

VCD5000 Vehicle Cradle

This section describes how to use a VCD5000 vehicle cradle with the MC95XX. For cradle installation and communication setup procedures refer to the *VCD9500 Vehicle Cradle Quick Reference Guide*.

Once installed in a vehicle, the cradle:

- holds the MC95XX securely in place
- provides power for operating the MC95XX
- re-charges the battery in the MC95XX.

Charging the MC95XX Battery

Insert the MC95XX into the vehicle cradle with the display facing out.

Move the level forward to lock the MC95XX into place. The MC95XX automatically begins charging.

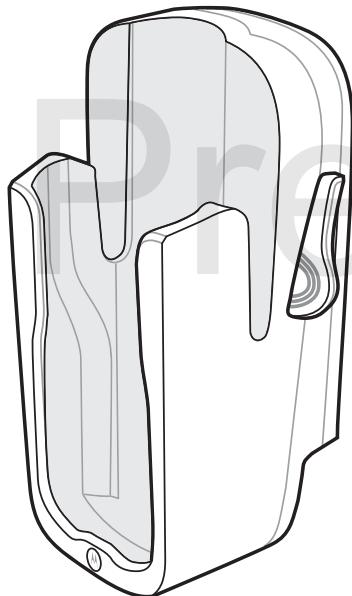


Figure 8-6 Vehicle Cradle



CAUTION Ensure the MC95XX is fully inserted in the cradle. Lack of proper insertion may result in property damage or personal injury. Motorola is not responsible for any loss resulting from the use of the products while driving.

To remove the MC95XX, move the level toward the back of the Vehicle cradle. Lift the MC95XX out of the cradle.

The MC95XX's Battery Status LED indicates the status of the battery charging in the MC95XX. See [Table 1-1 on page 1-7](#) for charging status indications. The 4800 mAh battery fully charges in less than six hours.

Vehicle Battery Charger

This section describes how to use the Vehicle Battery Charger.

Charging the Battery

To charge a spare battery:

1. Ensure that the charger is connected to power.
2. Insert the spare battery into the slot to begin charging.

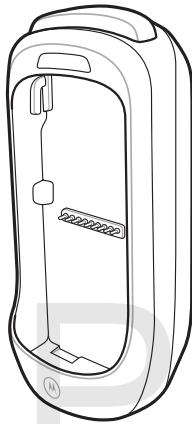


Figure 8-7 Vehicle Battery Charger

The charging status is indicated on the front of the battery. See [Table 2-7 on page 2-8](#) for charging status indications. The 4800 mAh battery fully charges in less than six hours.

Magnetic Stripe Reader

This section describes how to set up and use the snap-on (Magnetic Stripe Reader (MSR) with the MC95XX. The MSR snaps on to the back of the MC95XX and removes easily when not in use.

When attached to the MC95XX, the MSR allows the MC95XX to capture data from magnetic stripe cards. To download MSR data capture software, visit the Support Central web site.

Attaching and Removing the MSR

To attach, slide the cleat of the MSR into the interface pocket of the MC95XX and snap into place.

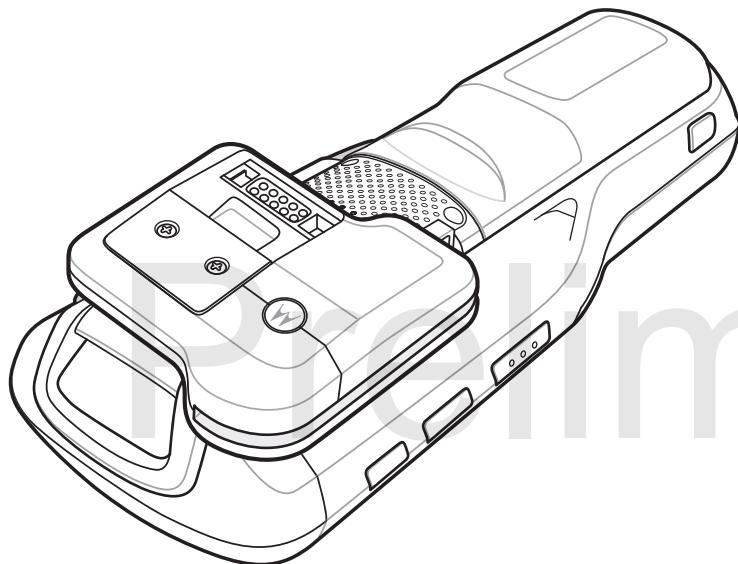


Figure 8-8 MSR Installation

To remove the MSR, press the release button and lift off the MC95XX.

Using the MSR

Install an MSR enabled application onto the MC95XX.

To use the MSR:

1. Attach the MSR to the MC95XX.
2. Power on the MC95XX.
3. Launch the MSR application.
4. Swipe the magnetic stripe card through the MSR, with the magnetic stripe on the card facing away from the MC95XX. Swipe the card in either direction, up and down or down and up. For best results, gently press down on the card while swiping to ensure contact with the bottom of the reader.



Figure 8-9 Swipe Card through MSR

5. The application indicates if the data has been read correctly.

Cables

This section describes how to set up and use the cables. The cables are available with a variety of connection capabilities.

The following communication/charge cables are available:

- USB Charging cable
 - Provide the MC95XX with operating and charging power when used with the Motorola approved power supply.
 - Synchronize information between the MC95XX and a host computer. With customized or third party software, it can also synchronize the MC95XX with corporate databases.

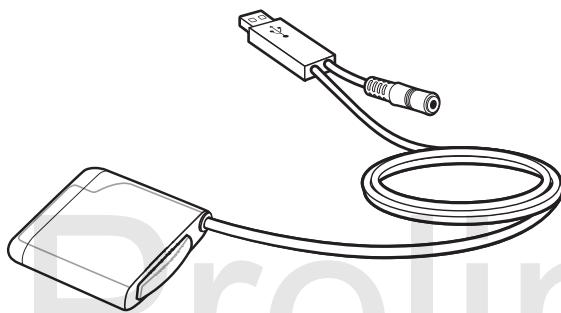


Figure 8-10 USB Charging Cable

- Charge Only cable
 - Provide the MC95XX with operating and charging power when used with the Motorola approved power supply.
- Single Bay Cradle/Charger Y Cable
 - Provide the power to a Single Bay USB Cradle and Single Slot Battery Charger or two Single Slot Battery Chargers when used with the Motorola approved power supply.



Figure 8-11 Single Slot Cradle/Charger Y Cable

- Auto Charge cable.
 - Provide the MC95XX with operating and charging power when used with the Motorola approved power supply.

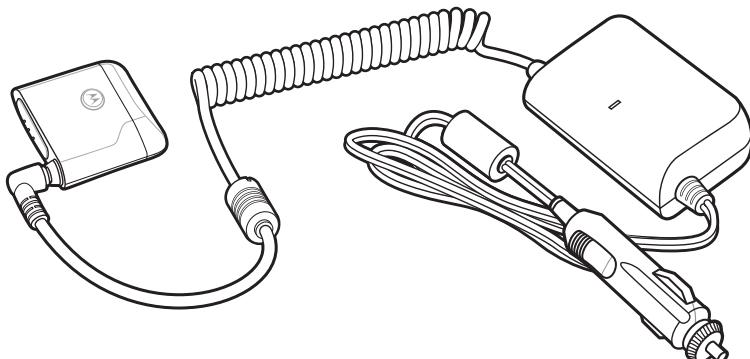


Figure 8-12 Auto Charge Cable

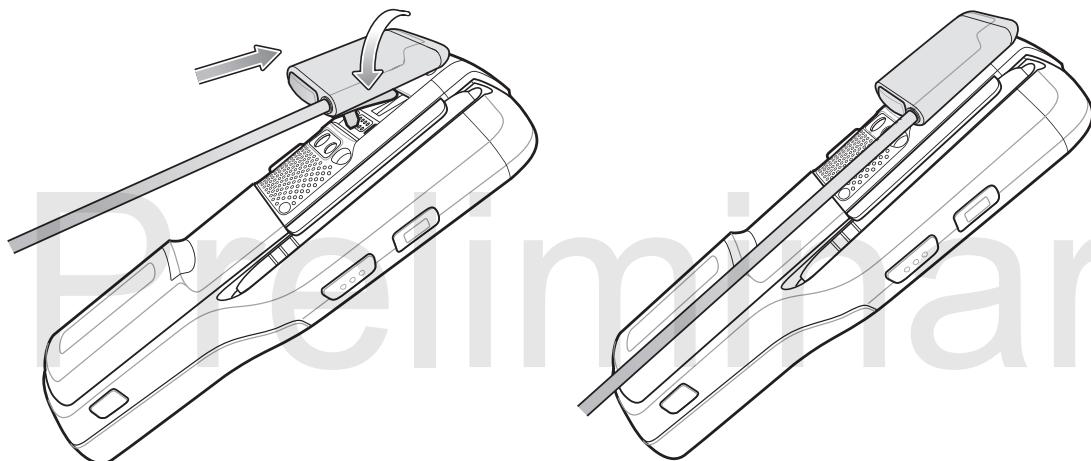


Figure 8-13 Cable Installation

Battery Charging and Operating Power

The communication/charge cables can charge the MC95XX battery and supply operating power.

To charge the MC95XX battery:

1. Connect the cable power input connector to the Motorola approved power source.
2. Align the cleat on the cable with the interface pocket on the back of the MC95XX.

The MC95XX amber Battery Status LED indicates the MC95XX battery charging status. The 4800 mAh battery charges in less than six hours. See [Table 1-1 on page 1-7](#) for charging status indications.

3. When charging is complete, press the release button up and remove the cable from the MC95XX.

Chapter 9 Maintenance & Troubleshooting

Introduction

This chapter includes instructions on cleaning and storing the MC95XX, and provides troubleshooting solutions for potential problems during MC95XX operation.

Maintaining the MC95XX

For trouble-free service, observe the following tips when using the MC95XX:

- Do not scratch the screen of the MC95XX. When working with the MC95XX, use the supplied stylus or plastic-tipped pens intended for use with a touch-sensitive screen. Never use an actual pen or pencil or other sharp object on the surface of the MC95XX screen.
Motorola recommends using a screen protector, p/n KT-122010-01R.
- The touch-sensitive screen of the MC95XX is glass. Do not drop the MC95XX or subject it to strong impact.
- Protect the MC95XX from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.
- Do not store or use the MC95XX in any location that is dusty, damp, or wet.
- Use a soft lens cloth to clean the MC95XX. If the surface of the MC95XX screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.
- Periodically replace the rechargeable battery to ensure maximum battery life and product performance. Battery life depends on individual usage patterns.

- A screen protector is applied to the MC95XX. Motorola recommends using this to minimize wear and tear. Screen protectors enhance the usability and durability of touch screen displays. Benefits include:
 - Protection from scratches and gouges
 - Durable writing and touch surface with tactile feel
 - Abrasion and chemical resistance
 - Glare reduction
 - Keeping the device's screen looking new
 - Quick and easy installation.

Removing the Screen Protector

A screen protector is applied to the MC95XX. Motorola recommends using this to minimize wear and tear. Screen protectors enhance the usability and durability of touch screen displays.

To remove the screen protector, lift the corner using a thin plastic card, such as a credit card, then carefully lift it off the display.



Figure 9-1 Removing the Screen Protector



CAUTION Do not use a sharp object to remove the protector. Doing so can damage the display.



NOTE Not using a screen protector can affect warranty coverage. To purchase replacement protectors, contact your local account manager or Motorola, Inc. These include screen protector installation instructions. Part number: KT-122010-01R Screen Protector 3/pk.

Battery Safety Guidelines

- The area in which the units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non commercial environment.
- Follow battery usage, storage, and charging guidelines found in the user's guide.
- Improper battery use may result in a fire, explosion, or other hazard.

- To charge the mobile device battery, the battery and charger temperatures must be between +32 °F and +104 °F (0 °C and +40 °C)
- Do not use incompatible batteries and chargers. Use of an incompatible battery or charger may present a risk of fire, explosion, leakage, or other hazard. If you have any questions about the compatibility of a battery or a charger, contact Motorola Enterprise Mobility support.
- For devices that utilize a USB port as a charging source, the device shall only be connected to products that bear the USB-IF logo or have completed the USB-IF compliance program.
- To enable authentication of an approved battery, as required by IEEE1725 clause 10.2.1, all batteries will carry a Motorola hologram. Do not fit any battery without checking it has the Motorola authentication hologram.
- Do not disassemble or open, crush, bend or deform, puncture, or shred.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to properly dispose of used re-chargeable batteries.
- Do not dispose of batteries in fire.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- If you suspect damage to your equipment or battery, contact Motorola Enterprise Mobility support to arrange for inspection.

Cleaning



CAUTION Always wear eye protection.

Read warning label on compressed air and alcohol product before using.

If you have to use any other solution for medical reasons please contact Motorola for more information.



WARNING! Avoid exposing this product to contact with hot oil or other flammable liquids. If such exposure occurs, unplug the device and clean the product immediately in accordance with these guidelines.

Materials Required

- Alcohol wipes
- Lens tissue
- Cotton tipped applicators

- Isopropyl alcohol
- Can of compressed air with a tube.

Cleaning the MC95XX

Housing

Using the alcohol wipes, wipe the housing including keys and in-between keys.

Display

The display can be wiped down with the alcohol wipes, but care should be taken not to allow any pooling of liquid around the edges of the display. Immediately dry the display with a soft, non-abrasive cloth to prevent streaking.

Scanner Exit Window

Wipe the scanner exit window periodically with a lens tissue or other material suitable for cleaning optical material such as eyeglasses.

Connector

1. Remove the main battery from mobile computer. See *Replacing the Battery* on page 1-8.
2. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the cotton tipped applicator back-and-forth across the connector on the bottom of the MC95XX. Do not leave any cotton residue on the connector.
4. Repeat at least three times.
5. Use the cotton tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.
6. Use a dry cotton tipped applicator and repeat steps 4 through 6.
7. Spray compressed air on the connector area by pointing the tube/nozzle about $\frac{1}{2}$ inch away from the surface.
CAUTION: Do not point nozzle at yourself and others, ensure the nozzle or tube is away from your face.
8. Inspect the area for any grease or dirt, repeat if required.

Cleaning Cradle Connectors

To clean the connectors on a cradle:

1. Remove the DC power cable from the cradle.
2. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the cotton tipped applicator along the pins of the connector. Slowly move the applicator back-and-forth from one side of the connector to the other. Do not let any cotton residue on the connector.
4. All sides of the connector should also be rubbed with the cotton tipped applicator.
5. Spray compressed air in the connector area by pointing the tube/nozzle about $\frac{1}{2}$ inch away from the surface.
CAUTION: do not point nozzle at yourself and others, ensure the nozzle or tube is pointed away from your face.

6. Ensure that there is no lint left by the cotton tipped applicator, remove lint if found.
7. If grease and other dirt can be found on other areas of the cradle, use lint free cloth and alcohol to remove.
8. Allow at least 10 to 30 minutes (depending on ambient temperature and humidity) for the alcohol to air dry before applying power to cradle.

If the temperature is low and humidity is high, longer drying time is required. Warm temperature and dry humidity requires less drying time.

Cleaning Frequency

The cleaning frequency is up to the customer's discretion due to the varied environments in which the mobile devices are used. They may be cleaned as frequently as required. However when used in dirty environments it may be advisable to periodically clean the scanner exit window to ensure optimum scanning performance.

Preliminary

Troubleshooting

MC95XX

Table 9-1 Troubleshooting the MC95XX

Problem	Cause	Solution
MC95XX does not turn on.	Battery not charged.	Charge or replace the battery in the MC95XX.
	Battery not installed properly.	Install the battery properly. See <i>Installing the Battery</i> on page 1-6.
	System crash.	Perform a warm boot. If the MC95XX still does not turn on, perform a cold boot. See <i>Resetting the MC95XX</i> on page 3-3.
Battery did not charge.	Battery failed.	Replace battery. If the MC95XX still does not operate, perform a warm boot, then a cold boot. See <i>Resetting the MC95XX</i> on page 3-3.
	MC95XX removed from cradle while battery was charging.	Place the MC95XX onto the cradle. The 4800 mAh battery fully charges in less than six hours.
	Extreme battery temperature.	Battery does not charge if ambient temperature is below 0°C (32°F) or above 40°C (104°F).
Cannot see characters on display.	MC95XX not powered on.	Press the Power button.
During data communication, no data transmitted, or transmitted data was incomplete.	MC95XX removed from cradle or disconnected from host computer during communication.	Replace the MC95XX onto the cradle, or reattach the communication cable and re-transmit.
	Incorrect cable configuration.	See the system administrator.
	Communication software was incorrectly installed or configured.	Perform setup. Refer to the <i>MC95XX Integrator Guide</i> for details.
No sound.	Volume setting is low or turned off.	Adjust the volume. See <i>Adjusting Volume</i> on page 3-21.

Table 9-1 Troubleshooting the MC95XX (Continued)

Problem	Cause	Solution
MC95XX shuts off.	MC95XX is inactive.	The MC95XX turns off after a period of inactivity. If the MC95XX is running on battery power, set this period from 1 to 5 minutes, in one-minute intervals. If the MC95XX is running on external power, set this period to 1, 2, 5, 10, 15, or 30 minutes. Check the Power window by selecting Start > Settings > System tab and tapping the Power icon. Select the Advanced tab and change the setting for a longer delay before the automatic shutoff feature activates.
	Battery is depleted.	Replace the battery.
	Battery is not inserted properly.	Insert the battery properly. See <i>Installing the Battery on page 1-6</i> .
Tapping the window buttons or icons does not activate the corresponding feature.	Screen is not calibrated correctly.	Re-calibrate the screen. Tap Start > Settings > System tab > Screen icon > Align Screen button.
	The MC95XX is not responding.	Warm boot the MC95XX. See <i>Resetting the MC95XX on page 3-3</i> .
A message appears stating that the MC95XX memory is full.	Too many files stored on the MC95XX.	Delete unused memos and records. If necessary, save these records on the host computer (or use an microSD card for additional memory).
	Too many applications installed on the MC95XX.	Remove user-installed applications on the MC95XX to recover memory. Select Start > Settings > System tab and tap the Remove Programs icon. Select the unused program and tap Remove .
The Battery Status LED flashes with the Power button is pressed and the MC95XX does not turn on.	The MC95XX's battery is low.	Recharge the battery.
Camera application does not launch.	DataWedge application running.	Stop DataWedge application. Tap Start > Settings > System > Task Manager . Select DataWedge application and tap End Task .

Table 9-1 Troubleshooting the MC95XX (Continued)

Problem	Cause	Solution
The MC95XX does not decode with reading bar code.	Scanning application is not loaded.	Load a scanning application on the MC95XX. See your system administrator.
	Unreadable bar code.	Ensure the symbol is not defaced.
	Distance between exit window and bar code is incorrect.	Place the MC95XX within proper scanning range.
	MC95XX is not programmed for the bar code.	Program the MC95XX to accept the type of bar code being scanned. Refer to the EMDK or Control Panel application.
	MC95XX is not programmed to generate a beep.	If the MC95XX does not beep on a good decode, set the application to generate a beep on good decode.
	Battery is low.	If the scanner stops emitting a laser beam upon a trigger press, check the battery level. When the battery is low, the scanner shuts off before the MC95XX low battery condition notification. Note: If the scanner is still not reading symbols, contact the distributor or Motorola.

Bluetooth Connection

Table 9-2 Troubleshooting Bluetooth Connection

Problem	Cause	Solution
MC95XX cannot find any Bluetooth devices nearby.	Too far from other Bluetooth devices.	Move closer to the other Bluetooth device(s), within a range of 10 meters.
	The Bluetooth device(s) nearby are not turned on.	Turn on the Bluetooth device(s) to find.
	The Bluetooth device(s) are not in discoverable mode.	Set the Bluetooth device(s) to discoverable mode. If needed, refer to the device's user documentation for help.
When trying to connect a Bluetooth phone and MC95XX, the phone thinks a previously paired MC95XX is used.	The phone remembers the name and address of the MC95XX it last paired with via the Bluetooth radio.	Manually delete the pairing device and name from the phone. Refer to the phone's user documentation for instructions.

Single Bay USB Cradle

Table 9-3 Troubleshooting the Single Bay USB Cradle

Symptom	Possible Cause	Action
MC95XX battery is not charging.	MC95XX was removed from cradle or cradle was unplugged from AC power too soon.	Ensure cradle is receiving power. Ensure MC95XX is seated correctly. Confirm main battery is charging under Start > Settings > System > Power . The 4800 mAh battery fully charges in less than six hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	The MC95XX is not fully seated in the cradle.	Remove and re-insert the MC95XX onto the cradle properly.
	Extreme battery temperature.	Battery does not charge if ambient temperature is below 0°C (32°F) or above 40°C (104°F).
During data communication, no data transmits, or transmitted data was incomplete.	MC95XX removed from cradle during communications.	Replace MC95XX in cradle and retransmit.
	Communication software is not installed or configured properly.	Perform setup as described in the <i>MC95XX Integrator Guide</i> .

Single Slot Battery Charger

Table 9-4 Single Slot Battery Charger

Symptom	Possible Cause	Action
Spare battery is not charging.	Battery not fully seated in charging slot.	Remove and re-insert the spare battery in the cradle, ensuring it is properly seated.
	Battery inserted incorrectly.	Re-insert the battery so the charging contacts on the battery align with the contacts on the cradle.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.

Four Bay Ethernet Cradle

Table 9-5 Troubleshooting the Four Bay Ethernet Cradle

Symptom	Cause	Solution
During communication, no data transmits, or transmitted data was incomplete.	MC95XX removed from cradle during communications.	Replace MC95XX in cradle and retransmit.
	MC95XX has no active connection.	An icon is visible in the status bar if a connection is currently active.
Battery is not charging.	MC95XX removed from the cradle too soon.	Replace the MC95XX in the cradle. The 4800 mAh battery fully charges in less than six hours. Tap Start > Settings > System > Power to view battery status.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	MC95XX is not inserted correctly in the cradle.	Remove the MC95XX and reinsert it correctly. Verify charging is active. Tap Start > Settings > System > Power to view battery status.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 0°C (32°F) and 35°C (95°F).

Four Bay Charge Only Cradle

Table 9-6 Troubleshooting the Four Bay Ethernet Cradle

Symptom	Cause	Solution
Battery is not charging.	MC95XX removed from the cradle too soon.	Replace the MC95XX in the cradle. The 4800 mAh battery fully charges in less than six hours. Tap Start > Settings > System > Power to view battery status.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	MC95XX is not inserted correctly in the cradle.	Remove the MC95XX and reinsert it correctly. Verify charging is active. Tap Start > Settings > System > Power to view battery status.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 0°C (32°F) and 35°C (95°F).

Vehicle Cradle

Table 9-7 Troubleshooting the Vehicle Cradle

Symptom	Possible Cause	Action
MC95XX battery charging LED does not light up.	Cradle is not receiving power.	Ensure the power input cable is securely connected to the cradle's power port.
MC95XX battery is not recharging.	MC95XX was removed from the cradle too soon.	Replace the MC95XX in the cradle. The 4800 mAh battery fully charges in less than six hours.
	Battery is faulty.	Replace the battery.
	MC95XX is not placed correctly in the cradle.	Remove the MC95XX from the cradle, and re-insert correctly. If the battery still does not charge, contact customer support. The MC95XX battery charging LED slowly blinks amber when the MC95XX is correctly inserted and charging.
	Ambient temperature of the cradle is too warm.	Move to an area where the ambient temperature is between 0°C and 35°C.

Four Slot Battery Charger

Table 9-8 Troubleshooting The Four Slot Battery Charger

Symptom	Possible Cause	Action
Battery not charging.	Battery was removed from the charger or charger was unplugged from AC power too soon.	Re-insert the battery in the charger or re-connect the charger's power supply. The 4800 mAh battery fully charges in less than six hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Battery contacts not connected to charger.	Verify that the battery is seated in the battery well correctly with the contacts facing down.

Cables

Table 9-9 Troubleshooting the Cables

Symptom	Possible Cause	Action
MC95XX battery is not charging.	MC95XX was disconnected from AC power too soon.	Connect the power cable correctly. Confirm main battery is charging under Start > Settings > System > Power . The 4800 mAh battery fully charges in less than six hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	The MC95XX is not fully attached to power.	Detach and re-attach the power cable to the MC95XX, ensuring it is firmly connected.
During data communication, no data transmits, or transmitted data was incomplete.	Cable was disconnected from MC95XX during communications.	Re-attach the cable and retransmit.
	Incorrect cable configuration.	See the system administrator.
	Communication software is not installed or configured properly.	Perform setup as described in the <i>MC95XX Integrator Guide</i> .

Magnetic Stripe Reader

Table 9-10 Troubleshooting the Magnetic Stripe Reader

Symptom	Possible Cause	Action
MSR cannot read card.	MSR removed from MC95XX during card swipe.	Reattach MSR to MC95XX and reswipe the card.
	Faulty magnetic stripe on card.	See the system administrator.
	MSR application is not installed or configured properly.	Ensure the MSR application is installed on the MC95XX. Ensure the MSR application is configured correctly.

Table 9-10 Troubleshooting the Magnetic Stripe Reader (Continued)

Symptom	Possible Cause	Action
MC95XX battery is not charging.	MC95XX was removed from MSR or MSR was unplugged from AC power too soon.	Ensure MSR is receiving power. Ensure MC95XX is attached correctly. Confirm main battery is charging under Start > Settings > System > Power . The 4800 mAh battery fully charges in less than six hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	The MC95XX is not fully attached to the MSR.	Detach and re-attach the MSR to the MC95XX, ensuring it is firmly connected.
During data communication, no data transmits, or transmitted data was incomplete.	MC95XX detached from MSR during communications.	Reattach MC95XX to MSR and retransmit.
	Incorrect cable configuration.	See the system administrator.
	Communication software is not installed or configured properly.	Perform setup as described in the <i>MC95XX Integrator Guide</i> .

Preliminary

Appendix A Technical Specifications

MC95XX Technical Specifications

The following tables summarize the mobile computer's intended operating environment and technical hardware specifications.

MC95XX

Table A-1 MC95XX Technical Specifications

Item	Description
Physical Characteristics	
Dimensions	Height: 22.86 cm (9.0 in.) Depth: 5.08 cm (2.0 in.) Width: 8.89 cm (3.5 in.)
Weight	623.7 g (22 oz.)
Display	Transflective color 3.7" VGA with backlight, TFT-LCD, 65K colors, 480 pixels W x 640 pixels L
Touch Panel	Polycarbonate analog resistive touch
Backlight	LED backlight
Battery	Rechargeable Lithium Ion 3.7V, 4800 mAh Smart battery
Expansion Slot	User accessible microSD slot. Supports up to 16 GB cards.
Network Connections	High-speed USB client, full-speed USB host
Notification	LED, audible alert and vibrate.
Keypad Options	Alpha Primary Alpha Numeric Wide Calculator Numeric Telephony Numeric

Table A-1 MC95XX Technical Specifications (Continued)

Item	Description
Audio	VoWWAN; VoWLAN; TEAM Express compliant, rugged audio connector; high-quality speakerphone; headset (wired or Bluetooth) and handset and speaker phone modes.
Performance Characteristics	
CPU	Marvell PXA360 processor at 806 MHz
Operating System	MC9590: Microsoft® Windows Mobile™ 6.1 Classic MC9596 and MC9598: Microsoft® Windows Mobile™ 6.1 Professional
Memory	128 MB RAM/512MB Flash
Interface	USB 2.0 Client/USB 1.1 Host
Output Power	USB: 5 VDC @ 200 mA max.
User Environment	
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	32°F to 104°F / 0° C to 40° C
Humidity	95% non-condensing
Drop Specification	Meets and exceeds MIL-STD 810F drop specifications: 1.8 m (6 ft.) drop to concrete across the operating temperature range.
Tumble	2000 1.0 m (3.2 ft.) tumbles (4000 drops) at room temperature.
Electrostatic Discharge (ESD)	+/-15kVdc air discharge, +/8kVdc direct discharge, +/8kVdc indirect discharge
Sealing	IP67 with battery installed (IP64 without battery)
Wireless WAN Data and Voice Communications	
Wireless Wide Area Network (WWAN) radios	MC9596: GSM: GPRS (850, 900, 1800 and 1900 MHz) MC9598: CDMA: EvDO Rev. A (850 and 1900MHz)
Wireless LAN Data and Voice Communications	
Wireless Local Area Network (WLAN) radio	Tri-mode IEEE® 802.11a/b/g
Data Rates Supported	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Operating Channels	Chan 34-165 (5040 – 5825 MHz), Chan 1-13 (2412-2472 MHz), Chan 14 (2484 MHz) Japan only; actual operating channels/frequencies depend on regulatory rules and certification agency
Security	WEP (40 or 128 bit), TKIP, AES, WPA (Personal or Enterprise), WPA2 (Personal or Enterprise), 802.1x, EAP-TLS, TTLS (CHAP, MS-CHAP, MS-CHAPv2, PAP or MD5), PEAP (TLS, MSCHAPv2, EAP-GTC), LEAP, EAP-FAST (TLS, MS-CHAPv2, EAP-GTC)

Table A-1 MC95XX Technical Specifications (Continued)

Item	Description
Spreading Technique	Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM)
Antenna	Internal
Voice Communication	Voice-over-IP ready (with P2P, PBX, PTT clients), Wi-Fi™-certified, IEEE 802.11 a/b/g direct sequence wireless LAN, Wi-Fi Multimedia (WMM), Motorola Voice Quality manager (VQM)
Wireless PAN Data and Voice Communications	
Bluetooth	Class II, v 2.0 EDR; on-board antenna.
Regulatory	
Electrical Safety	IEC/UL/CSA/EN 60950-1
Environmental	RoHS-compliant
WLAN and Bluetooth (PAN)	USA: FCC Part 15.247, 15.407 Canada: RSS-210 EU: EN 300 328, EN 301 893 Japan: ARIB STD-T33, T66, T70, T71 Australia: AS/NZS 4268
Wireless Wide Area Network	GSM-HSDPA Global: 3GPP TS 51.010, 3GPP TS 34.121, 3GPP TS 34.123, GCF approved module USA: FCC Part 22, Part 24 Canada: RSS-132, RSS-133 EU: EN 301 511, EN 301 908 Australia: AS/ACIF S 024 CDMA-EvDO Rev A USA: FCC Part 22, Part 24 Canada: RSS-129, RSS-133 HAC compliant
RF Exposure	USA: FCC Part 2, FCC OET Bulletin 65 Supplement C Canada: RSS-102 EU: EN 50360 Japan: ARIB STD T56 Australia: Radio communications Standard 2003
EMI/RFI	USA: FCC Part 15, Class B Canada: ICES 003 Class B EU: EN55022 Class B, EN55024, EN 301 489-1, EN 301 489-7, EN 301 489-17, EN 301 489-19, EN 301 489-24, EN 60601-1-2, EN 50121-3-2, EN 50121-4 Australia: AS/NZS CISPRA-22

Table A-1 MC95XX Technical Specifications (Continued)

Item	Description
Laser Safety	IEC/Class 2/FDA Class II in accordance with IEC60825-1/EN60825-1
Data Capture Specifications	
Options	1D laser scanner 2D imager 1D laser scanner and color camera 2D imager and color camera
Linear 1D Scanner (SE950) Specifications	
Optical Resolution	0.005 in. minimum element width
Roll	+/- 30° from vertical
Pitch Angle	+/- 65° from normal
Skew Tolerance	+/- 60° from normal
Ambient Light	Sunlight: 8,000 ft. candles (86,112 Lux) Artificial Light: 450 ft. candles (4,844 Lux)
Shock	2,000 +/- 5% G
Scan Rate	50 (+/- 6) scans/sec (bidirectional)
Scan Angle	46.5° (typical)
Laser Power	1.0 mW nominal
2D Imager Engine (SE4500) Specifications	
Field of View	Horizontal - 32.2° Vertical - 24.5°
Optical Resolution	640 H x 480 V pixels (gray scale)
Roll	360°
Pitch Angle	+/- 60° from normal
Skew Tolerance	+/- 50° from normal
Ambient Light	Total darkness to 9,000 ft. candles (96,900 Lux)
Shock	2,000 +/- 5% G
Focal Distance from Front of Engine	Near: 5 inches Far: 9 inches
Aiming Element (VLD)	650 nm +/- 5 nm

Table A-1 MC95XX Technical Specifications (Continued)

Item	Description
Illumination Element (LED)	635 nm +/- 20 nm
Camera Specifications	
Resolution	2 Mega pixel with flash and auto focus.

Table A-2 Data Capture Options

Item	Description
Laser Decode Capability	Code 39 Codabar Interleaved 2 of 5 MSI UPC/EAN supplementals Webcode GS1 DataBar Truncated GS1 DataBar Expanded GS1 DataBar Stacked Omni

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Table A-2 Data Capture Options (Continued)

Item	Description		
Imaging Decode Capability	Code 39 Codabar Discrete 2 of 5 EAN-13 UPC/EAN supplementals Webcode Composite C Macro PDF-417 Data Matrix US Planet Canadian 4-state Chinese 2 of 5 microQR GS1 DataBar Truncated GS1 DataBar Expanded GS1 DataBar Stacked Omni	Code 128 Code 11 MSI UPCA Coupon Code TLC39 Micro PDF-417 (Macro) Micro PDF-417 Maxi Code UK 4-state Japanese 4-state USPS 4-state (US4CB) GS1 DataBar GS1 DataBar Limited GS1 DataBar Expanded Stacked	Code 93 Interleaved 2 of 5 EAN-8 UPCE Trioptic 39 Composite AB PDF-417 QR Code US Postnet Australian 4-state Dutch Kix Aztec GS1 DataBar Stacked
Camera Decode Capability	Code 39 Codabar Discrete 2 of 5 EAN-13 UPC/EAN supplementals Webcode Composite C Macro PDF-417 Data Matrix US Planet Canadian 4-state GS1 DataBar GS1 DataBar Truncated GS1 DataBar Expanded GS1 DataBar Stacked Omni	Code 128 Code 11 MSI UPCA Coupon Code TLC39 Micro PDF-417 (Macro) Micro PDF-417 Maxi Code UK 4-state Japanese 4-state GS1 DataBar Limited GS1 DataBar Expanded Stacked	Code 93 Interleaved 2 of 5 EAN-8 UPCE Trioptic 39 Composite AB PDF-417 QR Code US Postnet Australian 4-state Dutch Kix GS1 DataBar Stacked

MC95XX Accessory Specifications

Single Bay USB Cradle

Table A-3 Single Bay USB Cradle Technical Specifications

Feature	Description
Dimensions	Height: 15.45 cm (6.08 in.) Width: 12.00 cm (4.72 in.) Depth: 18.90 cm (7.44 in.)
Weight	430 g (15.2 oz)
Input Power	12 VDC
Power Consumption	30 watts
Interface	USB
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Single Slot Battery Charger

Table A-4 Single Slot Battery Charger Technical Specifications

Feature	Description
Dimensions	Height: 11.15 cm (4.39 in.) Width: 7.70 cm (3.03 in.) Depth: 9.95 cm (3.92 in.)
Weight	105 g (3.7 oz)
Input Power	12 VDC
Power Consumption	30 watts
Interface	USB
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)

Table A-4 Single Slot Battery Charger Technical Specifications (Continued)

Feature	Description
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Four Bay Ethernet Cradle

Table A-5 Four Bay Ethernet Cradle Technical Specifications

Feature	Description
Dimensions	Height: 11.3 cm (4.45 in.) Width: 45.7 cm (18.00 in.) Depth: 5.6 cm (2.20 in.)
Weight	735 g (1.47 lb)
Input Power	12 VDC
Power Consumption	100 watts
Interface	Ethernet
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Four Bay Charge Only Cradle

Table A-6 *Four Bay Charge Only Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 11.3 cm (4.45 in.) Width: 45.7 cm (18.00 in.) Depth: 5.6 cm (2.20 in.)
Weight	705 g (1.41 lb)
Input Power	12 VDC
Power Consumption	100 watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Four Slot Battery Charger

Table A-7 *Four Slot Battery Charger Technical Specifications*

Feature	Description
Dimensions	Height: 3.47 cm (1.37 in.) Width: 15.50 cm (6.10 in.) Depth: 21.00 cm (8.27 in.)
Weight	386 g (13.6 oz)
Input Power	12 VDC
Power Consumption	30 watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)

Table A-7 *Four Slot Battery Charger Technical Specifications (Continued)*

Feature	Description
Humidity	5% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Magnetic Stripe Reader

Table A-8 *Magnetic Stripe Reader (MSR) Technical Specifications*

Feature	Description
Dimensions	Height: 3.56 cm (1.4 in.) Width: 8.38 cm (3.3 in.) Depth: 7.87 cm (3.1 in.)
Weight	48 g (1.7 oz)
Interface	Serial with baud rate up to 19,200
Format	ANSI, ISO, AAMVA, CA DMV, user-configurable generic format
Swipe Speed	5 to 50 in. (127 to 1270 mm) /sec, bi-directional
Decoders	Generic, Raw Data
Mode	Buffered, unbuffered
Track Reading Capabilities	Tracks 1 and 3: 210 bpi Track 2: 75 and 210 bpi, autodetect
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	5% to 95% non-condensing
Drop	1.22 m (4 ft.) drops to concrete
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Vehicle Cradle

Table A-9 *Vehicle Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 22.25 cm (8.76 in.) Width: 15.40 cm (6.06 in.) Depth: 9.75 cm (3.84 in.)
Weight	805 g (28.4 oz)
Input Power	12/24 VDC
Power Consumption	25 watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	10% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Vehicle Battery Charger

Table A-10 *Vehicle Battery Charger Technical Specifications*

Feature	Description
Dimensions	Height: 14.70 cm (5.79 in.) Width: 6.75 cm (2.66 in.) Depth: 4.75 cm (1.87 in.)
Weight	130 g (4.6 oz)
Input Power	5.4 VDC
Power Consumption	XX watts
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)

Table A-10 *Vehicle Battery Charger Technical Specifications (Continued)*

Feature	Description
Humidity	10% to 95% non-condensing
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Preliminary

Appendix B Voice Quality Manager

Introduction

The Voice Quality Manager (VQM) is a software package that resides on the MC95XX. VQM enables a set of features for Voice over WiFi (VoWiFi) calls, and a sub-set of those features for cellular line calls. The VQM user interface is designed to be intuitive and easy to use, so complex tasks such as enabling the Acoustic Echo Canceller (AEC) while a call is in progress are done with very little or no user intervention.

Features

The VQM software:

- Improves the voice transmission quality without using additional battery power.
- Turns on the AEC for VoWiFi calls automatically, without user intervention.
- Prioritizes the outgoing audio IP packets.
- Provides user-selectable audio modes (speakerphone and handset) with a single tap of the VQM icon. A VQM icon in the title bar of the device indicates the audio mode currently in use.
- NDIS 5.1 compliant.

Enabling VQM

To enable VQM:

1. Tap **Start > Programs > File Explorer**.
2. Navigate to the **Windows** folder.
3. Locate the file **VQMAudioNotify**.
4. Tap the filename to enable VQM.

Audio Modes

The MC95XX can be in any one of the seven different audio modes. The mode is visually indicated by the VQM icon on the title bar.



Figure B-1 VQM Icon in Title Bar

The VQM icon indicates that the device is in speakerphone mode without Acoustic Echo Cancellation (indicated by the gray VQM icon). The audio modes and their corresponding VQM title bar icons are:

Table B-1 VQM Icons

Icon	Description
	Speakerphone with Acoustic Echo Cancellation.
	Speakerphone without Acoustic Echo Cancellation.
	Handset with Acoustic Echo Cancellation (device is in handset mode only while on a call).
	Headset while on a call (Acoustic Echo Cancellation is not enabled for Bluetooth headsets).
	Headset while not on a call.
	Bluetooth headset while on a call (Acoustic Echo Cancellation is not enabled for Bluetooth headsets). White icon.
	Bluetooth headset while not on a call. Gray icon.

Changing Audio Modes

Depending upon the audio mode being used, the mode can be changed by tapping the VQM icon in the title bar. The audio mode can only be changed only while the user is on a call.

The table below lists the current audio mode and the subsequent audio mode after tapping the VQM icon.

Table B-2 *Changing Audio Modes*

Audio Mode before Tapping VQM Icon	Audio Mode after Tapping VQM Icon
Speakerphone	Handset
Handset	Speakerphone
Bluetooth headset	Speakerphone

If the audio mode is set to speakerphone and the user taps the VQM icon, the audio mode changes to handset.

If the user is using a Bluetooth headset, tapping the VQM icon un-pairs the Bluetooth headset from the device causing the audio to be routed to the default mode. In VQM 2.5, there is no way to go back to the Bluetooth headset using the VQM icon if it is un-paired. The only way to reconnect the Bluetooth headset to the device is by using the BTExplorer application.

If the user taps the VQM icon when a wired headset is connected to the mobile device, the audio mode does not change. The audio continues to get routed to the wired headset.

If the user taps the VQM icon while not on a call there is not change to the audio mode.

Tap and hold the VQM icon in the title bar to display a notification dialog box that contains:

- AEC: The Acoustic Echo Canceller status
- DSCP Marked Packets: The number of outbound voice packets that have been recognized and marked as high priority by VQM.
- VQM Version: The VQM version number.



Figure B-2 *VQM Audio Control Dialog Box*

Voice Packet Prioritization

IP soft phones transmit voice packets in the same manner as any other application that sends data over the network. On a network with different types of traffic, voice packets are given the same priority as any other traffic, and therefore may be subject to delays.

WiFi Multi-media (WMM) is a solution to this problem. WMM is a specification that supports prioritizing traffic, and "higher-priority" packets can be given preferential treatment.

To make use of WMM, the devices that generate traffic must mark their packets as high or normal priority in a field in the IP packet called Differentiated Services Code-Point (DSCP). The wireless infrastructure, which must be configured to support WMM, gives a higher priority to packets that have been marked as high priority through DSCP marking by the devices that generate traffic.

VQM detects if there is an ongoing Voice over WiFi (VoWiFi) call, and if so, marks outgoing voice packets (Only outgoing voice packets can be marked. The incoming voice packets have already been through the network, so it makes no sense to mark them.) as high-priority using DSCP. This enables WMM-compatible wireless infrastructure to treat the voice packets preferentially. This results in fewer delays for voice packets, which in turn improves the call quality.

Limitations

- There is no VPN support in VQM.
- Only the Avaya softphone is currently supported.

Acoustic Echo Cancellation

Acoustic Echo occurs during a voice call when the audio from the earpiece enters the microphone of the same device. This results in the person at the other end hearing back a delayed version of his/her own voice ("Echo"). Needless to say, "Echo" is not desirable, and needs to be suppressed. This is the functionality performed by the Acoustic Echo Canceller (AEC). There are two approaches to suppressing the Echo:

- Turn the Acoustic Echo Canceller (AEC) on permanently. This approach is not very efficient because the device consumes more power when the AEC is on.
- Turn the Acoustic Echo Canceller (AEC) on only when there is an ongoing call.

VQM follows the second of the two approaches mentioned above.

VQM automatically turns on the Acoustic Echo Canceller (AEC) when the mobile device is in a VoWiFi call. When the call is terminated, VQM turns the AEC off. Note that the AEC is turned on for speakerphone and handset modes and does not get turned on for wired headset and Bluetooth headset modes. The AEC is not required for wired headset because the audio volume is quite low (because of the proximity of the earpiece to the ear), and therefore it is very unlikely for the audio from the earpiece to go in to the mouthpiece. Bluetooth headsets typically have an Echo Canceller built in. Turning the AEC on only while on a call saves battery power, compared to leaving the AEC turned on permanently.

The AEC is not turned on for Cellular calls because the WWAN phone application has a built-in echo canceller.

Disabling VQM

To disable VQM perform a warm boot.

Appendix C Keypads

Introduction

The MC95XX offers four types modular keypad configurations:

- Alpha Primary
- Alpha Numeric Wide
- Calculator Numeric
- Telephony Numeric.

Alpha Primary Keypad

The Alpha Primary keypad produces the 26-character alphabet (A-Z, both lowercase and uppercase), numbers (0-9), and assorted characters. The keypad is color-coded to indicate which modifier key to press to produce a particular character or action. The keypad default is lowercase alphanumeric. See [Table C-1](#) for key and button descriptions and [Table C-9 on page C-18](#) for the keypad's special functions.

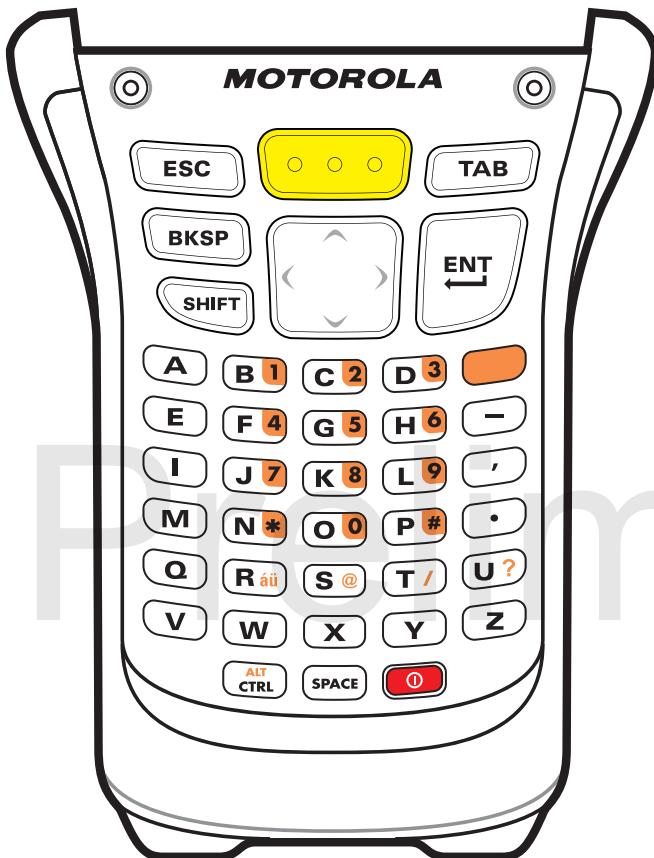


Figure C-1 Alpha Primary Keypad Configuration

Table C-1 Alpha Primary Keypad Descriptions

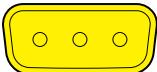
Key	Action
Orange Key 	Accesses the secondary layer of characters and actions (shown on the keypad in orange). Press the Orange key once to activate this mode temporarily, followed by another key. This illuminates the LED and displays the following icon at the bottom of the screen, until a second key is pressed:  Press the Orange key twice to lock this mode. This illuminates the LED and displays the following icon at the bottom of the screen:  Press the Orange key a third time to unlock.
Scan 	Activates the scanner/imager in a scan enabled application.
Navigation 	Moves up one item. Moves left one item when pressed with the Orange key. Moves down one item. Moves right one item when pressed with the Orange key.
Shift 	Changes the state of the alpha characters from lowercase to uppercase. <ul style="list-style-type: none">Press the Shift key to activate this mode temporarily, followed by another key. This displays the following icon at the bottom of the screen, until a second key is pressed: Press the Shift key twice to lock this mode. This displays the following icon at the bottom of the screen:  Press the Shift key a third time to unlock.
Backspace 	Produces a backspace.
Enter 	Executes a selected item or function.
CTRL 	Press and release the CTRL key to activate the keypad alternate CTRL functions. The  icon appears at the bottom of the screen. Press the Orange key followed by the CTRL key to activate the keypad alternate ALT functions. The  icon appears at the bottom of the screen.

Table C-1 Alpha Primary Keypad Descriptions (Continued)

Key	Action
SPACE 	Produces a space character.
ESC 	Exits the current operation.
TAB 	Move from one field to another.

Table C-2 Alpha Primary Keypad Input Modes

Key	Normal	Shift + Key	Orange + Key
A	a	A	
B	b	B	1
C	c	C	2
D	d	D	3
E	e	E	
F	f	F	4
G	g	G	5
H	h	H	6
I	i	I	
J	j	J	7
K	k	K	8
L	l	L	9
M	m	M	
N	n	N	*
O	o	O	0
P	p	P	#
Q	q	Q	
R	r	R	au

Note: An application can change the key functions. The keypad may not function exactly as described.

Table C-2 Alpha Primary Keypad Input Modes (Continued)

Key	Normal	Shift + Key	Orange + Key
S	s	S	@
T	t	T	/
U	u	T	?
V	v	V	
W	w	W	
X	x	X	
Y	y	Y	
Z	z	Z	
ENTER	Enter	Enter	Enter
TAB	Tab	Tab	Back tab
SPACE	Space	Space	Space
BKSP	Backspace	Backspace	Backspace

Note: An application can change the key functions. The keypad may not function exactly as described.

Alpha Numeric Wide Keypad

The Alpha Numeric keypad produces the 26-character alphabet (A-Z, both lowercase and uppercase), numbers (0-9), and assorted characters. The keypad is color-coded to indicate which modifier key to press to produce a particular character or action. The keypad default is lowercase alphanumeric. See [Table C-3](#) for key and button descriptions and [Table C-9 on page C-18](#) for the keypad's special functions.



Figure C-2 Alpha Numeric Wide Keypad Configuration

Table C-3 Alpha Numeric Wide Keypad Descriptions

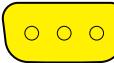
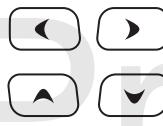
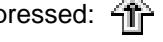
Key	Action
Orange Key 	Accesses the secondary layer of characters and actions (shown on the keypad in orange). Press the Orange key once to activate this mode temporarily, followed by another key. This illuminates the LED and displays the following icon at the bottom of the screen, until a second key is pressed:  Press the Orange key twice to lock this mode. This illuminates the LED and displays the following icon at the bottom of the screen:  Press the Orange key a third time to unlock.
Scan 	Activates the scanner/imager in a scan enabled application.
Navigation 	Moves up one item. Moves left one item when pressed with the Orange key. Moves down one item. Moves right one item when pressed with the Orange key.
Shift 	Changes the state of the alpha characters from lowercase to uppercase. <ul style="list-style-type: none">Press the Shift key to activate this mode temporarily, followed by another key. This displays the following icon at the bottom of the screen, until a second key is pressed: Press the Shift key twice to lock this mode. This displays the following icon at the bottom of the screen:  Press the Shift key a third time to unlock.
Backspace 	Produces a backspace.
Enter 	Executes a selected item or function.
CTRL 	Press and release the CTRL key to activate the keypad alternate CTRL functions. The  icon appears at the bottom of the screen. Press the Orange key followed by the CTRL key to activate the keypad alternate ALT functions. The  icon appears at the bottom of the screen.

Table C-3 Alpha Numeric Wide Keypad Descriptions (Continued)

Key	Action
SPACE 	Produces a space character.
ESC 	Exits the current operation.
TAB 	Move from one field to another.

Table C-4 Alpha Primary Keypad Input Modes

Key	Normal	Shift + Key	Orange + Key
1	1	!	1
2	2	@	2
3	3	#	3
4	4	\$	4
5	5	%	5
6	6	^	6
7	7	&	7
8	8	*	8
9	9	(9
0	0)	0
,	,	<	,
.	.	>	
A	a	A	?
B	b	B	+
C	c	C	-
D	d	D	*
E	e	E	/
F	f	F	=
G	g	G	!

Note: An application can change the key functions. The keypad may not function exactly as described.

Table C-4 Alpha Primary Keypad Input Modes (Continued)

Key	Normal	Shift + Key	Orange + Key
H	h	H	@
I	i	I	#
J	j	J	\$
K	k	K	%
L	l	L	&
M	m	M	:
N	n	N	(
O	o	O)
P	p	P	'
Q	q	Q	"
R	r	R	au
S	s	S	
T	t	T	
U	u	U	
V	v	V	
W	w	W	
X	x	X	
Y	y	Y	
Z	z	Z	
ENTER	Enter	Enter	Enter
TAB	Tab	Tab	Tab
SPACE	Space	Space	Space
BKSP	Backspace	Backspace	Backspace

Note: An application can change the key functions. The keypad may not function exactly as described.