

Chapter 2 Battery Management

Introduction

This chapter provides information on battery functionality, battery status indications, charging the MC95XX, charging spare batteries and power saving techniques.

Battery Functionality

The 4800 mAh battery provides power to the MC95XX and contains charging and status indications on the front of the battery. The indicators function differently depending upon the battery mode and allow the user to determine the health of the battery.

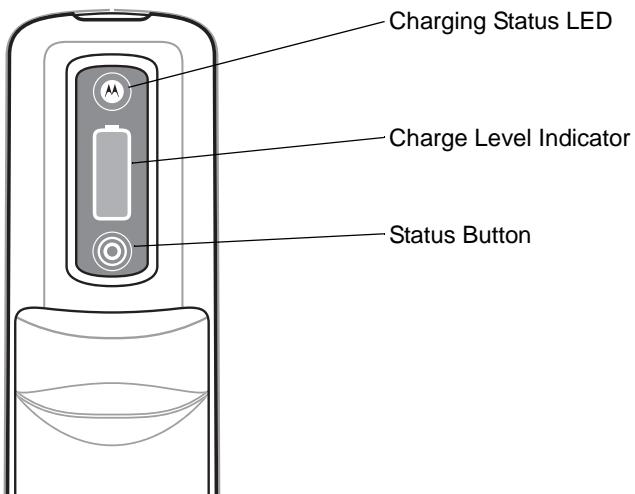


Figure 2-1 *Battery*

Charging Status LED indicates the charging status of the battery. The Charge Level Indicator indicates an unhealthy battery and the charge level of the battery when the Status button is pressed.

Battery Health

A battery becomes unhealthy when the number of charge cycles reach a predefined threshold (end of usable life). When the battery becomes unhealthy, a dialog box displays on the MC95XX. When this appears, tap **Dismiss**. Replace the battery as soon as possible. The battery Charge Level indicator display an “X” when the battery becomes unhealthy (see *Figure 2-3*).

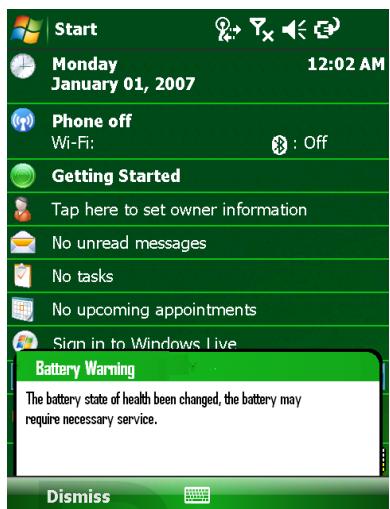


Figure 2-2 Battery Warning Dialog Box

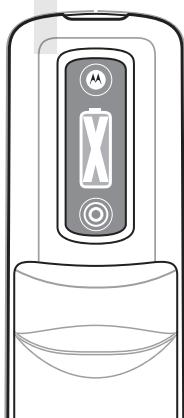


Figure 2-3 Unhealthy Battery Indication

Battery Status

The MC95XX battery provides status information on the front of the battery that allows the user to make determination on what battery to use. The battery status indications vary depending upon the mode of the battery:

- Installed in an MC95XX
- In a charger
- stand-alone.

Installed in an MC95XX

When the 4800 mAh battery is installed in the MC95XX, the user can view the charge status and health of the battery (see [Figure 2-4](#)). The battery Charging Status LED is disabled when the battery is installed in the MC95XX. If the battery is unhealthy, the Charge Level indicator displays an "X" (see [Figure 2-3](#)).

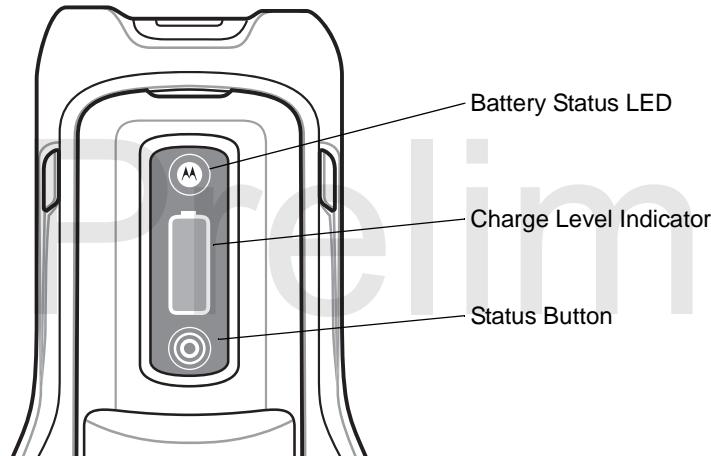


Figure 2-4 Battery in MC95XX

Press the Status button to display the current battery charge level. [Table 2-1](#) list the Charge Level indications when the Status button is pressed.

 **NOTE** When the MC95XX is charging in a cradle, the battery front panel is not visible but is visible when using a charging cable. The Charge Level indicator display an unknown state indication (see [Table 2-2](#)).

Table 2-1 Charge Level Indicator

Charge Level Indicator	Description
	Indicates that the remaining charge is approximately between 0% and 20%.
	Indicates that the remaining charge is approximately between 21% and 40%.

Table 2-1 Charge Level Indicator (Continued)

Charge Level Indicator	Description
	Indicates that the remaining charge is approximately between 41% and 60%.
	Indicates that the remaining charge is approximately between 61% and 80%.
	Indicates that the remaining charge is approximately between 81% and 100%.

Table 2-2 Battery Charging in MC95XX

Action	State	Healthy Battery		Unhealthy Battery	
		Battery Status LED	Charge Level Indicator	Battery Status LED	Charge Level Indicator
None	Not Charging	Off		Off	
None	Charging	Off		Unknown State	
Button Press	Not Charging	Off		See Table 2-1 on page 2-3 for detailed information.	

The health of the battery can also be viewed on the MC95XX Power applet. Tap **Start > Settings > Power** icon > **BatteryMgmt** tab.

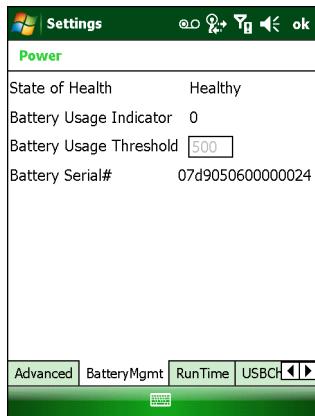


Figure 2-5 Power - BatteryMgmt Window

Table 2-3 BatteryMgmt Window

Item	Description
State of Health	Indicates the current state of the battery (Healthy or Unhealthy).
Battery Usage Indicator	Indicates the usage of the battery.
Battery Usage Threshold	Indicates the usage indicator threshold.
Battery Serial #	Displays the serial number of the battery.

For information on changing the Battery Usage Threshold, refer to the *MC95XX Series Mobile Computer Integrator Guide*.

In a Charger

When the battery is in a Single Slot Battery Charger, Four Slot Battery Charger or Vehicle Battery Charger, the battery charging status and health is indicated on the front of the battery. If the charger is not powered, the battery acts as if it is in stand-alone mode. See *Stand-alone* on page 2-7 for more information.

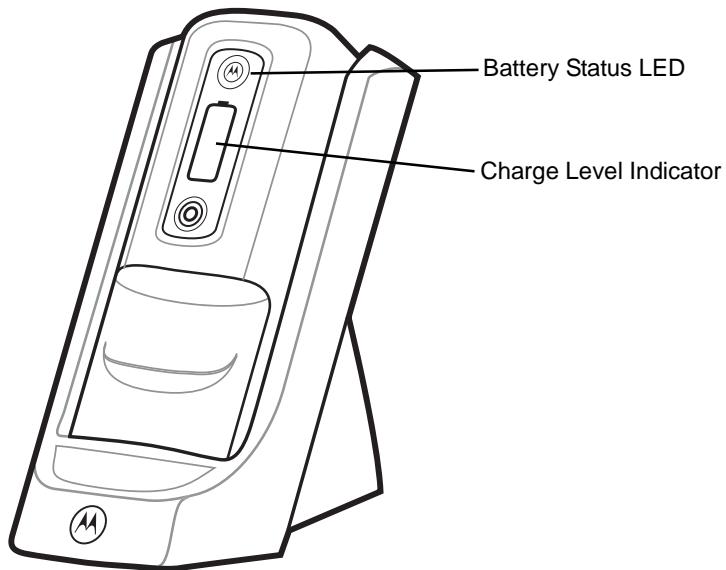


Figure 2-6 Battery in Single Slot Battery Charger

The Battery Status LED displays the current state of charging as described in [Table 2-4](#). When the battery Status button is pressed, the Charge Level indicator displays the charge level of the battery as described in [Table 2-1](#).

Table 2-4 Battery Status in Charger

State	Healthy Battery		Unhealthy Battery	
	Battery Status LED	Charge Level Indicator	Battery Status LED	Charge Level Indicator
None (charger not powered)	Off		Off	
Charging	Slow Blinking Amber (1 blink every 2 seconds)		Slow Blinking Red (1 blink every 2 seconds)	

Table 2-4 Battery Status in Charger (Continued)

State	Healthy Battery		Unhealthy Battery	
	Battery Status LED	Charge Level Indicator	Battery Status LED	Charge Level Indicator
Fully Charged	Solid Green		Solid Red	
Charging Error <ul style="list-style-type: none"> temperature is too low or too high. charging has gone on too long without completion (typically eight hours). 	Fast Blinking Amber (2 blinks/second)		Fast Blinking Amber (2 blinks/second)	

Stand-alone

When the battery is not installed in an MC95XX or a charger, the charge status and health of the battery displays on the battery front panel. If the battery is unhealthy, an "X" appears in the Charge Level indicator. Press the Status button to view the health and charge level of the battery. See [Table 2-5](#) for Battery Status LED and Charge Level indicator descriptions.

Table 2-5 Battery Status - Stand-alone

Action	Healthy Battery		Unhealthy Battery	
	Battery Status LED	Charge Level Indicator	Battery Status LED	Charge Level Indicator
No Action	Off		Off	
Button Press	Solid Green		Solid Red	

See [Table 2-1 on page 2-3](#) for detail information.

Charging the MC95XX



CAUTION Ensure that you follow the guidelines for battery safety described in *Battery Safety Guidelines* on page 9-2.

The MC95XX is equipped with a memory backup battery which automatically charges from the fully-charged main battery. When using the MC95XX for the first time, the backup battery requires approximately 36 hours to fully charge. This is also true any time the backup battery is discharged, which occurs when the main battery is removed for several hours. The backup battery retains RAM data in memory for at least 15 minutes (at room temperature) when the MC95XX's main battery is removed. When the MC95XX reaches a very low battery state, the combination of main battery and backup battery retains RAM data in memory for at least 48 hours.

To charge the battery, use either a cradle or charging cable. For cable and cradle setup and charging procedures refer to the *MC95XX Integrator Guide*.

To charge the battery:

1. Connect the charging accessory to the appropriate power source. See *MC95XX Series Mobile Computer Integrator Guide* for setup information.
2. Align and hook the MC95XX interface pocket onto the cradle's or cable's cleat. The MC95XX begins charging. The Charging/Battery Status LED blinks while charging, then turns solid when fully charged (LED color depends upon health of the battery). See [Table 2-6](#) for charging indications. The 4800 mAh battery fully charges in less than six hours.

Table 2-6 Charging/Battery Status LED Indications

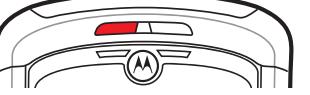
State	Healthy Battery	Unhealthy Battery
	MC95XX LED Status	MC95XX LED Status
None <ul style="list-style-type: none"> • battery is not charging • MC95XX is not connected correctly to the cradle/cable or not connected to a power source. • cradle/cable is not powered. 	Off 	Off 
Charging	Slow Blinking Amber (1 blink every 2 seconds) 	Slow Blinking Red (1 blink every 2 seconds) 

Table 2-6 Charging/Battery Status LED Indications (Continued)

State	Healthy Battery	Unhealthy Battery
	MC95XX LED Status	MC95XX LED Status
Fully Charged	Solid Green 	Solid Red 
Charging Error <ul style="list-style-type: none"> temperature is too low or too high. charging has gone on too long without completion (typically eight hours). 	Fast Blinking Amber (2 blinks/second) 	Fast Blinking Amber (2 blinks/second) 

Preliminary

Charging a Spare Battery

Charge a spare battery using one of the following accessories:

- Single Slot Battery Charger
- Four Slot Battery Charger
- Vehicle Battery Charger.

To charge a spare battery:

1. Ensure the charger is connected to an appropriate power source.
2. Insert the spare battery into the charger. The spare battery begins charging.

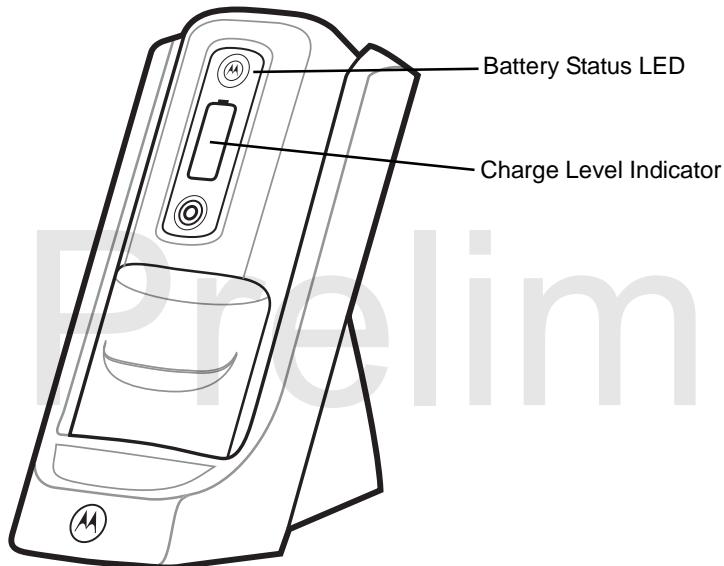


Figure 2-7 Spare Battery in Single Slot Battery Charger

The battery charging and health status is indicated on the front of the battery. [Table 2-7](#) lists the charging indications.

Table 2-7 Battery Charging Status Indications

State	Healthy Battery		Unhealthy Battery	
	Battery Status LED	Charge Level Indicator	Battery Status LED	Charge Level Indicator
None (charger not powered)	Off		Off	
Charging	Slow Blinking Amber (1 blink every 2 seconds)		Slow Blinking Red (1 blink every 2 seconds)	
Fully Charged	Solid Green		Solid Red	
Charging Error <ul style="list-style-type: none"> temperature is too low or too high. charging has gone on too long without completion (typically eight hours). 	Fast Blinking Amber (2 blinks/second)		Fast Blinking Amber (2 blinks/second)	

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Note that charging is intelligently controlled by the MC95XX.

To accomplish this, for small periods of time, the MC95XX alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC95XX indicates when charging is disabled due to abnormal temperatures via its LED.

Power Saving Techniques

Observe the following battery saving tips:

- Leave the MC95XX connected to AC power at all times when not in use.
- Set the MC95XX to turn off after a short period of non-use.
- Set the backlight to turn off after a short period of non-use.
- Turn off all wireless activities when not in use.

Changing the Power Settings

To set the MC95XX to turn off after a short period of non-use:

1. Tap **Start > Settings > System tab > Power icon > Advanced tab.**
2. Select the **On battery power: Turn off device if not used for** check box and select a value from the drop-down list.
3. Select **ok.**

Changing the Backlight Settings

To change the backlight settings in order to conserve more battery power:

1. Tap **Start > Settings > System tab > Backlight icon > Battery Power tab.**
2. Select the **Disable backlight if device is not used for** check box and select a value from the drop-down list.
3. Select the **Brightness** tab.
4. Tap the **Disable backlight** check box to turn off the display backlight, or use the slider to set a low value for the backlight.
5. Select **ok.**

Changing the Keypad Backlight Settings

To change the keypad backlight settings in order to conserve more battery power:

1. Tap **Start > Settings > System tab > Keylight icon > Battery Power tab.**
2. Select the **On battery power: Disable keylight if device if not used for** check box and select a value from the drop-down list.
3. Select the **Advanced** tab.
4. Tap the **Disable keylight** check box to turn off the keypad backlight.
5. Select **ok.**

Turning Off the Radios

Windows Mobile 6 devices include **Wireless Manager**, which provides a simple method of enabling, disabling, and configuring all the device's wireless capabilities in one place.

To open **Wireless Manager**, tap the **Connectivity** icon or tap **Wireless Manager** on the **Today** screen.



Figure 2-8 Opening Wireless Manager

Select **Wireless Manager**.

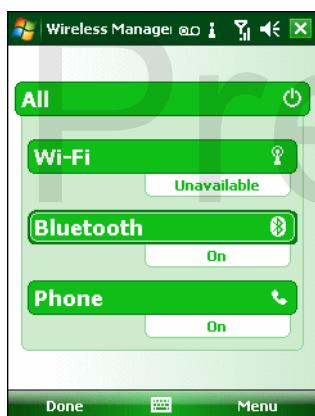


Figure 2-9 Wireless Manager Window



NOTE Wireless connection options vary depending upon configurations.

To enable or disable a wireless connection, tap the specific button.

To enable or disable all wireless connections, tap and hold the **All** button.

To configure settings for a connection, tap **Menu**.



Figure 2-10 Wireless Manager Menu

Preliminary

Chapter 3 Using the MC95XX

Introduction

This chapter explains the indicators, buttons, status icons, and controls on the MC95XX, and provides basic instructions for using the device.

LED Indicators

The MC95XX has three LED indicators. The Decode LED indicates scanning status. The Battery Status LED indicates battery charging and status. The WAN Radio Status LED indicates WAN radio status. [Table 3-1](#) describes the LED indications.

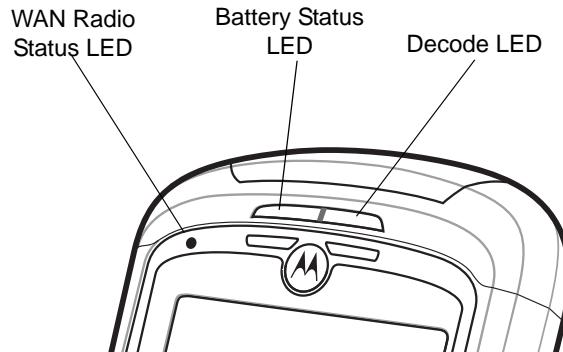


Figure 3-1 LED Indicators

Table 3-1 LED Indications

LED State	Indication
Decode LED	
Solid Green	Successful decode/capture.
Solid Red	Scanning/imaging in process.
Off	Not enabled.

Table 3-1 LED Indications (Continued)

LED State	Indication
Battery Status LED	
Off	Indicates that the: <ul style="list-style-type: none"> • battery is not charging • MC95XX is not connected correctly to the cradle or not connected to a power source. • cradle is not powered.
Slow Blinking Amber (1 blink every 2 seconds)	Indicates that a healthy battery is charging.
Slow Blinking Red (1 blink every 2 seconds)	Indicates that an unhealthy battery is charging.
Solid Green	Indicates that a healthy battery is fully charged.
Solid Red	Indicates that an unhealthy battery is fully charged.
Fast Blinking Amber (2 blinks/second)	Indicates a charging error, e.g.: <ul style="list-style-type: none"> • temperature is too low or too high. • charging has gone on too long without completion (typically eight hours).
Single Blink Amber (when Power button pressed)	Battery depleted.
Off	Not charging.
Single Blink Amber (when Power button pressed)	Battery depleted.
Blinking Amber (when Power button pressed)	Battery over-temperature condition.
WAN Radio Status LED (MC9596 or MC9598 only)	
Slow Blinking Green	WAN activity.
Off	No RF activity.



NOTE For information about scanning/decoding, see [Chapter 4, Data Capture](#). For information about WAN radio status and settings, see [Chapter 5, Using the Phone](#), or refer to the *MC95XXSeries Mobile Computer Integrator Guide*.