 10 |
| Taking a Look at the Display | 11 |
| 8.4" Display Front View | 11 |
| Display Indicators | 12 |
| Connections | 13 |
| USB Device | 13 |
| Connecting the laptop | 13 |
| Display Configuration | 14 |
| Display Configuration Parameters | 14 |
| Display Configuration Change | 15 |
| Maintenance Programming Software | 15 |
| How to Modify Configuration Parameters | 15 |
| Basic Operations | 18 |
| Power On | 18 |
| Power Off | 19 |
| Standby | 20 |
| Wake Up | 20 |
| OSD Button | 21 |
| Emergency key | 21 |
| Function keys | 21 |
| Illumination Control | 23 |
| Brightness Control | 23 |
| Touch Screen Calibration | 23 |
| Backward Compatibility | 23 |
| Display Software | 24 |
| Video Controller | 24 |
| Embedded Controller | 24 |
| Display Software | 24 |
| Display Control | 25 |
| Display DLL | 25 |
| Extrakey | 25 |
| MW Manager | 25 |
| Display Adjustment | 27 |
| Setting the Timing Mode | 27 |
| Embedded On-Screen Display Control | 27 |
| Main Menu | 28 |
| Volume Control | 28 |
| Video Control (Main Menu) | 28 |
| Color Control | 29 |
| Display Adjust | 30 |
| Tools | 31 |
| Mobile and Office Configurations | 33 |
| Display Configuration Tips | 33 |
| Office Mode | 33 |
| Mobile Mode | 33 |
| Disable Power Button | 33 |
| Configuration for ML910 Laptop | 34 |
| Display Upgrade | 35 |
| Description/Tutorial | 35 |
| Display Firmware | 35 |
| Display Drivers | 35 |
| Display Service | 36 |
| Getting Assistance | 37 |
| Appendix A: Safety Instructions | 38 |
| Appendix B: Warranty Information | 39 |
| Appendix C: Display Specifications | 42 |

Appendix D: Troubleshooting Information..... 45
Appendix E: Acronyms and Abbreviations 46

Using This Manual

Before using this 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 this Manual

This manual is intended for staff who operate the Motorola MW810 Mobile Workstation (MW810) and need to configure, upgrade or maintain its display, which is also referred to as either *device* or *Display* in this manual. This 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 Display** - a brief functional explanation
- **Connections** - a description of the display connections
- **Optional Internal Peripherals** - internal peripheral devices
- **Display Configuration** - configuration upon turning on
- **Basic Operations** - a brief description of basic operations
- **Display Software** - a description of the display software package
- **Display Adjustment** - on-screen-display adjustment
- **Mobile & Office** - tips for mobile and office configurations
- **Display Upgrade** - upgrade of display's firmware components
- **Getting Assistance** - getting assistance from Motorola

The *Appendices* contain:

- **Appendix A** - safety instructions
- **Appendix B** - warranty information
- **Appendix C** - display specifications
- **Appendix D** - troubleshooting information
- **Appendix E** - acronyms and abbreviations

Related Manuals

This manual describes the MW810 display 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:

- 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, CPU Owner's Guide - 6802982C81 (MW810 R1.1) or 6802987C40 (MW810 R1.2)
- Motorola MW810 Mobile Workstation, Software Development Kit - 6802983C00

For documentation of 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.

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 install Windows operating system software supporting the display'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>.

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:

| | |
|---|--|
| <i>Italics</i> | 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 Display**
Transmissive, high contrast backlit displays offer outstanding performance even in the most 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.

What is the Display?

The MW 810 offers the rugged display:

- *8.4" SVGA high brightness display*
TFT-technology display with 800 NIT (800 Cd/m²) LCD backlighting.

All displays offer features as follows:

- The screen made of tempered glass which is covered by a protective film to prevent the glass from shattering in the event of breakage
- A touch screen that can be activated with either a gloved finger or a stylus pen
- Sealing against moisture
- 2 USB 2.0 ports for connectivity with external USB devices
- Support analog RGB and digital DVI video inputs
- On-chip OSD for high-quality programmable menus
- Compatible with VESA resolution standards
- VESA display data channel (DDC) compatible

Getting the Display Running

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

Unpacking

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

If your display is shipped as stand-alone device, after unpacking the shipping carton, the following items should be found:

- Display box
- Power cable
- CPU-to-Display cable
- Field support CD with this *Owner's Guide*

If your display is part of the MW810 Mobile Workstation, refer to the Motorola MW810 Mobile Workstation User's Guide for a list of shipped items.

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

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 Display for the First Time

When the installation is completed, perform the following procedures to turn on the display.

- Press the power button
- Wait until Windows operating system starts

Read in the Display Configuration chapter about a variety of parameters that define functionality of the display when you turn it on. Modify configuration parameters if required.

Taking a Look at the Display

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

8.4" Display Front View



| | |
|---------------------------|--|
| POWER BUTTON | Turns the display power ON and OFF. This button functions identically as the Power Button on the front panel of the CPU box. NOTE: If the display is used with the MW810 CPU, the main power switch on the rear CPU panel must be switched on before using the Power Button. |
| SPEAKER | Used for audio and alert signaling. |
| FUNCTION KEYS | 6 function buttons to facilitate specific operations. The function of each button is set via a pre-installed software application |
| EMERGENCY KEY | Use this button to signal an emergency event to software emergency application, installed in the workstation. The Emergency button becomes functional as soon as the operating system is running. |
| BACKLIGHT CONTROL | Backlight on/off button. |
| OSD BUTTON | On-Screen-Display for display controls. |
| BRIGHTNESS CONTROL | Brightness up- and down buttons. |
| VOLUME CONTROL | Volume up- and down buttons. |

Display Indicators

The display has two LED indicators that are located at the front panel (Display Mode and Display Temperature) and Emergency LED at the top.

These LED's alongside with display illumination provide the following indication about operational conditions.

| STATE | DISPLAY MODE LED | TEMP LED | EMERG LED | KEY ILLUM | BACKL CTRL | BACK LIGHT |
|---------------------------------------|------------------------|-------------|--------------------|--------------|---------------|---------------|
| Power off | OFF | OFF | OFF | OFF | OFF | OFF |
| Video on (normal operational mode) | Green | OFF | ON | ON | ON | ON |
| Video on (low temperature, heater on) | Green | Red | ON | ON | ON | ON |
| Video on (high temperature) | Green | Red | ON | ON | ON | ON |
| Video off | Yellow (50% intensity) | | ON | ON | ON | OFF |
| No video cable* | Yellow (50% intensity) | | ON | ON | ON | ON |
| System standby mode | Yellow (50% intensity) | OFF | ON (50% intensity) | OFF | OFF | OFF |
| Backlight off | Green | | ON | OFF | ON | OFF |
| Low car battery voltage | Yellow | | ON | ON | ON | ON |

NOTE: When there is no video cable connected to the display, **No Cable** message will pop up on the screen for 3 seconds and then disappear.

Connections

The display has three USB 2.0 ports for connection an external USB device and a connector for attaching the cable from the MW810 CPU or another laptop or desktop.

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. Display USB 2.0 ports support transfer rates up 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 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.

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

CAUTION: a device connected to the USB port should not consume more than 0.5A. Otherwise, the system will not operate properly.

Connecting the laptop

Follow instructions below when you need to connect the display to a laptop:

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

Use Motorola original integrated molded cables for connection to the MW810 or 3rd-party CPU's. For details see MW810 Installation Manual.

Display Configuration

The device has *codeplug* - a protected memory area to store the configuration parameters accessed when you turn on the display. That binary-format data contains basic information about display capabilities including general settings, power-up, power-off modes, etc.

This section describes various configuration parameters that can be selected and modified if required.

Display Configuration Parameters

| PARAMETER | DESCRIPTION | AVAILABLE OPTIONS | FACTORY SETTING |
|---------------------------------|--|---|--------------------------------|
| POWER SOURCE | Specifies a kind of car battery the display is connected to. | 9V or 12/24V | 12/24V |
| POWER UP PREFERENCES | Selects desired source to turn on the display. | USB 5V PRESENCE - Turn on the front edge of USB 5V signal. POWER BUTTON - Turn on pressing of the Power Button on CPU or Display units. | ENABLE ENABLE |
| DISPLAY POWER UP OPTIONS | Provides several options to power on the display while the CPU is off. | TURN ON - Power on and wait for the CPU power up without any time limitation. IGNORE - Do not power on if the CPU is Off. WAIT - Power on and wait up to 10 seconds for any CPU power up trigger. | TURN ON |
| POWER DOWN PREFERENCES | Selects desired method to turn the display off. | CPU REQUEST – Turn off when CPU power-off request is received. USB 5V ABSENCE -Turn off as soon as the CPU unit is powered off. POWER BUTTON - Turn off as soon as the display Power Button is pressed. | ENABLE ENABLE ENABLE |
| CRITICAL TURN OFF | Enables or disables turning the device off by pressing and holding the power button for 6 seconds or more. | ENABLE / DISABLE | ENABLE |
| POWER OFF EVENT | Enables or disables sending Power Off notification to the CPU in order to turn the CPU off. | ENABLE / DISABLE | ENABLE |
| BLUETOOTH | Specifies the state of the Bluetooth radio after display power up. | ON / OFF | ON |
| SPEAKER | Specifies a state of internal speaker after display power up. | UNMUTE / MUTE | UNMUTE |
| 1W SUPPORT | Specifies whether the display support 1-wire interface with CPU. | ENABLE / DISABLE | DISABLE |
| OSD CONTROL | Enables or disables OSD functionality. | ENABLE / DISABLE | ENABLE |

| PARAMETER | DESCRIPTION | AVAILABLE OPTIONS | FACTORY SETTING |
|--|--|-------------------------------|-----------------|
| OSD BUTTON DEFAULT FUNCTION | Defines the OSD button function. | DISABLE / FULL / SIMPLE * | FULL |
| KEY ILLUMINATION CONTROL | Enable or disable illumination of function and emergency keys. When disabled, keys illumination is off; when enabled, keys illumination behaves according to selection of the TYPE of ILLUMINATION parameter. | ENABLE / DISABLE | ENABLE |
| TYPE OF ILLUMINATION | Auto means illumination level of labels, function and emergency keys is correlated with the LCD brightness. Manual means a constant level of LED's, labels, function and emergency keys illumination. | AUTO / MANUAL | AUTO |
| FUNCTION KEY ILLUMINATION LEVEL | Defines a constant level of illumination for function keys. | Control range from 0 to 31 | 15 |
| NOTIFICATION LED ILLUMINATION LEVEL | Defines a constant level of illumination for Notification LED's. | Control range from 0 to 31 | 5 |
| BRIGHTNESS FACTOR | Defines relative brightness level, which cannot be exceeded by this display. | Control range from 50 to 100% | 100% |

* When SIMPLE is selected, the OSD button by default controls the brightness and audio levels.

In addition, the display's codeplug presents read-only information such as:

- Inverter Type
- Display Model
- Date of Manufacturing
- Bluetooth Media Access Control address
- Serial Number
- Main board ID
- Function board ID

Display Configuration Change

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

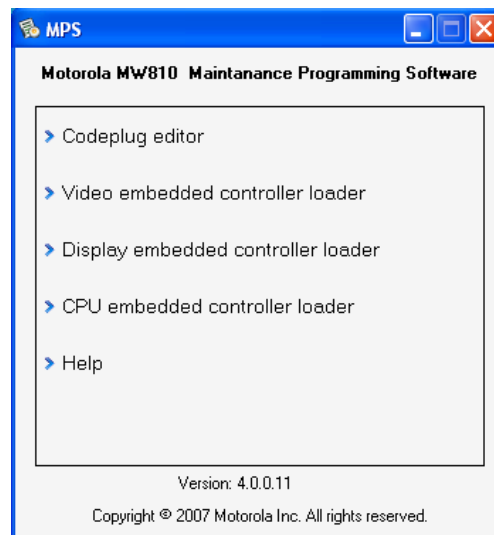
Maintenance Programming Software

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.

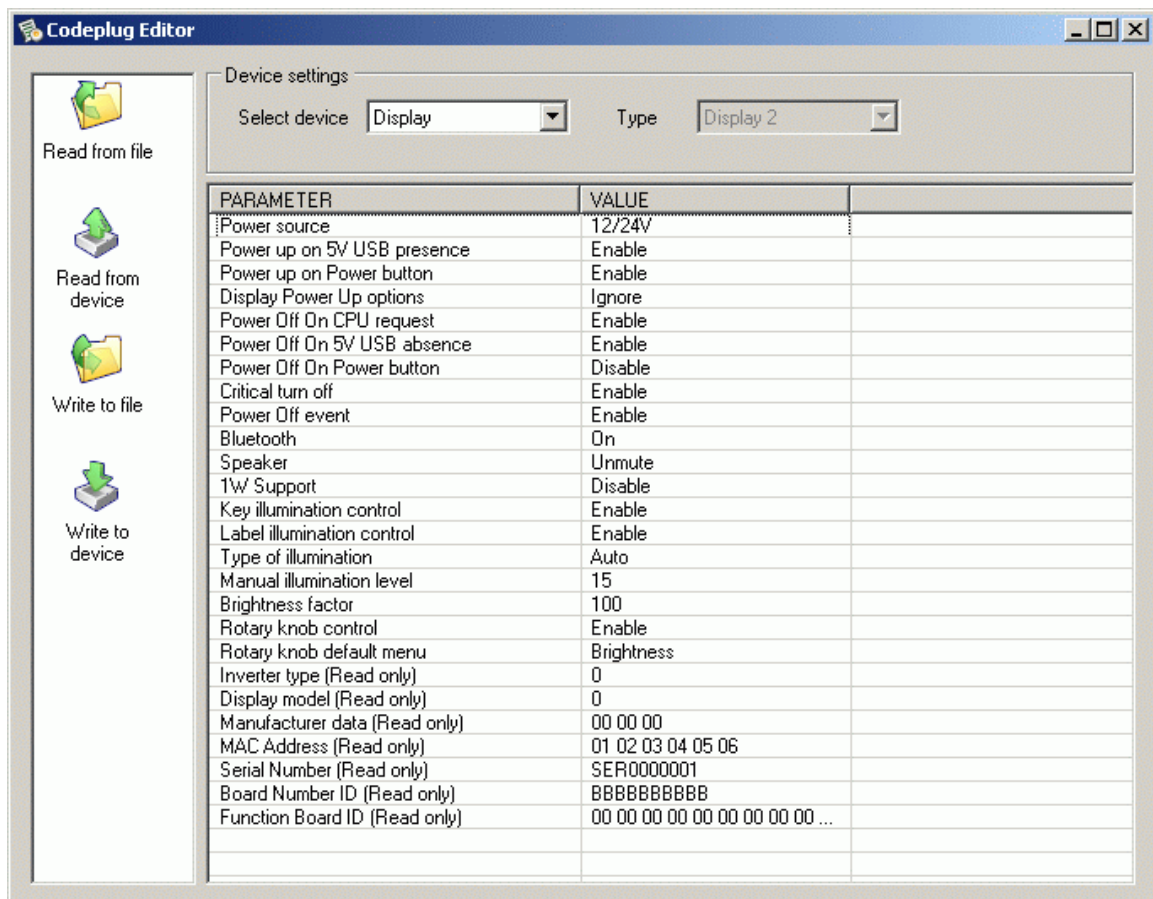
How to Modify Configuration Parameters

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



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

- Select **Display** as a device to be programmed.
- Select a type of the display (Primary or Secondary).
- Click on **Read from Display** 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 Display** to program the device and wait for a confirmation of successful programming completion.

NOTE: Codeplug has a checksum calculated from its content. Prior to programming the MPS checks data integrity to protect the device from programming of corrupted data. For details refer to Maintenance Programming Software User's Manual.

Basic Operations

This section describes the following display operations:

- Power On
- Power Off
- CCFL Heater control
- Standby
- Wake Up
- OSD button
- Emergency key
- Function keys
- Illumination control
- Brightness control
- Touch-screen calibration

NOTE: Proper display functionality can be achieved only if the MW810 Display Control package is installed. This package is a part of the MW810 CPU software image. When you use the display with a laptop as the secondary display option, do not forget to install the display software. Refer to the Display Software chapter in this document for details.

Power On

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

The `POWER UP PREFERENCES` parameter in the display's codeplug provides two options to turn the display on:

- `USB 5V PRESENCE` - Turn on the front edge of USB 5V CPU output.
- `POWER BUTTON` - Turn on pressure of the power button on CPU or Display units.

When `USB 5V PRESENCE = ENABLE`, the CPU will turn the display on by means of USB 5V output from the CPU USB controller.

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

You can select any of above options or use their combination.

Turn on the display and see high-quality picture without image distortions. If you have an issue, see troubleshooting information in Appendix D.

During power up sequence the device performs Power-On self test. If any of conditions below is found, the device will not power on.

CAUTION: Critical Temperature Conditions

The device is operational only within valid temperature range. When the internal temperature (equivalent to ambient) is beyond the operational range, the display will indicate about operational failure and will not power on.

CAUTION: Discharged Vehicle Battery

The device is operational when the car battery voltage is above the low control limit.

If the level of the car battery voltage is below of the *Low Battery Threshold*, the device will indicate about low battery level and not power up.

CAUTION: Over-voltage

The device is operational when the car battery voltage is within valid range. If the level of the car battery voltage is higher than the *Critically High Battery Limit*, the device will not power up.

CAUTION: Over-current

The device is operational when the battery current drain is within valid range. If the level of the car battery current drain is higher than the *Critical Current Consumption Limit*, the device will not power up.

Power Off

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

The POWER OFF PREFERENCES parameter provides three options to turn off the display: CPU REQUEST, USB 5V ABSENCE, and POWER BUTTON. You can select any of above options or use their combination.

- When CPU REQUEST = ENABLE, the device will automatically shut itself down when the CPU issues power off request.
- When USB 5V ABSENCE = ENABLE, the device will automatically shut itself down when the CPU deasserts USB 5V output.
- When POWER BUTTON = ENABLE, pressure of the display power button will force power off.

If you press display's power button while POWER BUTTON = ENABLE, the display will turn itself off immediately, not waiting for the end of the CPU shut down process.

This operation may (or may not) force the CPU shut down depending on setting of the POWER OFF EVENT parameter. If your intention is to turn off the CPU when the display is off, enable sending of Power Off notification to the CPU. If it's not your intention, disable sending of Power Off notification - it will prevent the CPU from shutting down.

If the system does not respond, you can turn the device off by pressing and holding the display 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 content.

CAUTION: Critical Shut Down

Some critical 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 critical 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 low battery indication and send the Low Battery event to the CPU.
- *Drops in car battery voltage.*
If battery voltage falls below the *Critical Low Battery 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 consumption exceeds the *Critical Current Consumption Limit*, the device will execute critical shut down and power itself off.
- *Over-voltage protection*
If during normal operation, the car battery voltage level exceeds the *Critically High Battery Limit*, the device will execute critical shut down and power itself off.

Refer to Appendix D for absolute values of display thresholds.

CAUTION:

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

Standby

The display enters low-power mode following CPU standby state. In that case, the display closes the backlight and suspends all USB accessories connected to it.

The display can initiate the CPU standby if the Power button is configured to enter the CPU into a low-power state. For details about this option, refer to the help file attached to Windows Power Options (**Start** → **Settings** → **Control Panel** → **Power Options**).

In addition, you can configure a function key so that its pressure initiates the CPU standby. Refer to the Function Key description for details.

Wake Up

The display can wake up the CPU using the following methods:

- A touch to the digitizer panel (touch-screen)
- Press on the emergency key
- Press on a function key
- Press on the OSD key
- Wake up event from an USB HID device connected to the display
- Power button (if configured)

NOTE: All above events wake up the MW810 CPU. Be aware that some laptops or desktops may not support a specific event. If your display is connected to 3rd-party device, refer to its owner's guide for verification of wake up events.

A contact to the touch panel, emergency, and function key or wake up event from USB HID device connected to the display 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 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 the touch panel, the OSD button, the emergency and function keys.

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

OSD Button

The OSD is intended for controlling the display brightness and volume of sound.

- The OSD button push activates the on-screen display control.
- Long OSD button push (for 3 seconds or more) activates the auto adjustment of the screen image. Auto adjustment automatically sizes, centers, and tunes the video signal parameters in order to eliminate image distortions. That's valid only for RGB video input.
- When OSD is activated, its function is defined by OSD DEFAULT FUNCTION parameter

Emergency key

The display is equipped with the bright-orange emergency button. When the emergency button is pressed, the display provides high-priority data event to the CPU operating system. That intends for a customer software emergency applications that may hook and process this event.

For details about implementation of emergency event processing refer to Motorola MW810 Mobile Workstation, Software Development Kit.

Function keys

The display is equipped with the 6 function keys. When a function key is pressed, the display triggers a data event to the CPU operating system. This is intended for a customer software application that may hook and process this event. For details refer to MW810 Mobile Workstation, Software Development Kit.

In addition, the MW810 *Extrakey* software utility can assign to display function key specific purpose of the operating system that can be activated on the pressure of that key.

CAUTION: Assignment of a function key is available when the MW810 Display Control package is installed by the Windows operating system.

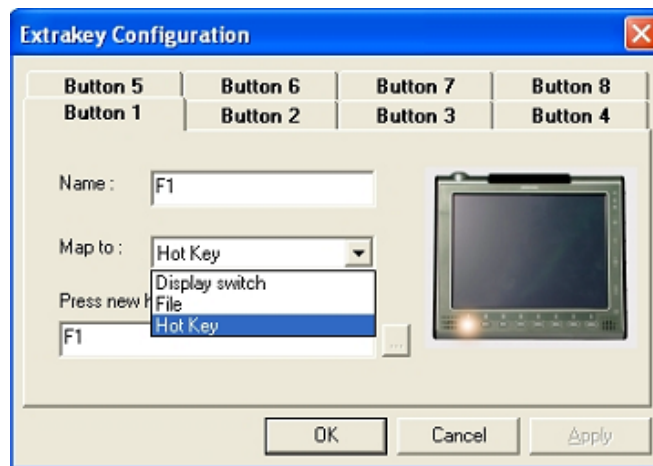
The Extrakey application allows the function key to operate as follows:

- Operate like the standard keyboard hotkey
- Launch any application (like Notepad or Calculator)
- Display Backlight on/off
- Enter system into standby mode

- Enter to hibernation mode (when enabled)
- Display speaker mute
- CPU audio (mixer) up
- CPU audio (mixer) down

You can customize the Extrakey using Configuration window, which can be run 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 hot key (such as Ctrl + X, F1 etc.), to file (as a shortcut), or to the display switch to blank the screen:



How to set a shortcut to the hot key:

- Choose **Hot Key** in the **Map to** drop-list.
- Move cursor to **Press new hotkey** field and right-click once to activate it.
- Press key you want 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 full path to file you want to open 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 **Backlight Switch** in the **Map to** drop-list.
- Field **Name** defines how the Extrakey Bar button will be named (this is optional).

How to set a shortcut to the power management:

- Choose **Standby** 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.

Illumination Control

The display allows selecting a mode of illumination: either manual or automatic. When the manual illumination mode is selected (TYPE OF ILLUMINATION = MANUAL) the level of illumination is constant and can be defined by the MANUAL ILLUMINATION LEVEL parameter.

When the automatic illumination mode is selected (TYPE OF ILLUMINATION = AUTO) the level of LEDs, labels, function and emergency keys illumination is correlated with the LCD brightness and varies according to brightness change.

The KEY ILLUMINATION CONTROL parameter enables or disables illumination of emergency and function keys.

The LABEL ILLUMINATION CONTROL parameter enables or disables illumination of display labels.

The PWR LED INTENSITY specifies intensity of the Power LED when the display is in standby mode.

Brightness Control

If necessary, the maximal brightness level of the display can be limited. The MAX BRIGHTNESS codeplug parameter defines relative brightness level, which cannot be exceeded by this display.

Touch Screen 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 in between corresponding data points because of resistance variance of each panel.

When you use touch panel module for the first time, or, when there is discrepancy between the pushed and displayed positions, then calibration is required. This needs to be done only once, and then, calibration data is stored. The CPU will automatically calculate the touched position on display monitor.

CAUTION: Re-calibration may be required when you see a discrepancy between the touched and displayed positions. This adjustment may be executed with the Display Calibration Tool.

Backward Compatibility

If your display is connected to one of the old MW800 CPU models (F5206A, F5207A, and F5217A), enable supporting of the 1-Wire interface between CPU and Display. Use the 1W SUPPORT parameter for that purpose.

Display Software

Video Controller

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

- Brightness control
- Volume control
- Illumination control
- On-screen display

Embedded Controller

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

- Power on/off sequences
- Handling function and emergency keys
- Control by GPIO lines
- Measure internal temperatures in most critical points
- Implement thermal control algorithm allowing withstanding with $-30^{\circ}\text{C} \dots +70^{\circ}\text{C}$ ambient temperature
- Implement internal heater control to allow heating the device up when low ambient temperature
- Handling the display configuration

Display Software

Proper display functionality can be achieved only if the MW810 Display Control package is installed. This package is a part of the MW810 CPU software image. When you use the device with a laptop as the secondary display option, do not forget to install the display software (refer to the Display Upgrade chapter in this document).

The MW810 Display Control package consists of:

- *MWDisplayControl* - service application to access the display hardware.
- *MWDll* - provides API for third party or internal applications to control and manage the display. It serves as an interface engine between the MWDisplayService and 3'rd party or internal applications.
- *MWAgent* - provides notifications to the operating system about specific display events.
- *MWManager* - simple application for troubleshooting.
- *Extrakey* - software utility that can assign specific function of the operating system to a Function key that can be activated by pressing this key.

Display Control

MWDisplayControl is a standard service application that starts automatically at startup, before user logs in and run in the background continuously while the CPU is on. *MWDisplayService* acts as a serial communication server and provides synchronized access to the display for all applications (clients) that are using MWDII API. The service allows sharing of display resources between multiple applications and connection of multiple displays to the single CPU.

Display DLL

MWDII provides access for internal and 3rd-party applications API to display resources via the *MWDisplayService*. The API includes unique MW810 interface as well as standard DDC/CI commands.

In addition, it provides a mechanism to retrieve events from the display and deliver them to application clients. System event sources can be one of the following: the Emergency key, a Function key, the power button, thermal and battery control events.

Extrakey

Extrakey is a software utility than can assign specific function of the operating system to a Function key. Refer to the Function Key chapter for details.

MW Manager

MWManager receives, shows and logs all display events. It displays hardware and software versions, temperature and battery status. This software application provides basic information about the display and selection of desired notifications on extreme conditions. To run Display Manager, click the MW800 Display Manager icon on the Start menu.

This application provides the following information:

- **Versions** - General information about Display hardware, embedded firmware and software versions
- **Power** - The Display current consumption and the voltage level of the vehicle battery
- **Temperature** Real-time internal temperatures
- **Agent Notifications** - alerts if one of the following event occurs
 - ✓ *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 critical temperature indication. If during operation the internal temperature goes outside the operational limit, 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 low battery indication and send the Low Battery event to the CPU.
 - ✓ *Drops in car battery voltage.*
If battery voltage falls below the *Critically Low Battery Threshold* for 20 seconds or more, the device will send a Cranking alert 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 for documentation of extreme events.

Display Adjustment

Display performance can vary due to the graphics card, host computer, lighting conditions and other environmental factors. In order to get the best image on a monitor, some adjustments may be required.

The MW810 display provides three options for image adjustment:

- Proper setting of the timing mode (refresh rate and resolution)
- Embedded On-Screen Display control
- Windows On-Screen Display application

Setting the Timing Mode

Set proper video adapter timing mode to maximize the quality of the screen image. The timing mode consists of the Resolution and Refresh Rate. Recommended screen resolution is VESA 1024 by 768 pixels; recommended screen refresh rate is 60 Hz.

Set the screen resolution in Display Properties as follows: click the right mouse button at desktop and select **Properties** → **Settings**. Select recommended resolution using the Screen Resolution slider.

Set the screen refresh rate in Display Properties as follows: click the right mouse button at desktop and select **Properties** → **Settings** → **Advanced** → **Monitor**. Select recommended refresh rate in the Screen Refresh Rate field.

If after setting of the video adapter timing mode the quality of the screen image needs to be improved, use Embedded or Windows On-Screen Display controls to adjust the screen image.

Embedded On-Screen Display Control


On-Screen Display (OSD) is a control panel on a display screen that allows you to select viewing options and/or adjust components of the display, such as brightness, contrast, horizontal and vertical positioning, etc. This section describes controls available to tune the image via OSD menus.

The OSD panel includes control tabs for activation of different OSD features. In addition, the MW810 OSD panel provides information about video input parameters as follows:

- Resolution
- Refresh frequency
- Video Input: Analog or Digital (DVI)
- The version of the LCD controller firmware

How to use the embedded on-screen display:

- Push the OSD button located on the front display panel to activate the OSD control.
- Long push (for 3 seconds or more) activates the Auto Adjust. That's valid only for RGB video input.
- Scroll through menu options.
- When a specific OSD feature is selected, activate that feature by pushing of the OSD button.

- You can exit OSD any time by selection of the  tab. Also, the OSD control will be automatically closed if the OSD button is inactive and the OSD time-out (factory setting - 5 seconds) is elapsed.
- Display saves the new OSD data after OSD menu closure.
- OSD control keeps the Factory display settings. It can be restored if necessary.

Main Menu

Allows selection viewing options and/or adjust components of the display.



Push the OSD button. The main OSD screen provides the following options:

- ✓ Volume
- ✓ Video
- ✓ Color
- ✓ Display Adjust
- ✓ Tools


Scroll to select desired feature.

Activate selected feature by pushing of the OSD button.


Volume Control



Allows adjusting a volume of sound from internal speaker.





- From the main menu select the  tab and push the OSD button.
- Scroll to set desired level of sound.

Video Control (Main Menu)

To activate video controls, from the main menu select the  tab and push the OSD button.



Available features are as follows:

-  Brightness
-  Contrast
-  LED Illumination
-  Night/Day view

Note: the Night/Day button allows toggling between Day and Night color palettes.

Note: if display's configuration allows automatic illumination control, manual adjustment of the LED Illumination is disabled. In that case LED sign will be in grey color.

Brightness



Adjusts the background black level of the screen image in order to keep details in darker image areas.

- From the main Video Control menu select the Brightness tab and push the OSD button.
- Scroll to set desired brightness level.

Contrast



Adjusts the difference between the background black and foreground white levels in order to keep details in lighter image areas.

- From the main Video Control menu select the Contrast tab and push the OSD button.
- Scroll to set desired contrast level.

LED Illumination





Allows to increase or decrease a level of illumination of displays function keys, labels, and emergency key.

- From the main Video Control menu select the Illumination tab and push the OSD button.
- Scroll to set desired illumination level.

Color Control



Color control affects the overall color quality.

- From the main menu select the  tab and push the OSD button.
- Select one of available features as shown next:  Color Temperature


Color Temperature







- Color temperature is the point at which equal combination of red, green, and blue colors create white at full intensity.
- The OSD provides a list the supported color temperature presets. The display is capable of color temperatures of 4200k, 5000k, 6500k, 7500k, and 9300k.
- To obtain accurate color, brings up the White Balance pattern and calibrate the output of your graphics card to match the input of your display.

Display Adjust



To activate geometry controls, from the main menu select the  tab and push the OSD button.

Available features are as follows:

-  Auto Adjust
-  Stretch
-  Horizontal position
-  Vertical position

Note: Geometry adjustments are available only at Analog Input.

Auto Adjust

Auto adjustment automatically sizes, centers, and tunes the video signal parameters in order to eliminate image distortions. That's valid only for RGB video input.

Note: A dialog box appears when auto adjustment is done. Confirm auto adjustment result in order to store the new set of parameters. Opposite, the display will restore the previous configuration.

Stretch




Allows shrink/stretch the image area.

- From the main Display menu select the Stretch tab and push the OSD button.
- Set desired size of the image.

Horizontal Position




Allows moving the screen image horizontally left or right.

- From the main Display menu select the  tab and push the OSD button.
- Set desired horizontal position of the image.

Vertical Position








Allows moving the screen image vertically up and down.

- From the main Display menu select the  tab and push the OSD button.
- Set desired vertical position of the image.
-

Tools



To activate Tools controls, from the main menu select the Tools tab and push the OSD button. Available features are as follows:

-  OSD setting
-  Factory Reset
-  OSD Pattern Generator
-  OSD Transparency
-  Sharpness

OSD Setting

OSD Timeout sets the time frame the OSD control is displayed. Factory setting is 5 seconds, i.e. if the OSD button is inactive for 5 seconds the OSD control disappears. Maximal OSD timeout is 15 seconds.

OSD Position allows moving the OSD control to another position at the screen.

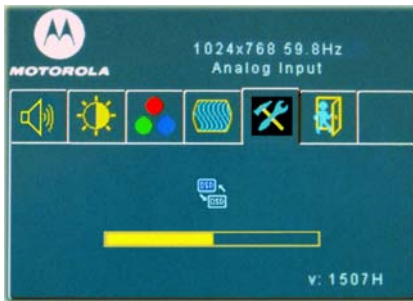
Factory Reset

Resets OSD parameters to factory default.

OSD Patterns

Generate video patterns for troubleshooting.

OSD Transparency



- Set desired transparency of the OSD Control window.

Sharpness



Allows sharpening text, color and images on your display.

- Adjust the slider bar to clarify and focus the screen image.

Mobile and Office Configurations

Display Configuration Tips

You can use the display either in *Office* or in *Mobile* modes.

Office Mode

In the office mode CPU and display work independently; changing in the CPU power state does not have any impact on the display and vice versa. This mode is similar to a secondary display connected to the laptop.

In the office mode the display shall be powered on and off from the power button located on the display with no dependency on the CPU status. If there is no video from the CPU, the display will stay in the Video Off state until video becomes active.

For the office display set configuration parameters as follows:

- POWER UP PREFERENCES: USB 5V PRESENCE = DISABLE, POWER BUTTON = ENABLE
- DISPLAY POWER UP OPTIONS = TURN ON
- POWER OFF PREFERENCES: CPU REQUEST = DISABLE, USB 5V ABSENCE = DISABLE, POWER BUTTON = ENABLE
- POWER OFF EVENT = DISABLE

Mobile Mode

In the mobile mode there is synchronization of power states between the CPU and Display, i.e.

- If CPU is on, it will turn on the display and vice versa.
- If CPU is off, it will turn off the display and vice versa.

For the mobile display set configuration parameters as follows:

- POWER UP PREFERENCES: USB 5V PRESENCE = ENABLE, POWER BUTTON = ENABLE
- DISPLAY POWER UP OPTIONS = WAIT or IGNORE
- POWER OFF PREFERENCES: CPU REQUEST = ENABLE, USB 5V ABSENCE = ENABLE, POWER BUTTON = ENABLE
- POWER OFF EVENT = ENABLE

Disable Power Button

You may want to disable the display power button in order to prevent system shut down when you press the display power button. Set configuration parameters as follows:

- POWER OFF PREFERENCES: CPU REQUEST = DISABLE, USB 5V ABSENCE = ENABLE, POWER BUTTON = DISABLE
- POWER OFF EVENT = DISABLE
- CRITICAL TURN OFF = DISABLE

Configuration for ML910 Laptop

You can use all the above configurations for the display connected to the ML910 laptop. If the display is connected to the ML910 docking station (so called MODS option), it's recommended to configure the display as follows:

- POWER UP PREFERENCES: USB 5V PRESENCE = DISABLE, POWER BUTTON = ENABLE
- DISPLAY POWER UP OPTIONS = WAIT or IGNORE
- POWER OFF PREFERENCES: CPU REQUEST = ENABLE, USB 5V ABSENCE = DISABLE, POWER BUTTON = ENABLE
- POWER OFF EVENT = ENABLE

This configuration will allow to turn the ML910 on and off from the display power button. Attaching/detaching of the ML910 to/from its docking station will not change the power state of the display.

Display Upgrade

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

Description/Tutorial

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



Display Firmware

From the main menu, click on the **Firmware Update** button and follow the on-screen instructions to continue and complete the process. The **Firmware Update** sub-menu provides installation the CPU and Display firmware components. The choices are shown next:

- **8.4" Display EC** - install or update firmware for the 8.4" Display embedded controller
- **8.4" Display EC** - install or update firmware for the 8.4" Display video controller

Select desired firmware component and click on the appropriate button - the MW810 Field Support kit will automatically install or replace selected firmware. Follow the on-screen instructions to continue and complete the process.

Display Drivers

The **Display Drivers** sub-menu provides installation of several OS drivers related to the MW810 display unit. The choices are shown next:

- **Touch Screen** - install or update the software driver for the Gunze touch panel
- **USB-RS232** - install or update drivers for the TI3410 USB-RS232 adapter
- **MW810 Utilities** - install or update the unique drivers and applications for MW810 CPU and display units

Select desired software component and click on the appropriate button - the MW810 Field Support kit will automatically install or replace selected software. Follow the on-screen instructions to continue and complete the process.

NOTE: Installation or update of the USB-RS232 driver requires manual user intervention. See the MW810 Field Support Kit User's Manual for details.

Display Service

Generally, the display software service is already preinstalled. If it has not yet been installed, you can reinstall by using of the MW810 Field Support Kit CD as follows:

The **CPU Drivers** sub-menu provides installation of several OS drivers related to the MW810 CPU unit. Select **MW810** software component and click on the appropriate button - the MW810 Field Support kit will automatically install or replace the MW810 display service and applications software. Follow the on-screen instructions to continue and complete the process.

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:

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: 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.

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.

Appendix C: Display Specifications

General

| PARAMETER | DESCRIPTION |
|------------------|--|
| LCD | <ul style="list-style-type: none"> Type: 12.1" (12.1" viewable diagonal area), Color filter : TFT active matrix XGA LCD, 0.294 mm pixel pitch, RGB vertical stripe Glass surface: Antiglare |
| INPUT RGB SIGNAL | <ul style="list-style-type: none"> Analog: RGB (75 ohms) Up to SXGA 75Hz / UXGA 60Hz Composite sync support Input format detection and auto-alignment Phase clock and image positioning |
| INPUT DVI SIGNAL | <ul style="list-style-type: none"> Up to UXGA 60Hz Direct connect to all DVI-compliant digital transmitters |
| RESOLUTION | <ul style="list-style-type: none"> 1024 x 768 @ 60 Hz 800 x 600 @ 60 Hz 640 x 480 @ 60 Hz |
| VIEWING ANGLE | <ul style="list-style-type: none"> HB: V = 160°, H = 160° SB: V = 120°, H = 100° |
| ON-CHIP OSD | <ul style="list-style-type: none"> On-chip RAM for high-quality programmable menus Auto image adjustment Pattern generator |
| TOUCH SCREEN | <ul style="list-style-type: none"> Resistive 8-wire active matrix 1024 x 1024 electrical resolution |
| FUNCTION KEYS | <ul style="list-style-type: none"> Emergency button 8 programmable function keys |
| LOUDSPEAKER | <ul style="list-style-type: none"> One, 0.5W output |
| DIMENSIONS | 292 x 270 x 49 mm |
| WEIGHT | <ul style="list-style-type: none"> HB – 3.12 kg SB – 2.93 kg |

Environmental Specifications

| PARAMETER | DESCRIPTION |
|------------------------|---|
| POWER SOURCE | <ul style="list-style-type: none"> Vehicle 12V, 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 | <ul style="list-style-type: none"> 13.8 VDC ± 20% with no loss of functionality for 12V battery 27.6 VDC ± 20% with no loss of functionality for 24V battery |

| | |
|---------------------------------|---|
| | <ul style="list-style-type: none"> 9 VDC \pm 10% with no loss of functionality for 9V battery |
| CAR BATTERY PROTECTION | <ul style="list-style-type: none"> Auto shut-down on low vehicle battery voltage to protect against excessive drain |
| POWER CONSUMPTION | <p>@ 13.8 VDC max</p> <ul style="list-style-type: none"> Maximal HB – 2.8A, SB – 1.5A (w/o heater), 4.5A (with heater) 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 | <ul style="list-style-type: none"> USA - EN301-489, receive full EMC certification relevant to mobile computing device Canada - ICES003 (equivalent to FCC Part 15, Class B) Europe – CE EN55024 |
| RADIATED EMISSION | <ul style="list-style-type: none"> USA - FCC Part 15 class B #247, BQB qualification for Bluetooth Canada - RSS210, RSS119, RSS 132, RSS133 Europe – CE EN55022 Australia - AS/NZS 3548 |
| SAFETY | <ul style="list-style-type: none"> USA - UL Canada - UL |

| | | |
|-----------------|--------------------|--|
| | • Europe - EN60950 | |
| FCC ID's | Bluetooth radio | FCC ID: QDS-BRCM1018 IC: 4324A-BRCM1018 |

Display Thresholds

| THRESHOLD | VALUE |
|---|-----------------------------|
| Low Display Temperature Threshold | Equivalent to -25°C ambient |
| High Display Temperature Threshold | Equivalent to +65°C ambient |
| Critically Low Display Temperature Threshold | Equivalent to -30°C ambient |
| Critically High Display Temperature Threshold | Equivalent to +70°C ambient |
| Low Battery Threshold | 10.2VDC |
| Critically Low Battery Threshold | 7.0VDC |
| Critically High Battery Limit | 35VDC |
| Critical Current Consumption Limit | 12A |
| Heater Low Threshold | 0°C |
| Heater High Threshold | 5°C |

Appendix D: 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: This manual does not cover operating system issues. For operation system directions, refer to Microsoft Windows XP 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.

| If you see | Do as follows |
|---|---|
| Display is powered on but the Power LED is off | <ul style="list-style-type: none"> • Make sure Power supply cable is securely connected • Make sure the main CPU power switch is on |
| Display is powered on but there is no screen image | <ul style="list-style-type: none"> • Make sure the system is not in standby mode • Make sure video cable is securely connected • Adjust the brightness and/or contrast |
| Abnormal colors | <ul style="list-style-type: none"> • Check the video cable to be sure it's securely connected • Check colors using pattern generator (see the Display Adjustments chapter). • Use OSD controls to adjust color settings. |
| Temperature LED is steady red. | The internal temperature is high. Never turn on the device until it cools down to normal operating temperature. |
| Temperature LED 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. |
| The image is too light or dark. | Use display OSD controls to adjust the brightness and contrast. |
| No sound or minimal volume. | <ul style="list-style-type: none"> • Make sure the sound driver is properly installed • Make sure the speaker codeplug setting is UNMUTE • Adjust the volume |
| No screen image on the primary display. | Press CTRL-ALT-F1 |
| No screen image on the secondary display. | Press CTRL-ALT-F12 and define the video mode for the secondary display |
| 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. |

Appendix E: Acronyms and Abbreviations

The following acronyms and abbreviations are used in this document:

| | |
|---------------|--|
| API | Application Programming Interface |
| CCFL | Cold Cathode Fluorescent Lamp |
| CD | Compact Disk |
| CD-ROM | Compact Disk Read-Only Memory |
| CPU | Central Processor Unit |
| DDC/CI | Display Data Channel Command Interface |
| DLL | Dynamic Link Library |
| DTE | Data Terminal Equipment |
| DVD | Digital Versatile Disc |
| DVI | Digital Visual Interface |
| EME | Electromagnetic Emission |
| FAQ | Frequently Asked Questions |
| FCC | Federal Communications Commission |
| GPIO | General Purpose Input Output |
| HB | High Brightness |
| HID | Human Interface Device |
| LCD | Liquid Crystal Display |
| LED | Light-Emitting Diode |
| MB | Megabit |
| MODS | Mobile Office Dock Solution |
| MPS | Maintenance Programming Software |
| ML | Mobile Laptop |
| MW | Mobile Workstation |
| NIT | Near Infrared Transmission |
| OSD | On-Screen Display |
| RGB | shorthand for Red, Green, Blue |
| RF | Radio Frequency |
| SB | Standard Brightness |
| SDK | Software Development Kit |
| TFT | Thin Film Transistor |
| USB | Universal Serial Bus |
| VDC | Volts Direct Current |
| VESA | Video Electronics Standard Association |
| WHQL | Windows Hardware Quality Lab |
| WLAN | Wireless Local Area Network |
| XGA | eXtended Video Graphics Array |



MOTOA⁴TM

Technology that's second natureTM

Motorola, Inc.
1301 E. Algonquin Road,
Schaumburg, IL 60196 U.S.A.

Inside the USA, Americas and Canada, call Motorola System Support Center at 1-800 221-7144
For Europe, the Middle East and Africa, call +420 533 336 123

MOTOROLA and the Stylized M Logo are registered in the U.S. Patent and Trademark Office. All other product or service names are the property of their respective owners. © Motorola, Inc. 2010.