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Lincolnshire IL, U.S.A.
http://www.zebra.com

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**Warranty**

For the complete Zebra hardware product warranty statement, go to:

## Revision History

Changes to the original manual are listed below:

<table>
<thead>
<tr>
<th>Change</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>-01 Rev A</td>
<td>2/2011</td>
<td>Initial release</td>
</tr>
<tr>
<td>-02 Rev A</td>
<td>01/2014</td>
<td>Add battery configuration. Update web addresses.</td>
</tr>
<tr>
<td>-03 Rev A</td>
<td>3/2015</td>
<td>Zebra Rebranding</td>
</tr>
<tr>
<td>Table of Contents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty</td>
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<td></td>
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<td>Revision History</td>
<td>iii</td>
<td></td>
</tr>
</tbody>
</table>

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Introduction

This MC319Z RFID Integrator Guide provides the unique set up and operating procedures for the MC319Z RFID mobile computers. This guide is intended as a supplement to the MC3000 Integrator Guide, p/n 72E-68900-xx. Procedures common to MC3000 products are addressed in the MC3000 Integrator Guide.

NOTE  Screens and windows pictured in this guide are samples and may differ from actual screens.

Configurations

All MC319Z models support the following features:

- Windows Mobile 6.5 Platform
- 256 MB RAM / 1 GB Flash
- 48-key alphanumeric keypad
- Color display
- WLAN 802.11 a/b/g radio
- Bluetooth

This guide covers the following configurations:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Country Support</th>
<th>Power</th>
<th>Data Capture</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC319Z-GL4H24EiW</td>
<td>Worldwide</td>
<td>1 W</td>
<td>Laser, RFID</td>
</tr>
<tr>
<td>MC319Z-GL4H24EIE</td>
<td>Europe</td>
<td>0.5 W</td>
<td>Laser, RFID</td>
</tr>
<tr>
<td>MC319Z-GL4H24EiW</td>
<td>Worldwide</td>
<td>1 W</td>
<td>Imager, RFID</td>
</tr>
<tr>
<td>MC319Z-GL4H24EIE</td>
<td>Europe</td>
<td>0.5 W</td>
<td>Imager, RFID</td>
</tr>
</tbody>
</table>
Chapter Descriptions

Topics covered in this guide are as follows:

- **Chapter 1, Getting Started** provides an overview of RFID technology and components and a description of the MC319Z RFID mobile computer and features.
- **Chapter 2, Updating the Mobile Computer** describes how to update the device image and radio firmware.
- **Chapter 3, MobileRFID Functionality** includes information on configuring the RFID radio and reading tags.
- **Chapter 4, RFID Sample Application** provides information on the RFID sample application and how to use it to assist in custom application development.
- **Chapter 5, Tag Locator** provides information on the application used to detect the location of a tag.
- **Chapter 6, Troubleshooting** describes MC319Z RFID mobile computer troubleshooting procedures.
- **Appendix A, Technical Specifications** includes the technical specifications for the reader.
- **Appendix B, RFID APIs** provides a reference for information on supported RFID APIs.

Notational Conventions

The following conventions are used in this document:

- "Mobile computer" or "reader" refers to the MC319Z RFID mobile computer.
- *Italics* are used to highlight the following:
  - Chapters and sections in this and related documents
  - Dialog box, window, links, software names, and screen names
  - Drop-down list, columns and list box names
  - Check box and radio button names
  - Icons on a screen
- **Bold** text is used to highlight the following:
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Check box and radio button names
  - Icons on a screen
  - 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 and Software

The following documents provide more information about the reader.

- MC319Z RFID Mobile Computer Quick Start Guide, p/n 72-146160-xx
- MC319Z RFID Mobile Computer Regulatory Guide, p/n 72-146159-xx
- MC3000 Mobile Computer User Guide, p/n 72E-68899-xx
- MC3000 Mobile Computer Integrator Guide, p/n 72E-68900-xx
- Application Guide for Zebra Devices, p/n 72E-68902-xx
- Mobility Services Platform 3.2 User’s Guide, p/n 72E-100158-xx
- MC319Z RFID Enterprise Mobility Developer Kit

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 support for your region. Contact information is available at: http://www.zebra.com/support.

When contacting Zebra support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software type and version number

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

If your problem cannot be solved by Zebra 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, please contact that business partner for support.
Chapter 1 Getting Started

Introduction

This chapter provides an overview of RFID technology and components, and describes the MC319Z RFID mobile computer and its features.

RFID Technology Overview

RFID (Radio Frequency Identification) is an advanced automatic identification (Auto ID) technology that uses radio frequency signals to identify tagged items. An RFID tag contains a circuit that can store data. This data may be pre-encoded or can be encoded in the field. The tags come in a variety of shapes and sizes.

To read a tag the mobile computer sends out radio frequency waves using its integrated antenna. This RF field powers and charges the tags, which are tuned to receive radio waves. The tags use this power to modulate the carrier signal. The reader interprets the modulated signal and converts the data to a format for computer storage. The computer application translates the data into an understandable format.

Figure 1-1  RFID System Elements
RFID Components

Zebra RFID solutions offer low cost, long read range, and a high read rate. These features provide real time end-to-end visibility of products and assets in the factory, distribution center, retail outlet, or other facility. The MC319Z RFID system consists of the following components:

- Silicon-based RFID tags that attach to retail products, vehicles, trailers, containers, pallets, boxes, etc.
- An integrated antenna that supports applications such as item level tracking and asset tracking.
- An embedded radio module that powers and communicates with tags for data capture and provides host connectivity for data migration.

Tags

Tags contain embedded chips that store unique information. Available in various shapes and sizes, tags, often called **transponders**, receive and respond to data requests. Tags require power to send data.

There are several categories of tags based on the protocol they support, read/write memory, and power options:

- Active RFID tags are powered by internal light-weight batteries, and also use these batteries to broadcast radio waves to the reader.
- Semi-passive RFID tags are also powered by internal light-weight batteries, but draw broadcasting power from the reader.
- Passive RFID tags are powered by a reader-generated RF field. These tags are much lighter and less expensive than active tags, and are typically applied to less expensive goods.

Antenna

Antennas transmit and receive radio frequency signals.

Radio Module

The radio module communicates with the tags and transfers the data to a host computer. It also provides features such as filtering, CRC check, and tag writing. The MC319Z RFID mobile computer supports standard RFID tags as described by EPCGlobal™ Class 1 Gen2 protocol.
The Zebra MC319Z RFID mobile computer includes an intelligent C1G2 UHF RFID reader with RFID read performance that provides real-time, seamless EPC-compliant tags processing. MC319Z RFID mobile computers are designed for indoor inventory management and asset tracking applications, and can host third-party, customer-driven embedded applications. Features include:

- ISO 18000-6C standard (EPC Class 1 Gen 2)
- Read, write, kill, lock, block write/block erase, and permalock functionality
- 48-key alphanumeric keypad
- 3" color display
- Orientation-insensitive integrated external antenna
- Laser-based bar code reader - reads 1D bar codes
- Windows® Mobile 6.5
- WLAN 802.11 a/b/g wireless connectivity
- Application-specific setup for ease of installation
- Low Level Reader Protocol (LLRP)
- Sample application and support for custom or third-party applications
- RFID API support
- Event and tag management support
The MC319Z RFID mobile computer provides a wide range of features that enable implementation of complete, high-performance, intelligent RFID solutions.

**NOTE** The MC319Z RFID mobile computer supports a 2x battery only; do not use a 1x battery. The Four-Slot Cradle does not accommodate the MC319Z RFID mobile computer.

Due to component tolerances, some users may experience undesired behavior when using battery part number 55-060112-xx. If the unit turns off without proper warning messages during heavy use, use battery 55-002152-xx (p/n 82-127909-xx).

**MC319Z RFID Mobile Computer Parts**

![MC319Z RFID Mobile Computer Parts](image)

**Figure 1-3** MC319Z RFID Mobile Computer Parts
MC319Z RFID Mobile Computer LEDs

The mobile computer LEDs indicate charging and reader status as described in Table 1-1.

### Table 1-1  LED Status Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Charging Indicators</strong></td>
<td></td>
</tr>
<tr>
<td>Off</td>
<td>Mobile computer not placed correctly in the cradle; cable not connected correctly; charger is not powered.</td>
</tr>
<tr>
<td>Fast Blinking Amber</td>
<td>Error in charging; check placement of mobile computer.</td>
</tr>
<tr>
<td>Slow Blinking Amber</td>
<td>Mobile computer is charging.</td>
</tr>
<tr>
<td>Solid Amber</td>
<td>Charging complete. Note: When the battery is initially inserted in the mobile computer, the amber LED flashes once if the battery power is low or the battery is not fully inserted.</td>
</tr>
</tbody>
</table>

---

**Reading Tags**

To read RFID tags:

1. Remove the MC319Z from AC power and ensure the LLRP icon is green.

   \( \checkmark \)  **Note**  When connected to power, the mobile computer cannot read RFID tags.

2. Use an RFID reader application to enable tag reading. For a sample application, browse to the MC319Z Application directory and select `RFIDSample3Plus.exe`. See Chapter 4, RFID Sample Application.

3. Aim the mobile computer at the tag, oriented horizontally or vertically depending on the tag orientation. The distance between the tag and the antenna is the approximate read range.

4. Press the trigger or tap the on-screen Read command within the application to interrogate all RFID tags within the radio frequency (RF) field of view and capture data from each new tag found. Release the trigger or tap the Stop Read command to stop interrogating tags.
Chapter 2 Updating the Mobile Computer

Introduction

This chapter describes how to update the device image and radio firmware.

Updating the Device Image

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

To update an operating system component, copy the update package to the mobile computer using ActiveSync, AirBEAM, or MSP.

Downloading an Update Loader Package

1. Download the appropriate update loader package from the Zebra Support Central web site http://www.zebra.com/support to a host computer.

2. Locate the update loader package file on the host computer and un-compress the file into a separate directory:
   - 30XXw61RFIDSCxxxxx.zip for updating via ActiveSync
   - 30XXw61RFIDABxxxxx.zip for updating via AirBEAM

Updating Images via ActiveSync

To install an update loader package using ActiveSync:

1. Insert the mobile computer into the cradle and connect the cradle to AC power.

2. Connect the mobile computer to the host computer using ActiveSync.

3. In ActiveSync on the host computer, open Explorer for the mobile computer.

4. Copy the contents of 3190w65MenUL02270X\UpdateLoader (the files only, not the folder) into the \Storage Card folder on the mobile computer.
5. On the mobile computer, navigate to the \Storage Card folder and tap the program STARTUPDLDR.EXE. The update takes approximately 10 minutes. Do not remove AC power during this time.

6. Copy MCRFIDInstall.CAB into the \Storage Card folder on the mobile computer.

7. On the mobile computer, navigate to the \Storage Card folder and tap MCRFIDInstall.CAB. The device reboots after the installation with RFID operational.

**Updating Images via AirBEAM**

Install the AirBEAM package files within 30XXw61RFIDABxxxx.zip in sequence:

1. 30XXw61MenUPRXXXXX.apf
2. 30XXw61RFIDPkgXXXX.apf

30XXw61RFIDPkgXXXX.apf executes silently and the mobile computer boots after installation, which takes approximately 7-10 seconds. Refer to the MC3000 Integrator Guide for more information on AirBEAM.

**Updating the RFID Firmware**

The RFID_FLASH utility, used to update the RFID radio firmware, is no longer provided. For related issues, contact Zebra support.
Chapter 3 MobileRFID Functionality

Introduction

MobileRFID is an RFID server application that runs in the background on the mobile computer. The MobileRFID icon appears in the system tray. This chapter includes information on using and configuring MobileRFID.

Figure 3-1  MobileRFID Icon
MobileRFID Icons

The MobileRFID icon indicates RFID radio status as described in Table 3-1.

Table 3-1  MobileRFID Icon Indicators

<table>
<thead>
<tr>
<th>Icon</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Checkmark]</td>
<td>RFID running, radio on.</td>
</tr>
<tr>
<td>![Checkmark]</td>
<td>RFID running, radio off.</td>
</tr>
<tr>
<td>![X]</td>
<td>RFID stopped (radio not found/battery critical/stopped from user interface).</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>RFID critical (radio muted, laser enabled).*</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>RFID warning (Tx low power).*</td>
</tr>
</tbody>
</table>

*RFID critical and RFID warning due to transmit low power is not applicable to the MC319Z.
MobileRFID Menu

If using RFID as the Windows default home screen, tap the RFID panel, then tap the Settings button.

Figure 3-2  MobileRFID Home Window and Settings Window

If not using RFID as the Windows default home screen, tap the MobileRFID icon in the system tray. A menu appears.

Figure 3-3  MobileRFID Icon Menu
Configure Region

Upon Startup
After upgrading the mobile computer, the following window appears on startup.

Figure 3-4  Country Not Set Window

1. Tap ok. When no country is selected, the Region Configuration window appears.

Figure 3-5  Region Configuration Window
2. Select the region of operation and communication standard as allowed by the regulatory standards of that country/region from the drop-down menus. The following warning message appears.

![Region Selection Warning Message](image)

**Figure 3-6  Region Selection Warning Message**

3. Tap Yes to confirm. A window appears indicating success.

![Region Selection Success Window](image)

**Figure 3-7  Region Selection Success Window**
After Startup

If not done at startup, set the regulatory region as follows:

1. Invoke the MobileRFID menu, then tap Configure Region.

2. In the Region Configuration window, select a region from the Region of Operation drop-down menu.

3. Tap Yes on the warning window that appears. A confirmation window appears upon successful completion.

4. Tap ok.
Configure RFID

RFID is in Server Mode by default. To configure RFID to operate in Client Mode:

1. Invoke the MobileRFID menu, then tap Configure RFID.

2. Select the Client Mode check box.

3. In the LLRP Port field, enter the port number on which the server waits for the RFID client to communicate. The default is 5084.

4. In the Server IP field, enter the server IP for the remote host to which RFID communicates as a client.

5. Tap Apply.

6. Tap ok to close the window.
**Version Information**

To view software version information for the RFID application, invoke the MobileRFID menu, then tap **About**.

![Figure 3-11 About MobileRFID Window](image)

This window displays the MobileRFID application version, radio library version, radio firmware version, and radio OEM data version.

*NOTE* The version information in Figure 3-11 may differ from the information on the actual mobile computer screen.
Run/Stop RFID

To stop RFID service tap Stop in MobileRFID menu. This frees the RFID radio.

![MobileRFID menu](image)

**Figure 3-12  RFID Stopped**

To restart RFID, tap Run in MobileRFID menu.
Battery Configuration

The option to configure battery life/performance is available from version 3.2.6004 of the MC319Z software.

The configure performance option is used to manage battery life of the MC319Z. There are five different pre-configured settings to balance between read-performance and battery life. Battery life will be maximum when the slider bar is kept to the left-most. The device will perform at maximum performance efficiency when the slider bar is kept to the right-most. By default, the slider bar is set at the center.

All settings made using this option can be overwritten using RFID3 API configuration settings.

---

**Figure 3-13  Battery Performance Configuration**
Introduction

The RFID Application CS_RFID3Sample6.exe provides an overview of how the application works and assists application developers in developing custom applications.

The mobile computer can read, write, lock, kill, and program Gen2 tags. Each tag contains the EPC number (64 or 96 bits), CRC, and kill code. The mobile computer can also collect data by decoding in-range EPC Gen2 RFID tags.

Initiating the read command within the sample application causes the mobile computer to interrogate all RFID tags within the radio frequency (RF) field of view. The reader captures data from each new tag and adds it to the list box in the EPC ID window. Select Stop Read to stop interrogating tags.
Launching the RFID Sample Application

Select **RFID Demo** in the **Start** menu to start the RFID sample application.

![RFID Demo Icon](image)

*Figure 4-1  RFID Demo Icon*

![RFID Sample Application Window](image)

*Figure 4-2  RFID Sample Application Window*
In the sample application window:

- Tap the **Start Reading** button to initiate the tag read. Tap **Stop Reading** to terminate tag reading.
- Use the **Mem Bank** drop-down to select a tag memory bank to read. The default memory bank is EPC (None). Other options are TID, Reserved, and User.

---

**Connection**

Tap **Connection** to display the reader IP and port number.

<table>
<thead>
<tr>
<th>Connection</th>
<th><img src="image" alt="Connection Window" /></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Host Name/Reader IP</strong></td>
<td>127.0.0.1</td>
</tr>
<tr>
<td><strong>Port</strong></td>
<td>5004</td>
</tr>
</tbody>
</table>

**Figure 4-3  Connection Window**

Select **Disconnect** to disconnect the reader.
Capabilities

Select **Menu > Capabilities** to view the capabilities of the connected reader.

![Capabilities Table]

**Figure 4-4  Capabilities Window**
Configuration Menu Options

The Configuration menu includes the following options:

- Tag Storage Settings
- Antenna
- RF Mode
- Singulation
- Power On/Off Radio
- Reset to Factory Defaults

Tag Storage Settings

Select Menu > Config > Tag Storage Settings to view/configure tag storage settings.

<table>
<thead>
<tr>
<th>Tag Storage Settings</th>
<th>2:42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Tag Count</td>
<td>64</td>
</tr>
<tr>
<td>Max Tag ID Length (Bytes)</td>
<td>12</td>
</tr>
<tr>
<td>Max Size of Memory Bank (Bytes)</td>
<td>64</td>
</tr>
</tbody>
</table>

**Figure 4-5  Tag Storage Settings Window**

This window includes the following fields:

- Maximum Tag Count - The maximum number of tags to store in the DLL.
- Max Tag ID Length - The maximum tag length.
- Max Size of Memory Bank - Storage to allocate for the memory bank's data.
- Apply - Select to apply the configuration changes.
Antenna

Select **Menu > Config > Antenna** to view/configure the antenna.

![Antenna Configuration Window](image)

This window includes the following fields:

- **Antenna ID** - Selecting an antenna ID updates the configuration values in the other fields.
- **Receive Sensitivity (dB)** - Lists the reader-supported values for the selected antenna.
- **Transmit Power (dBm)** - Lists the reader-supported values for the selected antenna.
- **Hop Table Index** - Updates the Hop Frequency list with its corresponding frequencies.
- **Apply** - Select to apply the configuration changes.
RF Mode

Select Menu > Config > RF Mode to view/configure the RF mode for each antenna.

This window includes the following fields:

- **Antenna ID** - Selecting an antenna ID updates the configuration values in the other fields.
- **Tari Value** - TARI specified in nsec.
- **RF Mode Table** - RF mode table configured for the current antenna.
- **Apply** - Select to apply the configuration changes.
Singulation

Select **Menu > Config > Singulation** to view/configure the singulation control settings for each antenna.

![Singulation Control Settings Window](image)

This window includes the following fields:

- **Antenna ID** - Selecting an antenna ID updates the configuration values in the other fields.
- **Session** - The session number for the inventory operation.
- **Tag Population** - The approximate tag population in the RF field of the antenna.
- **Tag Transit Time** - The time in milliseconds that the tag typically remains in the RF field of the antenna.
- **State Aware** - Indicates if the antenna performs state aware or state unaware singulation.
- **Inventory State** - Select a tag of state A or B. Valid only for State Aware singulation.
- **SL Flag** - Valid only for State Aware singulation.
- **Apply** - Select to apply the configuration changes.

*Figure 4-8  Singulation Control Settings Window*
Power On/Off Radio

Select Menu > Config > Power On/Off Radio to change the power settings of the RFID radio.

Reset to Factory Default

Select Menu > Config > Reset to Factory Default to restore the default reader configuration.
Operations Menu Options

The Operations menu includes the following options:

- Antenna Info
- Filter
- Access
- Triggers

Antenna Info

Select Menu > Operations > Antenna Info to view/configure the list of antennas that can be used for inventory/access operations.

Figure 4-10  Antenna Info Window
Filter

Select **Menu > Operations > Filter** to view/configure the following filters:

- Pre-Filter
- Post-Filter
- Access-Filter

Pre-Filter

Select **Menu > Operations > Filter > Pre-Filter** to view/configure pre-filters.

![PreFilter Window](image)

**Figure 4-11  PreFilter Window**

This window includes the following fields:

- **Antenna ID** - Selecting an antenna ID updates the configuration values in the other fields.
- **Memory Bank** - Memory bank on which the filter is applied.
- **Offset** - The first (msb) bit location of the specified memory bank against which to compare the tag mask.
- **Tag Pattern** - The pattern against which to compare the specified memory bank.
- **Filter Action** - Select the required filter action. For more information, refer to the Gen2 specification available at [http://www.epcglobalinc.org/standards/](http://www.epcglobalinc.org/standards/).
Post-Filter

Select Menu > Operations > Filter > Post-Filter to view/configure post-filters.

<table>
<thead>
<tr>
<th>PostFilter Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Bank</td>
</tr>
<tr>
<td>Offset</td>
</tr>
<tr>
<td>Tag Pattern</td>
</tr>
<tr>
<td>Tag Mask</td>
</tr>
</tbody>
</table>

This window includes the following fields:

- **Memory Bank** - Memory bank on which the filter is applied.
- **Offset** - The first (msb) bit location of the specified memory bank against which to compare the tag mask.
- **Tag Pattern** - The pattern against which to compare the specified memory bank.
- **Tag Mask** - The bit mask to facilitate bit wise filtering.
- **Match Pattern** - Select the tag pattern to match (A, B, both, or neither).
Access-Filter

Select Menu > Operations > Filter > Access-Filter to view/configure the access-filters.

![AccessFilter Window]

Figure 4-13  AccessFilter Window

See Post-Filter on page 4-12 for field descriptions.
Access

Select Menu > Operations > Access to perform the following access operations.

Figure 4-14 Access Menu

The Access menu includes the following options:

- Read
- Write
- Lock
- Kill
- Block Write
- Block Erase
To perform an access option on a single tag, right-click the tag in the list of read tags on the main window to invoke the tag's context menu.

Figure 4-15  Tag Context Menu

Access Operation Windows

The access operation windows include the following fields. Set options as required in the various parameter windows. Not all windows include all options.

- **Tag ID** - The name of the selected tag.
- **Password** - Set a password before performing any access operation (except Kill).
- **Memory Bank** - Select the memory bank (Reserved, EPC, TID, User)
- **Offset** - Offset of the first word to read from the selected memory bank.
- **Length** - Tag/data length.
- **Write Data** - The data to write to the selected tag (Write window only).
- **Lock Privilege** - Access options for the selected tag (Write window only):
  - **None** - The user cannot change the lock privilege of the particular memory bank.
  - **Read_Write** - The user can read and write to the tag.
  - **Perma_Lock** - Permanent lock.
  - **Perma_Unlock** - Permanent unlock.
  - **Unlock** - The user can unlock the tag for writing.
Figure 4-16  Read Access Operation Window

Figure 4-17  Write / Block-Write Access Operation Window
**Figure 4-18**  *Lock Access Operation Window*

**Figure 4-19**  *Kill Access Operation Window*
Figure 4-20   Block Erase Access Operation Window

Triggers

Select Menu > Operations > Trigger to view/configure the following triggers:

- Start Trigger
- Stop Trigger
- Report Trigger
### Start Trigger

<table>
<thead>
<tr>
<th>Trigger Type</th>
<th>Periodic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>Mar/31/11 07:20:24 PM</td>
</tr>
<tr>
<td>Period (ms)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Figure 4-21**  Start Trigger - Periodic Window

<table>
<thead>
<tr>
<th>Trigger Type</th>
<th>GPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>High To Low</td>
</tr>
<tr>
<td></td>
<td>Low To High</td>
</tr>
</tbody>
</table>

**Figure 4-22**  Start Trigger - GPI Window
**Trigger**

Trigger Type: Handheld

Event:
- Trigger Released
- Trigger Pressed

**Stop Trigger**

Trigger Type: Duration

Duration (ms): 2000
Figure 4-25  Stop Trigger - GPI with Timeout Window

Figure 4-26  Stop Trigger - Tag Observation with Timeout Window
Figure 4-27  Stop Trigger - N Attempts with Timeout Window

Figure 4-28  Stop Trigger - Handheld Trigger with Timeout Window
Report Trigger

Figure 4-29  Report Trigger Window
Management Menu Options

Management options are not applicable for handheld readers.

Help Menu

Select Menu > Help to display the version information. The version numbers displayed in this window are examples. Actual version numbers are based on the versions of the files on the device.

![Help Window](image)

Figure 4-30  Help Window

Exit

Select Menu > Exit to exit the RFID sample application.
Chapter 5 Tag Locator

Introduction

Use Tag Locater to detect the location of a tag. By providing the TagID of an item, this application can find the relative position of the tag with respect to the mobile computer. Move the mobile computer back and forth to obtain the location of the tag as indicated by the beep frequency and a vertical progress bar showing the relative position of the tag.

The Tag Locater application requires the following components/DLLs on the device:

- RFIDAPI32.dll (Version 5.1.15 or higher)
- Symbol_RFID3_Device.dll (Assembly version 1.1.0.1, File version 1.1.0.7 or higher)
- Symbol_Audio.dll
- Symbol.dll
- Symbol_Notification.dll
- Symbol_StandardForms.dll
Using Tag Locator

To use the Tag Locator application:

1. Tap TagLocator in the Application folder on the mobile computer to open the Tag Locator application.

2. Enter the tag ID in one of three ways:
   - Type the tag ID in the TagID text box, then select Locate or press and hold the trigger.
   - Perform a search operation by selecting the Search Tags button or by pressing and holding the trigger.
   - Select the Import Tags button to import a list of saved tags from a .csv file. See Locating Tags Using a .csv File on page 5-3.
Locating Tags Using a .csv File

1. Select the **Import Tags** button to import a list of saved tags from a .csv file. The following window appears.

![Opening a .csv File](image1)

**Figure 5-2**  Opening a .csv File

2. Select the desired .csv file to import the tags to the list.

![Tag List](image2)

**Figure 5-3**  Tag List

3. Select a tag from the list to search.
4. Select the Locate button or press and hold the trigger. Move the mobile computer in all directions to get the relative position of the tag, indicated by a beep, the vertical progress bar, or both.

Figure 5-4  Tag Search

Use the Options menu to turn the beeper on and off and to display data in ASCII or hexadecimal format.

Figure 5-5  Options Menu
# Chapter 6 Troubleshooting

## Introduction

Table 6-1 on page 6-1 provides troubleshooting information.

## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile computer does not turn on.</td>
<td>Lithium-ion battery not charged.</td>
<td>Charge or replace the lithium-ion battery.</td>
</tr>
<tr>
<td></td>
<td>Lithium-ion battery not installed properly.</td>
<td>Ensure battery is installed properly. Refer to the MC3000 Mobile Computer Integrator Guide.</td>
</tr>
<tr>
<td></td>
<td>System crash.</td>
<td>Perform a warm boot. If the RFID reader still does not turn on, perform a cold boot. Refer to the MC3000 Mobile Computer Integrator Guide.</td>
</tr>
<tr>
<td>Rechargeable lithium-ion battery did not charge.</td>
<td>Battery failed.</td>
<td>Replace battery. If the mobile computer still does not operate, try a warm boot, then a cold boot. Refer to the MC3000 Mobile Computer Integrator Guide.</td>
</tr>
<tr>
<td></td>
<td>Mobile computer removed from cradle while battery was charging.</td>
<td>Insert mobile computer in cradle and begin charging. The lithium-ion battery requires less than four hours to recharge fully.</td>
</tr>
<tr>
<td>Mobile computer turns off without proper warning messages during heavy use.</td>
<td>Due to component tolerances, this can occur when using battery part number 55-060112-xx.</td>
<td>Use battery 55-002152-xx (p/n 82-127909-xx).</td>
</tr>
<tr>
<td>No sound.</td>
<td>Volume setting is low or turned off.</td>
<td>Increase the volume setting.</td>
</tr>
</tbody>
</table>
### Table 6-1  Troubleshooting (Continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tapping the window buttons or icons does not activate the corresponding feature.</td>
<td>LCD screen not aligned correctly.</td>
<td>Re-calibrate the screen.</td>
</tr>
<tr>
<td></td>
<td>Battery is not inserted properly.</td>
<td>Insert the battery properly. Refer to the MC3000 Mobile Computer Integrator Guide.</td>
</tr>
<tr>
<td>A message appears stating that the mobile computer memory is full.</td>
<td>Too many files stored on the mobile computer.</td>
<td>Delete unused memos and records. Save these records on the host computer.</td>
</tr>
<tr>
<td></td>
<td>Too many applications installed on the mobile computer.</td>
<td>If additional applications have been installed on the RFID reader, remove them to recover memory. Tap Start &gt; Settings &gt; System tab &gt; Remove Programs icon.</td>
</tr>
<tr>
<td>Reader is not reading tags.</td>
<td>The tag is out of its read range.</td>
<td>Move the tag into the read range. See Reading Tags on page 1-5.</td>
</tr>
<tr>
<td></td>
<td>Tags are damaged.</td>
<td>Use tags of good quality.</td>
</tr>
<tr>
<td></td>
<td>Tags are not EPCgen2.</td>
<td>Use EPCgen2 tags.</td>
</tr>
<tr>
<td></td>
<td>Read application is not loaded.</td>
<td>Verify that the unit is loaded with a read application.</td>
</tr>
<tr>
<td>Reader is not reading tags and the LLRP icon is red.</td>
<td>The battery is cold or degraded.</td>
<td>Recharge or replace the battery. If the problem still exists, exit and restart LLRP.</td>
</tr>
</tbody>
</table>

**NOTE** If problems still occur, contact the distributor or call the local contact. See page xi for contact information.
## Technical Specifications

The following tables summarize the RFID reader intended operating environment and technical hardware specifications.

### Table A-1  Technical Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>MC319Z RFID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical and Environmental Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions 9.1 in. L x 3.6 in. W x 7.6 in. H</td>
<td></td>
</tr>
<tr>
<td>Weight 23 oz. / 650 g (includes battery, RFID, scanner, and radio)</td>
<td></td>
</tr>
<tr>
<td>Keypad 48 key</td>
<td></td>
</tr>
<tr>
<td>Terminal Emulation (5250, 3270, VT)</td>
<td></td>
</tr>
<tr>
<td>Display 3 in. 320 x 320 pixel color</td>
<td></td>
</tr>
<tr>
<td>Battery Extended capacity (2X) battery pack</td>
<td></td>
</tr>
<tr>
<td><strong>Performance Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>CPU Intel® XScale® Bulverde PXA270 processor at 624MHz</td>
<td></td>
</tr>
<tr>
<td>Operating System Microsoft Windows Mobile 6.5</td>
<td></td>
</tr>
<tr>
<td>Memory (RAM/ROM) 256 MB RAM/1 GB Flash</td>
<td></td>
</tr>
<tr>
<td>Application Development SMDKs available through the Support Web Site</td>
<td></td>
</tr>
<tr>
<td>Data Capture Options Laser engine reads 1D symbologies with intuitive laser aiming. RFID reader reads Gen2 tags.</td>
<td></td>
</tr>
</tbody>
</table>
### Technical Specifications (Continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>MC319Z RFID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser Decode Capability</td>
<td>Code 39</td>
</tr>
<tr>
<td></td>
<td>Codabar</td>
</tr>
<tr>
<td></td>
<td>Interleaved 2 of 5</td>
</tr>
<tr>
<td></td>
<td>MSI</td>
</tr>
<tr>
<td></td>
<td>UPC/EAN supplementals</td>
</tr>
<tr>
<td></td>
<td>Webcode</td>
</tr>
<tr>
<td></td>
<td>GS1 DataBar Expanded</td>
</tr>
<tr>
<td></td>
<td>Composite Code</td>
</tr>
<tr>
<td></td>
<td>Macro PDF417</td>
</tr>
<tr>
<td></td>
<td>Data Matrix</td>
</tr>
<tr>
<td></td>
<td>Australian 4-State</td>
</tr>
<tr>
<td></td>
<td>Dutch Kix</td>
</tr>
<tr>
<td></td>
<td>MicroQR</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### User Environment

| Operating Temperature             | -4°F to 122°F (-20°C to 50°C)            |
| Battery Charging Temperature      | 32°F to 104°F (0°F to 40°C) ambient temperature range |
| Storage Temperature               | -25°F to 160°F (-40°C to 70°C)           |
| Humidity                          | 0% to 95% non condensing                 |
| Drop Specification                | Multiple 6 ft. (1.8m) drops to concrete across operating temperature range |
| Tumble                            | 2,000 one-meter tumbles at room temperature (4,000 hits) |
| Environmental Sealing            | IP64                                     |
| ESD                               | +/-15kVdc air discharge                  |
|                                   | +/-8kVdc direct discharge                |
|                                   | +/-8kVdc indirect discharge              |

### RFID

| Standards Supported               | EPC Generation 2 UHF                     |
| Nominal read range               | 10 ft./3.04 m with the RFX6000 4x4 tag optimally oriented. |
| Field                             | Half read range beam width: +/- 80 degrees (with tags optimally oriented). |
| Antenna                           | Integrated, circularly polarized, 1.5 dB effective linear gain per axis (nominal); Antenna port for future support of optional external antenna. |
| Frequency Range                   | 902-928 MHz                             |
| Output power                      | 1W conducted (1.4W EIRP with integrated antenna) |
**Table A-1  Technical Specifications (Continued)**

<table>
<thead>
<tr>
<th>Item</th>
<th>MC319Z RFID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wireless Data Communications</strong></td>
<td></td>
</tr>
<tr>
<td>WLAN</td>
<td>802.11a/b/g</td>
</tr>
<tr>
<td>Output Power</td>
<td>100mW U.S. and International</td>
</tr>
<tr>
<td>Data Rate</td>
<td>802.11a: 54Mb per second</td>
</tr>
<tr>
<td></td>
<td>802.11b: 11Mb per second</td>
</tr>
<tr>
<td></td>
<td>802.11g: 54Mb per second</td>
</tr>
<tr>
<td>Antenna</td>
<td>Internal</td>
</tr>
<tr>
<td>Frequency Range:</td>
<td>802.11a: 5 GHz; country-dependent</td>
</tr>
<tr>
<td></td>
<td>802.11b: 2.4 GHz; country-dependent</td>
</tr>
<tr>
<td></td>
<td>802.11g: 2.4 GHz; country-dependent</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>Bluetooth® Version 1.2 with BTExplorer™ (manager) included</td>
</tr>
<tr>
<td><strong>Peripherals and Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Cradles</td>
<td>Single-slot available</td>
</tr>
<tr>
<td>Printers</td>
<td>Supports extensive line of Symbol approved printers, cables and accessories</td>
</tr>
<tr>
<td>Charger</td>
<td>4-Slot universal battery charger</td>
</tr>
<tr>
<td>Other Accessories</td>
<td>Cable Adapter Module; Magnetic Stripe Reader; Modem; Full set of holsters</td>
</tr>
<tr>
<td></td>
<td>In accordance with the SymbolPlus partner program</td>
</tr>
</tbody>
</table>
Appendix B  RFID APIs

RFID APIs are available in C and NET. For information on supported RFID APIs, refer to the *Enterprise Mobility Developer Kit* (EMDK), available at [http://www.zebra.com/support](http://www.zebra.com/support).

For C, refer to the EMDK for C v2.1 or later. For .Net, refer to the EMDK for .NET v2.2 or later.
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