

MC65 MOBILE COMPUTER INTEGRATOR GUIDE



MC65 MOBILE COMPUTER INTEGRATOR GUIDE

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Revision History

Changes to the original guide are listed below:

Change	Date	Description
-01 Rev A	9/2010	Initial release.
-01 Rev. B	3/2011	Correct scan button wake up on page 1-9.
-02 Rev. A	11/2011	Updates due to latest software, OEM version 02.31.00XX.
-02 Rev. B	06/30/12	Add Power off procedure, add new registry settings.
-03 Rev. A	3/2015	Zebra Rebranding

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ABOUT THIS GUIDE

Introduction

This *Integrator Guide* provides information about setting up and configuring the MC65 and its accessories.

✓ **NOTE** Screens and windows pictured in this guide are samples and can differ from actual screens.

Documentation Set

The documentation for the MC65 is divided into guides that provide information for specific user needs.

- **MC65 Quick Start Guide** - describes how to get the MC65 up and running.
- **MC65 User Guide** - describes how to use the MC65.
- **MC65 Integrator Guide** - describes how to set up the MC65 and its accessories.
- **Enterprise Mobility Developer Kit (EMDK) Help File** - provides API information for writing applications.

Configurations

This guide covers the following configurations:

Configuration	Radios	Display	Memory	Data Capture Options	Operating System	Keypads
MC659B	WLAN: 802.11 a/b/g WPAN: Bluetooth v2.0 EDR WWAN: CDMA or GSM/UMTS GPS: Stand-alone GPS or A-GPS	3.5" VGA Color	256 MB RAM/ 1 GB Flash or 512 MB RAM/1 GB Flash	2D imager or 2D imager and camera	Windows Mobile 6.5 Professional	Numeric, QWERTY, QWERTZ, AZERTY, PIM or DSD

Software Versions

This guide covers various software configurations and references are made to operating system or software versions for:

- Adaptation Kit Update (AKU) version
- OEM version
- Fusion version
- Phone version.

AKU Version

To determine the Adaptation Kit Update (AKU) version:

Tap **Start > Settings > System > About > Version**.

The second line lists the operating system version and the build number. The last part of the build number represents the AKU number. For example, *Build 23103.5.3.3* indicates that the device is running AKU version 5.3.3.

OEM Version

To determine the OEM software version:

Tap **Start > Settings > System > System Info > System**.



Fusion Software

To determine the Fusion software version:

Tap **Status Bar >  > Wireless Status > Versions**.

Phone Software

To determine the Phone software version:

Press  >  > **Phone information**.

Chapter Descriptions

Topics covered in this guide are as follows:

- [Chapter 1, Getting Started](#) provides information on MC65 configurations and accessories, charging the battery, and resetting the device.
- [Chapter 2, Accessories](#) describes the accessories available for the MC65 and how to set up power connections and battery charging capabilities, where applicable.
- [Chapter 3, ActiveSync](#) provides instructions on installing ActiveSync and setting up a partnership between the MC65 and a host computer.
- [Chapter 4, Application Deployment](#) provides information for provisioning and deploying applications to the MC65.
- [Chapter 5, Phone Setup](#) explains how to setup the phone on GCSM/UMTS and CDMA networks.

- [Chapter 6, Maintenance & Troubleshooting](#) includes instructions on cleaning and storing the MC65, and provides troubleshooting solutions for potential problems during MC65 operation.
- [Appendix A, Technical Specifications](#) includes tables listing the technical specifications for the MC65 and its accessories.

Notational Conventions

The following conventions are used in this document:

- “EDA” refers to Zebra MC65 family of hand-held computers.
- *Italics* are used to highlight the following:
 - chapters and sections in this and related documents
 - dialog box, window, and screen names
 - drop-down list and list box names
 - check box and radio button names
 - icons on a screen.
- **Bold** text is used to highlight the following:
 - key names on a keypad
 - button names on a screen.
- Bullets (•) indicate:
 - action items
 - lists of alternatives
 - lists of required steps that are not necessarily sequential.
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Documents

- *MC65 Quick Start Guide*, p/n 72-114971-xx.
- *MC65 Windows Mobile 6 Regulatory Guide*, p/n 72-134232-xx.
- *MC65 User Guide*, p/n 72E-133769-xx.
- *Mobility Services Platform 3.2 User Guide*, p/n 72E-100158-xx.
- *AirBEAM Smart Windows CE Client Product Reference Guide*, p/n 72-63060-01.
- *Wireless Fusion Enterprise Mobility Suite User Guide for Version 3.20*, p/n 72E-113153-01.
- *Enterprise Mobility Developer Kits (EMDKs)*, available at: <http://www.zebra.com/support>.
- Latest ActiveSync software, available at: <http://www.microsoft.com>.

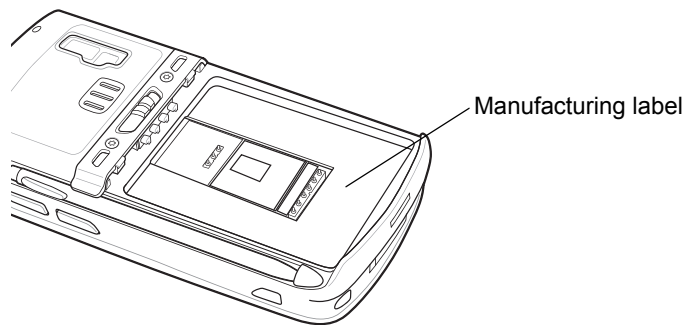
For the latest version of this guide and all guides, go to: <http://www.zebra.com/support>.

Service Information

If you have a problem with your equipment, contact Zebra Global Customer Support for your region. Contact information is available at: <http://www.zebra.com/support>.

When contacting support, please have the following information available:

- Serial number of the unit (found on manufacturing label)
- Model number or product name (found on manufacturing label)
- Software type and version number.



Zebra responds to calls by e-mail, telephone or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Global Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your business product from a Zebra business partner, contact that business partner for support.

CHAPTER 1 GETTING STARTED

Introduction

This chapter lists the parts and accessories for the MC65 and explains how to set up the MC65 for the first time.

Unpacking

Carefully remove all protective material from the MC65 and save the shipping container for later storage and shipping.

Verify that you received the following:

- MC65 EDA
- 3600 mAh Lithium-ion battery
- stylus with tether (installed)
- screen protector, installed on display window
- Regulatory Guide
- Quick Start Guide.

Inspect the equipment for damage. If any equipment is missing or damaged, contact the Zebra Global Customer Support center immediately. See [Service Information on page xiv](#) for contact information.

Prior to using the MC65 for the first time, remove the protective shipping film that covers the scan window, display and camera window.

Getting Started

To start using the MC65 for the first time:

- Install a microSD card (optional)
- Install the SIM card (GSM only)
- Install the main battery pack.
- Charge the MC65.
- Power on the MC65.

Installing a microSD Card

The microSD card slot provides secondary non-volatile storage. The slot is located under the battery pack. Refer to the documentation provided with the card for more information, and follow the manufacturer's recommendations for use.



CAUTION Follow proper ESD precautions to avoid damaging the SD card. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded.

To install the microSD card:

1. Remove the handstrap.
2. Lift rubber access door.
3. Slide the SIM card holder door up to unlock.
4. Lift SIM card holder door.

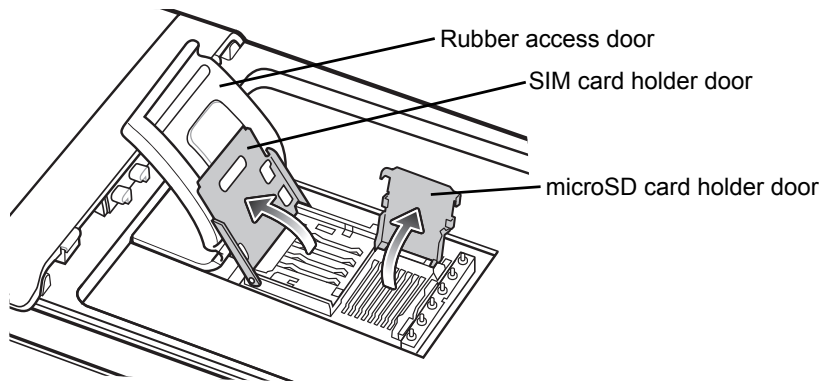


Figure 1-1 Lift SIM Slot Holder Door

5. Lift microSD card holder door.
6. Insert the microSD card into card holder door ensuring that the card slides into the holding tabs on each side of the door.

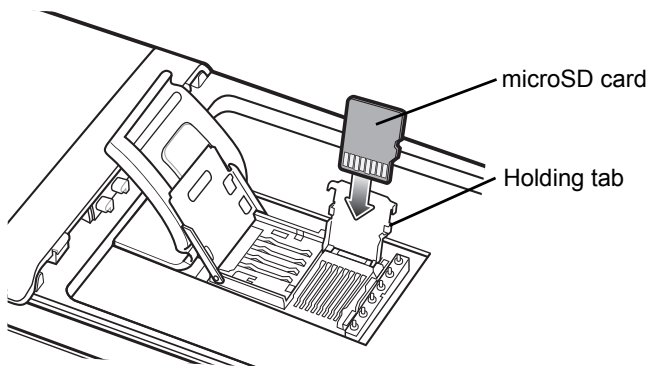


Figure 1-2 Insert microSD Card in Holder

7. Close the card holder door and push down until it is securely into place.
8. If installing a SIM card, proceed to [Installing the SIM Card](#).
9. Close SIM card holder door and slide down until it locks into place.
10. Close rubber access door.

Installing the SIM Card

- ✓ **NOTE** GSM only.
The MC65 does not support copying multiple contacts to some SIM cards. If an error message appears, see [Chapter 6, Maintenance & Troubleshooting](#) for more information.

GSM phone service requires a Subscriber Identification Module (SIM) card. Obtain the card from the your service provider. The card fits into the MC65 and can contain the following information:

- Mobile phone service provider account details.
- Information regarding service access and preferences.
- Contact information, which can be moved to Contacts on the MC65.
- Any additional services to which you have subscribed.

- ✓ **NOTE** For more information about SIM cards, refer to the service provider's documentation.

To install the SIM card:

1. Lift rubber access door.
2. Slide the SIM card holder up to unlock.
3. Lift the SIM card holder door.

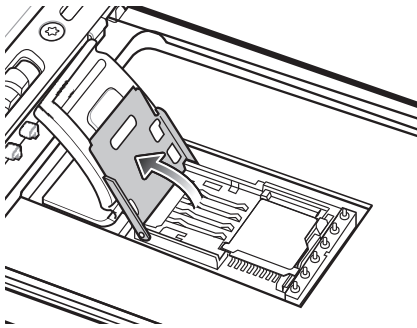


Figure 1-3 Lifting the SIM Cover

4. Insert the SIM card, as shown in [Figure 1-4](#) ensuring that the card slides into the holding tabs on each side of the door.

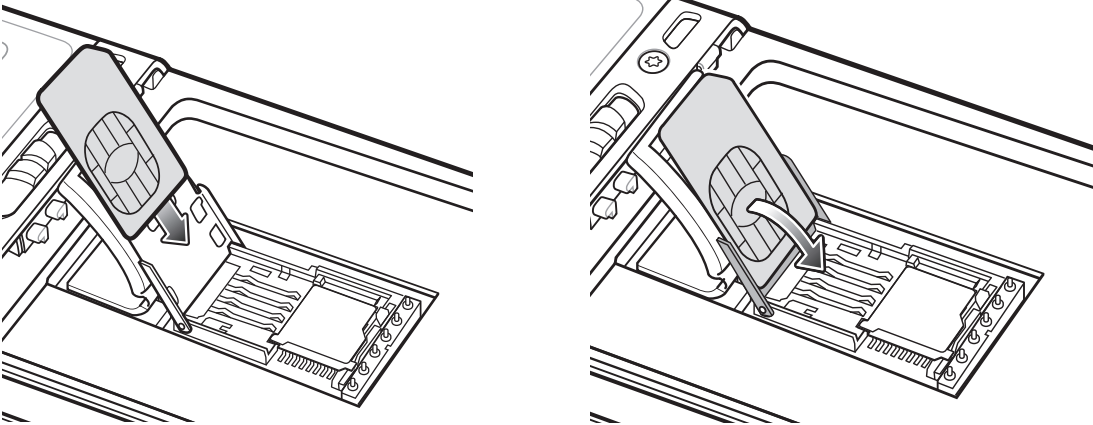


Figure 1-4 Inserting the SIM Card

5. Close SIM card holder door and slide down to lock into place.
6. Close the rubber access door.
7. Install the battery.

✓ **NOTE** For detailed information about WWAN activation and settings, refer to the *MC65 Integrator Guide*.

Installing the Battery

To install the battery.

1. Insert the battery, bottom first, into the battery compartment in the back of the MC65.
2. Press the battery down into the battery compartment until the battery release latch snaps into place.
3. Replace the handstrap.

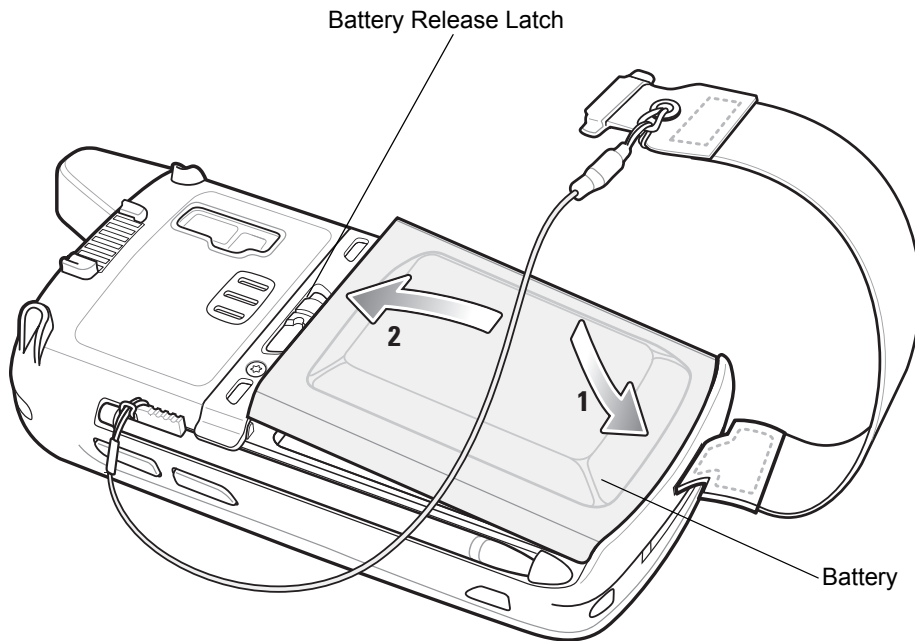


Figure 1-5 Inserting the Battery

Charging the Battery



CAUTION Ensure that you follow the guidelines for battery safety described in [Battery Safety Guidelines on page 6-2](#).

Charging the Main Battery

Before using the MC65 for the first time, charge the main battery until the amber Charging/Battery Status LED remains lit (see [Table 1-1 on page 1-6](#) for charge status indications). To charge the MC65, use a cable or a cradle with the appropriate power supply. For information about the accessories available for the MC65, see [Chapter 2, Accessories](#).

The MC65 is equipped with a memory backup battery which automatically charges from the fully-charged main battery. When using the MC65 for the first time, the backup battery requires approximately 40 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 MC65's main battery is removed. When the MC65 reaches a very low battery state, the combination of main battery and backup battery retains RAM data in memory for at least 36 hours.

For cable and cradle setup and charging procedures refer to the *MC65 Integrator Guide*.

- USB Charging Cable
- Charge Only Cable
- Single Slot USB Cradle
- Four Slot Charge Only Cradle
- Four Slot Ethernet Cradle.

To charge the main battery:

1. Connect the charging accessory to the appropriate power source.

2. Insert the MC65 into a cradle or attach to a cable. The MC65 begins charging. The Charging/Battery Status LED blinks amber while charging, then turns solid amber when fully charged. See [Table 1-1](#) for charging indications.

The 3600 mAh battery charges in less than six hours.

Table 1-1 LED Charge Indicators

Charging/Battery Status LED	Indication
Off	MC65 is not charging. MC65 is not inserted correctly in the cradle or connected to a power source. Charger/cradle is not powered.
Slow Blinking Amber (1 blink every 2 seconds)	MC65 is charging.
Solid Amber	Charging complete. Note: When the battery is initially inserted in the MC65, the amber LED flashes once if the battery power is low or the battery is not fully inserted.
Fast Blinking Amber (2 blinks/second)	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).

Charging Spare Batteries

See [Chapter 2, Accessories](#) for information on using accessories to change spare batteries.

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 MC65.

To accomplish this, for small periods of time, the MC65 or accessory alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 or accessory indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1](#).

Powering On the MC65

Press the Power button to turn on the MC65. The splash screen displays for about a minute as the MC65 initializes its flash file system, then the calibration window appears.

Calibrating the Screen

✓ **NOTE** The Calibration screen can be accessed by pressing **Blue** key then **Backspace** key.

To calibrate the screen so the cursor on the touch screen aligns with the tip of the stylus:

1. Remove the stylus from its holder on the side of the MC65.
2. Carefully press and briefly hold the tip of stylus on the center of each target that appears on the screen.
3. Repeat as the target moves around the screen, then tap the screen to continue.

Powering Off the MC65

✓ **NOTE** Only available on OEM version 02.31.002 and above.

To power off the MC65, press the Power button for five seconds. Tap **Power Off**.

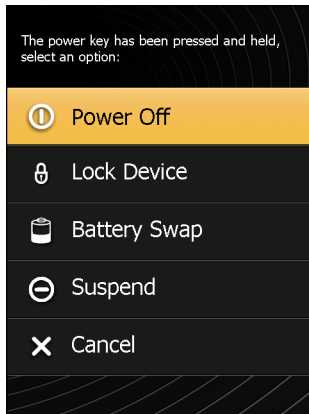


Figure 1-6 Power Key Menu

First-time Network Activation

Network Activation

To activate on a GSM/UMTS network:

1. If an active SIM card was installed in the MC65, the MC65 performs the activation process.
2. The **Phone Network - GSM/UMTS Setup** dialog box displays.
3. Tap **Yes** and then **OK**. For some carriers, the MC65 resets.
4. If during start-up, no update connection settings message appears, tap **Start > Settings > Connection > Phone Network Setup** and tap **Update Connection Settings** button.
5. If the network is unsupported, a message appears with links for manually setting the data connection and MMS settings.

To activate on a CDMA network:

1. Create an account with the CDMA carrier. Provide the MEID number (located on the back of the MC65 or tap **Start > Settings > System Display Info**) to the customer service representative.
2. If a SIM card was not installed, a **No SIM card found** dialog box displays.
3. Tap **OK**. The **Phone Network - CDMA Activation** dialog box displays.
4. Tap **Yes** to activate on a CDMA network.
5. On the **CDMA Setup** tab, tap the **Preferred network** option and select a network.
6. Tap **Yes**.
7. Tap the **Start Activation** button.
8. Tap **Yes** to activate.

9. Press **Activate Now** button.

For detailed information for configuring the phone and activating on a different network, see [Chapter 5, Phone Setup](#).

Replacing the Battery



CAUTION The MC65 backup battery retains data for up to 15 minutes. Replace the battery within 15 minutes to ensure that application states are maintained and that data is not lost.

1. If the MC65 is in suspend mode, press the red **Power** button to wake the device.
2. Press and hold the red **Power** button for approximately 5 seconds.
3. Release the **Power** button. On OEM version 02.31.00XX and above, tap **Battery Swap**. The Data Capture LED lights red.
4. When the LED turns off, remove the handstrap.
5. Slide the battery latch to the right. The battery ejects slightly.

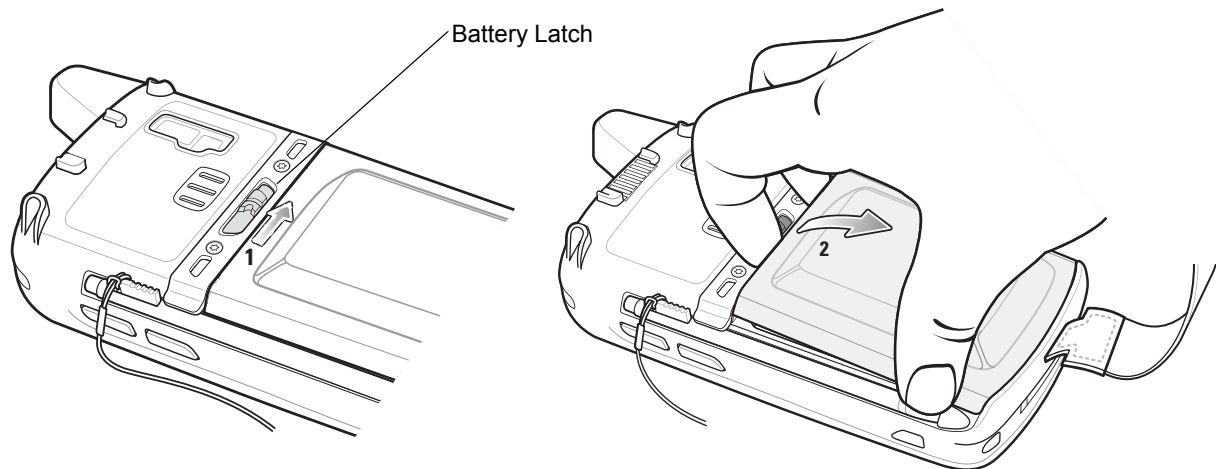


Figure 1-7 *Removing the Battery*







6. Lift the battery from the MC65.
7. Insert the replacement battery, bottom first, into the battery compartment in the back of the MC65.
8. Press the battery down until the battery release latch snaps into place.
9. Replace the handstrap.

Resetting the MC65

A reset restarts the MC65 by closing all running programs. Data saved in flash memory or a memory card is not lost.

If the MC65 is not functioning properly, perform a reset.

To perform a reset:

- On a numeric keypad, simultaneously press the red **Power** button and the  and  keys.
- On an alphanumeric keypad, simultaneously press the red **Power** button and the  and  keys.
- On a PIM keypad, simultaneously press the red **Power** button and the  and  keys.

Performing a Clean Boot



CAUTION A clean boot should only be performed by an authorized system administrator. You must connect the MC65 to AC power during a clean boot.

Removing AC power from the MC65 during a clean boot may render the MC65 inoperable.

A clean boot resets the MC65 to the factory default settings. All data in the **Application** folder is retained. You must download the Clean Boot Package file from the Support Central web site, <http://www.zebra.com/support> and install on the MC65.

To perform a clean boot:

1. Download the Clean Boot Package from the Support Central web site. Follow the instructions included in the package for installing the package onto the MC65.
2. Perform a reset.
3. Immediately, as soon as the device starts to boot and before the splash screen is visible, press and hold the left scan button.
4. Insert the MC65 into a powered cradle.
5. The MC65 updates and then resets.
6. Calibrate the screen.

Waking the MC65

The wake-up conditions define what actions wake up the MC65 after it has gone into suspend mode. The MC65 can go into suspend mode by either pressing the Power button or automatically by time-out settings

Table 1-2 Wake-up Default Settings

Condition for Wake-up	Power Button	Automatic Time-out
AC power is applied.	No	Yes
MC65 is inserted into a cradle.	Yes	Yes
MC65 is removed from a cradle.	Yes	Yes
MC65 is connected to a USB device.	No	Yes
MC65 is disconnected from a USB device.	No	Yes
A key is pressed.	No	No
The left scan trigger is pressed.	Yes	Yes

Table 1-2 Wake-up Default Settings

Condition for Wake-up	Power Button	Automatic Time-out
The screen is touched.	No	No
Bluetooth communication	Yes	Yes
Incoming phone call	Yes	Yes

CHAPTER 2 ACCESSORIES

Introduction

This chapter provides set up information for the MC65 various accessories listed in [Table 2-1](#):

Table 2-1 MC65 Accessories

Accessory	Part Number	Description
Cradles		
Single Slot USB Cradle	CRD5500-1000UR	Charges the MC65 main battery and a spare battery. Synchronizes the MC65 with a host computer through a USB connection.
Single Slot Ethernet/Modem/USB Cradle	CRD5500-1000XR	Charges the MC65 main battery and a spare battery. Synchronizes the MC65 with a host computer through an Ethernet, Modem or USB connection. Refer to the Zebra Support Central web site, http://www.zebra.com/support from required software.
Four Slot Charge Only Cradle	CRD5500-4000CR CRD5501-4000CR	Charges up to four MC65 devices.
Four Slot Ethernet Cradle	CRD5500-4000ER CRD5501-4000ER	Charges up to four MC65 devices and connects the MC65 with an Ethernet network.
Vehicle Cradle	VCD5500-1001R	Installs in a vehicle and charges the MC65 main battery.
Vehicle Holder	VCH5500-1000R	Provides an alternative mounting solution for the MC65 in a vehicle. Requires the Auto Charge cable for charging the MC65 battery.
Chargers		
Four Slot Spare Battery Charger	SAC5500-4000CR	Charges up to four MC65 battery packs.
USB Charging Cable	25-108022-02R	Provides power to the MC65 and USB communication with a host computer.
Charge Only Cable	25-112560-01R	Connects to a power supply to provide power to the MC65.
Auto Charge Cable	VCA5500-01R	Charges the MC65 using a vehicle's cigarette lighter.

Table 2-1 MC65 Accessories (Continued)

Accessory	Part Number	Description
Miscellaneous		
Spare 3600 mAh lithium-ion battery	BTRY-MC55EAB02	Replacement 3600 mAh battery.
DEX Cable	25-127558-01R	For use with electronic data exchange For example, vending machines.
Trigger Handle	TRG5500-101R	Adds a gun-style handle with a scanning trigger for comfortable and productive data capture.
Magnetic Stripe Reader	MSR5500-100R	Captures data from magnetic stripe cards.
Belt Mounted Rigid Holster	SG-MC5511110-01R	Clips onto belt to hold the MC65 when not in use.
Fabric Holster	SG-MC5521110-01R	Soft holder for added protection.
Stylus	KT-119150-03R KT-119150-50R	Replacement stylus (3-pack). Replacement stylus (50-pack).
Spring Loaded Stylus	STYLUS-00001-03R STYLUS-00001-10R	Optional spring loaded stylus (3-pack). Optional spring loaded stylus (10-pack).
Wall Mounting Kit	KT-136648-01R	Use for wall mounting the four slot cradles.
Screen Protector	KT-129195-03R	Package of 3 screen protectors.
Software	-	<i>Enterprise Mobility Developer Kits (EMDKs)</i> , available at: http://www.zebra.com/support .

Single Slot USB Cradle

This section describes how to set up and use a Single Slot USB cradle with the MC65. For USB communication setup procedures see [Chapter 3, ActiveSync](#).

The Single Slot USB cradle:

- Provides 5.4 VDC power for operating the MC65.
- Synchronizes information between the MC65 and a host computer. See [Chapter 3, ActiveSync](#) for information on setting up a partnership between the MC65 and a host computer.
- Charges the MC65's battery.
- Charges a spare battery.

Setup

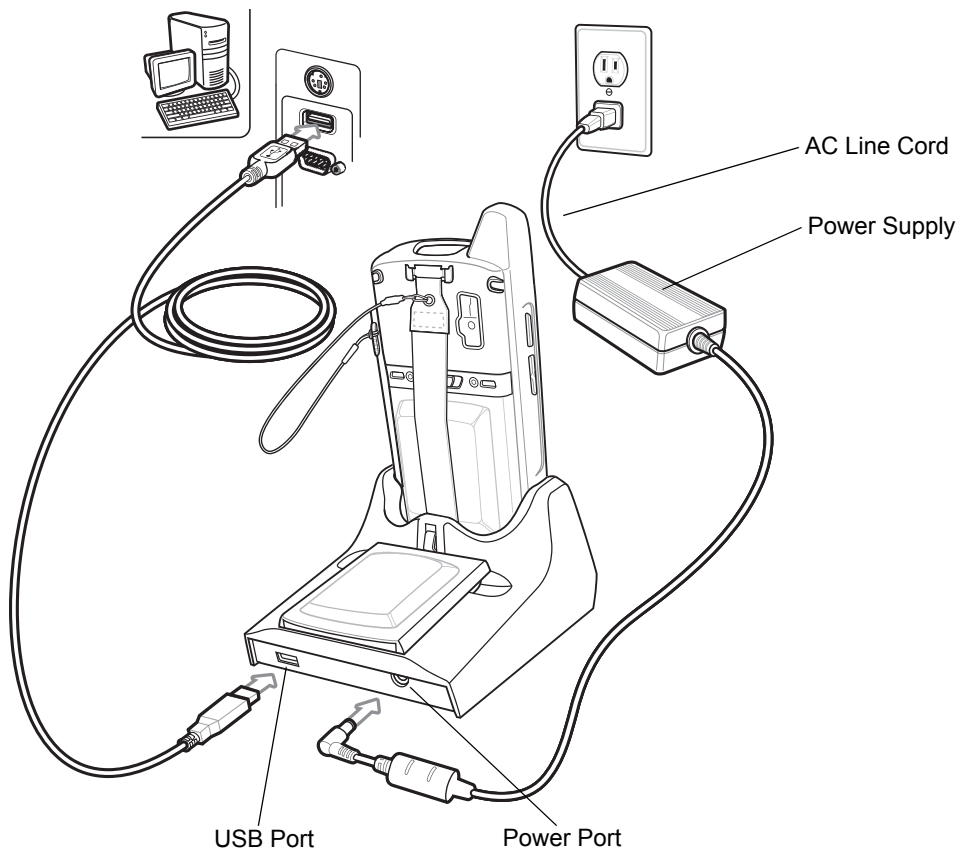


Figure 2-1 Single Slot USB Cradle Power and USB Connections

Charging the MC65 Battery

Connect the cradle to power. Insert the MC65 into the MC65 slot to begin charging.

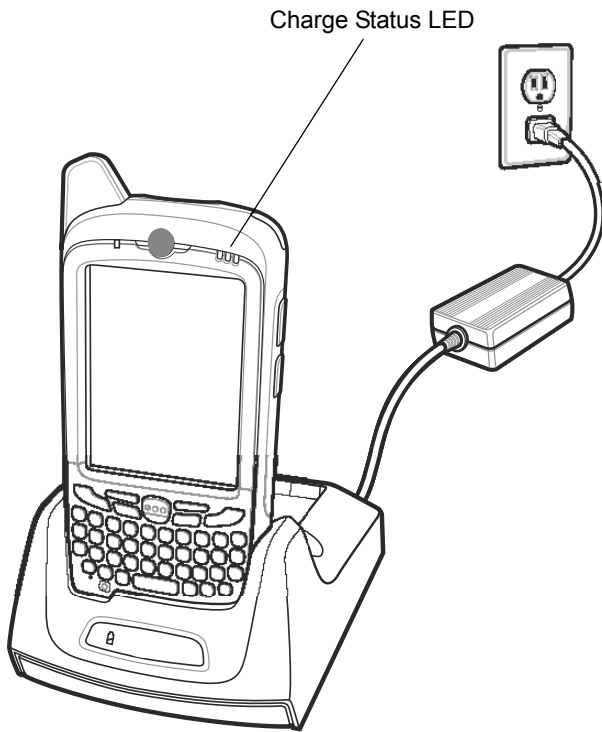


Figure 2-2 MC65 Battery Charging

Charging the Spare Battery

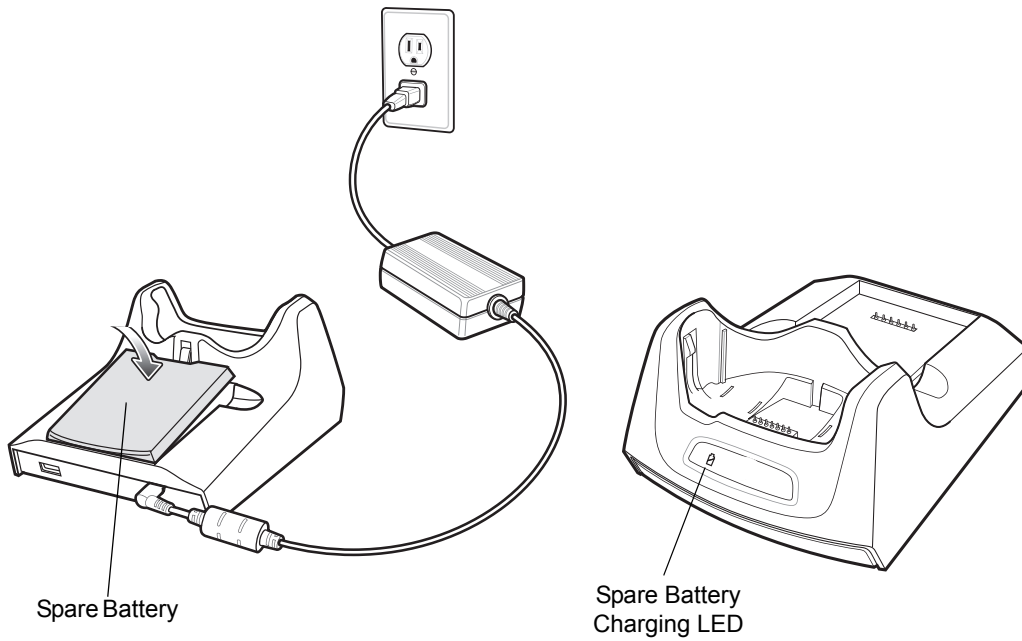


Figure 2-3 Spare Battery Charging

Battery Charging Indicators

The Single Slot USB cradle charges the MC65's main battery and a spare battery simultaneously.

The MC65's Charging/Battery Status LED indicates the status of the battery charging in the MC65. See [Table 1-1 on page 1-6](#) for charging status indications.

The spare battery charging LED on the cradle indicates the status of the spare battery charging in the cradle. See [Table 2-2](#) for charging status indications.

The 3600 mAh battery fully charges in approximately six hours.

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the MC65.

To accomplish this, for small periods of time, the MC65 or accessory alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 or accessory indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1 on page 1-6](#) and [Table 2-2](#).

Table 2-2 Spare Battery LED Charging Indicators

Spare Battery LED (on cradle)	Indication
Slow Blinking Amber	Spare battery is charging.
Solid Amber	Spare battery is fully charged.
Fast Blinking Amber	Charging error.
Off	Not charging.

Single Slot Ethernet/Modem/USB Cradle

This section describes how to set up and use a Single Slot Ethernet/Modem/USB cradle with the MC65. For USB communication setup procedures see [Chapter 3, ActiveSync](#).

The Single Slot Ethernet/Modem/USB cradle:

- Provides 5.4 VDC power for operating the MC65.
- Connects the MC65 to a host computer using USB, a dial-up network using the modem or an Ethernet network.
- Charges the MC65's battery.
- Charges a spare battery.

Required Software

Download the *USB Modem Driver and Update Loader Image Keyboard Micro Firmware for MC55xx* package from the Zebra Support Central web site: <http://www.zebra.com/support>.

First ensure that the MC65 has Keyboard Firmware version 4.2 or higher. To determine the Keyboard Firmware version, tap **Start > Settings > System > System Info** icon > **HW Version** tab. If the **Kbd FW Ver:** is 4.1 or lower, install the Keyboard Firmware 4.2 upgrade.

Install the Micro USB Modem Driver software. Following the instructions with the software package to install the software.

Country Settings

The modem defaults to operation with US telephone networks. To operate the modem with other country telephone networks, it must be configured using an application on the MC65. Download the *Cradle Modem Country Configurator Application Software for MC55xx* package from the Zebra Support Central web site: <http://www.zebra.com/support>.

Following the instructions with the software package to install the application on the MC65. The application includes country selections for all supported countries and automatically programs the modem and adjust its operating parameters to comply with the telephone network in the selected country.

Setup

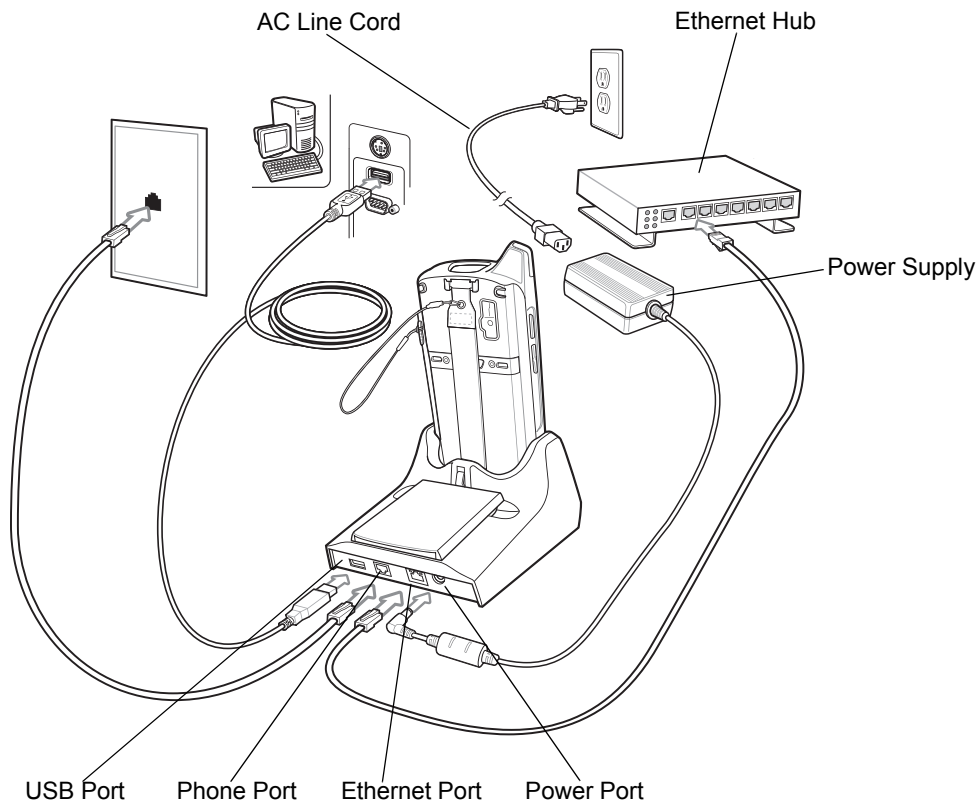


Figure 2-4 Cradle Setup

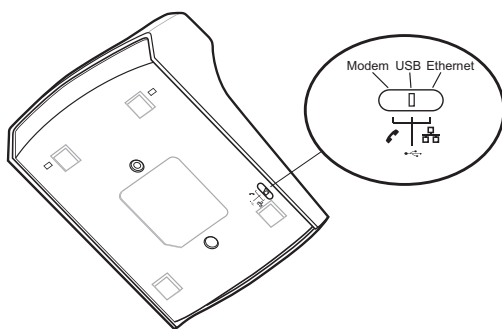


Figure 2-5 Connection Switch

Indicators

- **Spare Battery Charging LED** - Indicates the charging status of the spare battery.
- **Ethernet/Modem LED** - Blinks whenever Ethernet or modem connectivity is established.
- **Speed LED** - Lights green indicating that the transfer rate is 100 Mbps. When it is not lit, indicates that the transfer rate is 10Mbps.
- **Link LED** - Blinks yellow to indicate activity, or stays lit to indicate that a link is established. When it is not lit, indicates there is no link.

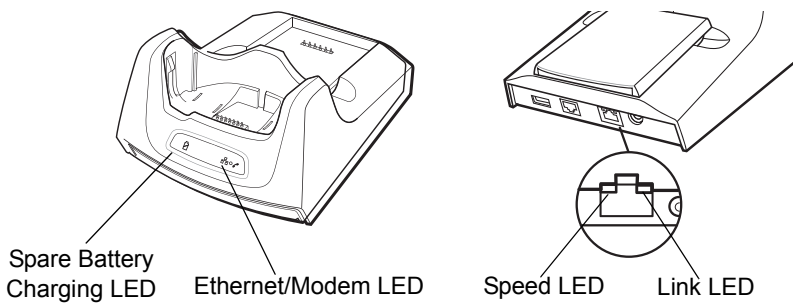


Figure 2-6 *Cradle Indicators*

MC65 Software Setup

Ethernet Setup

1. Tap **Start** > **Settings** > **Connections** tab > **Wi-Fi** icon.
2. Select **Work** from the drop-down menu.
3. Select **USB/Ethernet Series Adapter** from the list box.
4. Tap **Ok**.
5. Tap **Start** > **Settings** > **Connections** tab > **Connections** icon.
6. Tap **Advanced** tab.
7. Tap **Select Networks** button.
8. Select **My Work Network** from both drop-down menus.
9. Tap **Ok**.
10. Tap the **Tasks** tab.
11. Select **Edit my proxy server**.
12. Enable both checkboxes.
13. Tap **Advanced...** button.
14. Tap **HTTP** type.
15. In the **Server** text box, enter the proxy server name.
16. In the **Port** text box, enter the port number.
17. In the **User name** text box, enter the user name for the proxy server.
18. In the **Password** text box, enter the password for the proxy server.
19. Tap **ok** three times.
20. Perform a warm boot.

Modem Setup

1. Tap **Start** > **Settings** > **Connections** tab > **Connections** icon.
2. Tap **Add a new modem connection**.

3. In the **Enter a name for the connection** text box, enter a name for the connection.
4. In the **Select a modem** drop-down list, select Modem Cradle on USB.
5. Tap **Next**.
6. In the text box, enter the phone number to dial.
7. Tap **Next**.
8. In the **User name** text box, enter the user name, if required.
9. In the **Password** text box, enter the password, if required.
10. Tap **Finish**.
11. To test the connection, tap **Start > Programs > Internet Explorer**. Enter a web address.

Four Slot Ethernet Cradle

This section describes how to set up and use a Four Slot Ethernet cradle with the MC65.

The Four Slot Ethernet cradle:

- Provides 5.4 VDC power for operating the MC65.
- Connects the MC65 (up to four) to an Ethernet network. The CRD5500-4000ER provides a maximum of 100 Mbps data rate. The CRD5501-4001ER provides a maximum of 1 Gbps data rate.
- Simultaneously charges up to four MC65s.

You cannot ActiveSync using the Four Slot Ethernet cradle. To ActiveSync with a host computer, use the Single Slot USB/Serial cradle, USB Charging cable or Serial Charging cable.

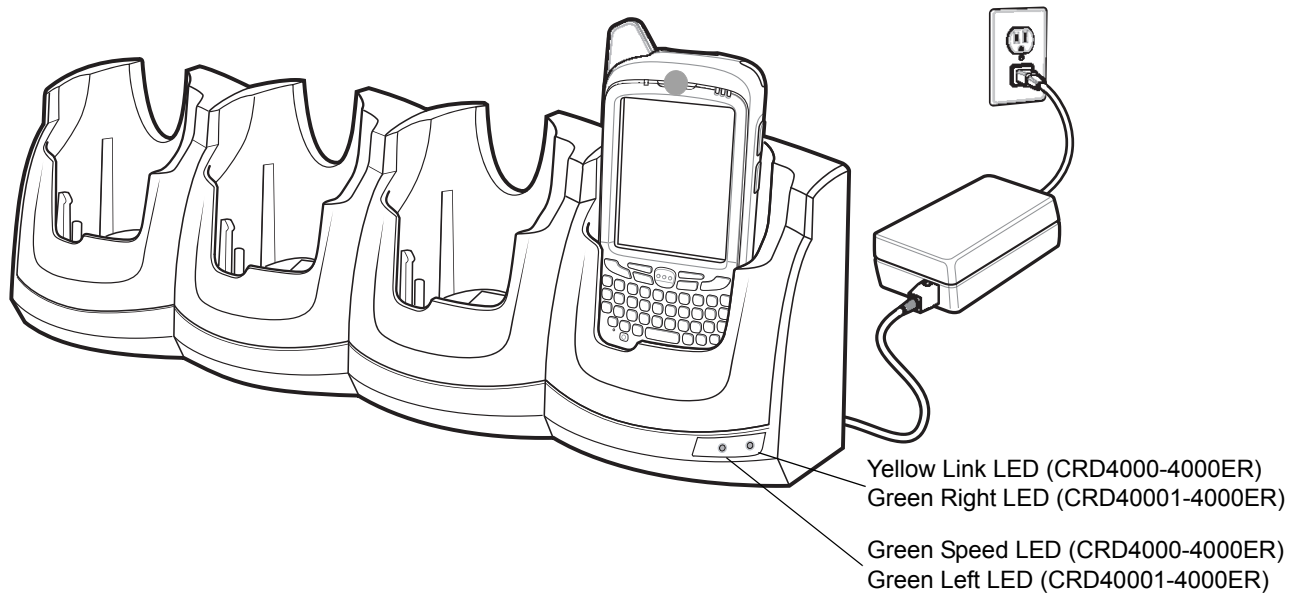


Figure 2-7 *Four Slot Ethernet Cradle*

Setup

Connect the Ethernet cradle to a power source and to an Ethernet switch, router, or hub, or a port on the host device.

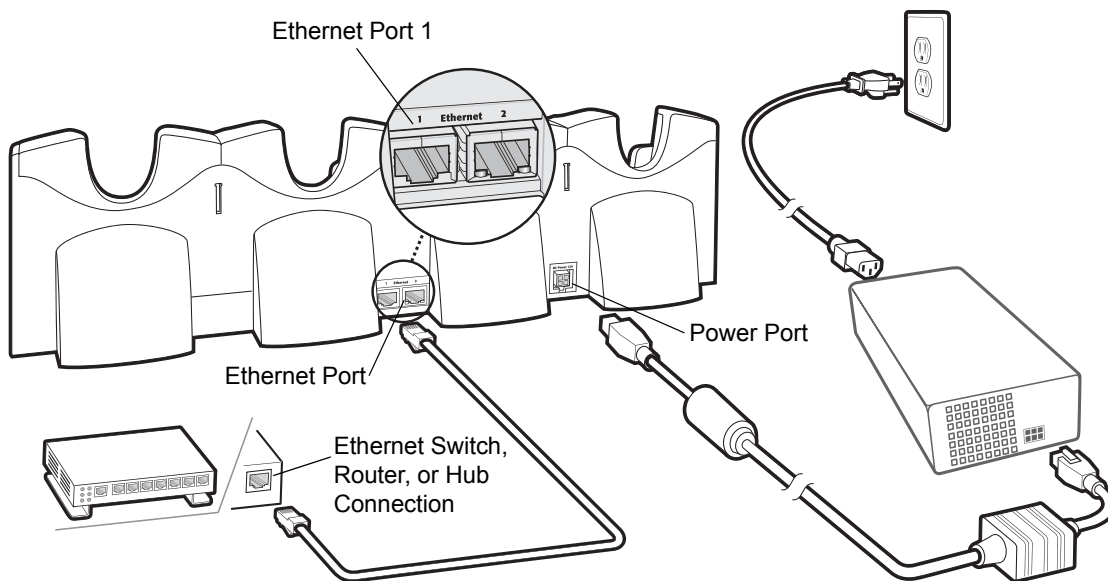


Figure 2-8 Four Slot Ethernet Cradle Connection

Daisychaining Ethernet Cradles

Daisychain up to four Ethernet cradles to connect several cradles to an Ethernet network. Use either a straight or crossover cable. Daisy-chaining should not be attempted when the main Ethernet connection to the first cradle is 10 Mbps as throughput issues will almost certainly result.

To daisychain more than one Ethernet cradle:

1. Connect power to each Ethernet cradle to daisychain.
2. Connect an Ethernet cable to Port 1 of the first cradle as shown in [Figure 2-8](#).
3. Connect a second Ethernet cable between Port 2 of the first cradle, and Port 1 of the second cradle.
4. Connect additional cradles as described in Step 3.

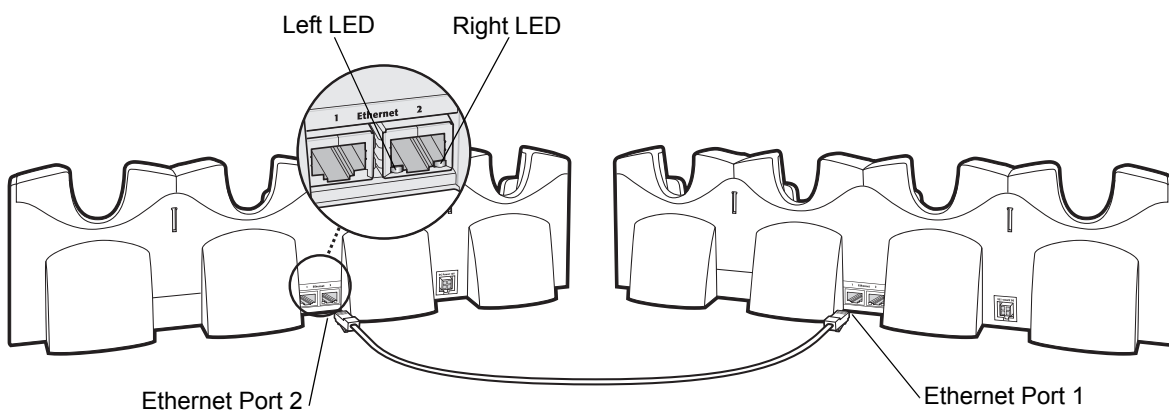


Figure 2-9 Daisychaining Four Slot Ethernet Cradles

Ethernet Cradle Drivers

The MC65 includes Ethernet cradle drivers that initiate automatically when you place the MC65 in a properly connected Four Slot Ethernet cradle. After inserting the MC65, configure the Ethernet connection:

1. Tap **Start > Settings > Connections tab >WiFi icon**. The **Configure Network Adapters** window appears.

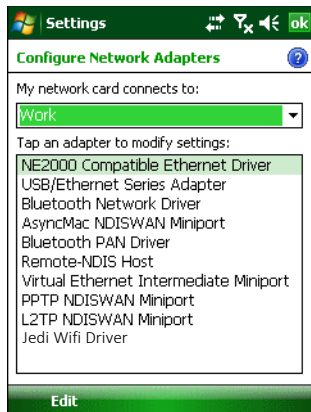


Figure 2-10 *Configure Network Adapters Window*

2. In the **My network card connects to:** drop-down list, select the appropriate connection.
3. In the **Tap an adapter to modify settings:** list, select **USB/Ethernet Series Adapter**.

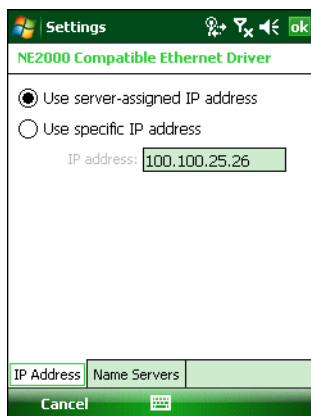


Figure 2-11 *IP Address Tab*

4. In the **IP address** window, select the appropriate radio button:
 - **Use server-assigned IP address**
 - or
 - **Use specific IP address.** Enter the IP address, Subnet mask, and Default gateway, as needed.
5. Tap the **Name Servers** tab.

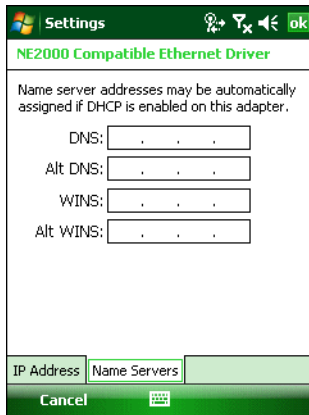


Figure 2-12 Name Servers Tab

6. Enter the appropriate DNS, Alt DNS, WINS, and Alt WINS server addresses.
7. Tap **ok**.

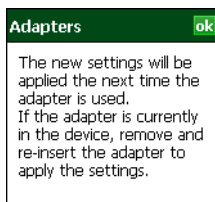


Figure 2-13 Adapters Dialog Box

8. Tap **ok** to confirm the setup.
9. Tap **ok** to exit.

Charging and Communication

Insert the MC65 into a slot to begin charging.

LED Charging Indicators

The MC65's charge LED shows the status of the battery charging in the MC65. See [Table 1-1 on page 1-6](#) for charging status indications.

The 3600 mAh battery fully charges in approximately six hours.

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the MC65.

To accomplish this, for small periods of time, the MC65 alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1 on page 1-6](#).

LED Communication Indicators (CRD5500-4000ER)

There are two LEDs on the front of the cradle and two on the Ethernet 2 port. The green Speed LED lights to indicate that the transfer rate is 100 Mbps. When the LED is not lit the transfer rate is 10 Mbps. The yellow Link LED blinks to indicate activity, or stays lit to indicate that a link is established. When it is not lit it indicates that there is no link.

Table 2-3 CRD5500-4000ER LED Indicators

Data Rate	Green Speed LED (Left)	Yellow Link LED (right)
100 Mbps	On	On/Blink
10 Mbps	Off	On/Blink

LED Communication Indicators (CRD5501-4000ER)

There are two green LEDs on the front of the cradle and two green LED on the Ethernet 2 port. These green LEDs light and blink to indicate the data transfer rate. When the LEDs are not lit the transfer rate is 10 Mbps.

Table 2-4 CRD5501-4000ER LED Indicators

Data Rate	Left LED (Green)	Right LED (Green)
1 Gbps	On/Blink	Off
100 Mbps	Off	On/Blink
10 Mbps	Off	Off

Four Slot Charge Only Cradle

This section describes how to set up and use a Four Slot Charge Only cradle with the MC65.

The Four Slot Charge Only cradle:

- Provides 5.4 VDC power for operating the MC65.
- Simultaneously charges up to four MC65s.

You cannot ActiveSync using the Four Slot Charge Only cradle. To ActiveSync with a host computer, use the Single Slot USB cradle.

Setup

Connect the Four Slot Charge Only cradle to a power source.

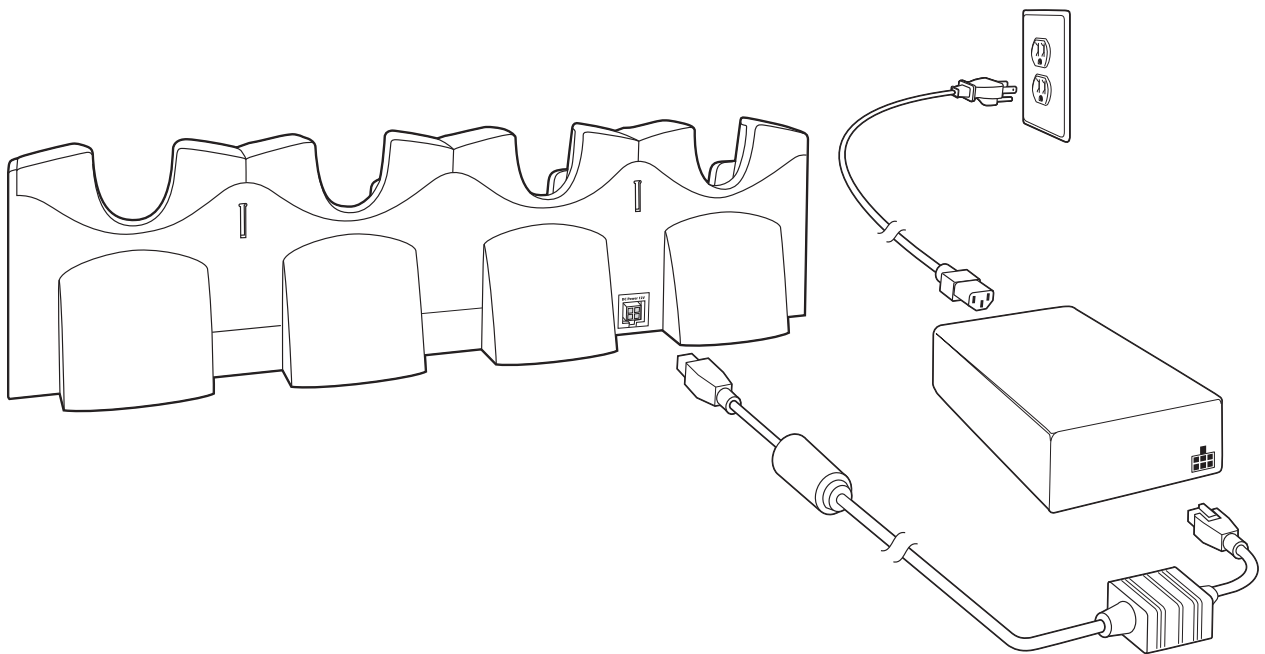


Figure 2-14 *Four Slot Charge Only Cradle Connection*

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the MC65.

To accomplish this, for small periods of time, the MC65 alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1 on page 1-6](#).

Wall Mount Bracket

Use the optional Wall Mount Bracket to mount a four slot cradle to a wall. To attach the Wall Mount Bracket:

1. Use the Wall Mount Bracket as a template and mark the locations of the four mounting screws.

✓ **NOTE** Use fasteners appropriate for the type of wall and the Wall Mount Bracket mounting slots. The Wall Mount Bracket mounting slots are designed for a fastener with a #8 pan head. Fasteners must be able to hold a minimum of 4.9 Kg (10.8 lbs).

2. Mount the fasteners to the wall. The screw heads should protrude about a half of an inch from the wall.
3. Slip the Wall Mount Bracket over the screw heads and slide the bracket down over the screw heads.
4. Tighten the screws to secure the bracket to the wall.

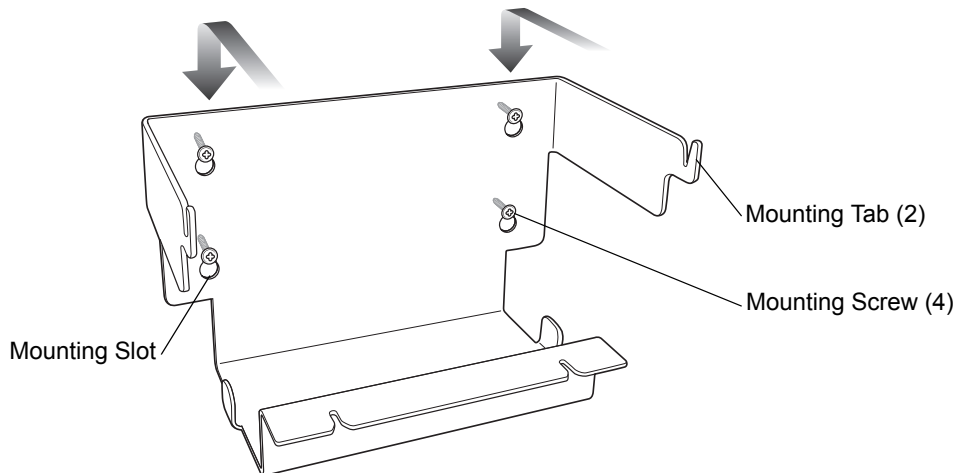


Figure 2-15 Wall Mount Bracket

To mount a four slot cradle:

1. Screw the supplied screws into the bottom of the four slot cradle. The screw heads should protrude about a quarter of an inch from the cradle.

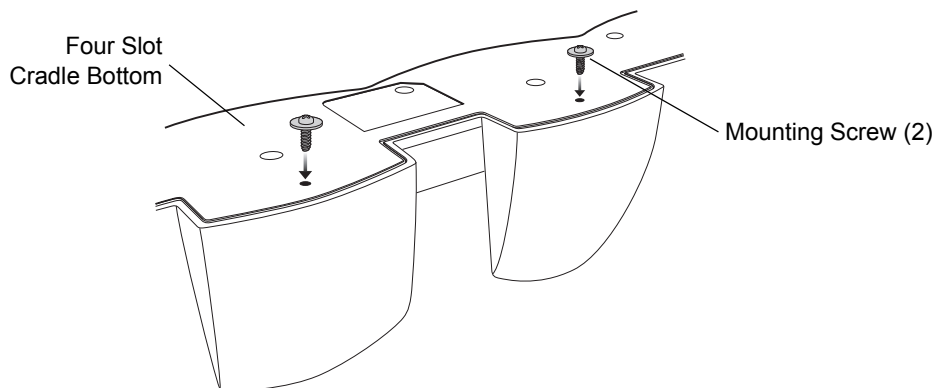


Figure 2-16 Cradle Mounting Screws

2. Align the Wall Mount Bracket mounting tabs with the mounting slots in the back of the four slot cradle. Slip the two mounting tabs into mounting slots.

3. Swing the four slot cradle down onto the mounting bracket and align the mounting screws so that they fit into the screw slots.

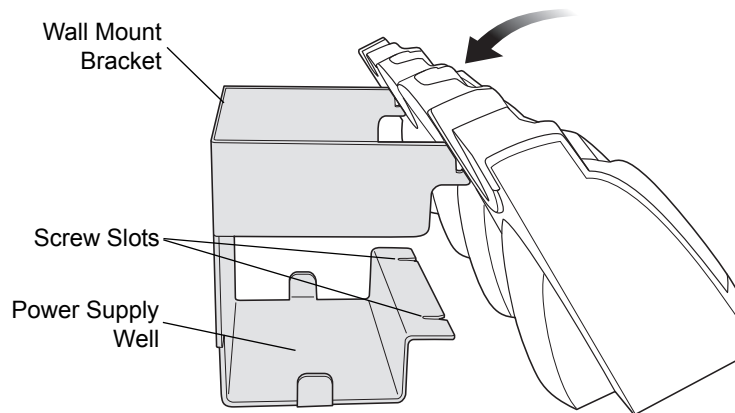


Figure 2-17 Wall Mount Bracket

4. Tighten the mounting screws to secure the four slot cradle to the bracket.

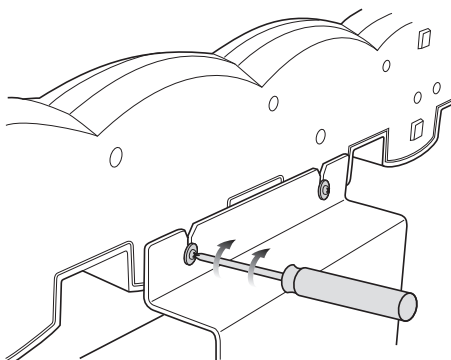


Figure 2-18 Mounting Screws

5. Connect power (see [Figure 2-14 on page 2-15](#)). The power supply should be located in the power supply well.

VCD5500 Vehicle Cradle

This section describes how to set up and use a VCD5500 vehicle cradle with the MC65.

Once installed in a vehicle, the cradle:

- holds the MC65 securely in place
- provides power for operating the MC65
- re-charges the battery in the MC65.

Requirements

For mounting:

- four #8-32 self-locking nuts
- four #8 washers
- a drill with a #6 drill bit (.204”).

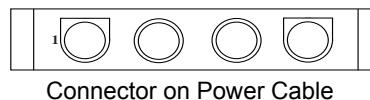
For power connection:

- power input cable (optional), p/n 25-61987-01R or 25-128974-01R
- UL Listed in-line fuse rated 250V, 5A (included), must be used if not connecting to vehicle's fuse panel
- in-line fuse holder (included), must be used if not connecting to vehicle's fuse panel.

Connector Pin-Outs

Table 2-5 Power Input Cable

Pin	Signal
1	Chassis ground (Black Wire)
2	Chassis ground (Bare Wire)
3	V+ (Red Wire)
4	V+ (Red Wire)



CAUTION ROAD SAFETY - Do not use the MC65 while driving. Park the vehicle first. Always ensure the MC65 is fully inserted into the cradle. Do not place it on the seat or where it can break loose in a collision or sudden stop. Lack of proper insertion may result in property damage or personal injury. Zebra. is not responsible for any loss resulting from the use of the products while driving. Remember: Safety comes first.

Mounting the Cradle



CAUTION Only mount the Vehicle Cradle in a vertical position with the release level at the top or in a horizontal position with the MC65 display facing up. Never mount the vehicle cradle on the side or upside down or on a wall that can be subject to impact or collision of greater than 40Gs, in accordance with SAE J1455 Section 4.10.3.5

1. Select a mounting location for the cradle. It should be flat, and must provide adequate support for the cradle.

✓ **NOTE** If using the GPS functionality of the MC65, ensure that the vehicle cradle is positioned so that the MC65 has a clear unobstructed view of the sky.

2. Prepare the mounting surface to accept four #8-32 studs, using the mounting template below. Drill four holes with a #6 drill bit.

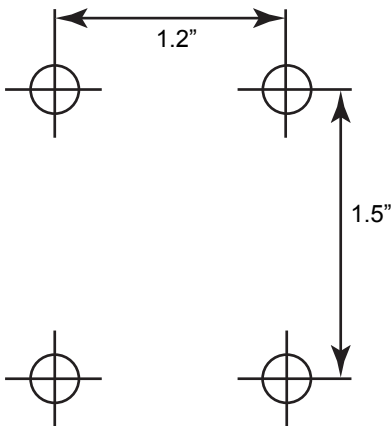


Figure 2-19 Vehicle Cradle Mounting Template

3. Position the cradle on the mounting surface.
4. Fasten it using four #8 washers and four #8-32 self-locking nuts.

⚠ **CAUTION** Do not install a VCD5500 Vehicle Cradle on or near an air bag cover plate or within an aerobic zone. Also, do not install it in a location that affects vehicle safety or driveability.

Power Connection

Please read all of the following instructions before beginning.

⚡ **WARNING!** A properly trained technician must perform the power connection. Improper connection can damage your vehicle, cradle or MC65. Refer to the vehicle's Owner's Manual for instructions for removing power.

To connect the cradle to power:

⚠ **CAUTION** When setting up connection for this cradle, only use the power input cable, part number 25-61987-01R or 25-128974-01R.

1. Locate the vehicle power source.

✓ **NOTE** The ideal location for connecting the vehicle cradle power input cable would be an accessory output in your vehicle's fuse panel. The vehicle cradle should be added to a circuit with a maximum load capacity for the cradle and the original circuit. Refer to the vehicle's *Owner's Manual* for identification of the circuit. If a fused output is not available, the vehicle cradle must be installed with the provided in-line fuse holder and UL Listed 5A fuse. The fuse protects the vehicle from an electrical short on the power line to the cradle.

To use the cradle to charge the MC65 and spare battery, when the vehicle's ignition is off, connect the cradle to unswitched power.

2. Route the power input cable from the cradle's power port to the connection point for the vehicle's power source.



CAUTION The means of routing and securing the power input cable from the cradle through to the vehicle power source is extremely important. Hazards associated with improper wiring can be severe. To avoid unintentional contact between the wire and any sharp edges, provide the cable with proper bushings and clamping where it passes through openings. If the wire is subjected to sharp surfaces and excess engine vibration, the wiring harness insulation can wear away, causing a short between the bare wire and chassis. This can start a fire. To avoid any mishaps, all wiring should be routed away from moving parts, high temperature areas and any contaminants.

3. When using the supplied in-line fuse holder (which must be used if not connecting to vehicle's fuse panel):
 - a. Ensure the fuse holder contains a 5A UL Listed slow-blow fuse.
 - b. Splice the fuse holder to the end of the red V+ wire, as shown above. Make the distance from the fuse to the power connection point as short as possible.

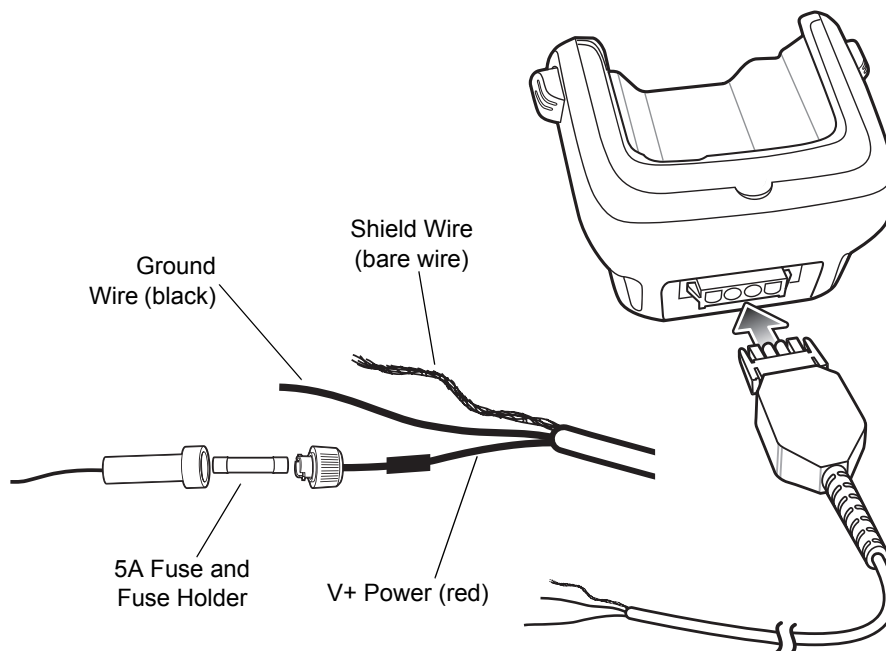


Figure 2-20 Vehicle Cradle Power Connection

4. Prepare the cable termination.
 - a. Red wire: connect to a +12/24 V vehicle power source.
 - b. Black wire and Shield wire: connect to vehicle ground wire or chassis ground.



NOTE How the cable terminates depends on the vehicle. If the vehicle has a power output connector, then you must attach a mating connector to the end of the power cable. You may be able to connect to a fuse panel with a simple blade terminal or commercially available connector. Consult the vehicle *Owner's Manual* for information on how to access the power supply in the vehicle.

5. Connect the power input cable into the power port on the cradle.

To see if the cradle has power, insert the MC65. The Charging LED on the MC65 blinks slowly to indicate charging and turns solid amber when the battery is completely charged. See [Table 1-1 on page 1-6](#) for other indications.

Charging the MC65 Battery

Insert the MC65 into the vehicle cradle to begin charging. A click indicates that the MC65 button release locking mechanism is enabled and the MC65 is locked in place.

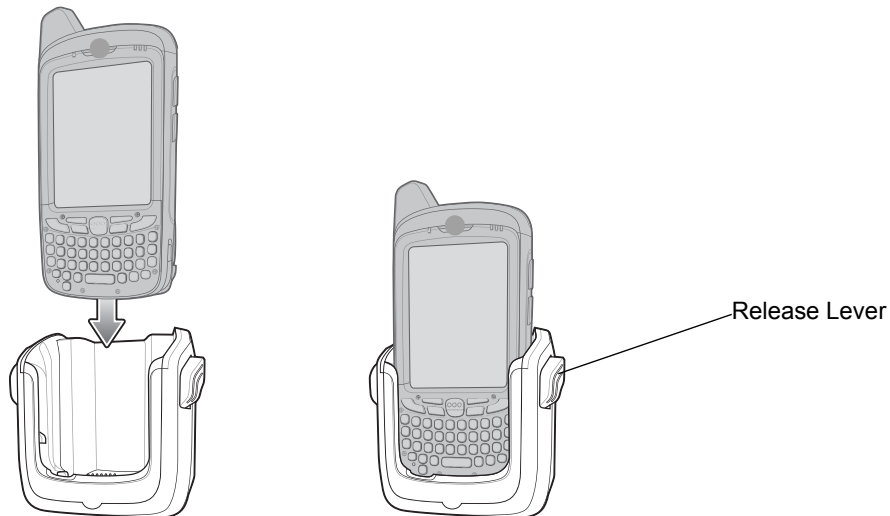


Figure 2-21 MC65 Battery Charging



CAUTION Ensure the MC65 is fully inserted in the cradle. Lack of proper insertion may result in property damage or personal injury. Zebra is not responsible for any loss resulting from the use of the products while driving.

Removing the MC65

To remove the MC65, press the release levers on the cradle and pull the MC65 up and out of the cradle.

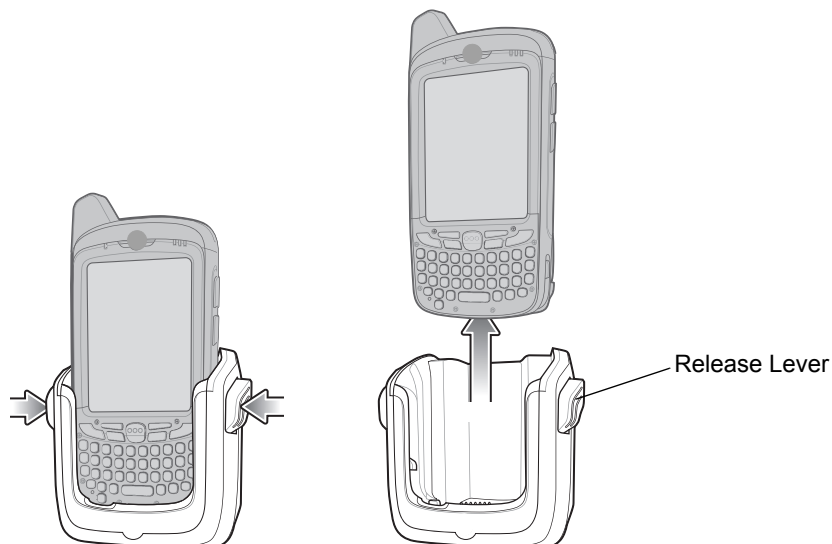


Figure 2-22 Removing the MC65

Battery Charging Indicators

The MC65's charge LED indicates the status of the battery charging in the MC65. See [Table 1-1 on page 1-6](#) for charging status indications.

The 3600 mAh battery charges in approximately six hours.

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the MC65.

To accomplish this, for small periods of time, the MC65 alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1 on page 1-6](#).

Four Slot Battery Charger

This section describes how to use the Four Slot Battery Charger to charge up to four MC65 spare batteries.

Spare Battery Charging

1. Connect the charger to a power source.
2. Insert the spare battery into a spare battery charging well and gently press down on the battery to ensure proper contact.

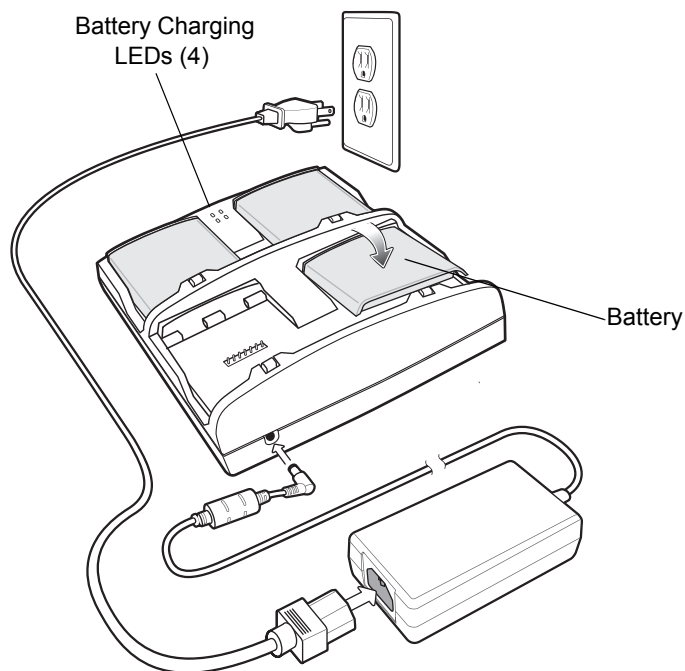


Figure 2-23 Four Slot Spare Battery Charger

Battery Charging Indicators

An amber LED is provided for each battery charging well. See [Table 2-6](#) for charging status indications. The 3600 mAh battery charges in approximately six hours.

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the charger in order to ensure safe operation and optimize long-term battery life.

To accomplish this, for small periods of time, the charger alternately enables and disables battery charging to keep the battery at acceptable temperatures. The charger indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 2-6](#).

Table 2-6 *Spare Battery LED Charging Indicators*

LED	Indication
Off	No spare battery in slot; spare battery not placed correctly; cradle is not powered.
Fast Blinking Amber	Error in charging; check placement of spare battery.
Slow Blinking Amber	Spare battery is charging.
Solid Amber	Charging complete.

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
- Charge Only cable
- Auto Charge cable.

USB Charging Cable

The USB Charging cable provides the MC65 with operating and charging power when used with the Zebra approved power supply and AC line cord and synchronize information between the MC65 and a host computer.

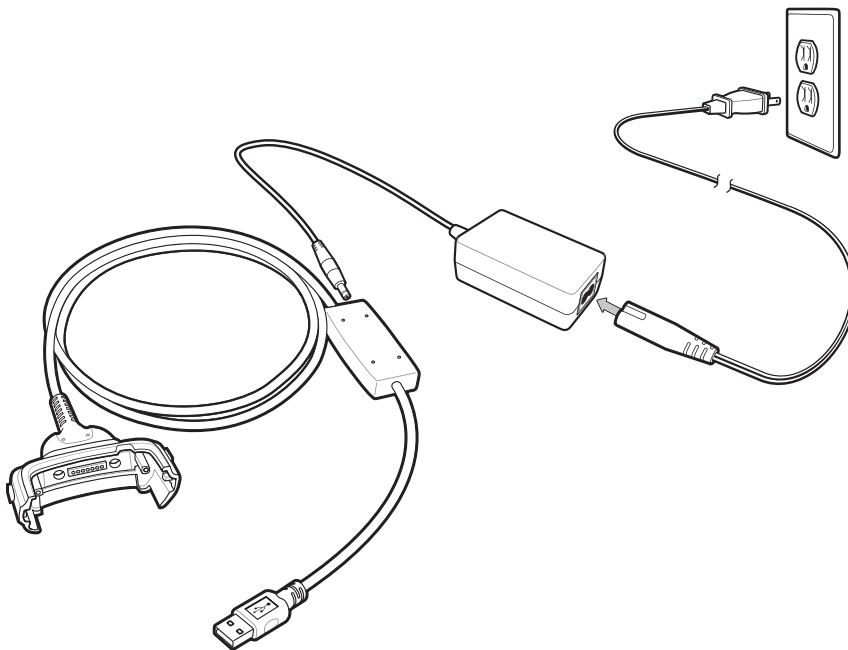


Figure 2-24 *USB Charging Cable*

Charge Only Cable

The Charge Only cable provide the MC65 with operating and charging power when used with the Zebra approved power supply.

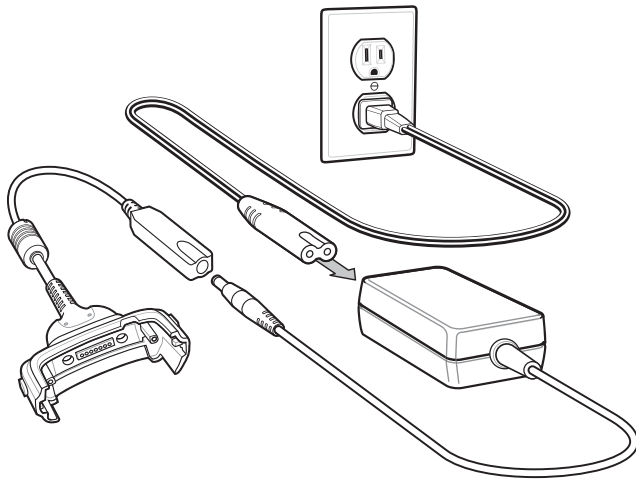


Figure 2-25 Charge Only Cable

Auto Charge Cable

The Auto Charge cable plugs into a vehicle cigarette lighter and provide the MC65 with operating and charging power.

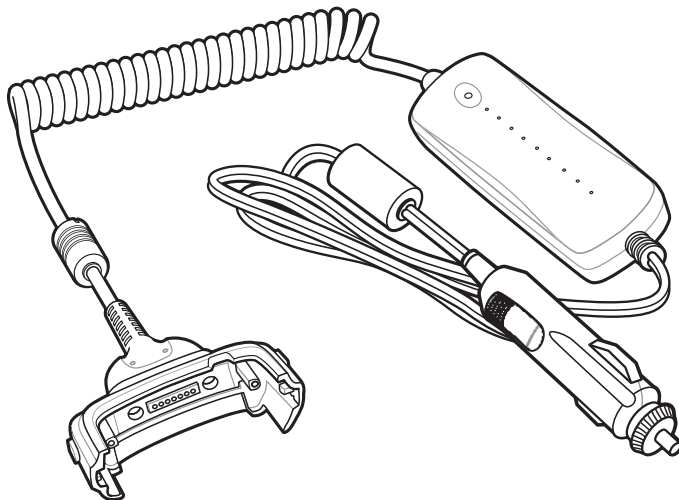


Figure 2-26 Auto Charge Cable

Connecting to the MC65

1. If required, connect the cable power input connector to the Zebra approved power source.
2. Slide the bottom of the MC65 into the connector cup end of the cable until the MC65 is firmly seated in the cup.
3. Slide the two locking tabs up until they both lock into position.

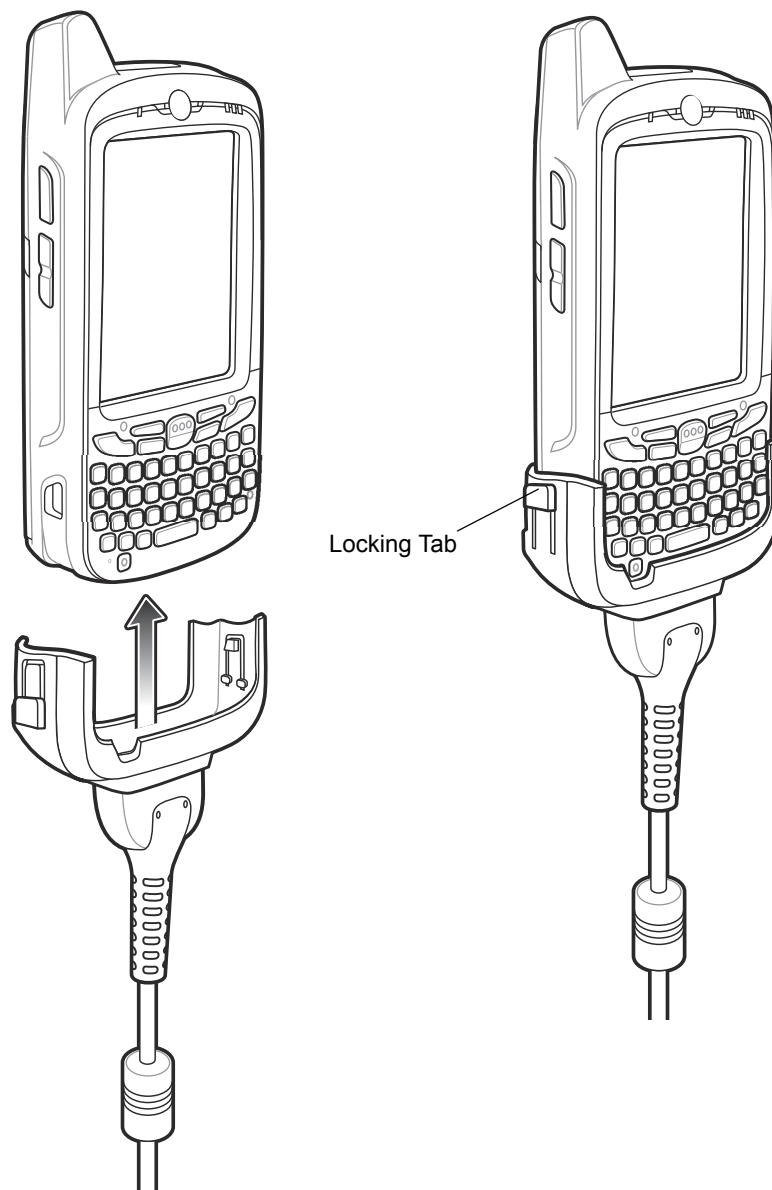


Figure 2-27 Cable Cup Locking Tabs

4. To remove, slide the two locking tab down and remove the cable from the MC65.

Battery Charging Indicators

The MC65 amber Charge LED indicates the MC65 battery charging status. The 3600 mAh battery charges in less than six hours. See [Table 1-1 on page 1-6](#) for charging status indications.

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). Charging is intelligently controlled by the MC65.

To accomplish this, for small periods of time, the MC65 alternately enables and disables battery charging to keep the battery at acceptable temperatures. The MC65 indicates when charging is disabled due to abnormal temperatures via its LED. See [Table 1-1 on page 1-6](#).

Vehicle Holder



WARNING! Some countries prohibit the mounting of any electronic device in any location on the vehicle dashboard and windshield. Be sure to check your local laws acceptable mounting areas before installing the auto mounting kit.

Installation Reminders

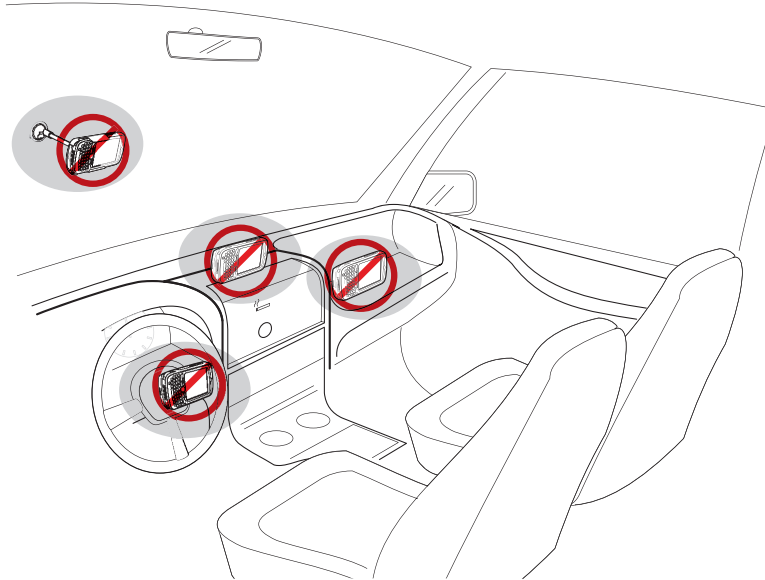


Figure 2-28 Vehicle Holder Mounting

- Do not mount the vehicle holder where it will obscure the driver's view of the road.
- Do not mount the vehicle holder near the driver seat air bag deployment area.
- Do not place the MC65 on top of the dashboard or anywhere without securing it in the vehicle holder.
- Do not mount the vehicle holder near the passenger seat air bag deployment area.
- Install the vehicle holder on the surface of your vehicle that is reasonably flat and free of dirt and oil.

Device Mounting Precautions

- Some countries prohibit the mounting of any electronic device in any location on the vehicle dashboard. Be sure to check your local laws acceptable mounting areas before installing the vehicle holder.
- The heating and cooling cycle of a vehicle's interior will in some cases loosen the adhesion of the suction cup. Check the vacuum seal of the vehicle mount kit for adequate adhesion each time you use the unit, and reinstall if necessary.
- If the vehicle holder has problems staying on, clean the plastic suction cup with alcohol, then reinstall.

Installation

Install the vehicle mount on the surface of your vehicle that is reasonably flat and free of dirt and oil. Clean the mounting surface with a glass cleaner and a clean cotton cloth. Install the vehicle mount on the windshield or other flat car surface using the supplied mounting disc.

Assembly

1. Insert the vehicle holder's cradle plate to the holes on the back of the cradle.
2. Push the cradle down until both parts are engaged.

Windshield Installation

1. Fix the suction cup mount to the selected area with the suction lever facing up.

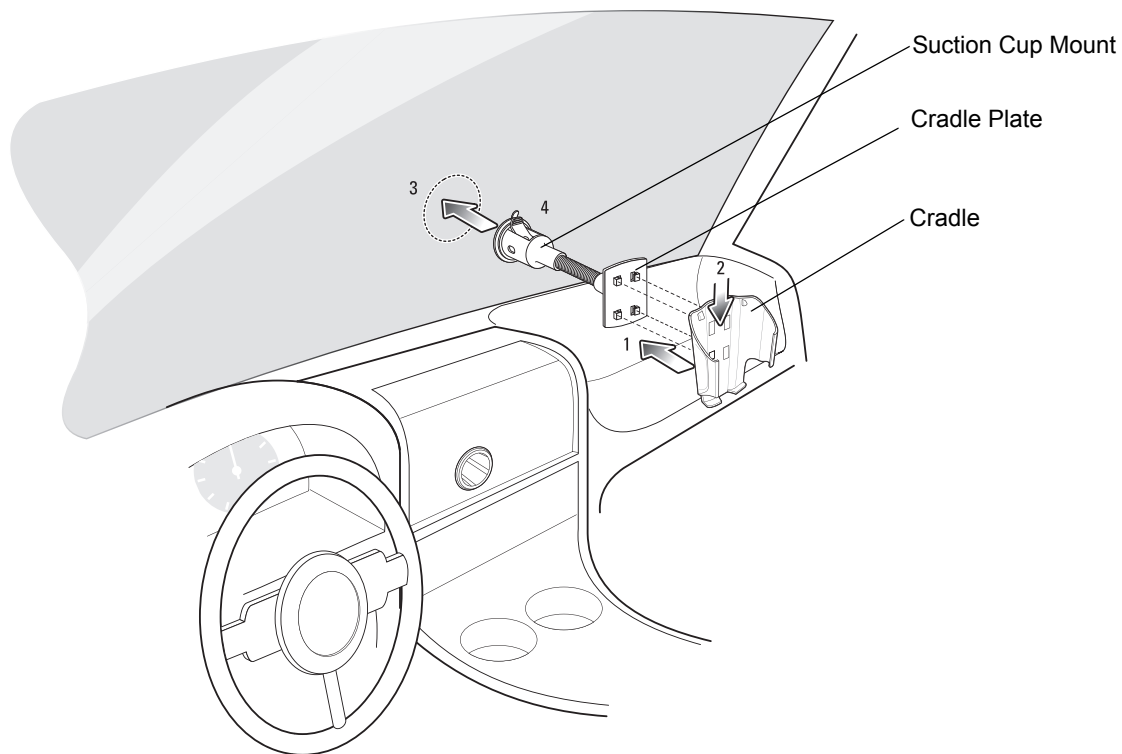


Figure 2-29 *Windshield Installation*

2. Flip the lever down to create a vacuum between the suction cup and the mounting surface.
3. Make sure that the suction bond is strong enough before proceeding to the next step.
4. Slide the MC65 into the cradle.

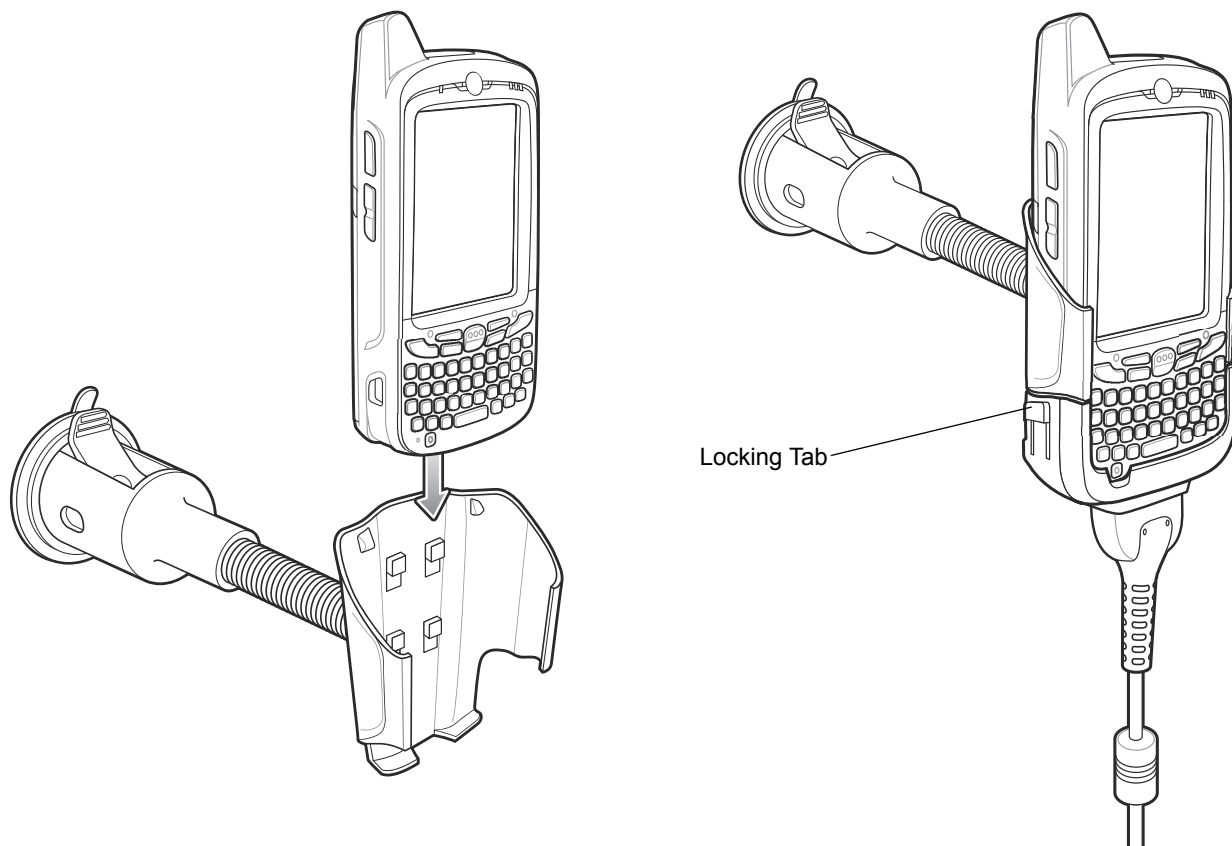


Figure 2-30 Insert MC65 into Vehicle Holder

5. Connect the auto charger cable to the MC65 and slide the two locking tabs up to secure the cable cup to the MC65.
 6. Connect the other end to the cigarette lighter socket.
- The LED indicator on the right side of the touch screen lights up orange during charging.

✓ **NOTE** Prior to removing the MC65 from the vehicle holder, disconnect the auto-charge cable from the MC65.

Flat Surface Installation

1. Remove the plastic sheet on the bottom of the mounting disc.
2. Place the disc, sticky side down, on a clean flat surface.

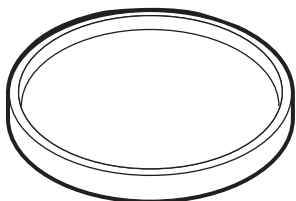


Figure 2-31 Mounting Disc

3. Fix the suction cup mount to the disc with the suction lever facing up.
4. Flip the lever down to create a vacuum between the suction cup and the disc.

5. Make sure that the suction bond is strong enough before proceeding to the next step.
6. Slide the MC65 into the cradle.

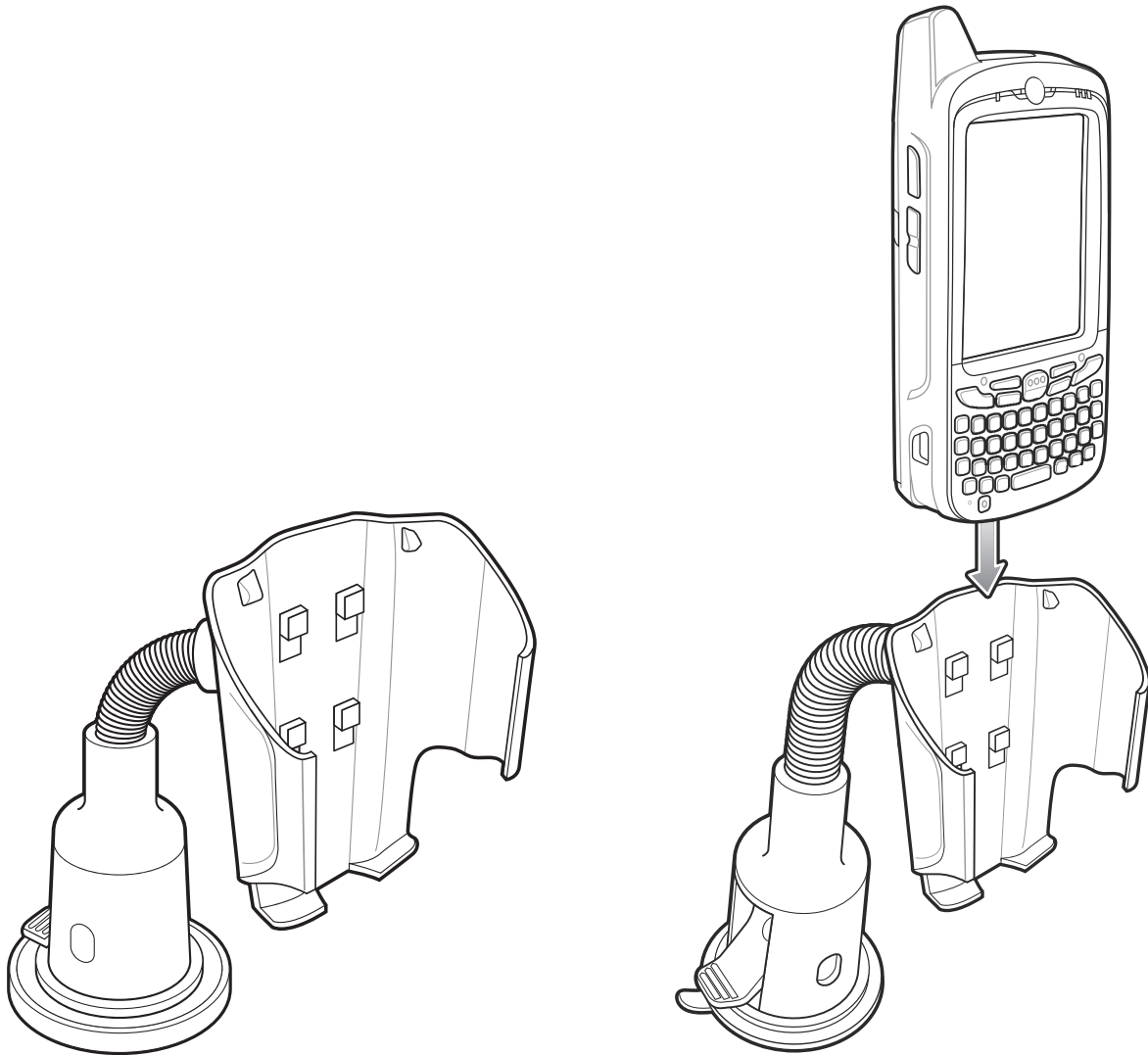


Figure 2-32 *Vehicle Holder Mounted on Flat Surface*

7. Connect the auto charger cable to the MC65 and slide the two locking tabs up to secure the cable cup to the MC65.
8. Connect the other end to the cigarette lighter socket.

The LED indicator on the right side of the touch screen lights up orange during charging.

CHAPTER 3 ACTIVESYNC

Introduction

To communicate with various host devices, install Microsoft ActiveSync (version 4.5 or higher) on the host computer. Use ActiveSync to synchronize information on the MC65 with information on the host computer. Changes made on the MC65 or host computer appear in both places after synchronization.

- ✓ **NOTE** When an MC65 with Windows Mobile 6.5 is connected to a host computer and an ActiveSync connection is made, the WLAN radio (if applicable) is disabled. This is a Microsoft security feature to prevent connection to two networks at the same time.

ActiveSync software:

- Allows working with mobile computer-compatible host applications on the host computer. ActiveSync replicates data from the MC65 so the host application can view, enter, and modify data on the MC65.
- Synchronizes files between the MC65 and host computer, converting the files to the correct format.
- Backs up the data stored on the MC65. Synchronization is a one-step procedure that ensures the data is always safe and up-to-date.
- Copies (rather than synchronizes) files between the MC65 and host computer.
- Controls when synchronization occurs by selecting a synchronization mode, e.g., set to synchronize continually while the MC65 is connected to the host computer, or set to only synchronize on command.
- Selects the types of information to synchronize and control how much data is synchronized.

Installing ActiveSync

To install ActiveSync on the host computer, download version 4.5 or higher from the Microsoft web site at <http://www.microsoft.com>. Refer to the installation instructions included with the ActiveSync software.

MC65 Setup

✓ **NOTE** Microsoft recommends installing ActiveSync on the host computer before connecting the MC65.

The MC65 by default is set up to communicate through a USB connection. [Chapter 2, Accessories](#) provides the accessory setup and cable connection information for use with the MC65. The MC65 communication settings must be set to match the communication settings used with ActiveSync.

1. On the MC65 tap **Start > ActiveSync** icon.
2. Tap **Menu > Connections**.
3. Select the connection type from the drop-down list.
4. Tap **OK** to exit the **Connections** window and tap **OK** to exit the **ActiveSync** window.
5. Proceed with installing ActiveSync on the host computer and setting up a partnership.

Setting Up an ActiveSync Connection on the Host Computer

To start ActiveSync:

1. Select **Start > Programs > Microsoft ActiveSync** on the host computer. The **ActiveSync** Window displays.

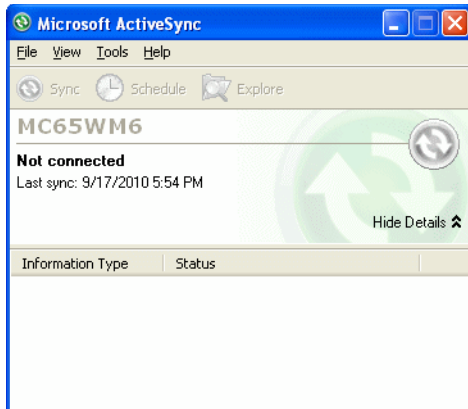


Figure 3-1 ActiveSync Window

- ✓ **NOTE** Assign each MC65 a unique device name. Do not try to synchronize more than one MC65 to the same name.

2. In the **ActiveSync** window, select **File > Connection Settings**. The **Connection Settings** window appears.

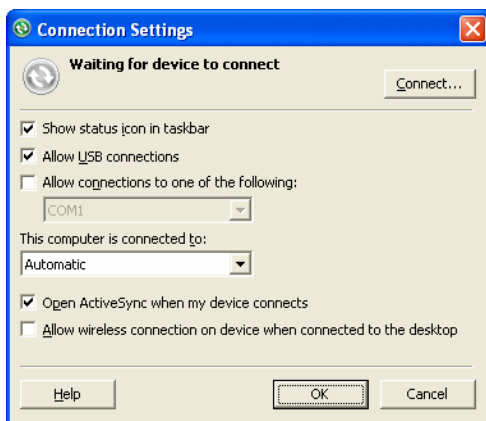


Figure 3-2 Connection Settings Window

3. Select **Allow USB connections** checkbox.
4. Select the **Show status icon in Taskbar** check box.
5. Select **OK** to save any changes made.

Synchronization the MC65

- ✓ **NOTE** When a MC65 with Windows Mobile 6.5 is connected to a host computer and an ActiveSync connection is made, the WLAN radio (if applicable) is disabled. This is a Microsoft security feature to prevent connection to two networks at the same time.

To synchronize:

1. If the **Get Connected** window does not appear on the host computer, select **Start > All Programs > Microsoft ActiveSync**.

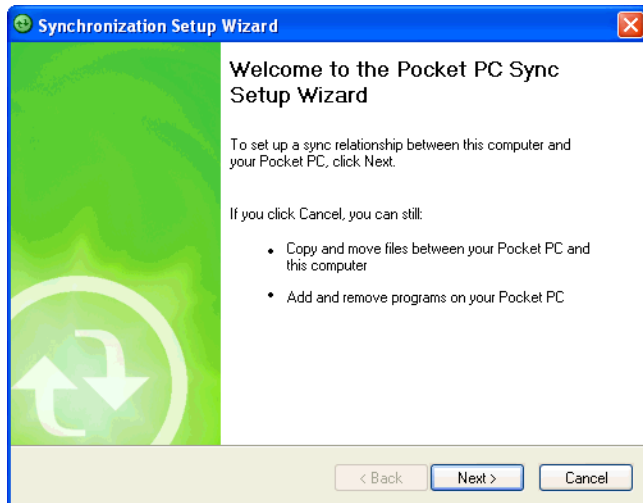


Figure 3-3 *Synchronization Setup Wizard Window*

2. Click **Next**.

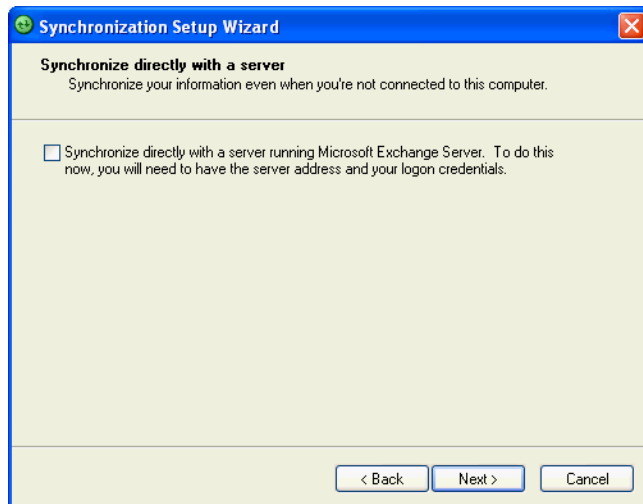


Figure 3-4 *Synchronization Directly With a Server Window*

3. Select the check box to synchronize with a server running Microsoft Exchange if applicable.
4. Click **Next**.

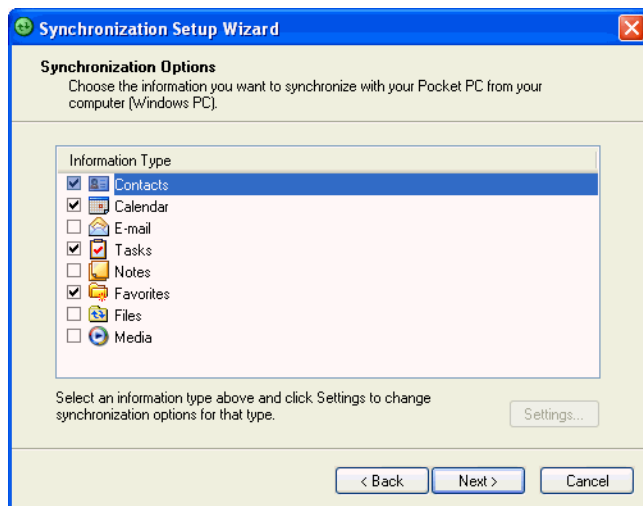


Figure 3-5 Synchronization Option Window

5. Select the appropriate settings and click **Next**.



Figure 3-6 Wizard Complete Window

6. Click **Finish**.

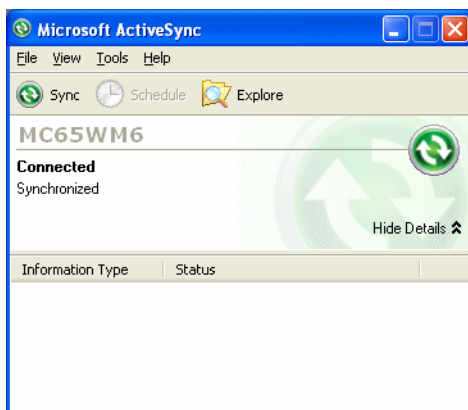


Figure 3-7 ActiveSync Connected Window

During the first synchronization, information stored on the MC65 is copied to the host computer. When the copy is complete and all data is synchronized, the MC65 can be disconnect from the host computer.



NOTE The first ActiveSync operation must be performed with a local, direct connection. Windows Mobile retains partnerships information after a reset.

For more information about using ActiveSync, start ActiveSync on the host computer, then see ActiveSync Help.

CHAPTER 4 APPLICATION DEPLOYMENT

Introduction

This chapter describes features in Windows Mobile including new security features, how to package applications, and procedures for deploying applications onto the MC65.

Security

The MC65 implements a set of security policies that determine whether an application is allowed to run and, if allowed, with what level of trust. To develop an application, you must know the security configuration of the device, and how to sign an application with the appropriate certificate to allow the application to run (and to run with the needed level of trust).

Application Security

Application security controls the applications that can run on the MC65.

- Trusted - All applications must be digitally signed by a certificate on the MC65.
- Prompted - User is prompted to allow unsigned applications to run.
- Open - All applications run.

Developers can include their own certificates and provision the device to “trusted.”

Digital Signatures

Digital signatures provide a way to authenticate the author of EXEs, DLLs, and packages. Digitally signed applications give users confidence that an application comes from where they think it comes from. For example, if an end-user downloads an update package from the internet that is digitally signed with Zebra’s software certificate, they are assured that the package is authentic and that it was created by Zebra. By enforcing the use of digital signatures, users can also prevent malicious applications from executing on the MC65. For example, users can provision the MC65 to only execute “trusted” applications (digitally signed).

Zebra ships all Windows Mobile 6 based products in an “open” state, which means all signed and unsigned applications should work. However, customers can still reconfigure their MC65 to operate in the “trusted”

mode. This means that only applications signed with a certificate from the Privileged Execution Trust Certificate Store can run.

To support the broadest number of deployments, third-party software developers should perform the following when releasing software for a Windows Mobile 6 devices:

- Sign all their EXEs & DLLs with their private key
- Provide the corresponding public certificate to end-users so that it can be installed into Privileged Execution Trust Certificate Store.

If the software is installed via a .CAB file, developer should also:

- Sign the .CAB file with their private key
- Provide the corresponding public certificate to end-users so that it can be installed into SPC Certificate Store.

Locking Down a Mobile Computer

Like most configuration options in Windows Mobile, security settings are set via XML provisioning. For example, to enforce the “trusted” model and only allow applications signed with a privileged certificate to run, use the following provisioning document:

```
<wap-provisioningdoc>
  <characteristic type="SecurityPolicy">
    <!-- Disallow unsigned apps -->
    <parm name= "4102" value= "0"/>

    <!-- No Prompt -->
    <parm name= "4122" value= "1"/>
  </characteristic>
</wap-provisioningdoc>
```

For more information on various security options, refer to the Security Policy Settings topic in the latest Windows Mobile documentation.

Installing Certificates

Use XML provisioning to query and delete certificates from certificate stores. To add a new certificate to the Privileged Execution Trust Certificate Store, use the following sample provisioning document:

```
<wap-provisioningdoc>
<characteristic type= "CertificateStore">
<characteristic type= "Privileged Execution Trust Authorities">
<characteristic type= "657141E12FA45786F6A57CA6464032D4B3A55475">
<parm name= "EncodedCertificate" value= "
This is sample text. This is sample text. This is sample text. This is sample text.
This is sample text. This is sample text. This is sample text. This is sample text.
This is sample text. This is sample text. This is sample text. This is sample text. = "/>
</characteristic>
</characteristic>
</characteristic>
</wap-provisioningdoc>
```

To create your own provisioning document with real certificate information:

1. Obtain a certificate from a security provider such as VeriSign.
2. Double-click on the certificate file (.CER) to open it.
3. Click on the *Details* tab and locate the *Thumbprint* field.
4. Copy the contents of the *Thumbprint* field and replace the value in the XML example above.
5. Click the **Copy to File...** button.
6. Click **Next** to start the Certificate Export Wizard.
7. Select *Base-64 encoded X.509 (.CER)* and then click **Next**.
8. Set the File Name to CertOutput.xml and click **Next**.
9. Click **Finish** to export the certificate.
10. Open the exported file, CertOutput.xml, in a text editor (i.e., NotePad).
11. Copy the contents of the file (excluding the first line, last line, and CR/LF) and replace the value of the *"EncodedCertificate"* parameter in the xml example above.

Device Management Security

You can control access to certain device settings and security levels, such as installing applications and changing security settings. Refer to the *Windows Mobile Version 6 Help* file for information on device management security.

Remote API Security

The Remote API (RAPI) enables applications that run on a desktop to perform actions on a remote device. RAPI provides the ability to manipulate the file system on the remote device, including the creation and deletion of files and directories. By default, Zebra ships with RAPI in the restricted mode. Certain tools, such as

RAPICongig, may not work properly. Refer to the *Windows Mobile Version 6 Help* file for finding information on Remote API security policies.

Packaging

✓ **NOTE** Applications compiled for Windows Mobile 6 are not backward-compatible with previous versions.

Packaging combines an application's executable files into a single file, called a package. This makes it easier to deploy and install an application to the MC65. Package new applications and updates, such as new DLL files, as CAB files, then deploy them to devices. Refer to the *Microsoft Windows Mobile 6 Help* file for information on CAB files.

Deployment

To install applications onto the MC65, developers package the application and all required files into a CAB file, then load the file onto the MC65 using one of the following options:

- Microsoft ActiveSync 4.5 or higher
- Storage Card
- MSP
- AirBEAM
- Image Loader Image (for updating the operating system).

Refer to the *Microsoft Windows Mobile 6 Help* file for information on CAB files.

Installation Using ActiveSync

To install an application package:

- Connect the MC65 to a host computer using ActiveSync. See [Chapter 3, ActiveSync](#) for more information.
- Locate the package file on the host computer.
- In ActiveSync on the host computer, open *Explorer* for the MC65.
- Copy the CAB file from the host computer to the \temp directory on the MC65.
- On the MC65, navigate to the \temp directory.
- Tap on the application CAB file. The application installs on the MC65.

Installation Using Storage Card

To install an application package:

- Copy the package CAB file to a microSD storage card using an appropriate storage card reader.
- Install the storage card into the MC65. See [Installing a microSD Card on page 1-2](#) for more information.
- On the MC65, open **File Explorer**.

- Open the *Storage Card* directory.
- Tap the package CAB file. The application installs on the MC65.

Installation Using AirBEAM

The AirBEAM Smart Client provides backward-compatible legacy AirBEAM functionality and backward-compatible legacy MSP 2.x Level 2 Agent functionality.

Refer to the AirBEAM Smart Windows CE Client Product Reference Guide, p/n 72-63060-xx, for instructions for AirBEAM Smart client.

MSP

The MSP 3 Client Software is a set of software components that come pre-installed on the MC65. The MSP 3 Client software consists of the following components:

The RD Client provides support for MSP 3 Staging functionality, provides support for the MSP 3 Legacy Staging process, and provides support for backward-compatible legacy MSP 2.x Legacy Staging functionality.

The MSP 3 Agent provides MSP 3 Provisioning functionality and Control functionality when used with MSP 3.2 Control Edition.

Refer to the Mobility Services Platform 3.2 User's Guide, p/n 72E-100158-xx, for instructions for using the Rapid Deployment and MSP3 Agent clients.

Update Loader Image

Windows Mobile contains an Image Update feature that updates all operating system components. All updates are distributed as update packages. Update packages can contain either partial or complete updates for the operating system. Zebra distributes the update packages on the Support Central Web Site, <http://www.zebra.com/support>.

To update an operating system component, copy the update package to the MC65 using one of a variety of transports, including ActiveSync, an microSD card, AirBEAM or MSP.

Download Update Loader Package

1. Go to the Zebra Support Central web site, <http://www.zebra.com/support>.
2. Download the appropriate update loader package to a host computer.
3. Locate the update loader package file on the host computer and un-compress the file into a separate directory.

ActiveSync

To install an update loader package using ActiveSync:

1. Connect the MC65 to a host computer using ActiveSync. See [Chapter 3, ActiveSync](#) for more information.
2. In ActiveSync on the host computer, open **Explorer** for the MC65.
3. Copy all the update loader package files from the host computer to the \temp directory on the MC65.
4. On the MC65, navigate to the \temp directory.
5. Tap on the update loader file, **STARTUPDLDR.EXE**. The Update Loader application installs the update loader package on the MC65.

A progress bar displays until the update completes.

6. The MC65 re-boots.
7. The calibration screen appears.

microSD Card

To install an update loader package using a microSD card:

1. Copy all the update loader package files to the root directory of a microSD card.
2. Install the microSD card into the MC65. See [Installing a microSD Card on page 1-2](#) for installation instructions.
3. Connect the MC65 to AC power. See [Chapter 2, Accessories](#).
4. Perform a reset.
5. Immediately, as soon as the device starts to boot and before the splash screen is visible, press and hold the left scan button.
6. The Update Loader application looks for the update loader file in the root directory of the microSD card. When it finds the file, it loads the update loader package onto the MC65. A progress bar displays until the update completes.
7. The MC65 re-boots.
8. The calibration screen appears.

XML Provisioning

To configure the settings on an MC65, use XML provisioning. To install an XML provisioning file on the MC65, create a Cabinet Provisioning File (CPF). A CPF file is similar to a CAB file and contains just one file: `_setup.xml`. Like a CAB file, the CPF extension is associated with `WCELoad.EXE`. Opening a CPF extracts the XML code and uses it to provision and configure the MC65. The user receives an e-mail notification indicating success or failure.

XML provisioning provides the ability to configure various features of the MC65 (i.e., registry and file system). However, some settings require security privileges. To change registry settings via a CPF file, you must have certain privileges (roles). Some registry keys require you to simply be an *Authenticated User*, while other registry keys require you to be a *Manager*. Refer to the *Microsoft Windows Mobile 6 Help* file, *Metabase Settings for Registry Configuration Service Provider* section, for the default role settings in Windows Mobile 6.

For those registry settings that require the *Manager* role, the CPF file must be signed with a privileged certificate installed on the device. Refer to the *Microsoft Windows Mobile 6 Help* file and the *Windows Mobile 6 SDK* for instructions and sample test certificates.

Creating an XML Provisioning File

To create a `.cpf` file:

1. Create a valid provisioning XML file named `_setup.xml` using an XML editor or the tools supplied with Visual Studio 2005. (For example, use the `SampleReg.xml` sample created in the [RegMerge on page 4-7](#) section and rename it `_setup.xml`.) Ensure the file contains the required parameters for the operation. Refer to the *Microsoft Windows Mobile 6 Help* file for information.

2. In the Windows Mobile 6 tools directory on the desktop computer (typically \Program Files\Windows CE Tools\wce500\Windows Mobile 6 Pocket PC SDK\Tools), run the Makecab.exe utility, using the following syntax to create a .cpf file from the _setup.xml file:

```
MakeCab.exe /D COMPRESS=OFF _setup.xml myOutCpf
```

✓ **NOTE** COMPRESS=OFF is required for backward compatibility with Pocket PC.

3. Optionally, use the Authenticode tools to sign the .cpf file.
4. Tap the filename to install.
5. Certain applications and settings require a reset to take affect. In these cases, reset the MC65. Refer to the *Windows Mobile Version 6 Help* file for more information.

XML Provisioning vs. RegMerge and Copy File

Prior to Windows Mobile 5.0, Zebra used two drivers (RegMerge and CopyFiles) to update the registry and to copy files during a reset. With Windows Mobile 6, Zebra recommends using XML provisioning instead. RegMerge and CopyFiles are supported for backward compatibility but Zebra may eliminate support in the future. The following sections provide examples of how RegMerge and CopyFiles were used, and how to perform the same function using XML provisioning.

RegMerge

RegMerge.dll is a built-in driver that allows updating the registry during a clean boot. RegMerge runs very early in the boot process and looks for registry files (.reg files) in certain Flash File System folders (i.e., \Application) during a clean boot. It then merges the registry changes into the system registry located in RAM.

The following example uses RegMerge to set a registry key:

SampleReg.reg

```
[HKEY_LOCAL_MACHINE\Hardware\DeviceMap\Backlight]
"BacklightIntensity"=dword:00000036
```

The following example uses XML provisioning to perform the same task:

SampleReg.xml

```
<wap-provisioningdoc>
  <characteristic type= "Registry">
    <characteristic type= "HKLM\Hardware\DeviceMap\Backlight">
      <parm name= "BacklightIntensity" value= "54" datatype= "integer" />
    </characteristic>
  </characteristic>
</wap-provisioningdoc>
```

CopyFiles

CopyFiles copies files from one folder to another on a clean boot. During a clean boot CopyFiles looks for files with a .CPY extension in the root of the Application FFS partition. These files are text files containing the source and destination for the desired files to copy, separated by ">".

The following example uses CopyFiles to copy a file from the \Application folder to the \Windows folder:

SampleCpy.cpy

```
\Application\example.txt > \Windows\example.txt
```

The following example uses XML provisioning to perform the same task:

SampleCpy.xml

```
<wap-provisioningdoc>
  <characteristic type= "FileOperation">
    <characteristic type= "\Windows" translation= "filesystem">
      <characteristic type= "MakeDir"/>
      <characteristic type= "example.txt" translation= "filesystem">
        <characteristic type= "Copy">
          <parm name= "Source" value= "\Application\example.txt" translation= "filesystem"/>
        </characteristic>
      </characteristic>
    </characteristic>
  </characteristic>
</wap-provisioningdoc>
```

Storage

Mobile 6 contains three types of file storage:

- Random Access Memory (RAM)
- Persistent Storage
- Application folder.

Random Access Memory

Executing programs use RAM to store data. Data stored in RAM is lost upon a warm boot. RAM also included a volatile file storage area called *Cache Disk*.

Volatile File Storage (Cache Disk)

Windows Mobile 6 memory architecture uses persistent storage for all files, registry settings, and database objects to ensure data is retained even after a power failure. Persistent storage is implemented using Flash memory technology which is generally slower than volatile RAM memory. In certain situations the speed of the operation is more important than the integrity of the data. For these situations, Zebra has provided a small volatile File Storage volume, accessed as the *Cache Disk* folder. Disk operations to the *Cache Disk* folder are much faster than to any of the persistent storage volumes, but data is lost across warm boots and power interruptions. Note that a backup battery powers RAM memory, including the *Cache Disk*, when you remove the main battery for a short period of time.

The MC65 uses the *Cache Disk* for temporary data that can be restored from other sources, for example, for temporarily “caching” HTML web pages by a browser or generating formatted files to send to a printer. Both situations benefit from the increased speed of the cache disk, but you can restore the data if needed.

DO NOT use the *Cache Disk* as a method to improve application performance. Analyze applications that perform slower in persistent storage to optimize disk access. Common areas for optimization include

minimizing the number of reads and writes to a file, removing unneeded debug logging, and minimizing file flushing or closing files.

Persistent Storage

Windows Mobile 6 protects all data and applications from power-related loss. Because Windows Mobile 6 mounts the entire file system and registry in persistent storage (rather than using RAM), MC65 devices provide a reliable storage platform even in the absence of battery power.

Persistent storage provides application developers with a reliable storage system available through the standard file system and registry APIs. Persistent storage is optimized for large reads and writes; therefore, applications reading and writing data in large chunks tend to outperform those applications reading and writing small blocks of data. Data in persistent storage is lost upon a reset.

Persistent storage contains all the directories under the root directory except for Application, Cache Disk, and Storage Card (if a storage card is installed). Persistent storage is approximately 650 MB (formatted).

Application Folder

The Application folder is a super-persistent storage that is persistent even after a reset. Accessing data in the Application folder is slower than accessing persistent storage. The Application folder is used for deployment and device-unique data. For example, network profiles can be stored in the Application folder so that connection to the network is available after a reset. The Application folder is approximately 96 MB (formatted).

Enterprise Mobility Developer Kits

The Zebra Developer Kit (EMDK) family of products allows you to write applications that take advantage of the capture, move and manage capabilities of the MC65. Go to the Support Central (<http://www.zebra.com/support>) to download the appropriate developer kit.

CHAPTER 5 PHONE SETUP

Introduction

If the cellular service is with AT&T, Telcel, Bell Mobility, Telstra, or any other operator that supplies a SIM card, install the SIM card into the MC65. Refer to [Installing the SIM Card on page 1-3](#) for more information. Note that first-time power-up may take up to five minutes, as the MC65 automatically configures itself for the carrier.

If the cellular service is with a carrier that requires calling-in for activation, such as Verizon or Sprint, activate using the **Phone Network Setup** application. It may take 10 to 15 minutes to complete the activation the first time. Note that another phone needs to be available, for calling your wireless operator's customer service department. Also, the MC65 needs to be in-coverage, i.e. in the service area, of your wireless operator, for it's activation process to complete.

If the user has a Global Phone service with Verizon or Sprint, and has a SIM card as part of the service, power-up the MC65 and complete activation, without inserting the SIM card. Insert the SIM card afterwards.

The **Phone Network Setup** application provides the ability to change networks when detected: by the MC65 or manually: when the user decides to change networks.

Automatic Network Setup

See [Network Activation on page 1-7](#) for information on activating the MC65 upon startup.

Manual Network Setup

- ✓ **NOTE** On OEM version 01.121.0X, when an AT&T SIM card is installed in the MC65, the user interface for the CDMA settings is hidden. To restore access to these settings, please contact Zebra Support.

CDMA Network Setup

- ✓ **NOTE** Upon a Master Reset or a software upgrade, CDMA users must restore data services and MMS settings. Tap **Start** > **Setting** > **Connections** > **Phone Network Setup**. On the **Band** tab, tap **Network Type** and select either **CDMA Only** or **CDMA First**.

To manually configure the MC65 for a CDMA network:

1. Tap **Start** > **Setting** > **Connections** > **Phone Network Setup**.

2. On the **Band** tab, select the Network Type:
 - **CDMA Only** - Searches for only CDMA networks. GSM/UMTS networks are ignored.
 - **CDMA First** - Searches first for CDMA networks and then for GSM/UMTS networks if CDMA networks are not found.
3. On the **CDMA Setup** tab, tap **Preferred network** and select your carrier.
4. Tap **Start Activation** button.
5. On the **Phone Network - CDMA Activation** dialog box, tap **Yes**.
6. On an active phone line, call your carrier to activate the MC65. Provide the MEID number on the screen to the customer representative.
7. When requested, tap **Activate Now** to activate the MC65.

GSM Network Setup

To manually configure the MC65 for a GSM/UMTS network:

1. Install an active SIM card into the MC65. Refer to [Installing the SIM Card on page 1-3](#).
2. Tap **Start > Setting > Connections > Phone Network Setup**.
3. On the **Band** tab, select the Network Type:
 - **GSM/UMTS Only** - Searches for only GSM/UMTS networks. CDMA networks are ignored.
 - **GSM/UMTS First** - Searches first for GSM/UMTS networks and then for CDMA networks if GSM/UMTS networks are not found.
4. Select **GSM/UMTS Preferred** and select:
 - **Auto (GSM & UMTS)** - Searches for either GSM or UMTS networks.
 - **GSM Only** - Searches for only GSM networks.
 - **UMTS Only** - Searches for only UMTS networks.
5. Tap **Band**. Select:
 - **All** - Configures the MC65 to use all bands.
 - **NA & CA** - Configures the MC65 to use bands used in North America and Canada.
 - **EMEA/APAC** - Configures the MC65 to use bands used in the Europe, Middle East, Africa (EMEA) region, and Asia Pacific (APAC) region.
 - **Brazil** - Configures the MC65 to use bands used in the Brazil region.
6. On the **GSM/UMTS** tab, tap **Preferred network** and select your carrier.
7. Tap the **Update Connection Settings** button.



NOTE SIM cards of supported carriers automatically configure the data connection and MMS settings upon activation. Data connection and MMS settings for non-supported carriers must be manually configured. See [Configuring a GSM Data Connection on page 5-5](#) and refer to the *MC65 User Guide* for MMS set up information.

The Public Land Mobile Network (PLMN) tab displays only when **Network Type** is set to **GSM/UMTS Only**. Tap **Show List** to display the PLMN list.

Dual Network Usage

The MC65 can be set up to be used on both a CDMA and GSM/UMTS networks and the user can switch between them.

✓ **NOTE** Each active network account uses its own phone number.

On OEM version 01.121.0X, when an AT&T SIM card is installed in the MC65, the user interface for the CDMA settings is hidden. To restore access to these settings, please contact Zebra Support.

1. Obtain an active GSM/UMTS SIM card.
2. Activate the MC65 on a CMDA network. See [CDMA Network Setup on page 5-1](#).
3. Install the SIM card. See [Installing the SIM Card on page 1-3](#).

To set the MC65 to use the CDMA network:

1. Tap > **Start** > **Setting** > **Connections** > **Phone network Setup**.
2. On the **Band** tab, tap **Network type** and select **CDMA First** or **CDMA Only**.
3. Tap **OK**.

To set the MC65 to use the GSM/UMTS network:

1. Tap > **Start** > **Setting** > **Connections** > **Phone network Setup**.
2. On the **Band** tab, tap **Network type** and select **GSM/UMTS First**.
3. On the **GSM/UMTS** tab, tap the **Update Connection Settings** button.
4. Tap **OK**.

Switching Between CDMA Networks

If the MC65 was initially provisioned on the Verizon network it can be switched to another CDMA network. If the MC65 is to be provisioned back to the Verizon network, additional carrier support is required. Contact the Zebra support for detailed information. See [Service Information on page xiv](#).

Global Usage

CDMA networks can be used internationally with the use of a Global SIM card provided by the CDMA carrier. After arriving, install the global SIM card into the MC65. See [Installing the SIM Card on page 1-3](#).

To set the MC65 to use the global SIM card:

1. Tap > **Start** > **Setting** > **Connections** > **Phone network Setup**.
2. On the **Band** tab, tap **Network type** and select **GSM/UMTS First**.
3. Tap **GSM/UMTS Preferred** and select **Auto (GSM & UMTS)**, **GSM Only** or **UMTS Only**.
4. Tap **Band** and select **All**, **NA & CA**, **EMEA/APAC** or **Brazil**.

5. On the **GSM/UMTS** tab, tap the **Update Connection Settings** button.



NOTE If using an unsupported network, data connection and MMS settings must be manually configured. See [Configuring a GSM Data Connection on page 5-5](#) and refer to the *MC65 User Guide* for MMS set up information.

6. Tap **OK**.
7. Upon return, remove the global SIM card.
8. Tap > **Start** > **Setting** > **Connections** > **Phone network Setup**.
9. On the **Band** tab, tap **Network type** and select **CDMA First** or **CDMA Only**.
10. Tap **OK**.

Configuring a GSM Data Connection

- ✓ **NOTE** SIM cards of supported carriers automatically configure the data connection upon activation. Data connections for non-supported carriers must be manually configured.

A data connection allows Internet access across a wireless network.

To set up a new data connection:

1. Acquire an Access Point Name (APN) from the service provider.
2. Tap **Start > Settings > Connections > Connections > Tasks**.
3. Under **My ISP** select **Add a new modem connection**.
4. Enter a connection name in the **Enter a name for the connection** text box.
5. Select **Cellular Line (GPRS)** from the **Select a modem:** drop-down list.
6. Tap **Next**.
7. Enter the APN from the service provider in the **Access point name** text box.
8. Tap **Next**.
9. Enter a username in the User name text box, if required by the service provider.
10. Enter a password in the Password text box, if required by the service provider.
11. Enter a domain name in the Domain text box, if required by the service provider.
12. Tap **Finish**.
13. Tap **OK** to exit **Connections**.

Phone Settings

Use the **Phone Settings** window to customize settings, such as the ring type and ring tone for incoming calls, security options, and other options depending on the type of service.

Sounds

Use the **Sounds** tab to customize ring type, ring tone, keypad tone.

Tap **Start > Settings > Personal > Phone > Sounds**.

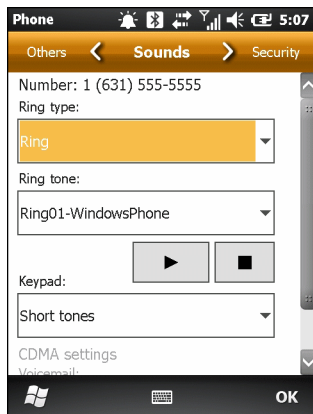


Figure 5-1 MC65 Phone Window - Phone Tab

1. Select a ring type from the **Ring type:** drop-down list. The ring type changes the way the MC65 rings when it receives an incoming call. Regardless of the ring type selected, a dialog box appears on the MC65's display for incoming calls.
2. Select a ring tone for incoming calls from the **Ring tone:** drop-down list. To hear a sample of the selected ring tone, tap . Tap to end the ring tone.

✓ **NOTE** To use custom .wav, .mid, or .wma files as ring tones, use ActiveSync on the host computer to copy the file to the /Windows/Rings folder on the MC65. Then select the sound from the ring tone list.

3. Select a keypad tone from the **Keypad:** drop-down list. This selection determines the tone that sounds when entering a phone number on the keypad.

Select **Short tones** or **Long tones** to specify the duration of the sound when you press a number on the keypad. Select **Off** to disable tones.

✓ **NOTE** Turning off sounds saves power and prolongs battery life.

Security

Enabling a PIN

Tap **Start > Settings > Personal > Phone > Security**.

✓ **NOTE** Place emergency calls at any time, without requiring a PIN or a SIM card.

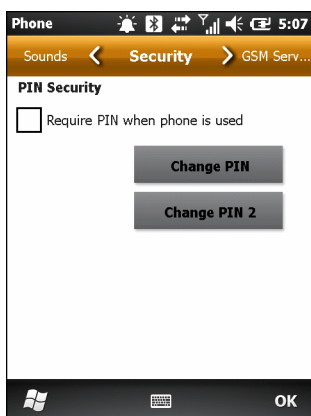


Figure 5-2 Security Tab

To require a PIN when using the phone:

1. Select the **Require PIN when phone is used** check box.

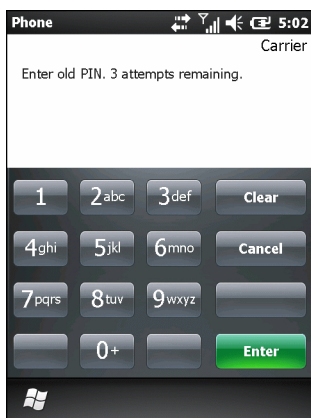


Figure 5-3 Enter PIN

2. Use the dialer keypad to enter a four to eight digit PIN.
3. Tap **Enter** to enable the PIN and return to the **Security** tab.

Changing a PIN



CAUTION If the user enters an incorrect PIN, the message “SIM PIN incorrect: Try again” appears. After three consecutive incorrect attempts, the SIM card is blocked. The phone does not allow entering a PIN again and the user must obtain a PIN Unblock Key from the service provider.

1. Tap **Change PIN**.
2. Use the dialer keypad to enter the current PIN.
3. Tap **Enter**.
4. Use the dialer keypad to enter a new four to eight digit PIN.
5. Tap **Enter**.
6. Reenter the new PIN for confirmation and tap **Enter**.
7. Tap **OK** to confirm the change.

Disabling a PIN

1. Deselect the **Require PIN when phone is used** check box.
2. Use the dialer keypad to enter the current PIN.
3. Tap **Enter**.
4. Tap **OK** to confirm the change and exit settings.

GSM Services

Use the **GSM Services** tab to configure settings for subscribed phone services. For example, block certain types of incoming and/or outgoing calls ([page 5-8](#)), disclose the caller's identity when making outgoing calls ([page 5-8](#)), forward incoming calls to a different phone number ([page 5-8](#)), receive notification of incoming calls when a phone session is in use ([page 5-9](#)), and set up voice mail and short message service ([page 5-9](#)).

1. Tap **Start > Settings > Personal > Phone> GSM Services**.

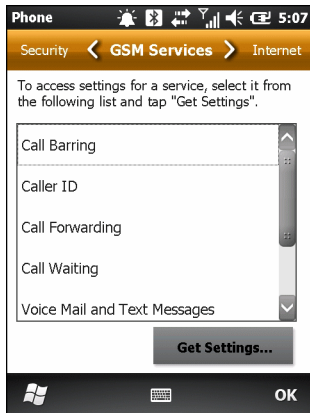


Figure 5-4 Phone Window - GSM Services

2. Select a service from the list and tap **Get Settings...**
3. Change services settings as follows.

Call Barring (Call Blocking)

Use call barring to block certain types of incoming and/or outgoing calls. Select the type of incoming and/or outgoing calls to block.

Caller ID

Enable caller ID to reveal the identity of the person making an outgoing call. Select the **Everyone** radio button to always display the caller ID. Select the **No one** radio button to prevent the caller's identity from appearing to others.

Call Forwarding

✓ **NOTE** Call Forwarding may not be available on all networks. Check with the service provider for availability.

Use call forwarding to forward incoming calls to a different phone number.

- To forward all calls to a different phone number:
 - select the **Forward all incoming phone calls** check box.
 - enter the phone number to receive forwarded calls in the **To:** text box.
- To forward incoming calls to a different phone number based on a specific situation, select one or more of the check boxes under **Forward phone calls only if:**
 - **No answer:** enter the phone number to receive forwarded calls only when the phone cannot be answered. Then select a time period from the **Forward after:** drop-down list. Options are 5, 10, 15, 20, 25, and 30 seconds.
 - **Unavailable:** enter the phone number to receive forwarded calls only when the phone is turned off or the user is unreachable.
 - **Busy:** enter the phone number to receive forwarded calls only when the line is busy.

Call Waiting

✓ **NOTE** Call Waiting may not be available on all networks. Check with your service provider for availability.

Call waiting notifies the user of an incoming call when the phone is in a phone session. Select the **Notify me** radio button to enable call waiting. Select the **Do not notify me** radio button to disable call waiting.

Voice Mail and Text Messages

To use voice mail and send short messages, enter the voice mail and/or text message phone number in the appropriate text boxes.

Fixed Dialing

Use Fixed Dialing to restrict the phone to dial only the phone number(s) or area code(s) specified in a Fixed Dialing list.

1. Select **Fixed Dialing** and tap **Get Settings**.
2. Select the **Enable fixed dialing** check box.
3. To add a number to the list, tap **Menu > Add**.
4. Enter the phone number or area code to restrict and tap **Done**.
5. Repeat steps 3 and 4 to add more numbers, and tap **Done** twice when complete.
6. Enter **PIN2** and tap **Done**.

✓ **NOTE** PIN2 is buffered in the MC65 indefinitely after entry and will not be requested again until a reboot of the MC65 has been performed. Should PIN2 be required, then the user must perform a reboot of the MC65.

Internet

Use the **Internet** tab to configure Internet calling.

Select an option from the down-down list.

Tap **OK**.

Services

Use the **Services** tab to set Broadcast Channels and GPDS Privacy features.

Broadcast Channels

Enable broadcast messages from local cell sites. These messages include emergency directions and information services.

GPS Privacy

Allows internet applications to use current location.

HAC

Turn Hearing Aide Compatibility (HAC) on and off.

CHAPTER 6 MAINTENANCE & TROUBLESHOOTING

Introduction

This chapter includes instructions on cleaning and storing the MC65, and provides troubleshooting solutions for potential problems during MC65 operation.

Maintaining the MC65

For trouble-free service, observe the following tips when using the MC65:

- Do not scratch the screen of the MC65. When working with the MC65, 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 MC65 screen.

Zebra recommends using a screen protector, p/n KT-129195-03R.

- The touch-sensitive screen of the MC65 is glass. Do not drop the MC65 or subject it to strong impact.
- Protect the MC65 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 MC65 in any location that is dusty, damp, or wet.
- Use a soft lens cloth to clean the MC65. If the surface of the MC65 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 MC65. Zebra 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 MC65. Zebra 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.

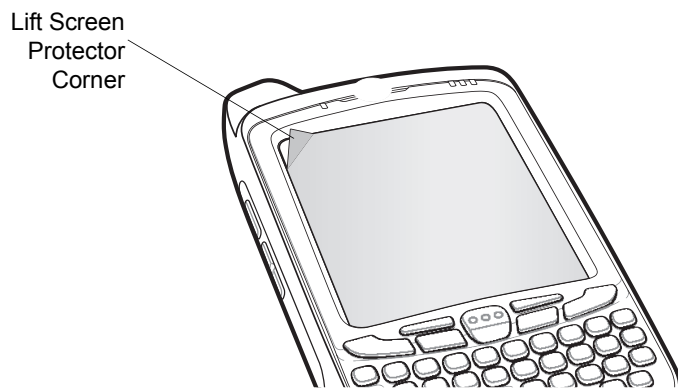


Figure 6-1 *Removing the Screen Protector*



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 Zebra. These include screen protector installation instructions. Part number: KT-129195-03R 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 this 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 Zebra Global 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 Zebra hologram. Do not fit any battery without checking it has the Zebra 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 Zebra Global Customer 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 Zebra 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 MC65

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 [Installing the Battery on page 1-4](#).
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 MC65. 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 ½ 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 ½ inch away from the surface.



CAUTION Do not point nozzle at yourself and others, ensure the nozzle or tube is 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.

Troubleshooting

MC65

Table 6-1 *Troubleshooting the MC65*

Problem	Cause	Solution
When pressing the power button the MC65 does not turn on.	Battery not charged.	Charge or replace the battery in the MC65.
	Battery not installed properly.	Install the battery properly. See Installing the Battery on page 1-4 .
	System crash.	Perform a reset. See Resetting the MC65 on page 1-8 .
When pressing the power button the MC65 does not turn on but two LEDs blink.	Battery charge is at a level where data is maintained but battery should be re-charged.	Charge or replace the battery in the MC65.
Rechargeable battery did not charge.	Battery failed.	Replace battery. If the MC65 still does not operate, perform a reset. See Resetting the MC65 on page 1-8 .
	MC65 removed from cradle while battery was charging.	Insert MC65 in cradle. The 3600 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.	MC65 not powered on.	Press the Power button.

Table 6-1 Troubleshooting the MC65 (Continued)


Problem	Cause	Solution
During data communication, no data transmitted, or transmitted data was incomplete.	MC65 removed from cradle or disconnected from host computer during communication.	Replace the MC65 in 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>MC65 Integrator Guide</i> for details.
No sound.	Volume setting is low or turned off.	Adjust the volume.
MC65 shuts off.	MC65 is inactive.	The MC65 turns off after a period of inactivity. If the MC65 is running on battery power, set this period from 1 to 5 minutes, in one-minute intervals. Check the <i>Power</i> window by selecting Tap Status Bar >  .
	Battery is depleted.	Replace the battery.
	Battery is not inserted properly.	Insert the battery properly. See Installing the Battery on page 1-4 .
Tapping the window buttons or icons does not activate the corresponding feature.	Screen is not calibrated correctly.	Re-calibrate the screen. Press Blue key - Backspace key.
	The device is not responding.	Reset the device. See Resetting the MC65 on page 1-8 .
A message appears stating that the MC65 memory is full.	Too many files stored on the MC65.	Delete unused memos and records. If necessary, save these records on the host computer (or use an SD card for additional memory).
	Too many applications installed on the MC65.	Remove user-installed applications on the MC65 to recover memory. Select Start > Settings > System and tap the Remove Programs icon. Select the unused program and tap Remove .
The Charging/Battery Status LED flashes with the Power button is pressed and the MC65 does not turn on.	The MC65'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 6-1 *Troubleshooting the MC65 (Continued)*

Problem	Cause	Solution
The MC65 does not decode with reading bar code.	Scanning application is not loaded.	Load a scanning application on the MC65. See your system administrator.
	Unreadable bar code.	Ensure the symbol is not defaced.
	Distance between exit window and bar code is incorrect.	Place the MC65 within proper scanning range.
	MC65 is not programmed for the bar code.	Program the MC65 to accept the type of bar code being scanned. Refer to the EMDK or Control Panel application.
	MC65 is not programmed to generate a beep.	If the MC65 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 MC65 low battery condition notification. Note: If the scanner is still not reading symbols, contact the distributor or Zebra.

Bluetooth Connection

Table 6-2 *Troubleshooting Bluetooth Connection*


Problem	Cause	Solution
MC65 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 (32.8 feet).
	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.

Single Slot USB Cradle

Table 6-3 *Troubleshooting the Single Slot USB Cradle*

Symptom	Possible Cause	Action
LEDs do not light when MC65 or spare battery is inserted.	Cradle is not receiving power.	Ensure the power cable is connected securely to both the cradle and to AC power.
	MC65 is not seated firmly in the cradle.	Remove and re-insert the MC65 into the cradle, ensuring it is firmly seated.
	Spare battery is not seated firmly in the cradle.	Remove and re-insert the spare battery into the charging slot, ensuring it is firmly seated.

Table 6-3 Troubleshooting the Single Slot USB Cradle (Continued)



Symptom	Possible Cause	Action
MC65 battery is not charging.	MC65 was removed from cradle or cradle was unplugged from AC power too soon.	Ensure cradle is receiving power. Ensure MC65 is seated correctly. Confirm main battery is charging under Tap Status Bar >  . The 3600 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 MC65 is not fully seated in the cradle.	Remove and re-insert the MC65 into the cradle, ensuring it is firmly seated.
	Extreme battery temperature.	Battery does not charge if ambient temperature is below 0°C (32°F) or above 40°C (104°F).
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 firmly 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.
During data communication, no data transmits, or transmitted data was incomplete.	MC65 removed from cradle during communications.	Replace MC65 in cradle and retransmit.
	Communication software is not installed or configured properly.	Perform setup as described in Single Slot USB Cradle on page 2-3 .

Four Slot Ethernet Cradle

Table 6-4 Troubleshooting the Four Slot Ethernet Cradle

Symptom	Cause	Solution
During communication, no data transmits, or transmitted data was incomplete.	MC65 removed from cradle during communications.	Replace MC65 in cradle and retransmit.
	MC65 has no active connection.	An icon is visible in the status bar if a connection is currently active.

Table 6-4 Troubleshooting the Four Slot Ethernet Cradle (Continued)

Symptom	Cause	Solution
Battery is not charging.	MC65 removed from the cradle too soon.	Replace the MC65 in the cradle. The 3600 mAh battery fully charges in less than six hours. Tap Status Bar >  to view battery status.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	MC65 is not inserted correctly in the cradle.	Remove the MC65 and reinsert it correctly. Verify charging is active. Tap Status Bar >  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 6-5 Troubleshooting the Vehicle Cradle

Symptom	Possible Cause	Action
MC65 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.
MC65 battery is not recharging.	MC65 was removed from the cradle too soon.	Replace the MC65 in the cradle. The 3600 mAh battery fully charges in less than six hours.
	Battery is faulty.	Replace the battery.
	MC65 is not placed correctly in the cradle.	Remove the MC65 from the cradle, and re-insert correctly. If the battery still does not charge, contact customer support. The MC65 battery charging LED slowly blinks amber when the MC65 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 40°C (32°F and 104°F).


Four Slot Battery Charger

Table 6-6 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 3600 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 6-7 *Troubleshooting the Cables*

Symptom	Possible Cause	Action
MC65 battery is not charging.	MC65 was disconnected from AC power too soon.	Connect the power cable correctly. Confirm main battery is charging under Tap Status Bar >  . The 3600 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 MC65 is not fully attached to power.	Detach and re-attach the power cable to the MC65, ensuring it is firmly connected.
During data communication, no data transmits, or transmitted data was incomplete.	Cable was disconnected from MC65 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 Cables on page 2-25 .

Magnetic Stripe Reader

Table 6-8 *Troubleshooting the Magnetic Stripe Reader*

Symptom	Possible Cause	Action
MSR cannot read card.	MSR removed from MC65 during card swipe.	Reattach MSR to MC65 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 MC65. Ensure the MSR application is configured correctly.
MC65 battery is not charging.	MC65 was removed from MSR or MSR was unplugged from AC power too soon.	Ensure MSR is receiving power. Ensure MC65 is attached correctly. Confirm main battery is charging under Start > Settings > System > Power . The 3600 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 MC65 is not fully attached to the MSR.	Detach and re-attach the MSR to the MC65, ensuring it is firmly connected.

Table 6-8 *Troubleshooting the Magnetic Stripe Reader (Continued)*

Symptom	Possible Cause	Action
During data communication, no data transmits, or transmitted data was incomplete.	MC65 detached from MSR during communications.	Reattach MC65 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>MC65 Integrator Guide</i> .

APPENDIX A TECHNICAL SPECIFICATIONS

MC65 Technical Specifications

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

MC65

Table A-1 MC65 EDA Technical Specifications

Item	Description
Physical Characteristics	
Dimensions	Height: 1.2 cm (6. in.) Width: 7.7 cm (3.03 in.) Depth: 3. cm (1. in.)
Weight	359 g (12.5 oz.)
Display	Color 3.5" VGA with backlight, 65K colors, 480 x 640
Touch Panel	Glass analog resistive touch
Backlight	LED backlight
Battery Pack	Rechargeable Lithium Ion 3.7V, 3600 mAh battery
Expansion Slot	microSD slot (supports up to 32 GB).
Connection Interface	USB 2.0 High Speed (host and client)
Notification	Audible tone plus multi-color LEDs
Keypad Options	numeric, QWERTY, AZERTY, QWERTZ, DSD or PIM
Audio	Dual microphone support with noise cancellation; vibrate alert; speaker; Bluetooth headset

Table A-1 MC65 EDA Technical Specifications (Continued)

Item	Description
Performance Characteristics	
CPU	MSM Qualcomm 7627@ 600 MHz (multi-processor architecture)
Operating System	Microsoft® Windows Mobile™ 6.5 Professional
Memory	256 MB RAM/1 GB Flash or 512 MB RAM/1 GB Flash
Output Power	USB: 5VDC @ 300 mA max.
User Environment	
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	32°F to 104°F
Humidity	5 to 95% non-condensing
Drop Specification	Multiple 6 ft. drops per MIL-STD 810G specifications Multiple 5 ft. drops to concrete at room temperature Multiple 4 ft. drops to concrete across the operating temperature range
Tumble	1,000 1.6 ft. tumbles at room temperature; per applicable IEC tumble specifications
Electrostatic Discharge (ESD)	+/-15kVdc air discharge, +/-8kVdc direct discharge, +/-8kVdc indirect discharge
Sealing	IP64; per applicable IEC sealing specifications
Vibration	4g's PK Sine (5Hz to 2KHz); 0.04g2/Hz Random (20Hz to 2KHz); 60 minute duration per axis, 3 axis
Thermal Shock	-40° C to 70° C (-40° F to 158° F) rapid transition
Battery Performance	
Standby Time	100 hours
Talk Time	6 hours
User Profiles	8 hours
Zebra Interactive Sensor Technology (IST)	
Motion Sensor	3-axis accelerometer that enables motion-sensing applications for dynamic screen orientation and power management.
Light Sensor	Ambient light sensor to auto adjust display brightness.
Wireless WAN Data and Voice Communications	
Radio	Dual 3.5G: GSM HSPA/HSUPA and CDMA EVDO Rev A
Frequency Band	UMTS/HSDPA and HSUPA: 850, 1900 and 2100 MHz GSM/EDGE: 850, 900, 1800 and 1900 MHz CDMA/EVDO Rev A: 850 and 1900 MHz

Table A-1 MC65 EDA Technical Specifications (Continued)

Item	Description
Wireless LAN Data and Voice Communications	
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 36-165 (5180 – 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	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)
Voice Communications	Voice-over-IP ready, Wi-Fi™-certified, IEEE 802.11a/b/g direct sequence wireless LAN, Wi-Fi™ (WMM and WMM-PS) Zebra Voice Quality Manager (VQM), Zebra TEAM Express Ready
Wireless PAN Data and Voice Communications	
Bluetooth	Class II, v2. with Enhanced Data Rate (EDR)
Global Positioning System	
GPS	Integrated stand-alone or Assisted-GPS (A-GPS).
Data Capture Specifications	
Options	2D imager and color camera
2D Imager Engine (SE4500-SR) Specifications	
Field of View	Horizontal - 39.6° Vertical - 25.7°
Optical Resolution	WVGA 752 H x 480 V pixels (gray scale)
Roll	360°
Pitch Angle	+/- 60° from normal
Skew Tolerance	+/- 60° from normal
Ambient Light	Indoor: 450 ft. candles (4845 lux) Outdoor: 9000 ft. candles (96,900 lux) Sunlight: 8000 ft. candles Fluorescent: 450 ft. candles
Focal Distance	From center of exit window: 19 cm (7.5 in.)
Aiming Element (VLD)	655 nm +/- 10 nm
Illumination Element (LED)	625 nm +/- 5 nm

Table A-1 MC65 EDA Technical Specifications (Continued)

Item	Description
2D Imager Engine (SE4500-DL) Specifications	
Field of View	Horizontal - 39.2° Vertical - 25.4°
Optical Resolution	752 H x 480 V pixels (gray scale)
Roll	360°
Pitch Angle	+/- 60° from normal
Skew Tolerance	+/- 60° from normal
Ambient Light	Indoor: 450 ft. candles (4845 lux) Outdoor: 9000 ft. candles (96,900 lux) Sunlight: 8000 ft. candles Fluorescent: 450 ft. candles
Focal Distance	From center of the exit window: 18.5 cm (7.3 in.)
Aiming Element (VLD)	655 nm +/- 10 nm
Illumination Element (LED)	625 nm +/- 5 nm LEDs (2x)
Camera Specifications	
Resolution	3.2 Mega pixel

Table A-2 Data Capture Options

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 GS1 DataBar Expanded 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 Stacked GS1 DataBar Expanded Stacked	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 Truncated GS1 DataBar Expanded GS1 DataBar Stacked Omni	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 Limited GS1 DataBar Stacked Omni

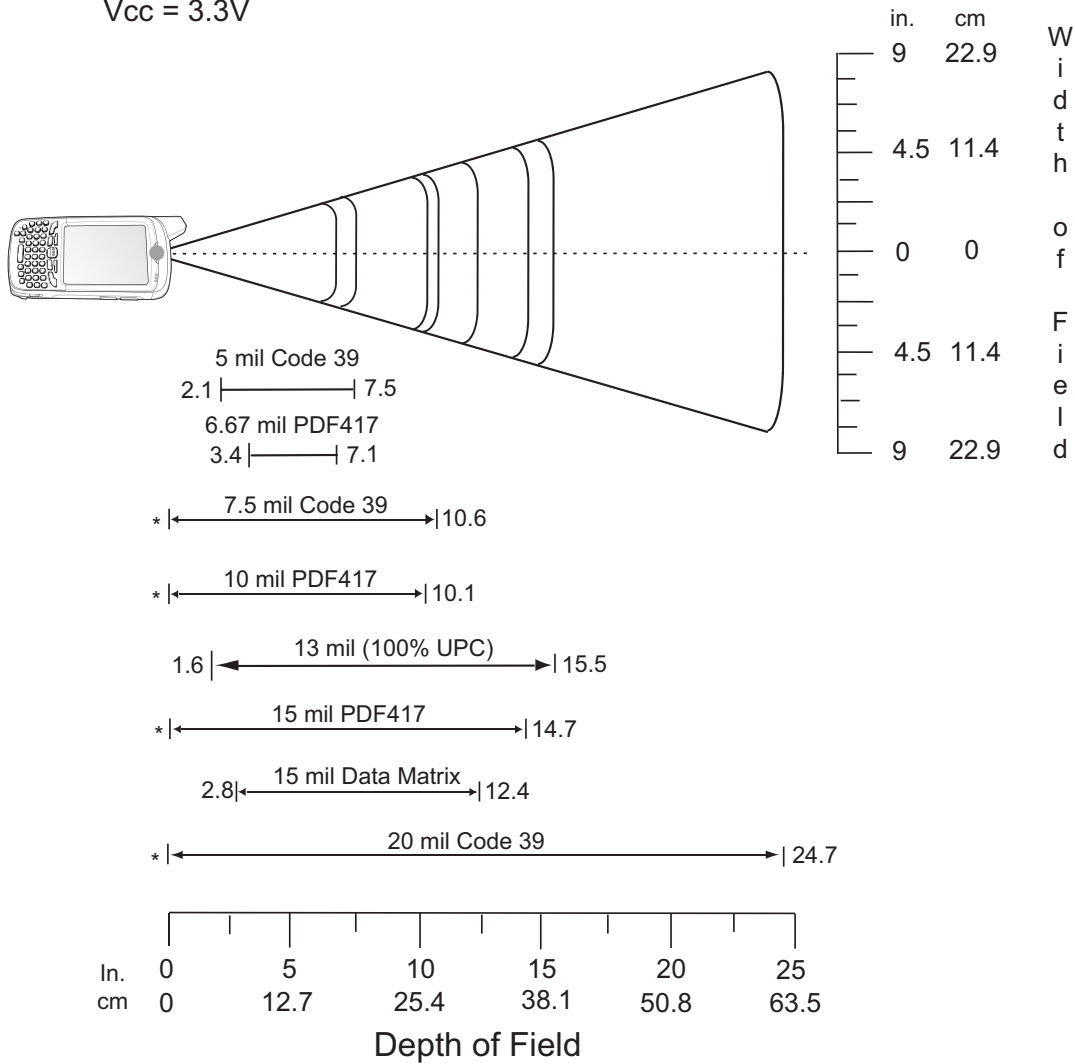
Decode Zones

SE4500-SR

Figure A-1 shows the decode zone for the SE4500-SR. Typical values appear. Table A-3 lists the typical distances for selected bar code densities. The minimum element width (or “symbol density”) is the width in mils of the narrowest element (bar or space) in the symbol.

Note: Typical performance at 73°F (23°C)
on high quality symbols in normal room light.

Vcc = 3.3V



* Minimum distance determined by symbol length and scan angle.

Figure A-1 SE4500-SR Decode Zone

Table A-3 SE4500-SR Decode Distances

Symbol Density/ Bar Code Type	Bar Code Content/ Contrast ^{Note 2}	Typical Working Ranges	
		Near	Far
5.0 mil Code 39	ABCDEFGH 80% MRD	2.1 in 5.33 cm	7.5 in 19.05 cm
6.67 mil PDF417	4 Col, 20 Rows 80% MRD	3.4 in 8.64 cm	7.1 in 18.03 cm
7.5 mil Code 39	ABCDEF 80% MRD	Note 1	10.6 in 26.92 cm
10 mil PDF417	3 Col, 17 Rows 80% MRD	Note 1	10.1 in 25.65 cm
13 mil UPC-A	012345678905 80% MRD	1.6 in 5.08 cm	15.5 in 39.37 cm
15 mil PDF417	80% MRD	Note 1	14.7 in 37.34 cm
15 mil Data Matrix	18 x 18 Modules 80% MRD	2.8 in 7.11 cm	12.4 in 31.50 cm
20 mil Code 39	123 80% MRD	Note 1	24.7 in 62.74 cm

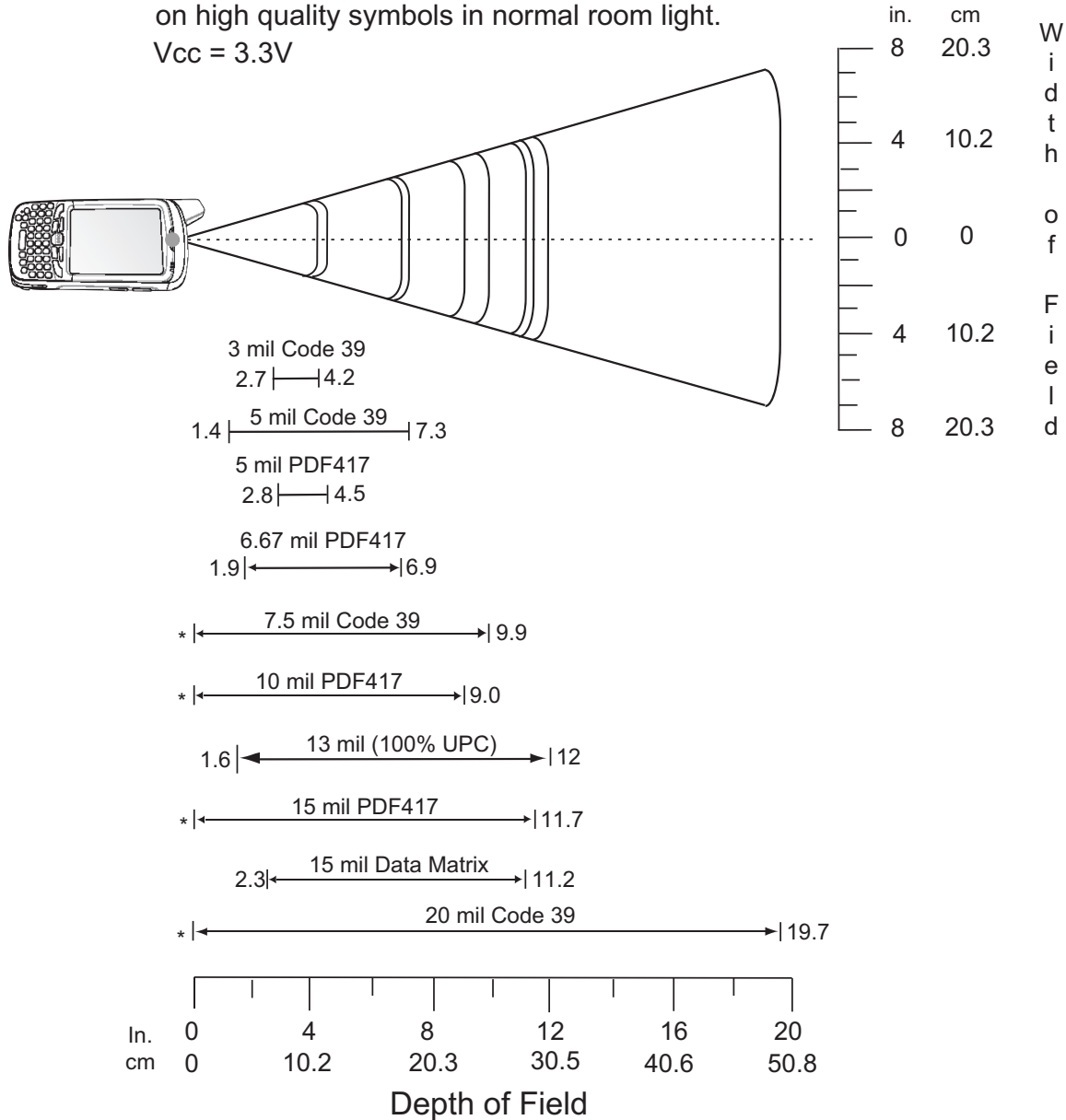
Notes:

1. Near distances are field-of-view (FOV) limited.
2. Contrast is measured as Mean Reflective Difference (MRD) at 670 nm.
3. Working range specifications at temperature = 23°C, pitch=18°, roll=0°, skew=0°, photographic quality, ambient light ~30 ft-c, humidity 45-70% RH.
4. Distances measured from front edge of scan engine chassis.

SE4500-DL

Figure A-2 shows the decode zone for the SE4500-DL. Typical values appear. Table A-4 lists the typical distances for selected bar code densities. The minimum element width (or “symbol density”) is the width in mils of the narrowest element (bar or space) in the symbol.

Note: Typical performance at 73°F (23°C)
on high quality symbols in normal room light.
Vcc = 3.3V



* Minimum distance determined by symbol length and scan angle.

Figure A-2 SE4500-DL Decode Zone

Table A-4 SE4500-DL Decode Distances

Symbol Density/ Bar Code Type	Bar Code Content/ Contrast ^{Note 2}	Typical Working Ranges	
		Near	Far
3.0 mil Code 39	80% MRD	2.7 in 6.86 cm	4.2 in 10.67 cm
5.0 mil Code 39	ABCDEFGH 80% MRD	1.4 in 3.56 cm	7.3 in 18.54 cm
5.0 mil PDF417	80% MRD	2.8 in 7.11 cm	4.5 in 11.43 cm
6.67 mil PDF417	4 Col, 20 Rows 80% MRD	1.9 in 4.83 cm	6.9 in 17.53 cm
7.5 mil Code 39	ABCDEF 80% MRD	Note 1	9.9 in 25.15 cm
10 mil PDF417	3 Col, 17 Rows 80% MRD	Note 1	9.0 in 22.86 cm
13 mil UPC-A	012345678905 80% MRD	1.6 in 5.08 cm	12.0 in 30.48 cm
15 mil PDF417	80% MRD	Note 1	11.7 in 29.72 cm
15 mil Data Matrix	18 x 18 Modules 80% MRD	2.3 in 5.84 cm	11.2 in 28.45 cm
20 mil Code 39	123 80% MRD	Note 1	19.7 in 50.04 cm

Notes:

1. Near distances are FOV limited.
2. Contrast is measured as Mean Reflective Difference (MRD) at 670 nm.
3. Working range specifications at temperature = 23°C, pitch=18°, roll=0°, skew=0°, photographic quality, ambient light ~30 ft-c, humidity 45-70%RH.
4. Distances measured from front edge of scan engine chassis.

MC65 External Connector Pin-Outs

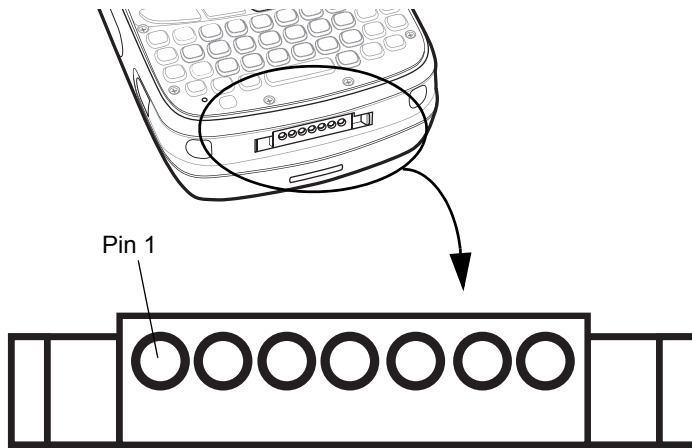


Figure A-3 External Connector

Table A-5 External Connector Pin-Outs

Pin	Description
1	External Trigger/Cradle Detect
2	USB_ID
3	5.4 VDC
4	USB_VCC
5	USB_D-
6	USB_D+
7	Ground

MC65 Accessory Specifications

Single Slot USB Cradle

Table A-6 *Single Slot USB Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 7.1 cm (2.80 in.) Width: 11.0 cm (4.33 in.) Depth: 15.0 cm (5.91 in.)
Weight	210 g (7.41 oz)
Input Voltage	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

Four Slot Battery Charger

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

Feature	Description
Dimensions	Height: 4.7 cm (1.85 in.) Width: 15.5 cm (6.10 in.) Depth: 21.0 cm (8.27 in.)
Weight	384 g (13.55 oz)
Input Voltage	12 VDC
Power Consumption	30 watts
Operating Temperature	0°C to 40°C (32°F to 104°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

Four Slot Charge Only Cradle

Table A-8 *Four Slot Charge Only Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 13.7 cm (5.39 in.) Width: 46.8 cm (18.43 in.) Depth: 9.9 cm (3.90 in.)
Weight	1115 g (39.33 oz)
Input Voltage	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 Ethernet Cradle

Table A-9 *Four Slot Ethernet Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 13.7 cm (5.39 in.) Width: 46.8 cm (18.43 in.) Depth: 9.9 cm (3.90 in.)
Weight	1115 g (39.33 oz)
Power	12 VDC
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-9 *Four Slot Ethernet Cradle 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

Magstripe Reader

Table A-10 *Magstripe Reader (MSR) Technical Specifications*

Feature	Description
Dimensions	8.4 cm x 9.4 cm (3.3 in. x 3.7 in.)
Weight	79.4 g (2.8 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	32° to 122° F (0° to 50° C)
Storage Temperature	-40° to 158° F (-40° to 70° C)
Humidity	5% to 95% non-condensing
Drop	4 ft. (1.22 m) drops to concrete
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Vehicle Cradle

Table A-11 *Vehicle Cradle Technical Specifications*

Feature	Description
Dimensions	Height: 10.4 cm (4.09 in.) Width: 11.1 cm (4.37 in.) Depth: 6.9 cm (2.72 in.)
Weight	240 g (8.47 oz)
Power	9- 32 VDC
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	0°C to 40°C (32°C 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

Cables

Table A-12 *USB Charging Cable Technical Specifications*

Feature	Description
Length	161.9 cm (63.74 in.)
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	10% to 95% non-condensing
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Table A-13 *Charge Only Cable Technical Specifications*

Feature	Description
Length	28.0 cm (11.00 in.)
Operating Temperature	-10°C to 50°C (14°F to 122°F)

Table A-13 *Charge Only Cable Technical Specifications (Continued)*

Feature	Description
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	10% to 95% non-condensing
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

Table A-14 *Auto Charge Cable Technical Specifications*

Feature	Description
Length	169.0 cm (66.54 in.)
Input Voltage	12 - 24 VDC
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	10% to 95% non-condensing
Electrostatic Discharge (ESD)	+/- 15 kV air +/- 8 kV contact

APPENDIX B SOFTWARE

SMS8 Configuration

To set the primary local language for SMS messages:

Using a registry editor, navigate to the following:

[HKEY_LOCAL_MACHINE\Comm\Cellular\RIL\SMS\NLTables]

Edit the following key:

“LocalePrimaryLanguage” = dword:1

where:

dword:0 = None

dword:1 = Turkish

dword:2 = Spanish

dword:3 = Portuguese

Cache Disk Configuration

To enable or disable the use of cache disk:

Using a registry editor, navigate to the following:

[HKEY_LOCAL_MACHINE\Drivers\Builtin\RAMDisk]

Edit the following key:

“Size” = dword:4194304

where:

dword:0 = Cache disk size is 0.

dword:4194304 = Cache disk size is 4,194,304 bytes (4 MB)

Auto Reboot

To warm boot the MC65 in case of an ARM9 lockup.

Using a registry editor, navigate to the following:

[HKEY_LOCAL_MACHINE\Software\Zebra\AutoReboot]

Edit the following key:

“Enable” = dword:1

where:

dword:0 = disabled.

dword:1 = enabled (default).

✓ **NOTE** The absence of a value shall default to “Enabled.”

Daily Reboot

To warm boot the MC65 at a specified time of day.

Using a registry editor, navigate to the following:

[HKEY_LOCAL_MACHINE\Software\Zebra\dailyReboot]

Edit the following key:

“dailyRebootTime” = XX:XX

where:

XX:XX is a time from 00:00 (12:00 am) to 23:59 in 24 hours time format.

Edit the following key:

“Disable” = dword:1

where:

dword:0 = enabled.

dword:1 = disabled (default).

✓ **NOTE** If this key is not present then the default is “Disabled.”

SMS Cell Broadcast

To locally enable or disable the Cell Broadcast feature. Cell Broadcast is one-to-many geographically focused service.

Using a registry editor, navigate to the following:

[HKEY_LOCAL_MACHINE\Software\Zebra\SMS_CB]

Edit the following key:

"Enable" = dword:1

where:

dword:0 = disabled.

dword:1 = enabled (default).

✓ **NOTE** The absence of a value shall default to "Enabled."

GLOSSARY

A

API. (Application Programming Interface) An interface by means of which one software component communicates with or controls another. Usually used to refer to services provided by one software component to another, usually via software interrupts or function calls

AZERTY. A standard keyboard commonly used on French keyboards. “AZERTY” refers to the arrangement of keys on the top row of keys.

AKU. (Adaptation Kit Update) Updates to the Windows Mobile operating system.

AFH. Adaptive Frequency Hopping

ActiveSync. ActiveSync is a data synchronization program developed by Microsoft for use with Windows Mobile operating systems.

B

Bar Code. A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a bar code symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format. See **Symbology**.

Bit. Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

Bits per Second (bps). Bits transmitted or received.

Bluetooth. A wireless protocol utilizing short-range communications technology facilitating data transmission over short distances.

boot or boot-up. The process a computer goes through when it starts. During boot-up, the computer can run self-diagnostic tests and configure hardware and software.

bps. See **Bits Per Second**.

Byte. On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.

C

CDRH. Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

CDRH Class 1. This is the lowest power CDRH laser classification. This class is considered intrinsically safe, even if all laser output were directed into the eye's pupil. There are no special operating procedures for this class.

CDRH Class 2. No additional software mechanisms are needed to conform to this limit. Laser operation in this class poses no danger for unintentional direct human exposure.

Character. A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.

Codabar. A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (“-”, “\$”, “.”, “/”, “,” and “+”).

Code 128. A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.

Code 3 of 9 (Code 39). A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9 and 7 special characters (“-”, “.”, “/”, “+”, “%”, “\$” and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.

Code 93. An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.

COM port. Communication port; ports are identified by number, e.g., COM1, COM2.

Cradle. A cradle is used for charging the terminal battery and for communicating with a host computer, and provides a storage place for the terminal when not in use.

D

DCP. See **Device Configuration Package**.

Decode. To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

Decode Algorithm. A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

Decryption. Decryption is the decoding and unscrambling of received encrypted data. Also see, **Encryption** and **Key**.

Depth of Field. The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.

Device Configuration Package. The Symbol Device Configuration Package provides the Product Reference Guide (PRG), flash partitions, Terminal Configuration Manager (TCM) and the associated TCM scripts. With this package hex images that represent flash partitions can be created and downloaded to the mobile computer.

Discrete 2 of 5. A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.

E

EAN. European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

EMDK. Enterprise Mobility Developer's Kit.

ESD. Electro-Static Discharge

F

File Transfer Protocol (FTP). A TCP/IP application protocol governing file transfer via network or telephone lines. See **TCP/IP**.

Flash Memory. Flash memory is nonvolatile, semi-permanent storage that can be electronically erased in the circuit and reprogrammed.

FHSS (Frequency Hopping Spread). A method of transmitting radio signals by rapidly switching a carrier among many frequency channels, using a pseudorandom sequence known to both transmitter and receiver.

G

GPS (Global Positioning System). A satellite-based navigation system made up of a network of 24 satellites. GPS satellites circle the earth and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location.

H

Hz. Hertz; A unit of frequency equal to one cycle per second.

Host Computer. A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs and network control.

I

IEC. International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

IEC (825) Class 1. This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.

IEEE Address. See **MAC Address**.

Input/Output Ports. I/O ports are primarily dedicated to passing information into or out of the terminal's memory. MC65 mobile computers include USB ports.

Interleaved 2 of 5. A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/STOP characters may be encoded.

Internet Protocol Address. See **IP**.

I/O Ports. The connection between two devices, defined by common physical characteristics, signal characteristics, and signal meanings. Types of interfaces include RS-232 and USB.

IP. Internet Protocol. The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts "packets" from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a "datagram" to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.

IP Address. (Internet Protocol address) The address of a computer attached to an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a IP network. Client workstations have either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

IPX/SPX. Internet Package Exchange/Sequential Packet Exchange. A communications protocol for Novell. IPX is Novell's Layer 3 protocol, similar to XNS and IP, and used in NetWare networks. SPX is Novell's version of the Xerox SPP protocol.

ISM. Industry Scientific and Medical

K

Key. A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, **Encryption** and **Decrypting**.

L

LASER. Light Amplification by Stimulated Emission of Radiation. The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

laser scanner. A type of bar code reader that uses a beam of laser light.

LCD. See **Liquid Crystal Display**.

LED Indicator. A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.

Light Emitting Diode. See **LED**.

Liquid Crystal Display (LCD). A display that uses liquid crystal sealed between two glass plates. The crystals are excited by precise electrical charges, causing them to reflect light outside according to their bias. They use little electricity and react relatively quickly. They require external light to reflect their information to the user.

M

MC. Mobile Computer.

MDN. Mobile Directory Number. The directory listing telephone number that is dialed (generally using POTS) to reach a mobile unit. The MDN is usually associated with a MIN in a cellular telephone -- in the US and Canada, the MDN and MIN are the same value for voice cellular users. International roaming considerations often result in the MDN being different from the MIN.

MIN. Mobile Identification Number. The unique account number associated with a cellular device. It is broadcast by the cellular device when accessing the cellular system.

Mobile Computer. In this text, *mobile computer* refers to the MC65. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

N

Nominal. The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

NVM. Non-Volatile Memory.

O

Open System Authentication. Open System authentication is a null authentication algorithm.

P

PAN . Personal Area Network. Using Bluetooth wireless technology, PANs enable devices to communicate wirelessly. Generally, a wireless PAN consists of a dynamic group of less than 255 devices that communicate within about a 33-foot range. Only devices within this limited area typically participate in the network.

PING. (Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

Q

QWERTY. A standard keyboard commonly used on European keyboards. "QWERTY" refers to the arrangement of keys on the top row of keys.

QWERTZ. A standard keyboard commonly used on German keyboards. "QWERTZ" refers to the arrangement of keys on the top row of keys.

R

RAM. Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

RF. Radio Frequency.

ROM. Read-Only Memory. Data stored in ROM cannot be changed or removed.

Router. A device that connects networks and supports the required protocols for packet filtering. Routers are typically used to extend the range of cabling and to organize the topology of a network into subnets. See **Subnet**.

S

Scanner. An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are: 1) Light source (laser or photoelectric cell) - illuminates a bar code.; 2) Photodetector - registers the difference in reflected light (more light reflected from spaces); 3) Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

SDK. Software Development Kit

Shared Key. Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.

SID. System Identification code. An identifier issued by the FCC for each market. It is also broadcast by the cellular carriers to allow cellular devices to distinguish between the home and roaming service.

Space. The lighter element of a bar code formed by the background between bars.

Specular Reflection. The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.

Start/Stop Character. A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.

Subnet. A subset of nodes on a network that are serviced by the same router. See **Router**.

Subnet Mask. A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.

Substrate. A foundation material on which a substance or image is placed.

Symbol. A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters and check characters.

Symbol Aspect Ratio. The ratio of symbol height to symbol width.

Symbol Height. The distance between the outside edges of the quiet zones of the first row and the last row.

Symbol Length. Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character.

Symbology. The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39, PDF417, etc.).

T

TCP/IP. (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications. TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted. IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.

Telnet. A terminal emulation protocol commonly used on the Internet and TCP/IP-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program.

Terminal. See **Mobile Computer**.

Terminal Emulation. A "terminal emulation" emulates a character-based mainframe session on a remote non-mainframe terminal, including all display features, commands and function keys. The VC5000 Series supports Terminal Emulations in 3270, 5250 and VT220.

TFTP. (Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading firmware, downloading software and remote booting of diskless devices.

Tolerance. Allowable deviation from the nominal bar or space width.

Transmission Control Protocol/Internet Protocol. See **TCP/IP**.

Trivial File Transfer Protocol. See **TFTP**.

U

UDP. User Datagram Protocol. A protocol within the IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

UPC. Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which is any of four widths. The standard symbology for retail food packages in the United States.

V

Visible Laser Diode (VLD). A solid state device which produces visible laser light.

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