

# RFID DEMO APPLICATIONS



**ZEBRA**

## User Guide

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# **RFID DEMO APPLICATIONS USER GUIDE**

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## Revision History

Changes to the original guide are listed below:

Change	Date	Description
-01 Rev A	5/2012	Initial release
-02 Rev A	2/2014	Add features and update figures in PowerSession chapter.
-03 Rev A	4/2015	Zebra Re-branding
-04 Rev A	3/2017	Add FX7500; removed references to the Registration window in chapters 4 and 5.
-05 Rev A	12/2017	Add FX9600
-06 Rev A	10/2018	Add ATR7000
-07 Rev A	4/2019	Add Beam Configuration Info for ATR7000
-08 Rev A	2/2020	Updated ATR7000 Antenna Configuration section.

# Table of Contents

Copyright .....	3
For Australia Only .....	3
Terms of Use .....	3
Revision History .....	4

## About This Guide

Introduction .....	8
Chapter Descriptions .....	8
Notational Conventions .....	8
Related Documents .....	9
Service Information .....	9

## Getting Started

Introduction .....	10
System Requirements .....	10

## RFID Sample Application

Introduction .....	12
Launching the RFID Sample Application .....	13
Connection .....	14
Capabilities .....	14
Configuration Menu Options .....	16
Tag Storage Settings .....	16
Antenna .....	17
RF Mode .....	18
Singulation .....	18
Power On/Off Radio .....	20
Reset to Factory Default .....	20
Operations Menu Options .....	21
Antenna Info .....	21
Filter .....	22
Access .....	25
Triggers .....	29
Management Menu Options .....	35
Help Menu .....	35

## Table of Contents

Exit .....	35
<b>Tag Locator</b>	
Introduction .....	36
Using Tag Locator .....	37
Locating Tags Using a .csv File .....	38
<b>SessionOne</b>	
Introduction .....	40
Installation .....	40
Connecting to the RFID Reader .....	41
Reading Tags .....	43
Main Tab .....	43
Tag Reads .....	45
Reader .....	45
Antennas .....	46
Tag Details .....	46
RSSI / Direction / Zone .....	46
Settings Tab .....	46
Appearance .....	48
Antenna Colors .....	48
RSSI Monitoring .....	48
Read Settings .....	48
Autosave .....	48
Product Picture .....	49
Filters .....	49
Tag Match Settings .....	49
Tag Direction .....	49
RF Modes .....	49
Start Reading When .....	50
Stop Reading After .....	50
Low Level Stuff .....	50
Device Discovery .....	50
Autologin .....	50
<b>PowerSession</b>	
Introduction .....	51
Installation .....	51
Connecting to the RFID Reader .....	52
Reading Tags .....	54
Main Tab .....	55
General Tag Reads Info .....	55
Tag Reads Details .....	56
Reader Management .....	57
Reader Info .....	57
Settings .....	58
Application Settings .....	58
Optimization Mode .....	60

## Table of Contents

Reader Settings .....	60
Software Update for Multiple Readers .....	64
Utilizing PowerSession with ATR7000 .....	66
Reading Tags with an ATR7000 Using PowerSession .....	66
Custom Application of ATR7000 Antenna Sequence Settings .....	69
<b>RapidRead</b>	
Introduction .....	71
Installation .....	72
Options .....	74
RapidRead Tag File .....	76
Using RapidRead .....	77
RapidRead Lite .....	78
Summary Screen .....	78
Detail Screen .....	79
RapidRead Full .....	80
Summary Screen .....	80
Detail Screen .....	81
Gieger Counter .....	82
RapidRead Scan .....	84
Summary Screen .....	84
Detail Screen .....	85
RapidRead Write .....	86
<b>RFID Demo Application for Android</b>	
Introduction .....	89
<b>RFID Demo Application for iOS</b>	
Introduction .....	90
<b>Index .....</b>	<b>91</b>

# About This Guide

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## Introduction

The *RFID Demo Applications User Guide* provides general instructions for using sample applications which demonstrate the capabilities of Zebra fixed and hand-held RFID readers and how these features can be used in everyday applications.

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## Chapter Descriptions

Topics covered in this guide are as follows:

- [Getting Started](#) introduces the RFID demo applications which demonstrate the capabilities of Zebra fixed and hand-held RFID readers.
- [RFID Sample Application](#) provides an overview of the RFID application CS\_RFID3Sample6.exe which assists application developers in developing custom applications for hand-held RFID devices.
- [Tag Locator](#) describes the Tag Locator application which is used on hand-held RFID devices to detect the relative position of tags.
- [SessionOne](#) describes the SessionOne PC-based application used to discover and connect to Zebra fixed and hand-held RFID readers, specifically the FX7400, FX7500, FX9500, FX9600, MC3x90-Z, and MC9x90-Z.
- [PowerSession](#) describes PowerSession, a multi-reader, PC-based application used to discover and connect to Zebra fixed and hand-held RFID readers, specifically the FX7400, FX7500, FX9500, FX9600, MC3x90-Z, MC9x90-Z, and ATR7000.
- [RapidRead](#) describes RapidRead, an application used on hand-held readers to demonstrate inventory, asset counting, tag writing and item locating, specifically the MC3x90-Z, and MC9x90-Z.

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## Notational Conventions

The following conventions are used in this document:

- *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



- **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.
- Throughout the programming bar code menus, asterisks (\*) are used to denote default parameter settings.



\* Indicates Default — \* Baud Rate 9600 — Feature/Option

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## Related Documents

Refer to the *Product Reference Guide* for the fixed or hand-held RFID reader for product-specific information.

For the latest version of this guide and all Zebra guides, go to: [www.zebra.com/support](http://www.zebra.com/support).

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## Service Information

If you have a problem using the equipment, contact your facility's technical or systems support. If there is a problem with the equipment, they will contact the Zebra Global Customer Support Center at: [www.zebra.com/support](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.

# Getting Started

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## Introduction

The RFID demo applications demonstrate the capabilities of Zebra fixed and hand-held readers. This guide provides specific information about the following applications:

- RFID Sample Application
- Tag Locator
- SessionOne
- PowerSession
- RapidRead

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## System Requirements

[Table 1](#) includes system requirements for the RFID demo applications.

**Table 1** RFID Demo Application Requirements

Demo Application	Devices Supported	Application Type	OS Requirement
RFID Sample Application	MC3090-Z, MC3190-Z, MC9090-Z, MC9190-Z	Hand-held application	Windows Mobile 6.x
Tag Locator	MC3090-Z, MC3190-Z, MC9090-Z, MC9190-Z	Hand-held application	Windows Mobile 6.x
SessionOne	FX7400, FX7500, FX9500, FX9600, MC3090-Z, MC3190-Z, MC9090-Z, MC9190-Z	Single reader application	Windows XP 32-bit, 64-bit; Windows 7 32-bit, 64-bit

**Table 1** RFID Demo Application Requirements

Demo Application	Devices Supported	Application Type	OS Requirement
PowerSession	FX7400, FX7500, FX9500, FX9600, MC3090-Z, MC3190-Z, MC9090-Z, MC9190-Z ATR7000	Multi-reader application	Windows XP 32-bit, 64-bit; Windows 7 32-bit, 64-bit
RapidRead	MC3090-Z, MC3190-Z, MC9090-Z, MC9190-Z	Hand-held application	Windows Mobile 6.x

# RFID Sample Application

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## Introduction

The RFID Application CS\_RFID3Sample6.exe provides an overview of how the application works and assists application developers in developing custom applications.

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

Initiating the read command within the sample application causes the hand-held reader 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.

**Figure 1** RFID Demo Icon



**Figure 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**.

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## Connection

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

**Figure 3** Connection Window

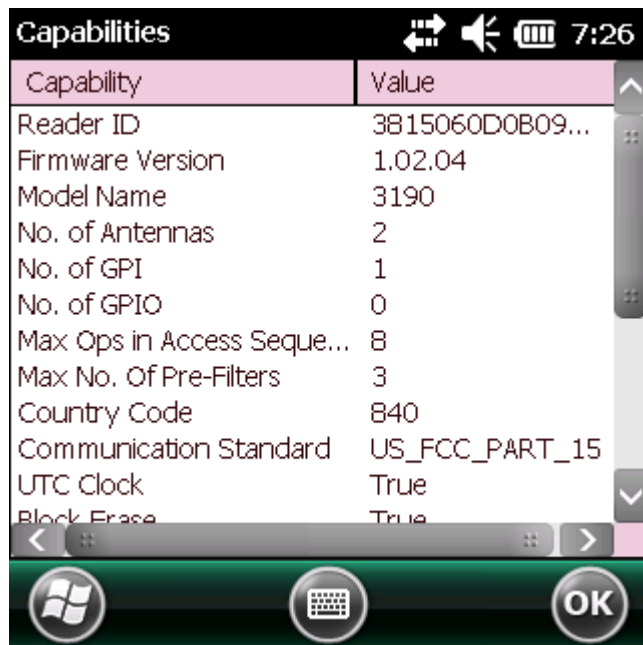
The screenshot shows a mobile application interface. At the top is a black header bar with the word "Connection" in white on the left, and three icons (a double-headed arrow, a speaker, and a battery level indicator) followed by the time "7:25" on the right. Below the header, there are two text input fields. The first is labeled "Host Name/Reader IP" and contains the text "127.0.0.1". The second is labeled "Port" and contains the text "5084". Below these fields is a pink rectangular button with the text "Disconnect". At the bottom of the screen is a dark green horizontal bar containing three circular icons: a Windows logo, a keyboard icon, and an "OK" button.

Select **Disconnect** to disconnect the reader.

---

## Capabilities

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

**Figure 4** Capabilities Window

The screenshot shows a mobile application window titled "Capabilities". The window has a status bar at the top with icons for signal, volume, and battery, and the time 7:26. The main content is a table with two columns: "Capability" and "Value". The table lists various system parameters and their current values. At the bottom of the window, there is a navigation bar with three icons: a Windows logo, a keyboard icon, and an "OK" button.

Capability	Value
Reader ID	3815060D0B09...
Firmware Version	1.02.04
Model Name	3190
No. of Antennas	2
No. of GPI	1
No. of GPIO	0
Max Ops in Access Seque...	8
Max No. Of Pre-Filters	3
Country Code	840
Communication Standard	US_FCC_PART_15
UTC Clock	True
Block Erase	True

## 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.

**Figure 5** Tag Storage Settings Window



Maximum Tag Count	64
Max Tag ID Length (Bytes)	12
Max Size of Memory Bank (Bytes)	64

Apply

Windows Keyboard OK

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.

**Figure 6** Antenna Configuration Window



The screenshot shows the 'Antenna Config' window. At the top is a black header bar with the title 'Antenna Config' on the left, and three icons (a double-headed arrow, a speaker, and a battery level indicator) followed by the time '7:27' on the right. Below the header are four configuration fields, each with a label on the left and a value in a box with a dropdown arrow on the right: 'Antenna ID' with value '1', 'Receive Sensitivity (dB)' with value '0', 'Transmit Power (dBm)' with value '2700', and 'Hop Table Index' with value '1'. Below these fields is a pink rectangular area containing a list of frequency values: '915750, 915250, 903250, 926750, 926250, 904250, 927250, 920250,'. To the right of this list are up and down arrow icons. Below the pink area is a pink button labeled 'Apply'. At the bottom of the window is a dark green bar containing three circular icons: a Windows logo, a keyboard icon, and a button labeled 'OK'.

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.

**Figure 7** RF Mode Window

Parameter	Value
Mode Identifier	18
DR	DR_64_3
Bdr	62500
M	MV 4

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.

**Figure 8** Singulation Control Settings Window

**Singulation** 7:29

Antenna ID: 1

Session: S0

Tag Population: 100

Tag Transit Time: 0

☒ State Aware

Inventory State: STATE A

SL Flag: DEASSERTED

Apply

Windows Keyboard OK

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.

## Power On/Off Radio

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

**Figure 9** Radio Power Settings Menu



## 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 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.

**Figure 11** PreFilter Window

The screenshot shows the 'PreFilter' window with a title bar containing icons for back, forward, and a battery level indicator, along with the time 7:32. The main area contains several configuration fields:

- Antenna ID:** A dropdown menu showing '1' and a checkbox labeled 'Use Filter 1' which is checked.
- Memory Bank:** A dropdown menu showing 'EPC' and an **Offset** field with the value '32'.
- Tag Pattern:** A text field containing 'aabbccdd'.
- Filter Action:** A dropdown menu showing 'STATE AWARE'.
- Action:** A dropdown menu showing 'INV A NOT INV B' and a **Target** field with the value '50'.

Below these fields is a tabbed interface with two tabs: 'Filter 1' (active) and 'Filter 2'. To the right of the tabs is an 'Apply' button. At the bottom of the window is a navigation bar with three circular icons: a Windows logo, a keyboard icon, and an 'OK' button.

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: [www.epcglobalinc.org/standards/](http://www.epcglobalinc.org/standards/).

## Post-Filter

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

**Figure 12** PostFilter Window

The screenshot shows the 'PostFilter' window with a title bar containing a back arrow, a speaker icon, a battery icon, and the time '7:33'. The window contains the following fields and controls:

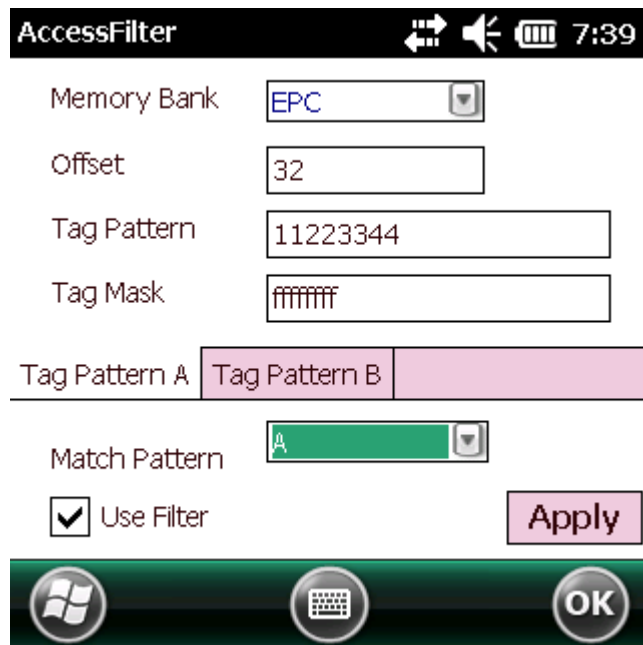
- Memory Bank:** A dropdown menu with 'USER' selected.
- Offset:** A text input field containing the value '2'.
- Tag Pattern:** A text input field containing the value 'aabb'.
- Tag Mask:** A text input field containing the value 'ffff'.
- Tag Pattern A / Tag Pattern B:** A section with two tabs, 'Tag Pattern A' and 'Tag Pattern B'. The 'Tag Pattern B' tab is currently selected and highlighted in pink.
- Match Pattern:** A dropdown menu with 'A AND B' selected.
- Use Filter:** A checkbox that is checked.
- Apply:** A pink button labeled 'Apply'.
- Footer:** A green bar at the bottom containing three circular icons: a Windows logo, a keyboard icon, and an 'OK' button.

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.

**Figure 13** AccessFilter Window

The screenshot shows the 'AccessFilter' window with a black title bar containing the title and system icons. The main area has a white background with several input fields: 'Memory Bank' with a dropdown menu showing 'EPC', 'Offset' with a text box containing '32', 'Tag Pattern' with a text box containing '11223344', and 'Tag Mask' with a text box containing 'ffffff'. Below these is a section with three tabs: 'Tag Pattern A', 'Tag Pattern B', and an unlabeled pink tab. Under the 'Tag Pattern A' tab is a 'Match Pattern' dropdown menu showing 'A'. At the bottom left is a checked checkbox labeled 'Use Filter', and at the bottom right is a pink 'Apply' button. The very bottom of the window features a dark green bar with three circular icons: a Windows logo, a keyboard icon, and an 'OK' button.

AccessFilter

Memory Bank

Offset




Tag Pattern

Tag Mask

Tag Pattern A Tag Pattern B

Match Pattern

☒ Use Filter

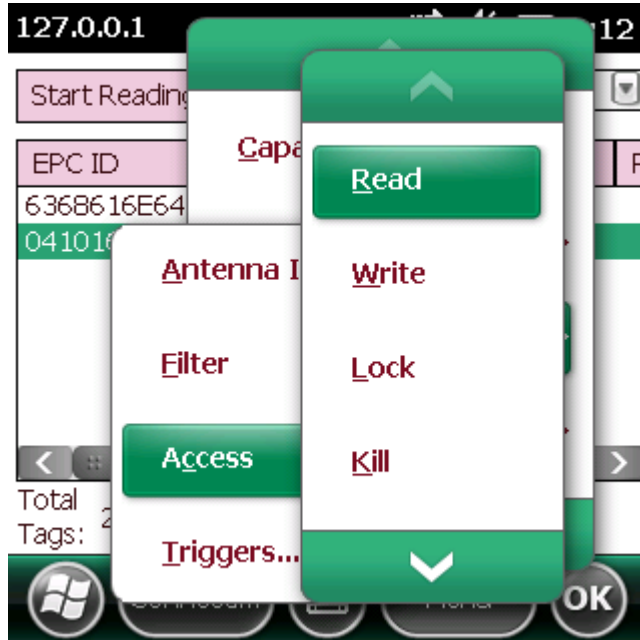
See [Post-Filter on page 23](#) for field descriptions.



## Access

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

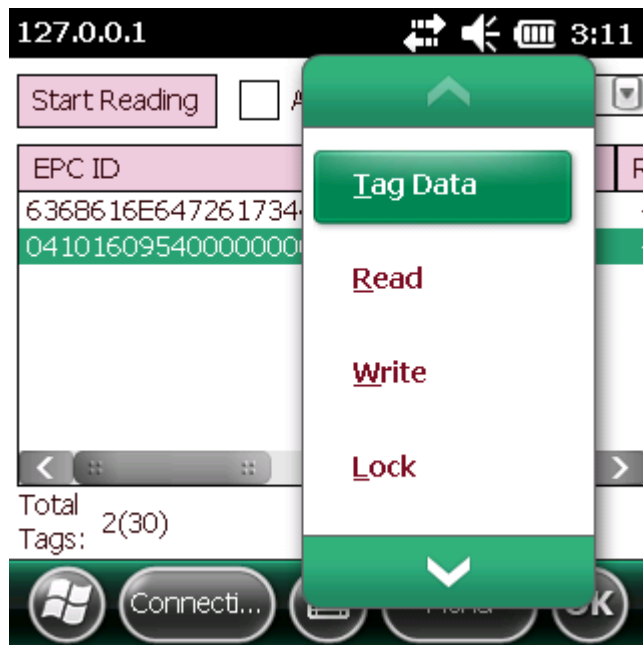
**Figure 14** Access Menu



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 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 can not 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 16** Read Access Operation Window


The screenshot shows the 'Read' window of the RFID application. The title bar is black with white text 'Read' and icons for Bluetooth, speaker, battery, and time '7:40'. The main area has a white background with the following fields: 'Tag ID (Hex)' with value 'AD8522004852838514000061', 'Password (Hex)' with value '0', 'Memory Bank' with a dropdown menu showing 'EPC', 'Offset (Bytes)' with value '0', and 'Length (Bytes)' with value '0'. Below these is a pink-shaded box for 'Data Read (Hex)' containing 'EF6E3000AD8522004852838514000061'. At the bottom are two pink buttons labeled 'Access Filter' and 'Read'. The bottom status bar is green with icons for Windows, keyboard, and 'OK'.

**Figure 17** Write / Block-Write Access Operation Window


The screenshot shows the 'Write Tags' window of the RFID application. The title bar is black with white text 'Write Tags' and icons for Bluetooth, speaker, battery, and time '7:41'. The main area has a white background with the following fields: 'Tag ID (Hex)' with value 'AD8522004852838514000061', 'Password (Hex)' with value '0', 'Memory Bank' with a dropdown menu showing 'USER', 'Offset (Bytes)' with value '0', and 'Length (Bytes)' with value '4'. Below these is a white box for 'Data (Hex)' containing 'Aabbccdd'. At the bottom are two pink buttons labeled 'Access Filter' and 'Write'. The bottom status bar is green with icons for Windows, keyboard, and 'OK'.

**Figure 18** Lock Access Operation Window

The Lock Access Operation Window features a black title bar with the word "Lock" on the left and icons for back, forward, and battery status on the right, along with the time 7:42. Below the title bar, there are four input fields: "Tag ID (Hex)" containing "AD852200485283851400006", "Password (Hex)" containing "0", "Memory Bank" with a dropdown menu showing "EPC MEMORY", and "Lock Privilege" with a dropdown menu showing "READ WRITE". At the bottom of the form area are two pink buttons labeled "Access Filter" and "Lock". A green bar at the very bottom contains three circular icons: a Windows logo, a keyboard icon, and an "OK" button.

**Figure 19** Kill Access Operation Window

The Kill Access Operation Window features a black title bar with the word "Kill" on the left and icons for back, forward, and battery status on the right, along with the time 7:42. Below the title bar, there are two input fields: "Tag ID (Hex)" containing "AD8522004852838514000061" and "Kill Password (Hex)" containing "0". At the bottom of the form area are two pink buttons labeled "Access Filter" and "Kill". A green bar at the very bottom contains three circular icons: a Windows logo, a keyboard icon, and an "OK" button.

**Figure 20** Block Erase Access Operation Window

**Block Erase** 3:50

Tag ID (Hex) 04101609540000000000000000000000

Password (Hex) 0

Memory Bank USER

Offset (Bytes) 0

Length (Bytes) 4

Access Filter Erase

Windows Keyboard OK

## Triggers

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

- Start Trigger
- Stop Trigger
- Report Trigger

### Start Trigger

**Figure 21** Start Trigger - Periodic Window

The screenshot shows a mobile application interface for configuring a periodic trigger. At the top, a black header bar contains the title "Trigger" and icons for connectivity, volume, battery, and the time "7:43". Below the header, the "Trigger Type" is set to "Periodic" in a dropdown menu. The "Start Date" is set to "Mar/31/11 07:20:24 PM" in a date and time picker. The "Period (ms)" is set to "1" in a text input field. Below these fields, there are four tabs: "Start Trigger" (selected), "Stop Trigger", "Report Trigger", and an empty tab. Under the "Start Trigger" tab, there is a "Tag Report Trigger" input field with the value "0" and an "Apply" button. At the bottom, there is a green bar with three circular icons: a Windows logo, a keyboard icon, and an "OK" button.

**Figure 22** Start Trigger - GPI Window

The screenshot shows a mobile application interface for configuring a GPI trigger. At the top, a black header bar contains the title "Trigger" and icons for connectivity, volume, battery, and the time "1:14". Below the header, the "Trigger Type" is set to "GPI" in a dropdown menu. The "Event" is set to "1" in a dropdown menu. Below the event dropdown, there are two checkboxes: "High To Low" (unchecked) and "Low To High" (checked). Below these checkboxes, there are four tabs: "Start Trigger" (selected), "Stop Trigger", "Report Trigger", and an empty tab. Under the "Start Trigger" tab, there is a "Tag Report Trigger" input field with the value "0" and an "Apply" button. At the bottom, there is a green bar with three circular icons: a Windows logo, a keyboard icon, and an "OK" button.

**Figure 23** Start Trigger - Hand-held Trigger Window

Trigger 12:50

Trigger Type Handheld Trigger

Event ☐ Trigger Released ☒ Trigger Pressed

Start Trigger Stop Trigger Report Trigger

Tag Report Trigger 0 Apply

OK

## Stop Trigger

**Figure 24** Stop Trigger - Periodic Window

Trigger 12:48

Trigger Type Duration

Duration(ms) 2000

Start Trigger Stop Trigger Report Trigger

Tag Report Trigger 0 Apply

OK

**Figure 25** Stop Trigger - GPI with Timeout Window

The screenshot shows a configuration window titled 'Trigger' with a status bar at the top displaying icons for signal, volume, battery, and the time 12:48. The main area contains the following settings:

- Trigger Type: GPI with Timeout (dropdown menu)
- Port: 1 (dropdown menu)
- Time Out: 2000 (text input)
- Event: ☒ High To Low, ☐ Low To High

Below the settings are four buttons: 'Start Trigger', 'Stop Trigger', 'Report Trigger', and an empty button. At the bottom, there is a 'Tag Report Trigger' section with a text input containing '0' and an 'Apply' button. The very bottom of the screen features a navigation bar with three circular icons: a Windows logo, a keyboard icon, and an 'OK' button.

**Figure 26** Stop Trigger - Tag Observation with Timeout Window

The screenshot shows a configuration window titled 'Trigger' with a status bar at the top displaying icons for signal, volume, battery, and the time 12:48. The main area contains the following settings:

- Trigger Type: Tag Observation (dropdown menu)
- Tag Observation: 5 (text input)
- Time: 1000 (text input)

Below the settings are four buttons: 'Start Trigger', 'Stop Trigger', 'Report Trigger', and an empty button. At the bottom, there is a 'Tag Report Trigger' section with a text input containing '0' and an 'Apply' button. The very bottom of the screen features a navigation bar with three circular icons: a Windows logo, a keyboard icon, and an 'OK' button.



**Figure 27** Stop Trigger - N Attempts with Timeout Window

**Trigger**    12:49

Trigger Type

No. of Attempts

Time Out

Start Trigger Stop Trigger Report Trigger

Tag Report Trigger

**Figure 28** Stop Trigger - Hand-held Trigger with Timeout Window

**Trigger**    12:50

Trigger Type

Time Out

Event ☒ Trigger Released  
☐ Trigger Pressed

Start Trigger Stop Trigger Report Trigger

Tag Report Trigger

**Report Trigger**

**Figure 29** Report Trigger Window

Trigger 12:56

New Tag Moderated 500

Tag Invisible Moderated 500

Tag back to visibility Moderated 500

Start Trigger Stop Trigger Report Trigger

Tag Report Trigger 0 Apply

OK

---

## Management Menu Options

Management options are not applicable for hand-held 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.

**Figure 30** Help Window



CS\_RFID3Sample6

C-Dll: 5.1.22, .NET-Dll: 1.1.0.0

Copyright (C) 2010



---

## Exit

Select **Menu > Exit** to exit the RFID sample application.

# Tag Locator

---

## Introduction

Use Tag Locator 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 hand-held reader. Slowly move the hand-held back and forth. Use the beep frequency and vertical progress bar on the screen to help direct you to the general location of the tag.

The Tag Locator 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 hand-held reader to open the Tag Locator application.

**Figure 31** Tag Locator



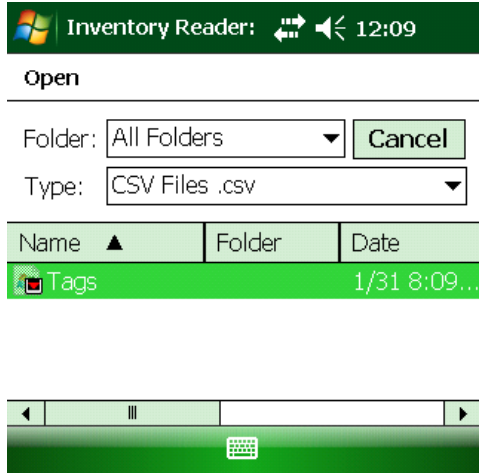
2. Enter the tag ID in one of three ways:

- 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 38](#).

## Locating Tags Using a .csv File

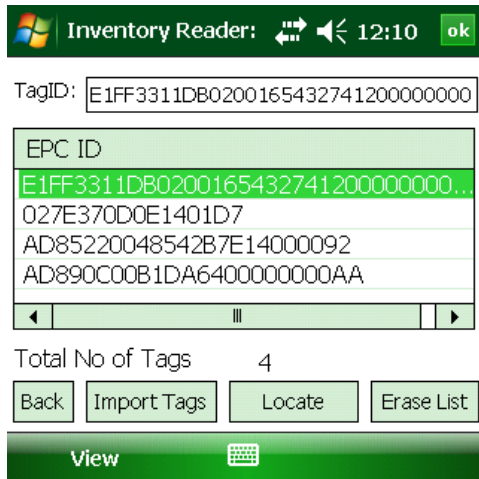
1. Select the **Import Tags** button to import a list of saved tags from a .csv file. The following window appears.

**Figure 32** Opening a .csv File



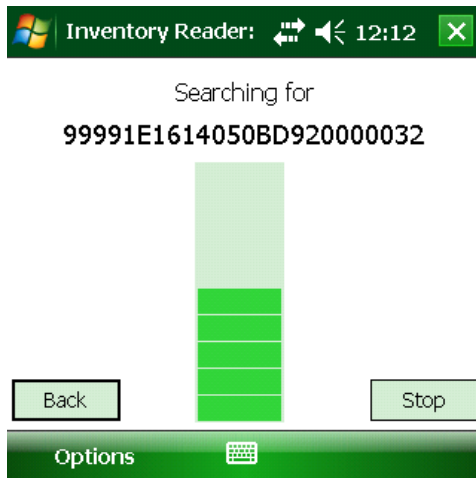
2. Select the desired .csv file to import the tags to the list.

**Figure 33** Tag List



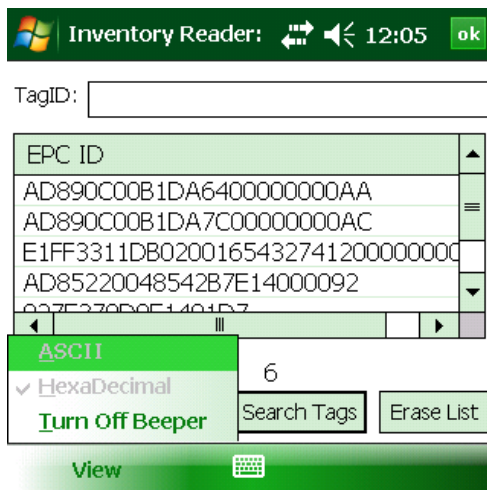
3. Select a tag from the list to search.
4. Select the **Locate** button or press and hold the trigger. Move the hand-held reader in all directions to find the relative position of the tag, indicated by a beep, the vertical progress bar, or both.

**Figure 34** Tag Search



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

**Figure 35** Options Menu



# SessionOne

---

## Introduction

SessionOne is a single reader, PC-based application used to discover and connect to Zebra fixed and hand-held RFID readers, specifically the FX Series Fixed Readers and MC Series Hand-held Readers. This tool allows users to easily perform tag inventory and access operations.



**NOTE:** SessionOne is not supported for the ATR7000 reader. Use PowerSession instead.

---

## Installation

To install SessionOne on the host PC:

1. Locate **SessionOne** at: [www.zebra.com/support](http://www.zebra.com/support).
2. Download the **SessionOne** zip file to the host PC and unzip the file.
3. Double-click the **sessiononesetup.exe** file.
4. Follow the screen prompts to complete installation.



## Connecting to the RFID Reader

To connect to the reader through SessionOne:

1. Connect the reader to the host PC. Refer to the reader's *Product Reference Guide* for instructions.



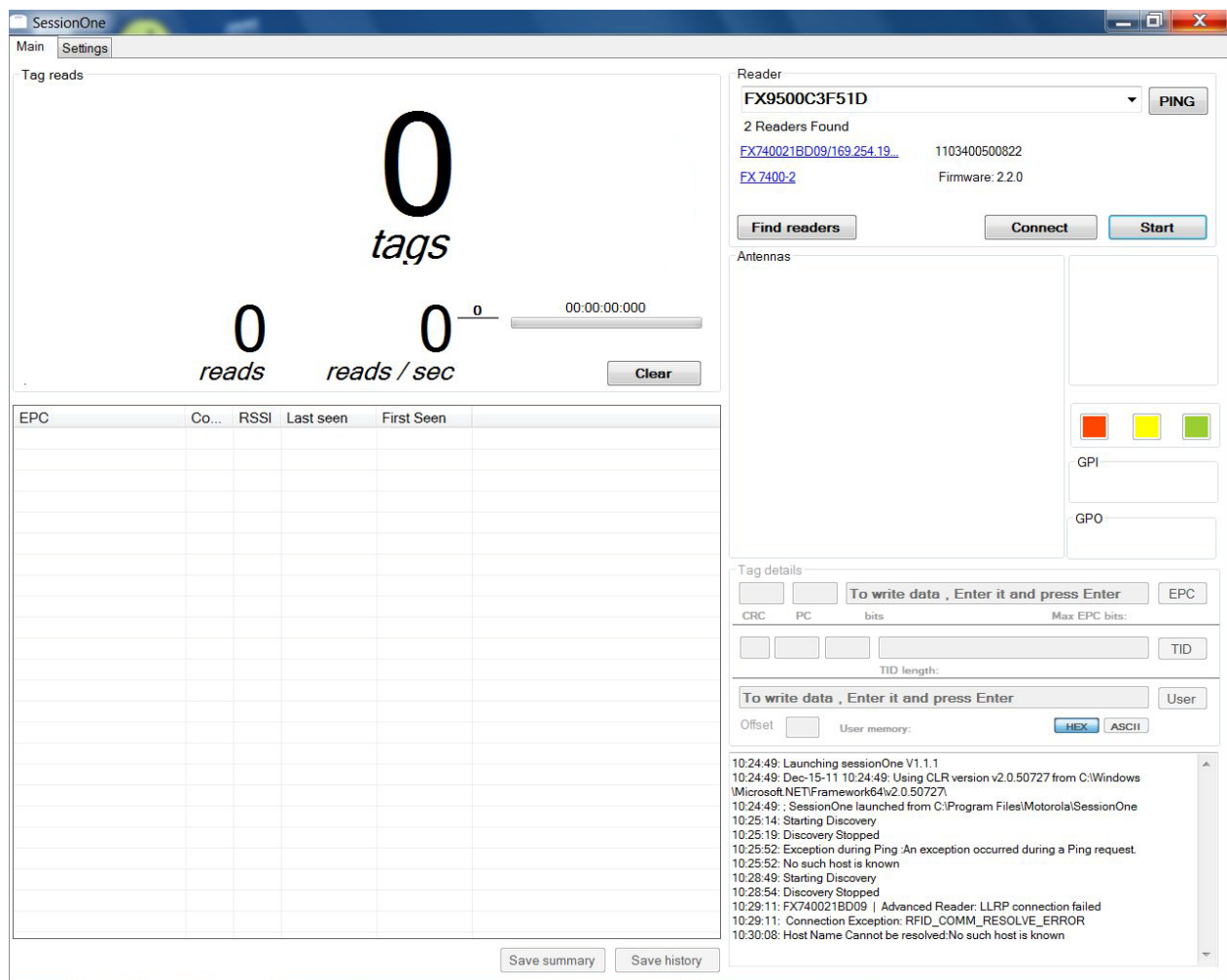
**NOTE:** If connecting to the host PC via a USB cable, note the following:

- For the FX7400, FX7500, and FX9600, ensure the USB mode is set to Network (the default mode). If the USB mode is ActiveSync, use the Administrator Console to change it to Network before connecting to the host PC.
- For hand-held readers, synchronize the device with the host PC.

2. Select **SessionOne** from the host PC **Start** menu to launch the application.

3. The SessionOne main window opens.

**Figure 36** SessionOne Main Tab



4. Click **Find readers** to discover all readers in the area. Click on the reader name to connect to that reader, or select from the **Reader** text box/ drop-down list and click **Connect**.



**NOTE:** If connecting to the host PC via a USB cable, note the following:

- To select a fixed reader, select **USB FX** | *friendly name* from the drop-down list.
- To select a hand-held reader (MC3090-Z, MC3190-Z, or MC9090-Z), select **USB Mobile** | *friendly name* from the drop-down list.

See the next section if SessionOne does not locate the reader, or to search for a specific reader.

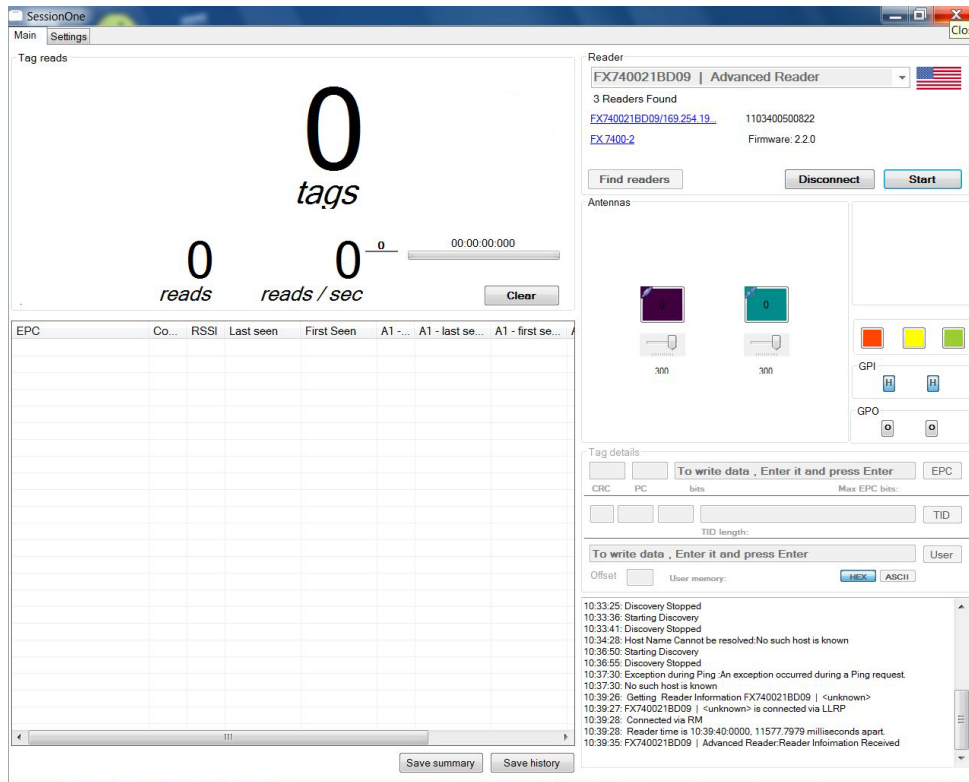
To use the host name to search for the reader:

1. Enter the reader host name in the **Reader** text box (e.g., fx7400cd3b0d) with no spaces. The host name is provided on a label on the reader, or on the CD provided with the reader. Click **Find readers**. The **Find readers** button changes to **Stop Finding** while SessionOne scans for a reader and displays connection activity at the bottom right area of the window.
2. When the message **Found Reader** appears, select the reader from the **Reader** drop-down list and click **Connect**.
3. Click **PING** to verify that the reader is connected. The button turns green to confirm connection. If the button turns red, continue to the following procedure.

If SessionOne does not find the reader:

1. Open a command prompt on the host PC by selecting **Start > Programs > Accessories > Command Prompt**.
2. Enter **ping <reader host name>** and press **Return**. For example, enter **ping fx7400cd3b0d** and press **Return**. Note the reader's IP address that displays.
3. Close the command prompt and return to SessionOne. Enter the reader's IP address in the **Reader** text box (e.g., **10.11.11.183**).
4. Click **PING** to locate and connect to the reader.

**Figure 37** SessionOne Main Tab - Reader Connected



- ✓ **NOTE:** After selecting a reader from the reader text box/drop-down list, if you select **Start** before selecting the **Connect** button, SessionOne automatically connects to the reader and begins inventory. Information related to the selected reader appears, including:
  - Link to the reader URL
  - Serial number or MAC address
  - Reader model name and number
  - Firmware version.
- ✓ **NOTE:** If the reader does not read RFID tags, ensure the reader's region setting is configured. Refer to the reader's *Product Reference Guide* for instructions.

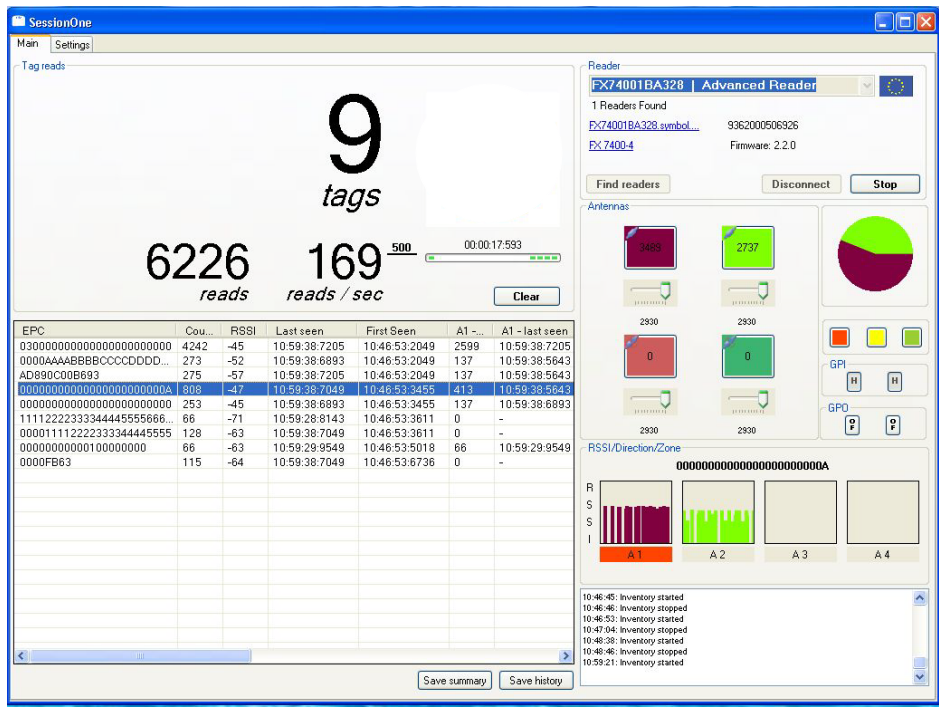
## Reading Tags

Select **Start** to read tags in the area. The tags appear in the tag list. Select **Stop** to stop reading tags.

## Main Tab

The **Main** tab includes the following fields.

Figure 38 Main Tab



## Tag Reads

This field includes the following items:

- **Tags** - number of tags read.
- **Reads** - total number of reads of all tags.
- **Reads / sec** - number of reads per second.
- **Time bar** - time elapsed in the current read session.
- **Clear** button - click to clear all tags from the list.
- Tag table - tracks tag read information:
  - **EPC** - unique tag EPC ID.
  - **Count** - number of times that tag was read.
  - **RSSI** - Received Signal Strength Indication.
  - **Last Seen** - UTC time (in microseconds) when the tag was last seen.
  - **First Seen** - UTC time (in microseconds) when the tag was first seen.
  - **Ax** - number of times that individual antenna read the tag.
  - **Ax Last Seen** - UTC time (in microseconds) when that antenna last saw the tag.
  - **Ax First Seen** - UTC time (in microseconds) when that antenna first saw the tag.
- **Save summary** button - summarizes and saves the details of each tag read.
- **Save history** button - saves and stores the details of each tag read.

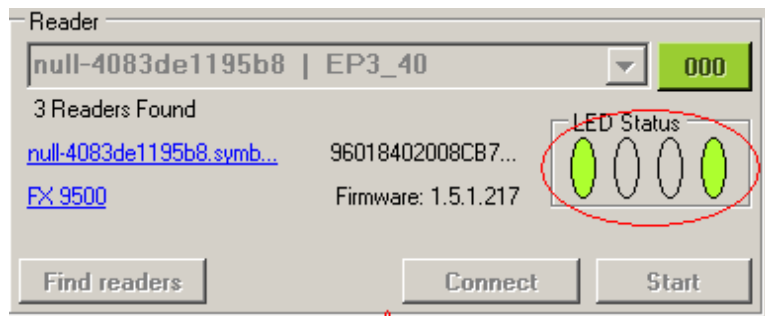
## Reader

This field includes the following items:

- **Reader** text / drop-down box - enter the reader name, hostname, or IP address to connect to and press enter, or select from the drop-down list to view information related to the reader.
- **Ping** button - click to locate the reader in the text box. A successful ping appears in green and displays the round trip time of the ping in milliseconds.

Upon a successful reader management (RM) login, clicking **Ping** also enables the reader's LED to light in green to indicate that reader was pinged.

**Figure 39** Pinging Reader



- **Readers Found** - lists all readers discovered in the area.
- **Find Readers** button - click to find all readers in the area.

- **Connect / Disconnect** button - click to connect to or disconnect from the selected reader. To connect to a reader, first select that reader from the drop-down list or enter the hostname/IP address, and then click **Connect**.
- **Start / Stop** button - click to start or stop reading tags.

## Antennas

This field includes the following items:

- **Antennas** listed by color - each color represents an antenna port in the reader.
  - A blue icon on top of each antenna indicates whether the antenna is connected or disconnected.
  - An enabled antenna appears in the color selected in the **Settings** tab. A disabled antenna appears in the control color. To enable or disable an antenna, first ensure you are logged in with a valid user name and password, then click an antenna image. See [Autologin on page 50](#).
  - Number value - the number inside each antenna indicates the total reads by that particular antenna.
  - Slide bar - the slide located under each antenna indicates the power level of each antenna. Use the slide bar to change the antenna's power value.
- Pie chart - represents the contribution of each antenna in total tag reads.
- User LED (small colored boxes under the pie chart) - the user LED colors available. The LED is set to a particular reader. To enable or disable the LED, first ensure you are logged in with a valid user name and password, then click an LED image. See [Autologin on page 50](#).
- **GPI** field (General Purpose Input) - indicates the status of the **GPI** input.
- **GPO** field (General Purpose Output) - click on a **GPO** button to change the pin status of the device.

## Tag Details

This field includes the following items:

- EPC - write tags and read the fields.
- TID - read only.
- User memory - read and write.

## RSSI / Direction / Zone

This field is active when running inventory. Select a tag in the list to display the RSSI value for that tag in each antenna as a dynamic bar graph.

---

## Settings Tab

The **Settings** tab includes the following fields.

Figure 40 Settings Tab

SessionOne

Main Settings

Appearance

Item description tags

First read only ☐ Show tool tips ☒ Scroll tag list ☐

After  seconds, reset unique tag count

Every  seconds, recount only those tags seen in the last  milliseconds

Antenna colors

1 2 3 4 5 6 7 8

RSSI monitoring

Window time span (ms) 3000

Refresh rate (ms) 10

Read settings

Session 0 1 2 3

State Aware ☐

SL Flag ☐

Tag population estimate 100

Tag transit time (ms) 0

Autosave

Save every 300 seconds ☐

Save summary ☐ Save history ☐

Product pictures

Show pictures ☐ on every read ☐ Clear

Show friendly names ☐ Set GPO ☐

Ignore first 11 bytes, and last 0 bytes of EPC

Get pictures from file Click Browse To load File (txt or csv) Browse

Start reading when

Start is pressed ☒ Start is pressed + GPI ☐ goes Lt

Stop reading after

Stop is pressed ☒ Stop is pressed + GPI ☐ goes Lt

Low-level stuff

UDP timeout 5000 UDP local port 5

LLRP timeout 0

Sync time to PC ☐

Device discovery

Auto-add prefix FX7400 ☒

Resolve hostnames ☒ Discovery on startup ☐

Clear Readers List On Discovery ☐

Autologin

Login admin Password \*\*\*\*\*

Filters

<Disabled> tags matching See tool tip for examples

<Disabled> tags with RSSI between and

Tag Match Settings

Inventory listed tags only ☐

Get Tag List File Click Browse To load File (txt or csv) Browse

Tag direction

Determine tag direction ☒ Minimum trend 5 Average 1 values

Exclude reads older than 2000 ms

RF Modes

RF Mode Mode 2: DR\_64\_3.FORWARD\_LINK\_MODULATION\_PR\_ASK 25000.25000. M Apply

## Appearance

- **Item description** - enter text to appear in the **Main** tab below the unique tag reads count.
- **First read only** - check to update the list view in the **Main** tab only for the first read of the tag (no list view update for subsequent tag reads). Leave unchecked to update everything in the list view (all antenna details, RSSI values, etc.) For optimal performance, enable this option.
- **Show tool tips** - check to display tool tips for some controls.
- **Scroll tag list** - in a large tag environment where the tags exceed the display limit, check this to automatically scroll the list to ensure that the latest read tag is visible.
- **After** (text box) **seconds, reset unique tag count** - select the radio button, then enter the number of seconds after which the count of unique tags resets in the **Main** tab.
- **Every** (text box) **seconds, recount only those tags seen in the last** (text box) **milliseconds** - for the value entered in the first text box (in seconds), the unique tags count in the **Main** tab is set by the value of unique tags entered in the second text box (in milliseconds).

## Antenna Colors

Select an antenna color to change the associated antenna's display color in the **Main** tab.

## RSSI Monitoring

During tag inventory, select a tag to plot an RSSI graph for that tag.

- **Windows time span** - the time frame within which to consider RSSI values of the tag. Exclude any tag read older than this duration.
- **Refresh rate** - the time interval for refreshing or redrawing the RSSI graph.

## Read Settings

- **Session** - specify the session of the reader.
- **State aware** - check to select state aware singulation.
  - **A, B buttons** - after checking **State Aware**, click to specify the inventoried flag value of the selected session (A or B).
  - **SL Flag button** - after checking **State Aware**, click to specify the flag (**SL**) state (asserted or deasserted).
- **Tag population estimate** - the expected tag population in the field of view of the antenna.
- **Tag transmit time** - the measure of expected tag mobility in the field of view of the antenna where this inventory operation is executed.

## Autosave

This field includes settings for saving history or a summary.

- **Save every** - enter the time interval for autosave.
- **seconds** - check to save the tag list in the application data folder.
- **Save summary** - check to store consolidated summary for each tag instead of detailed reads in the application data folder.
- **Save history** - check to store detailed information on every read in the application data folder.



## Product Picture

This field includes settings to show a picture in the **Main** tab where the Zebra logo appears during inventory.

- **Show pictures** - check to display the picture.
- **on every read** - check to display the picture on every read of the tag rather than on the first read only.
- **Show friendly names** - check to replace the tag ID in the list with a friendly name.
- **Set GPO** - check to enable GPO (if available in the loaded file).
- **Ignore first** (text box) **bytes, and last** (text box) **bytes of EPC** - specify which part of the tag ID to consider when comparing the tag ID read during inventory with the partial or full tag ID in the loaded file.
- **Get pictures from file** - click **Browse** to locate and load the .txt or .csv file. Each line of the file is in the format:  
**<tag ID / part tag ID>,<Location of Image to Show>,<Friendly Name>,GPO<GPO number>**

For example:

00,\pics\00.png,My Tag,GPO 1

## Filters

- **Include/Exclude/Disable** field - choose whether to include/exclude/disable the filter.
- **tags matching** - enter the filter expression.
- **tag with RSSI between** (text box) **and** (text box) - enter the RSSI filter range.

## Tag Match Settings

- **Inventory listed tags only** - check to load the file which contains the tag list to read.
- **Get Tag List File** - click **Browse** to browse tag lists. Select the tag list to inventory.

Tags listed that were read appear in green, tags not yet read appear in red. Inventory stops when all tags in the list are read.

## Tag Direction

This field indicates the directionality of the tag if the tag appears in the bottom of the RSSI graph.

- **Determine tag direction** - check to enable this option.
- **Minimum trend** - enter the number of RSSI value averages to take to determine tag direction.
- **Average** - enter the number of RSSI values to take to calculate the average.
- **Exclude reads older than** - enter the time in which to exclude RSSI values for older tags read when determining the tag's direction.

## RF Modes

Displays the RF mode set in the reader and allows the user to change this mode (applied to all antennas).

## Start Reading When

- **Start is pressed** - select to start inventory upon clicking the **Start** button.
- **Start is pressed+GPI** - select to start inventory based on the GPI trigger. Enter the trigger (integer) in the text box.
- **goes** - select whether the required start trigger is **HI** or **LO**.

## Stop Reading After

- **Stop is pressed** - select to stop inventory upon clicking the **Stop** button.
- **tags** - select to specify the number of tags after which to stop inventory.
- **reads** - select to specify the number of reads after which to stop inventory.
- **seconds** - select to specify the number of seconds after which to stop inventory.
- **rounds** - select to specify the number of rounds after which to stop inventory.
- **GPI** - select to stop inventory based on the GPI trigger. Enter the trigger (integer) in the text box.
- **goes** - select whether the required stop trigger is **HI** or **LO**.

## Low Level Stuff

- **UDP timeout** - enter how long to wait to receive device discovery response information.
- **UDP local port** - enter the port in which the local host binds to send the device discovery message.
- **LLRP timeout** - set the timeout of the reader connection.
- **Sync time to PC** - check to synchronize the reader time with the local time.

## Device Discovery

- **Auto-add prefix** - check to add an auto prefix while trying to resolve the hostname. For example, enter **FX7400**. Then, to connect to a series of FX7400XXXXX devices, search XXXXX only because *FX7400* is already included as an auto-add prefix.
- **Resolve hostnames** - check to resolve the hostname during device discovery.
- **Discovery on startup** - select to perform device discovery while the application is starting up.
- **Clear Readers List On Discovery** - check to discard discovered reader information when performing the next discovery.

## Autologin

Enter the user name and password in these fields to log in to the device. Once logged in, the user can perform all reader management related operations, including enabling and disabling antennas and setting user LEDs.

# PowerSession

---

## Introduction

PowerSession is a multi-reader, PC-based application used to discover and connect to Zebra fixed readers such as the FX7500, FX9600, and ATR7000, as well as MC Series RFID Hand-held Readers.

For PowerSession information specific to the ATR7000, please see the last section in this chapter.

---

## Installation

To install PowerSession on the host PC:

1. Locate **PowerSession** at: [www.zebra.com/support](http://www.zebra.com/support).
2. Download the PowerSession zip file to the host PC and unzip the file.
3. Double-click on the **powersessionsetup.exe** file.
4. Follow the screen prompts to complete installation.

## Connecting to the RFID Reader

To connect to the reader through PowerSession:

1. Connect the reader to the host PC. Refer to the reader's *Product Reference Guide* for instructions (refer to [www.zebra.com/support](http://www.zebra.com/support) for the latest guides)

✓ **NOTE:** If connecting to the host PC via a USB cable, note the following:

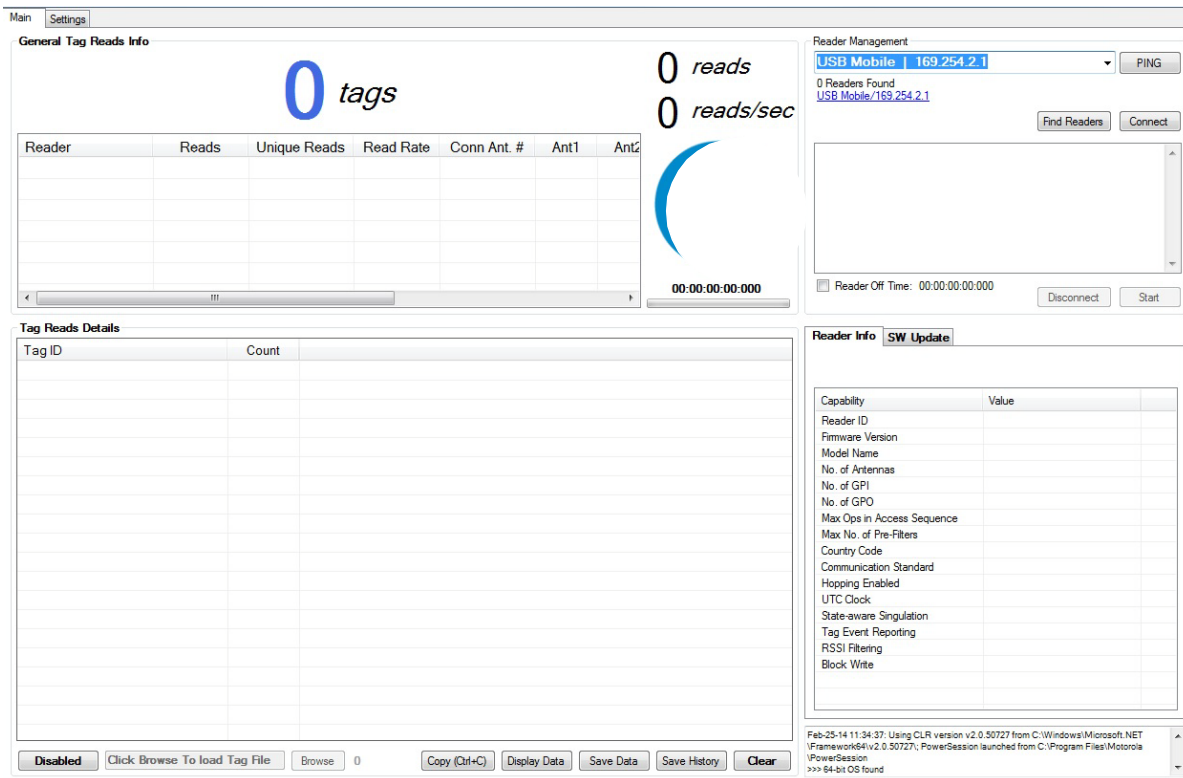
For the FX7400, FX7500, and FX9600, ensure the USB mode is set to *Network* (the default mode). If the USB mode is *ActiveSync*, use the *Administrator Console* to change it to *Network* before connecting to the host PC.

For hand-held readers, synchronize the device with the host PC.

✓ **NOTE:** The ATR7000 does not support connection over USB.

2. Select *PowerSession* from the host PC *Start* menu to launch the application.
3. The PowerSession main window opens.

**Figure 41** PowerSession Main Tab



4. Click **Find Readers** to discover all readers in the area. Click on the reader name to connect to that reader, or select from the **Reader Management** text box/ drop-down list and click **Connect**.

✓ **NOTE:** If connecting to the host PC via a USB cable, note the following:

To select a fixed reader, select **USB FX | friendly name** from the drop-down list.

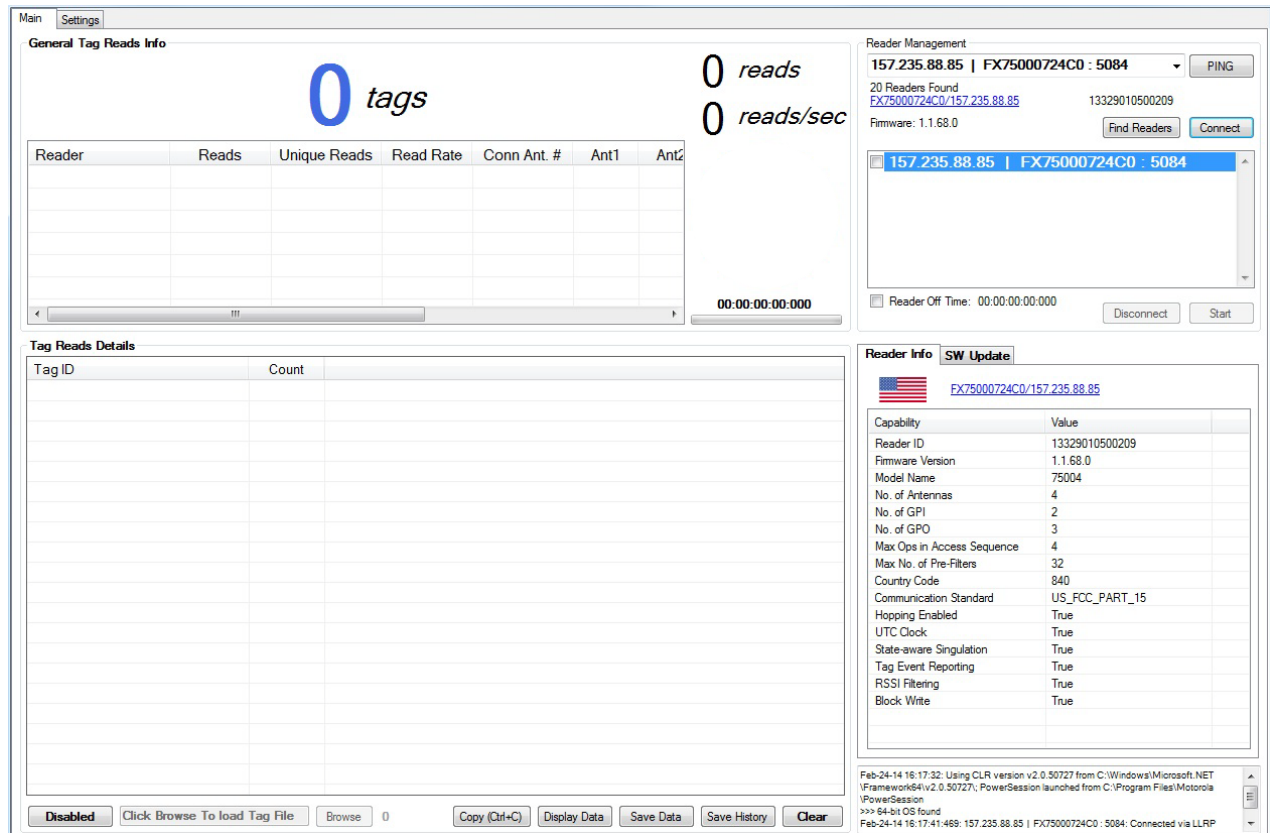
To select a hand-held reader (MC3090-Z, MC3190-Z, or MC9090-Z), select **USB Mobile | friendly name** from the drop-down list.

To search for a reader using the host name:

1. Enter the reader host name in the *Reader Management* text box (e.g., fx7400cd3b0d) with no spaces. The host name is provided on a label on the reader, or on the CD provided with the reader. Select **Find Readers**. The **Find Readers** button changes to **Stop Finding** while PowerSession scans for a reader and displays connection activity at the bottom right area of the window.
2. When the message *Found Reader* appears, select the reader from the *Reader Management* drop-down list and select **Connect**.
3. Click **PING** to verify that the reader is connected. The button turns green to confirm connection. If the button turns red, continue to directions below to search for a specific reader.

To search for a specific reader:

1. Open a command prompt on the host PC by selecting *Start > Programs > Accessories > Command Prompt*.
2. Enter *ping <reader host name>* and select **Return**. For example, enter *ping fx7400cd3b0d* and select **Return**. The reader's IP address displays.
3. Close the command prompt and return to PowerSession. Enter the reader's IP address in the *Reader Management* text box (e.g., 10.11.11.183).
4. Select **PING** to locate and connect to the reader.

**Figure 42** PowerSession Main Tab - Reader Connected

- ✓ **NOTE:** Select and connect to a reader before executing an inventory operation. Information related to the selected reader appears, including:
- Link to the reader URL
  - Serial number or MAC address
  - Reader model name and number
  - Firmware version.

- ✓ **NOTE:** If the reader does not read RFID tags, ensure the reader's region setting is configured. Refer to the reader's *Product Reference Guide* for instructions at: [www.zebra.com/support](http://www.zebra.com/support).

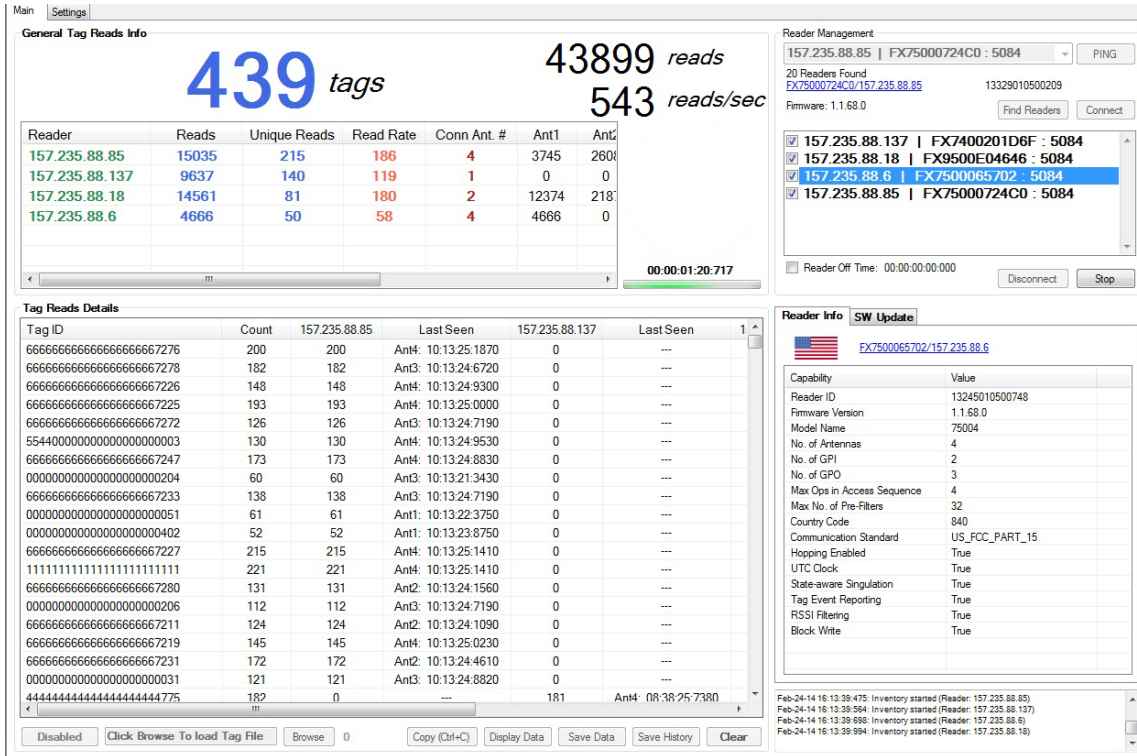
## Reading Tags

Select **Start** to read tags in the area. The tags appear in the tag list. To stop reading tags, select **Stop**.

## Main Tab

The **Main** tab includes the following fields.

**Figure 43** Main Tab



## General Tag Reads Info

This field includes the following items:

- **Tags** - total number of unique tags read so far.
- **Reads** - total number of reads of all tags so far.
- **Reads / sec** - how many reads occur per second.
- **Time bar** - time elapsed in the current read session.

The table includes the following items:

- **Reader** - IP address of each selected reader.
- **Reads** - total number of reads of all tags so far.
- **Unique Reads** - total number of unique tags read so far.
- **Read Rate** - how many reads occur per second.
- **Conn Ant. # - Ant1-Ant 8** - number of antenna ports on the reader that are physically connected to antennas.

## Tag Reads Details

Figure 44 Tag Reads Details

Tag Reads Details

Loaded: **46**    Unseen: **9**    Seen: **37**    Unknown: **9**

Tag ID	Count	157.235.88.6	Last Seen
4444444444444444444444751	1	1	Ant1: 11:20:55.9220
4444444444444444444444802	2	2	Ant1: 11:20:56.0860
777722223333444455556666	2	2	Ant1: 11:20:56.1790
4444444444444444444444729	2	2	Ant1: 11:20:56.1330
4444444444444444444444678	2	2	Ant1: 11:20:56.0630
4444444444444444444444728	2	2	Ant1: 11:20:56.0630
4444444444444444444444771	2	2	Ant1: 11:20:56.0160
E200680600DBA11CADE0025	2	2	Ant1: 11:20:56.1330
4444444444444444444444774	2	2	Ant1: 11:20:56.0160
4444444444444444444444769	2	2	Ant1: 11:20:56.0620
4444444444444444444444796	2	2	Ant1: 11:20:56.0390
4444444444444444444444767	1	1	Ant1: 11:20:55.9920
4444444444444444444444814	0	0	---
4444444444444444444444726	0	0	---
4444444444444444444444812	0	0	---
4444444444444444444444807	0	0	---
4444444444444444444444804	0	0	---
E2006806000000000000000	0	0	---

Select All  
Copy Ctrl+C

Reader Info    SW Update

FX75000657002/157.235.88.6

Capability	Value
Reader ID	13245010500748
Firmware Version	1.1.68.0
Model Name	75004
No. of Antennas	4
No. of GPI	2
No. of GPO	3
Max Ops in Access Sequence	4
Max No. of Pre-Filters	32
Country Code	840
Communication Standard	US_FCC_PART_15
Hopping Enabled	True
UTC Clock	True
State-aware Singulation	True
Tag Event Reporting	True
RSSI Filtering	True
Block Write	True

Feb-24-14 16:22:31.017: Inventory stopped (Reader: 157.235.88.6)  
Feb-24-14 17:28:13.907: Disconnection event (Reader: 157.235.88.6)  
Feb-24-14 17:28:14.125: Lost connection on reader(157.235.88.6), cleaning up  
Feb-25-14 09:42:01.759: 157.235.88.6 | FX75000657002: 5084: Connected via LLRP

Search Tags    loaded TagList.txt    Browse    46    Copy (Ctrl+C)    Display Data    Save Data    Save History    Clear

This field includes the following items:

- **Loaded** - when the loading tag list functionality is enabled, this field displays the total number of tags loaded from a specific file that are expected to be seen.
- **Seen** - when the loading tag list functionality is enabled, this field displays the number of tags from the loaded tag list which the reader has seen so far.
- **Unseen** - when the loading tag list functionality is enabled, this field displays the number of tags from the loaded tag list which the reader has not yet seen.
- **Unknown** - when the loading tag list functionality is enabled, this field displays the number of tags that the reader has seen but are not included in the loaded tag list.
- **Tag ID** - unique tag ID.
- **Count** - number of times that tag was read.
- **IP Address** - IP address of each selected reader on which the inventory operation is executed.
- **Last Seen** - UTC time (in microseconds) when the tag was last seen.
- **Copy** - select to copy and paste selected tag data records from the table into either a .txt or .csv file. Load this file later into PowerSession for a list of tags to search.



**NOTE:** You can also right-click on the **Tag Reads Details** table and use the pop-up menu to select and copy tag data records in the table.

- **Save Data** - select to save the read results according to the current operation mode.
- **Save History** - according to the current operation mode, Save the tag read history information.



**NOTE:** The *Record Tag Read History* option must be enabled under *Settings*.

- **Display Data** - select to display tag data in the *Tag Reads Details* table after performing inventory in Optimization mode.
- **Clear** - select **Clear** to clear the current read results.



The searching tags section includes the following items:

- **Disabled/Search Tags** button - click **Disabled** to enable the loading tag list functionality. The button text changes to **Search Tags**.
- **Browse** - select **Browse** to load a tag file. The file can contain one tag ID per line. After each tag ID you can enter comments separated by commas.
- **Start** - select **Start** to start searching tags.
- **Stop** - select **Stop** to stop searching tags.

## Reader Management


This field includes the following items:

- **Reader Management** text box/drop-down list - enter the reader name to connect to, or select from the drop-down list, then press enter or select **Connect**. It also lists all readers discovered in the area.
- **Ping** - select **Ping** to check the connectivity of the selected reader. A successful ping appears in green and displays the round trip time of the ping in milliseconds.
- **Find Readers** - select **Find Readers** to find all readers in the area.
- **Connect / Disconnect** - select to connect to or disconnect from the selected reader.
- **Reader List** - lists all readers connected to PowerSession.
- **Start / Stop** - click to start or stop reading tags.

## Reader Info

This field displays the reader capabilities information of a selected reader.

**Figure 45** Reader Info Tab

Reader Info		SW Update
		<a href="#">FX7500065702/157.235.88.6</a>
Capability	Value	
Reader ID	13245010500748	
Firmware Version	1.1.68.0	
Model Name	75004	
No. of Antennas	4	
No. of GPI	2	
No. of GPO	3	
Max Ops in Access Sequence	4	
Max No. of Pre-Filters	32	
Country Code	840	
Communication Standard	US_FCC_PART_15	
Hopping Enabled	True	
UTC Clock	True	
State-aware Singulation	True	
Tag Event Reporting	True	
RSSI Filtering	True	
Block Write	True	

## Settings

The **Settings** tab includes Application Settings, and Reader Settings.

**Figure 46** Settings Tab

The screenshot shows the 'Settings' tab of the PowerSession application. It is organized into several functional areas:

- Application Settings:**
  - Appearance:** Checkboxes for 'First read only', 'Show tool tips', and 'Scroll tag list'.
  - Tag Data File:** Checkboxes for 'Save Reader Info in the Tag File', 'Record Tag Read History', and 'Record Unknown Tag Read History'.
  - Device Discovery:** A checkbox for 'Discovery on startup'.
  - Product Pictures:** Checkboxes for 'Show pictures' and 'Show friendly names', a text input for 'Ignore first' bytes, and a text input for 'last' bytes of EPC. A 'Get pictures from file' section with a 'Browse' button and a 'Clear' button.
  - Low-level Stuff:** Input fields for 'LLRP timeout (ms)', 'Max timeouts', 'UDP timeout (ms)', and 'UDP local port'. An 'Apply Default Settings' button.
  - Optimization Mode:** A checkbox for 'Enable Optimization for Tag Data Processing' and a note about enabling optimization for large tag populations.
- Reader Settings:**
  - Connected Reader List:** A dropdown menu showing '157.235.88.6 | FX7500065702 : 5084' and an 'Apply' button.
  - Reader Description:** A text input field and a 'Save Settings' button.
  - Antenna Singulation Settings:**
    - Antenna ID:** A dropdown menu set to 'All Antennas'.
    - Session:** A dropdown menu set to 'SESSION\_0'.
    - State Aware:** A checkbox and buttons for 'A', 'B', 'A<>B', and 'SL DeAsserted'.
    - Tag population estimate:** A text input set to '100'.
    - Tag transit time (ms):** A text input set to '0'.
  - Tag Storage Setting:** Input fields for 'Max Tag ID' and 'Length (Byte)' with an 'Apply' button.
  - Reader Login Info:** Input fields for 'User Name' and 'Password' with an 'Apply' button.
  - ASCII Debug (Expert Configuration):** A section for 'Debug Packet Types' and 'Reported Debug Message(s)' with a 'Clear Messages' button.
  - Antenna Enable/Disable (Blue: Connected Antenna):** A visual representation of antennas A1, A2, A3, and A4, each with a checked checkbox and an 'Apply' button.
  - RF Modes:** A dropdown menu for 'Antenna ID' and a text input for 'Mode 23: FORWARD\_LINK\_MODULATION\_PR\_ASK, 668, DR\_8, 668, 668, MV\_FM0, 668'.
  - Filters:** A text input for '<Disabled> tags matching' with an 'Apply' button.
  - Antenna Stop Trigger:** A dropdown for 'Antenna ID' and a text input for 'Trigger Type' set to 'N\_Attempts' with a value of '1'.
  - Trigger Settings:**
    - Start reading:** Radio buttons for 'As soon as Start is pressed' and 'Start is pressed + GPI 1'.
    - Stop reading after:** Radio buttons for 'Stop is pressed', 'tags', 'rounds', 'ms', and 'GPI 1'.
    - Report Trigger:** Input fields for 'Tag Report Trigger' (set to '1') and 'Periodic Report Trigger' (set to '0 sec').
    - Autonomous Mode:** A checkbox and input fields for 'New Tag Event' (set to 'Immediate') and '0 ms'.
  - Antenna Power:** A dropdown for 'Antenna ID' and a text input for '3000' with an 'Apply' button.

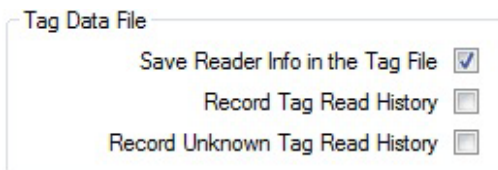
## Application Settings

### Appearance

- **First read only** - select the check-box to update the list view in the *Main* tab only for the first read of the tag (no list view update for subsequent tag reads). Leave unchecked to update everything in the list view. For optimal performance, enable this option.
- **Show tool tips** - select to display tool tips for some controls.
- **Scroll tag list** - in a large tag environment where the tags exceed the display limit, select check-box to automatically scroll the list to ensure that the latest read tag is visible.

## Tag Data File

Figure 47 Tag Data File



Tag Data File

Save Reader Info in the Tag File ☒

Record Tag Read History ☐

Record Unknown Tag Read History ☐

**Save Reader Info in the Tag File** - select to save reader settings information in the tag file.



**NOTE:** The saved reader settings are settings applied when the inventory operation was performed.

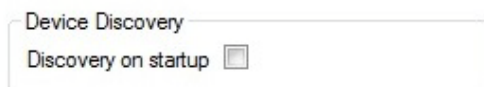
**Record Tag Read History** - check to record detailed information on every tag read.

**Record Unknown Tag Read History** - check to record detailed information on every unknown tag read while reading tags in *Searching Tags* mode.

## Device Discovery

Select **Discovery on startup** to perform device discovery while the application is starting up.

Figure 48 Device Discovery Setting



Device Discovery

Discovery on startup ☐

## Product Picture

This field includes settings to show a picture in the *Main* tab where the Zebra logo appears during inventory.

- **Show pictures** - select check-box to display the picture.
- **On every read** - select check-box to display the picture on every read of the tag rather than on the first read only.
- **Show friendly names** - select check-box to replace the tag ID in the list with a friendly name.
- **Ignore first** (text box) **bytes, and last** (text box) **bytes of EPC** - specify which part of the tag ID to consider when comparing the tag ID read during inventory with the partial or full tag ID in the loaded file.
- **Get pictures from file** - click **Browse** to locate and load the .txt or .csv file. Each line of the file is in the format:  
**<tag ID / part tag ID>,<Location of Image to Show>,<Friendly Name>**

For example:

00,\pics\00.png,My Tag

## Low Level Stuff

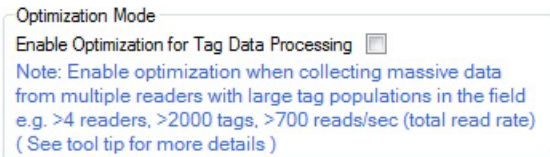
- **LLRP timeout** - set the timeout for the reader connection and the response from the reader (default is 0).
- **Max timeouts** - enter the maximum allowed UDP timeouts that occur sequentially before stopping discovery.
- **UDP timeout** - enter the time (in ms) to wait for device discovery response information.

- **UDP local port** - enter the port in which the local host should bind to send the device discovery.

## Optimization Mode

Enable the **Optimization Mode** to improve the data throughput of PowerSession to handle large amounts of tag data from multiple readers.

**Figure 49** Optimization Mode



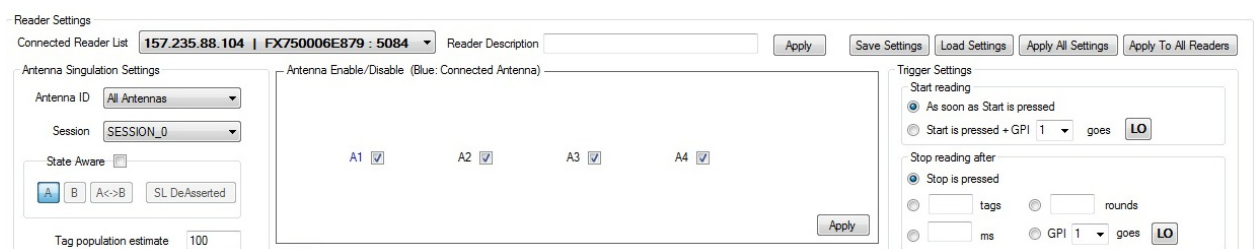
- Optimization mode can only be applied to the normal inventory operation.
- ✓ **NOTE:** Optimization mode cannot be applied to the tag list searching operation and AAR zone-based inventory operation.
- Enabling optimization will disable:
    - The tag list gui update so that no tag data is displayed in the tag list table during the inventory.
    - Displaying the product pictures and tag friendly names even when the features are enabled.
  - After the inventory operation is stopped, a user can:
    - Save the tag data and tag read history information.
    - Select the **Display Data** option to display all tag data in the tag list table.

## Reader Settings

- **Connected Reader List** - select a reader from the *Connected Reader List*.
- **Reader Description** - enter a description (up to 40 characters) for the selected reader, then click **Apply**. The description appears in the **Connected Reader List**, associated with that reader's IP address.

## Save/Load/Apply Reader Settings

**Figure 50** Save/Load/Apply Setting



- **Save Settings** - save the reader settings of a currently selected reader in an XML file.

Figure 51 XML Saved Reader Setting Example

```

<?xml version="1.0" encoding="utf-8"?>
<ReaderConfig xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <ReaderModelName>FX7400</ReaderModelName>
  <EnabledAntennaList>1-4</EnabledAntennaList>
  <MaxTagIDLength>64</MaxTagIDLength>
  <AntennaListSingulationSettings>
    <AntennaSingulation AntennaID="1" Session="SESSION_S0" TagPopulation="100" TagTransitTime="0" PerformStateAwareSingulation="false" />
    <AntennaSingulation AntennaID="2" Session="SESSION_S0" TagPopulation="100" TagTransitTime="0" PerformStateAwareSingulation="false" />
    <AntennaSingulation AntennaID="3" Session="SESSION_S0" TagPopulation="100" TagTransitTime="0" PerformStateAwareSingulation="false" />
    <AntennaSingulation AntennaID="4" Session="SESSION_S0" TagPopulation="100" TagTransitTime="0" PerformStateAwareSingulation="false" />
  </AntennaListSingulationSettings>
  <AntennaListRFModeSettings>
    <AntennaRFMode AntennaID="1" RFModeTableIndex="0" />
    <AntennaRFMode AntennaID="2" RFModeTableIndex="0" />
    <AntennaRFMode AntennaID="3" RFModeTableIndex="0" />
    <AntennaRFMode AntennaID="4" RFModeTableIndex="0" />
  </AntennaListRFModeSettings>
  <AntennaListPowerSettings>
    <AntennaPower AntennaID="1" AntennaPowerValue="3000" />
    <AntennaPower AntennaID="2" AntennaPowerValue="3000" />
    <AntennaPower AntennaID="3" AntennaPowerValue="3000" />
    <AntennaPower AntennaID="4" AntennaPowerValue="3000" />
  </AntennaListPowerSettings>
  <TriggerSettings>
    <StartTriggerSettings StartTriggerType="START_TRIGGER_TYPE_IMMEDIATE" />
    <StopTriggerSettings StopTriggerType="STOP_TRIGGER_TYPE_IMMEDIATE" />
    <ReportTriggerSettings TagReportTriggerValue="1" />
    <AutonomousMode Enabled="false" />
  </TriggerSettings>
  <PrefilterListSettings Status="Include" FilterMaskValue="3333*" />
</ReaderConfig>

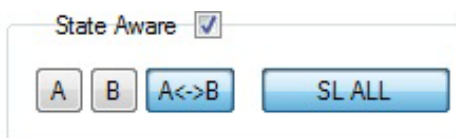
```

- Load Settings - load reader settings from a saved reader settings XML file and apply to the currently selected reader.
- Apply All Settings - apply specified reader settings to the currently select reader.
- Apply To All Settings - apply specified reader settings to all readers listed in the *Connect Reader List* drop-down.

## Antenna Singulation Settings

- **Antenna ID** - select whether to apply singulation settings to all antennas or a specified antenna.
- **Session** - specify the session of the reader.
- **State Aware** - check to select *State Aware Singulation*.
  - **A, B, A<->B** - Click to specify the inventoried flag value of the selected session: A, B or A<->B (AB Flip)
  - **SL Asserted / SL DeAsserted / SL ALL** button - click to specify the flag (SL) state: SL Asserted, SL DeAsserted or SL ALL.

Figure 52 Antenna Singulation Setting



✓ **NOTE:** The **A<->B** and **SL ALL** settings are exclusive to the FX7500, FX9600, and ATR7000 devices.

- **Tag population estimate** - the expected tag population in the field of view of the antenna.
- **Tag transit time** - the time (in milliseconds) that the tag typically remains in RF field of the antenna where the inventory operation is running.

## Antenna Stop Trigger Setting

Specify how long an inventory should be performed on a particular antenna port before it stops and switches to the next available antenna port.

**Figure 53** Antenna Stop Trigger

The trigger types are:

- **N\_Attempts**: number of inventory attempts
- **N\_Millisecs**: inventory duration in Milliseconds
- **N\_Seconds**: inventory duration in Seconds.

## Reader Login Info Setting

Specify the reader RM login credentials and select **Apply**. The credentials are applied when performing the SW update on the reader.

**Figure 54** Reader Login Info

## Antenna Enable/Disable

- **A(x)** check boxes - the number of antenna check boxes that appear equals the number of antenna ports that the reader supports. Check an antenna check box to perform inventory on this antenna port if it is physically connected to an antenna, then click **Apply**.

✓ **NOTE:** A blue antenna check box indicates that the corresponding antenna port on reader is physically connected to an antenna.

**Figure 55** Antenna Enable/Disable RF Modes

- **Antenna ID** - select whether to allow changing the RF mode for all antennas or a specified antenna.
- **RF Mode** drop-down list - lists the reader's supported RF modes and displays the mode currently set in the reader.

## Filters

- Select a filter option to *Include*, *Exclude* or *Disable* tags matching a certain criteria to be included in the *tags matching* field.

## Select Apply.



**NOTE:** Filtering is performed using pre-filters (up to the maximum allowed) and based on 96 bits EPC ID.

Because pre-filters are based on the current singulation settings, configure required singulation settings before applying filters.

## Antenna Power

- **Antenna ID** - select whether to apply the antenna power setting to all antennas or a specified antenna.
- **Antenna power slide bar** - adjust the reader-supported antenna power values.
- Select **Apply**.

## Tag Storage Setting

- **Max Tag ID Length (Byte)** - specify the maximum storage size to allocate for a tag EPC ID.

## Trigger Settings

- **Start reading**
  - **As soon as Start is pressed** - select to start inventory upon clicking the **Start** button.
  - **Start is pressed + GPI** - select to start inventory based on the GPI trigger. Select the value representing the GPI trigger (integer) to use from the drop-down list.
  - **goes** - select whether the required start trigger is **HI** or **LO**.
- **Stop reading after**
  - **Stop is pressed** - select to stop inventory upon clicking the **Stop** button.
  - **tags** - select to specify the number of tags after which to stop inventory.
  - **rounds** - select to specify the number of rounds after which to stop inventory.
  - **ms** - select to specify the number of milliseconds after which to stop inventory.
  - **GPI** - select to stop inventory based on a GPI trigger. Select the value representing the GPI trigger (integer) to use from the drop-down list.
  - **goes** - select whether the required stop trigger is **HI** or **LO**.

## Report Trigger Settings

The Report Trigger option provides the ability to specify the duration to generate tag reports.

**Figure 56** Report Trigger

Report Trigger

Tag Report Trigger  Periodic Report Trigger  sec

- **Tag Report Trigger** - enter a value to specify when to report tag data during inventory. The default settings is **1**, which implies to report Tag data immediately.



- **Periodic Report Trigger** (applies to FX7500, FX9600 and ATR7000 only) - specify the time period (in seconds) after which the tag will be reported if the tag is continued to be read after the period. The default settings is **0**, which implies that Tag reports will be generated immediately.



**NOTE:** The *Tag Report Trigger* and *Periodic Report Trigger* are mutually exclusive. *Periodic Report Trigger* has priority on *Tag Report Trigger*.

## Autonomous Mode

- **Autonomous Mode** - check to enable autonomous mode on the reader.
- **New Tag Event** - specify the new tag event mode for subscribing:
  - **Never** - report no tag data.
  - **Immediate** - report data for a new tag immediately.
  - **Moderated** - report data for a new tag only after the specified moderation time and that tag was seen for the moderation duration.
  - **ms** - when **Moderated** mode is selected, enter the moderation duration for the new tag event.

## Software Update for Multiple Readers

The Software Update option provides the ability to update multiple devices (FX7400, FX7500, FX9600 and ATR7000).

To update software for multiple readers:

1. In the *Reader Settings*, enter admin privileged *User Name* and *Password* login credentials for a selected reader in the *Connected Reader List* of the main window.
2. Select **Apply**.

**Figure 57** Reader Login

Reader Login Info ☒

User Name

Password

**Apply**



## FTP/FTPS Server Based Software Update

To update FTP/FTPS:

1. Next to *Install Software Via*, select **FTP/FTPS Server**.
2. Enter the FTP/FTPS server user account information that has access to download files from the server.
3. Provide a default admin privileged *User Name* and *Password* for the reader.

## Local File Based Software Update

To update local file based software:

1. Next to *Install Software Via*, select **File Based Upload**.
2. Select the *response.txt* file to specify the reader software package location.
3. Provide a default admin privileged *User Name* and *Password* for the reader.

**Figure 58** Software Update Screen

**Reader Info** **SW Update**

Update Settings

Install Software Via: ☒ FTP/FTPS Server ☐ File Based Upload

FTP/FTPS Path:

FTP User Name:  FTP Password:

Default Reader User Name:  Default Reader Password:

**Overall Update Status:**

Reader Name	Update %	Update Status
157.235.88.137	87%	Writing PLATFORM
157.235.88.177	100%	Reader is rebooting. Please wait for a few minutes

## Software Update Procedures

Select one or multiple readers from the connected reader list in the main window.

1. Select the *SW Update* tab from the main window.
2. Provide all required inputs for the software update.
3. Select **Start Update** to start software update on selected readers.

✓ **NOTE:** Simultaneous software update of multiple readers is supported only for FX7400, FX7500, FX9600 and ATR7000.

All selected readers in the connected reader list should have the same reader model name, either FX7400, FX7500, FX9600 or ATR7000.

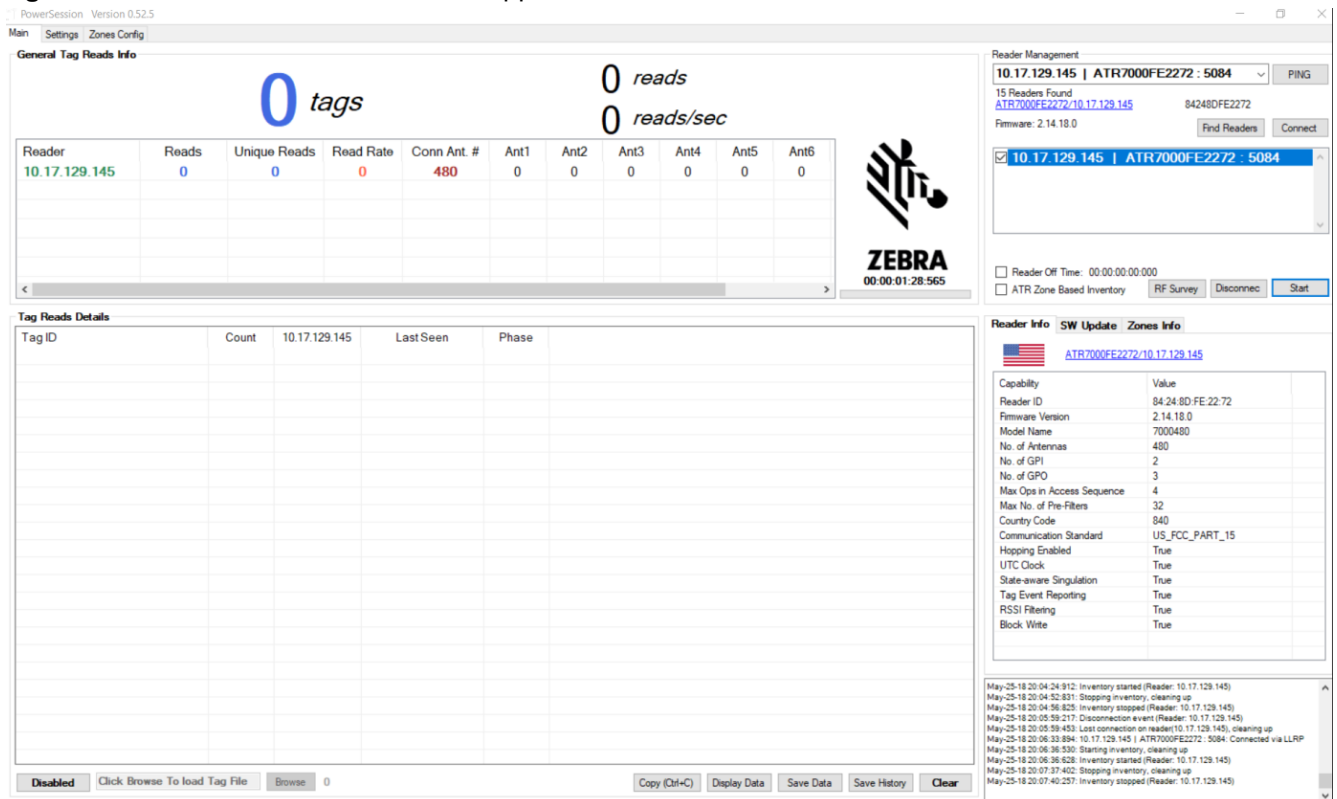
If a selected reader's login Information is not configured in the Reader Settings, PowerSession defaults to the default reader login credentials provided by the user to update reader software.

This section describes aspects of PowerSession that are only applicable when using the ATR7000. The most notable difference when using PowerSession with an ATR7000 is that for a standard fixed reader an antenna is associated with a physical port (i.e. antenna connector, cable, and antenna), whereas, for the ATR7000 with its integral beam steered antenna array, an antenna is “virtual” in the sense that an antenna is defined as a beam with a specific polarization steered in a specific direction. The ATR7000 supports a total of 291 beams, 97 directions with three distinct polarizations.

## Reading Tags with an ATR7000 Using PowerSession

1. Installation of PowerSession as described on page 52 and Connecting the RFID Reader as described on page 53 and most other information applicable to the FX series readers are also applicable to ATR7000.
2. Once connected, the application appears as shown in Figure 59 below.

**Figure 59** PowerSession for ATR7000 Application Window



3. Next, select the reader by clicking the check box left of the reader IP and click on the Start button to read tags.
4. The tags read will be displayed as show in Figure 60 below.

Figure 60 PowerSession for ATR7000 Tags Read Window

PowerSession Version 0.50.4

Main Settings Zones Config

### General Tag Reads Info

**5 tags** **2084 reads** **33 reads/sec**

Reader	Reads	Unique Reads	Read Rate	Conn Ant. #	Ant1	Ant2	A
192.168.10.11	2084	5	33	480	0	0	

**ZEBRA**  
00:00:01:08:660

### Tag Reads Details

Tag ID	Count	192.168.10.11	Last Seen	Phase
3BF00000DE0B6B3B20F0F6C	616	616	Ant97: 09:19:20:2280	0
3BF00000DE0B6B3B20F0F6E	547	547	Ant97: 09:19:20:2340	0
3BF00000DE0B6B3B20F0F6D	345	345	Ant97: 09:19:20:2090	0
3BF00000DE0B6B3B20F0F6A	176	176	Ant97: 09:19:20:2380	0
3BF00000DE0B6B3B20F0F6B	400	400	Ant97: 09:19:20:2220	0

Disabled Click Browse To load Tag File Browse 0 Copy (Ctrl+C) Display Data Save Data Save History Clear

### Reader Management

192.168.10.11 | aarfc8154 PING

3 Readers Found  
aarfc8154/192.168.10.11 00:15:70:FC:81:54  
Firmware: 2.14.8.0 Find Readers Connect

☒ 192.168.10.11 | aarfc8154

☐ Reader Off Time: 00:00:00:00:00:00 Disconnect Start  
☐ AAR Zone Based Inventory

### Reader Info SW Update Zones Info

aarfc8154/192.168.10.11

Capability	Value
Reader ID	00:15:70:FC:81:54
Firmware Version	2.14.8.0
Model Name	7400256
No. of Antennas	480
No. of GPI	2
No. of GPO	3
Max Ops in Access Sequence	4
Max No. of Pre-Filters	32
Country Code	940
Communication Standard	US_FCC_PART_15
Hopping Enabled	True
UTC Clock	True
State-aware Singulation	True
Tag Event Reporting	True
RSSI Filtering	True
Block Write	True

Apr-24-18 02:20:33:080: Inventory stopped (Reader: 192.168.10.11)  
Apr-24-18 02:24:59:673: Starting inventory, cleaning up  
Apr-24-18 02:24:59:781: Inventory started (Reader: 192.168.10.11)  
Apr-24-18 02:25:46:293: Stopping inventory, cleaning up  
Apr-24-18 02:25:46:389: Inventory stopped (Reader: 192.168.10.11)

## ATR7000 Settings

The Settings tab, shown in [Figure 61](#), is used to configure the reader to transmit pre-defined beams either singly or in a pre-determined scan sequence. There is also a setting for Antenna Power, which can be varied between 16 dBm EIRP up to a maximum of 36 dBm EIRP.

**Figure 61** ATR7000 Settings Tab

The screenshot displays the ATR7000 Settings Tab. Key sections include:

- Application Settings:** Appearance (First read only, Show tool tips, Scroll tag list), Tag Data File (Save Reader Info, Record Tag Read History, Record Unknown Tag Read History), Device Discovery (Discovery on startup).
- Product Pictures:** Show pictures, Show friendly names, Ignore first bytes, last bytes of EPC, Get pictures from file.
- Event Configuration:** Antenna Events (checked).
- Low-level Stuff:** LLRP timeout (ms), Max timeouts, UDP timeout (ms), UDP local port.
- Optimization Mode:** Enable Optimization for Tag Data Processing.
- Reader Settings:** Connected Reader List (10.17.130.78 | atr7000f41acc), Reader Description, Apply, Save Settings, Load Settings, Apply All Settings, Apply To All Readers.
- Antenna Singulation Settings:** Antenna ID (All Antennas), Session (SESSION\_0), State Aware (A, B, A<->B, SL DeAsserted), Tag population estimate (100), Tag transit time (ms) (0).
- Antenna Enable/Disable:** Antenna Sequence (A1-A48), Disable All, Enable All, LHCP All, Default, Apply.
- RF Modes:** Antenna ID (All Antennas), Mode 11: FORWARD\_LINK\_MODULATION\_PR\_ASK, 1500, DR\_64\_3, 25000, 0, MV\_4, 60000.
- Filters:** <Disabled> tags matching, Apply.
- Antenna Stop Trigger:** Antenna ID (All Antennas), Trigger Type (N\_Milliseconds), 400.
- Trigger Settings:** Start reading (As soon as Start is pressed, Start is pressed + GPI 1 goes LO), Stop reading after (Stop is pressed, tags, rounds, ms, GPI 1 goes LO), Report Trigger (Tag Report Trigger, Periodic Report Trigger), Autonomous Mode (New Tag Event, Immediate, 0 ms).
- Tag Storage Setting:** Max Tag ID Length (Byte) (64), Apply.
- Reader Login Info:** User Name, Password, Apply.
- ASCII Debug:** <Disabled> Debug Packet Types, Reported Debug Message(s), Clear Messages, 0 Enabled, Apply.
- Antenna Power:** (Selected Power / 100 dBm EIRP), Antenna ID (All Antennas), 3600, Apply.

## ATR7000 Antenna Configuration

- **Disable All** - shortcut button allows deselection of all antennas.
- **Enable All** - shortcut button allows selection of all antennas.
- **LHCP All** - allows selection of all left hand circular polarized antennas.
- **Antenna Sequence** - allows selection of antenna sequence on the ATR7000.
  - Specify a comma separated list of antennas (1,5,8,9..).
  - Specify a list (1-16).
- **Default** - allows the selection of antennas that are used in the ATR7000 in RTLS mode. When an antenna sequence is selected, it defaults to the beams used in RTLS mode. If the user has changed the antennas that are part of the antenna sequence, the **Default** button provides a shortcut to modify the antenna sequence to the RTLS mode.



**NOTE:** Virtual antennas 1 to 100, and 398 and above, are reserved and are not selectable from the Settings page. The user must scroll down in the Antenna Settings page to view enabled antennas. These antennas are highlighted in blue. See [Figure 62](#).

**Figure 62** Default Enabled Beams

Antenna Enable/Disable (Blue: Connected Antenna)

A97	<input type="checkbox"/>	A98	<input type="checkbox"/>	A99	<input type="checkbox"/>	A100	<input type="checkbox"/>	A101	<input checked="" type="checkbox"/>	A102	<input checked="" type="checkbox"/>	A103	<input checked="" type="checkbox"/>	A104	<input checked="" type="checkbox"/>
A105	<input checked="" type="checkbox"/>	A106	<input checked="" type="checkbox"/>	A107	<input checked="" type="checkbox"/>	A108	<input checked="" type="checkbox"/>	A109	<input checked="" type="checkbox"/>	A110	<input checked="" type="checkbox"/>	A111	<input checked="" type="checkbox"/>	A112	<input checked="" type="checkbox"/>
A113	<input checked="" type="checkbox"/>	A114	<input checked="" type="checkbox"/>	A115	<input checked="" type="checkbox"/>	A116	<input checked="" type="checkbox"/>	A117	<input checked="" type="checkbox"/>	A118	<input checked="" type="checkbox"/>	A119	<input checked="" type="checkbox"/>	A120	<input checked="" type="checkbox"/>
A121	<input checked="" type="checkbox"/>	A122	<input checked="" type="checkbox"/>	A123	<input checked="" type="checkbox"/>	A124	<input checked="" type="checkbox"/>	A125	<input checked="" type="checkbox"/>	A126	<input checked="" type="checkbox"/>	A127	<input checked="" type="checkbox"/>	A128	<input checked="" type="checkbox"/>
A129	<input checked="" type="checkbox"/>	A130	<input checked="" type="checkbox"/>	A131	<input checked="" type="checkbox"/>	A132	<input checked="" type="checkbox"/>	A133	<input checked="" type="checkbox"/>	A134	<input checked="" type="checkbox"/>	A135	<input checked="" type="checkbox"/>	A136	<input checked="" type="checkbox"/>
A137	<input checked="" type="checkbox"/>	A138	<input checked="" type="checkbox"/>	A139	<input checked="" type="checkbox"/>	A140	<input checked="" type="checkbox"/>	A141	<input checked="" type="checkbox"/>	A142	<input checked="" type="checkbox"/>	A143	<input checked="" type="checkbox"/>	A144	<input checked="" type="checkbox"/>
A145	<input checked="" type="checkbox"/>	A146	<input checked="" type="checkbox"/>	A147	<input checked="" type="checkbox"/>	A148	<input checked="" type="checkbox"/>	A149	<input checked="" type="checkbox"/>	A150	<input checked="" type="checkbox"/>	A151	<input checked="" type="checkbox"/>	A152	<input checked="" type="checkbox"/>

## Custom Application of ATR7000 Antenna Sequence Settings

For example, to manually apply a beam scanning sequence identical to that applied by pressing the Default button as described in the Antenna Configuration section, the user enters the following in the Antenna Sequence area on the Settings tab: 397, 325, 332, 338, 345, 328, 335, 341, 348, 330, 337, 344, 326, 333, 340, 346, 329, 336, 342. See [Figure 63](#) below for Antenna Sequence.

**Figure 63** Antenna Sequence

Antenna Enable/Disable (Blue: Connected Antenna)

Antenna Sequence ☒ 397,325,332,338,345,328,335,341,348,330,337,344,326,333,340,346,329,336,342 19 Enabled

A1	<input type="checkbox"/>	A2	<input type="checkbox"/>	A3	<input type="checkbox"/>	A4	<input type="checkbox"/>	A5	<input type="checkbox"/>	A6	<input type="checkbox"/>	A7	<input type="checkbox"/>	A8	<input type="checkbox"/>
A9	<input type="checkbox"/>	A10	<input type="checkbox"/>	A11	<input type="checkbox"/>	A12	<input type="checkbox"/>	A13	<input type="checkbox"/>	A14	<input type="checkbox"/>	A15	<input type="checkbox"/>	A16	<input type="checkbox"/>
A17	<input type="checkbox"/>	A18	<input type="checkbox"/>	A19	<input type="checkbox"/>	A20	<input type="checkbox"/>	A21	<input type="checkbox"/>	A22	<input type="checkbox"/>	A23	<input type="checkbox"/>	A24	<input type="checkbox"/>
A25	<input type="checkbox"/>	A26	<input type="checkbox"/>	A27	<input type="checkbox"/>	A28	<input type="checkbox"/>	A29	<input type="checkbox"/>	A30	<input type="checkbox"/>	A31	<input type="checkbox"/>	A32	<input type="checkbox"/>
A33	<input type="checkbox"/>	A34	<input type="checkbox"/>	A35	<input type="checkbox"/>	A36	<input type="checkbox"/>	A37	<input type="checkbox"/>	A38	<input type="checkbox"/>	A39	<input type="checkbox"/>	A40	<input type="checkbox"/>
A41	<input type="checkbox"/>	A42	<input type="checkbox"/>	A43	<input type="checkbox"/>	A44	<input type="checkbox"/>	A45	<input type="checkbox"/>	A46	<input type="checkbox"/>	A47	<input type="checkbox"/>	A48	<input type="checkbox"/>

The above sequence configures the ATR7000 to transmit first at boresight, then 18 additional beams in a random pattern at 45° elevation, azimuths 0°, 105°, 195°, 300°, 45°, 150°, 240°, 335°, etc. This sequence is similar to and achieves similar coverage and read performance for an ATR7000 using PowerSession as an ATR7000 used in an RTLS application.

A complete list of antenna beams with scan angles and polarizations supported by PowerSession is shown in [Table 2](#).

**Table 2** ATR7000 Antenna Beams Supported by PowerSession

ATR7000 Beam Configuration																									
“Reserved”																									
Azimuth	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	265	300	315	330	345	
Elevation																									
60	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
45	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
30	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	
15	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	
0	97																								
Theta Polarization																									

ATR7000 Beam Configuration																									
Azimuth	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	265	300	315	330	345	
Elevation																									
60	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	
45	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	
30	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	
15	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	
0	197																								
Phi Polarization																									
Azimuth	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	265	300	315	330	345	
Elevation																									
60	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	
45	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	
30	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	
15	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	
0	297																								
Left Hand Circular Polarization (LHCP)																									
Azimuth	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	265	300	315	330	345	
Elevation																									
60	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	
45	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	
30	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	
15	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	
0	397																								

# RapidRead

---

## Introduction

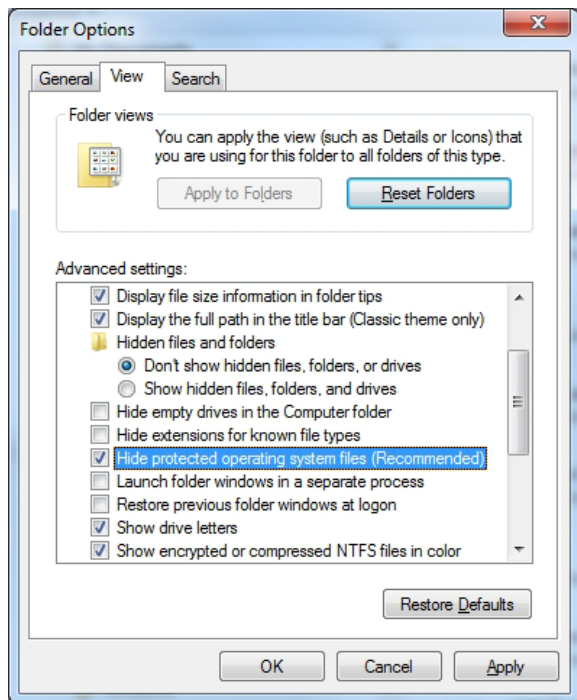
RapidRead is a RFID hand-held reader application used to demonstrate inventory and asset counting, tag writing and item locating.

## Installation

To install RapidRead on the hand-held RFID reader:

1. Locate **RapidRead** at [www.zebra.com/support](http://www.zebra.com/support).
2. Download the **RapidRead** zip file to the host PC and unzip the file.
3. Using Active Sync (XP) or Windows Mobile Device Center (Win7), connect the PC to the hand-held reader.
4. On the hand-held reader, open **File Explorer** and double click on the **Temp** folder (If the **Temp** folder is not visible, tap **Windows** icon > **File Explorer** > **Menu** > **Show All Files**).

**Figure 64** Folder Options

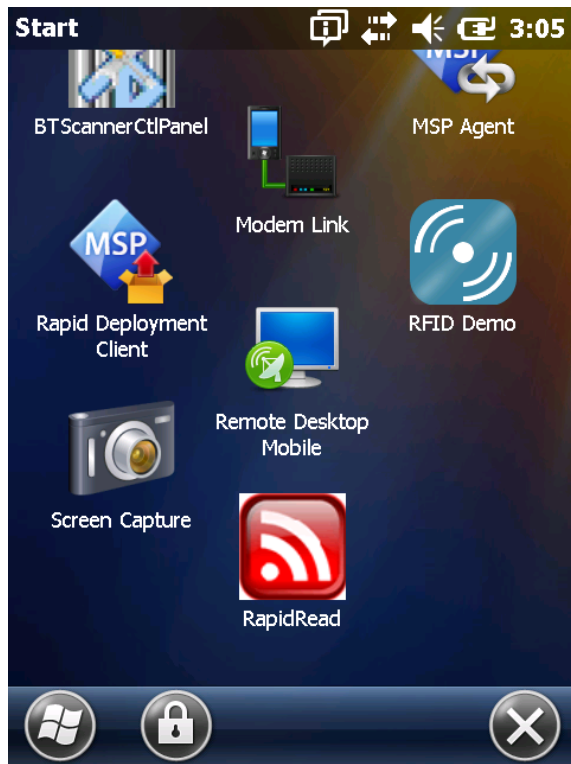


5. From the PC, copy the **CAB** file to the **Temp** folder on the hand-held reader (If the **Temp** folder is not visible, tap **Tools** > **Folder Options** > **View** > uncheck the option **Hide protected operating system files** > select **Yes** > tap **Apply**).
6. On the hand-held reader, tap on the **CAB** file to install.
7. When prompted, select **Device** for installation directory.

To access RapidRead, double tap the **RapidRead** icon on the home screen of the hand-held reader or select **File Explorer** > **Program Files** > **RapidRead**.



**Figure 65** RapidRead Icon



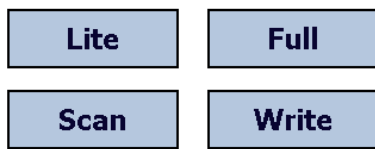
## Options

To select specific options, select **Menu > Options**.

**Figure 66** RapidRead Menu



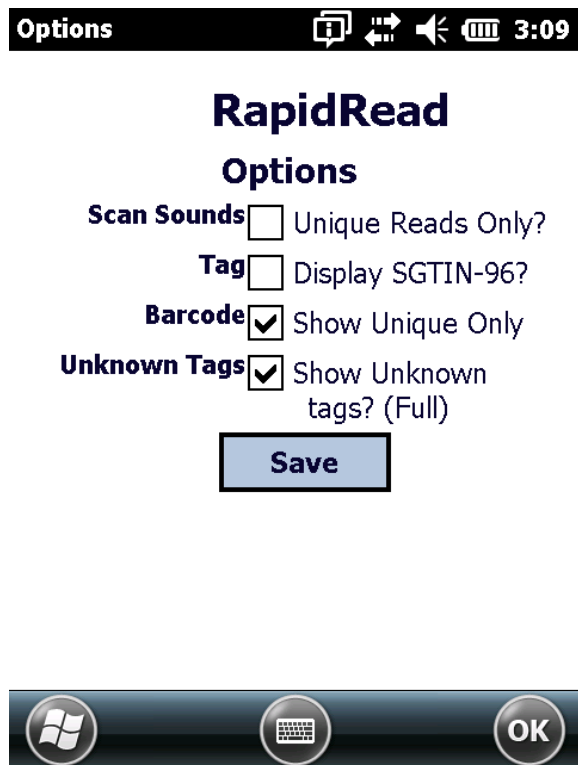
## RapidRead



The following selections are available on the **Options** screen:

- Scan Sounds (applicable for Lite and Full) - check to produce a sound for unique tag reads only, rather than on each tag read.
- Tag (applicable for Lite only) - check to display tag reads in SGTIN-96 format.
- Barcode - check to display number of unique bar codes read rather than the total number of bar codes read.
- Unknown Tags (applicable for Full only) - check to show tags which are not in the database but have been read.

**Figure 67** RapidRead Options Screen



## RapidRead Tag File

RapidRead has the ability to read and compare against an onboard tag database (tags.csv) displaying matching results, missing and unknown items that have been read during a session.

To implement after installation is complete:

1. Locate the **tags.csv** file in the **RapidRead** application folder (under **Program** files) on the hand-held reader.
2. While connected to the PC through ActiveSync or Windows Mobile Device Center, copy the **tags.csv** file from the hand-held reader to desktop.

✓ **NOTE:** The **tags.csv** file is a database of tagged inventory and is comma delimited without header information.

3. Using a simple text based application such as, Microsoft® Notepad, modify the file to match your specific tag EPC numbers and enter **Item Descriptions**. Separate the EPC number and item description with a comma per line for each 'valid' tag.
4. When complete, save the **tags.csv** file to your PC and copy the file back to the hand-held reader, replacing the original file.

✓ **NOTE:** The tag file must be renamed **tags** as it is the only database name that the hand-held reader recognizes.

**Figure 68** Sample List of Tags

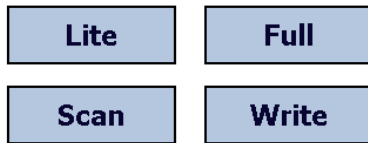
	File	Edit	Format	View	Help
	00000000000000000000000000000001,Jawbone Bluetooth				
	00000000000000000000000000000002,JawBone Bluetooth				
EPC TAG ID (24 digits)	00000000000000000000000000000003, Motorola H385 BT				
	00000000000000000000000000000004, Motorola H385 BT				
COMMA	00000000000000000000000000000005, Plantronics EX222 BT				
	00000000000000000000000000000006, Plantronics EX222 BT				
ITEM DESCRIPTION (24 chars)	00000000000000000000000000000007, Mot S9 BT Headphones				
	00000000000000000000000000000008, Mot S9 BT Headphones				
	00000000000000000000000000000009, Jabra BT DogTag				
	00000000000000000000000000000010, Jabra BT Dog Tag				

## Using RapidRead

Figure 69 RapidRead Main Screen



### RapidRead



The four modes of operation are as follows:

- Lite – read all tags in read range via RFID.
- Full – read all tags in read range via RFID; compare against database (tags.csv).
- Scan – bar code scanning (functions on both RFID enabled hand-held as well as non-RFID hand-held).
- Write – function to encode RFID tags by key entry, bar code scanning, or STGIN-96.

## RapidRead Lite

RapidRead Lite offers the following features:

- Ability to scan all standard EPC class1 GEN2 tags within read range and display tag reads.
- Display EPC number read.
- Display number of times a particular tag has been read.
- Display unique tag count.

## Summary Screen

The Summary screen displays the number of unique tags read.

Figure 70 RapidRead Lite Summary Screen



4

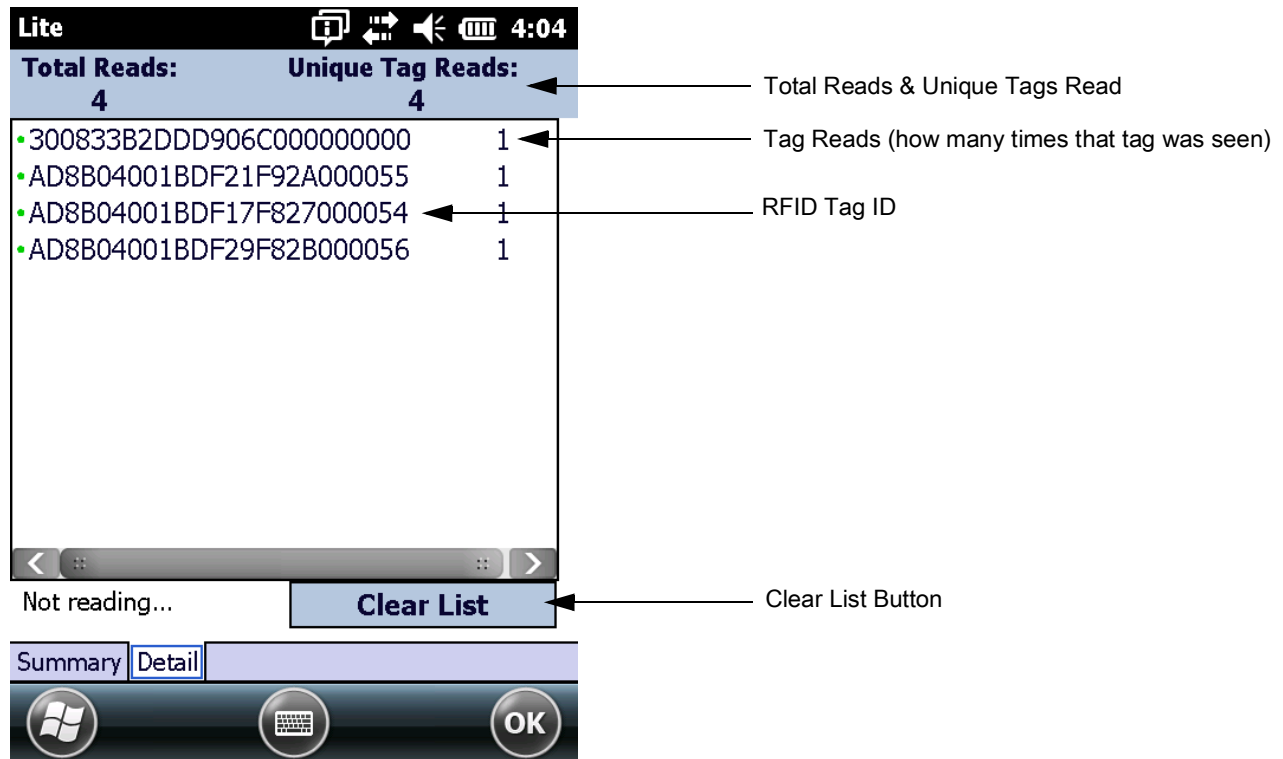


RFID Read occurs only when the trigger is engaged.

## Detail Screen

Select the **Detail** tab to display a list of individual reads. To clear the list, tap the **Clear List** button.

**Figure 71** RapidRead Lite Detail Screen



✓ **NOTE:** If SGTIN-96 format is selected, tags not in valid SGTIN-96 format appear in HEX format.

✓ **NOTE:** If the reader display cannot accommodate the tag ID length, the application displays only a portion of the tag ID. Select the tag ID to open a window that displays the entire ID.

## RapidRead Full

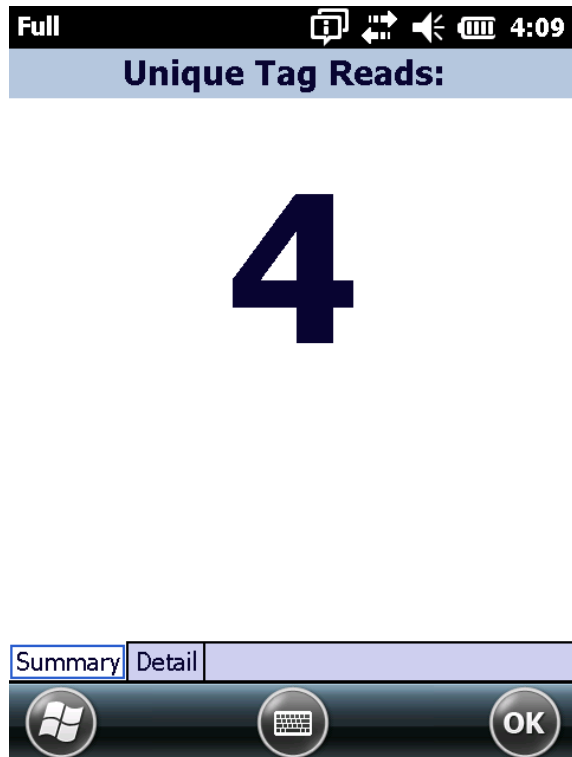
RapidRead Full offers the following features:

- Ability to scan all standard EPC class1 GEN2 tags within read range and display tag reads.
- Validate read against the tag database (tags.csv) in the RapidRead application folder.
- Display associated asset configurable description.
- Display number of times a particular tag has been read.
- Display total read and unique tag read counts.
- Visual and audible feedback to assist in locating a particular tag (Geiger counter).

## Summary Screen

The Summary screen displays the number of unique tags read.

**Figure 72** RapidRead Full Summary Screen



RFID Read occurs only when the trigger is engaged.



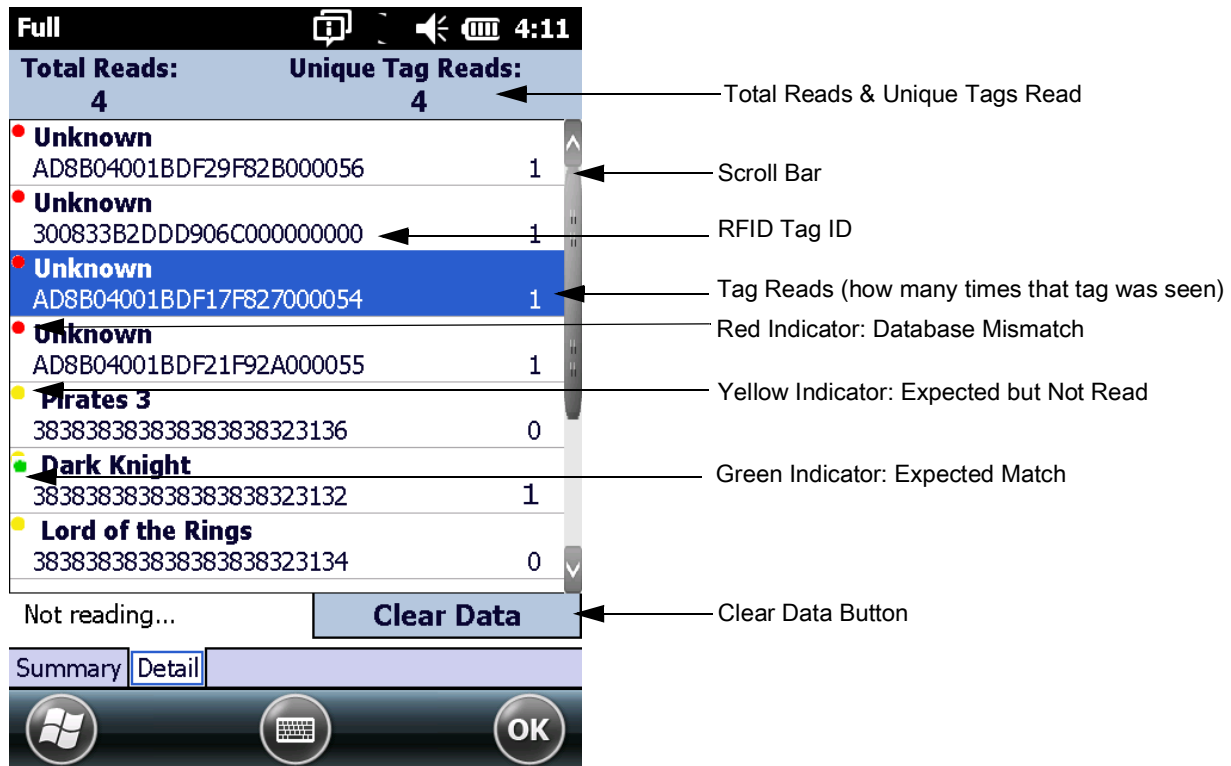
## Detail Screen

The color coded indicators (located next to the titles) are defined as follows:

- Green - read is a match to an asset that has been defined in the tags.csv file.
- Yellow - expected tag but has not been read.
- Red - read does not have a match in the tags.csv file and is classified as unknown.

Select the **Detail** tab to display a list of individual reads. To clear the list, tap the **Clear Data** button.

**Figure 73** RapidRead Full Detail Screen

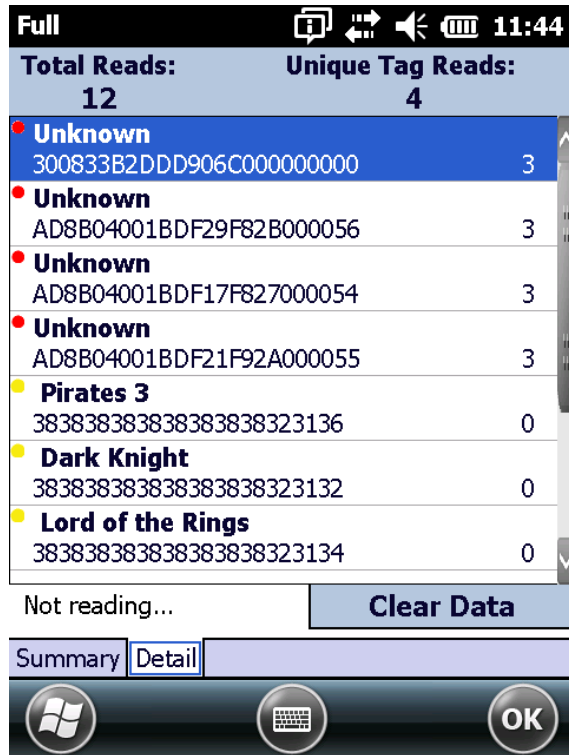


## Gieger Counter

The Gieger counter is a tag locator application that assists with locating missing items (applicable to RapidRead Full only). To use the Gieger counter feature:

1. Select the **Detail** tab.

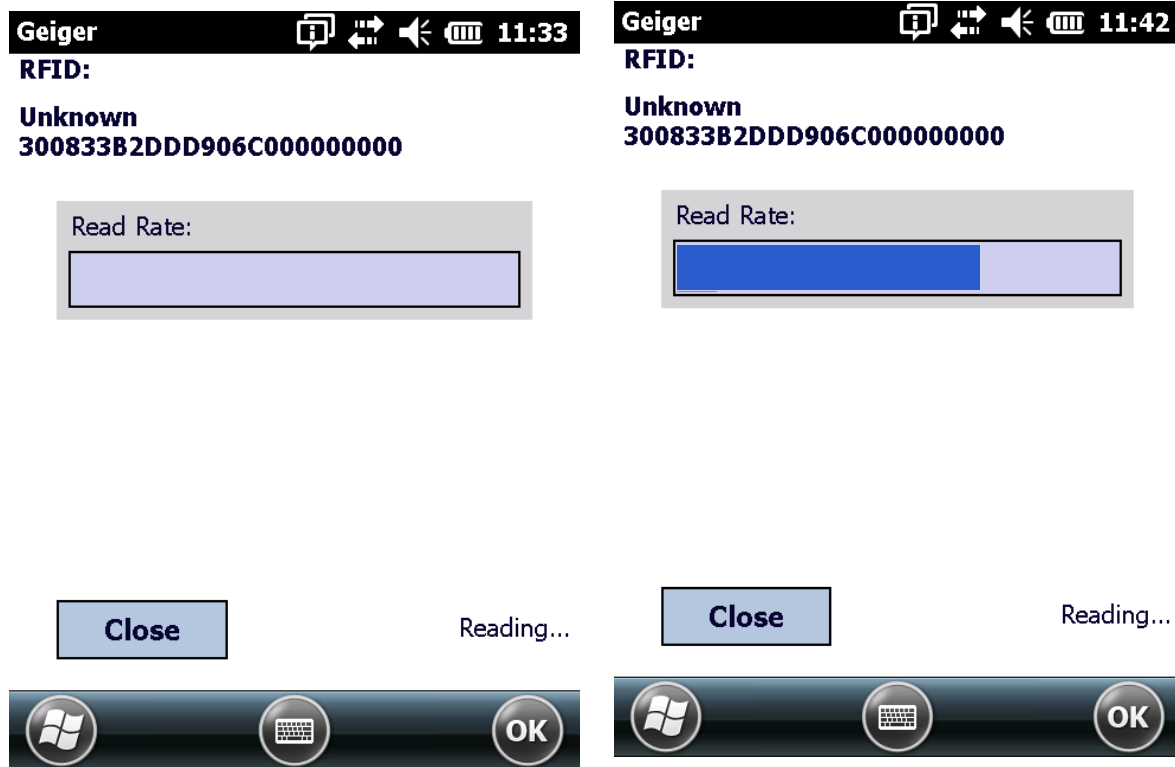
**Figure 74** RapidRead Full Detail Tab



2. Tap one of the missing items. The Geiger Counter screen opens as displayed in [Figure 75](#).

3. Pull the hand-held trigger and begin to slowly move the reader around. As the reader approaches the item, beeping frequency increases and the visual bar on the screen will become larger.

**Figure 75** Gieger Counter Read Rate



## RapidRead Scan

RapidRead Scan offers the following features:

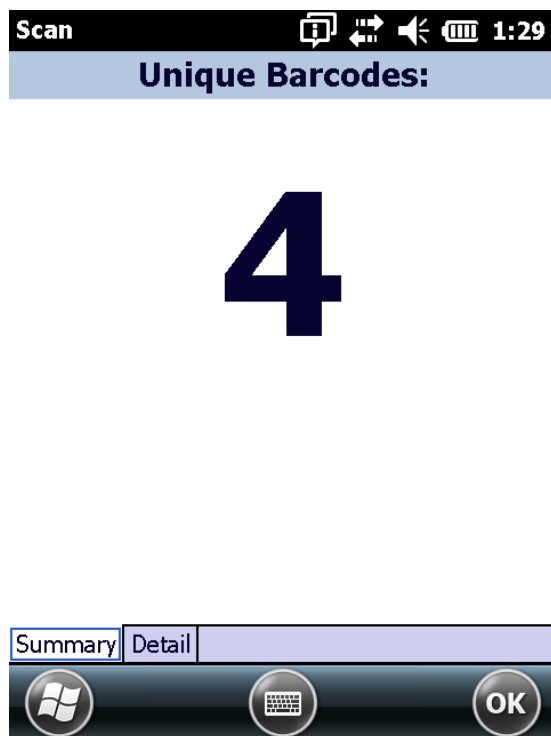
- Ability to scan bar code.
- Display bar code read.
- Display number of times a particular bar code has been read.
- Display unique bar code count.

✓ **NOTE:** RapidRead Scan mode also functions on a non-RFID hand-held devices as well.

## Summary Screen

Bar code read occurs only when the trigger is engaged. The Summary screen displays the number of unique bar codes read.

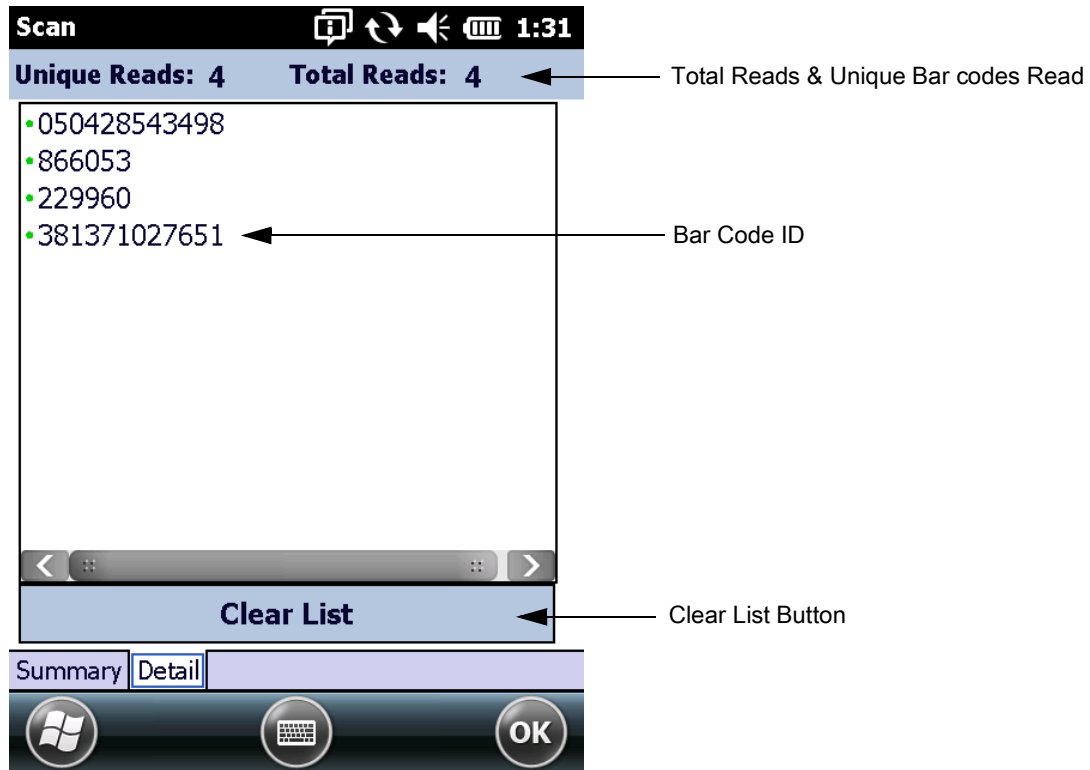
**Figure 76** RapidRead Scan Summary Screen



## Detail Screen

Select the **Detail** tab to display a list of individual reads. To clear the list, tap the **Clear List** button.

**Figure 77** RapidRead Scan Detail Screen



## RapidRead Write

The RapidRead Write methods of input are:

- Key entry
- Scan a bar code
- STGIN-96

### Key Enter Tab

To write to a tag via key entry:

1. Enter 24 digits representing the RFID tag ID.
2. Check **Auto-increment** to increment the entered number by one digit for the next tag encode.
3. Tap the **Write Tag** button to write the information to the tag. Once encoded, a successful encode message will be displayed on screen.

Figure 78 RapidRead Write Key Enter Screen

Write 10:58

**Key Enter:**

**Key Enter RFID Tag ID:**  
*(24 digits)*

☐ Auto-increment

**Write Tag**

Key Enter Barcode SGTIN-96

Windows Keyboard OK

## Bar Code Tab

To write to a tag via bar code scan:

1. Scan a bar code to enter the bar code data in the text field. Leading zeros are added to the front of the ID if the bar code contains less than 24 digits.
2. Tap the **Write Tag** button to write the information to the tag. Once encoded, a successful encode message will be displayed on screen.

Figure 79 RapidRead Write Barcode Screen

Write 11:00

Scan Barcode:

Scan Barcode for RFID Tag ID:  
(up to 24 digits)

Write Tag

Key Enter Barcode SGTIN-96 OK

## SGTIN-96 Tab

Populate fields with appropriate information.

1. Enter filter data in the **Enter FILTER** field.
2. Enter partition data in the **Enter PARTITION** field.
3. Scan the corresponding UPC bar code in the **Scan UPC** field.
4. Tap the **Write Tag** button to write the information to the tag. Once encoded, a successful encode message will be displayed on screen.

**Figure 80** RapidRead Write SGTIN-96 Screen

**Write** 11:02

**SGTIN-96:**

**HEADER = 48**

**Enter FILTER:** (001, 010, 011)

**Enter PARTITION:** (0-6)

**Scan UPC:**

**Write Tag**

Key Enter Barcode SGTIN-96 OK



# RFID Demo Application for Android

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## Introduction

Please refer to the RFD85000 and RFD2000 respective user guides for details on how to use the RFID demo application for Android.

# RFID Demo Application for iOS

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## Introduction

Please refer to the RFD85000 user guides for details on how to use the RFID demo application for iOS.

# Index

## A

antennas	46
colors	48
configuring with RFID sample application	17
enabling	62
GPI	46
GPO	46
ID	62
information	21
number connected	55
power	63
singulation settings	61
autonomous mode	64

## C

chapter descriptions	8
connection	
RFID sample application	14
conventions	
notational	8

## D

device discovery	50, 59
devices supported	10
discovering devices	50, 59

## E

EPC	45, 46
-----	--------

## F

filters	22, 49, 63
finding readers	45, 50, 59

## G

GPI	46, 50, 63
GPO	46

enabling	49
----------	----

## I

installation	
PowerSession	51, 76
connecting to reader	52
RapidRead	72
connecting to reader	72
SessionOne	40
connecting to reader	41, 52
IP address	55, 56

## L

LLRP timeout	50, 60
--------------	--------

## N

notational conventions	8
------------------------	---

## O

operating systems	10
options	
RapidRead	74
overview	8, 10
PowerSession	51
RapidRead	71, 89, 90
sample application	12
SessionOne	40
Tag Locator	36

## P

pinging reader	45, 57
PowerSession	51
connecting to reader	52, 57
installation	51, 76
main tab	55
general tag reads	55

reader	57
reader info	57
settings tab	58
antenna enable and disable	62
antenna power	63
antenna singulation settings	61
appearance	58
autonomous mode	64
device discovery	59
filters	63
low level	59
product picture	60
reader settings	60
RF mode	62
tag storage setting	63
trigger settings	63

## R

RapidRead	71, 89, 90
connecting to reader	72
full	80
gieger counter	82
installation	72
lite	78
options	74
scan	84
tag file	76
write	86
bar code tab	87
key enter tab	86
STGIN-96 tab	88
readers	
connecting to	41, 46, 52, 57, 72
discovering	50, 59
finding	45
in main tab	45, 57
information	57
IP address	55, 56
selecting	57
supported	10
reading tags	43, 54
details	46
main tab fields	45, 55
saving	45, 48, 56
settings	48
starting and stopping	46, 50, 57
with RFID sample application	13
related documents	9
requirements	10
RF mode	49, 62
RFID sample application	12
access options	25
antenna	17
antenna information	21

capabilities	14
configuration menu	16
connection	14
exiting	35
filter	22
launching	13
operations menu	21
power	20
reading tags	13
resetting defaults	20
RF mode	18
singulation	18
tag storage	16
triggers	29
RSSI	45, 46
monitoring	48

## S

saving data	56
saving history	45, 48
saving summary	45, 48
SessionOne	40
connecting to reader	41, 46, 52
installation	40
main tab	43
antennas	46
reader	45
RSSI	46
tag details	46
tag reads	45
settings tab	46
antenna colors	48
appearance	48
autologin	50
autosave	48
device discovery	50
filters	49
low level	50
product picture	49
read settings	48
RF mode	49
RSSI monitoring	48
start reading when	50
stop reading	50
tag direction	49
tag match	49
settings	46, 58
antenna colors	48
antenna enable and disable	62
antenna power	63
antenna singulation	61
appearance	48, 58
autologin	50
autonomous mode	64

autosave .....	48
device discovery .....	50, 59
filters .....	49, 63
low level .....	50, 59
product picture .....	49, 60
read settings .....	48
reader .....	60
RF mode .....	49, 62
RSSI monitoring .....	48
start reading when .....	50
stop reading .....	50
tag direction .....	49
tag match .....	49
tag storage .....	63
trigger .....	63
system requirements .....	10

## T

tag file	
RapidRead .....	76
Tag Locator .....	36
importing tag list .....	37, 38
locating tags .....	37, 38
options menu .....	39
using .....	37
tag reading .....	43, 54
details .....	46
main tab fields .....	45, 55
saving .....	45, 48, 56
settings .....	48
starting and stopping .....	46, 50, 57
with RFID sample application .....	13
TID .....	46
trigger settings .....	63

## U

UDP .....	50, 59
-----------	--------



